



Avrasya Spor Bilimleri ve Eđitim Dergisi

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How Do Swimming Students' Anthropometric Characteristics Affect Short-Course Swimming Performance?

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Original Article

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Abstract

It has been found that anthropometric swimming performance factors may be related to and affect swimming performance. In light of this, the study's objective was to examine the association between certain motoric and anthropometric traits and 25-meter freestyle swimming performance results. A total of 16 male swimming students from Yozgat Bozok University's Faculty of Sport Sciences (age: 21.75±1.23 years; weight: 78.29±13.04 kg; height: 177±5.44 cm; body fat percentage: 17±7.5 %) took part in the study as volunteers. Height, body mass, skinfold thickness, circumference measurements (biceps in flexion, calf), diameter measurements (humerus epicondyle, femur epicondyle), static flexibility measurements (shoulder flexion, trunk-neck extension, ankle extension), and strength measurements (leg strength, back strength) were carried out to assess the anthropometric measurements of swimming students. In a semi-Olympic swimming pool, short-course freestyle scores of swimming students were recorded. The data appeared to have a normal distribution after the skewness and kurtosis tests, so the Pearson Correlation test was used to look at the correlation between 25-meter freestyle swimming levels and other characteristics. It was discovered that there was no statistically significant correlation between static flexibility and strength tests and 25-meter freestyle swimming performance results, but there was a negative and statistically significant correlation between swimming performance results of swimming students and mesomorph variables ($r=-0.529$, $p=0.035$). It is believed that identifying swimmers' somatotype structures may be crucial for talent selection and serve as an indicator of swimming ability.

Keywords: Swimming, Somatotype, Strength, Flexibility, Swimming Degree

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INTRODUCTION

To overcome the frictional force in the water and propel the body forward, swimming is a movement style defined by the periodic movement of the upper and lower extremities (Barbosa et al., 2013; Bartolomeu et al., 2018). On the other hand, competitive swimming is seen as a type of cyclic sport that is done to travel a given distance as quickly as feasible (Barbosa et al., 2010). Similar to other sports, swimming performance is mostly determined by a person's aerobic, anaerobic, strength, flexibility, coordination, stroke technique, beginning turns, and anthropometric characteristics (height, weight, and body fat percentage) (Lätt et al., 2010; Sammoud et al., 2018; Zamparo et al., 2005).

The qualities that govern technique, meaning the mechanical application of force and power to the water that results in forward motion, substantially complicate the relationship between force, power, and swimming speed. Height and arm length are two characteristics that will boost mechanical power production. Leading sprinters typically stand taller on average than swimmers from other groups. Usually, the neck's length and the fathom's length are equal. On the other side, the stroke length is often 6–10% longer than the height of good sprinters. The same applies to hand and foot length. It has been observed that the swimmers who perform the best toe strikes are also the best sprinters (Stager and Tanner, 2005).

Evidence in the literature shows that anthropometric factors are related to swimming performance. It was shown that swimmers with longer lengths and limb lengths had superior swimming economy and stroke length in the study by Toussaint et al. (1991) on male freestyle swimmers. Nevill et al.'s (2015) study discovered that young swimmers had a variety of factors that contributed to their personal best 100-meter freestyle swimming times, including a higher foot-to-lower leg ratio, larger feet, shorter lower legs, and more lean body mass proves that it offers.

Sammoud et al., (2018) found that an increase in forearm circumference or volume will improve 100-meter breaststroke swimming performance and that young swimmers' hand and leg lengths substantially impact their performance. The segment length ratio (arm ratio and circumference ratio) was found to be favorably connected with the average speed performance of the 100-meter breaststroke. According to Nevill et al.'s study from 2020, swimmers perform better when they have lower body fat percentages, larger shoulders, wider stroke lengths (shorter forearm lengths), smaller arm circumferences, and wider forearm circumferences. Revealed seven traits that all swimmers share.

It is clear from the research conducted as a consequence of the literature review that physical ability and anthropometric traits influence swimming performance. In light of this, this study aims to investigate the association between anthropometric characteristics, a few motor characteristics, and 25-meter freestyle swimming abilities. It was regarded as an investigation with the objective of collecting knowledge that would benefit swimming sport coaches, athletes, and sports in general.

METHODS

Research Model

In order to evaluate 25-meter short course performance in relation to anthropometric factors and a few motor abilities, this study used an experimental cross-sectional research method.

Sampling

A total of 16 male swimming students from Yozgat Bozok University's Faculty of Sports Sciences, who consistently attend swimming lessons two days per week, have no recent sports-related injuries and are enrolled in the study voluntarily, were recruited for this research. The study's potential dangers were explained to the participants before it began, and they voluntarily provided their signatures on the participant consent form. The ethics committee approved our research for this reason. The descriptive characteristics of swimming students are given in Table 1.

Table 1. Descriptive characteristics of the participants

Descriptive Characteristics	N	M	SD
Age (year)	16	21.75	1.23
Height (cm)	16	177	5.44
Weight (kg)	16	78.29	13.04
Body Fat (%)	16	17	7.5
Swimming Time (s)	16	20.82	2.62

Mean (M), Standard deviation (SD)

Data Collection Tools

Height and Body Weight Measurements: A tape measure that was attached to the wall was used to measure the height of the swimming students. Body weight was determined with bare feet and only swimwear on using a SECA brand (Germany) digital scale with a precision of 0.1 kg (Lohman et al., 1988).

Body Fat Percentage (%) Calculation: The body fat percentage (%) was calculated using Yuhaz's method.

The percentage of fat calculated using Yuhaz's formula is equal to $5.783 + 0.153$ (triceps skinfold thickness + supra iliac skinfold thickness + abdominal skinfold thickness).

Skinfold Thickness Measurements: Skinfold thickness measurements were taken from the subscapular, triceps, biceps, chest, abdominal, supra iliac I, supra iliac II, thigh, calf, and midaxillary regions with a Holstein brand (UK) skinfold caliper. Measurements were made on the right side of the body. After grasping the thickness of the subcutaneous fat layer with the thumb and forefinger and gently pulling, the caliper was placed approximately 1 cm away from the fingers. The distance between the ends of the caliper pressing on the skin folds was read from the indicator after waiting for 1-2 seconds and recorded in mm (Lohman et al., 1988).

Circumference Measurements: Circumference measurements were made from the flexed biceps and calf regions using a Gulick anthropometric tape measure (UK). Measurements were taken

twice on the right side of the body, and the average of the two measurements was used when calculating. Measurements were completed as suggested by Callaway et al. (1998).

Diameter Measurements: Diameter measurements were taken from the humeral epicondyle and femoral epicondyle with Lafayette brand (USA) sliding caliper. Appropriate areas on the body were identified before measurements were taken, and the tip of the caliper was used by applying as much pressure as possible. Measurements were made as suggested by Wilmore et al. (1988).

Somatotype Evaluation: Somatotype values were determined by Heath Carter Somatotype Method. Formulas were determined using body weight, height, flexion biceps, calf circumference, femur and humerus diameter measurements, and somatotype values for triceps, subscapular, supra iliac, biceps, and calf skinfold thickness (Carter, 2002).

Endomorphy= $-0.7182+0.1451*x-0.00068*x^2+0.0000014*x^3$ (x=Triceps skinfold thickness+suprailiac skinfold thickness+subscapula skinfold thickness)

Height Correction Formula= $x*170.18/\text{height (cm)}$

Mesomorphy= $[0.858+0.601*\text{elbow width-humerus diameter (cm)}+0.601*\text{knee width-femur diameter (cm)}+0.188*\text{arm circumference (cm)}+0.161*\text{calf circumference (cm)}]-[\text{height (m)}*0.131]+4.50$

Ectomorphy= $(\text{Length-to-weight ratio})*0.732-28.58$ (Length-to-weight ratio= $\text{Height}/\sqrt[3]{\text{Weight}}$)

Measuring Static Flexibility: With the aid of a tape measure that was fastened to the wall, measures of ankle extension, trunk-neck extension, and shoulder flexion were taken. The best result was achieved after two measurements, and it was noted on the data sheet. To evaluate shoulder flexion, participants lie on their backs with their arms shoulder-width apart and raise their arms as high as they can while keeping their torsos off the ground. It was determined how far the hand's tip was from the acromial point. The participants were in the prone position with their hands folded behind their backs, raising their heads as high as they could for the measurement of trunk-neck extension. The measurement in millimeters was made at the point that corresponded to the nose level. The participants stretched their right leg as far as they could while seated to measure ankle extension, and the point on the tape measure that touched the ground was considered to be zero. According to Özer (2013), a measurement was made between the wrist extension and the ground and the top of the foot.

Strength Measurements: Strength measurements were measured with a Takei brand (Japan) digital back-leg dynamometer. In the measurement of leg strength, the participants placed their feet on the dynamometer bench and pulled the dynamometer bar, which they grasped with their hands, vertically using their legs, while the knees were bent, the arms were tense, the back was straight, and the body was slightly bent forward. The value on the display is recorded in kilograms. In the measurement of back strength, the participants placed their feet on the dynamometer table and pulled the dynamometer bar vertically up, with the knees and arms stretched, the back straight and

the body slightly bent forward. The value of the indicator was recorded in kilograms (Aslan et al., 2011).

25 m Swimming Performance Measurements: Students' performances in the 25-meter swim were measured using a hand timer made by the Casio company. After the prescribed warm-up routine, which consisted of 10 minutes of on-land jogging and 10 minutes of slow swimming in a pool, the students were allowed to participate in the test (Yazar et al., 2021). The directive to exit the sprint stone signaled the start of the timer, and 25 meters of freestyle swimming were entered on the athlete information form.

Ethical Approval

During the research Helsinki Declaration was followed and this study was approved by of Yozgat Bozok University Clinical Research Ethics Committee (Date: 29.12.2022; Decision no: 2017-KAEK-189_2022.12.29_05)

Collection of Data

All measurements were completed within 3 days. Anthropometric, static flexibility and strength measurements were made on the first day. Then one day was suspended. On the third day, short-term performance measures were collected. Short lane measurements were repeated three times. Participants rested after each repetition until they recovered completely. The best of three measurements was taken and included in the statistical analysis. For the analysis of the data, the short course performance results of the swimming students' were collected after anthropometric tests.

Analysis of Data

The data obtained for the statistical analysis and evaluation of the study were analyzed using the SPSS 22.0 program. The skewness and kurtosis tests were used to determine whether the data showed a normal distribution, and it was seen that the data showed a normal distribution. Pearson Correlation test was applied to examine the relationship between 25 meters freestyle swimming performance results and other variables. The level of significance in the study was accepted as $p < 0.05$.

RESULTS

The findings regarding the correlation values of swimming students' somatotype, static flexibility, and strength tests, and 25 meters freestyle swimming performance results are given in Table 2.

Table 2. Correlation values of swimming students' somatotype, static flexibility, and strength tests, and 25 meters freestyle swimming performance results

Variables	N	M	SD	R	P
Endomorph	16	5.02	1.86	0.142	0.59
Mesomorph	16	4.92	1.70	-0.529	0.03*
Ectomorph	16	1.92	1.16	0.121	0.65
Shoulder Flexion (cm)	16	50.84	9.83	-0.418	0.10
Trunk-Neck Extension (cm)	16	39.18	6.71	-0.292	0.27
Ankle Extension (cm)	16	11.15	2.26	0.021	0.93
Leg Strength (kg)	16	144.18	29	-0.497	0.05
Back Strength (kg)	16	170.68	38.25	-0.369	0.15

Mean (M), Standard deviation (SD), Correlation coefficient (R), * $p < 0.05$

When the relationship between swimming students' somatotype structures and their 25-meter freestyle swimming degrees is examined, it is found in Table 2 that there is a negative, moderate, and statistically significant relationship between swimming performance results and mesomorph variables ($r = -0.529$, $p = 0.035$), but no significant relationship was found between endomorph ($r = 0.142$, $p = 0.599$), and ectomorph ($r = 0.121$, $p = 0.655$) variables. No statistically significant correlation was found between swimming performance results and static flexibility test variables such as shoulder flexion, trunk neck flexion and ankle extension (Respectively: $r = -0.418$, $p = 0.108$; $r = -0.292$, $p = 0.272$; $r = 0.021$, $p = 0.938$). In addition, no statistically significant relationship was found between swimming performance results and strength test variables such as, leg strength and back strength (Respectively: $r = -0.497$, $p = 0.050$; $r = -0.369$, $p = 0.159$).

DISCUSSION AND CONCLUSION

Knowing the physical and anthropometric characteristics that underlie swimming performance is crucial for skill development and appropriate program targeting (Bond et al., 2015). Range of motion (ROM), power force on land, and anthropometric qualities are the specific technical factors that an athlete uses to maximize the average race pace (Nicol et al., 2022). Accordingly, the study looked into the correlation between anthropometric characteristics, a few motor characteristics, and 25-meter freestyle swimming performance. This study is limited to 16 male volunteer participants studying at Yozgat Bozok University Faculty of Sport Sciences. Only the assessment of back and leg strength was applied to the volunteer participants.

There was no difference between the 50 m freestyle swimming stroke rate and 50 m freestyle swimming degrees in the study by Ozlu and Akkus (2016), which involved 31 male swimmers and measured the effect of 50 m freestyle stroke rate on performance. Freestyle swimming performance also increased as body weight went up. It has been found that the swimmers have an

endo-mesomorph body type is an important finding pointing to an increase in performance. In Ozkadi's (2019) thesis study, which included 40 swimmers, 20 male and 20 female, aged 16 to 17, it was discovered that long jump, aerobic endurance, speed characteristics, and flexibility in men significantly affect swimming performance. In contrast, women's swimming performance is significantly influenced by height, hand, foot, forearm circumference, body composition, long jump, speed, agility, and balance characteristics. In the study of Tahillioğlu et al., (1999) on 24 male elite swimmers aged 18-21 years, it was seen that the somatotype structures of the swimmers were mesomorphic and when their anthropometric characteristics were examined, they were taller, broader-shouldered, and more muscular, and the muscle density was especially in the shoulders and upper body. It has also been stated that height provides a significant advantage to the athletes during the start, races, turns, and finishes. Yazar et al. (2021), in which he investigated the effects of physical and anthropometric features on sprint swimming performance on 15 male swimmers aged 19-23 years, and found that anthropometric features such as height, arm length, stroke length, leg length, and body length were particularly effective in 50 m freestyle sprint swimming performance. In addition, it is recommended to pay attention to these features when choosing athletes for short-distance swimming or when creating a team.

It was determined that there was a relationship between anthropometric features and swimming performance after looking at studies with similar research designs in the literature. This relationship included somatotype, some motoric features, and anthropometric features. Swimming results, a performance measure in this study, had a negative, moderate, and statistically significant association with the mesomorph variable. It was shown that swimming time dropped, and performance improved as students got closer to the mesomorph body type. In contrast to similar studies, the variables of static flexibility tests and time of swimming were shoulder flexion, trunk-neck extension, and ankle extension. It is believed that the reason there is no correlation between leg strength and back strength, which is one of the variables of strength tests, is because the swimming students are not at the elite level and train less than the elite level athletes. In Özkadi's (2019) study, the relationship between flexibility and swimming performance results may be because it consists of swimming athletes who have at least 3 years of sports age and participate in competitions.

In a study by Ozkan et al. (2010), 15 female volleyball players aged 14 to 20 competing in the second league had their body composition values, somatotype characteristics, anaerobic performances, and isometric leg-back strength measured. It has been determined that leg-back strength is also a factor in determining anaerobic performance. Additionally, it was noted that volleyball players' body fat percentages are normal. In Muñoz et al.'s (2020) study examining the anthropometric characteristics, body compositions, and somatotypes of 90 elite male runners between the ages of 17-23, the runners were divided into two groups middle-distance runners and long-distance runners according to their specialties. It has been found that middle-distance runners have more height, body weight, upper arm circumference, total upper arm area, and upper arm and thigh muscle area than long-distance runners. It has been stated that normative data that can help trainers in determining the abilities of elite middle and long-distance runners are provided. In the study of Penichet-Tomas et al. (2021), in which 13 elite male and 11 female traditional rowers

aged 23-31 participated, the anthropometric profile, body composition, somatotype of rowers, and which variables could be used as determinants of rowing performance were investigated. Male rowers have more muscle mass, girth, and width and are taller and heavier; female rowers were found to have higher skinfold total and fatter mass. Ectomorphs in male rowers; Balanced mesomorph body type was found in female rowers. It was found that height was the best predictor of rowing performance for male rowers, while muscle mass was the best predictor of rowing performance for female rowers. It was stated that the values found can be used as reference values for the coaches and rowers of traditional rowers competing at the national level. In the study of Marinho et al. (2016), in which 8 elite male mixed martial arts athletes between the ages of 26-36 participated, the body compositions, somatotypes, and physical fitness of the athletes were examined. It has been observed that athletes have high lean body mass and predominantly mesomorph body type. It was found that abdominal and upper extremity endurance were at a good level, but lower extremity performances in the long jump were weak. On the other hand, lower maximal power levels were obtained in the squat and bench press tests. It has been suggested that the results can be used in the skill detection process in mixed martial arts athletes.

When the studies in the literature investigating the anthropometric, somatotype, and some motoric characteristics of athletes in branches other than swimming are examined, it is seen that the anthropometric characteristics and somatotype structures of the athletes can play an important role in their talent selection according to the branches and may have an effect on their performance. The outcomes of this study and these results shows similarity. As a result, there was a negative and statistically significant relationship between swimming students' swimming performance results and the mesomorph variable ($r=-0.529$, $p=0.035$), while a statistically significant relationship was not found between static flexibility and strength tests and 25 meters freestyle swimming performance results.

The findings of the present study indicated that the somatotype structures of swimmers are regarded to be a significant factor in skill selection and to be a predictor of swimming success. And also, mesomorph variables play a significant role in and 25 meters freestyle swimming performance. In addition, body composition was found to be an important factor in 25 meters freestyle swimming performance of swimmer. The somatotype structures of the athletes can be used to create training plans, and the association between various swimming distances and somatotype structures, anthropometric measurements, and motoric features can be investigated.

Conflict of Interest: There is no personal or financial conflict of interest between the authors in this article.

Authors' Contribution: Research Design-EE; AO, Data Collection-EE, Statistical Analysis-IK; EE; HY; AO, Manuscript Preparation-EE; IK; HY; AO.

Ethical Approval

Ethics Committee: Yozgat Bozok University Clinical Research Ethics Committee

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Yarışmacı Vücut Geliştirme Sporcularının Egzersiz Bağımlılığı Düzeylerinin İncelenmesi

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Öz

Egzersiz bağımlılığı kişinin aşırı egzersiz yaptığı, fiziksel ve psikolojik olarak zarar gördüğü, iyilik halinin etkilendiği bir durumdur. Bu araştırmada yarışmacı vücut geliştirme sporcularının egzersiz bağımlılık düzeylerinin incelenmesi amaçlanmıştır. Araştırmanın çalışma grubunu Kişisel Bilgi Formu ve Egzersiz Bağımlılığı Ölçeği'ni (EBÖ) dolduran 23 kadın ve 126 erkek yarışmacı vücut geliştirme sporcusu oluşturmuştur. Katılımcıların yanıtlarından elde edilen verilere göre yarışmacı vücut geliştirme sporcularının toplam egzersiz bağımlılık (TEB) puanları, tamamının egzersiz bağımlısı olduğunu göstermiştir. Ayrıca katılımcıların EBÖ'nün aşırı odaklanma ve duygu değişimi (AODD) alt boyutunda aşırı bağımlı, bireysel ve sosyal ihtiyaçların ertelenmesi (BSIE) ve tolerans gelişimi ve tutku (TGT) alt boyutlarında egzersiz bağımlısı oldukları tespit edilmiştir. Yapılan analizler sonucunda cinsiyet, yaş, eğitim durumu, antrenman süresi, haftalık antrenman sayısı, spor yılı değişkenlerinde TEB seviyeleri ve alt boyutlarında anlamlı farklılıklar tespit edilmiştir. Milli sporcu olma değişkenine göre TEB ve alt boyutlarında istatistiksel olarak anlamlı bir farklılığın olmadığı belirlenmiştir. Tespit edilen bağımlılığın sebebi temel olarak sporculardaki mükemmeliyetçilik algısı, sosyal fizik kaygısı ve sosyal kabul duygusu gibi kavramlar ile açıklanmaya çalışılmıştır.

Anahtar kelimeler: Bağımlılık, Egzersiz, Spor, Vücut geliştirme, Yarışmacı sporcu

Examining the Exercise Addiction Levels of Competitive Bodybuilders

Abstract

Exercise addiction is a condition in which a person engages in excessive exercise, resulting in physical and psychological harm and affecting their well-being. The aim of this study was to examine the exercise addiction levels of competitive bodybuilders. The study group consisted of 23 female and 126 male competitive body building athletes who filled out the Personal Information Form and Exercise Addiction Scale (EAS). According to the data obtained from the participants' responses, the total exercise addiction (TEA) scores of the athletes indicated that all of them were exercise addicts. Additionally, it was found that the participants were excessively dependent on extreme focus and mood alternation (EFMA) sub-dimension of the EAS, as well as the postponement of individual and social needs (PISN) and the development of tolerance and passion (DTP) sub-dimensions. The analyses revealed significant differences in TEA levels and sub-dimensions in terms of gender, age, educational status, training duration, weekly training frequency, and years of sports practice variables. However, no statistically significant differences were found in TEA and sub-dimensions based on the variable of being a national athlete. The identified addiction was primarily attributed to concepts such as perfectionism perception, social physique anxiety, and sense of social acceptance in athletes.

Keywords: Addiction, Exercise, Sports, Bodybuilding, Competitive athlete

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GİRİŞ

Mükemmel bir vücut ideali ile başarının ilişkilendirilmesi kökenleri antik Yunan'a dayanan bir anlayıştır. Günümüzde ise iri ve estetik bir vücuda sahip olma algısı tüketim toplumunun sembolleri arasında gösterilmektedir (Corazza vd., 2019). Bu algıyla günümüzde yarışmacı ve rekreasyonel vücut geliştirme sporuna olan ilginin dünya genelinde gün geçtikçe arttığı, fitness merkezleri ve üye sayılarına bakılarak söylenilebilir. Diğer sporlardan farklı olarak vücut geliştirme, yeteneğin değil, estetiğin değerlendirildiği bir spordur. Sporcular derecelendirilirken kaslarının boyutu, şekli, simetrisi, definasyonu ve yağ seviyesi gibi özellikleri incelenir (Schoenfeld vd., 2020). Vücut geliştirme sporunda yarışma organizasyonları, erkeklerde vücut geliştirme, fizik, klasik fizik, kadınlarda ise body fitness, fizik, bikini fitness, wellness fitness gibi kategorilere ayrılmıştır (Türkiye Vücut Geliştirme, Fitness ve Bilek Güreşi Federasyonu, 2022). Ayrıca erkek ve kadın vücut geliştirme yarışmaları en çok bilinen yarışmalar olmakla birlikte erkek yarışmaları daha popülerdir.

Bir vücut geliştirme yarışmasına hazırlanmak sporcular için çok uzun ve zahmetli bir süreçtir. Hazırlık dönemi "hacim oluşturma" ve "kesme" olmak üzere iki farklı antrenman planlaması gerektirir (Lambert vd., 2004). Genellikle aylarca süren hacim oluşturma aşamasında, kalori fazlası özel bir diyet planı ve yüksek direnç antrenmanı yöntemi uygulanır. Böylelikle kas anabolizması aktif tutturarak büyümenin en üst düzeye çıkartılması hedeflenir (Lambert vd., 2004). Kesme aşamasına, yarışma tarihinden 8 ila 16 hafta önce geçilir. Bu safhanın amacı mümkün olduğunca kas kaybı yaşamadan kalori açığını koruyarak yağ kaybetmektir. Vücut geliştirme sporcuları yarışmadan bir hafta önce, karbonhidrat tüketimini azaltarak kaslardaki glikojeni azaltırlar ve su ve sodyum alımını sınırlayarak kasların dehidrasyonunu sağlarlar (Fussell, 2015). Son olarak genellikle yarışmadan önceki gün diüretik kullanarak kas definasyonunu geliştirirler (Lambert vd., 2004). Yukarıda açıklandığı gibi, vücut geliştirme sporu aşırı yorgunluk ve yüksek psikolojik gerginliklerin oluşabileceği bir spor olup yüksek motivasyon, derin bağlılık ve büyük özveri gerektirmektedir. Diğer sporlarda olduğu gibi vücut geliştirme sporunda da sporcuların başarılı olmak uğruna sağlıklarını tehdit eden tutum ve davranışlar sergilediği bilinmektedir (Cafri vd., 2005).

Bir maddenin, nesnenin veya yapılan davranışın ruhsal, fiziksel ya da sosyal sorunlara yol açmasına rağmen devam edilmesi, bırakma isteğine karşılık bırakılamaması ve sürdürme isteğinin durdurulamaması bağımlılık olarak tanımlanır (Ögel, 2010). Geçmişte bağımlılık denilince sigara, alkol, uyuşturucu gibi madde bağımlılıkları akla gelirken günümüzde oyun, alışveriş, dizi, egzersiz ve internet gibi süreç bağımlılıkları da akla gelmektedir (Nazlıgül ve Yılmaz, 2019). Düzenli egzersiz alışkanlığı sağlıklı bir davranış olarak kabul edilse de, bazı insanlar için aşırı veya takıntılı boyuta ulaşabilen, zarar verici saplantı olan, egzersiz bağımlılığına (EB) dönüşebilir (Szabo ve Griffiths, 2007). EB tanısının yedi belirtisi vardır. Bunlar; (1) Tolerans, egzersiz yoğunluğunun tatmin etmemesi veya yoğunluğun artırılması (2) Egzersiz yoksunluğu, egzersizin yapamamadan kaynaklanan kaygı ve stres ve yorgunluk (3) Niyet, egzersiz süresinin ve miktarının aşılması (4) Kontrol kaybı, egzersiz şiddetini arttırma isteği, egzersizi bırakmama veya kontrolden çıkarma

isteği (5) Zaman, ise egzersiz için ayrılan zamanın çok fazla olması (6) Soyutlama, çevresi ve iş hayatı ile ilgili aktivitelerini egzersiz yapmak için azaltması (7) Devamlılık ise hastalık veya sakatlığı egzersize devam etmek için görmezden gelmedir. Bu yedi semptomdan üçünün görülmesi kişiye egzersiz bağımlılığı (EB) tanısının konulması için yeterlidir (Amerikan Psikiyatri Birliği, 2001). Bu durum sonucunda kişi fiziksel ve/veya psikolojik sıkıntıya girebilir ve sağlığını kaybedebilir (Hausenblas ve Downs, 2002a; Lichtenstein ve Hinze, 2020). EB'yle ilgili araştırmalar davranışsal (egzersiz sıklığı), psikolojik (kompulsif davranış) ve fizyolojik (tolerans ve geri çekilme) faktörler üzerinde yoğunlaşmıştır (Hausenblas ve Downs, 2002b).

Sporcuların hedeflenen başarıya ulaşabilmesi için hazırlanan antrenman plan ve programlarının sıklık, süre ve yoğunluğuna dikkat etmeleri ve kusursuz bir doğrulukta uygulamaları gerekmektedir (Berczik vd., 2012). Alanyazındaki 77 çalışmanın sistematik incelemesine göre EB'nin yaygınlık oranı, spor türü, örneklem grubu ve kullanılan ölçüm aracına göre %3 ila %13 arasında değişiklik göstermektedir (Hausenblas ve Downs, 2002a). Pallanti vd. (2006), İtalya'da lise öğrencileriyle gerçekleştirdiği çalışmada elde ettiği %13'lük EB oranı diğer araştırmacıların sonuçlarına kıyasla oldukça yüksek gözükmektedir. Öte yandan dayanıklılık sporcuları ile yapılan çalışmalarda Ziemainz vd. (2013), %4,5 oranında ve Zeulner vd. ise (2016) %2,7 oranlarında EB yaygınlığı gözlemlemişlerdir. Szabo ve Griffiths (2007) gerçekleştirdikleri çalışmada, egzersiz yapan genel nüfusun %3,6'sı ve İngiliz spor bilimleri fakültesi öğrencilerinin %6,9'unun egzersiz bağımlısı olduklarını rapor etmişlerdir. Başka bir çalışmada Lichtenstein ve Jensen (2016), crossfit uygulayıcılarının %5'inin ve fitness yapan bireylerin %9,7'sinin egzersiz bağımlısı olduklarını belirtmişlerdir. Danimarka'da bireysel ve takım sporlarındaki EB'nin karşılaştırdığı çalışmada Lichtenstein vd. (2014), futbolcuların (%7,1), fitness yapan bireylerden (%9,7) daha düşük bir oranda egzersiz bağımlısı olduklarını ancak aralarındaki farkın istatistiksel olarak anlamlı olmadığını işaret etmişlerdir. Diğer yandan bu çalışmalar küçük katılımcı gruplarıyla gerçekleştirilmiştir. Ayrıca bu çalışmalardaki nüfusun büyük bir kısmının düzenli fiziksel aktiviteye katılma alışkanlığının olmadığı bilinmektedir. Bu durum, genel nüfus içindeki EB yüzdesinin çok daha küçük olduğunu işaret etmektedir (Kohl vd., 2012).

Yarışmacı sporcuların egzersiz bağımlılık seviyelerini inceleyen çalışmalara yerli ve yabancı literatürde rastlanmaktadır. Ancak bildiğimiz kadarıyla yarışmacı vücut geliştirme sporcularının (YVGS) egzersiz bağımlılıklarıyla ilgili çalışmalar yabancı literatürde nadir olarak gözükmektedir. Türkiye'deki YVGS egzersiz bağımlılık seviyelerini kapsamlı bir araştırmayla inceleyen çalışmaya ihtiyaç duyulmaktadır. Bu sebeple bu araştırma, yarışmacı vücut geliştirme sporcuları arasında EB'nin yaygınlığını belirlemeyi ve bazı değişkenlere göre incelemeyi amaçlayan tanımlayıcı bir çalışmadır. Fitness merkezlerine beden sağlığı ve estetiğini geliştirmeye yönelik amaçlarla başlayan bireylerin süreç içerisinde egzersiz bağımlısı olabileceklerini bilmeleri gerekmektedir. Bu konuda farkındalık geliştirmeleri, kendilerini korunmaları ve önlem almaları önemli bilişsel ve davranışsal kazanımlar arasındadır. Bu çalışma ve bu çalışma ekseninde gerçekleştirilecek yeni çalışmaların EB semptomları konusunda farkındalık oluşturmada katkı sağlayacağı düşünülmektedir.

METOT

Araştırma Modeli

Bu çalışma nicel yöntemlerden betimleyici model deseninde gerçekleştirilmiştir. Bu model var olan değişkeni olduğu haliyle araştırıp açıklamayı hedeflemektedir (Karasar, 2007).

Araştırma Grubu

Çalışmanın evrenini Türkiye Vücut Geliştirme Fitness Şampiyonası ve Avrupa Şampiyonası Milli Takım seçmelerine katılan 219 sporcu oluşturmaktadır. Evreni belirli örneklem yönteminde 0.3 etki büyüklüğü, 0.05 anlamlılık seviyesi ve %95 güç düzeyi ve kullanılarak yapılan hesaplama sonucunda çalışmaya en az 140 sporcunun katılması gerektiği bulunmuştur (Patton, 2002). Bu bağlamda çalışmanın örneklem grubunu anketi eksiksiz olarak tamamlayan 23 kadın ($Ort.yaş=23.26$, $S=3.29$), 126 erkek ($Ort.yaş=26$, $S=4.39$) olmak üzere toplam 149 ($Ort.yaş=25.58$, $S=4.34$) elit vücut geliştirme sporcusu oluşturmaktadır. Bu sayı çalışmanın gerçekleştirilmesi için gerekli olan sayıdan fazladır. Örneklem grubu ile ilgili demografik bilgiler Tablo 1 de verilmiştir.

Tablo 1. Araştırmadaki bağımsız değişkenlerin dağılımı

Bağımsız Değişkenler	N	%	
Cinsiyet	Kadın	23	15.8
	Erkek	126	84.2
Yaş	19-23 Yaş	55	36.9
	24-28 Yaş	67	45
	29 Yaş ve Üzeri	27	18.1
Eğitim Seviyesi	Orta öğretim	37	24.8
	Ön Lisans	28	18.8
	Lisans	77	51.7
	Yüksek Lisans	7	4.7
Spor Yılı	0-4 Yıl	30	20.1
	5-9 Yıl	102	68.5
	10+ yıl	17	11.4
Millilik Durumu	Evet	26	17.4
	Hayır	123	82.6
Katılımcıların Yaş Ortalaması		$\bar{X}=23.26$, $S=3.29$	
		$\bar{X}=26$, $S=4.39$	
		$\bar{X}=25.58$, $S=4.34$	

Veri Toplama Araçları

Bu çalışmada veri toplama aracı olarak demografik bilgi formu ve Egzersiz Bağımlılığı Ölçeği kullanılmıştır.

Demografik Bilgi Formu: Araştırmacılar tarafından hazırlanan demografik bilgi formunda cinsiyet, yaş, eğitim seviyesi, spor yılı ve millilik durumu sorularına yanıt verilmesi istenilmektedir.

Egzersiz Bağımlılığı Ölçeği (EBÖ): Tekkurşun-Demir vd., (2018) tarafından geliştirilen ölçek katılımcıların egzersiz bağımlılığı düzeyini ölçmeyi amaçlar. EBÖ, 17 madde ve 3 alt boyuttan oluşmaktadır. Sorular arasında ters madde bulunmayan 5'li likert tip ölçekte yüksek puan yüksek egzersiz bağımlılığı göstermektedir. EBÖ'de "1-17 puan arası normal grup, 18-34 puan arası az riskli grup, 35-51 puan arası riskli grup, 52-69 puan arası bağımlı grup, 70-85 puan arası yüksek düzeyde bağımlı grup" şeklindedir. Egzersiz bağımlılığı düzeylerini ölçmek amacıyla kullanılan EBÖ'nün örneklem grubu için güvenilirliği test edilmiştir. Bu doğrultuda "Toplam Egzersiz Bağımlılığı" (TEB) için Cronbach Alpha değeri 0.88 olarak bulunmuştur. EBÖ'nün alt boyutları olan "Aşırı Odaklanma ve Duygu Değişimi" (AODD) için 0.72; "Bireysel-Sosyal İhtiyaçların Ertelenmesi ve Çatışma" (BSIE) için ,85; "Tolerans Gelişimi ve Tutku" (TGT) için 0.85 Cronbach Alpha değeri hesaplanmıştır. Bir ölçeğin güvenilir sayılabilmesi için Cronbach Alpha değerinin 0.69'dan büyük olması gerekmektedir (Büyüköztürk, 2018). Elde edilen değerler ölçeğin örneklem grubu için güvenilir olduğunu göstermektedir.

Araştırma Yayın Etiği

Bu çalışmanın etik kurul onayı, Uşak Üniversitesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulundan 104-104-15 karar numarası ile alınmıştır.

Verilerin Toplanması

Araştırmada kullanılan EBÖ çevrimiçi olarak düzenlenmiş ve sosyal paylaşım araçlarıyla Türkiye Vücut Geliştirme Fitness Şampiyonası ve Avrupa Şampiyonası Milli Takım seçmelerine katılan sporcular ile paylaşılması sağlanmıştır. Hazırlanan bu formda katılımcılara araştırma hakkında gerekli bilgilendirmeler yapılmıştır. Araştırmaya uygun katılımcı özelliklerine sahip olduğunu beyan eden toplamda 149 kişi araştırmaya katılım göstermiştir.

Verilerin Analizi

Bu çalışmanın bağımsız değişkenleri olan cinsiyet, yaş, eğitim seviyesi, spor yılı ve millilik durumuna göre yarışmacı vücut geliştirme sporcularının TEB ve alt boyutları olan AODD, BSIE ve TGT seviyeleri ile bağımsız değişkenler arasındaki karşılaştırmalar değerlendirilmiştir. Çalışmadaki bağımlı değişkenlerin dağılımı Tablo 2'de verilmiştir. Değişkenler arasında karşılaştırma yapılmadan önce normallik ve homojenlik testi yapılmıştır. Verilerin normallik durumları çarpıklık ve basıklık değerlerine bakılarak belirlenirken homojen dağılımları ise Levene testi ile incelenmiştir. Bulgularda değişkenlerin çarpıklık ve basıklık değerlerinin ± 2 aralığında olduğu için normal dağılım gösterdiği ve "Levene Testi" sonuçlarının da $p > ,05$ olduğundan homojenlik varsayımını karşıladığı belirlenmiştir. Buna göre cinsiyet, ve millilik durumu gibi iki grup ortalamalarını karşılaştırmada bağımsız örneklem t-testi, yaş, eğitim seviyesi, ve spor yılı gibi 3 ve daha fazla grup ortalamalarını karşılaştırılmasında tek yönlü varyans analizi (ANOVA) kullanılmıştır (George ve Mallery, 2019).

Tablo 2. Bağımlı değişkenlerin dağılımı

Bağımlı Değişkenler	N	Min.	Maks.	Ort.	S	Çarpıklık	Basıklık
Aşırı odaklanma ve duygu değişimi	149	7	35	29.76	5.74	-1.417	1.411
Bireysel sosyal ihtiyaçların ertelenmesi ve çatışma	149	6	30	18.77	7.88	-.114	-1.045
Tolerans Gelişimi ve Tutku	149	4	20	15.3	4.55	-.664	-.364
Toplam	149	17	85	63.84	18.17	-.343	-.181

BULGULAR

Değişkenler arasında karşılaştırma yapılmadan önce yarışmacı vücut geliştirme sporcularının EBÖ verdikleri yanıtlar sonucunda ($Ort. = 63.84$, $S = 18.17$) bağımlı grup arasında yer aldığı ve EBÖ'nün alt boyutları olan AODD'de ($Ort. = 29.76$, $S = 5.74$) aşırı bağımlı, BSIE ve TGT alt boyutlarında ($Ort. = 18.77$, $S = 7.88$, $Ort. = 15.3$, $S = 4.55$) bağımlı grupta yer aldıkları Tablo 2'de görülmektedir.

Tablo 3'teki bağımsız örneklem t testi sonuçlarına göre cinsiyet değişkenine göre kadın ($Ort. = 71.87$, $S = 7.98$) ve erkek ($Ort. = 62.36$, $S = 10.97$) vücut geliştirme sporcularının TEB arasında istatistiksel olarak düşük düzeyde etki değeri olan anlamlı bir farklılık bulunmuştur ($t(147)=3.97$, $p=0.01$, $\eta^2= 0.1$) (Cohen, 2013). Cinsiyet değişkenine göre AODD alt boyutunda istatistiksel olarak anlamlı bir fark bulunmazken, BSIE alt boyutunda kadın YVGS ($Ort. = 23.3$, $S = 4.17$) ile erkek ($Ort. = 17.94$, $S = 5.9$) vücut geliştirme sporcularının arasında istatistiksel olarak orta düzeyde anlamlı bir farklılık bulunmuştur ($t(147)=4.17$, $p=0.01$, $\eta^2= 0.11$). Kadın ($Ort. = 17.83$, $S = 2.74$) ve erkek ($Ort. = 14.83$, $S = 3.8$) sporcular arasındaki istatistiksel olarak bulunan orta düzeydeki anlamlı farka TGT alt boyutunda da tespit edilmiştir ($t(147)=3.60$, $p=0.01$, $\eta^2= 0.08$) (Cohen, 2013).

Tablo 3. Cinsiyet ve milli sporcu olma durumu değişkenlerine göre toplam egzersiz bağımlılığı skoru (TEBS) T testi ve tanımlayıcı istatistiki bulguları

Bağımsız Değişkenler		N	Ort.	S	t	df	p	η^2
Cinsiyet	Kadın	23	71.87	7.98	3.97	147	0.01*	0.10
	Erkek	126	62.36	10.97				
Milli Sporcu Olma	Evet	26	64.08	11.09	0.12	147	0.90	
	Hayır	123	63.78	11.13				

* $p<0.05$

Katılımcıların milli düzeyde sporcu olma durumu değişkenine göre bu düzeyde sporcu olmuş YVGS ($Ort. = 64.08$, $S = 11.09$) ile milli düzeyde sporcu olmamış YVGS ($Ort. = 63.78$, $S = 11.13$), TEB skorları arasında istatistiksel olarak anlamlı bir farka rastlanmamıştır ($t(147)=0.12$, $p=0.9$). Milli sporcu olma durumu değişkenine göre EBÖ'nün alt boyutları olan AODD, BSIE ve TGT'de anlamlı bir fark yoktur.

Tablo 4. Cinsiyet, antrenman süresi ve milli sporcu olma durumu değişkenlerine göre egzersiz bağımlılığı alt boyutlarına ait T testi ve tanımlayıcı istatistik bulguları

Bağımsız Değişkenler		N	Ort.	S	t	df	p	η^2	
Cinsiyet	AODD	Kadın	23	30.74	2.96	1.37	147	0.17	
		Erkek	126	29.59	3.82				
	BSIE	Kadın	23	23.3	4.17	4.17	147	0.01*	0.11
		Erkek	126	17.94	5.90				
	TGT	Kadın	23	17.83	2.74	3.60	147	0.01*	0.08
		Erkek	126	14.83	3.80				
Milli Sporcu Olma Durumu	AODD	Evet	26	29.46	4.22	-0.46	147	0.68	
		Hayır	123	29.83	3.61				
	BSIE	Evet	26	18.62	5.42	-0.15	147	0.88	
		Hayır	123	18.8	6.11				
	TGT	Evet	26	16	3.85	1.04	147	0.30	
		Hayır	123	15.15	3.80				

* $p < 0.05$

Tablo 5’te gösterilen tek yönlü varyans analizlerine göre vücut geliştirme sporcularının TEB skorları ile yaş değişkeni arasında orta ($F_{(2, 146)} = 4.97$, $p = 0.01$, $\eta^2 = 0.06$), eğitim durumu değişkeni arasında orta ($F_{(3, 145)} = 4.941$, $p = 0.01$, $\eta^2 = 0.09$), ve spor yılı değişkeni arasında orta ($F_{(2, 146)} = 9.405$, $p = 0.01$, $\eta^2 = 0.11$) etki değerine sahip istatistiksel olarak anlamlı farkın bulunduğu görülmüştür (Kilic, 2014). Bulunan anlamlı farklılığın bağımsız değişkenin hangi alt boyutları arasında olduğunu belirlemede kullanılan çoklu karşılaştırma testlerinde rastlanan tip-I hatanın önlenmesi amacıyla Bonferroni düzeltilmesi yapılarak yaş ve spor yılında kritik alfa düzeyi $p < 0,017$, eğitim durumunda $p < 0.008$ olarak belirlenmiştir (Büyüköztürk, 2018). Yapılan Bonferroni post-hoc çoklu karşılaştırma testi sonuçlarına göre eğitim durumu değişkeninde bulunan anlamlı fark ön lisans mezunu vücut geliştirme sporcularının TEB puanlarının ($Ort. = 4$, $S = 0.62$) orta öğretim mezunu vücut geliştirme sporcularından ($Ort. = 3.47$, $S = 0.67$) yüksek olmasından kaynaklandığı görülmüştür. Benzer şekilde vücut geliştirme sporcularının TEB skorları ile spor yılı değişkeni arasında bulunan istatistiksel anlamlı farkın spor yılı 0-4 yıl arasında olan sporcuların ($Ort. = 4.13$, $S = 0.55$) TEB puanlarının spor yılı 5-9 yıl arasında olan sporculardan ($Ort. = 3.71$, $S = 0.58$) ve spor yılı 10 yıl ve üzerinde olan sporculardan ($Ort. = 3.35$, $S = 0.89$) yüksek olmasından kaynaklandığı yapılan karşılaştırma testleri sonucunda bulunmuştur.

Tablo 5. Yaş, eğitim seviyesi ve spor yılı değişkenlerine göre toplam egzersiz bağımlılığı skoru ANOVA testi ve tanımlayıcı istatistik bulguları

		N	\bar{X}	S	F	p	η^2	Post-hoc	
Yaş	TEB	19-23 yaş (I)	55	67.42	10.75	4.97	0.01*	0.06	
		24-28 yaş (II)	67	62.13	9.85				
		29+ (III)	27	60.74	12.98				
Eğitim Durumu	TEB	Ortaöğretim (I)	37	59	11.34	4.941	0.01*	0.09	II>I***
		Önlisans (II)	28	68.07	10.51				
		Lisans (III)	77	64	10.12				
		Yüksek lisans (IV)	7	70.17	9.33				
Spor Yılı	TEB	0-4 yıl (I)	30	63.13	9.91	9.405	0.01*	0.11	I>II** I>III**
		5-9 yıl (II)	102	63.83	11.09				
		10+ yıl (III)	17	72	9.14				

* $p < 0.05$, $p < 0.017$ **, $p < 0.008$ ***

Tablo 6’da yer alan tek yönlü varyans analizi sonuçları incelendiğinde yaş değişkeni ile EBÖ’nün BSIE alt boyutunda istatistiksel olarak anlamlı bir fark bulunmuştur ($F_{(2, 146)} = 4.82$, $p = 0.01$, $\eta^2 = 0.06$) ve bu fark karşılaştırma testleri sonucunda 19-23 yaş arası vücut geliştirme sporcularının ($Ort. = 3.45$, $S = 1.02$) BSIE seviyelerinin 24-28 yaş vücut geliştirme sporcularından ($Ort. = 2.95$, $S = 0.92$) yüksek olmasıyla açıklanmıştır. Yaş değişkeni ile EBÖ’nün TGT alt boyutunda da anlamlı farka rastlanmıştır ($F_{(2, 146)} = 6.75$, $p = 0.01$, $\eta^2 = 0.09$) ve yapılan karşılaştırma testleri sonucunda farkın 19-23 yaş arası vücut geliştirme sporcularının ($Ort. = 4.15$, $S = 0.9$) TGT seviyelerinin 29 yaş üstü sporculardan ($Ort. = 3.4$, $S = 1.01$) yüksek olmasından kaynaklandığı sonucu bulunmuştur.

Tablo 6. Yaş, eğitim seviyesi ve spor yılı değişkenlerine göre egzersiz bağımlılığı alt boyutlarına ait ANOVA testi ve tanımlayıcı istatistik bulguları

		N	\bar{X}	S	F	p	η^2	Post-hoc	
Yaş	AODD	19-23 yaş (I)	55	30.11	3.35	0.38	0.69		
		24-28 yaş (II)	67	29.54	3.47				
		29+ (III)	27	29.63	4.93				
	BSIE	19-23 yaş (I)	55	20.71	6.11	4.82	0.01*	0.06	I>II**
		24-28 yaş (II)	67	17.69	5.54				
		29+ (III)	27	17.52	5.98				
	TGT	19-23 yaş (I)	55	16.60	3.58	6.75	0.01*	0.09	I>III**
		24-28 yaş (II)	67	14.91	3.58				
		29+ (III)	27	13.59	4.06				
Eğitim Durumu	AODD	Ortaöğretim (I)	37	29.46	4.18	1.28	0.28		
		Önlisans (II)	28	30.21	3.10				
		Lisans (III)	77	29.53	3.67				
		Yüksek lisans (IV)	7	32.14	3.63				
	BSIE	Ortaöğretim (I)	37	16.24	6.06	4.89	0.01*	0.09	II>I***
		Önlisans (II)	28	21.29	5.81				
		Lisans (III)	77	18.78	5.57				
		Yüksek lisans (IV)	7	22.00	6.03				
	TGT	Ortaöğretim (I)	37	13.30	3.29	5.35	0.01*	0.1	II>I*** III>I***
		Önlisans (II)	28	16.57	3.80				
		Lisans (III)	77	15.69	3.63				
		Yüksek lisans (IV)	7	16.43	5.03				
Spor Yılı	AODD	0-4 yıl (I)	30	16.43	5.03	3.54	0.03*	0.05	
		5-9 yıl (II)	102	15.30	3.81				
		10+ yıl (III)	17	30.77	3.40				
	BSIE	0-4 yıl (I)	30	29.79	3.05	7.07	0.01*	0.09	I>II** I>III**
		5-9 yıl (II)	102	27.82	6.49				
		10+ yıl (III)	17	22.00	5.60				
	TGT	0-4 yıl (I)	30	18.28	5.78	8.5	0.01*	0.1	I>II** I>III**
		5-9 yıl (II)	102	16.00	5.82				
		10+ yıl (III)	17	17.40	2.58				

* $p < 0.05$, ** $p < 0.017$, *** $p < 0.008$

Eğitim durumu değişkeni ile BSIE ($F_{(3, 145)} = 4.89$, $p = 0.01$, $\eta^2 = 0.09$) ve TGT ($F_{(3, 145)} = 5.35$, $p = 0.01$, $\eta^2 = 0.1$) alt boyutlarında istatistiksel olarak anlamlı bir farka rastlanmıştır. Yapılan karşılaştırma testleri sonucunda BSIE deki istatistiksel anlamlı farkın ön lisans derecesine sahip vücut geliştirme sporcularının ($Ort. = 3.55$, $S = 0.97$), ortaöğretim derecesine sahip öğrencilerden ($Ort. = 2.71$, $S = 1.01$) daha yüksek BSIE puanlarına sahip olmasıyla açıklanmaktadır. Eğitim durumu değişkeni ile TGT arasındaki istatistiksel anlamlı farkın ise ön lisans ($Ort. = 4.14$, $S = 0.95$) ve lisans ($Ort. = 3.92$, $S = 0.91$) derecesine sahip vücut geliştirme sporcularının TGT seviyelerinin ortaöğretim ($Ort. = 3.32$, $S = 0.82$) mezunlarından yüksek olmasından kaynaklandığı sonucu bulunmuştur.

Spor yılı değişkeni ile vücut geliştirme sporcularının EBÖ'nün AODD ($F_{(2, 146)} = 3.54$, $p = 0.03$, $\eta^2 = 0.05$), BSIE ($F_{(2, 146)} = 7.07$, $p = 0.01$, $\eta^2 = 0.09$) ve TGT ($F_{(2, 146)} = 8.5$, $p = 0.01$, $\eta^2 = 0.1$) alt boyutları arasında istatistiksel olarak anlamlı farka rastlanmıştır. Vücut geliştirme sporcularının BSIE ve TGT puanları ile spor yılı değişkeni arasında bulunan istatistiksel anlamlı farkın spor yılı 0-4 yıl arasında olan sporcuların BSIE puanlarının ($Ort. = 3.67$, $S = 0.93$) ve TGT puanlarının ($Ort. = 4.35$, $S = 0.65$) hem spor yılı 5-9 yıl arasında olan sporcuların BSIE ($Ort. = 3.05$, $S = 0.96$) ve TGT ($Ort. = 3.76$, $S = 0.92$) puanlarından hem de spor yılı 10 yıl ve üzeri olan sporcuların BSIE ($Ort. = 2.67$, $S = 0.97$) ve TGT ($Ort. = 3.26$, $S = 1.2$) puanlarından yüksek olmasından kaynaklandığı yapılan karşılaştırma testleri sonucunda bulunmuştur.

TARTIŞMA VE SONUÇ

Egzersiz bağımlılığı konusuna artan ilgiye rağmen, farklı spor branşlarında bu durumun yaygınlığını inceleyen araştırmaların sınırlı olduğu görülmektedir. Ayrıca bu çalışmalarda tutarsızlıkların örneklem büyüklüğü ve kullanılan ölçüm araçlarından kaynaklandığı yerli ve yabancı alanyazında belirtilmektedir (Bavlı vd., 2011; Blaydon ve Lindner, 2002). Bu nedenle, farklı egzersiz veya fiziksel aktivitelerdeki egzersiz bağımlılığının varlığı, yaygınlığı ve bu durumun spesifik özellikleri halen belirsizliğini korumaktadır. Bu araştırmada yarışmacı vücut geliştirme sporcularının cinsiyet, yaş, eğitim seviyesi, spor yaşı ve milli sporcu olma değişkenlerine göre egzersiz bağımlılığı düzeylerinin incelenmesi amaçlanmıştır.

YVGS'nin egzersiz bağımlılığı ölçeğine verdikleri yanıtlardan elde edilen verilere göre katılımcıların tamamının egzersiz bağımlısı olduğu ve EBÖ'nün AODD alt boyutunda aşırı bağımlı, BSIE ve TGT alt boyutlarında egzersiz bağımlısı oldukları tespit edilmiştir. Alanyazındaki çalışmalarda vücut geliştiriciler arasında genel olarak yüksek bir egzersiz bağımlılığı yaygınlığı (Smith ve Hale, 2005), özellikle rekabetçi vücut geliştiriciler arasında bu yaygınlığın arttığı bilinmektedir (Cella vd., 2012; Hale vd., 2013; Skemp vd., 2013). Cella vd. (2012) Güney İtalya'daki spor merkezlerinde gerçekleştirdiği çalışmada (n=435) katılımcıların %45.4 ünün kuvvetli egzersiz bağımlısı olduğunu, benzer şekilde Hale vd. (2010), vücut geliştirme, powerlifter ve fitnessliftercılarla yaptığı çalışmada katılımcıların (n=146) %15.1'inin

riskli derecede egzersiz bağımlısı olduğunu ve bu durumun vücut geliştiriciler özelinde diğer iki gruptan daha yüksek olduğunu belirtmiştir. Skemp vd. (2013), ise yarışmacı vücut geliştirme sporcularının (n=85) egzersiz bağımlılık seviyelerinin %17 olduğunu ve yarışmacı olmayanlardan (n=48) %14 daha yüksek olduğunu bulmuşlardır. Temelde psikolojik, sosyal, fiziksel ve davranışsal alanların birinde veya birkaçında fonksiyon kaybı ve yoksunluk semptomlarının gözlemlenmesi egzersiz bağımlılığının altında yatan nedenler olarak belirtilmektedir (Bamber vd., 2003). Vücut geliştirme sporunda ise sosyal fizik kaygısı (başkalarının gözündeki fiziksel görünüşü), sosyal kabul duygusu ve mükemmeliyetçilik (aşırı derecede yüksek kişisel standartlar belirleme) duygusuyla arasında bir bağlantı olduğu düşünülmektedir. Vücut geliştiriciler daha kaslı hale geldikçe olumsuz duygularının üstesinden gelebilir ve kaslı görünüşleri sayesinde iyi hissetmeye başlarlar ve bu iyi his haline bağımlı hale gelebilirler. Ayrıca spor salonundaki sosyal ortamın bir parçası olmanın (sosyal kabul duygusu), beraberinde öz yeterlilik, öz imaj ve farklı kaygı düzeylerinde azalmaya yardımcı olduğu raporlanmıştır (Hart vd.,1989). Son olarak bu durumun vücut memnuniyetsizliği ve mükemmeliyetçilik ile doğru kendine güven ile ters orantılı olduğunu belirtilmiştir (Cook, 1996). Costa vd., (2012), ise düzenli fizyolojik problemler, fiziksel memnuniyetsizlik veya daha iyi bir fiziksel uygunluğa sahip olma güdüsüyle bireylerin egzersiz seviyelerini arttırarak bağımlılığa dönüştürdüğünü belirtmiştir.

Öte yandan cinsiyet değişkenine göre kadınların TEB ve EBÖ'nün alt boyutları olan BSIE ve TGT seviyelerinde erkeklerden daha yüksek ortalamalara sahip olmaları görülmektedir. Bu çalışmanın sonuçları covid-19 pandemisi döneminde Portekiz'de 234 katılımcıyla (133 kadın, 101 erkek) gerçekleştirilen çalışmayla paralellik göstermektedir (Salvador vd., 2022). Bu çalışmada Salvador vd., (2022) vücut geliştirme sporcularının, crossfit sporcuları ve rekreasyonel spor salonu kullanıcılarından daha yüksek düzeyde egzersiz bağımlılığı semptomlarını sergilediğini ayrıca kadın vücut geliştirme ve crossfit sporcularının erkeklerden daha yüksek egzersiz bağımlılığı skorlarına sahip olduklarını raporlamışlardır. Benzer bir çalışmada Hale vd. (2013), Boston'da 74 kadın vücut geliştirici ve fitnesscılarla yaptığı çalışmada toplamda %13,5 (n=10) oranında kadını risk altında egzersiz bağımlısı olarak tanımlamış ve bunlardan dokuzunun deneyimli vücut geliştirme sporcusu ve yalnızca birinin fitness sporcusu olduğunu belirtmiştir. Ayrıca egzersiz bağımlılığının iki sınıfa ayrıldığı çalışmada Blaydon ve Lindner (2002), erkek triatletlerde birincil dereceden egzersiz bağımlılığının (%31'e karşılık %25), kadın triatletlerde ise aralarında yeme bozukluğu semptomlarının da olduğu ikinci derece egzersiz bağımlılığının (%19,8'e karşılık %28) daha yüksek olduğunu tespit etmiştir. Bunun sebebi genel olarak toplumda, ideal kadınların yağsız ve zayıf, erkeklerin ise kaslı ve yapılı görünüşe sahip olması yönünde oluşmuş algı ile açıklanmaktadır (Hausenblas ve Fallon, 2002). Kadın ve erkek sporcuların egzersize yönelmesinde algılanan ideal fiziksel görünüme ulaşma veya mevcut fiziksel görünümü koruma ve/ya geliştirilme isteğinin önemli rol oynadığı bilinmektedir. Bu çalışmanın bulgularından farklı olarak Skemp vd. (2013) haltercilerde (kadın=54, erkek=79) egzersiz bağımlılığını çeşitli değişkenlere göre incelemişler ve EB skorlarının cinsiyete göre değişmediğini (%16,6'ya karşılık %16,4) bulmuşlardır. Bu çalışmanın bulgularının aksine Cicioğlu vd., (2019) çalışmasında (kadın=52, erkek=119) elit erkek atletlerin elit kadın atletlere göre istatistiksel olarak anlamlı düzeyde yüksek

egzersiz bağımlılığı düzeylerine sahip olduğunu tespit etmişlerdir. Alan yazındaki farklı çalışmalarda egzersiz bağımlılığının cinsiyet değişkenine göre değişmediğini (Batuhan ve Aydın, 2020; Demirel ve Cicioğlu, 2020) veya erkeklerin egzersiz bağımlılık seviyelerinin daha yüksek olduğunu gösteren çalışmalar mevcuttur (Cicioğlu vd., 2019; Costa vd., 2012).

Araştırmada incelenen 3 farklı yaş grubunun TEB skorları arasında istatistiksel olarak anlamlı fark olduğu ve sporcuların yaşları arttıkça egzersiz bağımlılık düzeylerinin azaldığı raporlanmıştır. Öte yandan bu farkın BSI alt boyutunda 19-23 yaş grubunun, 24-28 yaş grubundan ve TGT alt boyutunda yine 19-23 yaş grubunun, 29 yaş ve üstü grubundan yüksek bağımlılık seviyesine sahip olmasıyla açıklanmaktadır. Alanyazındaki çalışmalarda Alías-García vd. (2013), 18-55 yaş arası 378 erkek ve 206 kadınla gerçekleştirilen çalışmada egzersiz bağımlılığı durumunun genç popülasyonda daha büyük bir sıklıkla rastlandığını işaret etmişlerdir. Bununla birlikte Szabo (2003) egzersiz bağımlılığının yaşla birlikte azalarak dengeli bir egzersiz alışkanlığına dönüştüğünü belirtmektedir. Bu durum, erken yaşta spora başlanması kişilerin EB düzeylerini artırırken, uzun zaman sporla iç içe olmak yaşın ilerlemesi ile birlikte fiziksel ve psikolojik yorgunluktan dolayı EB düzeyinde azalmaya neden olacağı görüşüyle açıklanabilir (Furst ve Germone, 1993). Ayrıca YVGS'nin anabolik-androjenik steroid ve performans artırıcı ilaçları sıklıkla kullandıkları ve aşırı derecede bağımlılığın kuvvetli göstergelerinden olan bu ilaçların kullanımının genç YVGS daha yaygın olduğu yapılan araştırmalarda görülmüştür (Baggish vd., 2017; Pope vd., 2014). Bu durum, aşırı derecede yüksek kişisel standartlar belirleme, sürekli olarak mükemmellik ve aşırı hırslı hedefler için çaba gösterme ve/veya kendini aşırı derecede eleştirme eğilimleri ile açıklamaya çalışılsa (Minarik ve Ahrens, 1996) bile, bir grup araştırmacı tarafından uyumsuzluk ve psikopatoloji sınıfındaki davranışlar arasına konulmaktadır (Ashby ve Bruner, 2005). Bu çalışmanın aksine Costa vd. (2013) araştırmasında, 25-44 yaş erkek yetişkinlerin, genç erkeklerden (18-24 yaş) daha yüksek egzersiz bağımlılığı riski altında olduğunu bildirmiştir. Diğer yandan alanyazında sporcularda egzersiz bağımlılığı ile yaş değişkeni arasında anlamlı farkın olmadığını raporlayan çalışmalar bulunmaktadır (Cicioğlu vd., 2019; Costa vd., 2012).

Yapılan çalışmada YVGS eğitim seviyeleri ile TEB seviyelerinde anlamlı bir fark bulunmaktadır. Bu fark BSIE alt boyutunda ön lisans mezunlarının, orta öğretim mezunlarından ve TGT alt boyutunda ön lisans ve lisans mezunlarının, orta öğretim mezunlarından yüksek bağımlılık seviyesine sahip olmasıyla açıklanmaktadır. Çalışmanın sonucuna paralel olarak, (Celal ve Aktop, 2014) üniversite öğrencilerinin (n=168) eğitim düzeyleri ile egzersiz bağımlılık seviyeleri arasında pozitif bir ilişki olduğunu açıklamıştır. Bu durumu Beaton vd. (2009) sosyolojik açıdan eğitim seviyesi arttıkça, bireylerin tesislere erişim kolaylığının artması, sporun yararları hakkında daha fazla bilgi sahibi olması, ve bunların sonucunda düzenli spora katılım göstermeleriyle açıklanmaktadır. EB riskinin prevalansı, üniversite öğrencilerinde genel nüfusa göre daha yüksektir (Marques vd., 2019). Bunun aksine Uçar, (2019) 271 katılımcıyla gerçekleştirdiği çalışmada eğitim seviyesi ile egzersiz bağımlılığı ve alt boyutları arasında istatistiksel olarak düşük düzeyde negatif bir ilişki tespit etmiştir. Eğitim düzeyiyle egzersiz bağımlılığını inceleyen

çalışmaların büyük kısmında anlamlı bir fark olduğu sonucuna ulaşılmıştır (Kavuran vd., 2020; Sadıq, 2018).

Çalışmanın diğer değişkeni olan spor yılı değişkenine göre TEB ve alt boyutlarında anlamlı fark mevcuttur. Yapılan post hoc analizlerinde farkın BSIE ve TGT alt boyutlarında 0-4 yıl arası spor yaşına sahip YVGS egzersiz bağımlılık seviyelerinin spor yaşı 5-9 yıl olanlardan ve 10 yıl üzeri olanlardan yüksek olduğu görülmüştür. Spor yaşı az olan bireylerin genç bireyler oldukları düşünülmektedir. Polat ve Şimşek (2015) egzersiz yaşına göre bağımlılık sendromlarında farklılıklar olduğunu yedinci spor yaşından sonra EB seviyesinde hızlı bir düşüşün olduğunu belirtmektedir. Birgönül 2019 yılında 215 tenis sporcusu ile gerçekleştirdiği çalışmada, spor yaşı 1-4 yıl olan sporcuların egzersiz bağımlılık seviyelerinin spor yaşı 15-19 yıl olan sporculardan daha yüksek olduğunu tespit etmiştir. Alanyazında spor yaşı ile egzersiz bağımlılığı arasında ilişkinin rastlanılmadığı çalışmalarda mevcuttur (Batuhan ve Aydın, 2020; Uzun, 2019).

Çalışmanın son değişkeni olan Milli sporcu olma değişkenine göre gruplar arasında istatistiksel olarak anlamlı bir farkın olmadığı tespit edilmiştir. Alanyazındaki çalışmalarda sporcuların egzersiz bağımlılığı millilik durumuna göre ele alan herhangi bir çalışma bulunmamaktadır. Ancak Skemp vd. (2013), yarışmacı haltercilerin (n=85) yarışmacı olmayan haltercilere göre (n=48) egzersiz bağımlılık seviyelerinin istatistiksel olarak anlamlı derece yüksek olduğunu belirtmiştir. Ülkemizde gerçekleştirilen bir diğer çalışmada ise 72'si amatör, 89'u profesyonel olmak üzere toplam 161 futbolcunun katıldığı çalışmada amatör futbolcuların egzersiz bağımlılık düzeylerinin profesyonel futbolculardan yüksek olduğu tespit edilmiştir (Kavuran vd., 2020).

Sonuç olarak, Türkiye Vücut Geliştirme ve Fitness Şampiyonası Milli Takım Seçmelerine katılan sporculardan elde edilen verilere göre araştırmaya katılan sporcuların tamamının egzersiz bağımlısı olduğu belirlenmiştir. Ayrıca kadınların bağımlılık seviyelerinin erkeklerden yüksek olduğu ve yaş arttıkça egzersiz bağımlılığının azaldığı, eğitim seviyesiyle pozitif bir şekilde arttığı, yeni başlayanlarda tecrübelilere göre daha yüksek seviyede olduğu ve Milli sporcu olmayanlarında bağımlılık seviyelerinin Milli sporcularla aynı seviyede olduğu tespit edilmiştir.

ÖNERİLER

Alanyazındaki çalışmalar ışığında; sosyal fizik kaygısı, sosyal kabul duygusu ve mükemmeliyetçilik duygusuyla arasında olası bir bağlantı olduğu öne sürülen vücut geliştirme sporunun antrenör, doktor, fizyoterapist, diyetisyen gibi uzmanlardan destek alınarak planlı ve programlı bir şekilde yapılması tavsiye edilmektedir. Ayrıca Spor Bakanlığı ve federasyonlarca düzenlenen farklı kademelerdeki antrenör eğitim ve gelişim seminerlerinde egzersiz bağımlılığı konusuna yer verilmesi önerilir. Geniş kitlelere ulaşma imkanı sunan üniversitelerin spor bilimleri fakültelerindeki ders programlarının içerikleri egzersiz bağımlılığı konusuna yer verecek şekilde yeniden yapılandırılabilir. Böylelikle öğrenciler ve sporcular egzersiz bağımlılığı konusunda farkındalık geliştirebilirler, kendilerini koruyabilirler ve belirtilerin sergilendiği noktada uzmanlarla iletişime geçerek bağımlılığın ilerlemesini önleyebilirler. Bu anlamda sporculara verilecek bağımlılık eğitimlerinin etkinliğini inceleyen yeni araştırmalar gerçekleştirilebilir.

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Çıkar Çatışması: Yazarlar araştırma ile ilgili herhangi bir kişisel veya finansal çıkar çatışması olmadığını beyan etmektedirler.

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Analysis of Global Publications Related to Sport Management Education between 1990-2020

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Abstract

The aim of this research is to make a holistic analysis on sport management education by analysing all scientific publications between 1990-2020. Using the data obtained within the scope of the study, information graphics and descriptive bibliometric networks were created to reveal bibliometric networks. According to the results it was found that the most used keywords were sport management, education, sport and higher education. Citation analysis reveals that Lyras and Peachey are the most cited authors. There are a total of 77 journals in the data. Sport Management Education Journal, Sport Management Review and Journal of Sport Management are the most cited journals. The most cited universities are Griffith University, University of Louisville and Louisiana State University. The most cited studies in the literature focus on sexist discourse, the importance of race and ethnicity in education and socialization, the impact of sport on social change, sport participation and consumer spending, environmental sustainability in sport facilities, and how sport management affects society and managers.

Keywords: Bibliometrics analyse, Higher education, Scientometrics, Sport management education

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INTRODUCTION

As a consequence of a growing tendency towards inactiveness among people; governments, health care providers and recreationists have taken action and by means of various programs broadcasted through social media devices along with institutions, encouragement for physical activity has achieved success, even though partially (Beaton & Funk, 2008). Changes in the working life have enabled people to have more spare time and their participation in sport-based activities has significantly increased, which forced sport facilities and organisational structures to diversify and improve themselves in terms of quality and quantity. A sort of rapidly growing socio-sport environment has made the management of sport facilities a much more complicated process. There is an increasing competition in this field and special emphasis is laid on offering premium sport and recreation services. The growing interest for the professional management of sport and recreation facilities is not surprising, when the increasing level of education and demand for technological support are taken into consideration (Guerrero et al., 2008). It's the main purpose of facilities to provide people with opportunities of active recreation and free time activities (Beaton & Funk, 2008). Sportive success of a country depends mainly on its economic development along with its level of educational and technological development. Naturally, a direct relationship between developmental level and sportive success can be clearly determined.

The phenomenon of sport, which has a multinational structure, requires a management in order to continue its existence through events. Pitts and Stotlar (2002) have defined sports management as the totality of people and activities taking charge in production, facilities, advertisement and organising related with fitness and recreation. Despite the market value of sport and sportive events on a global scale, not a sufficient management theory and practice to identify the way how sports management is conducted have been put forward yet. Athletic clubs and associations are similar to other international corporations with regards to financial, tangible and intangible assets which are to be managed and marketed. However, the majority of studies on sports management have been confined to magazines on sport practicing and for full comprehension of international sports management, more international comparisons which are taking notice of other research models, such as research on entrepreneurship, are required. Owing to the need for more researches to realise how sport is adapted and integrated to different environments on a global scale, current researches and implementations on international sports management are undergoing remarkable changes (Ratten, 2011).

In this context, sport management has become indispensable for achieving certain goals considering the changing conditions. The method of managing sport directly contributes to the best use of sport's organisational structures, masses, many tools and skills, intentions and objectives with full functionality. Sports management acts as a catalyst both in organizational sport structures and in certain activities, because by creating an incentive psychosocial atmosphere, by rewarding those who give a higher performance and by determining the ones who have special talents for sport it helps to achieve maximum productivity. In addition, sports management takes active role in organising sportive events and in recruiting the staff required during this process, in

promoting this staff, in building consensus and in actualizing the suitable conditions (Neferu, 2017). To fulfil these tasks, sports management needs qualified executives. The executive is supposed to have sufficient professional qualifications and to implement these qualifications efficiently. Çiftçi and Mirzeoğlu (2014) have defined the essential traits of a sport manager as: the ability of making correct decisions, establishing good human relations, having adequate knowledge and skills. In addition, implying effective managing strategies, assuming responsibility when necessary, having high intellectual capabilities as well as having social and human relations skills are of great significance, because the success of sportive organisations is highly dependent on the skills of the executives (Yetim & Şenel, 2001). Management is a combination of science and art. In the process of an organizational event, achieving success depends mainly on the skills of the organising managers as it does in business systems, in public sector, in art, in culture and in sport (Zec, 2011). Among the responsibilities of sport management are; infield management, education and supervision, implementation and surveying (Force, 1993). In view of the definitions made about the scope of sports management and managers, it's clear that they are the effective units and decision makers during the planning, application and finalization processes of an organizational event.

It is important to improve the quality and quantity of education programmes that contribute to the production of academic knowledge. The first academic programme on sport management started at Ohio University in 1996 and since then many sport management departments have been established in many universities (Costa, 2005). As the sports management is an academic and an applied process, there has been much research and debate about how this process is to be carried out. The aim of this research is to analyse all scientific publications between 1990-2020 and to make a holistic analysis on sport management education. In this context, academic studies published between the years 1990-2020 were examined. During the study content process, the classification system of the United Nations was used to categorize the countries (United Nations, 2019) and the information graphics that reveal bibliometric networks were created using descriptive bibliometric networks (VOSviewer). In this context, it has been tried to contribute to the literature on the field.

METHOD

Bibliometric Analysis

Scientists contribute to the improvement of the knowledge, created by authors, researchers, pragmatists, in terms of discourse and concept. The knowledge created is transferred to the relevant literature through conference proceedings, books and journals. Hence, the created knowledge describes the field with the main lines and a universe of discourse is formed. Concept definitions and the programs, which are accepted as the common theme, constitute the basis where the field is defined. Through complement of knowledge which has been created, skills related with the field, basic concepts, terms and their scopes and curriculums involved as well are determined. This conceptual index, the outcome of a series of studies and research, is a guide for the field personnel to carry out their tasks in the best manner. Furthermore, it interactively extends the field of study and supports the creation of new knowledge. Determination of the literature concerned, limitations, shortcomings, weaknesses, and evaluation of the current situation would be quite beneficial in the field of recreation management, which is relatively new.

The term ‘‘scientometrics’’, which was proposed by Nalimov (1960), has been used to characterize the extension of scientific studies, to determine the structure of the field, to label the interrelationship between the writers and to illustrate the productivity (Hood & Wilson, 2001). Bibliometric analyse is an area of investigation which is based on stock-taking and through which the published books, magazines, articles and printouts of the cited texts are analysed by means of mathematical and statistical techniques (Al & Coştur, 2007; Meho, 2007; Pritchard, 1969; Yıldırım & Demir, 2019). Bibliometric analyses can be both in descriptive (determining the number of books and articles published in a certain year) and evaluative (evaluating the effects of an article via citing-analyses) forms (Kuruthan et al., 2017; Tabuk, 2022). These analyses make it possible to exhibit the general view of a certain discipline through the statistical investigations of topics, articles, cited writers and sources (Zarifm Mahmoudi et al., 2013). The citing data are regarded as an indicator of how often an article is referred to by other researchers and whether it is used as a source or not. The methods which have widespread usage in bibliometric analyses such as citing-analyse and citing-rate, impact factor and approval rate of the articles, can also be used in the quality evaluation process of academic journals (Lee, et al., 2002). This type of research provides an opportunity for the improvement of new methods and techniques, as well as paving the way for subsequent studies. This research was carried out using bibliometric analysis (Yersüren & Özel, 2020).

Bibliometric analyses identify the most published researchers, academic journals and commonly used keywords, enabling the creation of databases that increase interaction between authors, countries, universities or supporting institutions. It also identifies important indicators such as author-citation indices (h and q indices) that reveal performance data and productivity of authors, universities and countries. Bibliometric analyses also help to create descriptive statistical databases, enabling the qualitative evaluation of scientific publications and the creation of data that will contribute to the relevant discipline. It is believed that new scientific documents that

emerge as a result of research will shape the future of science. These documents are subjected to an examination and research process in the process of information document analysis (Bowen, 2009). Document analysis is the examination and research process necessary for the recovery and interpretation of the collected empirical data (Corbin & Strauss, 2008). Thus, maximum efficiency in resource utilization is achieved and full benefit is obtained from the efforts (Al et al., 2012).

This study aims to identify the positive impact of sport management research on the ground, based on the concepts of sport management, sport management education and higher education. The terms used in accordance with the keywords selected in the scanning process were specified either in the article subject, in the keywords list or in the abstract. The words used in the review were determined in line with the literature and marked on the condition of being limited to field studies.

The research design was created using the PRISMA (Page et al., 2021) method designed for systematic reviews (Figure 1). In the first stage, the main database was created by using the keyword "sport management". In the exclusion process, after narrowing the searches with the words "sport management education" and "higher education", short readings were made on the abstracts of the articles and the exclusion process was carried out in accordance with the inclusion criteria; a) studies within the scope of sport sciences, b) studies with sport management education expressions in the article titles, c) studies with higher education and sport management content. At the end of the data collection process, 191 studies were analysed by carrying out the classification process for each article.

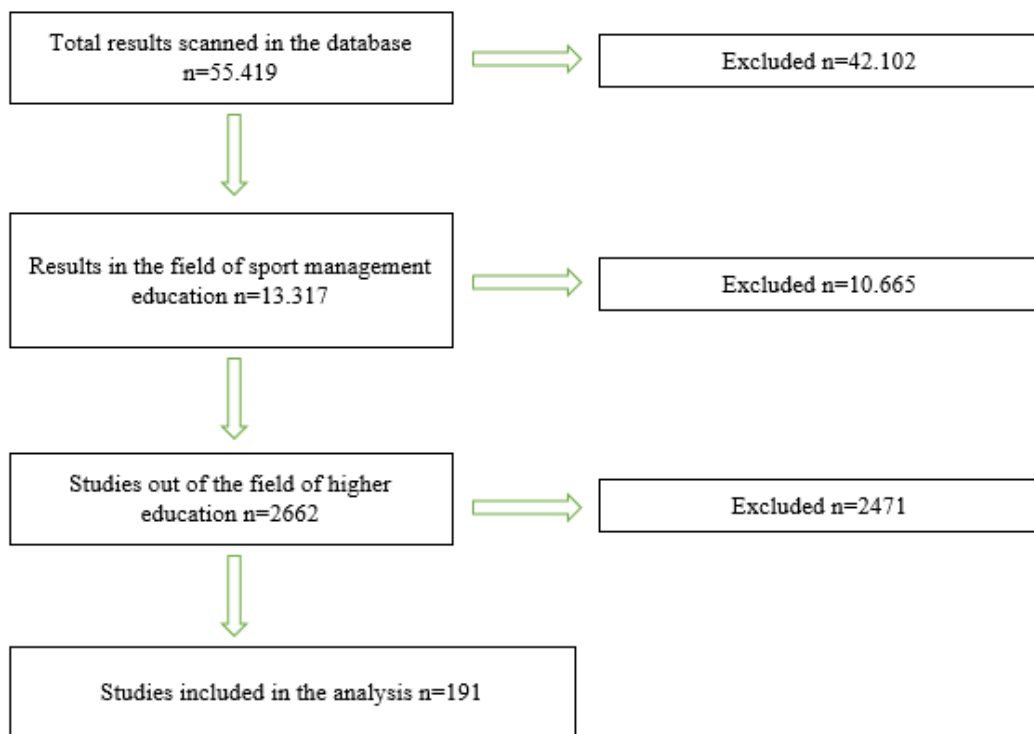


Figure 1. PRISMA process

Based on the data obtained in the literature review; the publication years of the studies, citation index changes by years, the most productive researchers, the universities and countries with the most publications were determined and classified according to Web of Science (WOS) categories. Thomson Reuters Web of Science database titled "Web of Science Core Collection" (n=191) related to sport management education was studied. For the search, sport management education keywords were scanned to include all publications between 1990 and 2020. The first publication belongs to 1993. The United Nations classification system was used to categorize countries. Knowledge graphs revealing bibliometric networks were created using VOSviewer (Eck & Waltman, 2022), which reveals bibliometric networks. Only the WOS database was included in the study. Data analysis was carried out in December 2021. The research was limited to scientific research published between 1990 and 2020. Due to rapid changes in scientific knowledge production, subsequent research is likely to yield different results (Liu et al., 2012).

RESULTS

Science Categories, Publication Year and Article Types

A total of 191 articles published during a period of 1990-2020 is found in our basic search. Most researched areas of sport management education were found to be *Hospitality Leisure Sport Tourism* and *Education Educational Research Management* (51,83%, 42,93 and 32,46 Table 1). There is an increase in the number of publications after 2015. The most publications were made in 2020 (n=32 Figure 1). The most common document types were article, proceedings paper, review, editorial material and early access (83.24%, 8.37, 4.18, 3.66 and 1.57 respectively; Table 2).

Table 1. Web of science categories

	f	%
Hospitality Leisure Sport Tourism	99	51.83
Education Educational Research Management	82	42.93
Sport Sciences	62	32.46
Social Sciences Interdisciplinary	40	20.94
Sociology	9	4.71
Business	5	2.61
Economics	4	2.09
Education Scientific Disciplines	4	2.09
Environmental Sciences	3	1.57
	3	1.57

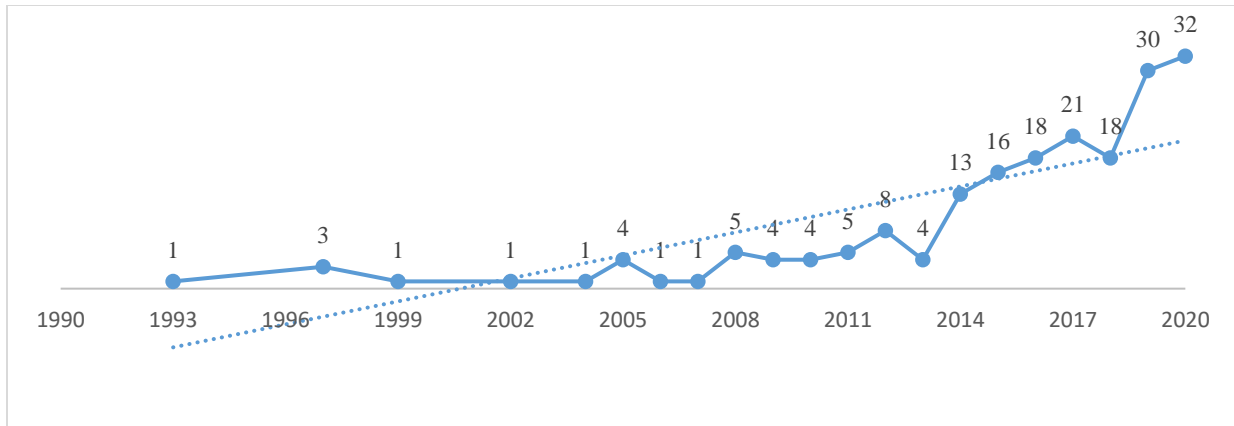


Figure 2. Total number of publications by year.

According to the change in the number of publications by years, there is a low acceleration in the increase in the number of publications from 1993 when the first publication was made to 2011. After the year, rapid periodic changes are observed. The rapid increase in the number of publications in 2014 (n=13) was similarly repeated in 2019 (n=30). It is seen in the literature that the first research was done in 1993. While the increase rate of publications was for the first 20 years (n=43), 148 publications were produced in the next 15-year period. The most publications were produced in 2022 (n=32).

Table 2. Types of documents

n=191	f	%
Article	159	83.24
Proceedings Paper	16	8.37
Review	8	4.18
Editorial Material	7	3.66
Early Access	3	1.57
Book Chapter	2	1.04
Book Review	1	0.52
Total	196	100

As seen in Table 2, there are a total of 7 publication types. It was determined that the most common type of publication was research article (n=159). The type of research that follows the articles is conference papers (n=16). The reason why the publication types have reached a higher number than the research data (n=196) is due to the fact that it is considered as a multi-publication type in the Web of Science database (Table 2). Authors can expand their conference papers and publish them as articles under the same title.

Authors Productivity, Countries, Meetings, Universities and Journals

A total of 191 research in sport management education are determined. As seen in the Table 3, it is observed that the authors named Sotiriadou (5), Pierce (4), Sauder (4), Taylor (4) and Hardin

(3) lead the research. The USA took part in the first conversation with 95 articles followed by Australia, England, Canada and Spain (95, 25, 16, 13 and 11 Figure 2). 191 studies are excluded in the results according to the WOS database count (Table 2).

Table 3. Author’s productivity

	f	%
Sotiriadou P.	5	2.61
Pierce D.	4	2.09
Sauder M. H.	4	2.09
Shreffler M. B.	4	2.09
Taylor E. A.	4	2.09
Hardin R.	3	1.57
López-Carril S.	3	1.57
Mudrick M.	3	1.57
Schulenkorf N.	3	1.57
Sherry E.	3	1.57

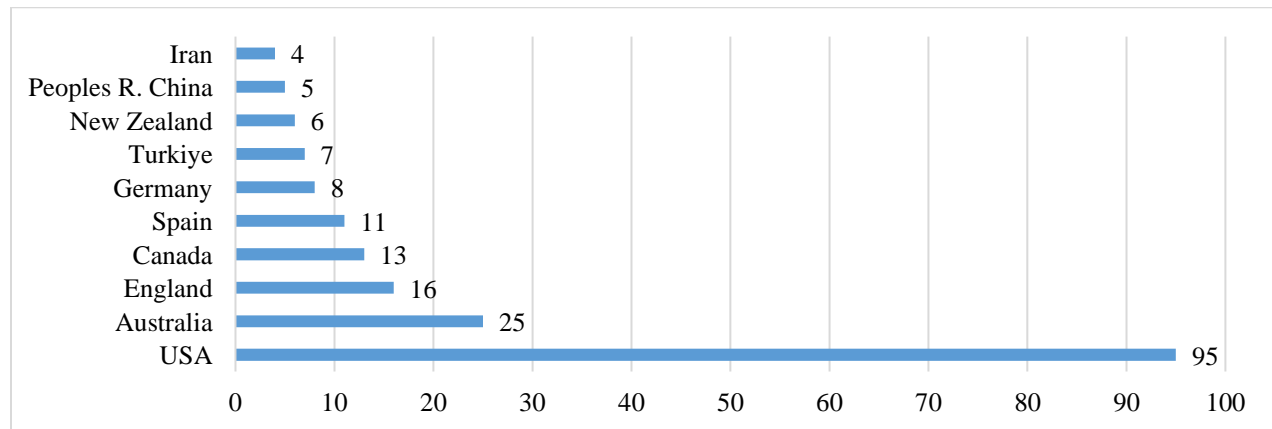


Figure 3. Number of publications by country

Consistent with the results in Figure 2, the country with the highest number of studies in sport management education research is the United States of America (n=95). Australia (n=25) and England (n=16) follow the USA with publication. As can be seen in Figure 3, the USA has established a research network with many countries. It is seen that the studies related to the research subject are in the central position in the network of countries.

Table 4. Universities with the most publications

n=209	f	%
Griffith University	8	4.18
University of Louisville	8	4.18
Louisiana State University	6	3.14
Temple University	6	3.14
La Trobe University	5	2.61
Texas A&M University	5	2.61
University of Technology Sydney	5	2.61
University of Tennessee	5	2.61
University of Valencia	5	2.61
Bowling Green State University	4	2.09

In terms of universities contributing to the literature on sport management education, Griffith University and the University of Louisville continue to lead with the same number of publications (n=16 Table 4). The USA has 6 universities in the top ten list.

Table 5. Journals with the most publications

n=77	f	%
Sport Management Education Journal	36	18.84
Sport Management Review	29	15.18
Journal of Sport Management	28	14.66
Journal of Hospitality Leisure Sport Tourism Education	18	9.42
European Sport Management Quarterly	4	2.09
Procedia Social and Behavioral Sciences	3	1.57
South African Journal for Research in Sport Physical Education and Recreation	3	1.57
5th International Scientific Conference on Kinesiology Proceedings Book	2	1.04
Anthropologist	2	1.04
Energy Education Science and Technology Part B Social and Educational Studies	2	1.04
International Conference on New Horizons in Education Inte 2014	2	1.04
International Review For The Sociology of Sport	2	1.04
Journal of Applied Sport Management	2	1.04
Physical Culture and Sport Studies and Research	2	1.04
Podium Sport Leisure and Tourism Review	2	1.04

Using the keywords selected for the research, 77 journals were identified in the search made in the Web of Science database. It is seen that these journals are the journals in which the most publications (n=99) are made in the field of study of the academic journals called sports management. A total of 111 academic publications were made in the first four journals in Table 5. In this issue the most contributing journals are *Sport Management Education Journal*, *Sport Management Review*, *Journal of Sport Management*, *Journal of Hospitality Leisure Sport Tourism Education* and *European Sport Management Quarterly* (n=36, 29, 28, 18 and 4 respectively Table 5).

Citation Analyses

The h-index of sport management education is 17. The average number of citations per article is 6.74. A total of 1003 citations were found for 191 articles, which were separated from the citations of the authors themselves. It was found that there is a systematic increase in publication, citation and h-index values according to publication periods. The most publications are published in the III. period (Table 6). The most cited document was an original article titled “Integrating sport-for-development theory and praxis” written by Lyras and Peachey. This article is published in 2011 and received citations 117 times (10,64 times per year; Table 7).

Table 6. h-index and citation changes in the field of sport management

WOS Database	n	h-index	Average citation	Sum of citation	Sum of citing articles
I. 1990-1999	5	4	7	35	35
II. 2000-2009	21	11	18,57	384	346
III. 2010-2020	169	14	5,34	800	722
IV. 1990-2020	191	17	6,74	1135	1003

Table 7. Ten most cited articles in sport management education

Title	Authors	PY	TC*	ACPY**
Integrating sport-for-development theory and praxis	Lyras, Alexis; Peachey, Jon Welty	2011	117	10,64
Can gender equity be more equitable?: Promoting an alternative frame for sport management research, education, and practice	Shaw, Sally; Frisby, Wendy	2006	85	5,31
eSport management: Embracing eSport education and research opportunities	Funk, Daniel C.; Pizzo, Anthony D.; Baker, Bradley J.	2018	55	13,75
The demand for sport: Sport consumption and participation models	Lera-Lopez, Fernando; Rapún-Gárate, Manuel	2007	54	3,6
Addressing epistemological racism in sport management research	Singer, JN	2005	48	2,82
Managing sport for social change: The state of play	Sherry, Emma; Schulenkorf, Nico; Chalip, Laurence	2015	41	5,86
Perceptions of African American faculty in kinesiology-based programs at predominantly white American institutions of higher education	Burden, JW; Harrison, L; Hodge, SR	2005	29	1,71
Research about efficiency level of physical education and sports academy students in Turkey on ability about studying a lesson	Sahan, Hasan	2012	28	2,8
Experiencing sport management: The use of personal narrative in sport management studies	Rinehart, RE	2005	28	1,65
Environmental Sustainability in Sport Facility Management: A Delphi Study	Mallen, Cheryl; Adams, Lorne; Stevens, Julie;	2010	27	2,25

Note: PY= Publication Year, TC=Total Citations, ACPY= Average Citations Per Year, *= The most cited publications and **= Documents with the highest citation average by year

Keyword and Bibliometric Network Analyses

The keyword analysis shows that 'sport management', 'education', 'sport', 'higher education' and 'social media' (n=34, 15, 13, 11 and 9 respectively, Table 8) are the most frequently used terms. We performed a holistic bibliometric network analysis and created infographics using VOSviewer. The results show us that there are three keyword centres in the literature. These are “sport management”, “sport” and “higher education. As a main keyword sport management is located in the centre of the network, linked to the other keywords (Figure 4).

Table 8. The most frequently used 30 keywords in sport management education

1	Sport Management (34)	11	Teaching (5)
2	Education (15)	12	Career Development (4)
3	Sport (13)	13	Doping (4)
4	Higher Education (11)	14	Student Engagement (4)
5	Social Media (9)	15	Case Study (3)
6	Curriculum (6)	16	Disability (3)
7	Experiential Learning (6)	17	Employability (3)
8	Sport Management Education (6)	18	Gender (3)
9	Online Learning (5)	19	Human Resource Management (3)
10	Physical Education (5)	20	Management (3)

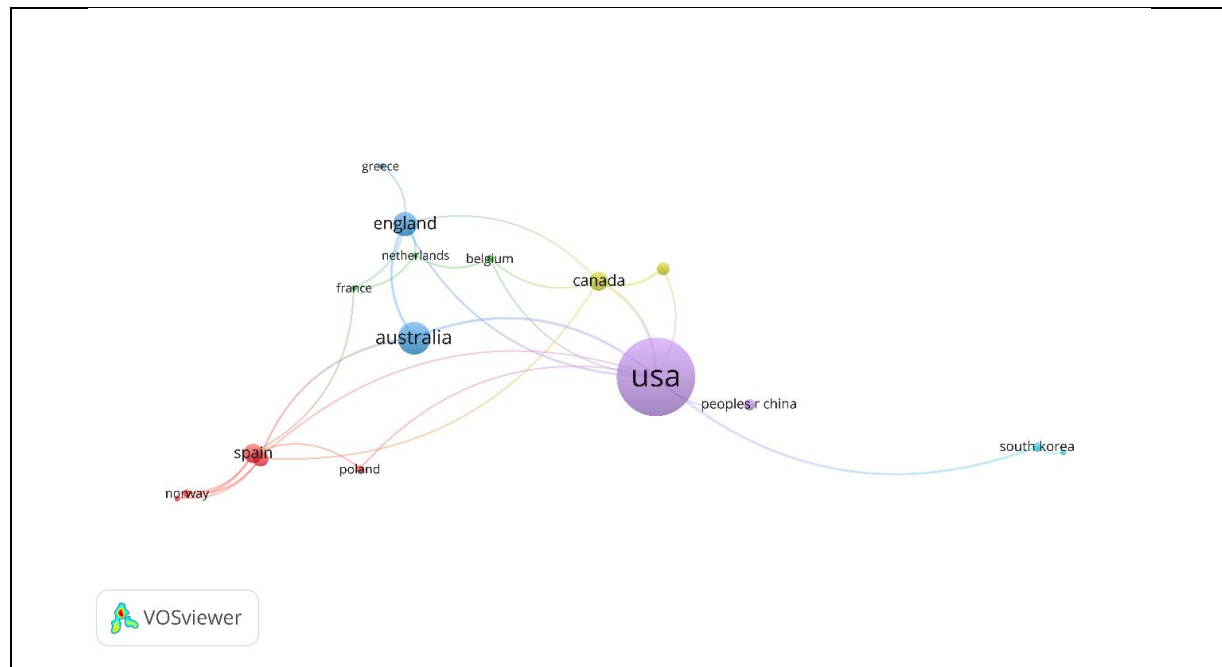


Figure 4. Countries network

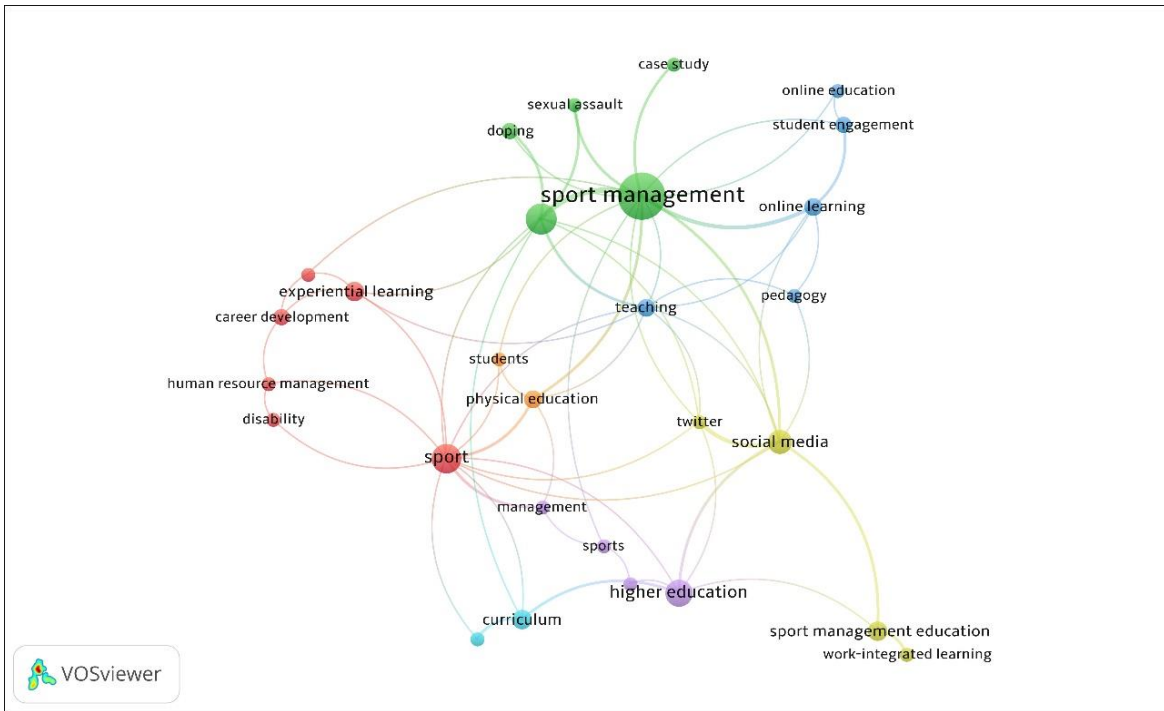


Figure 5. Keywords network

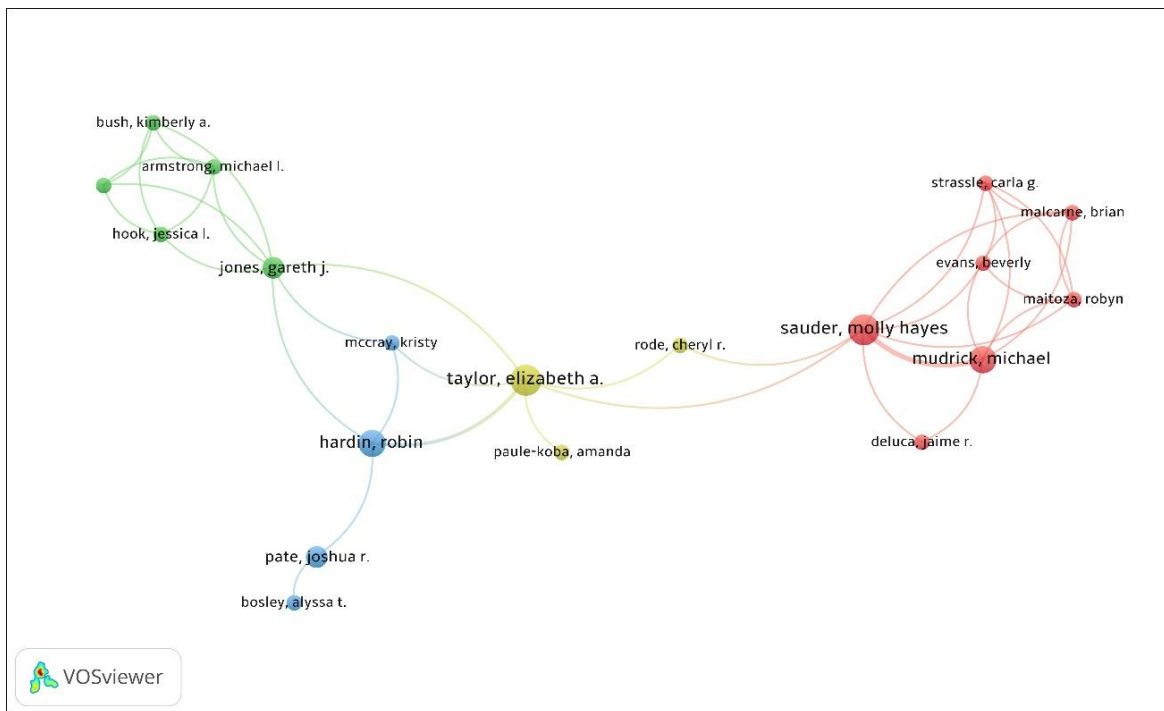


Figure 6. Authors network

DISCUSSION AND CONCLUSION

This study aims to conduct a bibliometric analysis in order to reveal the relationships between the concepts in keywords and abstracts, the most cited authors, the most cited journals and the most cited countries in sport management education studies. With a total of 1135 citations, the h-index of this number was found to be 17. There was a strong correlation between the keywords sport management education and higher education.

The findings indicated that the most used keywords were "sport management", "education", "sport" and "higher education". The least used keywords were determined as disability, employability, gender, human resource management and management. Based on the keywords, information about the direction of the research can be given. The fact that the studies have been cited more may be related to the rarity of the subject. 47 studies conducted between 2015-2020 still have not received any citations. The citation analysis reveals that Lyras and Peachey are the most cited authors. There are a total of 77 journals in the data. "Sport Management Education Journal", "Sport Management Review" and "Journal of Sport Management" are the most cited journals. Top publishing institutes are "Griffith University", "University of Louisville" and "Louisiana State University" and the most researched country is the USA.

According to all our results and based on the literature discussion, recommendations for the authors are suggested below:

The most cited works in the literature are as follows: The impact of sports on social changes (Lyras & Peachey, 2011), dominating gendered discourse in sport organizations (Shaw & Frisby, 2006), the standing of e-sport in sports management (Funk et al., 2018), participation in sport and consumer expenditures for sport (Lera-Lopez & Rapún-Gárate, 2007), the importance of race and ethnicity in sports management research and training (Singer, 2005), relation between sport and social change (Sherry et al., 2015), race-based organizational socialization (Burden et al., 2005), study skills of students at sport science institutes (Şahan, 2012), the influence of sports management on society and managers (Rinehart, 2005), environmental sustainability in the sport facilities management (Mallen et al., 2010).

Ever since it was set as a target to make sports management an autonomous discipline, emphasis has been laid on the quality of curriculums and course training programs. Within this framework, over the last 35 years theoretical and applied (empirical) research into the following topics have been carried out: Curriculum and knowledge; job training, experiential learning and service education; employability; pedagogy; social gender; technology and e-education; globalisation and internationalization; accreditation process (Miragaia & Soares, 2017).

Suggesting that sports is not always a job and that sports management is not always a profession, Corlett (1997) considered the boom in career-wise university departments in parallel to sports management in the later twentieth century, to be a response to the conception of sport and

organization. Sports management programs are to be improved according to the necessities of time, emerging trends and in harmony with internationalization. Kelley et al. (1994) proposed that sports management programs should constantly be identified and restructured in terms of curriculum to be accepted as an academic discipline. The development of curricula and the conduct of research in a more globalized way can be very helpful to keep pace with rapidly changing commercial, economic and cultural environments (Masteralexis & McDonald, 1997). In his study focusing on what to do for the improvement of sports management as an increasingly popularity gaining discipline, Mahony (2008) mentioned the lack of qualified lecturers and researching students. He also underlined the significance of cooperation with the sector and the need for faculties of sports management. The students are to be provided with more eligibility options to obtain a job in the sector after graduation. Volunteering in the sector, taking part in training courses and participating in government-sponsored entrepreneurship projects can improve their qualifications. Mahony also stated that sports management is quite a new discipline, adding that the number of academic members in departments such as psychology and sociology is almost 15-20 times greater than that of sports management, which is still on the way to development. In addition to Mahony, Chelladurai (1992) showed at Zeigler conference that he was holding the same views, saying that “We don’t have the labour to specialize in our sub-fields”, whereby he confirmed the situation.

On the basis of these consequences, doing research on the following issues could make substantial contributions to the field:

- a) Determining the sub-disciplines of sports management
- b) Sports management applications and apprenticeship programs
- c) Sports management and cooperation with the sector
- d) Career opportunities in sports management
- e) Curriculums
- f) Cooperation with local and national sport organizations
- g) Cooperation with local administrations

Additionally, in consideration of the diversity of sports management; offering sport policies to governments regarding the health care aspects, developing new technical applications for every level of sports administration, diversifying the programs for the purpose of adaptation of sports to social life and participation in sports, observing the outcomes of flourishing sport industry, creating ways of applied training in sports management and organising student events within this scope are all of great importance.

Education of sports management is a discipline which is exerting academic effort to extend the use of principal and conceptual methods and applications as activities based on an international structure are carried out in cooperation with national organizations and many other partners. So, improvement of local dynamics should be focussed on. Finally, conducting researches to develop qualified programs that would promote national achievement and international participation in sports, could contribute to the improvement of sports management discipline.

Limitations

In this study only the WOS database was used. Further studies including more databases such as Russian Science Citation Index, Scopus, SciELO Citation Index, PubMed, Index Copernicus or DOAJ can be performed in the future. Researchers should be encouraged and supported to carry out more articles in sport management education area.

Conflict of Interest: Any personal and financial conflicts of interest within the scope of the study not available.

Authors' Contribution: Study design; Study design, data collection, statistical analysis, data interpretation, article preparation, literature review processes were carried out by the author (MET). The author has read and accepted the published version of the article.

Research Publication Ethics: This research was conducted using the document review method and includes studies published at <https://www.webofscience.com>. During the writing process of the current study, the scientific, ethical and citation rules within the scope of the "Directive on Scientific Research and Publication Ethics of Higher Education Institutions" were followed; no falsification was made on the collected data and this study was not sent to any other academic publication environment for evaluation.

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The Congruence of Teaching Styles Used by Turkish Physical Education Teachers with National Curriculum' Goals and Learning Outcomes

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Abstract

This study was carried out to determine the congruence of the teaching styles used by Turkish physical education teachers in their lessons with the goals and learning outcomes of the curriculum they are responsible for taking into consideration. The case study design was used and eight physical education teachers serving in middle and high school grades in the central districts of a metropolitan city were involved in this study. In the study, a semi-structured interview form prepared by the authors was used to reveal which teaching styles physical education teachers prefer in their lessons, the reasons for their preference, and the congruence between the teaching styles they use in their lessons and the goals and learning outcomes of the curriculum. Content analysis was used to analyze the data. The results of the study indicated that physical education teachers generally preferred reproduction cluster teaching styles to vary extents and mostly used the practice style. Effective skill learning and effective time management were found to be the most mentioned reasons for teachers to prefer the practice and the command styles more in their lessons. The study additionally revealed that when selecting teaching styles for their lessons, physical education teachers did not take into consideration the goals and learning outcomes of the curriculum. Based on the results of the study, it is recommended that professional development programs be designed to enhance the curriculum literacy of physical education teachers and to inform them of the teaching styles that are aligned with certain goals and learning outcomes.

Keywords: Curriculum goals and learning outcomes, Physical education curriculum, Physical education teachers, Teaching styles

Türk Beden Eğitimi Öğretmenlerinin Derslerinde Kullandıkları Öğretim Stillerinin Öğretim Programlarının Amaç ve Kazanımları ile Uyumu

Öz

Bu çalışma, Türk beden eğitimi öğretmenlerinin derslerinde kullandıkları öğretim stillerinin dikkate almakla sorumlu oldukları öğretim programının amaç ve kazanımlarıyla uyumunun belirlenmesi amacıyla gerçekleştirilmiştir. Durum çalışması deseninin kullanıldığı bu çalışmaya bir büyükşehir merkez ilçelerinde ortaokul ve lise öğretim kademelerinde görev yapan sekiz beden eğitimi öğretmeni dahil edilmiştir. Çalışmada, beden eğitimi öğretmenlerinin derslerinde hangi öğretim stillerini tercih ettikleri, tercih etme gerekçeleri ve derslerinde kullandıkları öğretim stilleriyle öğretim programının amaç ve kazanımları arasındaki uyumu belirlemek üzere araştırmacıların hazırladığı yarı yapılandırılmış görüşme formundan yararlanılmıştır. Verilerin çözümlenmesi amacıyla içerik analizi kullanılmıştır. Çalışmanın sonuçları, beden eğitimi öğretmenlerinin genel olarak sunuş kümesi öğretim stillerini değişen oranlarda tercih ettiklerini ve esas olarak da çoğunlukla alıştırmaya stilini kullandıklarını göstermiştir. Öğretmenlerin alıştırmaya ve komut stilini derslerinde daha fazla tercih etmelerinin en sık bahsedilen gerekçelerinin; etkili beceri öğrenimi ve zaman yönetimi olduğu belirlenmiştir. Çalışmada ayrıca, beden eğitimi öğretmenlerinin dersleri için öğretim stili seçerken öğretim programının amaç ve kazanımlarını kendilerine ölçüt almadıkları belirlenmiştir. Çalışma sonuçlarından yola çıkarak beden eğitimi öğretmenlerinin, dikkate almakla yükümlü oldukları öğretim programı hakkında okuryazarlıklarının artırılması ve belirli amaçlar ve kazanımlarla uyumlu öğretim stilleri hakkında bilgilendirilmesi amacıyla mesleki gelişim programlarının düzenlenmesi önerilmektedir.

Anahtar Kelimeler: Beden eğitimi öğretmenleri, Beden eğitimi öğretim programı, Beden eğitimi öğretmenleri, Öğretim stilleri

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INTRODUCTION

The national curriculum of various countries encourages teachers to embrace diverse pedagogical approaches (Chatoupi, 2018). Moreover, physical education (PE) teachers are required to use appropriate pedagogies to achieve the goals stated in the curriculum (Goldberger & SueSee, 2020). In Türkiye, it has been highlighted that teachers must utilize suitable pedagogical tools (teaching models, strategies, and styles) to achieve the lesson learning outcomes in the PE curriculums since 2006 for the middle school level and since 2009 for the high school level (Ministry of National Education [MoNE], 2006, 2009, 2013, 2018). In this vein, it is stated that the Spectrum of Teaching Styles (the Spectrum) (Mosston & Ashworth, 2008), which ensures that lesson objectives and teacher actions are aligned (Goldberger et al., 2012), is a pedagogical toolbox that PE teachers can benefit from to meet the diverse needs of students and the different educational objectives (psychomotor, cognitive, affective) of the curriculum (Sanchez et al., 2012). In other words, it can be stated that the Spectrum is an efficient pedagogical toolbox that offers 11 alternative ways to meet the diverse learning needs of students, to ensure that lessons are more inclusive, and to enable students to attain multidimensional learning outcomes.

The heart of the Spectrum theory is the premise that teaching behavior consists of a chain of decision making. Who makes certain decisions for teaching episodes distinguishes one teaching style from another. In this regard, there are three sets of decisions that must be made for each teaching episode. These are pre-impact (planning/preparation), impact (action/implementation), and post-impact (assessment/feedback) sets. These decisions form the structure of a particular teaching style and there are distinct teaching styles depending on the people (learner or teacher) who make the decisions in these decision sets. In other statements, what characterizes teaching styles from each other is that each style has a distinctive decision-making structure. In other statements, what characterizes teaching styles from one another is that each style has a distinctive decision-making structure. In this regard, there are 11 teaching styles in the reproduction (Command [A], Practice [B], Reciprocal [C], Self-check [D], Inclusion [E]) and production cluster (Guided Discovery [F], Convergent Discovery [G], Divergent Discovery [H], Learner Designed-Individual Program [I], Learner Initiated [J] and Self Teaching [K]) of the Spectrum. Each teaching style contributes to specific developmental opportunities for learners and to the achievement of different educational objectives due to its unique decision structure that distinguishes it from other teaching styles. However, to mention specifically cognitive clusters, when teaching styles in the reproduction cluster are used, the objective of teaching is the reproduction of certain known concepts/skills by students. On the other hand, in the cluster of production styles, the objective of instruction is to enable students to discover new concepts/skills that they did not previously know (Mosston & Ashworth, 2008).

PE teachers have a special opportunity to enhance student learning in psychomotor, cognitive, and affective/social domains (Garn & Byra, 2002). However, this requires PE teachers to benefit from alternative ways of teaching their lessons. In this sense, the use of various teaching styles in the

reproduction and production cluster of the Spectrum facilitates the achievement of diverse learning outcomes in the curriculum (Goldberger et al., 2012; Kulinna & Cothran, 2003; Syrmpas et al., 2017). For instance, it is probable to notice that the national PE curriculum in Türkiye (MoNE, 2008) has multi-faceted goals when the current middle school curriculum is reviewed. Accordingly, the goal of the curriculum is stated as *“preparing students for the higher level of education by developing movement skills, active and healthy life skills, concepts and strategies that they will utilize throughout their entire lives, as well as self-management skills, social skills and thinking skills”*; in accordance with this goal, it is expressed that students enrolled in the PE lesson are expected to attain eight curriculum outcomes including psychomotor, cognitive, affective, and social learning domains. In order to accomplish this, it was reported that teachers must use teaching styles compatible with the learning outcomes. In addition, it was pointed out that the use of only traditional teacher-centered teaching approaches in the lessons would not be sufficient to meet the learning outcomes in the curriculum and that learner-centered teaching approaches must be utilized (MoNE, 2018).

Until now, several quantitative self-reported studies have been conducted to reveal the teaching styles used by PE teachers. Although the results of these studies carried out in countries such as Türkiye, Korea, France, England, Portugal, Canada, ABD, Finland, Australia, and Greece showed that reproduction cluster teaching styles were generally used more frequently, teachers in these studies claimed that they also used various production cluster teaching styles (Cothran et al., 2005; İnce and Hünük, 2010; Jaakkola and Watt, 2011; Kulinna and Cothran, 2003; SueSee et al., 2018; Syrmpas et al., 2016). Based on the results of their cross-cultural study, Cothran et al. (2005) stated that additional methods including different data sources such as observation and qualitative interviews need to be used to verify the results of the self-reported study. Because studies on observed teaching styles have dramatically shown that PE teachers in fact use few teaching styles in their lessons (Curtner-Smith et al., 2001; Saraç-Yılmaz et al., 2005; SueSee & Barker, 2019; SueSee et al., 2019). Especially in these studies, it was reported that a considerable percentage of PE lessons were taught using the practice style, while other teaching styles were not used at all or were used to a minimal extent. For instance, SueSee and Barker (2019), in their study conducted with Swedish PE teachers, firstly, the teaching styles used by 42 teachers who attended the quantitative part of the study were determined by means of a questionnaire. Subsequently, the systematic observation was used to identify the teaching styles used by the six volunteer teachers in their lessons. According to the results obtained from the questionnaire, it was reported that the most used teaching styles of the PE teachers were practice, divergent discovery and learner designed, respectively. On the other hand, the systematic observation results of the lessons of six teachers showed that the most used teaching style was practice, in addition to a fairly limited use of divergent discovery and self-check styles. In conclusion, the systematic observational results of the study revealed that production styles could not be used to the extent claimed by the teachers.

In the literature, qualitative research to determine the teaching styles used by PE teachers in their lessons is quite limited. In such a study, Syrmpas et al., (2017) attempted to uncover the underlying

factors influencing the pedagogical choices of ten PE teachers in Greece toward reproduction and production approaches. The teachers who attended the study expressed that they generally preferred the reproduction approach in their lessons. Only three of the teachers claimed that they used the production approach. The authors' results also showed that PE teachers' prior K-12 experiences (as a student themselves) influenced their teaching preferences and that the in-service professional development programs they were obliged to attend had a rather weak impact on their lesson practices. It was found that some of the reasons that propelled teachers to use the reproduction approach were prioritizing the development of students' psychomotor skills, control, and time management, and that they thought they could achieve their prioritized goals more effectively with the reproduction approach. On the other hand, so far, it has not been enlightened whether the teaching styles used by Turkish PE teachers are congruent with the goals and learning outcomes of the national curriculum that they are responsible for taking into consideration. Furthermore, the reasons why Turkish PE teachers prefer reproduction cluster teaching styles more are not explicitly known. Therefore, it is considered that this present study will eliminate significant ambiguity. Accordingly, the purpose of the current study was to determine the congruence of the teaching styles used by the PE teachers in their lessons with the goals and learning outcomes of the national curriculum that they are responsible for considering. The following study questions were addressed for this purpose:

1. Which teaching styles are used by PE teachers in their lessons?
2. For what reasons do PE teachers prefer to utilize these teaching styles?
3. Are the teaching styles that PE teachers use in their lessons congruent with the goals and learning outcomes of the national curriculum?

METHOD

Study Design

In the present study, a case study design, which is a very common qualitative research design, was used to address which teaching styles PE teachers use in their lessons and how these styles are coherent with the goals and learning outcomes of the national curriculum. A case study is an in-depth, comprehensive description and analysis of a restricted phenomenon such as a program, institution, individual, process or a social unit (a person, group, or community). In other words, it is characterized as an in-depth description and analysis of a bounded system (Merriam, 2009). Case studies are a preferable method when (i) the main study questions are "how" or "why"; (ii) the researcher has little or no control over behavioral phenomena; and (3) the focus of the study is a current phenomenon (Yin, 2014).

Study Group

The underlying idea of qualitative research is the purposeful selection of participants or settings that will optimally contribute to the understanding of the problem and the research question (Creswell & Creswell, 2018). PE teachers to be selected for the study were determined according to the maximum variation sampling method, which is one of the purposive sampling methods. In this sampling method, the purpose is to determine whether there is any common phenomenon among diverse situations and to address various dimensions of the research problem depending on this diversity (Yıldırım & Şimşek, 2018). In this regard, it was ensured that the volunteer PE teachers involved in the current study differed from each other in terms of gender, ages, school type, and years of employment. Nonetheless, all teachers selected in the study were working in an urban area.

Table 1. Information about the characteristics of the PE teachers who attended the study

Codenames	Gender	Ages	School type	Year of employment	The source of their knowledge regarding teaching styles	Their opinions on the sufficiency of the courses they attended regarding styles
Sevgi	Female	36	Middle School	12	PETE program	Not sufficient
Hümeyra	Female	54	High School	28	PETE program	Sufficient
Cengiz	Male	49	High School	26	In-service programs	Not sufficient
Görkem	Male	38	High School	10	PETE program	Sufficient
Hande	Female	43	Middle School	17	PETE program	Sufficient
Seher	Female	46	Middle School	20	PETE program	Not sufficient
Buğra	Male	36	High School	11	PETE program	Not sufficient
Yetkin	Male	37	Middle School	12	PETE program	Not sufficient

As shown in Table 1, the eight PE teachers interviewed were coded with pseudonyms as Sevgi, Hümeyra, Cengiz, Görkem, Hande, Seher, Buğra and Yetkin. Four of the PE teachers enrolled in the study were female and four were male. Their ages ranged from 36 to 54 years and four of them were serving at the middle school level and four at the high school level. Teachers' years of employment ranged from 10 to 28 years. Furthermore, it is understood that seven of the teachers learned teaching styles during the physical education teacher education (PETE) program and one of them learned teaching styles during in-service programs. Finally, five of the teachers stated that the courses they attended regarding teaching styles were not sufficient, while the other three indicated that the courses they attended during the PETE program regarding teaching styles were sufficient.

Data Collection

In all methods of qualitative research, part and sometimes the whole of the data is collected through interviews. The most common form of interview is a face-to-face interview in which one person obtains information about a subject from another (Merriam, 2009). Semi-structured interviews

were carried out with the PE teachers within the scope of the study. In semi-structured interviews, interviewees are encouraged to talk about the topic(s) in elaborate and detailed ways. The interviewee is allowed to express his/her opinion in any manner he/she wishes. The researcher generally has only a framework of the questions they intend to ask (Howitt, 2019). In this study, a semi-structured interview form was prepared to determine (i) *which teaching styles PE teachers prefer in their lessons*, (ii) *the reasons why they prefer them*, and (iii) *the congruence between the teaching styles they use in their lessons and the curriculum goals and learning outcomes*. This interview form was then shared with a faculty member in the subject area of PE and sports pedagogy and a PE teacher and feedback was obtained on the clarity and sufficiency of the questions.

Additionally, in the current study, sample scenarios of 11 teaching styles, descriptive characteristics of each teaching style, and sample task sheets and lesson plans were provided to facilitate PE teachers to recognize the names of teaching styles and identify which teaching style matches the teaching practices. Before starting the interview questions, the teachers were given an adequate amount of time to review the documents provided to them and when they considered themselves prepared for the interview, the interview was initiated. The PE teachers were provided with the subject and purpose of the study, and scheduled appointments were taken in advance for the day and hour of the interviews. The interviews were carried out face-to-face in the teachers' own schools and in their private rooms according to their requests. Before the interview, the teachers were stated that voice recordings would be made, and the interview was initiated with their consent. The interviews lasted approximately 30 minutes.

Ethical Approval

The required permission for the conduct of the study was obtained from Balıkesir University Social Sciences and Humanities Ethics Commission (Decision No: 2022/06).

Data Analysis

The general purpose of qualitative data analysis is to extract meaning from textual and visual data. This process entails dividing the data into sections and parts and assembling them together again. Content analysis was utilized to analyze the data in the study. Content analysis means the careful, detailed, systematic examination and interpretation of a certain body of material in order to identify patterns, themes, assumptions, and meanings (Lune & Berk, 2017). The main purpose of content analysis is to uncover the concepts embedded in the data and the relationship between these concepts through coding. The procedure in this analysis is to assemble similar data within the framework of certain concepts and themes and to organize and interpret them in a way that the readers can understand (Yıldırım & Şimşek, 2018). For the analysis of the interviews, first of all, the voice recordings were converted into computerized transcripts and the teachers were assigned code names. First, the whole transcript was read and reviewed in detail. Subsequently, the data were coded, and the word or words assigned as codes were marked. Themes were formed in accordance with the codes assigned. To illustrate, the concepts of "*effective skill learning*",

“*effective time management*” and “*student control*” were identified as codes, and then these codes were arranged into the theme of “*subjective reasons for preferring the practice and the command styles over the others*”.

Validity and Reliability

Various strategies were used by the researchers to ensure the validity and reliability of the study (Creswell & Creswell, 2018; Merriam, 2009; Yıldırım & Şimşek, 2018). Before the interviews were conducted, the interview form prepared by the researchers was presented to a PE teacher and a faculty member to obtain feedback on the clarity and adequacy of the questions. Moreover, the teachers to be selected for the study were selected from individuals who would contribute to the purpose of the study.

Before each interview with the teachers, in order to make them feel comfortable and to ensure a warm and natural atmosphere, they were informed about the purpose of the study, acquaintance conversations were made, it was stated that their personal information would remain anonymous, and a conversational language was used to facilitate a conversational atmosphere. In this manner, a climate of trust was cultivated with the teachers.

All interviews were held in the teachers' own rooms (sports room) in line with the requests of the PE teachers who attended the study. Besides, during the face-to-face interviews, teachers' responses to the questions were constantly confirmed, and if there were any misunderstandings by the teacher or the researcher, they were immediately corrected and confirmed.

Multiple researchers experienced in qualitative research separately examine the data gathered as a consequence of the interviews carried out with teachers, formed codes, and then discussed each code and theme to ensure a group consensus. Furthermore, the study design, the characteristics of the teachers enrolled in the study, how the data were collected and the data collection tool, how the data were analyzed, and how the results were arranged were explained in detail. Finally, the results obtained from the interviews were reported under the relevant codes and themes through direct expressions without the researchers' interpretation.

RESULTS

The results obtained by analyzing the interviews with PE teachers within the framework of the present study are organized into three themes: (i) *teaching styles used in the lessons*, (ii) *subjective reasons for preferring the practice and the command styles over the others*, and (iii) *criteria considered in selecting a teaching style for a given lesson*.

Teaching styles used in lessons

In order to uncover which teaching styles the PE teachers who participated in the study prefer in their lessons and to what extent they utilize teaching styles in their lessons, the questions “*Which teaching style(s) do you think you use in physical education and sports lessons?*”, “*Which teaching style(s) do you think you use mostly?-Can you describe a typical lesson briefly?*”, “*Which teaching style(s) do you think you use less often?-Can you briefly describe?*” were asked. In accordance with the opinions of the teachers, “*Teaching styles used in lessons*” was determined as the first theme and the codes obtained under the theme are shown in Table 2.

Tablo 2. Teaching styles used in lessons

Codes	Sevgi	Hümeyra	Cengiz	Görkem	Hande	Seher	Buğra	Yetkin
Style A	Sometimes	Sometimes	Mostly	Mostly	Sometimes	Mostly	-	-
Style B	Mostly	Mostly	Mostly	Mostly	Mostly	Mostly	Mostly	Mostly
Style C	Sometimes	-	-	-	-	-	-	-
Style E	-	-	-	-	Sometimes	-	-	-

When Table 2 is seen, it is recognized that all of the PE teachers who participated in the study use reproduction cluster teaching styles (excluding self-check teaching style) in their lessons, whereas they do not utilize production cluster teaching styles at any time. Eight PE teachers who attended the study expressed that they mostly used the practice style in their lessons. Besides, it is realized that the other teaching style that teachers Cengiz, Görkem, and Seher stated that they used mostly along with the practice style was the command style. Furthermore, along with the dominance of the practice style, teacher Sevgi reported using sometimes the command and the reciprocal styles, teacher Hümeyra stated that she used now and then the command style alongside the practice style, and teacher Hande mentioned that she utilized sometimes the command and the inclusion styles as well as the practice style.

For instance, Cengiz, one of the teachers who expressed that he mostly used both command and practice styles, said, “*I can tell you that the percentage of my use of practice and command styles in the lessons is about 60% to 40%... First, I demonstrate. I say this is the core of the movement. If you do this, it will be like this, if you do that, it will be like this, our hand and arm must be like this, the position of our foot must be like this. After demonstrating and describing it, yes, it's your turn, please do it. Then I correct your mistakes. Your hand must be like this, your arm must be like this, your foot must be like this...*” He described a common lesson, which is recognized as the practice

style. Cengiz also stated, *“At the beginning of the lesson, we use the command for order activities. Since the students do not learn the order activities in middle school, I spend nearly 6 weeks on these activities. At least 15 minutes, 20 minutes.”* He mentioned his typical lessons in which he used the command style.

Expressing that he only uses the practice style in his lessons, teacher Buğra shared, *“We demonstrate first. For example, I first explain the inside-foot passing, then I demonstrate it, then I let them do it. I give a verbal description; I model the movement. Then I tell the children, Now, let's see, let's practice it... While the children are practicing, I provide them with individual corrections, etc. Typically, this is the way our lessons happen.”* summarized a general PE lesson with these sentences. Yetkin, another teacher who stated that he only used the practice style, stated, *“I first present the subject matter to the children on the monitor and then I demonstrate the techniques I want to teach. The children first see it visually. They visualize it, then I demonstrate it myself, and then I attempt to get the children to do it.”* He described a typical lesson with these sentences.

Hümeyra indicated that besides the practice style, she also uses the command style for order activities at the beginning of the academic year and stated, *“...We also use the command style. In order exercises, turn right, turn left, count in place...We do them...In pairs, fours, threes, ceremonial march, wheel to the right, wheel to the left, we give them by command...We generally teach them at the beginning of the semester.”* Expressed this situation in her words.

Hande noted that in addition to the practice style, she also sometimes used the inclusion style in her lessons and explained, *“We also use the inclusion style from sometimes...For example, we demonstrated the serve in volleyball. For example, those who can serve from 3 meters switch to 6 meters. Those who can throw from 6 meters pass to the 9-meter line. We also give everyone the option to improve themselves in this way. Because not everyone can do it at the same level. Their arm strength is not enough, their coordination is not enough... During this process, they evaluate themselves.”* With these sentences, she shared an example of teaching episodes specific to the inclusion style. The fact that teacher Hande provided students with varying difficulty options for the same movement skill and ensured that they had the opportunity to check themselves in this process means that she carried out teaching episodes that fit the decision structure of the inclusion style to a considerable extent (although she did not use task sheets).

Lastly, Sevgi mentioned that in addition to the practice style, she sometimes uses the reciprocal style: *“I mostly use the practice style in my lessons. I occasionally use the reciprocal style... As for the reciprocal style, the year I was involved in a project, I actually tried to use it. Especially at that semester, the subject matter was volleyball. I asked the children to check each other while they were making passes on the wall, overarm pass and bump pass. In this sense, the student's peer can sometimes provide what you want to give much faster. In other words, they can learn faster through their peers. Or he tries not to make the mistake he sees in her. But this style does not always work, that is, it does not fit in the teaching of every movement. I mean, it depends on the subject matter. You have two hoops in basketball, but in volleyball the whole wall is mine. In that sense, you can*

use somewhat different styles in volleyball teaching.” stated that she was able to use the reciprocal style in the teaching of movement skills such as overarm pass and bump pass in volleyball, although not in the teaching of every skill.

Subjective reasons for preferring the practice and the command styles over the others

In order to determine the subjective reasons underlying the use of the practice and the command styles more in their lessons by the PE teachers enrolled in the study, the questions “*Why do you prefer these teaching styles more than other teaching styles in your lessons?*”, “*What are your primary reasons for teaching your lessons in this way?*”, “*Do you think that the practice style (and the command) is more effective?*” were asked. As a result of the teachers’ opinions, the theme of “*subjective reasons for preferring the practice and the command styles over the others*” and the codes obtained are presented in Table 3.

Table 3. Subjective reasons for preferring the practice and the command styles over the others

Codes	Sevgi	Hümeyra	Cengiz	Görkem	Hande	Seher	Buğra	Yetkin
Effective skills learning		*	*	*			*	*
Effective time management	*		*	*		*	*	
Student control						*	*	
Student readiness			*			*		
Lack of materials						*		
Economical					*			

As shown in Table 3, a considerable number of the PE teachers who attended the study stated that because they thought that they could teach skills more effectively (n=5) and use time more efficiently (n=5), they used practice and command styles mostly in their lessons. In addition, the other stated reasons were that these styles ensured that they kept students under control (n=2) and that they consider that students’ readiness levels are poor for the use of the other styles (n=2). One teacher also reported that the lack of adequate amount of sports equipment in the school in parallel to the number of students in his classes was a factor in his preference for the command and the practice style. Lastly, one teacher linked her preference for the command and the practice style to the fact that these styles were more economical than the other styles. In this regard, the highlights of the teachers’ opinions are as follows:

Teacher Buğra stated, “*Because we think we can teach better, because it is effective in terms of time management, because it is effective in terms of classroom management.*” Teacher Cengiz said, “*For example, if I use the reciprocal, it would not be an effective work. A lesson is over until I explain it. When I demonstrate and practice and then provide corrections, it is more effective in this way.*” With these sentences, the teacher elaborated on why he used the command and the practice styles more in his lessons. Hümeyra, on the other hand, justified her preference for the command and the practice style by saying, “*...The teacher should correct the children. I mean, children don't learn anything when you leave them alone...*”

Görkem explained the reason for preferring the command and practice style more in his lessons as follows: “...*We use the command and the practice more because they are economical in terms of time. We want to manage the process faster and we want to convey a lot of things to the child in a short period of time here...*”, he stated that these styles facilitated him to use his time more efficiently.

On the other hand, teacher Seher expressed the reasons for using the practice and command style more in her lessons as follows: “...*For example, unfortunately, we cannot use some styles. I mean the child's readiness. The material issue, and the time issue... We try to use time effectively. In 40 minutes, for example, if we try to teach with the guided discovery style, we will have to teach the same subject matter for two weeks, three weeks. We use command and practice styles because they are more effective in terms of time management, keeping students under control, students' readiness levels...*”

Teacher Hande stated that providing task sheets to students, especially in other teaching styles, caused problems in terms of the class sizes and school facilities: “*Using task sheets in certain teaching styles can be troubling in terms of wasting paper. Also, our classes are crowded. I mean, only one of the classes I teach is a class of 23 students, the others are always between 31 and 38 students, and giving task sheets to 32 students and I teach 9 classes is a huge waste. It is economically challenging for the school...*” stated and justified the use of the limited teaching style in the Spectrum with the economic restrictions of her school.

Criteria considered in selecting a teaching style for a given lesson

In order to determine which criteria PE teachers, consider when choosing a teaching style for a certain lesson and whether they take into account the goals and learning outcomes of the PE curriculum they are responsible for implementing, the questions “*Do you take into account the goals and learning outcomes of the curriculum when choosing a teaching style to use in a particular lesson? If yes, how? If no, which criteria do you consider, and why?*” were asked. According to the opinions of the teachers, the theme of “*criteria considered in selecting a teaching style for a given lesson*” was determined and the codes under the theme are included in Table 4.

Table 4. Criteria considered in selecting a teaching style for a given lesson

Codes	Sevgi	Hümeyra	Cengiz	Görkem	Hande	Seher	Buğra	Yetkin
Subject matter	*	*		*		*		
Sports materials	*			*		*	*	*
Student characteristics			*	*	*			
Class size			*	*		*		
Teacher characteristics								*

According to Table 4, it is realized that the criteria that PE teachers consider in the selection of teaching styles for their lessons are primarily the subject matter (n=4) and the available sports materials of the school (n=4), followed by student characteristics (readiness, interest, willingness,

age level, etc.) (n=3) and the number of students in the classes they teach (n=3). One of the teachers who attended the study also stated that the teacher's characteristics (ability) were also determinative in the selection of teaching style. On the other hand, it was determined that for all teachers involved in the study, the goals and learning outcomes of the curriculum were not a criterion they considered while choosing a teaching style. The highlights of the teachers' views are reported below:

Teacher Sevgi pointed out the subject matter and the school's available sports material rather than the goals of the curriculum with the following statements: *"In the choice of teaching style, the subject matter of the lesson and the material resources of the school rather than the goals and learning outcomes of the curriculum."* Teacher Hümeýra stated, *"We do not take into account the goals and learning outcomes of the curriculum in any way. No, we do not look at them. They are very meaningless. It is mentioned there, learning outcomes, blah, blah, blah. I look at the subject matter of the lesson."* Hümeýra stated that the goals and learning outcomes of the curriculum are not a crucial factor for her when selecting a teaching style and that she makes decisions based on the subject matter.

Cengiz stated that student characteristics were the criterion with the following statements: *"For me, the most important thing rather than the goals and learning outcomes of the curriculum is the characteristics of the students, which is why I conduct the lessons in this way."* On the other hand, Yetkin emphasized teacher characteristics with the following expressions: *"Actually, to speak a little bit realistically, it is in fact according to the characteristics of the teacher rather than the goals of the curriculum...The curriculum is just on paper...We can say that the teacher's abilities are determinant."*

Yetkin also mentioned the issue of materials: *"...material is a very crucial requirement when choosing a teaching style. It is an important issue, an important criterion. I mean, it certainly determines how the lesson will be taught. If you have one soccer ball at school, you can design a lesson accordingly. If you have ten soccer balls, you can teach based on that..."* Teacher Sevgi indicated that the criteria she considered while choosing a teaching style were the subject matter and the existing sports materials: *"... The teaching style I will use differs according to the subject matter of the lesson. Also, the school's available sports material affects how I teach the lesson."*

Görkem emphasized factors such as students' interest in PE and the class size, in addition to the subject matter and sports material facilities. He expressed his opinion as follows: *"The subject matter to be addressed in the lesson is important. Student characteristics, their interest and engagement, class size, available school equipment and materials"* Similarly, teacher Seher pointed out that *"...When choosing a teaching style, the priority for me is the subject I will teach and the available equipment of the school. Class size is another criterion."* She noted similar issues with her statements. Finally, teacher Hande said, *"For me, the criteria for choosing a teaching style are the characteristics of the students, class level, and age. Age level is the most determinant for me."* She emphasized student characteristics with her expressions.

DISCUSSION

The results from the present study revealed that the PE teachers favored only the reproduction cluster teaching styles in their lessons (except for the self-check style). In particular, however, it was concluded that the most common teaching style that dominated the lessons of all the PE teachers attending the study was the practice style. In addition to the practice style, the second favorite teaching style of the PE teachers was the command style, however with varying prevalence. Thirdly, the teaching styles reported to be sometimes used by the two teachers were identified as the reciprocal and the inclusion styles. Teachers who attended the current study stated that they had never used F—K teaching styles, which contrasts with the findings of quantitative self-reported studies in the prior literature (Cothran et al., 2005; İnce & Hünük, 2010; Jaakkola & Watt, 2011; Kulinna & Cothran, 2003; SueSee et al., 2018; Syrmpas et al., 2016). However, the present study's findings significantly align with those of systematic observation studies involving PE teachers from various countries, including Türkiye (Curtner-Smith et al., 2001; Saraç-Yılmaz et al., 2005; SueSee & Barker, 2019; SueSee et al., 2019). Finally, this study confirmed that the reproduction cluster teaching styles in general, and the practice style in particular, are commonly used in PE lessons. Considering these results, it can be argued that the PE teachers who attended the study, in the subheading of the issues to be taken into consideration in the implementation of the curriculum, in relation to the pedagogical approaches that must be used in the lessons, *“Teachers must use the most appropriate ... methods/styles ... for students to attain the learning outcomes of the lesson.”* and *“... the use of approaches based only on traditional teacher-centered teaching will not be sufficient to achieve the learning outcomes of this curriculum. Learner-centered teaching approaches must be utilized.”* (MoNE, 2018). It could be said that they in a sense do not take these principles into consideration for their lessons or that their curriculum literacy is at a poor level.

As a result of the current study, it was found that the factors that prompted PE teachers to use the practice and the command styles more frequently were primarily that they thought they could teach skills better with these teaching styles and that they could use lesson time more efficiently. Other significant factors included the belief that their students' readiness level was insufficient for proper implementation of other teaching styles and the notion that they could better control their students by using these teaching styles. The lack of sports material in their schools in comparison to the number of students enrolled in their classes and the fact that they believed these styles were more cost-effective than other styles requiring the use of task sheets were the other subjective factors mentioned by two teachers. These findings alignment in with the relevant literature. For instance, Cothran and Kulinna (2008), in their qualitative study, reported that the three factors that influenced teachers to use the direct instruction model more were controlling students, using time efficiently, and believing that direct instruction was more appropriate for providing knowledge to students. Syrmpas et al. (2017), in their qualitative study, reported that some of the factors prompting teachers to use the reproduction approach were prioritizing the development of students' psychomotor skills, classroom control and time management. The fact that PE teachers prefer the

practice and the command styles more than the other nine teaching styles in the spectrum can be expressed by the fact that they prioritize psychomotor learning outcomes more than cognitive or affective/social learning outcomes in their lessons. Similarly, İnce and Hünük (2010) reported that Turkish PE teachers preferred the command and practice style more, and this may be since teachers prioritize sport-specific skill development in their lessons. Demirhan et al. (2008) conducted a study with Turkish PE teachers and claimed that the fact that PE and sports activities are mostly psychomotor and that PE teachers are coaching-oriented may be the reasons that prompt them to use the command and the practice styles more frequently. Jaakkola and Watt (2011) indicated that a potential reason why Finnish PE teachers use the command and the practice styles mostly may be that they focus on teaching motor skills rather than social or cognitive learning outcomes in their lessons and therefore prefer styles that focus on teaching motor skills. Curtner-Smith et al. (2001) also revealed that PE teachers in the United Kingdom focus almost solely on enhancing their students' movement skill performance. Chatoupis (2018), as a result of a review study based on data from four continents (North America, Europe, Asia, and Australia) and 15 different countries published between 2000 and 2016, argued that the development of psychomotor skills and sporting skills represents one of the primary objectives of PE lessons all over the world, and in this context, PE teachers use the command and the practice teaching style extensively, perhaps because they are interested in developing their students' psychomotor skills competence and teaching competitive sport. Furthermore, the results of the current study are consistent with the results of the review by Chatoupis (2018), published between 2000 and 2016 and based on data from four continents (North America, Europe, Asia, and Australia) and 15 different countries.

In addition, in present study, the PE teachers claimed that the insufficient number of sports materials in their schools was another reason for their higher preference for the practice and command styles. This result related to sports materials represents one of the problems that are usually highlighted in studies conducted in Türkiye (Demirhan et al., 2008; Demirhan et al., 2014; Mirzeoğlu et al., 2019; Uğraş et al., 2019; Yılmaz et al., 2018). For example, Demirhan et al. (2008) reported that large class sizes and limited materials may be some of the factors that cause teachers to prefer command and practice styles more in their lessons. According to the teachers who were involved in this study, their schools did not have sufficient materials for the number of students enrolled in the classes they teach. It is assumed that this may possess a significant role in driving them to become more teacher centered. In addition, the insufficient number of materials can be a significant barrier to transferring decisions to students in other teaching styles (because each student will not have the material to practice at the same time). The other reason expressed by a teacher was that he thought that the requirement to use task sheets in other teaching styles would cause an economic burden on the school. This argument may be reasonable. Because the use of task sheets, especially from C style onwards, can be an essential factor in achieving the objectives related to subject matter and behavior.

In the study, it was determined that another interesting reason for teachers not using other teaching styles was that they believed that the present readiness level of their students was not sufficient for

the appropriate implementation of other styles. In other terms, the teachers participating in the study believed that their students are incapable of taking responsibility for decisions in other styles. This result may be logical from the PE teachers' point of view because as the teaching styles in the spectrum move from A to K, the student's decision-making responsibility increases. For example, Byra (2019) stated that even though styles the reciprocal, the self-check, and the inclusion are in the reproduction cluster, students' involvement in the decision-making process in these three styles is markedly different from styles the command and the practice. The author also suggested that the decisions assigned to the student in C—E styles represent the characteristics of student-centered teaching. For example, in the case of style reciprocal, Mosston and Ashworth (2008) reported that most students may initially find it challenging to engage in appropriate verbal behavior with their peers (because it is not part of prior learning experiences). The authors stated that offering detailed, objective feedback for a doer and using criteria to do so is a learning experience that most students are unfamiliar with. The authors report that learners require time to achieve this. On the other hand, it has been argued that in the initial period, this was a new experience for the PE teacher, which was different from the previous one, and it might be quite challenging for the teacher to give up the potential of feedback by interacting only with the observer student; however, once the purpose of the style was recognized, it was suggested that it would eventually become one of the teaching styles that teachers and students would experience in the learning-teaching process.

In conclusion, it can be assumed that the PE teachers participating in this study have a limited level of literacy about the Spectrum theory. In this context, the fact that they believe that students are unable to undertake decisions in other teaching styles can be considered as evidence of that. However, on the contrary, the appropriate approach to enhance students' readiness for behaviors beyond the practice style should be for them to experience the decision responsibilities required by these teaching styles in their teaching episodes. This situation is not limited to students. For example, Zeng (2014) reported that the more skillful a teacher becomes in using different teaching styles, and thus in designing various learning experiences, the more skilled he/she will be in guiding/achieving various educational goals for his/her students.

As a result of this study, teachers indicated that the goals and learning outcomes of the curriculum were not a criterion they considered when deciding on the teaching style to utilize. This result is expected in accordance with the results obtained within the scope of the first and second research questions. This is because teachers predominantly use the practice style in their lessons, which will facilitate the acquisition of the psychomotor objectives and learning outcomes of the curriculum. Nevertheless, as researchers have noted, due to the multidimensional nature of the goals and objectives of the curriculum, it is not possible to accomplish all goals and objectives by utilizing a singular teaching style (SueSee, 2020). Therefore, PE teachers should make use of diverse teaching styles that are aimed at meeting the various objectives of PE lessons (Goldberger et al., 2012; Syrmpas et al., 2019). None of the teaching styles alone can meet all the subject matter objectives and behavioral objectives of education, and it is not possible to meet the learning needs of all students with a single teaching style. Each style has its specific learning focus; one style cannot

achieve the objectives of another style, and no single style can achieve all learning objectives. Rather, the use of diverse styles provides opportunities for different objectives to be met (Ashworth, 2020). None of the teaching styles is inherently superior or inferior to the other. On the contrary, each one may be more or less appropriate than another teaching style due to its distinctive learning conditions, depending on the objectives of the lesson, the context, and the students who participate in the lesson (Goldberger et al., 2012). Nevertheless, considering that a considerable majority of the PE teachers who attended this study (five teachers) stated that the previous courses they had received on teaching styles were not sufficient, it is understandable that they did not have a detailed understanding of the subject matter outcomes and behavioral outcomes of several teaching styles, and therefore, it is understandable that they lacked the ability to use the teaching styles that match the objectives and learning outcomes of the curriculum in their lessons.

Although the teachers indicated that they did not use many other teaching styles of the Spectrum, they claimed that they considered certain criteria when selecting a teaching style. In this regard, it can be considered that the criteria stated by the teachers may have directed them to use the practice and command style. These criteria were determined to be the subject matter and the existing sports materials of the school, student characteristics (readiness, interest, willingness, age level, etc.) and the number of students in the classes, and finally teacher characteristics (ability). In the literature review, Pangrazi and Beighle (2016) stated that some important factors to be considered in selecting an appropriate teaching style are (i) lesson objectives (skill development, knowledge, social behavior, etc.), (ii) activities to be taught, (iii) student characteristics (individual characteristics, interests, developmental levels, socioeconomic status, motivation and background, etc.), (iv) class size, (v) available equipment/materials and facilities, and (vi) teacher (abilities, skills and comfort). In this context, if the results obtained are interpreted, it can be argued that since they only intended to teach skill development and sports-related movements in their lessons, they believed that they could better accomplish this objective and teach the subject matter better with the practice and the command style. In addition, teachers have a bias that their students' existing level of readiness obliges them to use only the command and drill style. For this reason, they reported that they preferred these teaching styles more. Furthermore, the restricted materials in their schools prevent them from effectively using other teaching styles in which autonomy is relatively more than in command and practice styles, and finally, it can be suggested that whether teachers have the knowledge and skills to implement certain teaching styles and whether they are PE teaching-oriented or coaching-oriented may be influential in their preference for certain teaching styles.

CONCLUSION

The results of this study revealed that PE teachers in general prefer reproduction cluster teaching styles to varying degrees and mainly use the practice style. The reasons why teachers preferred the practice and the command style more in their lessons were that they believed that they could teach skills more effectively, they thought that they provided better time management and student control by using these styles, they believed that the obstacle to the use of other teaching styles was the poor

readiness of their students, they reported that sports materials were not sufficient for teaching styles with relatively high individuality, and they considered that these styles were economical. In the study, it was also determined that PE teachers did not consider the goals and learning outcomes of the curriculum as a criterion while selecting a teaching style for their lessons. Rather, the criteria they mentioned were the subject matter and the school's existing sports materials, student characteristics and the number of students in the classes, and finally teacher characteristics.

SUGGESTIONS

Quality professional development programs for PE teachers should be made offered to them in order to enhance their curriculum literacy and provide them with knowledge about teaching styles that are in accordance with certain goals and learning outcomes. In these professional development programs, teachers should receive both theoretical and long-term practical courses in a variety of teaching styles in the reproduction and production cluster in order to meet the curriculum's multifaceted objectives and learning outcomes. According to Joyce et al. (1992), teachers feel uncomfortable with a new teaching strategy until they have practiced it ten or more times. For this reason, the practical length of these programs should be designed long enough to ensure multiple opportunities to practice various teaching styles, first with a group of colleagues and then with their own students. In this process, PE teachers' receiving feedback from other members of the professional development group and program designers is another key to the efficiency of the process. However, although lack of experience with teaching styles (especially production cluster styles) is a factor that negatively affects teachers' use of different teaching styles, it is not the only reason. In this context, while designing professional development programs, teachers' prior beliefs about PE teaching should be considered and these beliefs should be taken into account in the design of the program. Furthermore, considering that most of the PE teachers involved in the study considered that the courses regarding teaching styles they had received in the past were insufficient, the connections between the subject matter and behavioral objectives of each teaching style in the reproduction and production cluster and the objectives and learning outcomes of the current PE curriculum should be meticulously addressed in the theoretical parts of the courses related to teaching styles in the PETE program. Additionally, it is of crucial value that the courses regarding teaching styles in PETE programs are not limited to theory, but that the teaching styles in both reproduction and production clusters are experienced practically by PETE students through techniques such as micro-teaching in in-faculty courses, that they are implemented in secondary and high school levels in field experiences, that these practices are constantly observed by faculty members, and that feedback is provided to PETE students on how they implement teaching styles.

Obviously, the lack of sports materials is a crucial barrier that inhibits PE teachers to utilize alternative pedagogical approaches. As addressed in the discussion, this result is an on-going obstacle in PE lessons in Türkiye. In this context, especially the support of local governments as well as other institutions to schools and the required cooperation between institutions could facilitate the solution of this issue.

Lastly, an important limitation of this study was that the PE teachers were selected from a single urban area. Therefore, including PE teachers from various cities in future studies would contribute to a more comprehensive understanding of the teaching styles used by Turkish PE teachers. In addition, future studies could focus on whether PE teachers' past K-12 experiences and their prior beliefs about teaching PE (which may potentially lead them to favor the practice and the command styles more) have a determinant role in their preferred teaching styles.

Conflict of Interest: There are no personal or financial conflicts of interest within the scope of the study.

Statement of Contribution of Authors: Study Design-MY, TB, ZG; Data Collection-MY, TB; Statistical Analysis-MY, TB, ZG; Preparation of the Manuscript, TB; All authors read and approved the final manuscript.

Information on Ethics Committee Permission

Ethics Committee: Balıkesir University Social Sciences and Humanities Ethics Commission

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Sporda Liderlik Alanında Yapılan Çalışmaların Bibliyometrik Analizi

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Öz

Geçmişten günümüze kadar sporda liderlik ile ilgili derleme yayın yapılmakla birlikte, yayınların birbirleriyle olan ilişkileri, yazar, atıf sayısı ve dergi atıf sayıları gibi belirleyici noktalarda gelecek çalışmalara yön veren çalışmaların eksikliği dikkat çekmektedir. Bu çalışmada spor bilimlerinde liderlik temasına ilişkin Web of Science (WoS) veri tabanında yayınlanan makalelerin geçmişten günümüze olan süreçlerini ve ilişkilerini belirlemek amaçlanmıştır. Çalışmada nitel veri analiz yöntemlerinden “Bibliyometrik atıf analizi” yöntemi kullanılmıştır. Çalışmadaki veriler WoS üzerinden VOSviewer (1.6.19) bibliyometrik analiz uygulaması kullanılarak toplanmıştır. Araştırmada 1987-2023 yılları arasında, “Sport science” kategorisinde ve “leadership” anahtar sözcüğü kullanılarak toplamda 860 makaleye ulaşılmıştır. Ulaşılan yayınların indekslerinin dağılımı “Social Science Citation Index (SSCI)” (n:734), “Science Citation Index Expanded (SCI-E)” (n:710), “Art & Humanities Citation Index (A&HCI)” (n:2), “Emerging Sources Citation Index (ESCI)” (n:129) ve diğer indeksler (n:17) şeklindedir. Bibliyometrik analiz sonucunda en çok kullanılan anahtar kelimeler, yıllara göre en çok yayın, üretilen yayın ve atıf sayısı, en çok yayın ve atıf üreten yazarlar ile ülkelere ve dergilere göre yayın ve atıf sayısı temaları altında incelenmiş ve görsel haritalar ile sunulmuştur.

Anahtar Kelimeler: Liderlik, Antrenörlük, Fiziksel aktivite, Beden eğitimi, Spor

Bibliometric Analysis of the Studies Conducted in the Field of Leadership in Sports

Abstract

Although reviews about leadership in sports have been published from the past to the present, there is a lack of studies that guide future studies at decisive points such as the relationships of publications with each other, the author, the number of citations and the number of journal citations. In this research, it is aimed to determine the effects and relationships of the articles published on the Web of Science (WoS) database on the theme of leadership in sports sciences in the process from past to present. The “Bibliometric citation analysis” method, one of the qualitative data analysis methods, was used in the study. The data in the study were collected using the VOSviewer (1.6.19) bibliometric analysis application via WoS. In the research, between 1987 and 2023, a total of 860 articles were reached in the category of “Sport science” and using the keyword “leadership”. The distribution of the indexes of the publications reached is as “Social Science Citation Index (SSCI)” (n:734), “Science Citation Index Expanded (SCI-E)” (n:710), “Art & Humanities Citation Index (A&HCI)” (n:2), “Emerging Sources Citation Index (ESCI)” (n:129) and other indices (n:17). As a result of the bibliometric analysis, the most commonly used keywords were examined under the themes of the most publications by year, the number of publications and citations produced, the authors who produce the most publications and citations, and the number of publications and citations by countries and journals.

Keywords: Leadership, Coaching, Physical activity, Physical education, Sport

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GİRİŞ

Son yıllarda üzerinde tartışılan ve en çok araştırma yapılan konulardan biridir liderlik. Günümüz şartlarında yönetim anlayışı; lidere olan ihtiyacın önemini daha fazla artırmaktadır (Işık ve Serinkan, 2020). İnsanların grup halinde yaşaması sosyalleşmeyi ve beraberinde insanların belirli amaçlar etrafında toplanmasını sağlamıştır. Böylelikle insan grupları oluşmuş ve bu grupları yönetecek ve hedeflere ulaşmayı kolaylaştıracak liderlere ihtiyaç doğmuştur (Eren, 2014). Lider kelimesi “önderlik yapan, yol gösteren, takipçilerinin istek ve ihtiyaçlarını önceden sezen, yaratıcı kimse” olarak tanımlanmakta; liderlik ise grubun ortak amaçlarını gerçekleştirmek için etrafındakileri istekli hale getiren ve aynı amaç için bir arada tutan kişi” olarak ifade edilmektedir (Tunçer, 2012). Başka bir tanıma göre liderlik “belirli amaçları şevk ve heyecanla gerçekleştirebilmek için başkalarını ikna edebilme yeteneği” olarak ifade edilmekte ve yönetilen birey ile yöneten birey arasındaki ilişkiyi kapsayan bir anlayış içerdiği dile getirilmektedir (Yetim, 1996).

Liderlik alanında öncülerden Stogdill’e (1974) göre liderlik; “bir grubu etkilemek için amaçların oluşturulması ve bu amaçların gerçekleştirilme süreci” olarak ifade edilmektedir. Bass ve Stogdill’e (1990) göre ise liderlik “birey ve grup üyeleri arasındaki her türlü etkileşim ve alışveriş” olarak tanımlanmaktadır. Liderlik kavramı, sporun içinde ve dışında çok çeşitli alanlarda araştırılmış ve bu da geniş bir liderlik tanımı ve teorilerini ortaya çıkarmıştır. Böylelikle çeşitli liderlik kavramlarının ortak yönleri, başkalarını etkileyen ve ortak hedeflere ulaşmaya odaklanan bir süreç olarak nitelendirilmektedir (Northouse, 2018). Değişen dünya şartları ve küresel eğilimler işletmelerdeki liderlerin daha güncel ve modern yönetim anlayışına sahip olmasını gerektirmektedir. Bu değişim ve yeniliklere uyum sağlayan ve değişim gösteren liderler hem kendilerinin hem de kurumlarının başarıları olmalarını sağlamaktadırlar (Yeşil, 2013).

Liderler, yaşamın her döneminde var olmuştur ve gelecek zaman diliminde de var olmaya devam edeceklerdir. Bu nedenle liderlerin yönetimde devamlı var olacakları düşünülmektedir (Tunçer, 2012). Modern toplumlarda belirli bir örgüt içerisinde insanların eğitim görmeleri, çalışmaları, tedavi olmaları ve hatta boş zamanlarını da kendi örgütlerinde değerlendirmeleri (spor yapmak, eğlenmek vb.) liderlik kavramı açısından önem arz etmektedir (Yetim, 1996). Bazı kurumlarda rekabet çok yoğun olarak varlığını sürdürse de kurumdaki bireylerin mutluluk, psikoloji ve doyum düzeylerinin kurumun da başarı ve veriminde etkili olduğu unutulmamalıdır. Bu bağlamda güçlü ve etkili bir lider olmanın bilgi, beceri ve yetenek eşliğinde değerlendirilmesi gerektiği göz ardı edilmemelidir. Ayrıca günümüz yönetim anlayışındaki yönetim ve liderlik anlayışı geçmişe kıyasla çok önemli bir faktördür (Özer, 2019). Günümüzde kurumsal liderlik ya da yöneticiliğin bir diğer popüler liderleri de herkes tarafından takip edilen spor yöneticileri veya spor liderleridir.

Spor yöneticileri diğer yöneticilerden farklı olarak göz önünde bulduklarından dolayı toplumu etkileme özelliğine de sahiptirler (Chappelet, 2009). Bu noktada kişileri etkilemede en önemli araç olarak, spor yöneticilerinin liderlik özellikleri ön plana çıkmaktadır (Gündoğdu ve Sunay, 2018). Günümüz dünyasında sporun bilimsel temeller üzerine oturması ve yapılan bilimsel çalışmaların

sonuçlarına göre sporda liderliğin öneminin arttığı söylenebilir (İkizler, 2000). Sporda liderlik, özellikle spor ortamlarında takımların bütün etkinliklerini kapsadığı için sporun temel bir yönünü oluşturmaktadır (Cotterill ve Fransen, 2016). Diğer yönetim alanlarına kıyasla sporda liderlik kavramı daha fazla önem taşımaktadır. Çünkü spor kulüplerinin yapısı ve faaliyetleri diğer yönetim faaliyet ve organizasyonlarından farklılık içermektedir. Spor örgütlerinde lider, belirlenmiş amaçlar doğrultusunda ve grup üyelerini etkilemek için aktif olarak yer almaktadır. Bu bağlamda lider ile sporcular uzun vadeli ve yoğun ilişkiler içine girmektedirler. Bu süreçte lider, olumlu veya olumsuz birçok duyguyu; mutluluk, üzüntü, gösteriş, hayal kırıklığı vb., sporcularıyla paylaşmaktadır. Böylelikle takım içinde çok özel ve güvenli bir atmosfer de oluşturulabilmektedir (Koruç, 1995).

Örgütsel anlamda düşünüldüğünde, takım liderliği, bir kurumdaki liderlikten farklı olarak kabul edilmektedir (Kozlowski vd., 2016). Yani takım lideri, bir ekibin ihtiyaçlarını karşılayan bir birey olarak görülür. Spor takımlarında, takım liderliği koçlar ve takım kaptanları gibi resmi sporcu liderlerinden ve aynı zamanda resmi olmayan sporcu liderlerinden oluşmaktadır. Spor takımlarının içindeki bu liderlik anlayışı; yöneticiler, antrenörler, spor psikologları ve akademisyenler için önem arz etmektedir (Day vd., 2014). Sporcu liderleri genel anlamda takım uyumunu, sporcu memnuniyetini ve takım birlikteliğini oldukça etkiler (Fransen vd., 2012).

Bilimsel bir gelişme, mevcut bilimsel çalışmaların ve gelişmelerin takip edilmesi ile bu alanda tespit edilen boşlukların doldurulması ile ortaya çıkmaktadır. Bu noktada bilim alanında ilerlemelere destek olabilmek için; bu alanı her yönüyle bilmek ve takip etmek gerekmektedir. Bilimsel çalışmaların takibi ve farklı bakış açılarının değerlendirilmesi bibliyometrik yöntem ile mümkün olabilmektedir. Bibliyometri yöntemi yeni uygulama alanı olmasının yanında dergi, yazar, yayın ve atıf gibi faktörleri de işe katarak var olan ilişkileri ortaya koyması ile yeni yapılmak istenen çalışmalara için de doğru bir yöntem olarak değerlendirilmektedir (Hunt, 2011). Ayrıca bibliyometri yöntemi sadece yayınları değil ülke, çalışma disiplinleri ve ortak yazarlıktaki bağlantılar ve yayıncıların başarısını da gösteren amacıyla kullanılmaktadır (Kurtz ve Bollen, 2010). Bibliyometrik analiz yöntemi son zamanlarda hızla artan yayınlarla ilgili yapılacak olan bilimsel yayınların derlenen analiz edilmesi için öncelikli bir araç haline gelmiştir (Salini, 2016).

Bibliyometrik analiz yöntemi kullanışlı bir yöntem olmasının yanında, birçok veri tabanında kullanılmaktadır. Bu veri tabanlarından en çok tercih edilenler arasında; Scopus ve Web of Science (WoS) veri tabanları yer almaktadır. Araştırmacılar bu veri tabanlarını kullanarak bibliyometrik analiz yapabilmektedirler. Scopus; tam metin bağlantılara sahip bir veri indekisleme tabanıdır ve 'Elsevier' yayıncısı tarafından desteklenmektedir (Burnham, 2006). Bu veri tabanı, birbirinden farklı yayıncı, teknik, sosyal ve tıp bilimleri alanlarındaki yayınları içermektedir (Boyle ve Sherman, 2006). Diğer bir veri tabanı olan WoS ise küresel anlamda en güvenli ve bağımsız atıf veri tabanı olarak tanımlanmaktadır (www.clarivate.com).

Literatür incelendiğinde, sporda liderlik ile ilgili birçok derleme çalışma mevcuttur. Fakat sporda liderlik ile ilgili derleme yayın yapılmakla birlikte, yayınların birbirleriyle olan ilişkileri, yazar,

atıf sayısı ve dergi atıf sayıları gibi belirleyici noktalarda gelecek çalışmalara yön verecek çalışmaların eksikliği görülmektedir. Bu çalışmada spor bilimlerinde liderlik temasına ilişkin WoS veri tabanında yayınlanan makalelerin geçmişten günümüze olan süreçlerini ve ilişkilerini belirlemek amaçlanmıştır. Araştırmada sporda liderlik ile ilgili literatür içerisinde yapılan çalışmaların incelenmesi ile spor yönetimi, liderlik ve spor alanında gelecekteki çalışmalara ışık tutacağı düşünülmektedir.

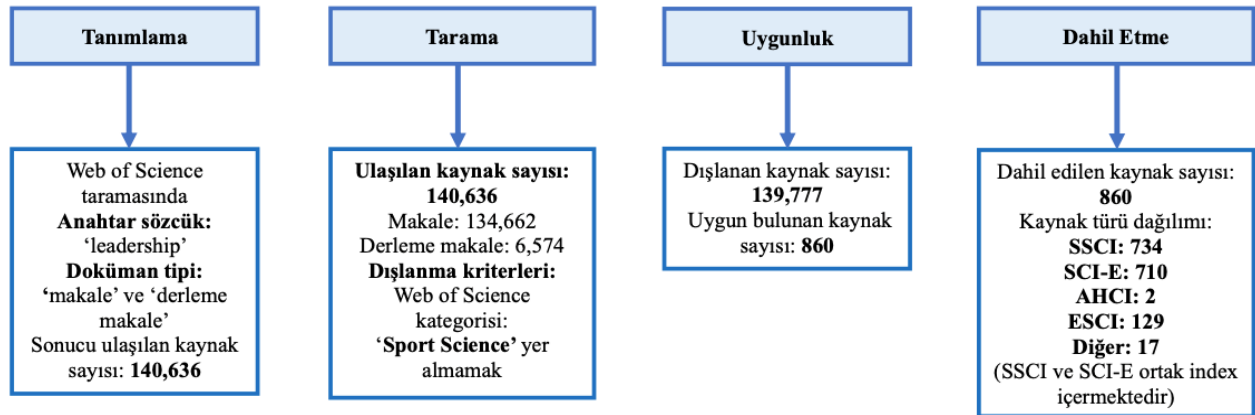
METOT

Araştırma Modeli

Araştırmada nitel araştırma yöntemlerinden bibliyometrik analiz tekniği kullanılmıştır. Bibliyometrik kelimesi; “biblio (Yunancada kitap anlamında)” ve “metric (ölçüm)” kelimelerinin bir araya gelmesinden oluşur. Bibliyometrik analiz “bilimsel araştırmaların gelişim düzeyini artırmayı sağlayan, disiplinler arası temel bir dayanak” olarak tanımlanmaktadır (Samiee ve Chabowski, 2012). Bibliyometrik analiz akademik araştırmaların nicel olarak ölçülebilmesi ve analitik bir şekilde de incelenmesini sağlayan güçlü bir araçtır (Krauskopf, 2018).

Veri Toplama Yöntemi

Araştırmada analiz edilen makaleler WoS veri tabanından 2023 yılı 28 Mayıs günü elde edilmiştir. WoS veri tabanında “Sport Science” kategorisi altında, “leadership” anahtar sözcüğü kullanılarak tüm yıllar dahil edilerek makaleler taranmıştır. Tarama sonucunda 860 yayınlanmış makaleye ulaşılmıştır. Ulaşılan yayınların indekslerinin dağılımı “Social Science Citation Index (SSCI)” (n:734), “Science Citation Index Expanded (SCI-E)” (n:710), “Art & Humanities Citation Index (A&HCI)” (n:2), “Emerging Sources Citation Index (ESCI)” (n:129) ve diğer indeksler (n:17) şeklindedir.



Şekil 1. PRISMA yöntemi ile araştırma dizaynının oluşturulması

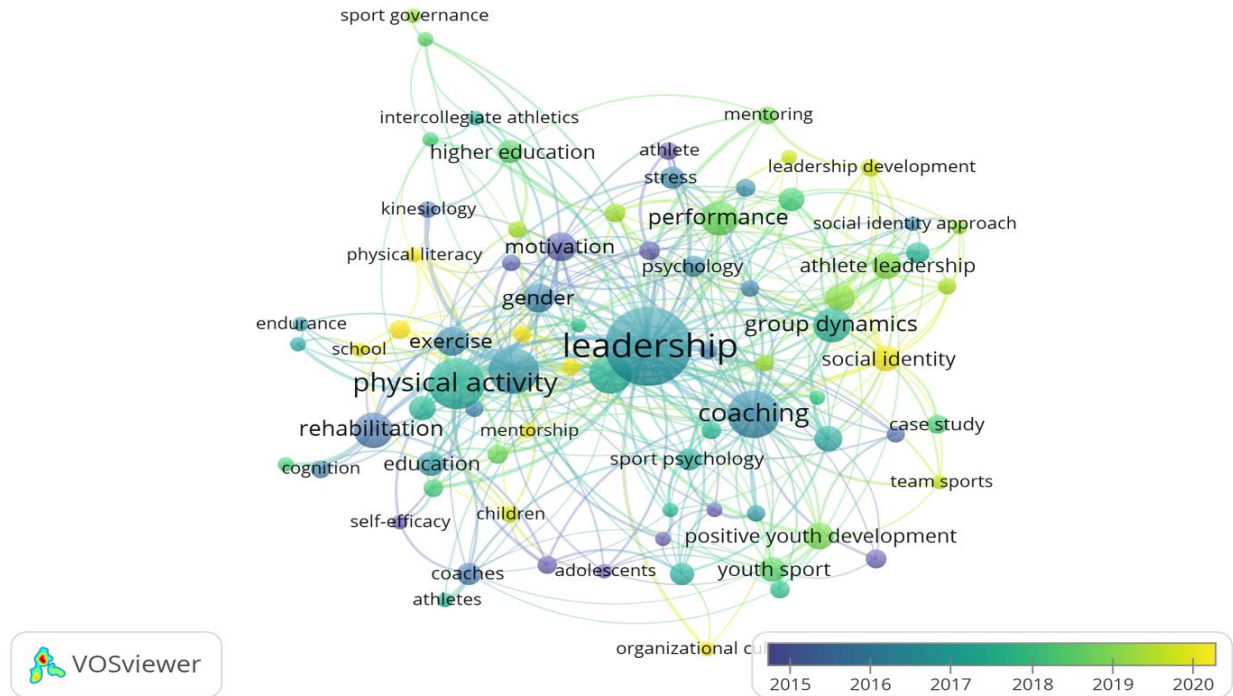
Verilerin Analizi

Araştırmada elde edilen veriler VOSviewer (1.6.19) analiz programı kullanılarak analiz edilmiştir. VOSviewer kelime anlamı olarak “Visualization of Similarities (Benzerliklerin görselleştirilmesi)” teknolojisini ifade etmektedir ve sıklıkla kullanılan bu analiz yöntemi 2010 yılında geliştirilmiştir (Van Eck ve Waltman, 2010). Analiz sonucu ulaşılan 860 makale; ortak anahtar kelimeler, ortak yazarlık, yayın sayısı, atıf sayısı, en çok yayın ve atıf sahibi yazar, dergi ve ülke temaları altında incelenmiştir. VOSviewer programı analizi sonucu ortaya çıkan şekillerdeki düğümlerin kalınlıkları, meydana gelme sıklığını göstermektedir. İki düğüm arasındaki mesafenin kısalması, yayınlar içerisindeki tekrar edilen anahtar kelimelerin bulunma sayısını artışı ifade etmektedir.

BULGULAR

Anahtar kelimelerin bibliyometrik analizi

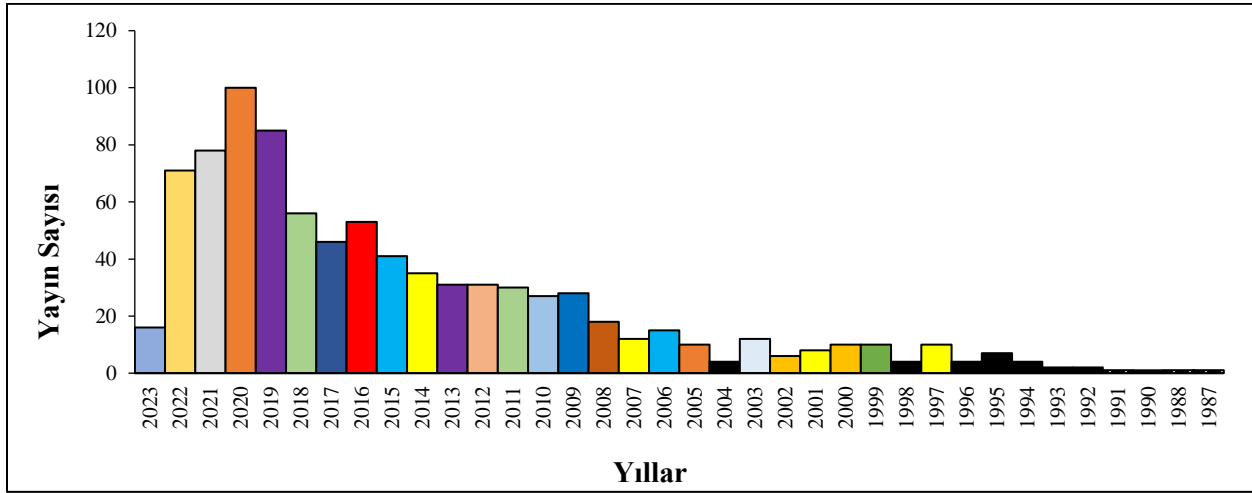
Yapılan bibliyometrik analiz sonucunda en az 5 defa tekrar edilen anahtar sözcük kriterini sağlayan 79 anahtar sözcüğe ulaşılmıştır. En az 5 defa veya daha fazla tekrar edilen 5 anahtar kelimenin sırasıyla; liderlik (n:89, toplam bağlantı gücü:121), fiziksel aktivite (n:42, toplam bağlantı gücü:45), antrenörlük (n:37, toplam bağlantı gücü:65), beden eğitimi (n:34, toplam bağlantı gücü:29) ve spor (n:26, toplam bağlantı gücü:54) olduğu görülmektedir. Toplam bağlantı gücü anahtar sözcüklerin diğer yayınlarda kullanılan anahtar sözcükler ile kaç defa eşleştiği anlamını taşımaktadır.



Şekil 2. Anahtar sözcüklerin bibliyometrik analizi

Yayın sayısının bibliyometrik analiz sonuçları

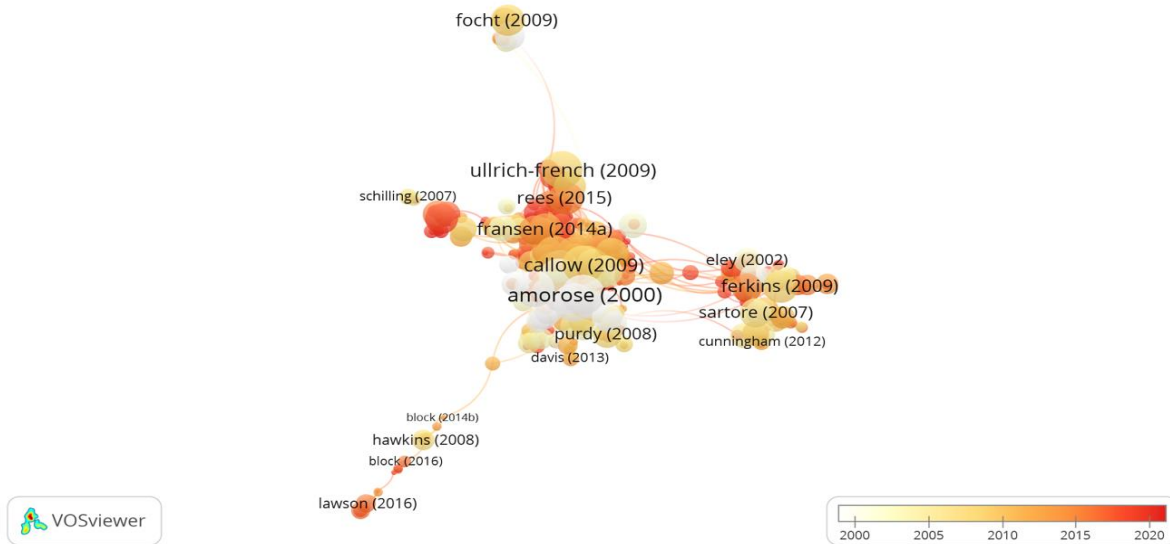
2023 Mayıs ayında Web of Science veri tabanı üzerinden spor bilimleri alanında “liderlik” kavramına ilişkin yayınlanmış tüm makaleler incelenmiştir. Aramada “leadership” anahtar kelimesi seçilmiş ve tarama “Sport science” kategorisi filtresi altında sınırlandırılmıştır. WoS veri tabanında yapılan analiz sonucuna göre liderlik ile ilgili yayınların ilk olarak 1987 yılında başladığı (n:1), en fazla yayın sayısına ise 2020 yılında (n:100) ulaşıldığı görülmektedir. 2023 yılı itibari ile de yayınlanmış mevcut yayın (n:16) bulunmaktadır. 1987 ve 2023 yılları arasında yayınlanmış 860 makale incelenmiştir. Elde edilen sonuçların yıllara göre dağılımı aşağıdaki grafikte sunulmuştur (Grafik 1).



Grafik 1. Yıllara göre yayın sayılarının değişimi

En fazla atıf sayısı olan yayınların bibliyometrik analizi

Bibliyometrik analiz sonucunda en az 3 yayına atıf kriterini sağlayan 644 yayın analiz edilmiştir.

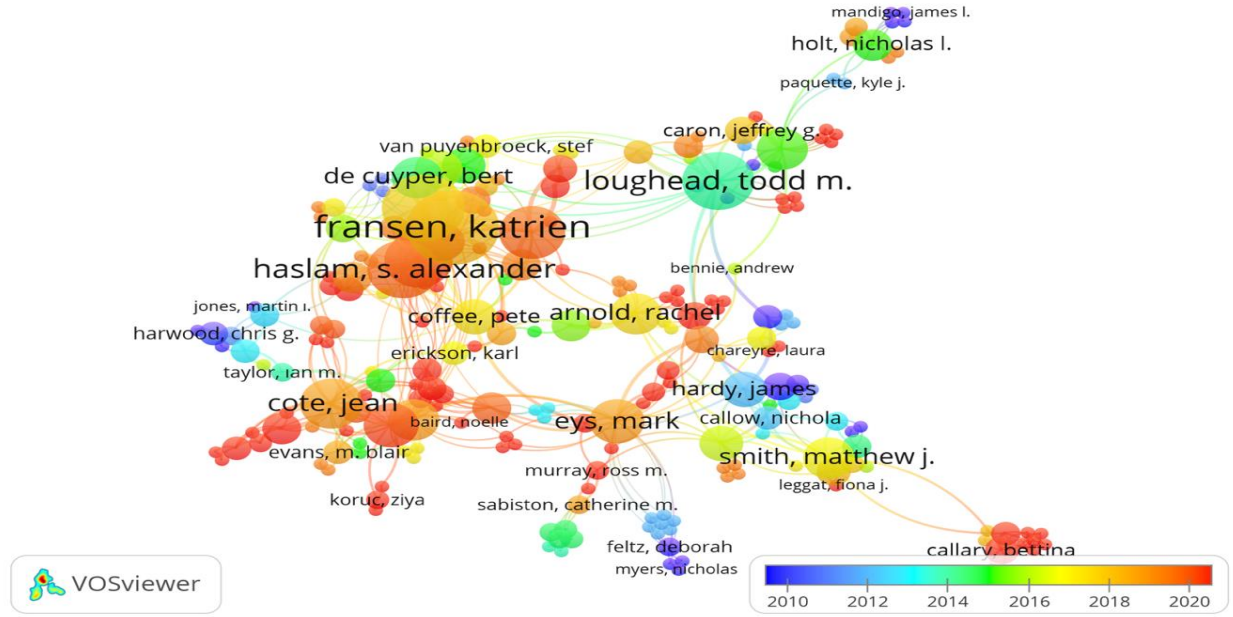


Şekil 3. Yayınların atıf sayısı bibliyometrik analizi

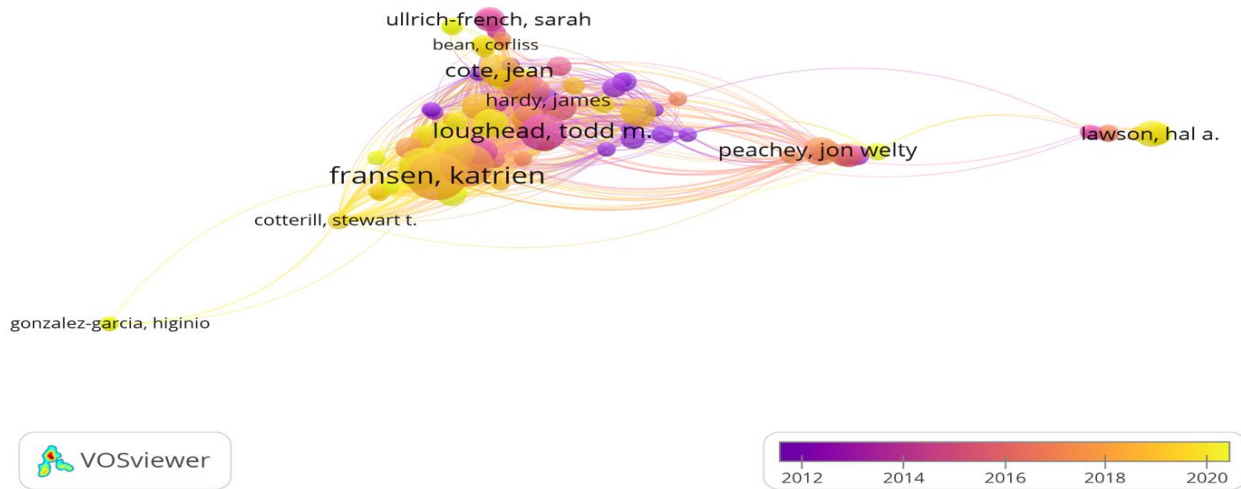
Bibliyometrik analiz sonucu Edwarson (2017) (n:212 atıf, bağlantı gücü:0), ikinci sırada; Mountjoy, (2016) (n:186 atıf, bağlantı gücü:1), üçüncü sırada; Amorose, (2000) (n:169 atıf, bağlantı gücü:10), dördüncü sırada; Hancock, (1995) (n:165 atıf, bağlantı gücü: 0) ve beşinci sırada; Chelladurai, (1990) (n:157 atıf, bağlantı gücü:43) olduğu görülmüştür.

Ortak yazarlık bibliyometrik analizi

Bibliyometrik analiz sonucunda en az 1 yayın ve 1 atıf sayısı kriterlerine uygun 2027 ortak yazarlık analiz edilmiştir.

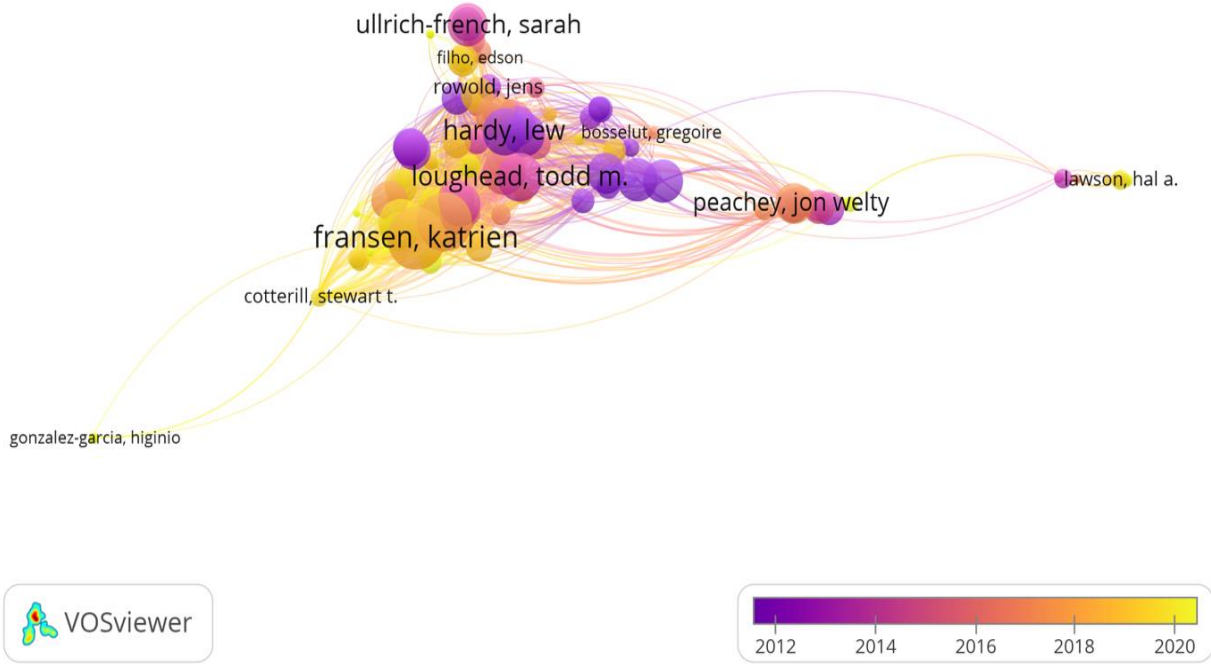


Şekil 4. Ortak yazarlık bağlantısı



Şekil 5. Yazarların yayın sayısı bağlantısı

Ortak yazarlık analizi sonucu en fazla yayın üreten ilk 5 yazar sırasıyla; Fransen Katrien (n:22 yayın, toplam bağlantı gücü:105), Filip Boen (n:18 yayın, toplam bağlantı gücü:90), S. Alexander Haslam (n:14 yayın, toplam bağlantı gücü:37), Todd M. Loughhead (n:14 yayın, toplam bağlantı gücü:64) ve Niklas K. Steffens (n:13 yayın, toplam bağlantı gücü:61) olduğu görülmektedir.

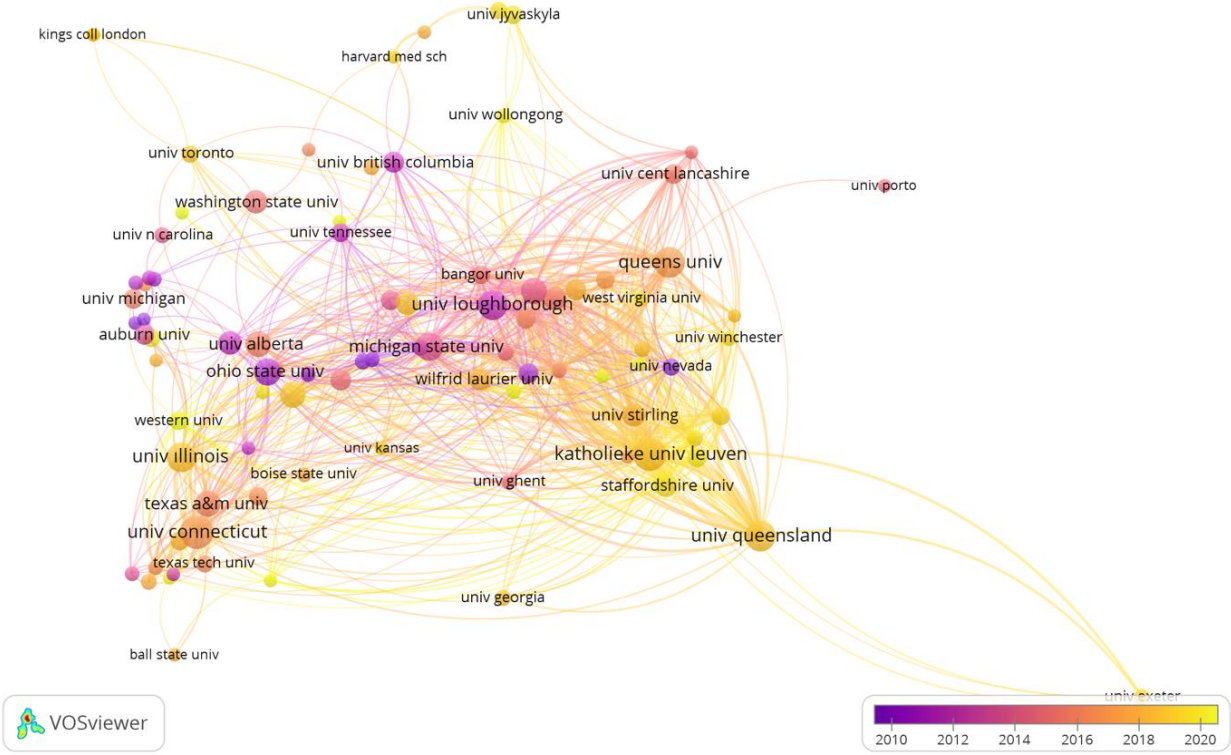


Şekil 6. Yazarların atıf sayısı bağlantısı

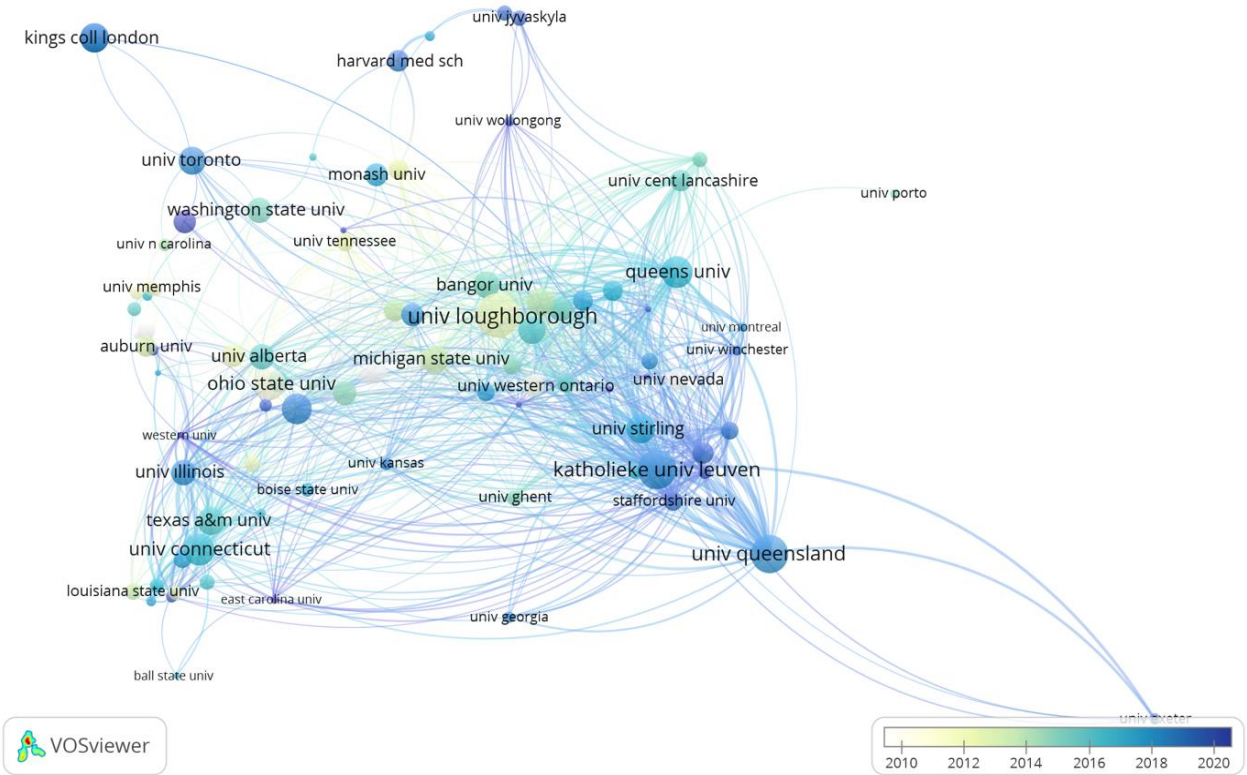
En çok atıf alan ilk 5 yazar ise Fransen Katrien (n:582 atıf, toplam bağlantı gücü: 105), Filip Boen (n:507 atıf, toplam bağlantı gücü:90), Brendon Stubbs (n:459 atıf, toplam bağlantı gücü:28), Todd M. Loughhead (n:377 yayın, toplam bağlantı gücü:37) ve S. Alexander Haslam (n:368 atıf, toplam bağlantı gücü:64) olduğu görülmektedir.

Kurum atıf ve yayın sayısı bibliyometrik analizi

Bibliyometrik analiz sonucunda en az 5 yayın ve 5 atıf kriteri sonucu 93 kurum analiz edilmiştir. Bibliyometrik analiz sonucunda en fazla yayın sayısına sahip ilk 5 kurum sırasıyla; “University of Connecticut” (n:28 yayın, toplam bağlantı gücü:127), ikinci sırada; “University Katholieke Leuven” (n:27 yayın, toplam bağlantı gücü:418), üçüncü sırada “University of Queensland” (n:24 yayın, toplam bağlantı gücü:332), dördüncü sırada “University Queens” (n:23 yayın, toplam bağlantı gücü:131) ve beşinci sırada “University of Loughborough” (n:21 yayın, toplam bağlantı gücü:113) olduğu saptanmıştır (Şekil 7).



Şekil 7. Kurumların yayın sayısı bibliyometrik analizi

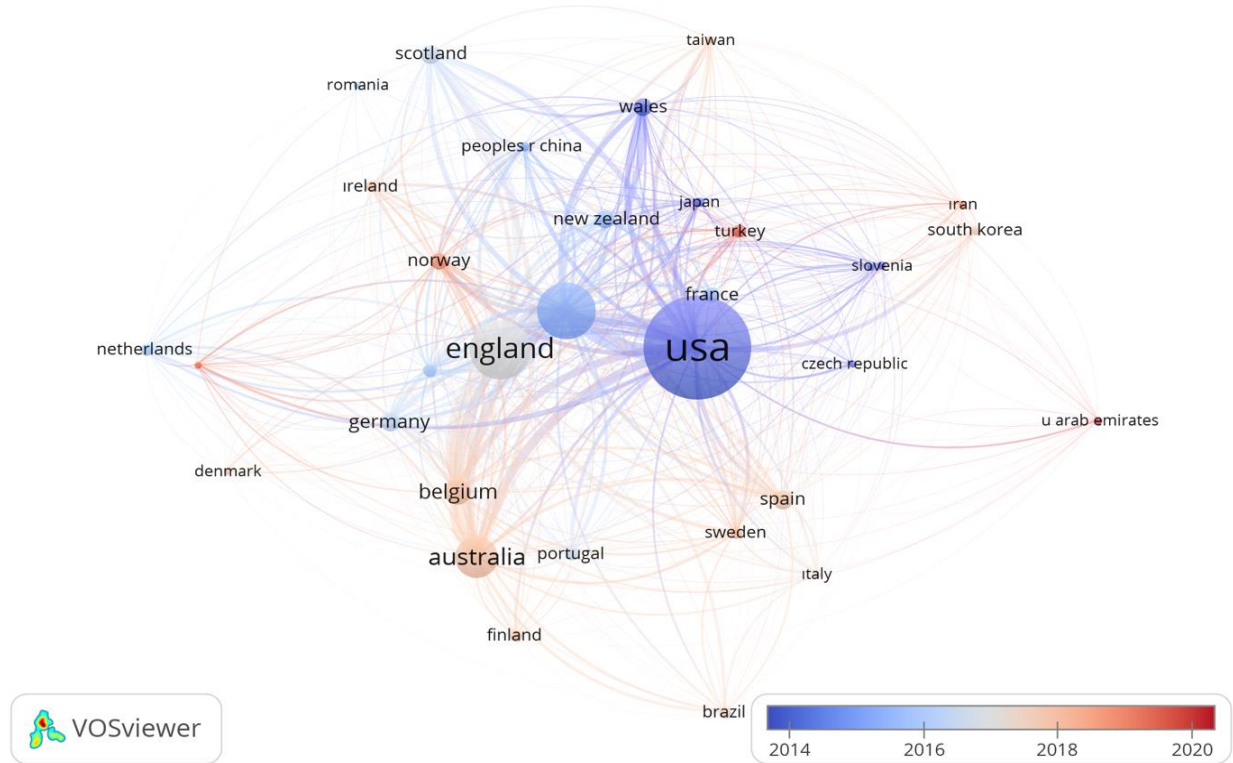


Şekil 8. Kurumların atıf sayısı bibliyometrik analizi

Bibliyometrik analiz sonucunda ilk 5 kurum sırasıyla; “University of Loughborough” (n:1039 atıf, toplam bağlantı gücü: 113), ikinci sırada; “University Katholieke Leuven” (n:815 atıf, toplam bağlantı gücü:418), üçüncü sırada; “University of Quennsland” (n:760 atıf, toplam bağlantı gücü:332), dördüncü sırada; “Ohio State University” (n:539 atıf, toplam bağlantı gücü:38) ve beşinci sırada; “University Queens” (n:534 atıf, toplam bağlantı gücü:131) olduğu saptanmıştır.

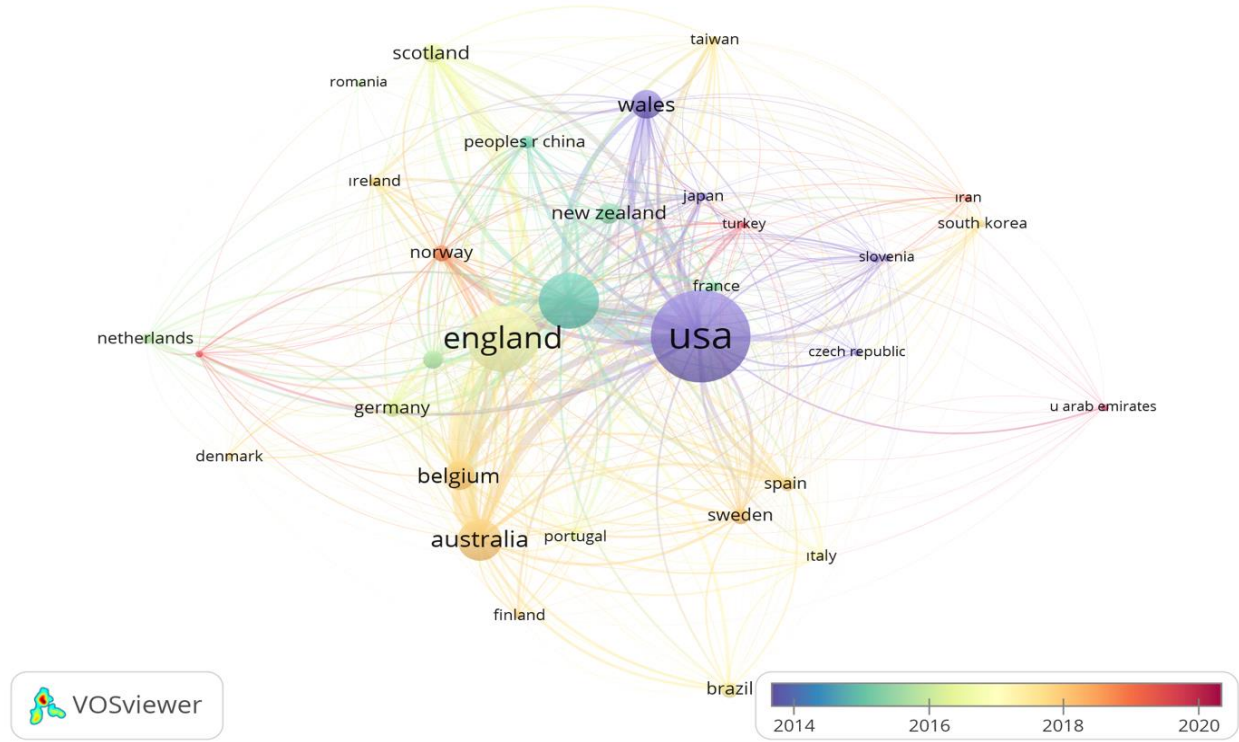
Ülkelerin yayın ve atıf sayısı bibliyometrik analizi

Ülkelerin yayın ve atıf sayısı belirlenirken en ez 3 yayın ve 3 atıf oranına göre analiz edilmiş ve sonucunda 33 ülke analize dahil edilmiştir. Analiz sonucu en fazla yayın sayısına sahip ilk 5 ülke sırasıyla; Amerika (n:413 yayın, toplam bağlantı gücü:772), İngiltere (n:160 yayın, toplam bağlantı gücü:943), Kanada (n:147 yayın, toplam bağlantı gücü:695), Avusturalya (n:88 yayın, toplam bağlantı gücü:510) ve Belçika (n:38 yayın, toplam bağlantı gücü:457) olduğu görülmektedir. Türkiye ise (n:12 yayın, toplam bağlantı gücü:22) 15. sırada yer almaktadır (Şekil 9).



Şekil 9. Ülkelerin yayın sayısı bağlantısı

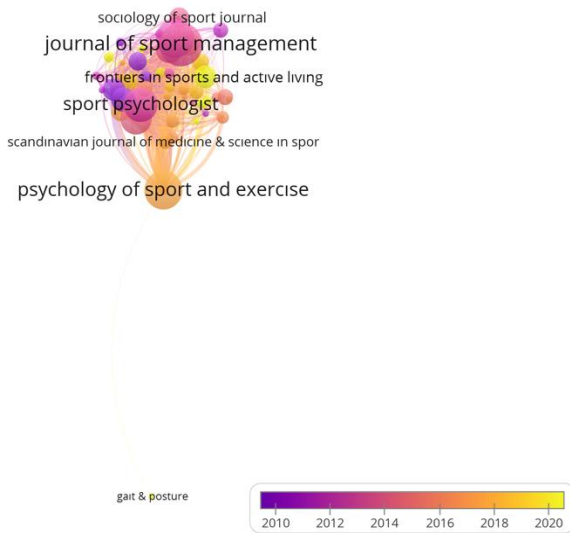
Atıf sayısına göre ilk 5 ülke sırasıyla Amerika (n:7947 atıf, toplam bağlantı gücü:772), İngiltere (n:4411 atıf, 943), Kanada (n:3384 atıf, toplam bağlantı gücü:695), Avusturalya (n:2003 atıf, 510) ve Belçika (n:1077 atıf, toplam bağlantı gücü:457) olduğu görülmektedir. Türkiye ise (n:15 atıf, toplam bağlantı gücü:22) 33 ülke arasında 29. sırada yer aldığı görülmüştür (Şekil 10).



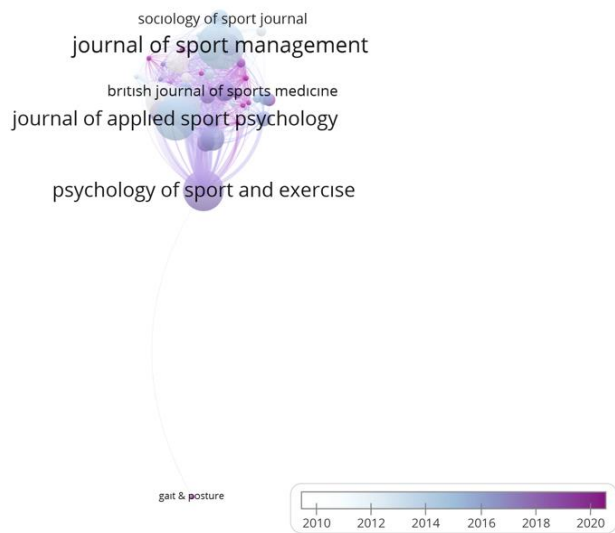
Şekil 10. Ülkelerin atıf sayısı bağlantısı

Atıf alan dergilerin bibliyometrik analizi

Dergilerin yayın sayısı ve atıf sayısı belirlenirken en az 3 yayın ve 3 atıf kriterine göre analiz edilmiştir ve sonucunda 47 dergi analize dahil edilmiştir.



Şekil 11. Dergilerin ürettikleri yayın bağlantısı



Şekil 12. Dergilerin ürettikleri atıf sayısı bağlantısı

Analiz sonucunda en fazla yayın üreten ilk 5 dergi sırasıyla; “Journal of Sport Management” (n:85 yayın, toplam bağlantı gücü:102), “Psychology of Sport and Exercise” (n:71 yayın, toplam bağlantı gücü:288), “Quest” (n:70 yayın, toplan bağlantı gücü:58), “Sport Psychologist” (n:57 yayın, toplam bağlantı gücü:280) ve “Journal of Applied Sport Psychology” (n:51 yayın, toplam bağlantı gücü:363) olduğu görülmektedir. Atıf alan ilk 5 dergi sırasıyla “Journal of Sport Management” (n:2057 atıf, toplam bağlantı gücü:102), “Journal of Applied Sport Psychology” (n:1698 atıf, toplam bağlantı gücü:363), “Psychology of Sport and Exercise” (n:1599 atıf, toplam bağlantı gücü:288), “Sport Psychologist” (n:1425 atıf, toplam bağlantı gücü:280) ve “Journal of Sport & Exercise Psychology” (n:1291 atıf, toplam bağlantı gücü:206) olduğu görülmektedir.

SONUÇ ve ÖNERİLER

Spor bilimlerinde liderlik kavramına ilişkin yapılan analizler sonucunda ulaşılan 860 yayında en çok kullanılan anahtar sözcüğün beklenildiği gibi “liderlik” olduğu görülmüştür. Araştırmalarda en çok kullanılan diğer anahtar sözcüklerin de (fiziksel aktivite, antrenörlük, beden eğitimi ve spor) sporla ilgili olduğu görülmektedir. Yıllara göre anahtar sözcük eğilimine bakıldığında daha eski tarihli yayınlarda “sporcu, antrenör, yetişkin, motivasyon, pedagoji, tatmin vb.” anahtar sözcükler kullanılırken, yakın tarihli çalışmalarda; “engellilik, nitelik, sosyal kimlik, iletişim, takım sporları, organizasyon kültürü, mentör vb.” anahtar sözcüklerin tercih edildiği görülmüştür.

Çalışmanın bir diğer sonucu yapılan yayınların yıllara göre değişimi incelendiğinde 2020 yılına kadar bir artış olduğu görülmüştür. Bu bulgu liderlik alanında yapılan çalışmaların sonuçlarıyla paralellik göstermektedir (Gan ve Yusof, 2020; Sheehy vd., 2018). Fakat 2020 yılından sonra yayın sayısının düşüş gösterdiği görülmüştür. Arama kriterlerine 1987 yılında; “Leadership behavior in sport: A field test of the Situational Leadership” ismiyle Bill Case tarafından ilk yayının yayınlandığı görülmüştür (Case, 1987). Çalışmada her kategoriden (ortaokul, lise, kolej ve Amatör Atletizm Birliği) antrenörün (n:40) liderlik davranışlarını ölçek yoluyla belirlediği saptanmıştır.

Yapılan analizler sonucunda en fazla atıfa sahip yayın Edwarson ve diğerleri tarafından 2017 yılında “Journal of Sport and Health Science” dergisinde “Considerations when using the activPAL monitor in field-based research with adult populations” ismiyle yayınlanmıştır. Çalışmada; fiziksel aktivite seviyesini objektif olarak ölçmede kullanılan pedometrelerin adım sayısı, adım hızı ve duruş süreleri ile ilgili bilgilerin sunumu amaçlanmıştır (Edwarson vd., 2017). İkinci sırada yer alan yayın Mountjoy ve diğerleri tarafından 2016 yılında “British Journal of Sports Medicine” dergisinde “International Olympic Committee consensus statement: harassment and abuse (non-accidental violence) in sport” ismiyle yayınlanmıştır. Çalışmada; sporda cinsel taciz ve istismara karşı Uluslararası Olimpiyat Komitesi Konsensüs beyanının genişletilmesi hakkında bilgiler verilmiştir (Mountjoy vd., 2016). Üçüncü sırada yer alan yayın Amorose ve diğerleri tarafından 2000 yılında “Journal of Sport & Exercise Psychology” dergisinde “Intrinsic motivation: Relationships with collegiate athletes' gender, scholarship status, and perceptions of

their coaches' behavior” ismiyle yayınlanmıştır. Çalışmada; içsel motivasyonu etkileyen cinsiyet, sporcu bursu, burslu takım arkadaşı, sporcu ve antrenör davranışları incelenmiştir (Amorose vd., 2000). Dördüncü sırada yer alan yayın Hancock ve diğerleri tarafından 1995 yılında “Journal of Motor Behaviour” dergisinde “On The Problem Of 2-Dimensional Error Scores - Measures And Analyses of Accuracy, Bias, And Consistency” ismiyle yayınlamıştır. Çalışmada; iki boyutlu performanslardan elde edilen veriler açıklama ve analiz etmede yeni analiz ve ölçüm yöntemleri hakkında bilgiler verilmiştir (Hancock vd., 1995). Beşinci sırada; Chelladurai ve diğerlerinin 1990 yılında “International Journal of Sport Psychology” dergisinde “Leadership in Sports-A Review” ismiyle yayınladığı çalışma yer almaktadır. Çalışmada, spor için liderlik ölçeği ile yapılan çalışmalar derlenip sunulmuştur (Chelladurai vd., 1990).

Çalışmanın bir diğer sonucu en fazla yayın ve atıf sahibi olan araştırmacı Fransen Katrien'dir. Araştırmacı “Catholic University of Leuven” kurumunda çalışmakta ve psikoloji, spor bilimleri, sosyal bilimler, ekonomi, halk, çevre ve iş sağlığı alanlarında çalışmaktadır. Araştırmacının toplamda 63 yayını bulunmakta ve bu yayınların 62'si de WoS'da yer almaktadır. Ayrıca araştırmacının H-indeksi 24 olup, toplamda 1,649 WoS atfı bulunmaktadır. İkinci sıradaki yazar Filip Boen de Fransen Kartien gibi “Catholic University of Leuven” kurumunda çalışmakta ve psikoloji, spor bilimleri, sosyal bilimler, halk, çevre ve iş sağlığı ile geriatri ve gerontoloji alanlarında çalışmaktadır. Araştırmacının toplamda 166 yayını bulunmakta; bu yayınlardan 127'si WoS' da yer almaktadır. Araştırmacının H-indeksi 30 ve toplamda 2,932 WoS atfı bulunmaktadır. Üçüncü sırada yer alan Haslam S. Alexander “The University of Queensland” kurumunda çalışmakta ve psikoloji, iş ekonomisi, spor bilimleri, çevre ve iş sağlığı ile bilim ve teknoloji alanlarında çalışmaktadır. Araştırmacının toplamda 397 yayını bulunmakta ve bu yayınların 380 tanesi WoS'da yer almaktadır. Araştırmacının H-indeksi 74; 23,627 WoS atfı ve 2019 ile 2020 yıllarına ait “en fazla atıf alan araştırmacı ödülü” bulunmaktadır. Dördüncü sırada yer alan Loughhead Todd M., “University of Windsor” kurumunda çalışmakta ve psikoloji, sosyal bilimler, spor bilimleri, eğitim araştırmaları ile iş ekonomisi alanlarında çalışmaktadır. Araştırmacının toplamda 78 yayını bulunmakta ve bu yayınların tamamı WoS' da yer almaktadır. Araştırmacının H-indeksi 20 olup, 1039 WoS atfı bulunmaktadır. Beşinci sırada yer alan Niklas K. Staffens; “The University of Queensland” kurumunda çalışmakta ve psikoloji, iş ekonomisi, spor bilimleri, sosyal bilimler, bilim ve teknoloji alanlarında çalışmaktadır. Araştırmacının toplamda 108 yayını bulunmakta ve bu yayınların 107 tanesi WoS'da yer almaktadır. Araştırmacının H-indeksi 32 ve toplamda 2,844 WoS atfı bulunmaktadır. Ayrıca yayın ve atıf sayısı incelendiğinde yayın ve atıf sayısı yüksek olan yazarların aralarındaki bağlantının olduğu görsel haritalarda da görülmüştür. Yayın sayısı yüksek olan yazarın atıf sayısının da yüksek olması yanında, yayın sayısı yüksek olan yazarların da birbirleriyle ortak yayınlarının bulunduğu görülmektedir.

Çalışmanın bir diğer sonucu en fazla yayın yapılan ülkenin Amerika olduğu görülmüştür. Amerika'yı İngiltere, Kanada, Avustralya ve Belçika takip etmektedir. Sporda liderlik ile ilgili yakın zamanda yayınlanan bibliyometrik analiz çalışmasında; Amerika'nın ilk sırada yayın ve atıf sayısına sahip ülke olduğu, Kanada ve Birleşik Krallığın onu takip ettiği bildirilmiştir (Cruz ve Kim, 2023). Yayın yıllarına bakıldığında Amerika daha erken tarihli yayınlara sahipken;

Avusturalya, Belçika ve İngiltere'nin daha yakın tarihli yayınlarının olduğu görülmüştür. Amerika'nın yayın ve atıf sayısının yüksek olmasının nedeni en fazla yayın ve atıf sayısına sahip yayıncının (Human Kinetics) Amerika menşeli olmasından kaynaklandığı söylenebilir.

En fazla yayın sahibi kurum "University of Connecticut" kurumu 1881 yılında Amerika'da kurulmuştur. İkinci sırada yer alan "University of Katholieke Lueven" kurumu, 1425 yılında Belçika'da kurulmuştur. Üçüncü sırada yer alan "University of Queensland" kurumu 1909 yılında Avustralya'da kurulmuştur. Dördüncü sırada yer alan "University of Queens" kurumu 1841 yılında Kanada'da kurulmuştur. Beşinci sırada yer alan "University of Loughborough" kurumu 1909 yılında Birleşik Krallık'ta kurulmuştur. İlk sıradaki Amerika'da kurulan kurumun en fazla yayına sahip olmasının sebebini, kuruluş tarihinin daha erken olması, üniversitenin 115 lisans bölümü sahibi olması ve bu bölümlerin multidisipliner (spor ve sağlık) olmasından kaynaklandığı düşünülebilir. Ayrıca üniversitenin "yaz lisans araştırma fonu" ve "UConn IDEA hibeleri" bulunması da akademisyenleri daha fazla yayın yapmaya teşvik ettiği düşünülebilir. Diğer 4 sırada yer alan üniversiteler de en fazla yayın ve atıf sayısına sahip yazarların çalıştığı kurumlardır. Dolayısıyla bu üniversitelerdeki çalışan yazarların bu sıralamadaki doğrudan etkisi vardır, denilebilir.

Çalışmanın bir diğer sonucu en çok yayın ve atıf sahibi olan derginin "Journal of Sport Management" olduğu görülmektedir. Dergi incelendiğinde derginin indeksinin "SCI-E ve SSCI" olduğu ve çeyreklik olarak Q1'de yer aldığı görülmektedir. Dergi 1987 yılında yayın hayatına başlamıştır ve yılda 6 sayı yayınlamaktadır. Derginin yayıncısı "Human Kinetics" ve H-indeksi 78'dir. İkinci sırada yer alan "Psychology of Sport and Exercise" dergisinin indeksi "SCI-E ve SSCI" olduğu ve Q1 sınıfında yer aldığı görülmektedir. Dergi 2000 yılında yayın hayatına başlamıştır ve yılda 6 sayı yayınlamaktadır. Derginin yayıncısı "Elsevier BV" ve H-indeksi 106'dır. Üçüncü sırada yer alan "Quest" dergisinin indeksi "SCI-E ve SSCI" olduğu ve Q2 sınıfında yer aldığı görülmektedir. Dergi 1963 yılında yayın hayatına başlamıştır ve yılda 4 sayı yayınlamaktadır. Derginin yayıncısı "Taylor & Francis" ve H-indeksi 63'tür. Dördüncü sırada yer alan "Sport Psychologist" dergisinin indeksi "SCI-E ve SSCI" olduğu ve Q3 sınıfında yer aldığı görülmektedir. Dergi 1987 yılında yayın hayatına başlamıştır ve yılda 4 sayı yayınlamaktadır. Derginin yayıncısı "Human Kinetics" ve H-indeksi 79'dur. Beşinci sırada yer alan "Journal of Applied Sport Psychology" dergisinin indeksi "SCI-E ve SSCI" olduğu ve Q2 sınıfında yer aldığı görülmektedir. Dergi 1989 yılında yayın hayatına başlamıştır ve yılda 6 sayı yayınlamaktadır. Derginin yayıncısı "Taylor & Francis" ve H-indeksi 85'tir. Yakın tarihli bir araştırmada spor liderliği alanında en fazla yayına sahip dergiler arasında "Psychology of Sport and Exercise", "Journal of Applied Sport Psychology" ve "Sport Psychologist" yer almaktadır (Cruz ve Kim, 2023). Bu bulgu, bu araştırmanın sonucunu da destekler niteliktedir.

Yapılan bu bibliyometrik analiz sonucunda sporda liderlik araştırmalarında literatür incelendiğinde, sporda liderlik ile ilgili birçok çalışma mevcuttur. Fakat sporda liderlik ile ilgili derleme yayın yapılmakla birlikte, yayınların birbirleriyle olan ilişkileri, yazar, atıf sayısı ve dergi atıf sayıları gibi belirleyici noktalarda gelecek çalışmalara yön verecek çalışmaların eksikliği

görülmüştür. Bu araştırmada spor bilimlerinde liderlik temasına ilişkin WoS veri tabanında yayınlanan makalelerin geçmişten günümüze olan süreçlerini ve ilişkilerini belirlemek amaçlanmıştır. Araştırma sonucunda sporda liderlik ile ilgili literatür içerisinde yapılan çalışmaların incelenmesi ile beraber spor yönetimi, liderlik ve spor alanında çalışma yapacak olan akademisyenlere de bu araştırma sonuçlarının yol göstereceği düşünülmektedir. Ayrıca Türkiye'nin liderlik ile ilgili yayın ve atıf sıralamasında gerilerde yer aldığı da görülmüştür.

Sporda liderlik araştırmalarında dergi kalitesinin, dergi yayıncısının ve ortak yazarlık iş birliğinin çok önemli olduğu söylenebilir. Bu bakımdan bu alanda yayın yapmayı düşünen yazarların çeyreklik dilimlerde yer alan H-indeksi yüksek dergilerde yayın yapmaları tavsiye edilebilir. Ayrıca yapılacak olan yayınlarda yüksek atıf alan yazarlarla iş birliği yapılması da önerilebilir. Yazım diline bakıldığında 860 makalenin 856'sının dilinin "İngilizce" olduğu dikkat çekmektedir. Bu bağlamda yapılacak yayınlarda yayının dilinin 'İngilizce' olması görünürlük ve atıf açısından tavsiye edilebilir.

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Araştırmacıların Katkı Oranı Beyanı: Araştırma Dizaynı-ÖA, Verilerin Toplanması-ÖA, İstatistik analiz-ÖA; Makalenin hazırlanması-ÖA.

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Kadın Sporcu Triadı: Düşük Kullanılabilir Enerji ve Triad Bileşenlerine Güncel Bakış

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Öz

Kadın Sporcu Triadı, bozulmuş yeme davranışı ile birlikte veya tek başına Düşük Kullanılabilir Enerji (DKE), menstrual fonksiyon bozukluğu ve düşük kemik mineral yoğunluğu gibi bileşenlerden oluşan klinik bir sendromdur. DKE durumu, triadın merkezi veya etiyolojik faktörüdür: Besinlerden alınan enerjinin hem egzersizin/antrenmanın enerji ihtiyacını hem de vücudun büyüme, bağışıklık ve üreme fonksiyonları ile termoregülasyon dahil olmak üzere temel fizyolojik fonksiyonlarını karşılamak için çok düşük (yetersiz) olması durumunda ortaya çıkan bir durumdur. Bu durumun, enerji alımındaki azalmadan veya enerji harcamasındaki artıştan kaynaklanabileceği belirtilmektedir. DKE'ye maruz kalan bir sporcu, normal vücut fonksiyonlarını sürdürecektir enerjiden yoksundur ve vücudun bir enerji tasarrufuna gitmesi gerekmektedir. DKE'den kaynaklanan kadın sporcu triadı ile ilişkili menstrual bozukluklar, kas-iskelet sistemini ve kardiyovasküler sağlığı olumsuz etkileyebilmekte, tedavi edilmediği takdirde her yıl kemik kütlelerinde yaklaşık %2-3 kayba neden olabilmektedir. Triadın tedavisi, multidisipliner bir yaklaşım gerektirir. Sağlık profesyonelleri, antrenörler ve aileler arasındaki iş birliği oldukça önemlidir. Triadın her bir bileşeninin tedavisi farklı sürelerde gerçekleşmekle birlikte temelinde kullanılabilir enerjinin iyileştirilmesi yatmaktadır.

Anahtar kelimeler: Düşük kullanılabilir enerji, Kadın sporcu triadı, Kemik mineral yoğunluğu, Menstrual bozukluklar, RED-S

Female Athlete Triad: Updated Overview of Low Energy Availability and Triad Components

Abstract

The Female Athlete Triad is a clinical syndrome consisting of components such as menstrual dysfunction, low bone mineral density, and with or without disordered eating Low Energy Availability (LEA). LEA is the central or etiological factor of the triad. LEA occurs when the energy taken from food is too low (insufficient) to meet both the energy needs of exercise/training and the body's basic physiological functions, including growth, immunity, reproductive functions, and thermoregulation. It is stated that this may be due to the decrease in energy intake or the increase in energy expenditure. An athlete exposed to LEA lacks the energy to maintain normal bodily functions and the body needs to use energy sparingly. Menstrual disorders associated with the female athlete triad resulting from LEA can adversely affect the musculoskeletal system and cardiovascular health and lead to a loss of approximately 2-3% in bone mass each year if left untreated. Treatment of the triad requires a multidisciplinary approach. Collaboration between health professionals, coaches, and families is very important. The treatment of each component of the triad takes place at different times, but the main purpose is to improve energy availability.

Keywords: Bone mineral density, Female athlete triad, Low energy availability, Menstrual dysfunction, RED-S

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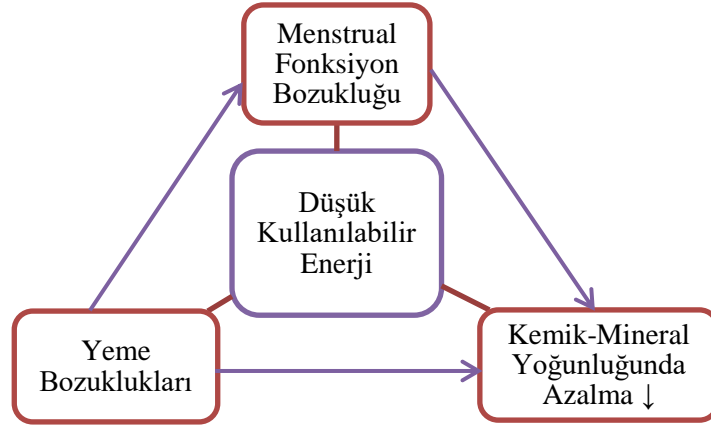
Kadınlar ve kız çocukları için düzenli fiziksel aktivitenin ve egzersizin saymakla bitmeyen faydalarına karşın bazı koşullar altında sağlığı tehdit eden sonuçlarının da olabileceği tespit edilmiştir (Williams vd., 2019). Kadın Sporcu Triadı (üçlemesi) ilk kez 1993 tarihinde açıklanmış ve 1997 yılında Amerikan Spor Hekimliği Koleji (The American College of Sports Medicine-ACSM) tarafından fiziksel olarak aktif kızlar/kadınlar ve kadın sporcularda sıklıkla görülen bozulmuş yeme davranışı, amenore ve osteoporozu içeren klinik bir sendrom olarak olarak tanımlanmıştır. 2007 yılında ise 3 yeni bileşen kabul edilmiştir:

- Bozulmuş yeme davranışı ile birlikte veya tek başına “Düşük Kullanılabilir Enerji” (DKE)
- Menstrual fonksiyon bozukluğu
- Düşük kemik mineral yoğunluğu

Daha sonra Kadın Sporcu Triadı Koalisyonu tarafından, 2014 yılında triad ile ilgili bir kılavuz yayımlanmıştır (Coelho vd., 2021; Joy vd., 2014; Williams vd., 2019). ACSM, yaptıkları spor dallarında mükemmelleşmeye çalışan kadın sporcuların potansiyel olarak ölümcül olabilecek triad açısından risk altında olduklarını açıklamıştır. Ayrıca sürekli kilo kaybının atletik performansı arttıracığına yönelik varsayımlar kesinlikle yanlıştır. Aşırı kısıtlayıcı diyet esnasında vücutta yağ kütlesi kadar kas kütlesi kaybının da yaşandığı bildirilmiştir dolayısıyla atletik performans olumsuz etkilenecektir. Kısıtlayıcı ve yetersiz beslenme; yorgunluk, elektrolit anomalileri, anemi ve depresyon gibi olumsuz etkileriyle performansın azalmasına neden olabilir (Yeager vd., 1993). Triad ile ilişkili sürekli DKE'nin, iskelet, endokrin, kardiyovasküler, üreme ve merkezi sinir sistemlerini etkileyebilecek tıbbi komplikasyonlara neden olarak sağlığı ve zindeliği bozabileceği belirlenmiştir (Curry vd., 2015). Sadece tartı ölçümlerinin değerlendirilmesi sporcularda akılcı bir yaklaşım değildir. Çünkü ölçüm, su ve kas kaybından veya artışından etkilenir. Sürekli belli bir ağırlık hedefine veya belli bir kiloyu korumaya odaklanmak sporcularda yeme bozukluklarına neden olabilir. Bu da sporcuyla amenore ve osteoporoz açısından riskli konuma getirebilir (Yeager vd., 1993).

Sporcularda DKE'nin neden olduğu diğer bir sendrom da Sporda Rölatif Enerji Eksikliği sendromudur (RED-S). RED-S, 2014 yılında tanımlanmıştır. RED-S, hem kadınları hem de erkekleri kapsamaktadır ayrıca hem fizyolojik hem de performans sonuçlarını daha geniş bir yelpazede ele almaktadır (Mountjoy vd., 2014; Williams vd., 2019). Daha kapsamlı bir yaklaşım olduğu için triad yerine RED-S kavramının kullanılmasını isteyen bazı yaklaşımlar mevcuttur. Fakat triad RED-S ile değiştirilmek istendiğinde 1) triadın en çok etkilediği kadın ve kız çocukları üzerindeki olması gereken ilgiyi azaltacaktır 2) düşük kullanılabilir enerjinin neden olduğu birincil sağlık sonuçlarının (yeme bozuklukları, menstrual fonksiyon bozuklukları ve düşük kemik mineral yoğunluğu) önemini azaltacaktır ve 3) triadın fizyolojik temellerinin anlaşılmasını zorlaştıracaktır (De Souza vd., 2014; Williams vd., 2019). Kadın sporculara benzer şekilde, erkek sporcularda da enerji alımı ile egzersiz enerjisi harcaması arasında bir uyumsuzluk olduğu durumlarda DKE

yaşayabileceğine dair artan kanıtlar mevcuttur. DKE ve bunun sonucunda RED-S'nin sağlık sonuçları açısından yüksek risk taşıyan erkek sporcu popülasyonları arasında bisiklet, kürek ve koşu ile ilgilenenler, jockeyler ve sıklet sınıflarında yarışan dövüş sporlarındaki sporcular yer almaktadır (Barrack vd., 2017; Mountjoy vd., 2018).



Şekil 1. Kadın sporcu triad bileşenleri

Triad, düşük kullanılabilir enerjinin neden olduğu sağlık sorunlarına odaklanmaktadır (Williams vd., 2019). Kadın sporcular, bozulmuş yeme davranışları ile birlikte veya tek başına en az bir veya daha fazla bileşenden muztarıptır (Joy vd., 2014).

Tüm aktivite düzeylerindeki kadın sporcularda yapılan bir meta-analiz çalışmasında, üç triad bileşeninin tümünü sergileyen kişilerin prevalansı %0-15.9 iken, triad koşullarından herhangi ikisine sahip kişilerin prevalansı %2.7-27, herhangi bir koşulu sergileyen kişilerin prevalansı ise %16-60 arasında bulunmuştur (Gibbs vd., 2013; Javed vd., 2013). Triad bileşenlerini yakından incelemek, triadın vücudumuz üzerindeki etkilerini anlamamızı kolaylaştıracaktır.

Araştırma için, beslenme/spor/spor beslenmesi konusundaki bilimsel kitaplardan ve makalelerden yararlanılmıştır. Literatür araştırması, 2000'li yıllar ağırlıklı olmak üzere geniş bir zaman dilimine yayılarak günümüzde kadın sporcularda triad kavramına yönelik yapılan yeni araştırmaları kapsamaktadır. Literatür taramasında ELSEVIER Science Direct (SciVerse), Taylor & Francis, EBSCOhost – Academic Search Complete, PubMed and SpringerLink, Google Scholar veri tabanlarından yararlanılmıştır.

Düşük Kullanılabilir Enerji (DKE)

Düşük kullanılabilir enerji durumu, triadın merkezi veya etiyolojik faktörüdür. Bu durumun, düşük enerji alımından, enerji harcamasındaki artıştan veya her ikisinden de kaynaklanabileceği ve

antrenman taleplerini artıran sporcularda farkında olmaksızın ortaya çıkabileceği bildirilmiştir (Joy vd., 2014).

Günlük Kullanılabilir Enerji (KE):
$$\frac{\text{Günlük enerji alımı [kcal]} - \text{Egzersiz enerji harcaması [kcal]}}{\text{Yağsız vücut kütlesi (YVK)(kg)}}$$

Optimal KE: 45 kcal/kg YVK günlük

Düşük KE: <30 kcal/kg YVK günlük

Subklinik DKE: 30-45 kcal/kg YVK günlük

Günlük enerji alımı; 3 günlük, 4 günlük ve 7 günlük besin tüketim kayıt yöntemiyle, 24 saatlik geriye dönük besin tüketim kaydı yöntemiyle ve besin tüketim sıklığı anketleriyle saptanabilir fakat raporlamada oluşacak ufak hatalar yanlış sonuçlara neden olabilir. Egzersiz enerji harcaması ise günlük fiziksel aktivite kayıtlarıyla belirlenebilir. Son olarak yağsız vücut kütlesi (YVK) altın standart olan çift enerjili X ışını absorpsiyometrisi (Dual Energy X-Ray Absorptiometry-DXA) ile saptanabilir veya sporcularda sıklıkla hava deplasmanı pletismografisi, biyoelektrik empedans analizi (BİA) ve deri kıvrım kalınlığı (DKK) ölçümleri de YVK'nin belirlenmesi için kullanılmaktadır (Joy vd., 2014).

Vücudun DKE durumunda olmasına rağmen sabit bir vücut ağırlığı mevcut olabilir. Beden kütle indeksi (BKİ), BKİ < 17,5 kg/m² veya vücut ağırlığı < %85 olması, DKE'nin gözlemlenebilir bir belirtisi olabilir. Yaşa ve cinsiyete göre ayarlanmış BKİ persentilleri 20 yaşına kadar kullanılabilir. KE'yi belirlemek için kesin bir yöntem yoktur. Diyet günlüklerinin yanlış sonuçlar verebildiği bazı çalışmalarda gösterilmiştir. DKE'nin ölçülebilir göstergeleri: düşük dinlenme metabolik hız, düşük yağ kütlesi ve düşük serbest triiyodotironin (T3) seviyeleridir (Joy vd., 2014; Statuta, 2020). Mevcut DKE sırasında, ölçülen dinlenme metabolik hızın (DMH) olması gereken DMH'nin < %90'ından az olabileceği bildirilmiştir (Joy vd., 2014). Leptin düzeylerinin de DKE'nin belirlenmesinde faydalı olabileceği düşünülmektedir ve bu konuda çalışmalar devam etmektedir (Statuta, 2020).

Bozulmuş Yeme Davranışı

En uç noktada Aneroksiya Nevroza (AN) ve Bulimia Nevroza (BN) yer almakla birlikte çok geniş bir spektrumu ifade etmektedir (Yeager vd., 1993). Amerikan Psikiyatri Birliği (American Psychiatric Association-APA), 2013 yılında Mental Bozuklukların Tanısal ve Sayımsal El Kitabının (Diagnostic and Statistical Manual of Mental Disorders-5-DSM-5) kriterlerine göre yeme bozukluklarını tanımlamıştır. DSM-5 kriterlerini karşılamayan sporcularda da bozulmuş yeme davranışları görülebilir (Güney ve Ersoy, 2020). Ciddi endokrin, iskelet ve psikiyatrik bozukluk geliştirme potansiyelleri yüksektir. Kadın sporcularda bozulmuş yeme davranışı görülme oranının %62'ye kadar çıkabileceği bazı küçük çalışmalarda gösterilmiştir (Yeager vd., 1993). Spor türüne bağlı olarak kadın sporcularda bozulmuş yeme davranışları prevalansı %1-62 arasında değişirken (Loucks ve Nattiv, 2005), ağırlığın önemli olduğu sporlarda daha yüksek oranlarda görülmektedir (Loucks ve Nattiv, 2005; Sundgot-Borgen, 1993; Sundgot-Borgen ve Torstveit,

2004). Bozulmuş yeme davranışı prevalansı yetişkin ve ergen elit kadın sporcularda sırasıyla yaklaşık %20 ve %13, yetişkin ve ergen elit erkek sporcularda sırasıyla %8 ve %3 olarak saptanmıştır (Martinsen ve Sundgot-Borgen, 2013; Mountjoy vd., 2014; Sundgot-Borgen ve Torstveit, 2010). AN veya BN gibi yeme bozuklukları prevalansı elit kadın sporcularda, sporcu olmayanlara göre daha yüksek (%13,5'e karşı %3,1) bulunurken ağırlığın önemli olduğu ve estetik spor dallarında bu prevalansın daha yüksek olduğu saptanmıştır (Javed vd., 2013).

Menstrual Fonksiyon Bozuklukları

Subklinik menstrual bozukluklardan (anovulatuvar döngüler) oligomenoreye ve birincil/ikincil amenoreye kadar değişen derecelerde disfonksiyon mevcuttur (Statuta, 2020). Öncelikle diğer sebeplerin (hamilelik, sistemik hastalıklar ve endokrinopatiler) hariç tutulması gerekmektedir (Joy vd., 2014).

Oligomenore: Yetişkinlerde siklus aralıkları >35 gün; ergenlerde >45 gün (Statuta, 2020).

Birincil Amenore: 15 yaşına kadar menarşın olmaması (Statuta, 2020).

İkincil Amenore: 6 aydan uzun süredir düzensiz menstrual döngü veya daha önce düzenli olan menstrual döngünün art arda 3 ay boyunca kesilmesi olarak tanımlanır (Statuta, 2020).

Düzenli menstrual döngünün gerçekleşmesi için hipotalamik gonadotropin salgılatıcı hormon, yumurtalıktan yeterli düzeyde östrojen salınmasını sağlayan bir süreç olan hipofiz bezinden folikül uyarıcı hormon (Follicle Stimulating Hormone-FSH) ve lüteinize edici hormon (Luteinizing Hormone-LH) salgılanmasını düzenler. Enerji eksikliği sırasında, hipotalamik-hipofiz fonksiyonu, temel fizyolojik mekanizmaların devam etmesine izin verecek şekilde değiştirilir. Ek olarak, hipotalamik-hipofiz-adrenal eksen aktive edilir ve hipotalamik-hipofiz-tiroidal eksen baskılanır, bu da kortizolün yükselmesine, toplam ve serbest triiyodotironin düzeylerinin düşmesine yol açar, bu da hipotalamik-hipofiz-adrenal eksenini daha da bozar. Artan büyüme hormonu, ghrelin ve peptit YY seviyeleri ve düşük leptin ve insülin benzeri büyüme faktörü 1 seviyeleri gibi amenoreli sporcuların metabolik ortamındaki değişiklikler, menstruasyon da dahil olmak üzere fizyolojik süreçleri tehlikeye atarak bir enerji tasarrufu durumuna neden olur. Psikojenik stresörler de menstrual bozukluklara yol açabilmektedir (Javed vd., 2013).

Sedanter kadınlar üzerinde yürütülen bir çalışmada, egzersiz enerji harcamasının ve enerji alımının kısa vadeli (5 gün) manipülasyonu yoluyla KE'yi <30 kcal/kg YVK/gün'ün altına düşüren iyi kontrollü müdahalelerin, LH pulsatilite doz tepkisi azalmasıyla ilişkili olduğu tespit edilmiştir (Loucks ve Thuma, 2003; Mountjoy vd., 2018). Bir diğer çalışmada ise; antrenmansız, daha önce düzenli menstrual sıklusa sahip olan gönüllülerde birkaç menstrual siklus boyunca enerji alımının ve egzersiz enerji harcamasının manipülasyonu yoluyla KE azalmıştır. Araştırmacılar, menstrual bozuklukların sıklığının (luteal faz kusurları, anovülasyon ve oligomenore dahil) temel ihtiyaçlara kıyasla enerji açığının büyüklüğünden etkilendiğini, ancak menstrual bozuklukların meydana

geldiği spesifik bir KE eşik değeri belirlenmediğini belirtmişlerdir (Mountjoy vd., 2018; Williams vd., 2015).

Toplumdaki kadınların %2-5'inde amenore görüldüğü bildirilmiştir. Kadın sporcularda bu oranın daha yüksek olduğu (%6-66) bildirilmiştir (Yeager vd., 1993). Spor türünden bağımsız olarak, eğlence amaçlı egzersiz yapanlar da dahil olmak üzere aktif kadınların dörtte birinde menstrual disfonksiyon gözlemlenmektedir (Javed vd., 2013). Koşucularda, antrenman süresi menstrual disfonksiyonla ilişkilidir; antrenman mesafesi haftada 8 mil altından 70 mil üzerine çıktıkça amenore görülme riski %3'ten %60'a çıkmaktadır (Javed vd., 2013; Nattiv vd., 2007). Bozulmuş yeme davranışları ile birlikte veya tek başına DKE seviyeleri amenoreye sebep olabilir. Amenoreli kadınların çoğunda östrojen seviyeleri postmenopozal seviyelere inerek omurgada hızlı kemik kayıpları oluşmasına neden olur. Bu kemik kaybının geriye dönüşü olmayabilir. Sporcular stres kırıkları, sakatlıklar ve yaralanmalar açısından yüksek risk altındadır (Yeager vd., 1993). Yapılan bir çalışmada, Avustralyalı egzersiz yapan bir grup kadının üçte birinin, aktif kadınlar için düzensiz menstrual siklusun "normal" olduğuna inandığını ve yaklaşık yarısının, menstrual bozuklukların zayıf kemik sağlığı için bir risk faktörü olduğunu düşündüğü bildirilmiştir (Miller vd., 2012; Mountjoy vd., 2018).

Düşük Kemik Mineral Yoğunluğu

Kemik dokusu, çeşitli polipeptitlerin, büyüme faktörlerinin, gonadal ve tiroid hormonlarının düzenlenmesi altında osteoklastlar (oluşmuş kemiği rezorbe eden) ve osteoblastlar (yeni kemik oluşturan) tarafından yönetilmekte ve sürekli yeniden modellemeye tabi tutulmaktadır (Javed vd., 2013). DKE, egzersizle ilişkili menstrual bozuklukların ortaya çıkmasında nedensel bir rol oynamaktadır. Uzun süreli üreme sisteminin baskılanmasıyla ilişkili hipoöstrojenemi, kas-iskelet ve kardiyovasküler sağlığı olumsuz etkileyebilir. DKE ayrıca hipoöstrojenizmden bağımsız olarak kas-iskelet sisteminde olumsuz etkilere sahip olabilir (Joy vd., 2014). Oligomenore/amenore veya ölçülmüş DKE'si olan fiziksel olarak aktif kadın sporcuların kesitsel çalışmaları, düzenli menstrual döngüye sahip sporculara ve diğerlerine kıyasla azalmış kemik mineral yoğunluğu (KMY), değişmiş kemik dokusu ve kemik döngüsü belirteçleri, azalmış kemik gücü tahminleri ve kemikte stres yaralanmaları riskinin arttığını göstermiştir (De Souza vd., 2008; Mountjoy vd., 2018; Nattiv vd., 2007). Amenoreli kadınların, durum tedavi edilmezse her yıl kemik kütlesinin yaklaşık %2-3'ünü kaybedeceği tahmin edilmektedir (Joy vd., 2014). Jokeyler, koşucular, yüzücüler ve bisikletçiler dahil olmak üzere belirli kadın ve erkek sporcuların daha düşük KMY riski altında oldukları bulunmuştur (Mountjoy vd., 2018).

Osteoporoz: Erken kemik kaybı ve/veya yetersiz kemik oluşumu, düşük kemik kütlesine ve dokusunda bozulmaya yol açarak iskelet kırılabilirliğini ve kırık riskini arttırmaktadır. Kadın sporcular arasında bu durumun yaygınlığı belirsizdir. Bununla birlikte, amenoreli bir sporcudaki kemik kaybının hızlı olduğu ve tamamen geri döndürülemeyebileceği açıktır (Yeager vd., 1993).

Düşük KMY'yi saptamak için altın standart olarak DXA ölçümleri kullanılır. Uluslararası Klinik Dansitometri Derneği, çocuklarda ve menopoz öncesi kadınlarda KMY'nin, değerlendirilmesinde Z skorlarının kullanılmasını önermektedir. Z skorları, aynı yaş ve cinsiyettekilerin KMY ortalamalarını ifade etmektedir. -2.0'ın altındaki Z skoru, kronolojik yaş için düşük kemik mineral yoğunluğu olarak adlandırılır ve çocuklarda osteoporoz tanısı hem kırık öyküsünün hem de düşük KMY'nin varlığını gerektirmektedir. Sporcular, sporcu olmayanlara göre %5-15 daha yüksek KMY'ye sahiptirler (Javed vd., 2013). Sporcu popülasyonunda düşük KMY, -1.0 ile -2.0 SD arasında bir Z skoru ile birlikte beslenme yetersizlikleri, hipoöstrojenizm, stres kırığı veya kırık için diğer ikincil klinik risk faktörleri öyküsü olarak tanımlanmakta ve -2.0 SD'nin altındaki bir değer, ikincil klinik risk faktörlerinin varlığı ile birlikte osteoporoz olarak kabul edilmektedir. Risk altındaki veya düşük KMY için tedavi gören sporcular için DXA taraması yoluyla KMY'yi yeniden değerlendirmek açısından önerilen aralık; yetişkinlerde 12 ay, ergenlerde 6 aydır (Mountjoy vd., 2014). KMY'nin geri kazanımı için ideal günlük KE alımı, kilo kazanımı, menstrual siklusun tekrar başlaması ve devamlılığı oldukça önem arz etmektedir (Joy vd., 2014).

Triadın Taranması

Riskli grupların tespit edilmesi triadın önlenmesi açısından çok önemlidir. Triad taraması, Spora Katılım Öncesi Fiziksel Değerlendirme (SKÖFD)'nin bir parçası olarak yapılmalıdır. Hem üniversite hem de lise öğrencileri risk açısından taranmalıdır (Joy vd., 2014). Liseli sporcularda yapılan bir çalışmada sırasıyla %18.2 bozulmuş yeme davranışı, %21.8 menstrual disfonksiyon ve %23.5 düşük KMY tespit edilmiştir (Curry vd., 2015). Önleme stratejileri hayati önem arz etmektedir çünkü zirve kemik yoğunluğunun %90'ına 18 yaşında ulaşıldığı düşünülürse ergenlerin taranması bu süreci geriye çevrilebilir kılacaktır (Joy vd., 2014; Matkovic, 1994). Ağırlığın önemli olduğu spor dallarında (bale, jimnastik veya dayanıklılık koşusu gibi ağırlık kategorilerini veya estetiği vurgulayanlar) triadın yaygınlığı, diğer spor dallarına göre 2 ila 3 kat daha fazla olarak bulunmuştur (Javed vd., 2013; Nattiv vd., 2007). Ayrıca elit düzeydeki sporcuları daha çok etkilediği tespit edilmiştir (Yeager vd., 1993). Yine de triad bileşenleri, eğlence amaçlı egzersiz yapanlar da dahil olmak üzere her yaşta ve spor dalından aktif kadınlarda ortaya çıkabilmektedir (Javed vd., 2013).

Katılım Öncesi Fiziksel Değerlendirme (Berhardt vd., 2010) ve Periyodik Sağlık Muayenesi (Ljungqvist vd., 2009) erken teşhis için yardımcı olabilecek benzer soruları içermektedir (Mountjoy vd., 2018). Son yıllarda, Kadın Sporcularda Düşük Kullanılabilir Enerji Anketi (LEAF-Q) (Melin vd., 2014), enerji eksikliğiyle bağlantılı fizyolojik semptomlar hakkında kısa bir anket olarak geliştirilmiştir (Mountjoy vd., 2018) ve LEAF-Q, Triad/RED-S'yi başarıyla tanımlamada %90 özgüllüğe ve %78 duyarlılığa sahip olduğu bildirilmiştir. Bu araç, DKE ve/veya oligomenore/amenore ve/veya düşük KMY'ye sahip on kadın sporcudan sekizinin yanı sıra daha yüksek KE, düzenli menstrual siklus ve normal KMY'ye sahip on sporcudan dokuzunu tanımlamıştır (Witkoś vd., 2023). Erkek Sporcularda Düşük Kullanılabilir Enerji Anketi (LEAM-Q) geliştirilmeye çalışılmaktadır (Mountjoy vd., 2018). Kendi kendine bildirilen anketlerin etkinliğine dair sınırlı kanıt vardır ve ek bireysel değerlendirme önerilmektedir (Mountjoy vd.,

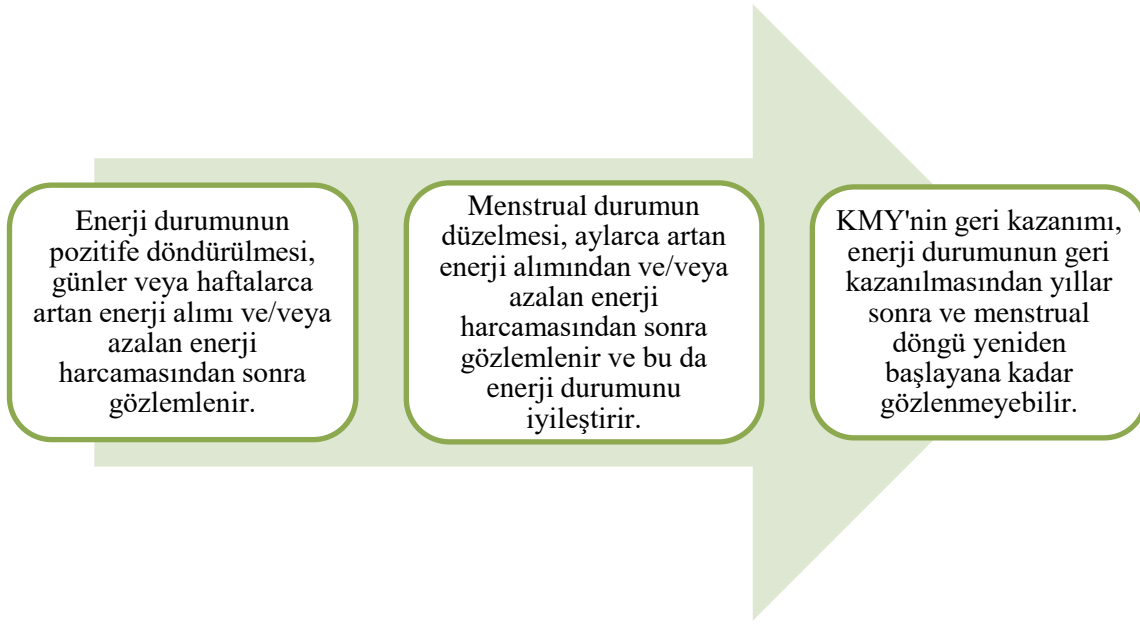
2018). RED-S Klinik Değerlendirme Aracı (RED-S CAT) (Mountjoy vd., 2015), klinisyenlere RED-S taramasında ve oyuna dönüş kararlarının verilmesinde yardımcı olabilecek bir tarama aracıdır ancak geçerliliğinin yapılması gerekmektedir (Mountjoy vd., 2018). Yeme bozukluklarının belirlenmesi için Yeme Bozukluğu Değerlendirme Ölçeği (EDE-Q), triad riski için potansiyel bir tarama aracı olarak kullanılmıştır ve ayrıca yeme bozukluğu semptomları olan erkekleri de belirleyebilmektedir. Kadın Sporcu Triadı Tarama Aracı (FAST) (McNULTY vd., 2001) kadın sporcuları taramak için kullanılmıştır ve ayrıca Yeme Bozukluğu Envanteri (EDI) (Garner vd., 1983) ve EDE-Q (Fairburn ve Beglin, 1994) gibi yeme bozuklukları tarama araçlarıyla pozitif korelasyon göstermektedir (Javed vd., 2013). Sporcularda Kısa Yeme Bozukluğu Anketi (BEDA-Q), yeme bozukluğu olan ve olmayan ergen kadın elit sporcuları, dokuz soruya dayalı ağırlıklı bir denklem puanı kullanarak belirlemektedir (Sim ve Burns, 2021). Anketler herhangi bir DKE/RED-S riskine işaret ediyorsa, sporcuların sağlığını ve performansını korumak için ve durumun kötüleşmesini önlemek için klinik takip gerekmektedir (Sim ve Burns, 2021).

Triadın Teşhis Edilmesi

Taramadan sonra, triad bileşenlerinden herhangi birinin doğru teşhisi, sporcunun doktor ve deneyimli multidisipliner sağlık ekibinin diğer üyeleri tarafından kapsamlı bir şekilde değerlendirilmesine bağlıdır. Multidisipliner ekibin üyeleri arasında bir doktor, bir spor diyetisyeni ve sporcuda bozulmuş yeme davranışları veya klinik yeme bozukluğu varsa bir psikiyatrist ve psikolog da yer almalıdır. Ekibin diğer üyeleri arasında bir egzersiz fizyoloğu, antrenör ve tıbbi danışmanlar da yer alabilir (Joy vd., 2014). 931 doktor üzerinde yapılan bir kadın sporcu triadı farkındalığı anketinde genel olarak sadece %37'sinin triadı duyduğu bildirilmiştir. Uzmanlıklar arasında farkındalığı değerlendirirken, farkındalık oranları en yüksek ortopedik cerrahi (%80), ardından kadın hastalıkları ve doğum (%55) ve fiziksel tıp ve rehabilitasyon/romatoloji (%52) bölümleri olmuştur. En düşük farkındalığa sahip üç bölüm ise anestezi (%9), radyoloji (%10) ve psikiyatri (%11) olmuştur. Antrenörlerin triad farkındalığını değerlendiren 2006 tarihli bir çalışmada, antrenörlerin yaklaşık %43'ü üç bileşeni de doğru bir şekilde tanımlayabilmiş, antrenörlerin sadece %8'i spora katılmadan önce menstrual fonksiyonu her zaman değerlendirdiğini bildirmiştir. Ancak bu çalışmanın sınırlılıkları vardır; yanıt verenlerin çoğu kadındır, yanıt verme oranı sadece %30'dur ve örneklem büyüklüğü düşüktür (Curry vd., 2015).

Triadın Tedavisi

Triadın yönetimi multidisiplinerdir ve sağlık profesyonelleri, antrenörler ve aileler arasındaki işbirliği oldukça önemlidir (Javed vd., 2013). Triadın tedavi edilmesinde her bir bileşenin için farklı sürelerle ihtiyaç vardır (Joy vd., 2014). Temelinde kullanılabilir enerjinin iyileştirilmesi yatmaktadır (Javed vd., 2013).



Şekil 2. Triadın tedavi süreci (Joy vd., 2014)

Şimdiye kadar yapılan çalışmalarda, vücut ağırlığının yaklaşık %5-10'u veya 1-4 kg kilo alımı menstrual döngünün yeniden başlaması ile ilişkilendirilmiştir (Joy vd., 2014; Mallinson vd., 2013). Hedef BKİ ve/veya kiloya ulaşabilmek için günlük enerji alımı %20-30 arttırılabilir veya 7-10 günlük süreçte 0,5 kg kazanımı yeterli olabilmektedir. Pozitif enerji dengesinin sağlanması için örneğin 2000 kcal/gün ile beslenen bir sporcuda kademeli olarak ek 200-600 kcal/gün artış yeterli olabilmektedir. KE doğru hesaplanabiliyorsa hedefimiz günlük KE \geq 45 kcal/YVA(kg)/gün olarak belirlenebilir (Joy vd., 2014).

Kemik yapımında görev alan besin öğeleri çok önemlidir; örneğin, <30 ng/mL serum 25-hidroksi D vitamini seviyeleri, stres kırığı insidansında artış ile ilişkili bulunmuştur. ABD Tarım Bakanlığı (The United States Department of Agriculture- USDA), diyet yönergeleri tarafından günde 600-800 IU D vitamini alımı önerilmektedir, fakat >30 ng/mL olan hedef serum 25-hidroksi D vitamini seviyelerine ulaşmak için geçici olarak daha fazla alım gerekebilir. 25-hidroksi D vitamini seviyelerinin iyileştirilmesinin iyileşme süresini kısaltabileceği ve oyuna erken dönüşü hızlandırabileceği belirtilmiştir. Ayrıca yeterli kalsiyum tüketimi, kemik stres yaralanması insidansını azaltmaya yardımcı olabilir (Mountjoy vd., 2018). Günlük kalsiyum alımı için mevcut tavsiye, 19-50 yaş arası erkek ve kadınlar için 1000 mg/gün ve 9-18 yaş arası çocuklar ve ergenler için 1300 mg/gün'dür (Mountjoy vd., 2018; You, 2015).

Görünür bozulmuş yeme davranışı/yeme bozuklukları; tıbbi, diyet ve zihinsel sağlık desteğini içeren multidisipliner bir ekiple tedavi edilmelidir. Şiddetli bradikardi, hipotansiyon, ortostaz ve/veya elektrolit dengesizliği olan hastalarda yatarak tedavi düşünülmelidir. Sporcuların tedaviye direnci genellikle sorunun ciddiyeti ile artmaktadır. Spor katılımı sporcular için motivasyon

kaynağı olarak kullanıldığında, spora geri dönecek kadar sağlıklı olma arzusu genellikle yeme bozukluğu olan sporcuların iyileşmesini kolaylaştırmaktadır (Mountjoy vd., 2018).

Triadlı sporcularda, menstrual döngüyü yeniden başlatmak veya KMY'yi iyileştirmek amacıyla kombine oral kontraseptiflerin kullanılması önerilmemektedir (Mountjoy vd., 2018). Başlıca gonadal steroidler östrojen, progesteron ve testosteronu içermektedir ve bunların tümü amenoreesi olan sporcularda düşük seviyelerde olduğu bulunmuştur (Mountjoy vd., 2014). Beslenme, psikolojik ve/veya değiştirilmiş egzersiz müdahalelerinin makul bir şekilde uygulanmasından sonra menstrual döngüler geri gelmezse, kısa süreli kullanım için siklik oral progestin ile transdermal estradiol (E2) tedavisi planlanabileceği bildirilmiştir. Özellikle transdermal E2, güvenilir bir hormonal kontrasepsiyon şekli değildir ve kemik sağlığı için transdermal E2 alan bir sporcuya istenmeyen gebeliklerden kaçınması tavsiye edilmelidir. Transdermal östrojen, kemik trofik hormon olan IGF-1 sekresyonunu etkilemez ve AN'de KMY'yi ve oligo-amenoreik sporcularda KMY ve kemik mikro mimarisini iyileştirdiği gösterilmiştir. Rekombinant paratiroid hormonu 1-34'ün AN'de KMY'yi iyileştirdiği gösterilmiştir ve DKE, hipotalamik amenore veya RED-S'li erişkinlerde gecikmiş kırık iyileşmesi veya çok düşük KMY durumunda nadir, kısa süreli kullanımı düşünülebileceği bildirilmiştir. Transdermal östrojen veya rPTH yalnızca bir metabolik kemik uzmanıyla birlikte reçete edilmelidir ve rPTH'nin açık büyüme plakları olan ergenlerde ve genç erişkinlerde kontrendike olduğuna dikkat etmek de oldukça önemlidir (Mountjoy vd., 2018).

SONUÇ ve ÖNERİLER

Sporcularda triadın oluşmadan önlenmesi ve/veya erkenden tedavi edilmesi son derece önemlidir. Triad kavramı, bileşenleri, tespiti, önlenmesi ve triadın sonuçları konusunda; kadın sporcular, antrenörler ve aileler bilgilendirilip eğitilmelidir. Triadın tespiti, değerlendirilmesi ve tedavisinde multidisipliner bir yaklaşım son derece önemlidir. Klinisyenler, antrenörler, diğer sağlık ve spor profesyonellerinden oluşan çok disiplinli ekiplerin, triad farkındalığını artırmak için bilinçlendirilmesi gerekir. Spor sağlığı alanında bu önemli konu ile ilgili araştırmalar yapmak ve yayınlamak, farkındalığı daha da artıracaktır. Ayrıca kadın sporcu triadının saptanmasına katkı sağlayacak daha fazla tarama yöntemlerinin geliştirilmesi ve yaygın eğitim çabalarına ihtiyaç olduğu da unutulmamalıdır.

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Yazar Katkı Beyanı: Yazarlar, çalışmada eşit katkı oranına sahiptir.

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Is Anaerobic Distance Capacity Effective on Speed, Acceleration and Agility in Football?

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Abstract

This study purposed to examine the effect of anaerobic distance capacity on agility, speed and acceleration in young football players. Twenty-five young football players participated in the present study voluntarily (n= 25, age= 16.72±1.10 years, height= 174.04±8.34 cm, weight= 65.86±11.26 kg). Agility value of young football players was obtained by the Illinois agility test. The speed and acceleration values of players were measured by 30-meter sprint test. 800 and 2400-meter run tests were performed to determine critical velocity and anaerobic distance capacity values. Players performed all of tests with maximum effort on a synthetic grass football pitch. The critical velocity and anaerobic distance capacity values were determined by total distance model (linear regression analysis between time and distance of 800 and 2400-meter runs). The slope and y-intercept of the regression line was determined as critical velocity and anaerobic distance capacity values, respectively (Total Distance Model: Run Distance = Anaerobic Distance Capacity + Critical Velocity x Run Duration). The effect of critical velocity and anaerobic distance capacity values on agility, speed and acceleration was examined by multiple linear regression analysis. According to linear regression models, it was found that anaerobic distance capacity and critical velocity values were not significant predictors of agility, speed and acceleration (p>0.05). Consequently, it can be said that anaerobic distance capacity value does not affect high-intensity anaerobic activities such as agility, speed, and acceleration in young football players.

Keywords: Anaerobic distance capacity, Critical velocity, Agility, Speed, Acceleration

Anaerobik Mesafe Kapasitesi Futbolda Hız, İvmelenme ve Çeviklik Üzerinde Etkili midir?

Öz

Bu çalışma, genç futbol oyuncularında anaerobik mesafe kapasitesinin çeviklik, hız ve ivme üzerindeki etkisini incelemeyi amaçlamıştır. Bu çalışmaya 25 genç futbol oyuncusu (n= 25, yaş= 16,72±1,10 yıl, boy uzunluğu= 174,04±8,34 cm, vücut ağırlığı= 65,86±11,26 kg) gönüllü olarak katılmıştır. Genç futbolcul oyuncularının çeviklik değerleri Illinois çeviklik testi ile elde edildi. Oyuncuların sürat ve ivme değerleri 30 metre sprint testiyle ölçüldü. Kritik hız ve anaerobik mesafe kapasitesi değerlerini belirlemek için 800 ve 2400 metre koşu testleri uygulandı. Oyuncular tüm testleri sentetik çim futbol sahasında maksimum eforla uyguladılar. Kritik hız ve anaerobik mesafe kapasitesi değerleri toplam mesafe modeli (800 ve 2400 metre koşularının süre ve mesafeleri arasında uygulanan doğrusal regresyon analizi) ile belirlendi. Regresyon doğrusunun eğimi ve y ekseninde kestiği nokta sırasıyla kritik hız ve anaerobik mesafe kapasitesi olarak belirlendi (Toplam Mesafe Modeli: Koşu Mesafesi = Anaerobik Mesafe Kapasitesi + Kritik Hız x Koşu Süresi). Kritik hız ve anaerobik mesafe kapasitesi değerlerinin çeviklik, sürat ve ivme üzerindeki etkisi çoklu doğrusal regresyon analizi ile incelenmiştir. Doğrusal regresyon modellerine göre anaerobik mesafe kapasitesi ve kritik hız değerlerinin çeviklik, sürat ve ivme değerlerinin anlamlı yordayıcısı olmadığı belirlendi (p>0,05). Sonuç olarak, genç futbol oyuncularında anaerobik mesafe kapasitesi değerinin çeviklik, sürat ve ivme gibi yüksek yoğunluklu anaerobik aktiviteler üzerinde önemli bir etkiye sahip olmadığı söylenebilir.

Anahtar kelimeler: Anaerobik mesafe kapasitesi, Kritik hız, Çeviklik, Hız, İvme

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INTRODUCTION

Football is a sports event including short, high intensity and intermittent activities. It was reported that soccer players performed 1000-1400 activities with short duration in the match (Vigne et al., 2010). Therefore, soccer needs a high anaerobic fitness level. A high anaerobic fitness level provides that high-intensity activities can be frequently performed in a football match. Anaerobic fitness can be built on good aerobic fitness. It was reported that repeated sprint ability was negatively correlated with maximum oxygen uptake (Meckel et al., 2009).

There are many aerobic performance parameters. One of these parameters is the critical velocity (CV). Critical velocity is a running version of the critical power parameter, and critical power is an exercise intensity distinguishing steady state and non-steady state domains (Vanhatalo et al., 2011). CV is the highest exercise intensity continued without fatigue in prolonged exercise (Denadai et al., 2005; Monod and Scherrer, 1965; Taylor and Batterham, 2002). CV is a parameter obtained using linear relationship between the time and distance of two or more runs performed with maximum effort (Ettema, 1966). Anaerobic distance capacity (ADC) is another parameter obtained with the CV concept, and it represents the distance covered by anaerobic energy reserves (Morton, 2014). The performance of high-intensity activities depends on anaerobic energy reserves in sports events such as football.

Three other performance components are agility, speed and acceleration. Agility is defined as performing activities with a change of direction quickly (Sheppard and Young, 2006; Young et al., 2002). The activities with a change of direction, known as agility, are frequently used to react to the ball or opponent during the match. However, speed is one of the most critical factors in high-intensity activities. Fast players can perform high-intensity activities at higher speeds. Speed is the highest movement speed during a sprint run (Kaplan et al., 2009). Repeated sprint ability can provide an advantage to football players in attack and defense actions. Also, acceleration is too important for attack and defense actions requiring high effort. Players need to increase speed during important attack and defense actions. Acceleration is the rate of speed increase performed to attain maximum sprint speed (Kaplan et al., 2009; Morton, 2014).

The players with high acceleration ability can provide an advantage to their opponents during the match. Therefore, agility, speed and acceleration are important performance components in football. However, the effect of ADC on these parameters was not researched. There was no study researching this relationship in the literature. The determination effect of ADC on these parameters can provide valuable data to sports scientists and football coaches for high intensity run training. This study aimed to examine the effect of ADC on agility, speed, and acceleration.

METHODS

Research Model

The research was designed with the relational research model within the scope of survey research. Relational research model is a method used to determine the relationships between two or more variables and the amount of covariation that may occur between the variables.

Research Group

The twenty-five young male football players playing in amateur football teams in Ordu were determined as study group ($n=25$, $age=16.72\pm 1.10$ years, $height=174.04\pm 8.34$ cm, $body\ weight=65.86\pm 11.26$ kg). According to the power analysis results, the study group should consist of 24 people with an effect size of 0.50, an alpha value of 0.05, and a power value of 0.95. Due to the possibility that not all players could complete the tests, the study group comprised 25 people. The criteria for inclusion in the study were determined as being an amateur licensed football player who plays football actively in their clubs, doing regular training at least three times a week, and not having any sports injuries. Players who do not meet these criteria were not included in the study.

Ethical Approval

The study was ethically approved by Ordu University Clinical Sciences Ethics Committee dated 25.11.2022 and issue no 2022/264 (File decision number: ODÜKA EK-2022-264).

Experimental Approach of The Study

The study consists of two stages. In the first stage, the height and body weight values of the football players forming the study group were measured. Then, to determine the critical velocity and anaerobic distance capacity values, 800 and 2400-meter runs were performed at least two days apart. In the second stage, 30-meter sprint and Illinois agility test protocols were performed. The tests were performed on a synthetic grass football pitch at the same time of day and in the same weather conditions. At least 48 hours (2 days) were given between all tests, allowing the players to participate in the tests in a rested manner. In addition, the players were informed not to eat at least 3-4 hours before the tests and not to do vigorous physical activity during the two days before the tests. The test protocols and measurements to be performed within the scope of the study are given below.

Anthropometric Measurements

The players' height and body weight measurements were performed at the facilities of the amateur clubs they are affiliated with before starting the first running test (800-meter running test). Height measurements were made in centimeters (cm) with bare feet, in the anatomical standing position and using a height measuring device from the top of the head (Holtain Ltd, Crymych, UK). Body weight values were calculated in kilograms (kg) using an electronic scale with sports clothes (sports shorts and T-shirt) and without any equipment to create weight on the body (Seca 874, SECA, Germany).

800 and 2400-meter Run Tests

In order to determine the ADC and CV values, 800 and 2400-meter running tests were performed on a synthetic grass football pitch at the same time of the day, with two days intervals. In the synthetic grass football pitch, the number of laps corresponding to 800 and 2400 meters is predetermined, and the distance is indicated by the training cones placed on the pitch. The players were followed during the run by being informed how many laps they had to run in order to complete the 800 and 2400-meter distances. Runs were performed with maximum effort, and verbal encouragement and feedback were provided to the players. A 10-minute warm-up and stretching period was performed before all running tests. Different observers followed each player, and the test was terminated by warning the player when the running distance was completed. The test time was recorded in seconds (sec) using an electronic stopwatch (Casio HS-80TW-1EF, Casio, Japan).

Critical Velocity (CV) and Anaerobic Distance Capacity (ADC) Values

The linear total distance model was used to determine critical velocity (CV) and anaerobic distance capacity (ADC). The linear total distance (Lin-TD) model consists of linear regression analysis applied between the duration and distance values of two or more runs performed with maximal effort (Monod and Scherrer, 1965). The equation of the Lin-TD model is expressed as (Bull et al., 2008; Florence and Weir, 1997; Gaesser et al., 1995; Hill, 1993; Hill and Ferguson, 1999; Housh et al., 1990; Housh et al., 2001; Jenkins and Quigley, 1990; Kranenburg and Smith, 1996; Monod and Scherrer, 1965; Moritani et al., 1981):

$$\text{Total Distance (TD)} = \text{ADC} + \text{CV} \times \text{time (t)}$$

In the model equation, the slope of the regression line represents the CV value, and the point where the regression line cuts on the vertical axis represents the ADC value (Monod and Scherrer, 1965). In this study, CV and ADC values were determined using the Lin-TD model using the time and distance values of 800 and 2400-meter runs (Penteado et al., 2014). Run distance in meters and duration in seconds are placed in the model. While the ADC value was determined in meters, the CV value found in meters/second (m/s) was converted to kilometer/hour (km/h) and included in the statistical analysis.

30-meter Sprint Test

Two days after the running tests, a 30-meter sprint test was performed on the synthetic turf football field (Figure 1). The sprint test track consists of 30 meters. After the test distance of 30 meters was determined with the steel meter, the start and end points of the test were marked with training cones. In order to determine the 0-10, 10-20, 0-20, 20-30 and 0-30 meter acceleration values of the players, the starting point of the test, the distances of 10, 20 and 30 meters were marked with training cones, and the gates of the wireless electronic photocell device were placed at these points. Sprint times were determined by a 4-gate wireless electronic photocell (Microgate Witty, Bolzano, Italy). Before the tests, a 10-minute warm-up and stretching period followed by short-distance sprint runs were performed. The test was performed as two repetitions with rest intervals, and the sprint time was recorded by obtaining the best sprint time. The

acceleration values of the players were determined by the acceleration formula ($a = \Delta V:\Delta t$) in the Microsoft Excel program (Microsoft Office 365, Microsoft Corp., Redmond, WA, USA).

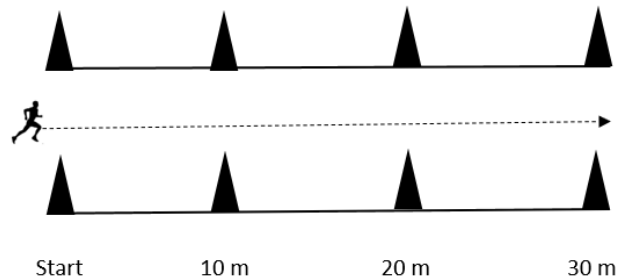


Figure 1. 30-meter Sprint Test Track

Illinois Agility Test

After the sprint, the agility test was performed to the players in the same training unit by giving the necessary rest intervals. Since the 30-meter sprint test requires ATP-PC stores in the muscle and does not create excessive lactic acid accumulation in the player, the speed and agility test measurements were performed in the same training period by giving sufficient rest intervals. Illinois agility test was performed to determine the agility values of the players. The Illinois agility test track (Figure 2) was marked on a synthetic grass football pitch by measuring with a steel meter. A wireless electronic photocell device was used to determine the test time (Microgate Witty, Bolzano, Italy). The start and end points of the test track were marked with training cones, and the wireless electronic photocell device doors were placed at these points. The test was performed as two repetitions with rest intervals. The best time was recorded as the test score.

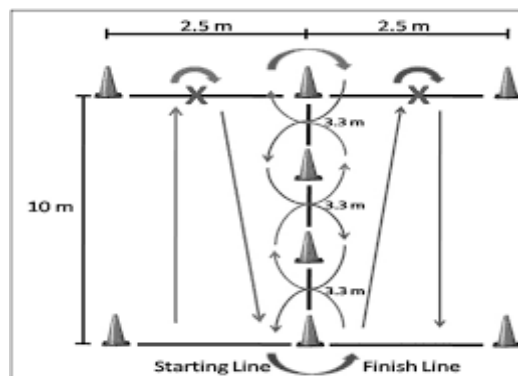


Figure 2. Illinois Agility Test Track (Raya et al., 2013)

Statistical Analysis

The data collected within the scope of the study are presented as descriptive values (mean, standard deviation, and minimum and maximum values). ADC and CV values were determined using linear regression analysis between 800 and 2400-meter running times and distances. The effects of ADC and CV values on speed, acceleration and agility were investigated with multiple linear regression models. Multiple linear regression models were created with ADC and CV

values as independent variables and speed, agility, and acceleration values as dependent variables. While creating the regression models, multicollinearity, variance inflation factor and tolerance values were checked. Regression models were created by paying attention to the absence of multicollinearity between the independent variables. All data were analyzed using statistical package program (SPSS 20.0, IBM Corp., Chicago, USA).

RESULTS

Table 1. The descriptive values of the test data (n=25)

	Mean	SD	Minimum	Maximum
CV (m/sec)	3.53	0.42	2.74	4.23
CV (km/h)	12.70	1.51	9.86	15.24
ADC (m)	190.87	69.87	43.44	300.75
Agility (sec)	16.30	0.65	14.99	17.90
800 m run	173.56	16.33	145.00	217.00
Mean velocity (km/h)	16.73	1.50	13.30	19.80
Max. velocity (km/h)	25.26	3.18	21.00	33.20
2400 m run	633.76	66.52	535.00	801.00
Mean velocity (km/h)	13.76	1.40	10.80	16.10
Max. velocity (km/h)	22.13	3.53	14.40	29.20
Velocity (km/h)	20.15	1.06	17.82	22.78
0-10 m run	22.93	1.01	20.63	25.53
0-20 m run	24.42	1.11	21.91	27.07
0-30 m run	3.14	0.33	2.45	4.01
Acceleration (m/sec ²)	2.03	0.18	1.64	2.51
0-10 m run	1.54	0.14	1.23	1.88

CV: Critical velocity, ADC: Anaerobic distance capacity, SD: Standard deviation

The descriptive values of the young male football players is presented in Table 1.

Table 2. The effect of anaerobic distance capacity and critical velocity on agility and speed (n=25)

Dependent Variables	Predictor Variables	B	β	p-value	r (zero-order)	R ²
Agility	constant	18.056		0.000		0.115
	CV	-0.140	-0.328	0.240	-0.339	
	ADC	0.000	0.016	0.955	0.237	
	*F=1.427. †p>0.05					
Model: Agility = 18.056 - 0.140 x CV + 0.000 x ADC						
0-10 m Speed	Predictor Variables	B	β	p-value	r (zero-order)	R ²
	constant	17.998		0.000		0.022
	CV	0.127	0.182	0.531	0.058	
	ADC	0.003	0.184	0.527	0.061	
*F= 0.244. †p>0.05						
Model: 0-10 m speed = 17.998 + 0.127 x CV + 0.003 x ADC						
0-20 m Speed	Predictor Variables	B	β	p-value	r (zero-order)	R ²
	constant	20.356		0.000		0.038
	CV	0.147	0.222	0.443	0.049	
	ADC	0.004	0.256	0.377	0.106	
*F=0.435. †p>0.05						
Model: 0-20 m speed = 20.356 + 0.147 x CV + 0.004 x ADC						
0-30 m Speed	Predictor Variables	B	β	p-value	r (zero-order)	R ²
	constant	20.156		0.000		0.078
	CV	0.253	0.346	0.225	0.112	
	ADC	0.005	0.347	0.224	0.114	
*F=0.934. †p>0.05						
Model: 0-30 m speed =20.156 + 0.253 x CV + 0.005 x ADC						

* Coefficient of the regression model, † significance value of regression model, CV: critical velocity (km/h), ADC: anaerobic distance capacity (m)

It was determined that the regression models were not statistically significant ($p>0.05$). The linear regression models showed that the CV and ADC were not significant predictors of agility and speed values (Table 2).

Table 3. The effect of anaerobic distance capacity and critical velocity on acceleration (n=25)

Dependent Variables	Predictor Variables	B	β	p-value	r (zero-order)	R ²
0-10 m Acceleration	Constant	2.391		0.024		0.027
	CV	0.045	0.206	0.477	0.073	
	ADC	0.001	0.197	0.496	0.058	
	*F=0.300. †p>0.05					
Model: 0-10 m acceleration =2.391 + 0.045 x CV + 0.001 x ADC						
0-20 m Acceleration	Predictor Variables	B	β	p-value	r (zero-order)	R ²
	Constant	1.548		0.008		0.041
	CV	0.028	0.239	0.407	0.063	
	ADC	0.001	0.261	0.366	0.100	
*F=0.471. †p>0.05						
Model: 0-20 m acceleration =1.548 + 0.028 x CV + 0.001 x ADC						
0-30 m Acceleration	Predictor Variables	B	β	p-value	r (zero-order)	R ²
	Constant	0.979		0.023		0.084
	CV	0.033	0.362	0.205	0.120	
	ADC	0.001	0.357	0.210	0.113	
*F=1.009. †p>0.05						
Model: 0-30 m acceleration =0.979 + 0.033 x CV + 0.001 x ADC						

* Coefficient of the regression model, † significance value of regression model, CV: critical velocity (km/h), ADC: anaerobic distance capacity (m)

According to linear regression models, it was found that the CV and ADC did not have any effect on acceleration values ($p>0.05$). The acceleration values were not significantly predicted by CV and ADC (Table 3).

DISCUSSION AND CONCLUSION

This study investigated the effects of CV and ADC on agility, speed and acceleration. Linear regression models revealed that CV and ADC values were not significant predictors of agility, speed and acceleration (Tables 2 and 3). The CV value is obtained by linear relationship between the duration and distance of runs performed with two or more maximal efforts. The slope of the linear regression graph represents the CV, and the point intersecting on the vertical axis represents the ADC value (Monod and Scherrer, 1965). The ADC value represents the distance covered by the anaerobic energy reserves stored in the muscle above the CV value. Therefore, it can be stated that the ADC value is a parameter in an anaerobic structure. No study investigates the relationship of ADC value with short-term high-intensity activities such as agility, speed and acceleration. Determining the effects of ADC value as an anaerobic parameter on agility, speed and acceleration will contribute to the scientific literature.

In a study conducted on an athlete and a sedentary group, a highly positive correlation was found between CV and maximum oxygen consumption in the athlete group and a highly negative

correlation between the fatigue index (the percentage decrease between the maximum speed reached in the 3-minute running test and the critical velocity) (Kramer et al., 2020). Similarly, in the sedentary group, there was a moderately positive correlation between CV and maximum oxygen consumption and a moderately negative correlation between CV and fatigue index in the same study. Activities that require maximum speed are known as anaerobic activities. In this respect, the negative relationship between the fatigue index, which expresses the percentage of decrease between the maximum speed and CV in the 3-minute running test, and CV is remarkable. Our study differs from the mentioned study in that CV value is not a significant predictor of agility, speed and acceleration values. However, the fatigue index expresses decrease in exercise performance and is closely related to the player's recovery ability. In this respect, it is expected that the fatigue index is related to aerobic endurance, which is related to the recovery ability of the athlete and, therefore, to the CV value.

As a result of six weeks of lower and upper extremity strength and football training performed to the football team, it has been reported that there was a significant increase in the CV value and distance covered in the Yo-Yo intermittent recovery test, a significant decrease in the 30-meter sprint time, while there was no change in the ADC value (Karsten et al., 2016). According to this finding, it is seen that the training practices mainly increase the CV value, thus the aerobic endurance level, but are not very effective on the ADC value. Our study determined that CV and ADC values had no significant effect on speed and acceleration values. In this respect, the findings of our study are similar to the results mentioned earlier. It is noteworthy that there is no relationship between the ADC value and the speed value in both studies.

It has been reported that agility value is associated with acceleration and maximum speed value in professional football players (Little and Williams, 2005). Similar to the study mentioned earlier, it was determined that the acceleration values in young football players was significantly related to the 30-meter sprint, agility and maximal speed values (Sever and Arslanoğlu, 2016). Köklü et al., (2015) found a significant relationship between young football players' 10 and 30-meter sprint values and the agility test values performed without the ball. Theoretically, it can be stated that the agility skill also includes the speed skill and is related to it. In activities requiring agility skills, the athlete must reach maximum speed (acceleration) and be fast. In this respect, the findings of these studies can be considered expected results. Our study determined that ADC value as an anaerobic parameter had no a significant effect on agility, speed and acceleration values. The findings of this study differ from the findings of these studies. It can be said that the ADC value expresses the limitation of the exercise to be performed at the intensities above the CV value. In this respect, it is reported to represent the distance covered with anaerobic energy reserves stored in the muscles (Morton, 2014). As an anaerobic parameter, the ADC value can be expected to be related to the anaerobic skills such as agility, speed and acceleration values. Our study determined that ADC value was not a significant predictor of these parameters in all regression models. This finding may reveal that the ADC value based on limited anaerobic energy reserves may not be associated with agility, speed and acceleration parameters, which may be related to skill and hereditary characteristics.

CV value is known as an aerobic performance parameter. Therefore, in activities that require aerobic endurance, the level of aerobic endurance can be evaluated by the CV value of the athlete. In addition, the other output of the critical velocity concept is the ADC value. This study tested the effect of ADC value on short-term high-intensity skills such as agility, speed and acceleration. Since there is no study on the subject in the literature, the results have been tried to be interpreted with similar findings. The effects of CV and ADC values as independent variables of linear regression models on agility, speed and acceleration were investigated. The analysis results revealed that CV and ADC values had no significant effect on agility, speed and acceleration parameters. The fact that the ADC value does not significantly affect agility, speed and acceleration may be because ADC is more related to anaerobic energy reserves as a parameter, and the parameters mentioned earlier are skills related to the synchronization of the neuromuscular system and hereditary factors. Neuromuscular compatibility and hereditary factors may cause these parameters to differ among athletes. In this respect, the study's results can bring a different perspective to the literature.

In conclusion, the study's results reveal that football players' CV and ADC values do not significantly affect agility, speed and acceleration values in football players. It can be stated that the CV and ADC values, which are the two outputs of the critical velocity concept, have a limited effect on actions requiring agility, speed and acceleration, which have an important place in football. Contrary to expectations, it can be concluded that the ADC value, an anaerobic parameter, is not effective on agility, speed and acceleration performance. Possible structural differences between the ADC value and the parameters mentioned earlier may cause this situation. As a result, it can be said that the ADC value is not an indicator of agility, speed and acceleration performance in football. In future studies to be performed to football players, different findings can be reached on the study subject by associating the ADC value with different anaerobic performance parameters.

Conflict of Interest: There is no conflict of interest between the authors.

Researchers' Statement of Contribution Rate: Research Design-MHM; Data Collection-MHM, EA; Statistical Analysis-EA, MHM; Preparation of the article, MHM, EA.

Ethical Approval

Name of Board: The study was ethically approved by the decision of the Ordu University Clinical Sciences Ethics Committee.

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Investigation of University Students' Recreation Benefit Awareness and Physical Activity Levels

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Original Article

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Abstract

Physical activity level is an important factor that affects health of people of all ages and awareness level about the benefits obtained from recreational activities may increase the frequency of participation. The objective of the study is to review the correlation between university students' recreation benefit awareness and their physical activity levels and to demonstrate whether or not there is a difference about this subject in terms of gender and faculty. A total of 909 university students 541 female students and 368 male students who studied at different universities in Turkey joined the study. Information Request Form, Leisure Benefit Scale and International Physical Activity Questionnaire were administered to the participants. The data obtained from the study were analyzed using Pearson Correlation Analysis and Independent Samples t Test. The study results indicate that there is a positive correlation between participants' recreation benefit awareness and their physical activity levels. Besides, it is seen that female participants' physical and psychological recreation benefit awareness was higher; however, as for the male participants their physical activity levels were higher. It was identified that of the participant students, those who studied on sports sciences had higher psychological and social recreation benefit awareness and physical activity levels. In light of the study findings, the fact that the university students' benefit awareness perception on recreational activities had increased made a positive contribution to their physical activity levels and dimensions of recreation benefit awareness and as a result, physical activity levels differed in terms of gender and the type of the faculty.

Keywords: Physical activity, Recreation benefit awareness, University students

Üniversite Öğrencilerinin Rekreasyon Fayda Farkındalıkları ile Fiziksel Aktivite Düzeylerinin İncelenmesi

Öz

Fiziksel aktivite düzeyi her yaşta bireyin sağlığına etki eden önemli bir faktördür ve rekreatif aktivitelerinden elde edilen faydalar ile ilgili farkındalık düzeyi aktivitelere katılım sıklığını artırabilir. Üniversite öğrenim sürecinin rekreatif aktivite fırsatları açısından zengin bir dönem olduğu düşünüldüğünde araştırmamız üniversite öğrencilerinin rekreasyon fayda farkındalığı ile fiziksel aktivite düzeyleri arasındaki ilişkiyi tespit etmeği amaçlamaktadır. Araştırmaya Türkiye'nin farklı bölgelerinde üniversitelerde öğrenim gören 541 kadın, 368 erkek toplam 909 üniversite öğrencisi katılmış ve Kişisel Bigi Formu, Rekreasyon Fayda Farkındalığı ve Fiziksel Aktivite Düzeyleri ölçeklerinden oluşan anket formu ile veriler elde edilmiştir. Sayısal değişkenler arasındaki ilişkiler Pearson korelasyon analizi ve iki grup arasında nicel değişkeninin ortalamaları arasında anlamlı bir fark olup olmadığını sınamak için bağımsız örneklem t testi kullanılmıştır. Araştırma sonuçları katılımcıların rekreasyon fayda farkındalıkları ve fiziksel aktivite düzeyleri arasında pozitif ilişki olduğu göstermektedir. Ayrıca kadınların fiziksel ve psikolojik rekreasyon fayda farkındalıklarının, erkeklerin ise fiziksel aktivite düzeylerinin daha yüksek olduğunu görülmüştür. Katılımcılarından spor bilimleri alanında eğitim gören öğrencilerin psikolojik ve sosyal rekreasyon fayda farkındalıkları ile fiziksel aktivite düzeylerinin daha yüksek olduğu tespit edilmiştir. Sonuç olarak üniversite öğrencilerinin rekreatif aktivitelerde fayda farkındalık algısının artması fiziksel aktivite düzeylerine olumlu katkı sağlamaktadır. Ayrıca cinsiyet ve eğitim alanı bazı faktörler ile ilişkili olarak rekreasyonel fayda farkındalığı alt boyutlarında değişkenlik göstermektedir.

Anahtar Kelimeler: Fiziksel aktivite, Rekreasyon fayda, Farkındalık

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INTRODUCTION

Today; with various reasons like reducing stress of daily life, socialization and health, people join different recreational activities such as artistic, cultural, social and physical recreational activities and go through different experiences. People should be aware of the positive and negative aspects and the benefits and risks that are related to the activity that they joined so that they can have a positive recreation experience (Barnett, 2005; Ryan and Deci, 2000). The term of recreation benefit awareness is defined in relation to experiential perception according to whether or not the participants achieve their goals or obtain some benefits when they participate in recreational activities (Kuo and Feng, 2013). The definition of recreation benefit awareness is rather broad and therefore this term is discussed in physiological, psychological and social perspectives (He et al., 2016). Additionally, Bright (2000) stated that recreational activities provide economical and social benefits to people's lives. People mainly obtain physiological and psychological benefits when they participate in recreational activities alone whereas they can experience more social benefits in addition to physiological and psychological benefits when they join these activities with an organized group or a party (Chang et al., 2018; Yeh et al., 2017).

Using social psychology theory; Ajzen (1991) reviewed benefits of participation in recreational activities and suggested that participants can benefit from recreational activities and – moreover- emphasized that participants having potential benefits of recreational activities at a higher level will show more positive participation attitude and more active participation behavior. The effect of benefit awareness about recreational activities upon active participation behavior may influence physical activity level positively, too. From another perspective; in addition to considering a recreational behavior as good or bad in terms of its benefits, people may consider the same recreational behavior as arousing good or bad feelings (Abelson et al., 1982). Those who believe that running provides some benefits for themselves in terms of health and physical fitness may still report that they do not like running and do not participate in running activities (Ajzen and Driver, 1991) and therefore, they may show a neutral correlation between recreational activity benefit awareness and physical activity level. This approach questions the significance of recreation benefit awareness when they recreationally join physical activities.

The term of recreation awareness has been studied in many studies in literature and its relation to such subjects as life satisfaction, liking one's own body, awareness, purchasing behavior styles has been investigated (Akyıldız-Durhan et al., 2022; Bülbül et al., 2021; Kurtipek et al., 2022; Öztürk, 2022). When the literature was focused on; it was seen that physical activity level among university students was examined in relation to such different topics as depression, anxiety, quality of life, smoking, academic success, healthy life styles (Murathan et al., 2013; Ölçücü et al., 2015; Pirinççi et al., 2020). However, within our knowledge, we have not so far seen any study reviewing the correlation between people's recreation benefit awareness and physical activity level. In the study of Haase et al. (2004) investigating the correlation between recreational physical activity level and health benefit awareness, risk awareness and national economical growth among university students coming from 23 countries; it was found that nearly half of the university students were not engaged in any physical activities and showed a limited health benefit awareness. In this study, benefit awareness was not assessed in relation to psychological and social aspects. In this sense, our study is a valuable study. In addition,

participation in recreational activities is expected to be at the highest-level during university education. Although it is known that regular participation in recreational activities gives numerous benefits, participation in recreational activities may decrease among the adults due to increasing responsibilities of professional life and starting a family life (Nimrod and Shrir, 2016). Therefore; to investigate the time period that is expected to be the most active one in one's lifespan –namely, “university students”- makes this study valuable.

Considering the importance of physical activity level for the health of people of all ages, to present the correlation between recreation benefit awareness –which is one of the factors influencing university students' physical activity levels- and physical activity levels will help those researchers who make researches on this field and those parties who work in this particular area.

In sum, the objective of the study was to demonstrate the correlation between university students' recreational benefit awareness and their physical activity levels. In line with this main objective, the differences between university students' recreational benefit awareness and their physical activity levels were also explored in terms of gender and faculty where the students studied. Hypothesis of the study were as follows:

- There is a significant relationship between the recreational benefit awareness and physical activity levels of university students.
- There is no gender difference between the recreational benefit awareness and physical activity levels of university students.
- There is no difference between the recreational benefit awareness and physical activity levels of university students according to their faculties.

METHOD

Research Model

This research was designed in a descriptive study model, using the questionnaire technique as a data collection tool. The study is in a descriptive survey model that questions university students' physical activity levels and awareness of recreational benefits (Gürbüz and Şahin, 2014).

Study Group

In the study; a suitable sampling method -one of non-random sample sampling methods- was used (Gast and Ledford, 2018). The study group was composed of university students who studied at different departments of different universities in Turkey (Mersin, Çukurova, Afyon Kocatepe, Sakarya University) during 2021-2022 fall semester while the sampling was composed of a total of 909 students (541 female students (Female_{age}: 21,55±4,03) and 368 male students (Male_{age}: 22,42±4,35)).

Data Collection Tools

In the study, Information Request Form, Leisure Benefit Scale (LBS) and International Physical Activity Questionnaire (IPAQ) were used as data collection tools. Data collection tools were voluntarily filled in by university students who studied at different departments of different universities online and face to face.

Information Request Form: The form included information about participants' age, gender, body weight, body height, faculties, and departments.

International Physical Activity Questionnaire (IPAQ): In the study, IPAQ short form –which was invented by Craig et al., (2003) and Turkish validity and reliability tests ($r=76$) of which were performed by Öztürk (2005)- was employed. In IPAQ, values of 10 or more minutes of physical activities are taken as a criterion. Using the questionnaire; vigorous and moderate activities performed in the last seven days and walking durations are transformed into basal metabolic rate (MET) and total physical activity score is calculated (MET-min/week) (Craig et al., 2003). Total physical activity score (MET-min/week) = walking + moderate activities + vigorous activities.

Leisure Benefit Scale: Developed by Ho (2008), “Leisure Benefit Scale” is a 5 point Likert type scale with 24 items and 3 dimensions (physical, psychological, social). In 2018, Akgül, Ertüzün and Karaküçük adapted the scale into Turkish. The first seven items of the scale measure physical dimension, the following eight questions psychological dimension and the last nine questions social dimension. The items of the scale are scored by responding (5) absolutely agree (1) absolutely disagree. The internal consistency coefficient alphas in the present study ranged from .88 to .91.

Ethical Approval

Ethical approval of the research was obtained with the decision of Mersin University Social and Human Sciences Ethics Committee dated 02.03.2023 and numbered 491.

Data Collection

The research data were collected from Google form at university in the Mersin, Adana, Afyon and Sakarya provinces after the ethics committee approval was obtained.

Analysis of Data

The data and findings attained in the study were processed using SPSS software. Descriptive statistics of the data and findings attained in the study were presented in means and standard deviation for numerical variables whereas for categorical variables, they were presented in frequency and percentage analyses. In the comparison of the scores obtained by the data collection tools in terms of demographic variables, the independent samples t-test was employed for the categorical variables of two groups. Welch's t-test was used in comparison of participants' awareness of recreation benefit and physical activity levels by faculties because there were no equal sample numbers in the comparison of sports sciences and other faculties. Additionally, correlations in numerical variables were assessed using Pearson correlation analysis. P value less than 0.05 was considered statistically significant.

RESULTS

Table 1. Comparison of participants' awareness of recreation benefit and physical activity levels by gender

Variables		Gender	N	\bar{X}	S	p
Recreation Benefit Awareness	Physical	Female	541	4,35	0,55	0,003*
		Male	368	4,24	0,57	
	Psychological	Female	541	4,23	0,59	0,002*
		Male	368	4,10	0,61	
	Social	Female	541	3,97	0,71	0,217
		Male	368	3,91	0,65	
	Physical activity (MET-min/week)	Female	541	1667,73	1831,09	0,001**
		Male	368	2719,00	2603,69	

*p<0,05; **p<0,01 level is significant.

A statistically significant difference was found between the averages of physical and psychological recreation benefit awareness and physical activity levels of male and female participants in the research group (p<0.05; p<0.01). The physical and psychological benefit awareness of female participants and the average of physical activity level of male participants are higher.

Table 2. Comparison of participants' awareness of recreation benefit and physical activity levels by faculties

Variables		Gender	N	\bar{X}	S	p
Recreation Benefit Awareness	Physical	Sport Faculty	83	4,37	0,68	0,280
		Other Faculty	826	4,30	0,55	
	Psychological	Sport Faculty	83	4,32	0,67	0,027*
		Other Faculty	826	4,16	0,59	
	Social	Sport Faculty	83	4,16	0,74	0,003*
		Other Faculty	826	3,92	0,68	
	Physical activity (MET-min/week)	Sport Faculty	83	3368,95	2586,76	0,001**
		Other Faculty	826	1965,15	2158,35	

*p<0,05; **p<0,01 level is significant.

A statistically significant difference was found between the average of psychological and social recreation benefit awareness and physical activity levels of the students of the faculty of sports sciences and other faculties in the research group (p<0.05; p<0.01). The psychological and social benefits awareness and physical activity level averages of the students studying at the Faculty of Sport Sciences are higher.

Table 3. The Relationship between physical activity and recreation benefit awareness

Variables		1	2	3
1. Physical activity	r			
2. Physical	r	,116**		
3. Psychological	r	,122**	,781**	
4. Social	r	,100*	,601**	,739**

*p<0,05; **p<0,01 level is significant.

A statistically significant positive correlation was found between the physical, psychological and social recreation benefit awareness of the participants in the research group and their physical activity levels ($r=0.116$; $r=0.122$; $r=0.100$; $p<0.01$). It is observed that as university students' awareness of recreational benefits increases, their physical activity levels increase.

DISCUSSION AND CONCLUSION

A positive correlation between participants' recreation benefit awareness and their physical activity levels was found and thus it was seen that as university students' recreation benefit awareness increased so did their physical activity levels. Even though there was no directly related study on the subject done with university students in literature as far as we know, some studies investigated the factors that affected recreational activity participation of people with health problems and explored their barriers to recreational activity participation and physical activity levels and benefit awareness, as well. In the meta-analysis study done by Williams et al., (2014) with people with spine injuries; they examined barriers to recreational physical activities, benefits and promoters and reported that awareness of recreational activity benefits kept motivating people to be physically active and people with spine injuries should be informed of these benefits so that multiple benefits of being physically active could motivate them to change exercise behaviors. Using relevant anecdotes to be narrated by peers was considered as a more effective way in order to communicate these benefits to the spine injury groups. Similar studies underlined the perceived advantages of recreational benefits in joining physical activities, the positive reactions and the encouraging feedbacks; which will facilitate first participation in recreational physical activities for those with health problems (Hammell 2007; Kehn and Kroll, 2009).

Although -in addition to physical benefit awareness- there is no study that indirectly examined the correlation between social and psychological benefit awareness and physical activity level, 421 people in Missouri-Rochepport who used race track regularly told that among the benefits of doing exercises, meeting new people and making social connections were the most important one (Bichis-Lupas and Moisey, 2001). Casey and his colleagues (2009) carried out a study in order to explore recreational physical activity participation among rural living adolescent girls and found that girls enjoyed community club sport and considered sports as an effective form of social interaction and thus their engagement in physical activities increased. Social and psychological benefit awareness can be associated with regular participation in physical activities in this sense and physical activity level may be increased. Yet, more relevant studies with healthy and different populations are needed to be done.

According to our study results, physical and psychological recreation benefit awareness of the female university students was higher than that of male university students. Body image perceived by female students and male students may have played a key role in affecting physical benefit awareness. Worries and concerns about body image may create awareness about physical health so that benefits that will lead to the desired body size can be achieved. The studies indicate that women suffer from higher level of body image dissatisfaction than men do (Ata et al., 2007; Tiggemann, 2005). It is estimated that nearly 50% of adolescent girls are dissatisfied with their bodies (Bearman et.al, 2006). A study done during COVID- 19 pandemic lockdown identified that women aged between 14 and 24 who followed Instagram

accounts on body image demonstrated higher scores in body image dissatisfaction and weakness as compared to those who reported to be following other types of Instagram accounts (Vall-Roqué et al., 2021). Besides, worries and concerns about body appreciation or body image are positively associated with female participation in regular exercises (Homan and Tylka, 2014) and therefore their participation in physical activities may be expected at higher levels.

However; even if LBS-subscales of physical and psychological benefit awareness were found to be higher among the female students in the current study, their physical activity levels were lower than male students. Many factors determine male and female participation in physical activities and are correlated with multifactorial conditions such as cultural, psychological, environmental, religious and living conditions. In the study of Van Tuyckom and his colleagues (2013) carried out with 25.000 participants from 27 European countries, they examined how physical activity level during leisure time changed in terms of gender in these countries. As the result of the study, no gender differences were found among the countries where there is a higher gender equality in terms of recreational physical activity level. In a similar study, Balish et al., (2016) compared gender equality and recreational physical activity level for both genders in 34 countries and argued that physical activity levels differed significantly both for women and men in these countries. Women who lived in the countries with high gender equality reported to be joining weekly recreational physical activities more than those women living in the countries with lower gender equality. World Economic Forum Global Gender Gap Report (World Economic Forum, 2018) shows that Türkiye ranked 130th out of 149 countries in gender inequality, which may have affected physical activity level -unlike men and other factors. In the study of Örnek (2021), gender equality and university students' attitudes were investigated and in general students demonstrated moderate egalitarian attitudes, which points out that traditional convictions still predominate.

Even in the adults who try to assume and live a physically active lifestyle, there often are barriers to physical activity participation. Of the most evident ones; old age, personal health status, socio-economic status, geography, social and physical environment, and physical barriers (Katzmarzyk et al., 2000; Kington and Smith, 1997; Seefeldt et al., 2002). The studies investigating university students' physical activity participation underlined lack of time the most as a barrier to participation (Capdevila et al., 2007; El-Gilany et al., 2011; Gawwad, 2008; Gómez et al., 2010; Lovell et al., 2010). Considering the fact that students live away from their families; increasing responsibilities and academic works may explain lack of time as a barrier to participation. In some studies, done with university students; fatigue and laziness are the internal barriers emphasized the most (Capdevila et al., 2007; Daskapan et al., 2006; Gómez et al., 2010; Ibrahim et al., 2013). In these studies, these barriers are similar for both genders whereas some studies report being a woman as a barrier perceived more in terms of gender (Martínez-Lemos et al., 2014; Sallis et al., 1992). In the current study, female students were also found physically to be more inactive as compared to male students. In conclusion, factors that prevent female university students from participating in physical activity independent of their awareness of recreational benefits should be taken into consideration and physical activity levels should be increased.

Lastly; among the university students, those who studied sports sciences showed higher psychological and social recreational benefit awareness and physical activity levels than other

students. Zhou and Tsai (2019) argue that university students may develop participation behaviors in leisure time activities by having recreation education, planning recreational activities and becoming aware of personal benefits of these activities and without being affected by recreational obstacles. As supported by the results of this research in the literature, activities that increase recreational awareness contribute to increasing physical activity levels and making them planned and programmed. Another study examined the correlation between recreation and stepping frequencies among the university students who completed recreation education and suggested that stepping frequency went up and an awareness was raised after the recreation education according to correlation analysis (Alpullu and Demir, 2019). The results of this research will contribute to the fact that experts in the field of recreation make some educational programmes that increase awareness of recreational benefits in university students.

Therefore, recreation education to be provided to the university students may play a key role in increasing their recreational benefit awareness and physical activity levels and can be ensured that educational programs that will increase recreational benefit awareness can be added to the curricula of other faculties other than the faculties of sports sciences. In addition, educational presentations that increase the awareness of recreational benefits can be organized by the recreation departments of the faculties of sports sciences within meetings related to the student clubs affiliated with the university. Moreover, in future studies, physical activity levels in different populations such as young or adult individuals who getting education to develop recreation benefit awareness can be revealed. In these studies, more objective data collection tools such as pedometers and accelerometer may be preferred to determine the level of physical activity.

Conflicts of Interest : All authors declare that they have no conflicts of interest.

Author Contributions: As the authors' contribution to the study, research design-YE; İY, data collection-YE; RZ, statistical analysis- İY; YE, preparation of the article, YE; İY; RZ.

Ethical Approval

Ethics Committee: Mersin University Social and Human Sciences Ethics Committee

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The Effects of Acute Vibration with Exercises Applied to the Lower Extremities on Balance Performance

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Abstract

This study was conducted to investigate the effects of exercises with acute vibration applied to the lower extremities on balance performance. The study included 68 voluntary participants, consisting of 34 male and 34 female athletes specializing in different branches who were students at the Faculty of Sport Sciences at Erciyes University. The participants were randomly divided into three groups, and different protocols were applied in each group. These groups were the exercise (E) group, the vibration + exercise (VE) group, and the control (C) group. Dynamic squats, standing calf raises (static surface), and right and left lunge exercises were performed for 30 s in the E and VE group, while no intervention was made in the C group during the same time. The VE group performed the exercises on the DKN XG10 vibration platform with vibration at 30 Hz, while the E group performed the same exercises on the same platform without vibration. The static and dynamic balance performance levels of the participants were measured using the Biodex Balance System (BBS) before and after the protocols, and the results were statistically compared. In the intragroup comparisons, there were significant differences between the pretest and posttest static balance parameters of the E group regarding their OSI and APSI values ($p<0.05$). Moreover, in terms of dynamic balance parameters, the OSI and MLSI results ($p<0.01$) of the VE group and the OSI ($p<0.01$), APSI ($p<0.01$), and MLSI results ($p<0.05$) of the E group varied significantly between the pretest and the posttest. In further studies, it is recommended to investigate the effects of different exercise types, acute vibration applied at different frequencies or durations on balance performance.

Keywords: Balance, Exercise, Vibration

Alt Ekstremiteye Uygulanan Akut Titreşim Egzersizlerinin Denge Performansına Etkisinin İncelenmesi

Öz

Bu araştırma, alt ekstremiteye akut titreşim ile birlikte uygulanan egzersizlerin denge performansına etkisini incelemek amacıyla yapılmıştır. Çalışmaya Erciyes Üniversitesi Spor Bilimleri Fakültesinde öğrenim gören farklı branşlarda uzmanlaşmış 34 kadın, 34 erkek olmak üzere toplam 68 sporcu gönüllü olarak katılmıştır. Çalışmaya katılan gönüllüler randomize olarak üç farklı gruba ayrılmış ve her gruba farklı protokoller uygulanmıştır. Bu gruplar, egzersiz (E) grubu, titreşim + egzersiz (VE) grubu ve kontrol (C) grubu olarak belirlenmiştir. E ve VE gruplarına dinamik squat, standing calf raises (sabit), sağ ve sol lunge egzersizleri 30 sn boyunca uygulanmış, K grubuna ise aynı süre içerisinde herhangi bir uygulama yapılmamıştır. VE grubu egzersizleri DKN XG10 titreşim cihazında 30 Hz'de titreşim uygulamalarıyla, E grubu ise aynı cihaz üzerinde titreşim uygulaması olmadan yapmıştır. Uygulanan bu protokol öncesi ve sonrası gönüllülerin statik ve dinamik denge performansları Biodex Denge Sistemi (BBS) ile belirlenerek istatistiksel karşılaştırmaları yapılmıştır. Grup içi ön test ve son test statik denge verilerinde E grubunun OSI ve APSI değerleri arasında anlamlı farklılık olduğu ($p<0,05$), dinamik dengede ise VE grubunun OSI ile MLSI değerlerinde ($p<0,01$), E grubundaysa OSI ($p<0,01$), APSI ($p<0,01$) ve MLSI ($p<0,05$) değerinde anlamlı farklılık olduğu tespit edilmiştir. Sonuç olarak, akut titreşim ile uygulanan egzersizlerin statik dengeyi kliniksel açıdan iyileştirdiği ancak anlamlı farklılık oluşturmadığı, dinamik dengeyi ise anlamlı derecede iyileştirdiği söylenebilir. İleri araştırmalarda farklı egzersiz türleri, farklı frekans veya sürelerde uygulanan akut titreşimin denge performansına etkilerinin araştırılması önerilmektedir.

Anahtar kelimeler: Denge, Egzersiz, Titreşim

INTRODUCTION

Vibration is defined as mechanical oscillations that occur because of periodic changes in the initial position of an object by regular or irregular motions (Cardinale and Bosco, 2003). During our activities of daily living, we are exposed to mechanical vibrations coming from the external environment, and these vibrations may help our body perform metabolic functions efficiently (Cardinale and Wakeling, 2005; Chan et al., 2013). It has been assumed that the low-amplitude high-frequency stimulation (vibration) of the entire body has favorable effects on many risk factors regarding falls and associated fractures by simultaneously improving muscle strength, body balance, and the mechanical competence of bones (Hibino et al., 2023). In general, during all controlled body vibration cases, when the individual is on a vibration platform, they are exposed to two main vibration effects, namely horizontal alternating (oscillating) and vertical (linear) effects (Rittweger, 2010). The transmission of such mechanical vibrations to the human body causes the tonic vibration reflex, which is a complicated spinal and supraspinal neurophysiological response (Rittweger, 2010; Zaidell et al., 2013). The tonic vibration reflex increases muscle activation and improves functional performance (Bogaerts et al., 2007; Stolzenberg et al., 2013; Huang and Pang, 2019). Because they have short- and long-term effects, vibration exercises have recently been utilized in several sports branches to improve various motor characteristics and different performance parameters (Şengür et al., 2018). One of the motor characteristics that play an effective role in daily life and success in sports is balance.

Balance refers to the ability of the person to keep their center of gravity and base of support on the same plane and maintain this situation (Gür and Ersöz, 2017). Balance is controlled by a complex and multifaceted neuromuscular process that constantly produces the responses necessary to maintain balance and involves afferent and efferent systems (Winter, 1995). The control mechanisms of balance include the integration of sensations coming from visual, vestibular, and position sense (proprioception) systems, motor functions, and cognitive functions (Howe et al., 2007). These complex connections in balance are also categorized in two different ways depending on whether the individual is in balance and whether the surface is static or dynamic (Muratlı, 2003; Spirduso, 1995; Şimşek et al., 2020). In the context of data obtained using novel technological devices that are used in laboratory settings in the current literature, balance is also expressed in the form of position changes in the body's center of gravity as Anterior-Posterior (A-P) and Medial-Lateral (M-L) balance (Şimşek and Arslan, 2019).

Previous studies have shown that whole-body vibrations provide acute or chronic adaptations and have positive effects on qualities such as strength (Rønnestad et al., 2004; Turner et al., 2011), speed (Mc Bride et al., 2009), throwing speed in handball (Şimşek and Ünver, 2020), and balance (Dallas et al., 2014; Despina et al., 2014; Cloak et al., 2016; Fort et al., 2012; Ritzmann et al., 2014). When the effects of acute vibration on balance performance are examined in the literature, there are studies reporting positive effects on volleyball players (Usta-Demir, 2009), football players (Berk et al., 2021; Cloak et al., 2014), rhythmic gymnasts (Despina et al., 2014) and dancers (Karim et al., 2019). There are also studies reporting that acute vibration applications do not have any effect on balance performance (Mahbub et al., 2020; Kaçoğlu, 2019; Pollock et al., 2011). However, it is seen that there is still insufficient information about the short- and long-term

effects of whole-body vibration exercises on static or dynamic balance (Hibino et al., 2023). In addition to this, it is seen that there is a dearth of studies in the literature in which the acute effects of whole-body vibration on balance are investigated using validated, reliable, fast, and clinically reproducible tests (Karim et al., 2019). Therefore, considering these issues in the literature, this study was conducted to investigate the effects of exercises applied to the lower extremities along with acute vibration on static and dynamic balance.

METHOD

Study Design

This study was planned with an experimental design, which is a quantitative research design. The design of the study included a pretest, a posttest, and a control group.

Research Group

The sample of the study included 68 voluntary participants, consisting of 34 male and 34 female athletes specializing in different branches (Athletic, Basketball, Fencing, Football, Wrestling, Weightlifting, Karate, Kickbox, Table Tennis, Muay Thai, Taekwondo, Tennis, Volleyball, Bodybuilding, Swimming) who were students at the Faculty of Sport Sciences at Erciyes University. The criteria for inclusion of volunteers in the study; must be specialized in a sports branch, BMI values must not be in the obese class (30 kg/m^2 and above), and must not have any disability (orthopedic injuries, etc.) that will prevent them from participating in the study. They were randomly divided into three groups, which were the exercise (E), vibration + exercise (VE), and control (C) groups.

Data Collection Instruments

Height and Weight Measurements: The height of each participant was measured barefooted at a precision of 0.1 cm using a standard steel stadiometer, while their weight (BW) was measured barefooted and with shorts and a t-shirt on at a precision of 0.1 kg using a scale. The BMI values of the participants were calculated in kg/m^2 using their weight and height measurements.

Balance Measurements: In this study, the Biodex Balance System (Biodex, Inc, Shirley, New York) was used to make balance measurements. BBS has mobility levels in the range of 1-12, and the 1st level corresponds to the greatest degree of mobility. The balance score obtained with BBS shows a better preservation of posture when it approaches 0 and a poorer preservation of posture when it diverges from 0.

Both static and dynamic balance measurements were made in this study. While the dynamic balance measurements were made on the 1st-level mobile platform, the static balance measurements were made on the stationary platform. Before the measurements, the participants were allowed to try the platform for a short time. The participants were instructed to stay still and not speak during the measurements, and both types of balance measurements were made barefoot.

The arms of the participants were relaxed and down for the static balance measurements and fixed at their chest in a crossed position for the dynamic balance (1st level) measurements. The measurements were taken for 30 s, the tests of the participants who either lost their balance completely or hung on to the platform for support were ended, and their measurements were repeated (Şimşek and Arslan, 2019; Şimşek et al., 2020). Three different parameters were determined (OSI: Overall Stability Index, APSI: Anterior-Posterior Stability Index, MLSI: Medial-Lateral Stability Index), and the results were statistically compared.

Vibration Interventions: The interventions involving vibration were applied using the DKN XG10 vibration platform that can produce vibrations at different frequencies and for different durations. The interventions were made for 30 s at a frequency of 30 Hz. Before starting the protocol, all exercises were visually introduced to the athletes, and the athletes were allowed to try them once after informing them about the implementation criteria. Four different exercises were performed with rest breaks of 30 s between exercises. These exercises were as follows:

1. Dynamic Squat
2. Standing Calf Raises (Stand on Toes and Wait)
3. Lunge (Right Foot)
4. Lunge (Left Foot)

Ethical Approval

All participants were informed about the research procedure, the inclusion criteria, the potential problems they could encounter, and the requirements of the process. They were informed that they could withdraw from the study at any time, and they signed an informed consent form before their participation. The study protocol was implemented in accordance with the principles of the Declaration of Helsinki, and it was approved by the Non-Invasive Clinical Studies Ethics Committee of Erciyes University with the decision dated 03.05.2023 and numbered 2023/5-9. The measurements were made in the Laboratory of the Faculty of Sport Sciences at Erciyes University.

Data Collection

For the participants who were randomly divided into 3 groups, the research protocol consisted of the stages of warm-up, pretest, exercises (with (VE) and without (E) vibration) or rest (C), and posttest. While the participants in C did not participate in any intervention, those in E performed exercises without vibration for 30 s, and those in VE performed exercises with vibration for 30 s.

1. *Dynamic Squat:* The Hawkey and Dallaway (2020) protocol was followed for dynamic squat exercises. The participants performed a dynamic squat movement by moving down in 2 s and up in 2 s at knee angles changing in the order of 25°, 80°, and 25° when the soles of both feet were completely in contact with the vibration platform.
2. *Standing Calf Raises (Stand on Toes and Wait):* The participants performed the exercises at a fixed position while their knees were slightly bent, and their trunk was in an upright position as they rose on their toes and waited.

3. *Lunge Position (Right Foot)*: The participants performed the exercise at a fixed position as their right knee was bent 90°, the sole of their right foot was completely in contact with the platform, and their left foot was on the floor.
4. *Lunge Position (Left Foot)*: The participants performed the exercise at a fixed position as their left knee was bent 90°, the sole of their left foot was completely in contact with the platform, and their right foot was on the floor.

Before the pretest balance measurements, the participants performed an active warm-up for 10 min, and the pretest measurements were made immediately after the warm-up. After the pretest, the participants in E performed the exercises described above, while those in VE performed the same exercises along with vibration. The participants in C were allowed to rest for as long as it took for the participants in the other groups to complete their exercises. Torvinen et al., (2002b) reported that the positive effects of acute whole-body vibrations are observed 2 min after the intervention, but they disappear almost completely after 1 h. Thus, in this study, a 2-min break was allowed after the intervention protocol, and the procedure was completed by making posttest balance measurements right after the break.

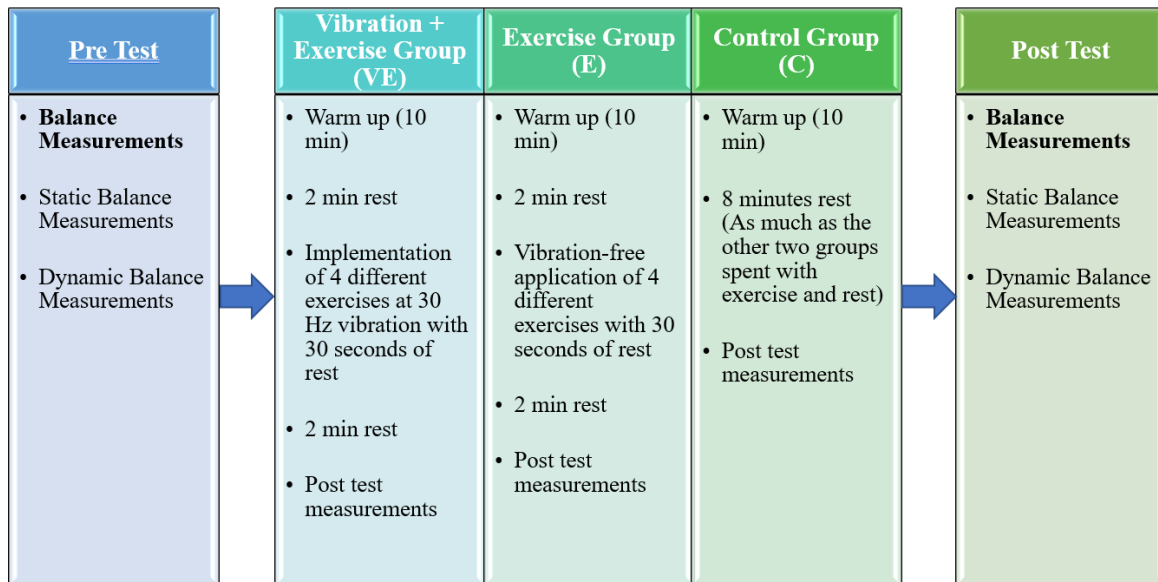


Figure 1. Scheme of the protocol applied in the study.

Data Analysis

The data that were collected in the study were analyzed using the SPSS 22 package program. Normal distribution assumptions were tested using the Kolmogorov-Smirnov test, skewness-kurtosis values, and histogram plots. Parametric tests were used for the normally distributed data, and non-parametric tests were used for the non-normally distributed data. Intergroup comparisons for the normally distributed data were made using one-way ANOVA and post hoc Tukey's HSD tests. For the non-normally distributed data, intragroup comparisons were made using the Wilcoxon test, intergroup comparisons were made using the Kruskal-Wallis H test, and pairwise comparisons were made using the Mann-Whitney U test.

FINDINGS

Table 1. Demographic information

Variable	Group	n	X	SD	Statistics	P Value and Differences
Age (year)	VE	26	21,35	,85	$X^2 = 7,019$,030* C – E, VE
	E	22	21,05	,79		
	C	20	22,30	1,92		
Height (cm)	VE	26	171,96	7,33	$F = 1,343$ Df= 2	,268
	E	22	173,52	9,37		
	C	20	169,30	8,61		
BW (kg)	VE	26	69,03	12,55	$F = ,104$ Df= 2	,902
	E	22	68,58	13,94		
	C	20	67,22	14,72		
BMI (kg/m ²)	VE	26	23,24	3,26	$F = ,276$ Df= 2	,760
	E	22	22,61	3,25		
	C	20	23,24	3,26		
Sport Age (Year)	VE	26	7,15	4,63	$X^2 = 2,046$,360
	E	22	6,27	5,43		
	C	20	8,60	4,49		

* $p < 0,05$ | **VE:** Vibration + Exercise Group, **E:** Exercise Group, **C:** Control Group.

Table 1 shows statistical comparisons with the mean and standard deviation values of the participant's age, height, BW, BMI, and sports age variables. When the data were analyzed, a statistically significant difference was found between VE ($M = 21.35$, $SD = .85$), E ($M = 21.05$, $SD = .79$), and C ($M = 22.30$, $SD = 1.92$) groups in the age variable ($p < 0.05$). It was determined that this difference was in favor of the C group with the E and VE groups. No significant difference was found between the groups in other variables ($p > 0.05$).

Table 2. Intragroup and intergroup comparisons of mean and standard deviation values of static balance measurements

Static Balance Variables	Group	VE (n=26)	E (n=22)	C (n=20)	Kruskal Wallis H		Significant Differences
		X ± SD	X ± SD	X ± SD	X^2	p	
OSI	Pre-Test	,52 ± ,39	,57 ± ,32	,34 ± ,18	8,459	,015*	C – VE, E
	Post-Test	,46 ± ,23	,41 ± ,33	,37 ± ,16	2,695	,260	
	Z	-,792	-2,263	-,986			
	P	,428	,024*	,324			
APSI	Pre-Test	,37 ± ,21	,45 ± ,31	,26 ± ,13	6,083	,048*	C – VE, E
	Post-Test	,35 ± ,19	,30 ± ,27	,23 ± ,10	5,886	,053	
	Z	-,729	-2,296	-,761			
	P	,466	,022*	,447			
MLSI	Pre-Test	,25 ± ,33	,21 ± ,16	,17 ± ,11	2,681	,262	
	Post-Test	,21 ± ,15	,20 ± ,20	,20 ± ,12	,619	,734	
	Z	-,519	-,233	-1,069			
	p	,604	,816	,285			

* $p < 0,05$ | **VE:** Vibration + Exercise group, **E:** Exercise group, **C:** Control group. When the data is examined in the row, comparison between TE, E and C groups, and when analyzed in the column, within-group comparison results are given.

Table 2 shows the statistical comparisons of VE, E and C groups with the mean and standard deviation values of the pre-test and post-test static balance (OSI, APSI and MLSI) parameters. According to the findings, a significant difference was found between the pre-test static balance values of the OSI [VE ($M= .52$, $SD= .39$), E ($M= .57$, $SD = .32$) and C ($M= .34$, $SD= .18$)] and APSI [VE ($M= .37$, $SD= .21$), E ($M= .45$, $SD = .31$) and C ($M= .26$, $SD= .13$)] balance parameters in the comparisons between the groups ($p<0.05$). It was determined that this difference was in favor of the C group with the E and VE groups. When the in-group comparisons were examined, a significant difference was found between the pre-test OSI ($M= .57$, $SD= .32$) and post-test OSI ($M= .41$, $SD= .33$), and the pre-test APSI ($M= .45$, $SD= .31$) and post-test APSI ($M= .30$, $SD= .27$) balance values of the E group in favor of the posttest ($p<0.05$). There was no significant difference between the other balance parameters, both within the group and between the groups ($p>0.05$).

Table 3. Intragroup and intergroup comparisons of mean and standard deviation values of dynamic balance measurements

Dynamic Balance Variables	Group	VE (n=26) X ± SD	E (n=22) X± SD	C (n=20) X ± SD	Kruskal Wallis H	
					X ²	p
OSI	Pre-Test	5,31 ± 3,75	6,66 ± 4,69	5,24 ± 4,04	1,463	,481
	Post-Test	3,95 ± 3,81	4,90 ± 4,15	4,90 ± 3,71	,978	,613
	Z	-2,975	-3,442	-1,308		
	P	,003**	,001**	,191		
APSI	Pre-Test	3,45 ± 2,62	4,40 ± 3,55	3,57 ± 2,53	,637	,727
	Post-Test	3,07 ± 3,15	3,20 ± 2,64	3,43 ± 2,60	,771	,680
	Z	-1,494	-3,203	-,673		
	P	,135	,001**	,501		
MLSI	Pre-Test	3,20 ± 2,40	3,43 ± 2,61	3,09 ± 2,83	,345	,842
	Post-Test	2,27 ± 1,93	3,06 ± 2,84	2,77 ± 2,30	,540	,763
	Z	-2,990	-2,558	-1,876		
	p	,003**	,011*	,061		

* $p<0,05$, ** $p<0,01$ | **VE:** Vibration + Exercise group, **E:** Exercise group, **C:** Control group. When the data is examined in the row, comparison between TE, E and C groups, and when analyzed in the column, within-group comparison results are given.

Table 3 shows statistical comparisons with the mean and standard deviation values of the pre-test and post-test dynamic balance (OSI, APSI and MLSI) parameters of VE, E and C groups. According to the findings, a significant difference was found between the OSI [Pre ($M= 5.31$, $SD= 3.75$), Post ($M= 3.95$, $SD= 3.81$)] and MLSI [Pre ($M= 3.20$, $SD= 2.40$), Post ($M= 2.27$, $SD= 1.93$)] dynamic balance values of the VE group, and the OSI [Pre ($M= 6.66$, $SD= 4.69$), Post ($M= 4.90$, $SD= 4.15$)], APSI [Pre ($M= 4.40$, $SD= 3.55$), Post ($M= 3.20$, $SD= 2.64$)] and MLSI* [Pre ($M= 3.43$, $SD= 2.61$), Post ($M= 3.06$, $SD= 2.84$)] dynamic balance values of the E group ($p<0.01$, * $p<0.05$). There was no significant difference between the other balance parameters, both within the group and between the groups ($p>0.05$).

DISCUSSION and CONCLUSION

This study was conducted to investigate the effects of exercises with acute vibration applied to the lower extremities on static and dynamic balance performance. In the intragroup (pretest/posttest) comparisons, while there were statistically significant differences in the static OSI and APSI values of the E group, there was no significant difference in the VE and C groups. In the intergroup comparisons, there were significant differences in the pretest static OSI and APSI values of the groups, where the values of the C group were better than those of the E and VE groups. There was no significant difference in other static balance parameters. In the intragroup comparisons of the dynamic balance values, the dynamic OSI and MLSI values of the VE group and OSI, APSI, and MLSI values of the E group were determined to significantly improve. On the other hand, there was no significant change in these parameters in the C group. No significant difference was determined in the intergroup comparisons.

Whole-body vibration is defined as the transfer of mechanical oscillations to the body through a vibration platform (Tomas et al., 2011; Cited in Şimşek and Ünver, 2020). The greatest advantage of vibration exercises is that they increase the number of sarcomeres that facilitate the contraction of the muscle based on the increased activation of muscle spindles by the stimulation of multiple muscle fibers in a very short time. Therefore, they induce involuntary contractions in the muscle, and these contractions increase gradually and stay on a fixed level until the vibration application ends (Latash, 1998; Cited in Şimşek and Ünver, 2020). This way, for an activity that is performed right after whole-body vibration exposure, the stimulated sarcomeres can be facilitated to contribute more to contractions. This, in turn, is expected to have a net effect on performance outcomes.

Among studies in the literature performed with acute vibration exercises, Berk et al., (2021) reported that the acute vibration exercises applied to the lower extremities of football players affected static and dynamic balance values positively. Usta-Demir (2019) stated that the acute whole-body vibration exercise performed by volleyball players in their study did not show a significant change in static forward-backward swing, right-left swing, forward-backward and right-left swing velocities, or swing area, while there was a significant difference only in the dynamic average track error. In their study where the effects of acute whole-body vibration exercises in elite and amateur male football players, Cloak et al., (2014) found that the elite players responded positively to vibration stimuli and showed significant improvements in dynamic postural stability index (DPSI) values, but the exercises did not have the same effect in the amateur players. Despina et al., (2014) compared the effects of 5 different acute vibration interventions after 15 min in a group of rhythmic gymnasts and determined a significant difference in forward-backward dynamic balance values in favor of those who took part in the vibration interventions. Torvinen et al., (2002b) reported that acute whole-body vibrations had a significant positive effect on lower extremity muscle performance and postural balance in young adults. The same authors stated that these effects were observed 2 min after the intervention, but they almost completely disappeared after 1 h. Karim et al., (2019) argued that whole-body vibration exercises are worth considering as a fast method in the improvement of static balance among dancers. Schlee et al., (2012) observed that acute whole-body vibration training performed by healthy young volunteers

reduced plantar foot sensitivity but led to improvements in balance and movement control. In their meta-analysis, Yin et al., (2023) revealed that whole-body vibration exercises had a positive effect on balance and gait functions in paralyzed patients. In our study, while the acute vibration intervention created quantitative improvements in both static and dynamic balance parameters, only some dynamic balance parameters (OSI and MLSI) showed statistically significant improvements. The acute effect of vibration exercises is likely to be mediated by neuromuscular and neural reactions. The general increase in neuromuscular activation as a response to whole-body vibration causes the acutely increased coactivation of lower extremity extensor and flexor muscles (Pollock et al., 2010; Roelants, 2004). Additionally, it may be suggested that acute vibration improves muscle performance through neurogenic potentiation involving spinal reflexes and muscle activation (Marin et al., 2021; Tsai et al., 2021), and performance in some balance parameters increases in line with this effect.

Furthermore, in the relevant literature, there are also studies that have reported no significant effect of acute vibration exercises on balance performance (Hibino et al., 2023; Kaçoğlu, 2019; Mahbub et al., 2020; Pollock et al., 2011; Torvinen et al., 2002a). In our study, as well, while there was a quantitative increase in the values of static balance parameters, the acute vibration intervention did not create a statistically significant improvement. Accordingly, it can be stated that acute vibration interventions do not influence static balance performance. On the other hand, as stated above, the dynamic balance values of the participants of our study were affected positively by the acute vibration exercises. It is believed that these highly variable results in different studies in the literature, including ours, may be related to differences in the methods used or the samples included in these studies. Moreover, these differences may have also been caused by the tonic vibration reflex. The tonic vibration reflex is affected by four factors: (1) the region of vibration, (2) the stimulability of the central nervous system, (3) muscle length before contraction, and (4) the frequency and amplitude of vibration (Bishop, 1974, Cited in Şimşek and Kırkaya, 2021). It was also shown that vibration had both facilitating and suppressing effects on muscle spindle activity, and both of these effects caused altered motor outputs (Pope and DeFreitas, 2015). Some studies demonstrated that acute whole-body vibration interventions led to an increase in the activation of leg muscles, and they caused changes in maximal voluntary contraction values at rates varying between 12.6% and 82.4% (Roelants et al., 2006). Maximum strength improvements of 10.4% and 7.9% in elite and amateur athletes, respectively, were attributed to stimulation by vibrations. As opposed to this, a 65-Hz vibration stimulus applied directly to the biceps tendon reduced neuromuscular performance (Moran et al., 2007). As clearly seen in these results, research outputs can be substantially influenced by the samples that are included in different studies, as well as different research methods.

According to the results of this study, considering the static balance parameters (pretest/posttest), the balance performance values of the VE and E groups improved clinically, but there was a statistically significant difference only in the E group. In contrast, in the C group, there were clinical declines in two parameters (OSI and MLSI), although this deterioration was not statistically significant. In this case, it can be suggested that rather than waiting and not performing any exercise or performing exercises along with vibration input, performing exercises alone (without vibrations) can significantly improve static balance performance. In terms of the dynamic

balance parameters, it can be considered that dynamic balance can be improved by exercising with or without the inclusion of vibration interventions. Hence, it was concluded that exercises applied along with acute vibration clinically improve static balance, while the rate of this improvement is not statistically significant, and they improve dynamic balance significantly. For future studies, investigating different types of exercises by the inclusion of different frequencies of vibrations applied for different durations can be recommended.

Conflict of Interest: The authors do not have any personal or financial conflicts of interest within the scope of the study.

Researchers' Contribution Rate Statement: Research Design-MŞÖ; EŞ, Statistical Analysis-EŞ, Preparation of The Article- MŞÖ; EŞ.

Ethical Approval

Committee Name: Non-Invasive Clinical Studies Ethics Committee of Erciyes University

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Sport Organizations in World Literature: Status and Systematic Determinants

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Original Article

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Abstract

The economic significance and development of sports have led to the determination of sports organizations as a research subject in the scientific world. From the perspective of sustainability, the continuity of sports and their innovative aspects have consistently influenced the ongoing development of sports. This research aims to systematically examine 1572 scientific studies conducted on sports organizations between 2012 and 2023 using bibliometric analysis techniques with various software programs such as R Studio and R Shiny. During the literature review, data were accessed through analyses of scientific production, average citations, journals, authors, countries, and keyword analysis. The analyses have shown that the journals in which the top researchers publish have a significant impact on the ranking of countries. This, in turn, has resulted in the emergence of a cause-and-effect relationship throughout the study. The research has highlighted the most influential countries, journals, authors, and the impact factors of authors in the field. This study reinforces the findings in the realm of sports organizations and serves as one of the initial references for future studies in the field.

Keywords: Bibliometric analysis, Scopus database, Sport, Sport organizations

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INTRODUCTION

Management, a widely discussed concept in contemporary times, encompasses the collaborative decision-making process undertaken by a collective of individuals based on shared ideas and concerted endeavors (Lam, 2014). The field of sports management, which can be traced back to the scholarly research of the 1980s (Gammelsæter, 2021), is systematically delineated as the systematic pursuit of social and professional objectives. The advent of modern sports activities has necessitated the evolution of a novel organizational framework (Marcu and Buhaş, 2014). An in-depth understanding of the organizational structure assumes paramount significance in comprehending the intricate design and structural framework of sports organizations (Slack and Parent, 2006). Therefore, to comprehend the overall structure and status of sports organizations, it is necessary to investigate national and international sports institutions responsible for sports. holistic structure and prevailing circumstances of sports organizations.

Prominent sports of sports while also supporting the formation of high-quality sports organizations. Notably, an in-depth exploration of the structural dimensions of sports organizations in literature contributes significantly to the multifaceted development of sports in cultural, economic, political, and social contexts, thus manifesting a pioneering outlook. Therefore, it is essential to investigate and evaluate organizations from new perspectives to promote innovative approaches.

Bibliometric analysis, having gained paramount importance organizations are intrinsically linked to the principles of sustainability, continuity, and long-term competitiveness, as elucidated by Manev and Jakimovski (2017). This enables the preservation of the continuity in the assessment of academic productivity (Ellegaard, 2018), has emerged as an indispensable tool for evaluating, analyzing, and visually representing scientific research (Moral-Muñoz et al., 2020). The employed methodologies offer a comprehensive overview and facilitate a systematic review of the literature (Donthu et al., 2021). Consequently, the application of bibliometric analysis as a standalone technique allows for the systematic presentation of scientific data and findings (Ellegaard and Wallin, 2005). This approach aids in the identification and analysis of variables such as publication count, citation count, impact factor, and production frequency (Choudhri et al., 2015; Khan et al., 2021). Further exploration of studies utilizing bibliometric analysis reveals a wide range of research conducted in diverse fields beyond sports organizations, including management of loyalty in sports organizations (Loranca-Valle et al., 2021), Olympic games (Millet et al., 2021), sports tourism and sustainability (Jiménez-García et al., 2020), and sports management (Aygün, 2023; Baier-Fuentes et al., 2020). Hence, bibliometric analysis enables a comprehensive examination not only of sports organizations but also various disciplines, facilitating universal evaluations.

The primary objective of this study is to conduct a comprehensive investigation employing the bibliometric analysis technique to explore the prevailing state, developmental trajectory, and prospective outlook of research pertaining to sports organizations. In addition to shedding light on

the intricacies of sports organizations, this research endeavors to illustrate the profound impact of sports' economic significance and the consequential influence exerted by sports organizations within the realm of scholarly discourse. Specifically, this inquiry aims to address the following research inquiries:

- (i) What is the evolutionary progression of sports organizations within the Scopus database?
- (ii) What is the contemporary status of sports organizations over the past decade?
- (iii) Who are the prominent scholars cited and contributing to the field of sports organizations?
- (iv) How can the research interests of individuals be directed towards forthcoming investigations?

The paper is structured in the following order. The second section delineates the methodology and pertinent definitions employed for executing the literature review within the scope of this study, whereas the third section encompasses the findings derived from the application of the bibliometric analysis technique. Subsequently, in the final section, the research endeavors to elucidate and bridge the existing gap in the literature by leveraging the acquired results, followed by a comprehensive discussion of the implications and conclusions derived from the study.

METHOD

Due to its inherently universal nature (Donthu et al., 2021), bibliometric analysis, as a quantitative method, strives to generate a definitive outcome by restricting a scientifically verifiable dataset based on the study's domain (Wallin, 2005). While it is occasionally classified as a review in specific sources, it can also be regarded as a research article in terms of its scholarly standing. Scopus and Web of Science (WoS) databases are widely acknowledged as prominent platforms that offer substantial support to researchers, specifically those engaged in conducting research utilizing bibliometric analysis techniques (Savaş, 2022).

In this study, the comprehensive and reliable data were obtained from the Scopus database due to its accessibility. Additionally, the data set was analyzed using R Shiny in the bibliometric program within R Studio. The methodology was developed by considering the following factors:

```
TITLE-ABS-KEY ("sports organizations") AND PUBYEAR > 2011 AND PUBYEAR < 2024 AND ( LIMIT-TO ( SUBJAREA , "BUSI" ) OR LIMIT-TO ( SUBJAREA , "SOCI" ) OR LIMIT-TO ( SUBJAREA , "ECON" ) OR LIMIT-TO ( SUBJAREA , "MULT" ) ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) OR LIMIT-TO ( DOCTYPE , "ch" ) OR LIMIT-TO ( DOCTYPE , "re" ) OR LIMIT-TO ( DOCTYPE , "bk" ) ) AND ( LIMIT-TO ( LANGUAGE , "English" ) ).
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As a consequence of the imposed limitations, the aim of this study was to scrutinize English-language scholarly works conducted within the domain of sports organizations during the period spanning from 2012 to 2023 (n=2430). Four disciplines presumed to bear direct relevance to sports organizations ("BUSI"=Business, Management and Accounting; "SOCI"=Social Sciences; "ECON"=Economics, Econometrics and Finance; "MULTI"=Multidisciplinary) were chosen for comprehensive analysis. The examination yielded a total of 1572 studies authored by 2714 scholars (Figure 1).

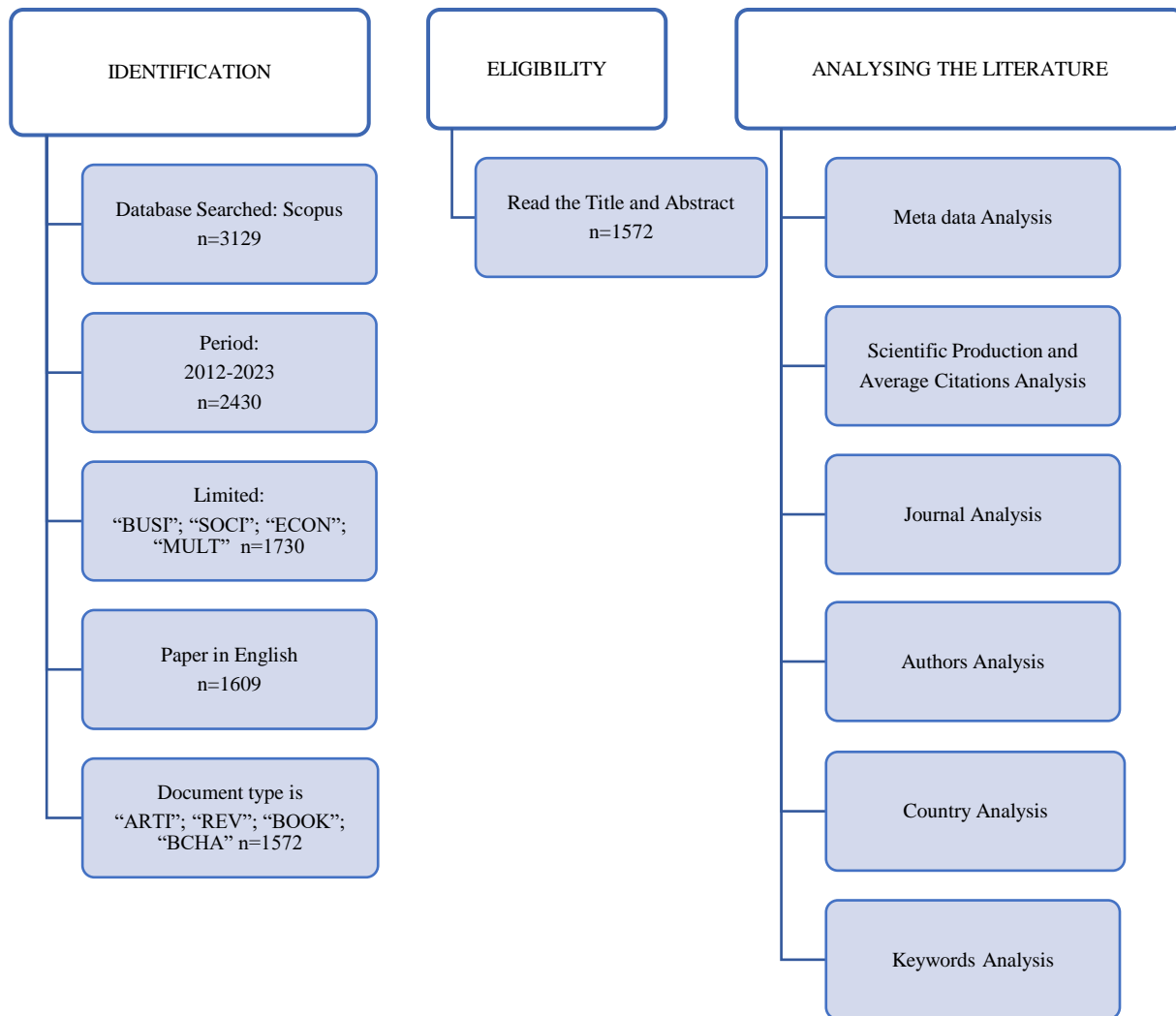


Figure 1. Stages of bibliometric analysis of research on digital literacy

RESULTS

Regarding data access, the literature search in this study relied on the Scopus database. Renowned for its comprehensiveness, the Scopus database incorporates abstract and citation databases spanning diverse disciplines (Scopus, 2022). Notably, sports organizations have emerged as a progressively intensifying research topic, particularly during the period from 2012 to 2023.

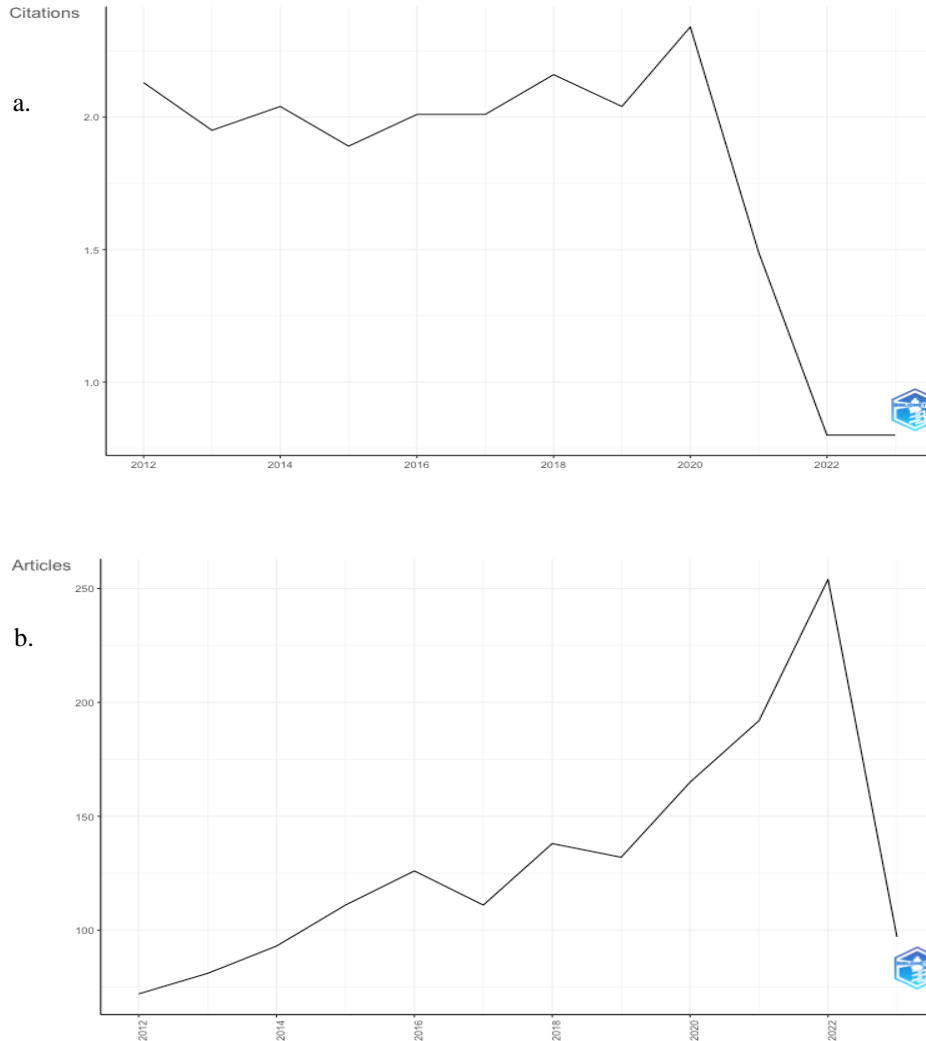


Figure 2. Annual number of production (a) and citations (b) related to sports organizations by years 2012-2023

Upon analyzing Figure 2, it becomes evident that a persistent upward trajectory characterizes the annual scientific output from 2012 to 2023. Specifically, the annual scientific production stood at 254 in 2022, but declined to 97 in 2023. Additionally, scrutinizing the annual average citation rates reveals that the peak citation rate of 2.34 occurred in 2020, followed by a diminishing trend in citation rates from 2020 to 2022.

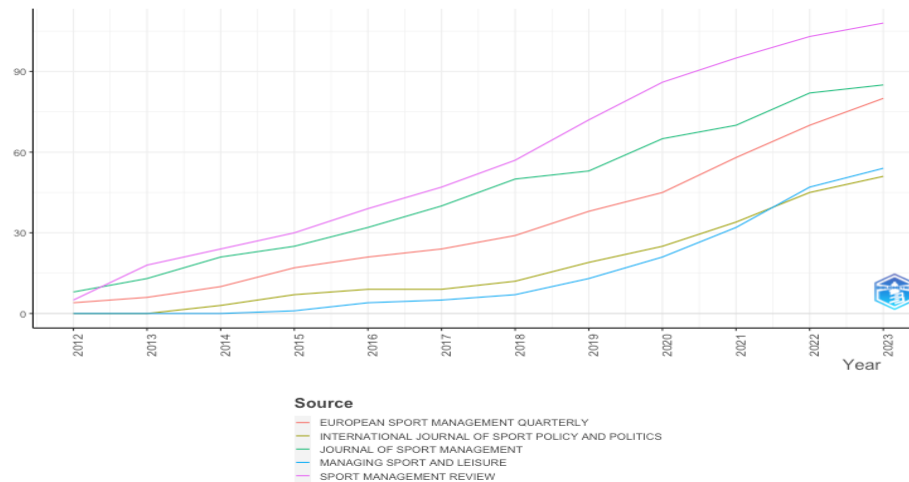


Figure 3. Most Relevant Sources Over Time

Regarding scientific output, the respective rankings are as follows: Sport Management Review (n=687) attains the foremost position, trailed by the Journal of Sport Management (n=544), European Sport Management Quarterly (n=402), International Journal of Sport Policy and Politics (n=214), and Managing Sport and Leisure (n=184). Additionally, there is clear evidence of a persistent upward trajectory in scientific production throughout the period spanning from 2012 to 2023.

Table 1. Ten most global highly cited documents and most local highly cited documents

<i>Most Global Cited Documents</i>		
Article	Doi Number	Total Citations
Hutchins, B., & Rowe, D. (2012). Routledge.	10.4324/9780203120415	209
Kanamori, S., et al. (2014). <i>PloS one</i>	10.1371/journal.pone.0099638	179
Stavros, C., et al. (2014). <i>Sport Management Review</i>	10.1016/j.smr.2013.11.004	158
Geurin-Eagleman, A. N., & Burch, L. M. (2016). <i>Sport Management Review</i>	10.1016/j.smr.2015.03.002	156
García-Fernández, J., et al. (2018). <i>Sport Management Review</i>	10.1016/j.smr.2017.07.003	150
Veal, A. J., Toohey, K., & Frawley, S. (2012). <i>Leisure and Events</i>	10.1080/19407963.2012.662619	147
Wicker, P., & Breuer, C. (2013). <i>Int. Journal of Vol. and Nonprofit Org.</i>	10.1007/s11266-012-9272-2	113
Trendafilova, S., et al. (2013). <i>Sport Management Review</i>	10.1016/j.smr.2012.12.006	98
Misener, K., & Doherty, A. (2009). <i>Journal of Sport Management</i>	10.1016/j.smr.2012.07.003	98
Wicker, P. (2017). <i>Sport Management Review</i>	10.1016/j.smr.2017.01.001	94
<i>Most Local Cited Documents</i>		
Article	Doi Number	Total Citations
Wicker, P., & Breuer, C. (2013). <i>Int. Journal of Vol. and Nonprofit Org.</i>	10.1007/s11266-012-9272-2	35
Misener, K., & Doherty, A. (2009). <i>Journal of Sport Management</i>	10.1016/j.smr.2012.07.003	31
Hoerber, L. et al. (2015). <i>European Sport Management Quarterly</i>	10.1080/16184742.2015.1085070	27
Trendafilova, S., et al. (2013). <i>Sport Management Review</i>	10.1016/j.smr.2012.12.006	26
Peachey, J. W., et al. (2015). <i>Revista De Gestión Deportiva</i>	10.1123/jsm.2014-0126	25
Ferkins, L., & Shilbury, D. (2012). <i>Journal of Sport Management</i>	10.1123/jsm.26.1.67	25
Adriaanse, J., & Schofield, T. (2014). <i>Journal of Sport Management</i>	10.1123/jsm.2013-0108	24
Shilbury, D., et al. (2013). <i>Sport Management Review</i>	10.1016/j.smr.2012.12.001	23
Millar, P., & Doherty, A. (2016). <i>Sport Management Review</i>	10.1016/j.smr.2016.01.002	21
Winand, M., et al. (2014). <i>Managing Leisure</i>	10.1080/13606719.2013.859460	21



Figure 5. Co-WordNet

Cowordnet is a technique employed in scientific research to elucidate the interrelationships between a given keyword and other associated terms. Its application aims to demonstrate the extensive interconnectedness of the concept of "sports organizations" across diverse domains. The key terms with the highest frequency encompass community sport, sport participation, sport federations, and sports clubs, constituting a prominent red cluster. A second cluster, denoted by the color blue, comprises closely related keywords such as professional sport, sport management, social responsibility, and professional sports. Through an examination of the word cluster network, it becomes evident that the network of words directly or indirectly linked to "sports organizations" may exhibit temporal variations. Notably, the association between sports organizations and the Covid-19 pandemic, which emerged in the final quarter of 2019, is exemplified by keywords such as physical activity and Covid-pandemic, depicted in the color pink.

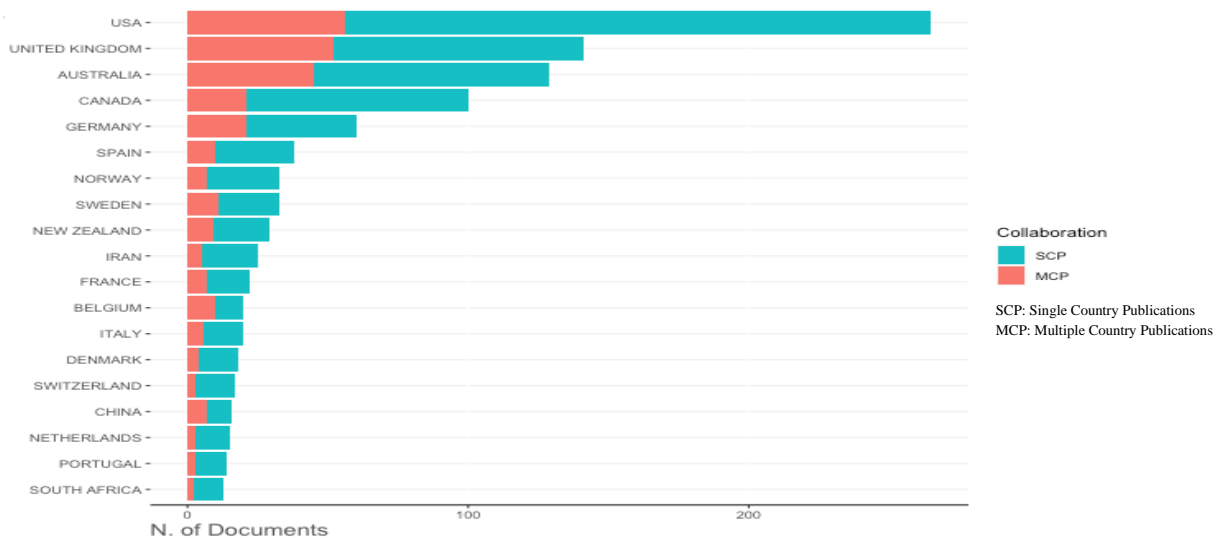


Figure 6. Number of documents by the corresponding author's country

In the analysis of corresponding author's country, it was evident that the preponderance of scholarly documents pertaining to sports organizations emanated from the United States (USA), totalling 141 publications. Following closely behind, the United Kingdom recorded 141 publications. Among other countries examined, South Africa contributed 13 documents, while Portugal contributed 14 documents. The United States and the United Kingdom exhibit prominent positions in terms of document count concerning sports organizations. Figure 8 illustrates a categorical differentiation between single-authored and multi-authored articles. This demarcation distinguishes articles in which all co-authors share the same country of origin (right side of the bar) from those featuring at least one co-author from a different country (left side of the bar). Notably, the United States, the United Kingdom, Australia, and Germany demonstrate a notable prevalence of articles attributed to international collaborations, signifying the involvement of authors from multiple countries in their production.

DISCUSSION AND CONCLUSION

This research offers a concise overview of the studies undertaken pertaining to sports organizations. By presenting a synthesis of the research findings, it is anticipated to serve as a valuable reference for informing and guiding future investigations in this domain.

With the increasing number of publications on sports organizations, a strong relationship is observed among authors, institutions, and countries. Notably, distinguished journals in the domain of sport management, such as *Sport Management Review* and *Journal of Sport Management*, have been acknowledged for their seminal contributions and significant influence in the realm of sports organizations. The international recognition of the social, cultural, and economic value of sports has motivated researchers to focus on studies related to sports organizations. The conducted and forthcoming studies will serve as a guide for the more effective management and administration of sports. Despite the perception of the Covid-19 period as a period of disruption for sports, efforts have been made to ensure the continuity of national and international activities in subsequent years. This has led to an increase in research conducted on sports organizations. Additionally, the economic significance of sports also influences scientific developments.

Whilst the scientific production exhibited a persistent upward trajectory from 2012 to 2022, the attainment of a scientific production rate of 97 in the year 2023 is not an unexpected finding. This can be rationalized by the ongoing nature of the year 2023, coupled with the consideration that a six-month period still remains, leading to the projection that this rate will continue to ascend until year-end (Figure 2). Hutchins & Rowe (2012), as well as Kanamori et al. (2014), are acknowledged as influential researchers within the field. Thanks to the universality of sports, conducting numerous studies related to sports is considered routine. Shilbury (2011) shares methodological similarities with our study in the scope of research on sports management and marketing, and like our study, it presents a general inference. González-Serrano et al. (2020), in their research on

entrepreneurship and innovation in the sports sector, employed analyses that are similar to our study, emphasizing the promising future of innovation and entrepreneurship for the sports industry. Furthermore, Chersulich-Tomino et al., (2020) highlight the importance of addressing management processes, including planning, control, and financial issues, in order to enhance the quality of sports events, which is crucial for the sustainability of sports activities.

As a result, a near-equitable distribution of scientific production and impact factor is observed among sports organizations when the gender variable is taken into account. The prominence of the United States and the United Kingdom, both in terms of productivity and production, is congruent with the affiliation of authors and journals hailing from these nations that occupy the top 5 positions. This confluence reinforces the preeminent standing of these countries, journals, and authors across diverse dimensions. Ultimately, whilst the employment of bibliometric analysis to evaluate sports organizations is regarded as an innovative approach, it is expected that there will be a surge in the number of researchers, publications, and impact factors. Therefore, the bibliometric analysis technique used will provide a comprehensive evaluation for future studies, contributing to the literature.

Conflict of Interest: The author declares that there is no conflict of interest.

Researchers' Statement of Contribution Rate: Research Design-MA; Data Collection-MA; Statistical analysis-MA; Preparation of the article-MA.

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The Role of Managers' Influence Tactics on the Individual Performance of Employees in Sports Organizations

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Original Article

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Abstract

This research was conducted with the aim of determining the impact of managers' influence tactics on the individual performance of employees working in sports organizations. The sample group of the study consisted of 230 male and 88 female employees, who volunteered and were working in sports organizations in the year 2023. As a data collection instrument, a form containing questions related to participants' demographic information was used. The "Influence Behaviour Questionnaire-Target," developed by Yukl et al. (2008) and adapted into Turkish by Gözü (2012), and the individual performance scale developed by Schepers (2008) for employees holding managerial positions and employed in lower-level positions, and adapted into Turkish by Özpehlivan (2015), were employed. The gathered data were analysed using the SPSS 22 software package, and the significance level was set at 0.05. According to the test results for the normality distribution of the data, the independent samples t-test was utilized for the analysis of variables demonstrating normal distribution in the comparisons between pairs of independent variables, while ANOVA analysis was conducted for multiple comparisons. As a result, a significant difference was found in the variable of job status in individual performance; however, no significant differences were detected in the variables of gender and educational status. Regarding the influence tactics employed by managers, significant differences were observed in the variables of gender and educational background; nonetheless, no statistically significant difference was observed in the job status variable. A positive correlation was identified between influence tactics and job performance.

Keywords: Manager, Influence tactics, Job performance, Sports

Yöneticilerin Etkileme Taktiklerinin Spor Örgütlerinde Çalışan Personelin Bireysel Performansı Üzerindeki Rolü

Öz

Bu araştırma yöneticilerin etkileme taktiklerinin spor örgütlerinde çalışan personellerin bireysel performansı üzerindeki etkisini belirlemek amacı ile yapılmıştır. Araştırmanın örneklem grubunu, 2023 yılında spor örgütlerinde çalışan gönüllü 230 erkek ve 88 kadın personel oluşturmuştur. Veri toplama aracı olarak, katılımcıların demografik bilgilerine ilişkin soruların yer aldığı form, Yukl ve diğerleri (2008) tarafından geliştirilen ve Gözü (2012) tarafından Türkçeye uyarlanan "Çalışanlara Yönelik Etkilenen Davranış Ölçeği (ÇEDÖ)" (Influence Behavior Questionnaire-Target) ve Schepers (2008) tarafından yönetici sıfatı taşıyanlar ve alt kadrolarda istihdam edilen çalışanların bireysel performanslarını ölçmek amacıyla geliştirilen, ve Özpehlivan (2015) tarafından Türkçeye uyarlanan bireysel performans ölçeği kullanılmıştır. Elde edilen veriler SPSS 22 paket programı kullanılarak analiz edilmiş ve anlamlılık derecesi 0.05 olarak belirlenmiştir. Verilerin normallik dağılımları test sonuçlarına göre, normal dağılım gösteren verilerin analizlerinde bağımsız değişkenlerin ikili karşılaştırmaları için T testi, çoklu karşılaştırmaları için ise Anova analizi yapılmıştır. Sonuç olarak; bireysel performans da görev durumu değişkeninde anlamlı farklılık tespit edilirken; cinsiyet ve eğitim durumu değişkenlerinde anlamlı farklılık tespit edilmemiştir. Yöneticilerin kullandıkları etkileme taktiklerinde ise cinsiyet ve eğitim değişkenlerinde anlamlı farklılık tespit edilirken; görev durumu değişkeninde istatistiksel olarak anlamlı farklılık tespit edilmemiştir. Etkileme taktiği ile iş performansı arasında pozitif yönlü bir ilişkinin olduğu görülmüştür.

Anahtar kelimeler: Yönetici, Etkileme taktikleri, İş performansı, Spor

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INTRODUCTION

When referring to the management of an institution, it is also necessary to bring up the managers and employees of that institution. Managers need to organize and motivate their subordinates to achieve any goal or purpose. However, this may not be so easy at times. Therefore, managers need to resort to some influence tactics to motivate their subordinates and employees. By using these influence tactics, managers aim to increase the work performance of employees and thus to reach their goal and purpose in the fastest way. Thus, influence behaviours are an important element for managers.

Before the concept of influencing, the concept of influence should be examined. According to Turkish Language Association (TLA), influence is the “power or influence of a person or thing on another person or thing”. According to TLA, influencing is having an influence (TDK, 2022). When the literature is examined, it can be seen that many definitions of influencing have been made. Some of these definitions are: Influencing is an activity used to change the behaviour, attitudes or values of a person or group (Faeth, 2004). It is the act of intentionally or unintentionally influencing someone's attitude, perception, or behavior towards the other person (Akhtar & Mahmood, 2009).

In the concept of influencing, the path followed, and the method used in order to realize the targeted strategy for a purpose are in question (İspir, 2008). Influencing is the ability to change the thoughts, attitudes and behaviours of others without using or forcing the power resulting from one's position (Koşar, 2016). These definitions can be extended further. Based on these definitions above and the literature, we can define influencing as “preparing those who will do the job in a job to be done and enabling them to do this job in the best way possible”. While using influence tactics, sometimes managers do not use power and coercion resulting from their position, although they can sometimes use these. The main purpose here is to persuade employees and get them to take action.

Influencing, which is at the centre of the management process, is also a concept that forms the basis of leadership. Influencing involves a process in which various methods must be followed. It is quite usual to use various strategies and tactics in different conditions. Which strategy or approach is adopted may vary depending on the characteristics of the manager who influences or the individual who is influenced. Choosing the most appropriate influencing method is a fundamental requirement for success and this choice is situation dependent. Various factors are effective in this choice. These factors include the relationships between the characteristics of the people who affect or want to be affected and the nature of the targeted behaviour. Therefore, the strategies to be used for influencing may vary according to these factors (Aydın, 2010). These changing factors affect the performance of employees positively or negatively. For effective performance, it is necessary to fulfill employees' demands, support their requests, and implement their decisions (Steizel & Rimbau-Gilabert, 2013).

Performance is the degree to which a planned activity achieves its goal. While the word performance is the quantitative (quantity) ratio of the goods or services produced in a certain time period in terms of institutions and businesses, performance is the individual “efficiency” and “efficacy” level of reaching the goal in terms of individuals. In summary, performance is the degree by which goals and objectives can be implemented (Tutar & Altınöz, 2010). Job performance, on the other hand, is “the comparison of an individual’s qualifications and abilities with the valuation criteria of the business as a result of developing and organizing these qualifications and abilities in a work-related way” (Gümüştekin & Öztemiz, 2005). Employee performance is the output of the data obtained at the end of a certain time for a planned activity (Çınar & Yeşil, 2016).

Job performance directly or indirectly affects many disciplines or is affected by many disciplines. For example, in a study on organizational commitment, it was stated how organizational commitment can be increased and under which conditions organizational commitment will be high. It can be said that the main purpose here is to improve the organizational commitment of individuals and increase their job performance. The main purpose of many studies on organizational trust, organizational justice, organizational culture, job satisfaction, in-company communication etc. is related to increasing job performance. In this context, we can say that job performance forms the basis of studies related to management, psychological and sociological fields. Within the scope of this research, which is planned in the light of this information, the aim is to make a significant contribution to the literature with the possible results that can be obtained by investigating the effects of influence tactics used by managers working in sports organizations on the work performance of employees.

METHOD

Research Model

This study, which aimed to determine the relationship between the influencing behaviours of managers towards employees and the individual performances of employees in the sample of personnel working in sports organizations, was carried out within the scope of the correlational screening model. The main purpose of this model is to show the changes of two or more variables with each other (Büyüköztürk et al., 2016).

Research Group

Population of the study consists of personnel working in sports organizations, and the sample consists of 318 (230 men and 88 women) of these personnel, who were reached by simple random sampling method. While the survey was administered face-to-face to 132 personnel who agreed to participate in the study, it was administered online to 186 personnel. Demographic information about the participants is shown in Table 1.

Table 1. Demographic information about the participants

Demographic information	Variable	f	%
Gender	Male	230	72.3
	Female	88	27.7
Educational Background	bachelor's degree	257	80.8
	postgraduate	61	19.2
Employment Status	coach	146	45.9
	Sports Training Specialist (STS)	91	28.6
	Other	81	25.5

When Table 1 is examined, it can be seen that most of the participants were men (72.3%) and undergraduates (80.8%). In terms of job status, almost half of the participants were trainers (45.9%).

Data Collection Tools

In the study, demographic information form created by the researchers, “Influence Behaviour Questionnaire” and “Individual Performance Scale” were used as data collection instruments.

Influenced Behaviour Questionnaire-Target (IBQ-T): The Influence Behaviour Questionnaire-Target, which consisted of 44 items and 11 sub-dimensions, and which was developed by Yukl et al., (2008) and adapted into Turkish by Gözü (2012) was used. Yukl et al., (2008) developed the scale in two types as influencer (manager) and influenced (target). The target version of the scale was used in this study. The reason for this is the assumption that those who are exposed to influencing behaviour can best describe the behaviour they are exposed to (İspir, 2008). The scale is prepared as a 5-point Likert scale with options as (1) I don't remember ever him using this tactic for me, (2) he rarely uses this tactic for me, (3) he uses this tactic for me from time to time, (4) he often uses this tactic for me, (5) he uses this tactic very often for me. Dimensions in the scale are Persuasion through reason (PTR), responsiveness (R), demanding incentive (DI), compliance with the rules (CR), informing (I), pressuring (P), cooperation (C), appreciation (A), negotiating (N), using personal intimacy (UPI), and forming coalitions with others (FCO). Internal consistency coefficient of the scale was calculated as .92 in the Turkish sample and as .83 in the US sample. In the present study, the internal consistency coefficient was calculated as .97.

Individual Performance Scale (IPS): The scale was developed by Schepers (2008) to measure the individual performance of managers and employees in subordinate positions and adapted by Özpehlivan (2015) in two sub-dimensions as basic performance (BP) (Items 1, 2, 3 and 4) and achievement performance (AP) (Items 5, 6, 7, 8 and 9). The scale consists of 9 items in a 5-Likert design (1=Totally disagree, 5=Totally agree). In the present study, Cronbach alpha internal consistency coefficient of the scale was calculated as .89.

Ethical Approval

Ethical approval was obtained for the study with the 06.06.2023 dated and 23/13 numbered decision of Bingöl University Health Sciences Scientific Research and Publication Ethics Committee.

Collection of Data

Within the scope of the study, the data were collected via face-to-face survey method and online with Google Form. The participants were informed about the content of the study and their voluntary participation consent was obtained, and the data of the study were obtained with the survey method.

Analysis of Data

Analyses were conducted by using the SPSS 22 package program. When the “Skewness” and “Kurtosis” coefficients were examined for normality distribution, it was seen that the coefficients were between "-1.5 and +1.5". Tabachnick et al., (2013) emphasized that the distribution is normal when the Skewness and Kurtosis values are between ± 1.50 . Histogram graphs were also used for the normality distribution of the data, and it was decided that the data were suitable for normal distribution. Statistically, descriptive statistics, t-test, one-way analysis of variance, Pearson correlation and regression analysis were preferred. Table 2 shows the distribution of scale scores and the values of Skewness and Kurtosis.

Table 2. The distribution of influenced behaviour and individual performance scale scores

Sub-dimensions (N=318)	Number of items	Mean	SD	Skewness	Kurtosis	Min.	Max.
BP	4	4.19	.63	-.853	.799	2.00	5.00
AP	5	4.25	.65	-.931	.596	2.20	5.00
IPS (Total)	9	4.22	.59	-1.054	1.412	2.11	5.00
PTR	4	3.03	1.07	-.214	-.769	1.00	5.00
R	4	2.66	1.10	.169	-.823	1.00	5.00
DI	4	2.92	1.06	-.041	-.537	1.00	5.00
CR	4	3.04	1.06	-.213	-.604	1.00	5.00
I	4	2.94	1.06	-.055	-.610	1.00	5.00
P	4	2.79	.92	.424	-.250	1.00	5.00
C	4	3.03	1.01	-.110	-.583	1.00	5.00
A	4	3.01	1.02	-.239	-.543	1.00	5.00
N	4	2.98	.97	-.166	-.325	1.00	5.00
UPI	4	2.58	.99	.159	-.443	1.00	5.00
FCO	4	2.58	.97	.245	-.384	1.00	5.00
IBQ-T (Total)	44	2.87	.77	-.009	.007	1.00	5.00

The score distribution of the measurement instruments used is shown in Table 2. According to the results in the table, the average values obtained by the participants from the individual performance scale were determined as (M= 4.22, SD= .59). When the second measurement instrument, Influence Behaviour Scale-Target, is examined, it can be seen that the values obtained are (M= 2.87, SD= .77).

FINDINGS

Table 3. Comparison of individual performance mean scores by the variable of gender

Sub-dimensions	Gender	N	Mean	SD	t	p
BP	Male	230	4.20	.65	.670	.503
	Female	88	4.15	.60		
AP	Male	230	4.27	.65	.848	.397
	Female	88	4.20	.67		
IPS (Total)	Male	230	4.24	.59	.841	.401
	Female	88	4.18	.59		

When Table 3 is examined, it can be seen that there is no statistically significant difference in the total score of the individual performance scale according to the gender variable of the participants, and in the mean scores of basic performance and achievement performance, which are the sub-dimensions ($p > 0.05$).

Table 4. Comparison of mean Influenced Behaviour Questionnaire-Target scores by gender

Sub-dimensions	Gender	N	Mean	SD	t	p
PTR	Male	230	3.06	1.068	.754	.451
	Female	88	2.96	1.093		
R	Male	230	2.67	1.084	.392	.696
	Female	88	2.62	1.165		
DI	Male	230	2.97	1.048	1.413	.159
	Female	88	2.78	1.117		
CR	Male	230	3.06	1.028	.628	.530
	Female	88	2.98	1.151		
I	Male	230	2.95	1.053	.358	.721
	Female	88	2.91	1.103		
P	Male	230	2.83	.875	1.191	.235
	Female	88	2.69	1.036		
C	Male	230	3.06	1.000	.617	.538
	Female	88	2.98	1.028		
A	Male	230	3.10	1.020	2.330	.020*
	Female	88	2.80	.996		
N	Male	230	3.01	.974	.799	.425
	Female	88	2.91	.972		
UPI	Male	230	2.66	.976	2.508	.013
	Female	88	2.36	.996		
FCO	Male	230	2.64	.946	1.783	.075
	Female	88	2.43	1.032		
IBQ-T (Total)	Male	230	2.91	.763	1.507	.133
	Female	88	2.76	.807		

When Table 4 is examined, it can be seen that while there is a statistically significant difference in the participants' mean scores of appreciation sub-dimension in terms of the variable of gender ($p = .020$, $t = 2.330$), there is no statistically significant difference between Influenced Behaviour Questionnaire total score and other mean sub-dimension scores ($p > 0.05$).

Table 5. Comparison of individual performance mean scores by educational status

Sub-dimensions	Educational Background	N	Mean	SD	t	p
BP	bachelor's degree	257	4.20	.63	.199	.842
	postgraduate	61	4.18	.65		
AP	bachelor's degree	257	4.26	.67	.308	.758
	postgraduate	61	4.22	.59		
IPS (Total)	bachelor's degree	257	4.23	.60	.284	.776
	postgraduate	61	4.20	.53		

When Table 5 is examined, it can be seen that there is no statistically significant difference in individual performance scale total score and basic performance and achievement performance mean scores of the participants in terms of educational status ($p>0.05$).

Table 6. Comparison of mean Influenced Behaviour Questionnaire scores by educational status

Sub-dimensions	Educational Background	N	Mean	SD	t	P
PTR	bachelor's degree	257	3.11	1.08	2.581	.010
	postgraduate	61	2.71	.97		
R	bachelor's degree	257	2.69	1.13	.840	.402
	postgraduate	61	2.55	.98		
DI	bachelor's degree	257	2.98	1.08	1.919	.056
	postgraduate	61	2.68	.99		
CR	bachelor's degree	257	3.11	1.09	2.236	.026*
	postgraduate	61	2.77	.86		
I	bachelor's degree	257	3.01	1.08	2.455	.015*
	postgraduate	61	2.64	.91		
P	bachelor's degree	257	2.77	.93	-.728	.467
	postgraduate	61	2.87	.87		
C	bachelor's degree	257	3.11	1.02	2.919	.004*
	postgraduate	61	2.70	.87		
A	bachelor's degree	257	3.06	1.01	1.518	.130
	postgraduate	61	2.84	1.04		
N	bachelor's degree	257	3.03	.98	1.692	.092
	postgraduate	61	2.79	.92		
UPI	bachelor's degree	257	2.60	1.01	.702	.483
	postgraduate	61	2.50	.85		
FCO	bachelor's degree	257	2.60	1.01	.718	.473
	postgraduate	61	2.50	.83		
IBQ-T (Total)	bachelor's degree	257	2.91	.80	2.057	.040*
	postgraduate	61	2.69	.62		

When Table 6 is examined, while statistically significant difference was found between the participants' influenced behaviour scale total mean score ($p=.040$, $t=2.057$) and persuasion through reason ($p=.010$, $t=2.581$), compliance with the rules ($p=.026$, $t=2.236$), informing ($p=.015$, $t=2.455$) and cooperation ($p=.004$, $t=2.919$) mean scores in terms of their educational status, no statistically significant difference was found in other sub-dimension mean scores ($p>0.05$).

Table 7. Comparison of individual performance mean scores in terms of the job position in the institution

Sub-dimensions	Employment Status	N	Mean	SD	F	P
BP	Coach ^a	146	4.16	.70	.803	.449
	STS ^b	91	4.26	.58		
	Other ^c	81	4.17	.57		
AP	Coach ^a	146	4.27	.71	3.097	.047* c<b
	STS ^b	91	4.34	.55		
	Other ^c	81	4.10	.64		
IPS (Total)	Coach ^a	146	4.22	.66	1.921	.148
	STS ^b	91	4.30	.49		
	Other ^c	81	4.13	.55		

When Table 7 is examined, while statistically significant difference was found in the achievement performance (p=.047, t=3.097) sub-dimension of the participants in terms of their job position, no statistically significant difference was found in individual performance total score and basic performance sub-dimension score (p>0.05).

Table 8. Comparison of influenced behaviour questionnaire mean scores by the job position in the institution

Sub-dimensions	Mission	N	Mean	SD	F	P
PTR	Coach ^a	146	2.92	1.21	2.064	.129
	STS ^b	91	3.04	.93		
	Other ^c	81	3.22	.94		
R	Coach ^a	146	2.68	1.17	.050	.951
	STS ^b	91	2.66	.95		
	Other ^c	81	2.63	1.14		
DI	Coach ^a	146	2.95	1.21	.182	.834
	STS ^b	91	2.87	.89		
	Other ^c	81	2.92	.98		
CR	Coach ^a	146	2.95	1.17	1.853	.158
	STS ^b	91	3.01	.89		
	Other ^c	81	3.23	.99		
I	Coach ^a	146	2.91	1.18	.609	.544
	STS ^b	91	2.89	.89		
	Other ^c	81	3.05	1.01		
P	Coach ^a	146	2.77	.98	.087	.917
	STS ^b	91	2.81	.80		
	Other ^c	81	2.81	.94		
C	Coach ^a	146	2.96	1.11	1.706	.183
	STS ^b	91	2.99	.88		
	Other ^c	81	3.21	.92		
A	Coach ^a	146	2.94	1.14	.965	.382
	STS ^b	91	3.01	.82		
	Other ^c	81	3.14	.96		

Table 8 (Continued). Comparison of influenced behaviour questionnaire mean scores by the job position in the institution

Sub-dimensions	Mission	N	Mean	SD	F	P
N	Coach ^a	146	2.88	1.09	1.518	.221
	STS ^b	91	3.10	.78		
	Other ^c	81	3.03	.92		
UPI	Coach ^a	146	2.53	1.03	1.259	.285
	STS ^b	91	2.72	.82		
	Other ^c	81	2.51	1.07		
FCO	Coach ^a	146	2.51	1.05	1.617	.200
	STS ^b	91	2.74	.76		
	Other ^c	81	2.55	1.01		
IBQ-T (Total)	Coach ^a	146	2.82	.90	.654	.521
	STS ^b	91	2.89	.59		
	Other ^c	81	2.94	.71		

When Table 8 is examined, it can be seen that there is no statistically significant difference between the participants' influenced behaviour total scores and all sub-dimension scores ($p > 0.05$).

Table 9. Correlation between influenced behaviour and individual performance total scores

	Individual Performance	
	r	.270**
Influenced Behaviour Questionnaire	p	.000
	n	318

Table 9 shows the correlation analysis between influenced behaviour and individual performance total scores of the participants. A positive low significant correlation was found between the participants' influenced behaviour questionnaire total scores and their individual performance total scores ($r = .270$, $p < 0.01$).

Table 10. Regression analysis of influenced behaviour and individual performance total scores

Influenced Behaviour Questionnaire	β^1	β^2	Std. Error	t	P
Individual Performance	.270	.207	.041	4.990	.000**
$R = .270$, $R^2 = .073$, $Adj.R^2 = .070$, $F = 24.90$, $p = .000$					

When Table 10 is examined, it can be seen that influenced behaviour scores show a significant correlation with individual performance scores ($R = .270$, $R^2 = .073$, $p < 0.001$). Individual performance was found as ($t = 4.990$, $p = .000$) when the t test results for the significance of regression coefficients were examined. It can be seen that influenced behaviour scores predict individual performance and explain 7% of total variance ($F = 24.90$, $p < 0.001$).

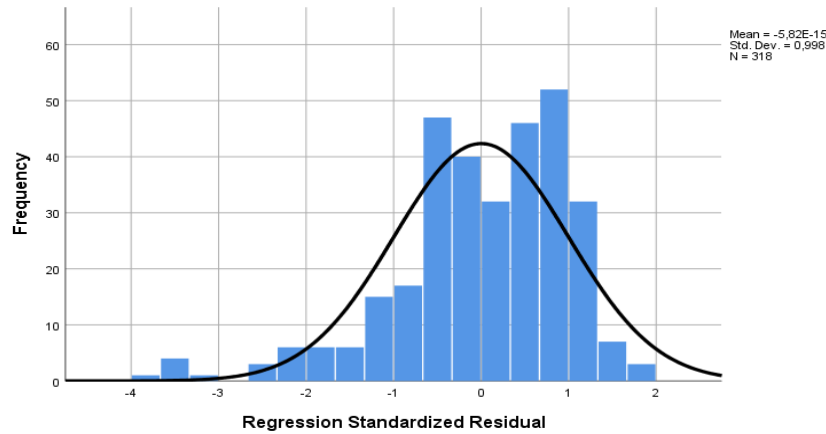


Figure 1. Regression analysis histogram graph

DISCUSSION AND CONCLUSION

The tactics that managers use to influence employees in organizations can affect the performance of employees positively (Castro et al., 2003). Therefore, managers can resort to some ways of influencing employees in order to increase their performance when needed. Thus, the relationship between the influencing tactics used by managers and job performance is discussed in the study, in addition to comparing job performance levels of sports organizations personnel and the influencing tactics used by managers according to some variables. According to the obtained data, this part of the study will focus on the effect of influencing tactics of managers on job performance.

According to the results of the research, when we examine the comparison of the individual performance and manager influence tactics of the participants in terms of the gender variable, it can be seen that individual performance does not differ between male and female participants. The results of the study conducted by Tükel (2018) support this finding. It was found that the mean scores of male participants were higher than those of female participants in appreciating behaviour. It can be said that managers' appreciative behaviour affects male participants more. Contrary to the results of our study, Koçak (2022) stated in his study with teachers that appreciating, one of the main influence tactics, did not differ in terms of gender. It can be said that the reason why the study indicates the opposite of the literature finding is due to the different organizational culture structures of the participants in the studies.

According to another result, it was concluded that while individual performance levels of employees did not differ according to their educational status, undergraduates showed higher behaviour than post-graduates in terms of persuasion through reason, compliance with the rules, informing, cooperation and influenced behaviour, which are among the influencing tactics of managers. The fact that graduates perceive some influence tactics used by managers lower than undergraduates can be attributed to the fact that their career goals and motivations are different.

When the literature is examined, Barbuto et al., (2007) concluded that education creates consistent differences in the behaviors of leaders in their interactions with subordinates. Tükel (2018) stated that there is no relationship between the education level and the components of influence tactics. This result does not support the finding of our study. We can say that some components of influencing tactics affect employees, especially undergraduates, who are more affected by these tactics.

According to the results of the study, when the job position in the institution, which is another variable, is examined, it can be seen that at the individual performance level, sportive education specialists have higher success performance than youth and sports personnel other than trainers and sportive education specialists. This situation can be interpreted as the fact that sports training experts work directly in their field of expertise, while increasing their success performance, it may negatively affect the performance of other employees. In addition, it was found that managers' influencing tactics did not differ according to the task situations. When the literature was examined, no findings were encountered according to the task status. From this point of view, this finding will be a reference for literature in future studies conducted with the personnel working in sports organizations.

Another important finding of the study is the relationship between the influence tactics used by the managers of sports organization employees and the individual performances of the employees. As a result of the study, it was found that there is a low level of positive relationship between influenced behaviour and individual performance. When the literature is examined, it can be seen that there are studies that overlap with our research results.

Lee et al., (2017) have stated that influence tactics have a positive impact on job performance. In a study conducted on white-collar employees, Yurttaş (2019) also stated that there is a positive relationship between influencing tactics and job performance. Çalı and İraz (2022) stated that the influence tactics applied by managers working in the tourism sector have a positive effect on job performance. In addition, according to the results of the applied regression analysis, it was found that influencing behaviours towards employees predicted individual performance. In a study investigating the relationship between the perceived influence tactics of youth and sports club managers and their job performance, Tükel (2018) stated that as sports managers' perceptions of influencing tactics increased, their perceptions of work performance also increased. The results of this study, which overlaps with our field-based study, also support us. In addition, according to Dohlen (2012), the purpose of using influence tactics is the intention to change the skills, behaviours, attitudes and performances of the target audience. In the context of daily life and job skills, there is an impact on the stakeholders of the organization in a sudden environment. Within the context of daily life and job skills, there is an influence of the organization on the stakeholders in a sudden environment. In business life, the direct or indirect effect of managers on their subordinates and the influence of lower-level employees on their superiors will affect their productivity in a positive or negative way.

As a conclusion, it has been found that there are many studies indicating that the influencing tactics used by managers increase the performance of employees. Employees are somehow under the influence of managers, and this affects business processes. However, it is a clear fact that there is a need for guiding studies for managers to use appropriate influence tactics in different situations and for various purposes. The influence tactics used may vary depending on the gender and educational status of the manager and the managed individuals, as well as depending on the types of organizations and the cultural structures of countries. For this reason, further research will contribute to the field by comparing different types of organizations, different cultures or comparing them from the perspective of managers.

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Ethical Approval

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Intervention with Physical Activity and Nutrition Program Adapted to Individuals with Autism with Eating Problems

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Original Article

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Abstract

The aim of the research is to reveal the results of the intervention with a physical activity and nutrition program adapted to autistic individuals with eating problems. Among the single-subject research models, the multiple probe model across behaviors with a single initial probe phase was used. The population of the research consists of adolescent individuals with mild autism and obesity problems. The sample of the research consists of one (1) person determined by simple random sampling method among the families who voluntarily agreed to participate in the research. The research lasted twenty-eight (28) weeks. The data obtained were recorded by weighing before starting the study, every week after the start of the study, and the week when the study ended. The data obtained at the end of the application was analyzed by showing it on a graph. The data obtained was converted into point scores and turned into a line graph to reveal the change that occurred. It was observed that there were significant changes in the weight of the individual participating in the research over the weeks. Considering the results obtained, it can be said that the exercise and diet programs implemented during the research were effective.

Keywords: Autism, Nutrition, Physical Activity, Adolescent, Obesity

Yeme Problemi Olan Otizmlı Bireylere Uyarlanmıř Fiziksel Aktivite ve Beslenme Programı ile Müdahale

Öz

Arařtırmanın amacı, yeme problemi olan otizmlı bireylere uyarlanmıř fiziksel aktivite ve beslenme programı ile müdahalenin sonuçlarını ortaya koyabilmektir. Tek denekli arařtırma modellerinden tekli bařlangıç yoklama evreli davranıřlar arası çoklu yoklama modeli kullanılmıřtır. Arařtırmanın evrenini, hafif düzeyde otizmlı, obezite sorunu olan adolesan bireyler oluřturmaktadır. Arařtırmanın örneklemini, arařtırmaya gönüllü katılmayı kabul eden ailelerin arasından basit tesadüfi örnekleme yöntemiyle belirlenen bir (1) kiři oluřturmaktadır. Arařtırma yirmi sekiz (28) hafta sürmüřtür. Çalıřmaya bařlamadan önce, bařladıktan sonra her hafta ve çalıřmanın sona erdiđi hafta tartı ile ölçüm yapılarak elde edilen veriler kayıt altına alınmıřtır. Uygulama sonunda elde edilen veriler, grafik üzerinde gösterilerek analiz edilmiřtir. Elde edilen veriler, nokta puana dönüřtürülerek, meydana gelen deđiřimi ortaya koymak için çizgi grafiđe dönüřtürülmüřtür. Arařtırmaya katılan bireyin haftalara göre kilosunda belirgin deđiřiklikler olduđu görülmüřtür. Elde edilen sonuçlara bakıldıđında arařtırma süresince uygulanan egzersiz ve diyet programlarının etkili olduđu söylenebilir.

Anahtar Kelimeler: Otizm, Beslenme, Fiziksel Aktivite, Adolesan, Obezite

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INTRODUCTION

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by impairment in communication, social, and motor skills, repetitive and stereotyped behaviours, typically emerging within the first three years of life and continuing throughout the individual's lifetime (Aktitiz et al., 2019; Broder-Fingert et al., 2014; Fujiwara et al., 2016). While the exact cause of autism is not fully understood, it is believed that in addition to genetic factors, environmental factors such as viruses, medications, radiation, and prenatal exposures may also play a role (Kim & Leventhal, 2015; Önal & Uçar, 2017; Özeren, 2011). The most fundamental symptoms observed in individuals with autism are difficulties in reciprocal communication, excessive attachment to objects, repetitive and stereotyped behaviours, extreme reactions to differences, avoidance of eye contact, and challenges in social activities and motor performance (Odabaş, 2016; Sowa & Meulenbroek, 2012). It has been noted that individuals with autism experience sensory issues, with these problems being more prominent in the auditory and tactile senses. They may have difficulties in interpreting or responding to social and sensory signals conveyed through these senses (Al-Heizan et al., 2015; Önal & Uçar, 2017).

In individuals with autism, eating behaviour disorders and digestive system problems are frequently encountered. It has been reported that the main reason for this is their limited food intake due to avoidance of certain foods based on texture and/or taste (food selectivity). Eating problems, such as consuming only specific textures and colors of food, avoiding trying new foods (neophobia), increased or decreased sensitivity to the smell, taste, and texture of foods, and difficulties in chewing, are quite common in individuals with autism. It has been observed that individuals with autism display aggressive behaviour when encountering new foods and tend to consume mostly the same foods by sticking to specific routines. Indeed, nutrition has an undeniable impact on reducing symptoms and behavioural issues in individuals diagnosed with autism, controlling associated medical conditions, and addressing deficiencies in certain elements. The implementation of proper nutrition strategies by families plays an important role in the positive development of the quality of life for individuals with autism (Aktitiz et al., 2019; Girli et al., 2016; Harris & Card, 2012; Merdan & Çetin, 2020; Uçar & Samur, 2017).

The rate of obesity, which is considered as the biggest health problem in recent years, is increasing day by day in childhood and adolescence. Individuals with neurodevelopmental disorders like autism may experience decreased levels of physical activity due to poor motor performance and reduced participation in sports activities because of behavioural issues. They are more likely to be at risk of being overweight or obese compared to typically developing individuals, due to specific dietary habits and excessive consumption of high-calorie foods. As they age, this risk is reported to increase. Genetic or behavioural conditions, sleep disorders, the degree of autism, and the side effects of medications are factors that contribute to an increased risk of obesity (Broder-Fingert et al., 2014; Çevik-Güner & Bilkay, 2022; Şengüzel et al., 2021; Vinck-Baroody et al., 2015). Obesity is generally associated with adverse health outcomes, including insulin resistance, diabetes, heart

disease, depression, and certain types of cancer. Since it often persists into adulthood, preventing obesity in autistic individuals is crucial (Dhaliwal et al., 2019; Srinivasan et al., 2014). Despite trying different dietary treatments to minimize the problems related to obesity and behavioural symptoms, there is currently no proven nutritional approach with established effectiveness. It is emphasized that personalized nutrition and physical activity programs, along with informing parents, are effective in preventing obesity (Derer, 2018; Girli et al., 2016; Özer & Kurşun, 2022; Srinivasan et al., 2014; Uçar & Samur, 2017).

In addition to its effects on preventing obesity and promoting overall health, physical activity has been found to be a strong complementary therapy in improving academic achievement, focus, motor performance, social communication, reducing stereotypical and aggressive behaviours, and positively enhancing behavioural and cognitive symptoms (Keskin et al., 2017; Lang et al., 2010; Marzouki et al., 2022; Sowa & Meulenbroek, 2012; Toscano et al., 2021). Individuals diagnosed with autism spectrum disorder have a higher rate of balance, movement, and coordination disorders compared to typically developing individuals. It has been stated that physical activities also contribute to the development of such motor skills. It is observed that physical activity plays an important role in maintaining the essential functions of autistic individuals, increasing their quality of life, and enhancing cognitive and social skills (Arslan & İnce, 2015; Derer, 2018; Keskin et al., 2017; Uzunçayır & İlhan, 2021).

When the literature was scanned, it was seen that there were various studies on individuals with autism, but there were not many scientific studies on this subject. Since there are few studies on this subject, it was decided to conduct this study. The aim of this research is to reveal the results and significance of the intervention with a tailored physical activity and nutrition program for individuals with autism who have eating problems.

MATERIAL AND METHOD

Research Model

One of the single-subject research models, single-start, inter-behavioural multiple probe model was used. In the single-baseline, multiple-probe design, a measurement related to the target behaviour is taken before the study, and then measurements are taken throughout the study to track the same behaviour for assessment purposes (Özdamar, 2003).

Research Group

The population of the research consists of adolescent individuals with mild-level autism and obesity problem living in Isparta province. The sample of the research consists of one (1) individual selected through simple random sampling method from among the families who constitute the population and voluntarily agree to participate in the study. Detailed information was provided to the selected individual about performing personalized physical activities and implementing a diet program. Additionally, the family was requested to provide support for the implementation of the personalized diet program prepared by an expert (Nutrition and Dietetics Specialist).

Study Duration and Targeted Skills

The research lasted for 28 weeks. In individuals with autism, issues such as difficulties in social communication, initiating or terminating an action or activity, and weaknesses in motor skills may be present. It is aimed to correct the nutritional problems of the individual participating in the research, to control the weight problem and to gain the habit of regular physical activity.

Ethical Approval

Ethics committee approval was received for this study from Clinical Research Ethics Committee (E- 87432956.050.99-347127, Date:14.09.2022).

Data Collection Tool

The weight of the individual was tracked using a Tanita measurement device before the study started, weekly during the study, and finally on the week the study ended. These measurements were recorded by the researcher.

Analysis of Data

At the end of the intervention, the collected data was analyzed and presented on graphs for visual representation and analysis. Due to the participation of only one (1) participant in the study, the data collected during the starting week and the subsequent twenty-eight (28) weeks were transformed into line graphs using statistical analysis software. Obtained data is converted into point-score in accordance with the scale protocol and converted into a line chart to reveal the change (Özdamar, 2013).

FINDINGS AND DISCUSSION

In this part of the research, the results obtained as a result of the analysis of the data obtained in the research are included.

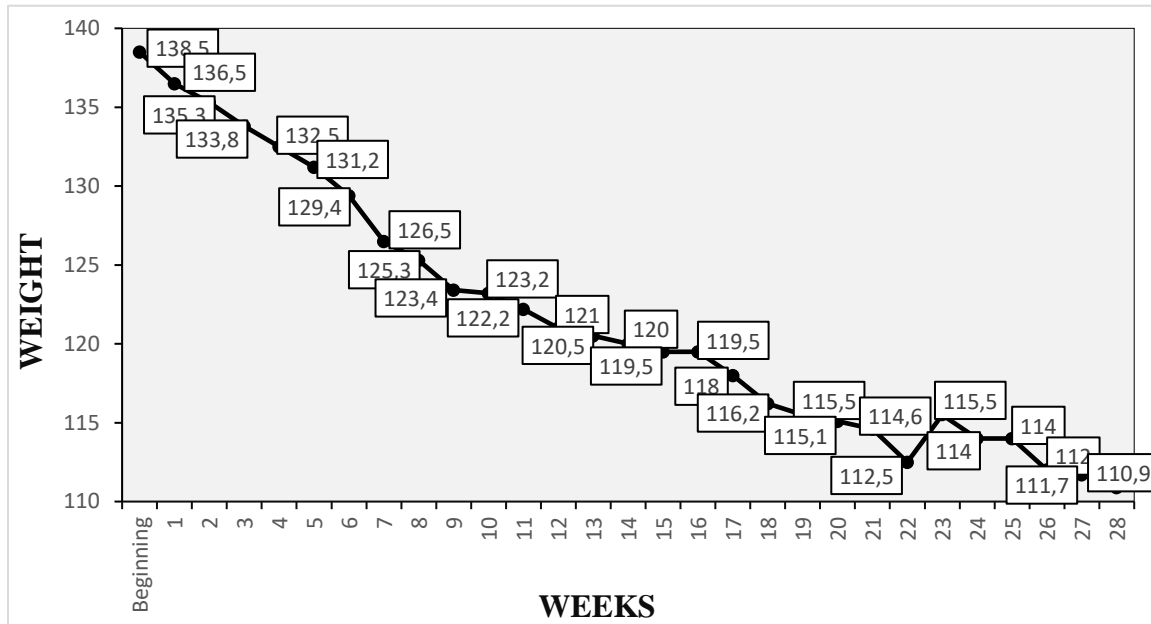


Figure 1. Change graph of participant's weight values according to weeks

In Figure 1, the significant differences in the weight change of the individual participating in the study according to the weeks are indicated. While the initial weight of the individual was 138.5 kilograms, it decreased to 110.9 kilograms at the end of the study. It is seen that the difference between the start and end data is 27.6 kilograms.

In this study, the results of the intervention with a physical activity and nutrition program adapted to individuals with autism with eating problems were examined. First of all, the family of the individual participating in the study was interviewed and the nutritional history was taken and information about their habits was collected. As a result of the data obtained, it was seen that the physical activity level of the individual was insufficient, he had obsessions about consuming sugary drinks and he was overly fond of a certain drink. It has been determined that he consumes only certain foods in his meals, avoids consuming some foods, has a certain eating pattern and feels uneasy when this order is violated. Nutrition problems are commonly encountered in individuals with autism. The eating disorders observed in the participant in this study are consistent with the diagnostic characteristics of autism. In a study examining eating behaviours in children and adolescents with neurodevelopmental disorders and typically developing individuals, the prevalence of atypical eating behaviours was found to be 70% in individuals with autism, which is 5 times higher than in individuals with other neurodevelopmental disorders (13%) and 15 times higher than in typically developing individuals (5%). The most commonly observed atypical eating behaviour in individuals with autism is the selective consumption of specific foods (Mayes &

Zickgraf, 2019). In a study comparing autistic children aged 6 to 18 with neurotypical children, it was found that autistic children had more limited food diversity and higher rates of behavioural problems during mealtime (Molina-López et al., 2021). In a study conducted with children and adolescent individuals diagnosed with autism, it was found that adolescents had lower levels of physical activity and higher food selectivity compared to children. Additionally, their Body Mass Index (BMI) values were higher. It is thought that this is due to the fact that as children get older, the difficulty experienced by families in directing them to physical activity increases (MacDonald et al., 2011; Nor et al., 2019).

When the literature is examined, it is found that individuals with autism tend to have a strong tendency to prefer specific foods, avoid diversity in their food choices, and show resistance to this (Orhan, 2014). Based on the observations and information obtained from the participating parent, it was determined that the individual with autism experienced significant eating problems, and the family lacked sufficient knowledge in this regard, resulting in weight and health problems. According to these data, a diet program that would be most suitable for quickly adapting to the diet process and an exercise program aimed at reducing fat mass and increasing muscle mass were prepared.

At the end of the first month, it is seen that the body weight of the individual has decreased from 138.5 kilograms to 132.5 kilograms and a loss of 6 kilograms has been achieved. The reason for the significant weight loss in the first month could be attributed to the individual moving away from harmful fast-food habits, transitioning to a healthier eating routine, increasing physical activity level, and the body quickly adapting to these changes. To overcome the obsession with sugary beverages, the first step taken was to reduce the amount of consumed beverages. In addition, increasing the number of meals and providing healthy alternatives as replacements were considered factors that contributed to reducing the desire for sugary beverages and helping the individual to lose weight. Although the effect of physical activity in the treatment of obesity is known, there are few studies investigating the effect of physical activity on individuals with autism and weight loss (Srinivasan et al., 2014). In the study of Pitetti et al. (2007), on adolescent individuals with developmental disabilities, including individuals with autism; It was determined that the body mass index decreased, and the energy expenditure increased in the group that was given treadmill training for 9 months compared to the group that did not receive the training. In a similar study, a program incorporating diet, physical activity, and psychological support was implemented, and a 10-week weight monitoring was conducted. According to the obtained data, no effect on body composition was observed, but improvements in lifestyle were reported (Hinckson et al., 2013).

Based on the data obtained at the end of the 2nd month in the research process, it is observed that the individual's body weight has decreased from 132.5 kilograms to 125.3 kilograms, resulting in a difference of 7.2 kilograms after completing the first month, it can be attributed to the individual's adaptation to the new dietary regimen and physical activity program, as well as the effect of exercise on increasing metabolism. A gradual approach has been demonstrated in implementing healthy lifestyle changes and restricting access to undesirable foods, and the family was asked not

to keep unhealthy foods at home. During this process, by the 2nd month, it can be stated that the obsession with sugary beverages was completely overcome, and with the addition of preferred foods to the diet, weight loss increased. In studies on the effect of physical activity on children with autism, it has been reported that it contributes to socialization, social skills, communication skills and physical development (Aksoy, 2020; Kaya & Alp, 2022; Odabaş, 2016). In a 15-month follow-up study, a 14-year-old individual with autism was subjected to an adapted physical education program. At the end of the study, it was found that motor skills were positively affected, and there was an improvement in the individual's quality of life (Akin & Alp, 2019). In a similar study, 30 autistic individuals between the ages of 10-16 were followed up with a physical activity program including 8-week stretching exercises, and it was observed that their motor skills increased compared to the control group (Şimşek, 2017). In another study, a peer-mediated adapted physical activity program consisting of 21 training sessions was applied to a 12-year-old male individual diagnosed with autism. At the end of the training, it was reported that communication skills improved, and it contributed to his physical and cognitive development as well as his ability to communicate with peers (Yarımkaaya et al., 2017).

While the body weight of the individual was 125.3 kilograms at the beginning of the 3rd month, it decreased to 119.5 kilograms at the end of the 4th month, and it was stated that the weight loss continued in 2 months with a difference of 5.8 kilograms. In this process, no weight change was observed between the 15th week and the 16th week. The reason for this may be that the individual participating in the study consumes only certain foods and does not want to go out of his habits, and that the nutrition program cannot be adequately changed for weight loss and that it is regulated on certain foods. In research involving adolescents with autism, it was found that 46.4% of the participants rejected specific foods, and 14.3% avoided trying new foods. This situation can reduce food diversity and nutrition quality, leading to eating disorders in individuals and consequently causing developmental deficiencies and health problems (Girli et al., 2016). In a study investigating the nutrition and gastrointestinal problems of individuals with autism, it was found that 62.6% had a limited eating routine, and 20.5% exhibited selective eating habits. Among the participants, 19.6% did not consume meat and meat products, and 18.6% consumed fast food more frequently. As a result of consuming a single type of food, the gut flora is negatively affected, which in turn impacts the immune system and increases the risk of infections (Merdan & Çetin, 2020).

When the study data is examined, a weight loss of 4.4 kilograms was achieved in the 5th month, and the body weight decreased from 119.5 kilograms to 115.1 kilograms. As the process of adapting to the diet progressed, the foods that the autistic adolescent individual avoided but were considered to contribute to their development were added to their diet through trial-and-error method, and information was provided about alternative foods and food preparation strategies to the family. As a result, it was observed that the individual started consuming many foods that they previously did not want to eat. It can be said that this situation affects the eating behaviour and health of the individual positively by increasing the food variety and nutritional quality. It has been observed that methods such as presenting only the preferred food, not allowing him to eat when he refuses, and verbal warning cause eating problems at a rate of 67% (Kodak & Piazza, 2008). In an

intervention study conducted with a 14-year-old male child with autism, it was stated that enriching vegetables with spices and seasonings and presenting them simultaneously helped to promote vegetable consumption and prevent rejection behavior towards vegetables (Ahearn, 2003).

According to the data on the graph, there was a weight gain at week 23 during the 6th month, and a loss of 1.1 kilograms was observed by the end of this month. The reason for the observed weight gain and relatively low weight loss during this period could be attributed to the fact that this period coincided with a holiday week, during which exercise might have been interrupted, and meal patterns might have become irregular due to the holiday celebrations. Additionally, the family might not have been able to provide the necessary care and attention to the diet plan during this time. When working with individuals with special needs, considering family support is one of the most important factors in getting behaviour change accepted and integrated (Peña & Payne, 2022). In a study involving 164 individuals diagnosed with autism between the ages of 4 and 18, food selectivity and consequently obesity were identified as the most significant issues. It was noted that families frequently resorted to methods such as distraction, allowing the child to consume more fluids, giving preferred foods as rewards, but these methods did not effectively resolve eating behaviour problems and did not lead to long-term changes (Bicer & Alsaffar, 2013). In a study involving families of individuals with autism, it was determined that stress factors related to taking care of the children hindered the parents' ability to find time for themselves and prepare healthy meals. Early intervention for behaviour change was emphasized, and providing opportunities for the child to make choices among acceptable options and reducing the quantity of unhealthy choices at home were highlighted. It was also recommended to increase participation in physical activities with the child (Polfuss et al., 2016).

According to the data obtained in the last month, it was observed that there was no change in weight in the first week, but in the last week, there was a difference of 3.1 kilograms, with the weight being 110.9 kilograms. The reasons for the continued weight loss could be attributed to the individual's adaptation to the diet plan, modifications made to the nutrition program based on the individual's consumption patterns, and the continuity of exercise. In a study, the experiences of parents in instilling healthy lifestyle changes in 8 disabled children with excessive weight problems were examined, and their progress was monitored by a dietitian. It was concluded that strategic progress in encouraging physical activity, addressing food selectivity, and making lifestyle changes is essential. Moreover, having expert supervision during this process provided parents with a positive experience. Furthermore, it has been emphasized that personalized programs and recommendations tailored to the individual's specific needs and preferences are more effective than general recommendations (Peña & Payne, 2022). In a study conducted on intellectually disabled and autistic overweight children and adolescents, a 10-week nutrition and physical activity program was implemented to manage weight. At the end of the program, a decrease in the consumption of sugary foods, improvements in their physical health, a reduction in body mass index, and a decrease in waist circumference were observed (Hinckson et al., 2013).

CONCLUSION AND RECOMMENDATIONS

As a result of the research, it was concluded that when individuals with autism who have eating problems are intervened with an adapted physical activity and nutrition program, negative eating behaviors can be changed and obesity, which is frequently encountered in individuals with autism, can be prevented. It was concluded that limited food consumption was expanded with gradual behavioral change, providing nutritional diversity and reducing obsessive behavior. It can be said that a regularly applied diet and exercise program has positive results in normalizing the eating disorders and eating habits of children with autism. Providing socio-economic and psychosocial support to parents is believed to improve both the quality of life of individuals with autism and their parents.

The number of samples in future studies may be increased. The working time can be further extended. Studies can be conducted on children in other groups with special needs (Down, Hyperactivity, mental development deficiency, etc.).

In order to effectively prevent and treat these conditions and to develop early intervention strategies, individualized applications should be made, and the level of physical activity should be increased. In managing food selectivity, obsessive behaviours, and weight issues in individuals with autism, a multidisciplinary approach involving professionals such as doctors, dietitians, physical education experts, and occupational therapists is essential. Programs addressing nutrition issues should be developed, and particular emphasis should be given to behaviour modification. Educating and providing necessary training to families, especially in regard to behaviour change, is crucial in overcoming these challenges. Parents should be sufficiently informed about healthy eating and physical activity by experts. Considering the socio-economic conditions of parents, a personalized diet program should be prepared by a specialist based on the needs of individuals with autism. Low-cost, non-specialized physical activity programs that can be fun for individuals with autism can be prepared to ensure their active participation in physical activity.

Research Limitations

In this study, a single-subject research model was used. In the single-subject research model, a small number of samples can be used. Therefore, the number of samples was limited to one person. In the single-subject research model, since the sample size is not suitable for the presentation of the findings with a table, the representation of the findings is reflected in line graphs.

Conflict of Interest: There are no personal or financial conflicts of interest among the authors regarding the scope of the study.

Authors' Contribution: Study Design; HA, DY –Data Collection; DY –Statistical analysis; HA –Manuscript Preparation; DY, HA.

Ethical Approval

Ethics Committee: Ethics committee approval was received for this study from Clinical Research Ethics Committee

Date: 14.09.2022

Decision/Protocol number: E- 87432956.050.99-347127

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Manchester City's Start of the Offensive Phase: A Lag-Sequential Analysis

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Abstract

Research on the playing patterns of Manchester City, particularly under Pep Guardiola's guidance, is limited. Existing studies do not investigate the associations between the offensive phase's initial actions (interceptions, tackles, defensive behavior followed by a pass) and other elements of the attacking phase, such as pitch space positions (zones) and goals. This study goes beyond subjective observation and applies lag-sequential analysis on Manchester City's 2019-2020 UEFA Champions League group stage matches. Behaviors were recorded using the SoccerEye Observational Instrument and software. The data was analyzed using the Sequential Data Interchange Standard-Generalized Sequential Querier (SDIS-GSEQ) and Microsoft Excel. Of the 417 offensive phase starts, 30.7% began with an interception, 8.2% with a tackle, and 29.5% with defensive behavior followed by a pass. Zone 5 (central mid-defensive sector) had a positive association ($z=4.1$) with interceptions, while zone 8 (central mid-offensive sector) had a positive association ($z=2.67$) with defensive behavior followed by a pass. Zones 3 (right defensive sector) and 12 (right offensive sector) showed a positive association with tackles ($z=2.96$ and $z=3.36$, respectively). Interceptions ($z=-2.61$) and defensive behavior followed by a pass ($z=-4.46$) were inhibited in zone 2. Starting an attack with a tackle may also result in a goal in Lags 7 and 8 ($z=2.15$, $z=2.54$, respectively).

Keywords: Attacking in football, Sequential analysis, Manchester City, Soccer

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INTRODUCTION

Ball recovery is not only defined as the foremost aim of the defensive phase, which could be a short or immediate action but also concurrently as the first stage of the attack (Barreira et al., 2014a). Successful ball recovery may result from attacking errors by the attacking team and/or depending on a good performance by the defending team. It is, therefore, crucial to be aware of the opportunities that affect ball recovery patterns, that is, where and how the ball is regained and the impact this has on subsequent patterns of attacking play. In this regard, coaches should be aware of how opposing teams recover the ball and where their players should put extra effort to try and regain possession in a specified match context (Almeida et al., 2014; Barreira et al., 2011; Barreira et al., 2014b).

Match analysis aids in identifying one's team's strengths and weaknesses, which leads to identifying opportunities and areas for improvement respectively (Lago-Peñas et al., 2011). It also helps to identify the opponents' strengths, weaknesses, opportunities, and threats. This is possible by using the necessary collected data to perceive ways how to exploit that team's weaknesses and counter their strengths (Carling et al., 2009). Approximately 1000 activity changes occur during a football match, resulting in a shift in activity every 5.65 seconds (Acar et al., 2008). When analysing offensive actions in football, one should take into consideration the pitch zones, the sectors in which players are enabled to execute actions ending with efficacy, such as a shot on goal or goal, or with no effectiveness, such as losing the ball to an opponent via an unsuccessful pass (Bergier et al., 2008). Additionally, match analysis provides a means of quantifying performance variables (Acar et al., 2008).

Several situational variables influence the complex process of attacking performance. Apropos to this, the behaviours of the players and teams in attacking patterns of play depend at least on four variables, namely, the 'game location' (home or away factor), the 'type of competition,' 'match status' (when teams are winning, drawing or losing), and the 'opponent's quality' (Almeida et al., 2014; Machado et al., 2014). Apart from these variables, Barreira et al., (2014a) argue that the 'size of the pitch' and the 'strengths and weaknesses of the opposition' significantly influence play patterns.

Literature shows ball recovery's importance on the success of attacking play, precisely answering how and in which zones (where) it occurs (Barreira et al., 2014b). Silva et al., (2005) codified eleven football matches from the 2002 World Cup and concluded that, from all the balls recovered, 13% of ball possession ended with a shot on target, 0.6% of which were scored. They suggest that the moments of transition during the match have great significance in football and can play a preponderant part. Additionally, they offer that, after ball recovery, the team's attack should materialise swiftly, thus making it difficult for the opponent to reorganise.

While some authors (Carling et al., 2007; Gómez et al., 2012; Reilly and Gilbourne, 2003) argue that the possibility of success increases when possession is recovered in the defensive and midfield

zones, others (Garganta et al., 1997; Lago-Ballesteros et al., 2012; Tenga et al., 2010) observe higher performance efficiency in possessions recovered in the offensive zones. These studies kindled an interest and curiosity to conduct this study and inspired the second set of hypotheses.

After losing the ball, and inversely, after ball recovery, both teams enter into a transition moment to compete in gaining an advantage in space and time, developing both individual and collective behaviours to create more instability in the opponent's team (when attacking) and to improve their organisation levels (when defending), with players acting upon these factors inside an unpredictable environment that frequently complicates teamwork (Barreira et al., 2014a; Shestakov et al., 2009). Underlining the importance of the transition moments, this study looks at the positive (attacking) transition when testing the second set of hypotheses.

Since the landmark work of Reep and Benajmin (1968), football tactics, such as play patterns, have changed drastically as much research has focused on goal-scoring patterns in numerous football competitions. Approximately 80% of the goals scored in 3213 matches between 1953 and 1968 resulted from a sequence of fewer than four passes (Reep and Benajmin, 1968). Furthermore, the latter observed that a goal is scored from every ten shots. Additionally, the statistical analysis of data on goals scored and the length of passing sequences found a negative binomial distribution (a distinct probability distribution that models the number of successes in a sequence) (Reep and Benajmin, 1968). More recently, Hughes and Franks (2005) found that, in the 1990 and 1994 FIFA World Cup competitions, 84% and 80% of the goals were scored from possessions of less than five passes. Similarly, 80% and 77% of the shots on target resulted from fewer than five passes. This shows that, in the early 1990s, the possession game was not a typical style of play.

A comparison was made between the Spanish, English, and Italian league winners of season 2009-2010, FC Barcelona (then managed by Guardiola), Manchester United, and Inter Milan, which indicated that the following patterns of counterattack play of FC Barcelona (2009-2010) occurred through Ball recovery by disarming, followed by a dribble ($Z=2.24$). Ball recovery by the goalkeeper's intervention; there is a propensity for the sequence to keep developing on the right side of the pitch in a controlled procedure, executing dribbling ($Z=2.47$) and ball conduction ($Z=2.71$). The long pass is associated with the end of the offensive phase without efficacy ($Z=2.21$). Shots on target were induced by the intervention of the opponent without efficacy ($Z=3.32$), crossing ($Z=2.82$), and dribble ($Z=3.32$) (Sarmiento et al., 2011).

With the six-second rule at Barcelona, Guardiola introduced the idea of immediate ball recovery when losing it. He has similarly adopted a counter-pressing model at Manchester City, which directs his team to react as fast as possible by blocking passing lanes for the opposition's player in possession, thus contributing to pressing. Unexpectedly, Segrave et al., (2018) claim Manchester City is most dangerous after losing possession. Few times they lose possession, yet, when they do, they make it difficult to be countered and do their best to find their opponents unbalanced (Segrave et al., 2018). This shows how Guardiola's attack does not exist in a vacuum; it is not a moment on its own but a moment that prepares the team for defending. Guardiola prepares his team when in

possession so that, when they lose possession, they are sufficiently balanced to handle transitions occurring to break through their initial counter-press. Manchester City's ideal counter-press happens when the full-back inverts to crowd the centre area of the pitch, providing more protection to the defensive midfielder, with the two central midfielders drifting laterally more freely. Thus, Manchester City generates enough pressure around the ball carrier, which plans to trigger the opposition's transition attack (Segrave et al., 2018).

This aspect of Guardiola's games was a catalyst for the set hypothesis and has highly influenced the scope of this paper, which analyses and explores Manchester City's regular patterns of play in the attacking phase, more precisely, their start of the offensive phase (BR) during six full matches played by Manchester City in the 2019-2020 UEFA Champions League group stage.

METHOD

Study Design

This multidimensional (observing different criteria), idiographic (one team), follow-up (continuous recording across games), and diachronic (developing and evolving) study (Barreira et al., 2014b; Kerr-Cumbo, 2020; Rees et al., 2011b) specifically focused on 'the start of the offensive phase' - ball recovery with an 'interception' (BRi), ball recovery with a 'tackle' (BRt), and ball recovery with a 'defensive behaviour followed by a pass' (BRp) (Barreira et al., 2013). Explicitly, on account of the dimensions of the collected data, this study applied a funnel-down approach (to reach a specific target), thus leading to further focused aims, as presented here under:

- To identify in which pitch zone/s the ball was recovered the most through 'BRi,' 'BRt,' and 'BRp.'
- To look at the 'goals scored' and how they were related to the variables of 'ball recovery,' more specifically, 'BRi,' 'BRt,' and 'BRp.'

This was done through a lag-sequential analysis which other homogeneous studies in the field applied (Almeida et al., 2014; Barreira et al., 2014a; Barreira et al., 2014b; Kubayi, 2020; Mitrotasios and Armatas, 2014; Sarmiento et al., 2011). Accordingly, the hypotheses of this study are given in Tables 8 and 10.

All the data was obtained from the six group-stage games that Manchester City played in the 2019-2020 UEFA Champions League, and this study analysed all the 417 attacks which resulted from 8277 events (Table 1). This study is approved by ethical committee at MCAST.

Table 1. Matches, results, and number of attacks and events observed

Match	Result	Attacks
Manchester City vs. Dinamo Zagreb	2-0	79
Manchester City vs Shaktar Donetsk	1-1	77
Atalanta vs. Manchester City	1-1	68
Dinamo Zagreb vs Manchester City	1-4	68
Shaktar Donetsk vs Manchester City	0-3	64
Manchester City vs Atalanta	5-1	61
Total Attacks		417
Total Events		8277

Tools for Data Collection and Analysis

Similarly to Barreira et al. (2013a), Barreira et al. (2013b), and Kubayi (2020), this study used InStat, SoccerEye Observational Instrument (Barreira et al., 2013a; Barreira et al., 2013b), SoccerEye Recording Software version 3.2 (Barreira et al., 2013a), Sequential Data Interchange Standard-Generalized Sequential Querier (SDIS-GSEQ) version 5.1.23 (Bakeman and Quera, 2001), and Microsoft Excel version 2104.

Like Kubayi (2020), this study used InStat to obtain the recording of all the six observed and analysed games. The SoccerEye (version 3.2) recording software, a data collection software which is theoretically framed on the SoccerEye Observational Instrument (Barreira et al., 2013b) and based on the updated version of the Organisational model of Soccer (Barreira et al., 2013a) has been used to collect all the 8277 events emerging from the 417 attacks happening in the six matches observed (like Barreira et al., 2014; Kerr Cumbo, 2020; Machado et al., 2014).

Together with a competition stage, match status, match time, and duration of the attack, as per the Organisational model of soccer, SoccerEye made it possible to record data pertaining to 80 different variables, which compose the following seven criteria;

1. Start of Offensive Phase (BR)
2. Development of Defence/Attack Transition-State (DT)
3. Progress of Ball Possession (DP)
4. End of the Offensive Phase (F)
5. Patterns of Pitch Space Position
6. Centre of the Game (CJ)
7. Spatial Patterns of Teams' Interaction (CEI)

SoccerEye made it possible to save all the data in formats that could be read by analysis software such as the Sequential Data Interchange Standard-Generalized Sequential Querier (SDIS-GSEQ version 5.1.23) (Barreira et al., 2013a; Barreira, 2014b) and Microsoft Excel. The SDIS-GSEQ was also used to run the Cohen's Kappa index to test the Intra-rater Reliability (Bakeman and

Quera, 2001; Barreira, et al., 2014a; McHugh, 2012). The results produced in the SDIS-GSEQ were always thoroughly re-analysed through the Microsoft Excel part of the Microsoft Office 365 ProPlus package.

Reliability

The official manual of the ‘SoccerEye Observational Instrument of the offensive phase in Soccer’ (Barreira et al., 2013a) was rigorously studied and applied. Multiple technical meetings and discussions with several international field experts further supported that. Additionally, discussions with statistics experts at the Malta College of Arts Science and Technology and Muğla Sıtkı Koçman University were held.

Moreover, as a recording system, “SoccerEye v3.2 provides four different recording designs: (i) restrict predefined recording; (ii) restrict free recording; (iii) open predefined recording; and (iv) open free recording” (Barreira et al., 2013b). To acquire further reliability, throughout the data collection procedure, this study utilised the ‘restrict predefined recording’ (Table 2) attribute. This permitted the observer to choose only the active categories, represented with marked black buttons, as all the inactive categories would become grey. The ‘restrict predefined recording’ first allows the user to record the situational variables, competition stage, match status, and match time, followed by the behavioural, spatial, and interactional criteria. This limited the possibility of mistakes during data entry.

Table 2. SoccerEye v3.2 Recording Designs (Barreira et al., 2013b)

(i) Restrict recording		
	(i-a) Predefined	(i-b) Free
Command	No command required	“Free input”
Observational instrument	SoccerEye	SoccerEye
Recording guidelines	Predefined recording order: a. Situational variables; b. Criterion 1, 2, 3, or 4; c. Special characters	No recording order
Data format	Multievent	Multievent Event

Data was logged in with a speed of 0,75x (75% of normal match play speed) to ensure that the observer did not miss any detail from the observed matches. Additionally, as proposed by Rees et al. (2011a), the footage was rewind and played again recurrently, ensuring that coding was performed reliably (playback speed rate altered according to the observer’s discretion). Two focal points that made this study opt for this software were that compared to the hand notation system, less time is spent in the observation process, and fewer errors are made. This further helped improve the study’s reliability (Rees et al., 2011b).

Like Sarmento et al. (2010), this study looked at the intra-rater reliability to define the reliability of a single data collector (McHugh, 2012) and hence the quality of the collected data through the intra-observer agreement, which was substantiated by the Kappa reliability index test. This was

done by utilising two fifteen min. of two random games, that is, the first fifteen min. of the second half (45 min-60 min) of the Dinamo Zagreb vs. Manchester City and the second fifteen min. of the game of Manchester City vs Shakhtar Donetsk. These add up to 30 min (5.5%) from 540 minutes of observed game time. The reliability test result was assessed by 'compute Kappa' on the SDIS-GSEQ software (version 5.1.23) (Bakeman and Quera, 2001). To ensure the intra-rater reliability consistency of the collected data, the Kappa coefficient was calculated for every one of the seven criteria individually and for all the criteria collectively (Casal et al., 2019).

This study referred to McHugh's (2012) Interpretation of Cohen's Kappa (Table 3). Ultimately, as shown in Table 4, three variables, namely, the start of the offensive phase (BR), patterns of pitch space position (zones), and end of the offensive phase (F), having a maximum value of Kappa of 1.00, 0.98, and 0.87 respectively (McHugh, 2012) were used as part of the analysis as they classify as almost perfect (BRs and zones) and strong (Fs).

Table 3. Interpretation of Cohen's Kappa (McHugh, 2012: 279)

Value of Kappa	Level of agreement	% Of Reliable Data
0-.20	None	0-4%
.21-.39	Minimal	4-15%
.40-.59	Weak	15-35%
.60-.79	Moderate	35-63%
.80-.90	Strong	64-81%
Above .90	Almost Perfect	82-100%

Table 4. All categories' results from Compute Kappa in SDIS-GSEQ

	Kappa	Agreement	Maximum value of Kappa
Start of the offensive phase (BR)	1.00	100%	1.00
Patterns of pitch space position (zones)	0.76	81%	0.98
End of the offensive phase (F)	0.82	99%	0.87
All categories together	0.86	93.3%	0.95

Statistical Analysis

Statistical significance was regulated at ' $z \geq 1.96$ ' and ' $p \leq 0.05$ ' (Bakeman and Quera, 2001; Sarmiento et al., 2016). By achieving the Z value (≥ 1.96), it is granted to find out the strength of the connections between the behaviours and their sequences (Barreira, 2011). When required, a retrospective or prospective viewpoint of plus ten lags subsequent to the primary event (ball recovery) was applied to establish the subsequent pattern/s of attacking play (Bakeman and Gottman, 1986; Sarmiento et al., 2016). Data got corrupted when *match time* and the *duration of the attack* were used; therefore, this study eliminated both variables during analysis.

Alternative and null hypotheses of the same relationships were created to determine whether positive (induces) or negative (inhibits) relationships existed between the tested variables.

RESULTS AND DISCUSSION

Descriptive analysis

The start of the offensive phase is defined as “when the observed team perform a ball recovery, directly or indirectly” (Barreira et al., 2013a). That is divided into defence/attack transition-state (BRi, BRt, BRgk, or BRp), “when the recovery of ball possession occurs in a direct/dynamic way” (Barreira et al., 2013a), and defence/attack transition-interphase (BRst, BRv, BRc, BRgki, BRdb, or BRti), which “is identified by an indirect/static ball recovery” (Barreira et al., 2013a).

This case study, made of 6 matches, covers a total of 417 attacks, including a total of 8277 events with an average of 69.5 starts of the offensive phase (BR) per match. 30.7% (128) of the 417 BR's occurred with a BRi. Another 8.2% (34) were by BRt, 9.6% (40) starts of the offensive phase were by BRgk, and 29.5% (123) by BRp, totalling 325 (78%) ‘starts of the offensive phase in a defence/attack transition-state.’ The remaining 92 (22%) ‘starts of the offensive phase’ were in a ‘defence/attack transition-interphase,’ that is, 2.4% (10) BRst, 2.9% (12) BRv, 4.5% (19) by BRgki, 0.2% (1) by BRdb, and 12% (50) by BRti, with no start of offensive phase starting with a BRc (Table 5).

Table 5. Descriptive report of all the types of the start of the offensive phase/ball possession recovery (BR)

	Acronym	n	Percentage
Starts of the Offensive Phase in a defence/attack transition-state			
Ball Possession Recovery by interception	BRi	128	30.7%
Ball Possession Recovery by tackle	BRt	34	8.2%
Ball Possession Recovery by the intervention of the goalkeeper in the defensive phase	BRgk	40	9.6%
Ball Possession Recovery by defensive behaviour followed by a pass	BRp	123	29.5%
Total		325	78.0%
Starts of the Offensive Phase in a Defence/attack transition-interphase2			
Start/restart the offensive phase	BRst	10	2.4%
Ball possession recovery by opponent's violation of the laws of the game	BRv	12	2.9%
Ball possession recovery by a corner kick	BRc	0	0%
Ball possession recovery by a goal kick	BRgki	19	4.5%
Ball possession recovery by a dropped ball	BRdb	1	0.2%
Ball possession recovery by Throw-In	BRti	50	12.0%
Total		92	22.0%

Start of the Offensive Phase – 1st and 2nd Half

From the 417 ball recoveries observed, 216 occurred in the first half, with the remaining 201 occurring in the second half of the six games. From these ball recoveries, Manchester City had 325 defence/attack transition states, 172 of which occurred in the first half, with the other 153 occurring in the second half. This puts Manchester City's ball recovery at 77.9% defence/attack transition state, which means that Manchester City mostly instantly recovers the ball. As shown in Figure 1

and Table 6, Manchester City have mainly started their offensive phase with a BRi: 128 and a BRp: 123. These two ball recoveries covered 60.2% of all ten types of ball recoveries, thus revealing a pattern in Manchester City's way of recovering the ball. Figure 1 shows the frequency of all ten categories at the start of the offensive phase. Since this study focuses on 'BRi,' 'BRt,' and 'BRp,' Figure 2 shows how these three criteria were adopted over the first and second half of the group games in addition to all the different score lines to contextualise the results in their full temporal actuality.

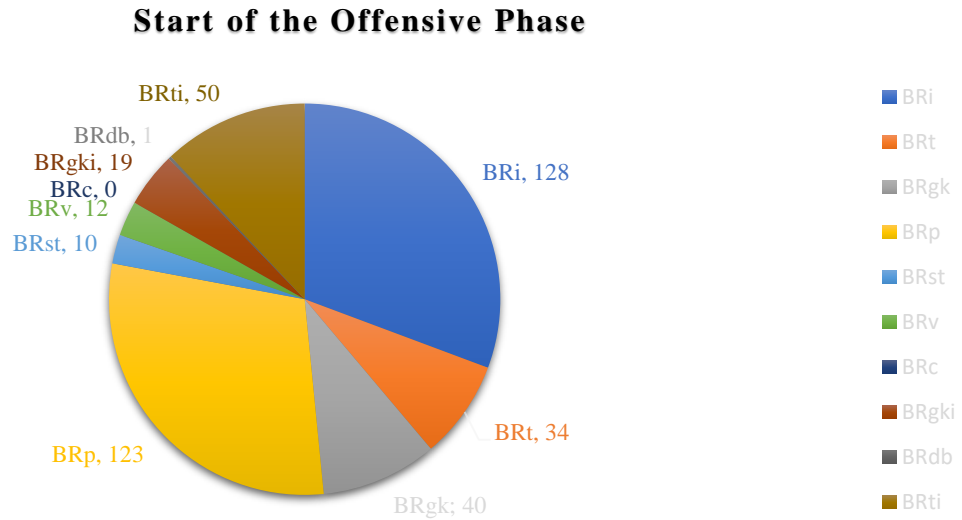


Figure 1. The total frequency of the ten starts of the offensive phase categories

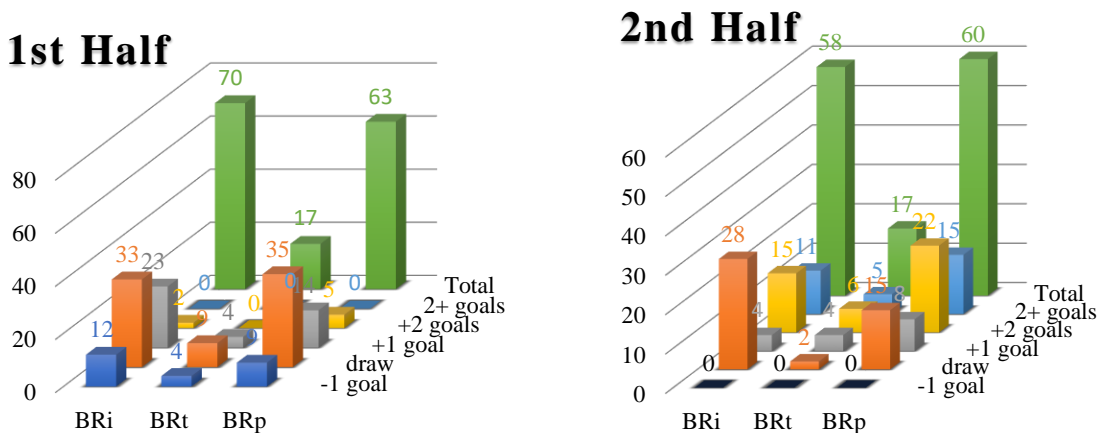


Figure 2. Temporal descriptive statistics of the Start of the Offensive Phase's Ball Recovery by an interception (BRi), tackle (BRt), and defensive behaviour, followed by pass (BRp) in the 1st and 2nd Half

The total 'BRi' and 'BRp' were more frequent in the first half, while the total 'BRt' was equal in both halves. Manchester City never won by more than two goals in the first half, and no 'BRt' occurred when winning by two. A total of 5 and 2 respectively can be noticed for 'BRp' and 'BRi' when winning by two goals. In these six games, Manchester City never lost in the second half, despite only losing for 20 min. In the first half, they managed to recover the ball 12 times through 'BRi,' 9 times through 'BRp,' and four times through 'BRt,' which could be a sign of attacking directly to recover the score quickly. When the score was draw, a +20 differed the first half from the second half in BRp terms, which could be due to Manchester City wanting to pass directly after winning the ball to try and be quick when opponents are unbalanced or unsettled (et al., 2018), or to keep possession by 'moving away from traffic.'

Start of the Offensive Phase in Pitch Zones

Of the 417 Manchester City's attacks, 305 (73.1%) started from the defensive half, with the other 112 (26.9%) starting from the offensive half. This puts Manchester City on the high side of starting attacks from the defensive half, especially when compared to the literature studying the 2012-2013 European championship top teams (Mitrotasios and Armatas, 2014), which shows that 43.4% of balls recovered occurred in the defensive half, with the other 56.6% occurring in the opposing half. The hugely significant amount of ball recoveries (73.1%) occurring in the defending half could be a result of their high pressing, where opponents find no solution to play from the back and rather look for long balls, with Manchester City's high defensive backline (Segrave et al., 2018) recovering the ball in their defensive half, and obviously, starting their attack again from their defensive half.

Start of the Offensive Phase – Match Results

As can be noticed in Table 6, it is interesting to highlight that the most significant win (5-1) contained the fewest ball recoveries (61). This could be due to dominating possession (Manchester City had 60% of ball possession); therefore, being superior in ball possession means not losing the ball frequently, thus avoiding having to recover the ball often. The same can be said for the game of Dinamo Zagreb vs. Manchester City (1-4), where Manchester City had 76% of ball possession. The location variable (Almeida et al., 2014; Machado et al., 2014) could have left an impact when drawing away against Atalanta (1-1). Contrarily, Manchester City drew when playing at home against Shakhtar Donetsk, with Manchester City winning two games each home and away. Therefore, the location variable might not have affected Manchester City's results.

Table 6. Frequency of all the ten categories of the start of the offensive phase per match

Game	Result	Start of Offensive Phase										Total
		BRi	BRT	BRgk	BRp	BRst	BRv	BRc	BRgki	BRdb	BRti	
Shaktar Donetsk vs Manchester City	0-3	22	6	4	19	1	1	0	3	0	8	64
Manchester City vs Dinamo Zagreb	2-0	22	6	8	28	1	5	0	1	0	8	79
Manchester City vs Atalanta	5-1	13	4	6	20	2	1	0	5	0	10	61
Atalanta vs Manchester City	1-1	29	3	6	14	2	2	0	4	0	8	68
Manchester City vs Shaktar Donetsk	1-1	23	8	9	20	2	1	0	2	1	11	77
Dinamo Zagreb vs Manchester City	1-4	19	7	7	22	2	2	0	4	0	5	68
		128	34	40	123	10	12	0	19	1	50	417
Total Ball Possession Recoveries												417
Total Events												8277

Start of the Offensive Phase per 15min.

Table 7 presents a temporal overview of the total number of events and ball recoveries occurring in the six matches observed. Considering all six matches together, the first fifteen minutes of the second half produced the highest number of events (1836) and ball recoveries (92). This could be attributed to the effect of the halftime team talk on players (psychologically), change in tactics or players, and/or the players being fresh after a fifteen-minute break (physically). Contrarily, the last fifteen minutes of the games produced the fewest events (870) and ball recoveries (39), perhaps due to tiredness and/or result settlement.

Table 7. The total number of events and ball recoveries per 15 min. of the six analysed Manchester City games

Time of all six matches	Number of Events	Ball recoveries
0:00-15:59 min.	1598	83
16:00-30:59 min.	1398	68
31:00-45:00 min.	1232	65
45:00-60:59 min.	1836	92
61:00-75:59 min.	1343	70
76:00-90:00 min.	870	39

The Association of ‘the start of the offensive phase’ (BRi, BRT, and BRp) with ‘patterns of pitch space position.’

To explore whether the findings satisfy the alternative or null hypotheses, this study analysed all the data generated in SDIS-GSEQ concerning the location on the pitch where Manchester City recovered the ball. Statistical significance was set at $p \leq 0.05$ and $z \geq 1.96$ (Bakeman and Quera, 2001; Sarmiento et al., 2016). The ‘intra-rater reliability test’ was performed, and a 1.00 ‘maximum

value of Kappa' was recorded for the 'Start of offensive phase' (BR), and a 0.98 'maximum value of kappa' was recorded for the 'Patterns of pitch space position' (zones), as shown in Table 4.

Data made it possible to understand 'the start of the offensive phase,' more specifically, by 'interception' (BRi), 'tackle' (BRt), and 'defensive behaviour followed by a pass' (BRp) from a spatial point of view. This was done by looking at the associations between 'BRi,' 'BRt,' and 'BRp' with the patterns of pitch space position (zones).

BRi recorded the highest number of ball recoveries (n=49), and statistical significance showed that it induced (BRi $z=4.1$) in the Central mid-defensive sector, specifically zone 5, a zone in which, according to Kerr-Cumbo (2022), City were significantly expected to be in "numerical superiority."

Another 21 balls BRp were recorded in zone 8. In the same competition, Kerr-Cumbo (2022) found statistical significance in City losing the ball in this zone (Kerr-Cumbo, 2022) yet, in this, we discovered that zone 8 induces ball recovery by defensive behaviour followed by a pass (BRp, $z=2.67$). The fact that the city wins the ball precisely in the same zone they lose it (according to Kerr-Cumbo, 2022) sits nicely with Guardiola's "Six Second Rule" at Barcelona and the idea of "Counter Pressing" Manchester City, and with the importance Pep's side put on the moment when they have just lost the ball, the idea of defending transition." Guardiola's philosophy to endlessly crowd the midfield to outnumber his opponents and to counterattack through central areas (Segrave et al., 2018) is shown through these results ('BRi' in 'zone 5' and 'BRp' in 'zone 8').

Although this study's first set of hypotheses focused on 'BRi,' 'BRt,' and 'BRp' about zones 5 and 8, the aim of this study is not to view the negative associations (as was done by Barreira et al., 2014b), data has inductively revealed an interesting fact. Through sequential analysis, it was clear that, in the observed games, there was an inhibition of BRi in 'zone 2' ($z=-2.61$) and an inhibition of BRp in the same zone ($z=-4.46$). It might be the case that this is since Manchester City utilise a high press (Segrave et al., 2018), pushing their defenders up to at least the 'mid-defensive sector' (zones 4, 5, and 6), which is backed up by the high number of BRgk, which reads $z=10.82$, thus showing that the ball was recovered multiple times by the goalkeeper when cleared by the opponents. Nonetheless, it could be that Manchester City recovered the ball in 'zone 2' in other ways, but not with a 'BRi' or 'BRp.' Additionally, while 'zone 5' and 'zone 8' did not induce BRt, the right defensive sector (zone 3, $z=2.96$) and right offensive sector (zone 12, $z=3.36$) were positively correlated with 'BRt.' This shows the success rate of starting an attack with a tackle at both ends on Manchester City's right side. This might show two opposing reasons for winning the ball at both ends: the idea of 'high press' when winning the ball up in 'zone 12' and the idea of 'under pressure' when winning the ball down in 'zone 3'. No statistical significance was found when looking at ball recoveries in the left path, which is shown in Figure 3.



Figure 3. Ball recovery by interception (BRi), tackle (BRt), and defensive behaviour, followed by a pass (BRp) associated with statistically significant zones

Table 8. Alternative and Null Hypothesis Testing – ‘The start of the offensive phase’ (BRi, BRt, and BRp) with ‘patterns of pitch space position’ (Zones)

H1/H2 – Alternative Hypothesis	H0 – Null Hypothesis		Hypothesis	NULL Hypothesis
Zones and Ball Recovery				
CMDS and CMOS relationship with Ball Recovery by Interception (Bri)				
H1a – Central mid-defensive sector (CMDS) induces ball possession recovery by interception (Bri)	H0 – Central mid-defensive sector (CMDS) does not induce ball possession recovery by interception (Bri)	Bri in Zone 5 (z=4.1)	Accepted	Rejected
H1b – Central mid-defensive sector (CMDS) inhibits ball possession recovery by interception (Bri)	H0 – Central mid-defensive sector (CMDS) does not inhibit ball possession recovery by interception (Bri)		Rejected	Accepted
H1c – Central mid-offensive sector (CMOS) induces ball possession recovery by interception (Bri)	H0 – Central mid-offensive sector (CMOS) does not induce ball possession recovery by interception (Bri)	Bri in Zone 5 (z=-0.96)	Rejected	Accepted
H1d – Central mid-offensive sector (CMOS) inhibits ball possession recovery by interception (Bri)	H0 – Central mid-offensive sector (CMOS) does not inhibit ball possession recovery by interception (Bri)		Rejected	Accepted
CMDS and CMOS relationship with Ball Recovery by Tackle (BRt)				
H1e – Central mid-defensive sector (CMDS) induces ball possession recovery by tackle (BRt)	H0 – Central mid-defensive sector (CMDS) does not induce ball possession recovery by tackle (BRt)	BRt in Zone 5 (z=-1.47)	Rejected	Accepted
H1f – Central mid-defensive sector (CMDS) inhibits ball possession recovery by tackle (BRt)	H0 – Central mid-defensive sector (CMDS) does not inhibit ball possession recovery by tackle (BRt)		Rejected	Accepted
H1g – Central mid-offensive sector (CMOS) induces ball possession recovery by tackle (BRt)	H0 – Central mid-offensive sector (CMOS) does not induce ball possession recovery by tackle (BRt)	BRt in Zone 8 (z=-1.34)	Rejected	Accepted
H1h – Central mid-offensive sector (CMOS) inhibits ball possession recovery by tackle (BRt)	H0 – Central mid-offensive sector (CMOS) does not inhibit ball possession recovery by tackle (BRt)		Rejected	Accepted

Table 8 (Continued). Alternative and Null Hypothesis Testing – ‘The start of the offensive phase’ (BRi, BRt, and BRp) with ‘patterns of pitch space position’ (Zones)

H1/H2 - Alternative Hypothesis	H0 - Null Hypothesis		Hypothesis	NULL Hypothesis
<i>Zones and Ball Recovery</i>				
CMDS and CMOS relationship with Ball Recovery by Defensive behaviour followed by a pass (BRp)				
H1i - Central mid-defensive sector (CMDS) induces ball possession recovery by defensive behaviour followed by a pass (BRp)	H0 - Central mid-defensive sector (CMDS) does not induce ball possession recovery by defensive behaviour followed by a pass (BRp)	BRp in Zone 5 (z=-1.74)	Rejected	Accepted
H1j - Central mid-defensive sector (CMDS) inhibits ball possession recovery by defensive behaviour followed by a pass (BRp)	H0 - Central mid-defensive sector (CMDS) does not inhibit ball possession recovery by defensive behaviour followed by a pass (BRp)		Rejected	Accepted
H1k - Central mid-offensive sector (CMOS) induces ball possession recovery by defensive behaviour followed by a pass (BRp)	H0 - Central mid-offensive sector (CMOS) does not induce ball possession recovery by defensive behaviour followed by a pass (BRp)	BRp in Zone 8 (z=-2.67)	Accepted	Rejected
H1l - Central mid-offensive sector (CMOS) inhibits ball possession recovery by defensive behaviour followed by a pass (BRp)	H0 - Central mid-offensive sector (CMOS) does not inhibit ball possession recovery by defensive behaviour followed by a pass (BRp)		Rejected	Accepted

The Association of ‘BRi,’ ‘BRt,’ and ‘BRp’ (the start of the offensive phase) with ‘the end of the offensive phase.’

A lagten0 sequential analysis in GSEQ-SDIS was applied (Bakeman and Quera, 2001). We started with a lag five analysis to test the Cohen Kappa association. Since no statistical significance was found, we ran a second analysis at lag 10.

The findings in this research for sequential associations, presented in yellow (Table 9), in contrast to already existing literature (Barreira et al., 2014b), marked in green, suggest no statistical significance when linking all criteria for the end of the offensive phase (F) with BRi and BRp.

Table 9. Ball recovery by interception (BRi), tackle (BRt), and defensive behaviour, followed by a pass (BRp) associated with the end of the offensive phase (F)

	With Efficacy			Without Efficacy				
	Fws	Fst	Fso	Fgl	Fled	Fgk	Fo	Fi
BRi					z=2.65		z=-2.65	
BRt				z=2.62 (Lag 7) z=2.15 (Lag 8) z= 2.54				(Lag 6) z=2.91
BRp		z=3.23			z=-3.29			

On the other hand, this study and existing literature found an association between BRt and F. From these associations, this study found that two attacks ended with efficacy and another attack ended without efficacy. The two attacks ending with efficacy resulted in Fgl by BRt at Lag 7 (z=2.15) and Lag 8 (z=2.54). This could be because when Manchester City recover the ball, they do not hurry to score whenever possible. Still, instead, “City wisely pick their moments to unleash their

weapons when their opponents are spread out during their attack” (Eckner and Reynolds, 2018). To continue sustaining this argument, after Manchester City recover the ball, “through their ‘patience’ strategy, Manchester City do repeatedly pass the ball back to their CBs if they do not find the gaps to penetrate higher up the pitch” (Kerr-Cumbo, 2020). There was one goal in each lag, with a p-value of $\sim .03$ in lag seven and a p-value of $\sim .01$ in lag 8.

The interesting point is that, from the 16 goals scored in these six matches, five goals were scored as follows: one from a BRi and two each from a BRt and a BRp. Therefore, the second set of hypotheses was on track, although the BRt is the only ball recovery criterion statistically significant, thus rejecting the null hypothesis H2c. BRt was the only criterion from the three criteria analysed that induced F criteria through Fgl and Fi. Compared with the existing literature (Barreira et al. 2014b) ball recovery by a ‘tackle’ (BRt) induced ‘F’ criteria three times in this study while occurring once in the existing literature.

No negative associations were observed in this study between BR and F. Regarding the attack ending without efficacy, BRt induced Fi, which occurred once in lag 6, with z and p-values of 2.91 and $\sim < 0.01$, respectively.

According to Segrave et al. (2018), once Manchester City loses possession, their ability to counter-press heavily depends on the players' starting positions, namely, the rest defence. Once the opposition intercepts the central midfielder's pass, Manchester City ready themselves to defend against counterattacks in the centre of the pitch as they crowd the area to be in a 5 to 2 advantage in their rest defence while keeping in mind to pick up any runners from the opponents. According to Eckner and Reynolds (2018), “In the matter of attacking transitions, rather than aiming to counter whenever possible, City wisely pick their moments to unleash their weapons when their opponents are spread out during their attack.”

Looking at the relationship between the type of ball possession recovery and the end of the offensive phase of the winning team during the 2002 World Cup competition, Taylor and Williams (2002) propose that the recovery of ball possession in the defensive area resulted in more attempts on goal than for the other participating teams. In contrast, Wright et al. (2011) found that most attacks leading to goal-scoring opportunities for football teams in the United Kingdom started in the attacking mid-third of the pitch. Smith and Lyons (2017) discovered that the most successful teams during four World Cups (2002 to 2014) regained ball possession in the middle third of the pitch, frequently providing the highest number of ball recoveries, leading to goals. From 31 analysed matches during the 2012 UEFA Euro Football Championship, 56.6% of the 76 goals scored were from a recovered ball in the attacking half, while 43.4% were from a recovered ball in the defending half (Mitrotasios and Armatas, 2014).

Table 10. Alternative and Null Hypothesis Testing – of ‘BRi,’ ‘BRt,’ and ‘BRp’ (the start of the offensive phase) with ‘the end of the offensive phase’

Ball Recovery to Goals Scored (Lag 10)					
Goals Scored related to Ball Recovery by Interception (BRi)					
H2a - Ball possession recovery by interception (BRi) induces scoring goals (Fgl)	H0 - Ball possession recovery by interception (BRi) does not induce scoring goals (Fgl)	BRi and Fgl (n=0)	Rejected	Accepted	
H2b - Ball possession recovery by interception (BRi) inhibits scoring goals (Fgl)	H0 - Ball possession recovery by interception (BRi) does not inhibit scoring goals (Fgl)				
Goals Scored related to Ball Recovery by Tackle (BRt)					
H2c - Ball possession recovery by tackle (BRt) induces scoring goals (Fgl)	H0 - Ball possession recovery by tackle (BRt) does not induce scoring goals (Fgl)	BRt and Fgl (Lag 7 z=2.15) (Lag 8 z=2.54)	Accepted	Rejected	
H2d - Ball possession recovery by tackle (BRt) inhibits scoring goals (Fgl)	H0 - Ball possession recovery by tackle (BRt) does not inhibit scoring goals (Fgl)				
Goals Scored related to Ball Recovery by Defensive behaviour followed by a pass (BRp)					
H2e - Ball possession recovery by a defensive behaviour followed by a pass (BRp) induces scoring goals (Fgl)	H0 - Ball possession recovery by a defensive behaviour followed by a pass (BRp) does not induce scoring goals (Fgl)	BRp and Fgl (n=0)	Rejected	Accepted	
H2f - Ball possession recovery by a defensive behaviour followed by a pass (BRp) inhibits scoring goals (Fgl)	H0 - Ball possession recovery by a defensive behaviour followed by a pass (BRp) does not inhibit scoring goals (Fgl)				

CONCLUSION

This study looked at the relationship of ‘BRi,’ ‘BRp,’ and ‘BRt’ with the ‘patterns of pitch space position,’ more specifically, ‘central mid-defensive’ sector (zone 5) and ‘central mid-offensive’ sector (zone 8), and with the ‘end of the offensive phase,’ more specifically, ‘goals scored’ (Fgl). When looking at all the games Manchester City played during the group stage of the UEFA Champions League 2018-2019, findings show that ‘BRi’ is positively associated with ‘zone 5’, while ‘BRp’ is positively associated with ‘zone 8’, and ‘BRt’ is positively associated with ‘Fgl’ at Lag 7 and Lag 8.

Conflict of interest: The corresponding author reports no conflict of interest.

Author contributions: Research Design: JS, RKC, Data Collection: JS, RKC, Writing: JS, RKC, KG, EŞ

Declaration: The author declares that this study complies with the current laws of the country where it was performed.

Ethical Approval

Ethics Committee: MCAST – The Malta College of Arts, Science & Technology

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Comparison of the Effects of Electrostimulation and Zumba Exercise on Some Physical and Physiological Parameters of Sedentary Women

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Abstract

The aim of this study is to compare the effects of Electrostimulation (EMS) exercise, which is a popular research topic recently, whose effectiveness and benefits are frequently stated in the literature, and zumba exercise, which is also a popular type of exercise, on some physical and physiological parameters in healthy sedentary women. A total of 30 women (35.8 ± 1.4 years) volunteered for this study. The participants were randomly divided into EMS (n:15) and Zumba (n:15) groups. Then, for a total of 6 weeks, the EMS group performed EMS exercise two days a week, and the Zumba group performed Zumba exercise two days a week. The body composition, blood pressure, maximal oxygen consumption (VO_{2max}), strength performance and determined blood parameters of the participants were evaluated at the beginning and end of the study. Each exercise session was followed by heart rate monitoring system in order to evaluate the participants' maximal, average heart rate and total calories burned. Moreover, rate of perceived exertion was recorded at the end of each exercise with the Borg scale. When intergroup comparison performed, a statistically significant difference was found in favor of the Zumba group in the values of body weight, body mass index (BMI), body fat percentage and. VO_{2max} There was no statistically significant difference between the groups in strength and blood lipid parameters. It can be said that both EMS and zumba practices have positive effects on body composition, strength and blood lipid levels when the duration of each session and the total duration of the exercises as well as intra-group changes are evaluated.

Keywords: Electrostimulation, Zumba, Sedentary

Elektrostimülasyon ve Zumba Egzersizinin Sedanter Kadınlarda Bazı Fiziksel ve Fizyolojik Parametreleri Üzerine Etkilerinin Karşılaştırılması

Öz

Bu çalışmanın amacı, son dönemlerde popüler bir araştırma konusu olmakla beraber etkinliği ve faydaları literatürde sıklıkla bildirilen elektrostimülasyon (EMS) uygulaması ile yine popüler bir egzersiz türü olan zumba egzersizinin sağlıklı sedanter kadınların bazı fiziksel ve fizyolojik parametreleri üzerinde etkilerinin karşılaştırılmasıdır. Çalışmaya yaş ortalamaları 35.8±1.4 yıl olan toplam 30 kadın gönüllü olarak katılmıştır. Katılımcılar rastgele EMS (n:15) ve Zumba (n:15) grubu olarak ikiye ayrılmıştır. Daha sonra toplamda 6 hafta olmak üzere, EMS grubuna haftada iki gün EMS uygulaması, zumba grubuna ise yine haftada iki gün olmak üzere zumba egzersizleri yaptırılmıştır. Çalışmanın başında ve sonunda katılımcıların vücut kompozisyonu, kan basıncı, maksimal oksijen tüketimi (VO_{2maks}), kuvvet performansları ve belirlenen kan parametreleri değerlendirilmiştir. Her bir egzersiz seansı katılımcıların maksimal, ortalama kalp atım hızları ve toplam harcanan kalorininin değerlendirilebilmesi için Realtrack Seego marka nabız monitörleme sistemi ile takip edilmiştir. Ayrıca BORG skalası ile her bir egzersiz sonunda algıladıkları zorluk dereceleri kaydedilmiştir. Gruplar arası karşılaştırma yapıldığında, vücut ağırlığı, beden kütle indeksi (BKI), vücut yağ yüzdesi ve maxVO₂, değerlerinde zumba grubu lehine istatistiksel olarak anlamlı fark tespit edilmiştir. Kuvvet ve kan lipit parametrelerinde ise gruplar arası istatistiksel olarak anlamlı fark tespit edilememiştir. Uygulamaların her bir seans süresi ve toplam süreleri ayrıca grup içi değişimler değerlendirildiğinde hem EMS hem de zumba uygulamasının vücut kompozisyonu, kuvvet ve kan lipit düzeyleri üzerinde olumlu etkileri olduğu söylenebilir.

Anahtar kelimeler: Elektromyostimülasyon, Zumba, Sedanter

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INTRODUCTION

As a result of technological developments and developments in industrialization in recent years, physical inactivity increased, so serious health problems increased in the world and in Turkey, and the quality of life was adversely affected (Atan et al., 2012; Keskin and Tokat, 2023). The World Health Organization (WHO) recognized physical inactivity as a global public health problem and reported it among the global risk factors for death, along with hypertension and obesity (Benjamin et al., 2017). It was reported that high inactivity levels (43.7%) were reached between 2001-2016 in Europe and many world countries, and therefore there is a great increase in participation in sports and physical activity in the last few years, especially by women, after reports of increased health problems were published (Guthold et al., 2018; Stamatakis and Chaudhury, 2008; Vendramin et al., 2016). Again, the American College of Sports Medicine (ACSM) recommends 75 to 150 minutes of moderate-intensity exercise per week in order to eliminate these negativities and to lead a healthy life. In addition to this, ACSM recommends adding strengthening activities that appeal to whole body muscle groups for at least two days (Garber et al., 2011). In line with the recommendations, new exercise methods are now used to reduce inactivity and to bring about positive changes in the perspective of health and performance (Jirathananuwat and Pongpirul, 2017; Lassen et al., 2018; Tokat and Keskin, 2023). Exercises such as zumba, EMS, and pilates are now most preferred training routines, especially for women (Aukštuolytė et al., 2018).

EMS is one of the exercise methods coming to the fore with the development of technology. EMS is an electrical muscle simulation that increases muscle strength and performance and enables simultaneous contraction of all fibers that make up the muscle especially by improving the intramuscular coordination of major muscle groups (Duchateau, 2007; Stojanovic et al., 2017; Vanderthommen and). EMS is performed in two ways, local and whole-body (Tiggemann et al., 2010). While the local EMS exercise is based on the exercise of current to the motor point of one or two muscle groups, the whole-body EMS exercise is based on the exercise of the same current over a large area and across several major muscle groups (Maffiuletti et al., 2009; Wirtz, Zinner et al., 2016). The EMS system, which has a powerful battery as a wireless electrical stimulator, allows muscle activation in the posterior thigh, arm, hip, abdomen, and chest muscles with the help of channels. These devices are managed by a software with the help of available parameters and channels that allow the intensity of each individual to be changed. EMS exercises lasting 20-25 minutes provide a concentrated effect by working all major muscle groups (Kemmler et al., 2012; Kemmler et al., 2018). For these reasons, EMS is an exercise method that positively affects muscle mass, fat mass and functional capacity, provides high adaptation in those who do not exercise, saves time and is also less physically tiring.

Zumba is a new fitness version that emerged in Colombia in the 1990s and is hugely popular around the world, inspired by dance-based Latin American music, basic aerobic steps, and other dances such as Indian, African dance (Perez and Greenwood-Robinson, 2009). It is a combination of exercises that increase calorie consumption, improve the cardiovascular system, increase the endurance of the whole body, and are based on aerobic training (Ljubojević et al., 2014). A

standard zumba exercise lasts about an hour and includes many dance styles and many fitness movements such as forward lunges and squats, and a person burns an average of 500-1000 calories during the exercise (Laskowski, 2013). It was determined by some studies that Zumba, a cardio-dance program that gained popularity in fitness programs, increases the motivation to be physically active, is effective in the development of body composition and muscle strength, and can be effective in the development of balance, quality of life, aerobic capacity, and cardiovascular system (Donath et al., 2014; Vendramin et al., 2016). According to a study conducted by the American Council on Exercise in 2012, apart from the fun factor, zumba program burns more calories than cardio, kickboxing, yoga, jogging, hula hoop, and step aerobics (Luettgen et al., 2012).

Although there are studies that discuss that EMS and zumba exercises have positive results on parameters such as body composition and muscle strength (Barene et al., 2014; Brocheri et al. 2005; Cugusi et al. 2015; Donath et al., 2014; Herrero et al. 2006; Krishnan et al., 2015; Micallef, 2014), people have a question point about which one will be more beneficial and there are limited studies in the literature to eliminate this question point. In this context, in this study, it is aimed to compare the effects of these two exercise practices, the effectiveness and benefits of which are frequently reported, on healthy sedentary women.

METHODS

Research Model

The research was designed with an experimental model, one of the quantitative research methods. In the study, the pretest-posttest control group design was preferred. In this design, measurements related to the dependent variable were applied to the participants before and after the experimental protocol (Büyüköztürk et al., 2012).

Research Group

A total of 30 women whose age average is 28 ± 2.3 years and who have no health problems participated in the study voluntarily. The participants were randomly divided into two groups as performing EMS (n:15) and performing zumba (n:15) exercises. Both groups were subjected to whole body EMS (WB-EMS) exercise and Zumba exercise twice a week for 6 weeks. The personalized diet programs of the participants were prepared by a specialist dietitian for 6 weeks and were controlled according to the body composition and hematological and biochemical parameters of each person. All measurements were taken twice, before and after exercise.

EMS Exercise Program

The exercise program was carried out twice a week, 20 minutes/session per day for 6 weeks. EMS was applied with bipolar impulses with a frequency of 85 Hz and a pulse width of 350 μ s. A 30 second stimulation was followed by a 10 second stimulation rest. Exercises: high knees, jumping jack, plank, squat, lunge, crunch, push up, which are suitable for each participant and easy to apply, were applied in order to stimulate upper leg, upper arm, lower abdomen, chest, lower back, upper back and latissimus dorsi muscles (Kemmler et al., 2010; Kemmler and Stengel, 2013; Schink et al., 2018). The values of the participants in each exercise (beats/min) for 6 weeks were determined by Realtrack Seego brand heart rate monitoring system (Spain), and the mean heart rate for the EMS exercise was determined as 151 ± 5.6 beats/min. Rate of perceived exertion (Borg, CR-20 scala) was saved immediately after each EMS exercise.

Zumba Exercise Program

Zumba exercise program was carried out twice a week, 45 minutes/session per day for 6 weeks. Each zumba training includes 60 minutes of zumba® basic1 principles (warm-up, the main part of the workout is zumba dances, cool-down and stretching) (Perez and Greenwood-Robinson, 2009). The exercise intensity is determined by the tempo of the music that changes during the exercise segments. The warm-up lasted 8-10 minutes (tempo 100-120 bpm) with basic dance steps (starter, step, sidesteps, etc.) with gradually accelerating music tempo. The main phase of the Zumba exercise was performed with original zumba fitness songs for 8-10 minutes. With the change of music, dance choreographies and movement intensity were also changed (tempo between 140-160 beats/min). In the main phase of Basic1 zumba exercises, generally Latin American dance choreographies such as merengue, salsa, samba, belly dance, cha cha cha, tango, etc. are used. The intensity and density of the exercise are determined by the differences between the character and dynamics of the movement (Lukić, 2006). Each dance choreography lasts 3-5 minutes, with 15-30 seconds of passive rest. At the end of the exercise, slower cooling movements were performed accompanied by slow music for mental and physical relaxation (musical tempo -90 beats/min). The intensity of the exercise was adjusted using cadence sticks (zumba cadence program) and by changing the character of the dance movements in the presented choreographies. The values of the participants in each exercise (beats/min) for 4 weeks were determined by the Realtrack Seego brand heart rate monitoring system (Spain), and the mean heart rate for the EMS exercise was determined as 120 ± 4.3 beats/min. Rate of perceived exertion (Borg, CR-10 scala) was saved immediately after each zumba exercise.

Data Collection Tools

Body Composition: While the height (cm) of the participants was measured with a stadiometer, Inbody 270 body analysis measuring device was used for the body weight (kg), Body mass index (BMI) (kg/m^2), body fat percentage (%), body fat mass (kg) and body muscle percentage (%).

Isometric Contraction Power: Takei brand dynamometer was used to determine isometric leg and back strength. The dynamometer was adjusted according to the participant's foot length, then the

participant applied as much force as possible to the device. The best result obtained by the participant as a result of two trials was accepted as the highest value.

Grasping strength: Holtin brand hand dynamometer was used for grasping strength. The best result obtained by the participant as a result of two trials was accepted as the highest value.

Blood Pressure: Systolic and diastolic blood pressures were measured with the “Omron” brand digital blood pressure device.

Rockport 1-mile Walk Test (VO_{2max}): The participants were asked to walk 1 mile (1609 m) as fast as possible with the start of the stopwatch. The mean number of heart beats per minute of the participant who completed 1 mile and completion time were recorded in the measurement chart. The participants' VO_{2max} values were estimated using the values recorded later and the VO_{2max} formula.

Blood laboratory tests: The participants' Glucose, Hemoglobin (HGB), HDL, LDL and total Cholesterol and Triglyceride levels were examined in the health center before and after exercise under doctor control.

Determination of Exercise Load and Intensity: Realtrack Seego brand heart rate monitoring system (Spain), which instantly records the maximum heart rate (HR_{max}) (beats/min), mean heart rate (beats/min), total calories burned (kcal) values, was used to determine and follow the load and intensity of each exercise for 6 weeks, and the values were recorded by the researcher following the monitor.

Rate of perceived exertion (RPE): Rate of perceived exertion was collected within 30 minutes after each workout using a modified Borg scale of 10. Each participant was asked the question of "What is your perceived exertion in the exercise?" to calculate the exercise load (Borg, 1998; Impellizzeri et al., 2004).

Regulation of Nutrition Programs: Each participant was interviewed face-to-face by a specialist dietitian. A personalized nutrition program was arranged according to the laboratory test results, body analysis values (body fat, muscle mass, body water ratios), lifestyle and nutritional habits of the participant. The daily calorie intake was determined to be above the Basal Metabolic Rate (BMR) and the protein value to be at least 1.5 g/kg.

Ethical Approval

All participants signed an “Informed Consent Form” stating that they voluntarily participated in the study. The study procedures followed the principles outlined in the Declaration of Helsinki and were approved by Karabuk University, Non-interventional Clinical Ethics Committee (2021/573).

Analysis of Data

For the analysis of the data the SPSS 23.0 package program was used. In order to determine whether the numeric variables were normally distributed or not, the Shapiro-Wilk test was used. In order to determine whether there was a difference between the groups or not, the “Paired Samples T test” was used. While the pre- and post-exercise values of the groups were compared with the Wilcoxon Test, the comparison of the two groups was performed using the One-way Anova-Tukey test. All analyses were processed at the significance level of 0.05.

RESULTS

Table 1. Comparison of the body composition values of the groups

Parameters	Group	Pre-Test Mean±SD	Post-Test Mean±SD	t	p	p
Body Weight (kg)	EMS Group	65.2±2.52	64.9±2.47	7.79	0.45	0.00*
	Zumba Group	70±3.05	67.6±2.88	6.03	0.00*	
BMI (kg/m²)	EMS Group	25±0.76	24.8±0.76	1.08	0.3	0.01*
	Zumba Group	26.2±0.99	25.1±0.96	4.69	0.00*	
Body Fat Percentage (%)	EMS Group	32.5±1.49	31.5±1.83	1.96	0.08	0.15
	Zumba Group	33.4±1.65	31.5±1.82	4.39	0.00*	
Body Fat Mass (kg)	EMS Group	21.4±1.48	20.9±1.74	1.33	0.21	0.04*
	Zumba Group	23.7±1.95	21.9±1.98	5.35	0.00*	
Body Muscle Mass (kg)	EMS Group	23.9±0.94	24.3±0.89	-2.52	0.03*	0.91
	Zumba Group	25.5±1.1	25.9±0.99	-1.08	0.29	

Data presented as mean ± SD. * p ≤ 0.05.

When the in-group evaluation was examined, while there was significance in body weight (kg), BMI (kg/m²), body fat percentage (%), body fat mass (kg) values in the Zumba group, there was statistical significance in the body muscle mass (kg) in the EMS group (p< 0.05). When the difference between the groups was examined, significance was found in body weight (kg), BMI (kg/m²) and body fat mass (kg) values (p<0.05).

Table 2. Comparison of the strength values of the groups

Parameters	Group	Pre-Test Mean±SD	Post-Test Mean±SD	t	p	p
Right Hand Grasping Strength (kg)	EMS Group	25.7±1.1	27.1±0.89	-2.36	0.04*	0.16
	Zumba Group	27.1±1.53	29.9±1.51	-5.12	0.00*	
Left Hand Grasping Strength (kg)	EMS Group	22.7±0.96	23.4±0.83	-1.41	0.19	0.32
	Zumba Group	26±1.39	28.2±1.22	-2.5	0.03*	
Leg Strength (kg)	EMS Group	70.5±4.34	73.3±4.04	-0.56	0.59	0.53
	Zumba Group	71.9±3.81	80.3±4.56	-2.43	0.03*	
Back Strength (kg)	EMS Group	60.9±3.08	65.6±3.92	-1.29	0.23	0.37
	Zumba Group	75.2±3.18	77.3±3.37	-1.33	0.21	

Data presented as mean ± SD. *p≤0.05.

When the in-group evaluation was examined, while significance was found in right hand grasping strength (kg) in both groups, significance was found in left hand grasping strength (kg), leg strength (kg) and back strength (kg) in the Zumba group ($p < 0.05$). When the difference between the groups was examined, no significance was found in all parameters.

Table 3. Comparison of the blood pressure and VO_{2max} values of the groups

Parameters	Group	Pre-Test Mean±SD	Post-Test Mean±SD	t	p	p
Systolic Blood Pressure (mmHg)	EMS Group	116±3.74	119±3.87	-0.83	0.23	0.23
	Zumba Group	123.8±3.37	117.4±3.56	1.23	0.00*	
Diastolic Blood Pressure (mmHg)	EMS Group	77.9±2.28	75.5±2.69	0.96	1.00	1.00
	Zumba Group	75.8±2.19	73.9±3.06	0.49	0.03*	
VO_{2max}(ml/kg/dk)	EMS Group	38.9±1.34	38.8±1.5	0.29	0.01*	0.01*
	Zumba Group	39.1±1.37	41.9±1.47	-3.81	0.03*	

Data presented as mean ± SD. * $p \leq 0.05$.

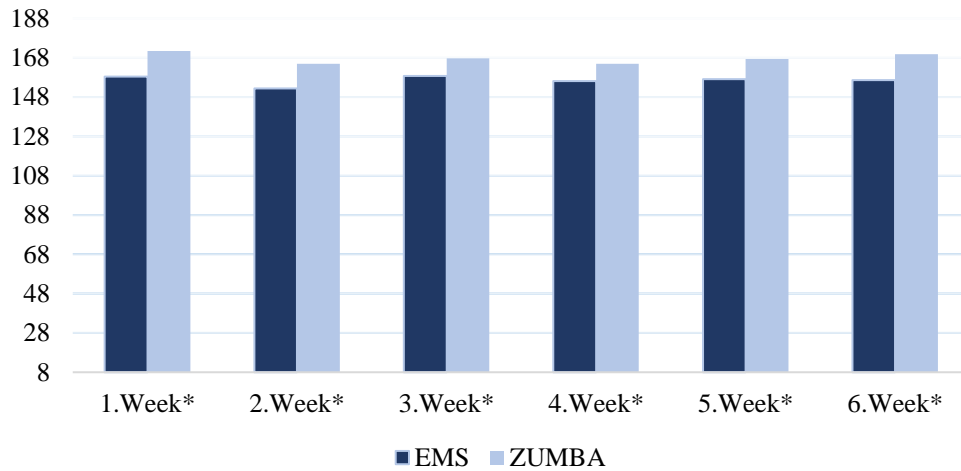
When the in-group evaluation was examined, statistically significant values were found in diastolic (mmHg) and systolic (mmHg) blood pressure and VO_{2max} values in the Zumba group. There was a significant difference in VO_{2max} (ml/kg/min) value in both groups. ($p < 0.05$).

Table 3. Comparison of the blood values of the groups

Parameters	Group	Pre-Test Mean±SD	Post-Test Mean±SD	t	p	p
HGB (g/dl)	EMS Group	12.8±0.35	12.9±0.32	-0.26	0.79	0.35
	Zumba Group	12.1±0.46	12.4±0.26	-1.26	0.23	
Glucose (mg/dl)	EMS Group	86.9±2.18	85.1±2.15	1.15	0.28	0.53
	Zumba Group	91.8±2.17	89.6±2.1	0.96	0.35	
HDL Cholesterol (mg/dl)	EMS Group	65.7±4.55	67.4±3.53	-0.95	0.37	0.66
	Zumba Group	61.7±3.43	62.1±2.97	-0.36	0.72	
LDL Cholesterol (mg/dl)	EMS Group	108.2±6.85	103.3±5.86	2.23	0.04*	0.37
	Zumba Group	106.2±6.83	98.6±4.65	2.19	0.04*	
Total Cholesterol (mg/dl)	EMS Group	189.7±7.07	184.6±6.88	2.35	0.04*	0.66
	Zumba Group	181.9±8.75	174.6±8.72	0.57	0.14	
Triglyceride (mg/dl)	EMS Group	181.7±7.31	79.6±7.02	0.72	0.49	0.19
	Zumba Group	85.4±10.6	71.6±8.98	27.8	0.02*	

Data presented as mean ± SD. * $p \leq 0.05$.

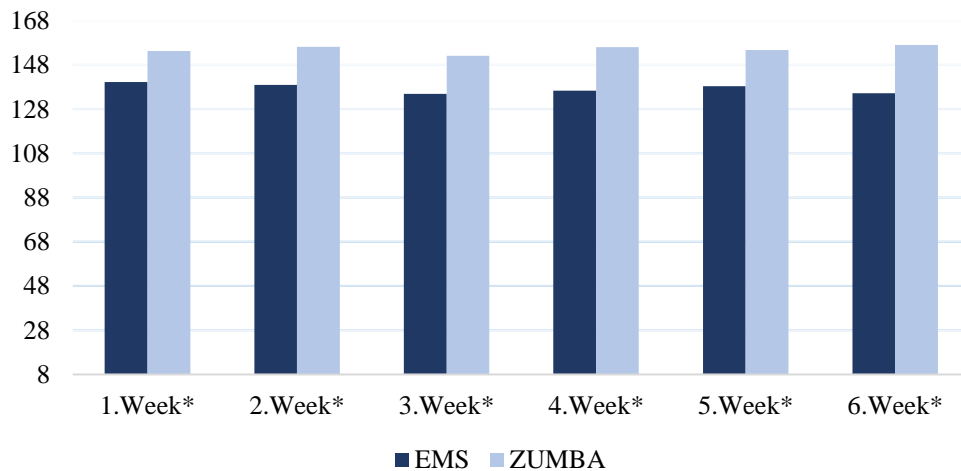
When the in-group evaluation was examined, the decrease in LDL cholesterol and total cholesterol values in the EMS group, and LDL cholesterol and Triglyceride values in the Zumba group were found to be statistically significant ($p < 0.05$). When the difference between the groups was examined, no significant difference was found in all parameters.



*p<0.05

Figure 1. Comparison of maximum heart rates (beat/min) of the groups during the exercise

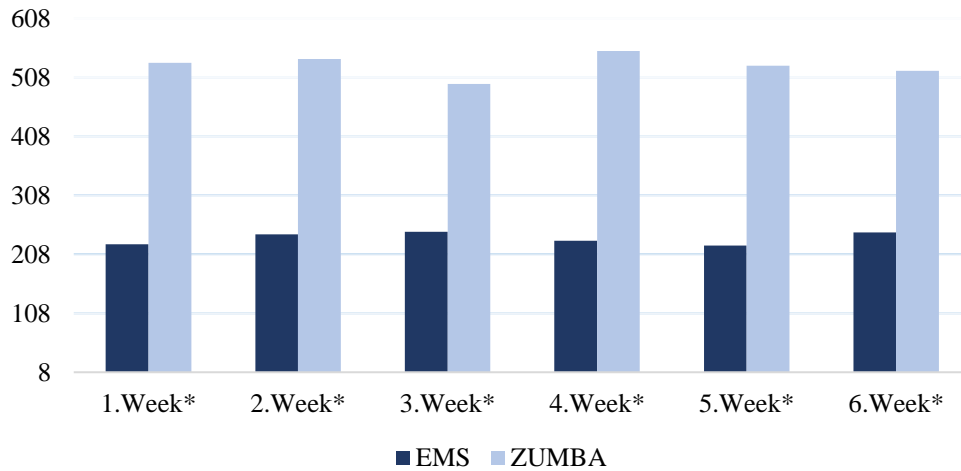
When the difference between the groups in the maximum heart rate recorded during zumba and EMS exercise for 6 weeks was examined, a significant difference was found at all weeks ($p<0.05$).



*p<0.05

Figure 2. Comparison of average heart rates (beat/min) of the groups during the exercise

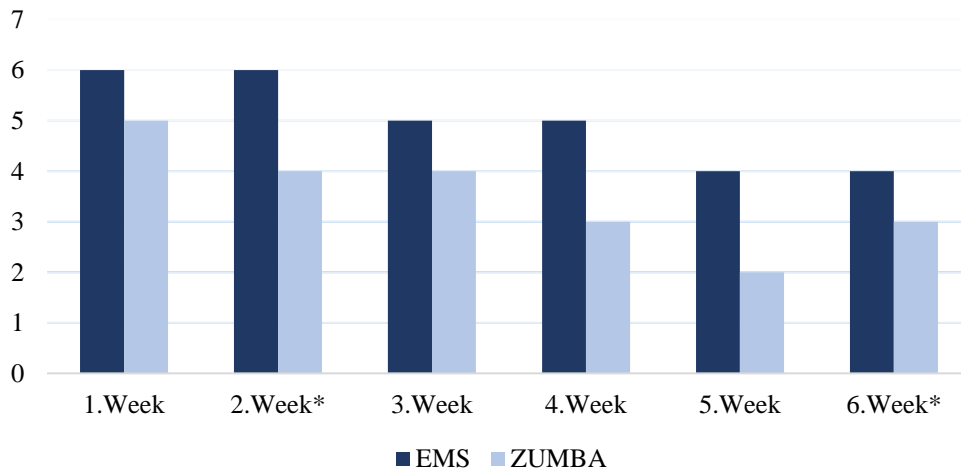
When the difference between the groups in the average heart rate recorded during zumba and EMS exercise for 6 weeks was examined, a significant difference was found at the all weeks ($p<0.05$).



*p<0.05

Figure 3. Comparison of the groups' total calories burned during the exercise (kcal)

When the difference between the groups in the total calories burned recorded during zumba and EMS exercise for 6 weeks was examined, a significant difference was found at all weeks (p<0.05).



*p<0.05

Figure 4. Perceived difficulty level immediately after 6 weeks of EMS exercise and zumba exercise

When the difference between the groups in the perceived difficulty level recorded immediately after the exercise for 6 weeks was examined, a significant difference was found at the 2nd and 5th weeks (p<0.05).

DISCUSSION AND CONCLUSION

The main finding of this study showed that Zumba exercises were more effective than EMS exercises on body weight, BMI (kg/m^2), body fat percentage (%), body fat mass, leg strength, diastolic and systolic blood pressure, and triglyceride. Moreover, positive improvement was detected regarding $\text{VO}_{2\text{max}}$ in favor of zumba and regarding LDL in both methods. Furthermore, although it was not significant, in both groups improvement in glucose values was detected. No change was detected in HGB values. However, some results in favor of the EMS group were obtained on total cholesterol and body fat mass.

Most studies examining the effects of Zumba exercise showed a mild to moderate reduction in body weight ranging from 1% to 3.6% of total body mass (Barene et al., 2014; Cugusi et al., 2015; Krishnan et al., 2015; Micallef, 2014). Similarly, 5 different studies showed a decrease in BMI values (Barene et al., 2014; Donath et al., 2014; Krishnan et al., 2015; Micallef, 2014). After 12 weeks of zumba exercise, BMI decreased by 3.7% (Cugusi et al., 2015), after 8 weeks of zumba exercise, it decreased by 2.5% (Micallef, 2014) and 1.8% (Donath et al., 2014). They reported that body fat mass decreased by 2% (Krishnan et al., 2015) after 16 weeks of zumba exercise and 3.5% (Ljubojević et al., 2014) after 8 weeks of zumba exercise. In the study by Bayrakdar et al. (2020), in which they investigated the effects of regular zumba exercises on anthropometric characteristics, they stated that 20 women with an average age of 38.25 ± 4.22 year performed zumba exercises for 12 weeks and there were significant differences in body weight, BMI, and body fat percentage. The findings of studies investigating the effects of Zumba exercise on body composition are in line with the findings of our study. When the studies examining the effects of Zumba exercise on maximal oxygen consumption ($\text{VO}_{2\text{max}}$) were examined, Krishnan et al., (2015) reported an improvement of 7.1% after 16 weeks of Zumba exercise. Donath et al. (2014), stated that there was a significant 21% increase in $\text{VO}_{2\text{max}}$ in the 6-minute walking test, which is a field test after zumba exercise. In our study, in parallel with the results in the literature, a significant increase in $\text{VO}_{2\text{max}}$ was found in the Zumba group. In studies examining systolic blood pressure (SBP), while only two studies found decreases in both SBP and diastolic blood pressure (Araneta and Tanori, 2015; Cugusi et al., 2015), other studies found no change (Barene et al., 2014; Krishnan et al., 2015). In our study, there was a decrease in both systolic and diastolic blood pressure. While Krishnan et al., (2015) stated that 16-week Zumba exercise led to a significant increase in lower extremity strength (16.4%), Cugusi et al., (2015) reported no difference in hand grasping strength. Moreover, Donath et al., (2014) stated that muscle strength did not change after 8 weeks of zumba exercise. In a study similar to the findings of our study (Araneta and Tanori, 2015), a significant decrease of 11.3% was found in triglyceride values after 12 weeks of regular Zumba exercise. In studies examining the effects on blood parameters after Zumba exercise, no changes were found in cholesterol values (Araneta and Tanori, 2015; Barene et al., 2014; Cugusi et al., 2015; Krishnan et al., 2015), glucose values (Araneta and Tanori, 2015; Barene et al., 2014; Cugusi et al., 2015; Krishnan et al., 2015) insulin (Krishnan et al., 2015), and hemoglobin values (Barene et al., 2014; Krishnan et al., 2015). Similarly, it was revealed that there was no change in triglyceride levels (Barene et al., 2014; Cugusi et al., 2015; Krishnan et al., 2015).

When the studies discussing the effects of EMS exercise are examined, in parallel with the findings of our study, in their study. Herrero et al., (2006) found a significant increase in strength (9.1% $p < 0.05$) after 53 contractions (3 seconds of stimulation-30 seconds of rest, 120 Hz) applied following 5 Hz warming with EMS 4 days a week for 4 weeks as a result of their study they performed on 40 healthy individuals. Brocheri et al. (2005) found a significant increase in isokinetic strength ($p < 0.05$) in the study they conducted on 17 ice hockey players, who applied 30 contractions (4 seconds, 85 Hz) with EMS 3 days a week for 3 weeks. In the study conducted on basketball players, a significant increase was observed in isometric strength parameter ($p < 0.01$) and squat jump performance ($p < 0.01$) in athletes who applied 48 contractions (3 seconds of stimulation-17 seconds of rest, 100 Hz) with EMS 3 days a week for 4 weeks (Maffiuletti et al., 2000).

Overall, our results show that Zumba and EMS can improve body composition, strength, and blood lipids. We observed that Zumba groups significantly improved aerobic fitness (VO_{2max}), It is seen that the zumba group works with more heart rate average and burn more calories during exercise. However, rate of perceived exertion in zumba exercise is also lower.

This study revealed that a 6-week EMS and Zumba exercise positively affects body composition, strength and blood lipids. Although limitations of the small sample the data revealed that Zumba is more effective than EMS for the restoration of aerobic fitness to baseline levels after training period. Considering that Zumba is also practicable in terms of RPE compared to EMS, Zumba can be an alternative method to improve the desired physical condition. In the light of this information, Zumba methods applied in different forms can be preferred as a more effective training strategy to improve aerobic fitness and general health conditions for trainers and recreational exercisers.

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Ethical Approval

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Do Bosu Ball Exercises Affect Countermovement Jump and Squad Jump Performance in Basketball Players?

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Abstract

This research was conducted to examine the effect of eight-week bosu ball exercises on vertical jump and strength performance in basketball players. The sample group of the research was composed of a total of 40 male basketball players, including 20 players in the experimental group and 20 players in the control group, who have been certified basketball players for at least two years at the at the Provincial Directorate of Youth and Sports Bingol province. Basketball training sessions of 60 minutes were applied to the athletes 3 days a week and continued for 8 weeks. The experimental group underwent an additional 30 minutes of bosu ball exercises. Anthropometric, vertical jump and strength measurements were respectively taken. In addition, comparisons between groups were made with Repeated Measures. According to the results of the evaluation, it was found that there was a statistically significant difference in vertical jump Countermovement Jump (CMJ) values in the comparison between the pre-test and post-test groups of the experimental and control group ($p<0.05$). There was no significant difference in back strength values between the pre-test and post-test groups of the experimental and control group ($p>0.05$). A statistically significant difference was found in the leg strength values between the pre-test and post-test groups of the experimental and control group ($p>0.05$). As a result, we think that bosu ball exercises affect the strength of the muscles in the leg area and thus can significantly affect the vertical jump and strength performance of athletes.

Keywords: Bosu ball, Countermovement jump, Squad jump, Strength

Basketbolcularda Bosu Ball Egzersizlerinin Countermovement Sıçrama ve Squad Sıçrama Performansına Etkisi Var mıdır?

Öz

Bu araştırma, basketbolcularda sekiz haftalık bosu ball egzersizlerinin dikey sıçrama ve kuvvet performansına etkisini incelemek amacıyla yapıldı. Araştırmanın örneklem grubunu Bingöl ili, Gençlik ve Spor İl Müdürlüğünde, en az iki yıl lisanslı olarak basketbol oynayan 20 deney 20 kontrol olmak üzere toplam 40 erkek basketbolcudan oluşturuldu. Sporculara haftanın 3 günü olacak şekilde 60 dakika basketbol antrenmanları uygulandı ve 8 hafta boyunca devam etti. Deney grubuna ek olarak 30 dakika bosu ball egzersizleri uygulandı. Sırasıyla antropometrik, dikey sıçrama ve kuvvet ölçümleri alındı. Test sonuçlarına göre grup içi bağımlı değişkenlerin karşılaştırılmasında bağımlı iki örneklem testi yapıldı. Ayrıca gruplar arası karşılaştırmalar tekrarlı ölçümler ile yapıldı. Yapılan değerlendirme sonucuna göre dikey sıçrama Countermovement Jump (CMJ) değerlerinde deney ve kontrol grubunun ön test ve son test gruplar arası karşılaştırmasında istatistiksel olarak anlamlı fark olduğu tespit edildi ($p<0.05$). Sırt kuvveti değerlerinde deney ve kontrol grubunun ön test ve son test gruplar arası karşılaştırmasında anlamlı farklılık tespit edilmedi ($p>0.05$). Bacak kuvveti değerlerinde deney ve kontrol grubunun ön test ve son test gruplar arası karşılaştırmasında istatistiksel olarak anlamlı farklılık tespit edildi ($p>0.05$). Sonuç olarak, bosu ball egzersizlerinin bacak bölgesinde bulunan kasların gücü etkilediği bu sayede sporcuların dikey sıçrama ve kuvvet performansına önemli oranda etkileyebileceğini düşünmekteyiz.

Anahtar kelimeler: Bosu ball, Countermovement Sıçrama, Squad Sıçrama, Kuvvet

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INTRODUCTION

Improving and peaking performance is the main goal of all coaches and athletes. In order to improve performance, it is important to apply it according to scientific principles in this regard. The effects of various types of muscle-building training, muscle fiber types, muscle biochemistry, and increasing the knowledge gained about nerve-muscle response provide new opportunities for coaches to train the athlete better (Acemoğlu, 2007). In basketball physiological capacity, physical structure, biomotoric characteristics, technical-tactical understanding, team discipline, psychological state, and coach occupy a very important place (Kılınç, 2008).

When we look at the basketball branch, it is seen that it has an aerobic energy system (Delextrat and Cohend, 2009; Meckell et al., 2009; Metaxas et al., 2009). Explosive power is highly needed in the game and is often used. Actions such as jumping, sudden turns, sudden acceleration and stopping involve explosive movement and muscle strength is important to be able to perform these actions (Alemdaroğlu, 2012; Erculj et al., 2010; Pliauga et al., 2015). Because in basketball, a player makes a minimum of 50 jumps during the competition, in addition to linear and directional runs of 10-20 m (Drinkwater et al., 2008). It is very important that the movement performed in defensive and offensive organizations during the game happens effectively, for this purpose, the ability to move quickly during the game with a repeated good jump must be combined with other technical actions (Pliauga et al., 2015).

The jumping ability has critical importance for performance in many sports, especially basketball, football, and volleyball (Aragón-Vargas and Gross, 1997). Jumping ability is often tested as an assessment of lower limb strength and power (Carlock et al., 2004). A common method of testing jumping ability is the use of jump and reach tests such as vertical jump tests (Leard et al., 2007). Maximal strength, strength development speed (Carvalho et al., 2014), and muscle stiffness (Driss et al., 2015) are important factors in vertical jump performance.

The bosu ball makes a significant contribution to the acquisition of the general fitness of the body and physical characteristics (Badr, 2013). Aerobic exercise programs are used to increase the strength of the upper and lower limb and central muscles. In addition, the bosu ball can be designed for the development of strength and balance (Şan, 2017). Body composition is the amount of fatty tissue, muscle tissue, and bone in the body (Şahin, 2020). Bosu exercises contribute to growth hormone, and muscle formation as well as burning fat by accelerating blood circulation in the body. Because of having such benefits, it is generally used by people who practice bosu exercises to do cardio exercises, to increase the strength of the lower body and central muscles (Turgut et al., 2018).

The type of exercise and the type of training are among the biggest factors in achieving success. These exercise programs, which contribute to the development of strength and jumping of basketball players, have attracted a lot of attention from coaches, and it has become important to

examine the effects of the bosu ball, which is actively used by basketball clubs today on anaerobic power, balance, jump, and strength in different branches. Based on this information, the aim of this study is to examine the effect of bosu ball exercises on basketball players' jumping and strength ability. According to the research, the hypothesis of the study is that bosu ball exercises have an effect on vertical jump and strength parameters.

METHOD

Research Model

This study was based on the pre-test, post-test, experimental and control group test models. Then, an interview was conducted with each participant who volunteered to participate in the research and written and oral information was provided about the purpose of the research, its duration, the tools used in the research, and the evaluation system (Büyüköztürk et al., 2012).

Research Group

The research group was composed of a total of 40 male basketball players, including 20 players in the experimental group and 20 players in the control group, who have been certified basketball players for at least two years at the Youth and Sports Services sports club in Bingol province. The average age of the experimental group was 14.75 ± 0.78 (years), the average height was 169 ± 0.09 (cm), the average weight was 53.48 ± 9.62 (kg), and the average BMI was 18.61 ± 2.19 (kg/cm^2) and the average age of the control group was 14.75 ± 0.17 (years), the average height was 164 ± 0.05 (cm), the average weight was 47.94 ± 7.79 (kg), and the average BMI was 17.67 ± 2.05 (kg/cm^2).

Field test protocols along with anthropometric measurements were applied to the volunteers taking part in the research. All measurements were applied to the participants in the morning (between 10.00 and 12.00) as they feel rested. Participants were informed 24 hours before about avoiding strenuous exercise, stimulating types of tea, coffee, alcohol, and carbonated beverages. Before the study, the parental consent form was signed for the athletes and all possible situations that may be encountered during the tests were explained in detail.

Research Protocol

All participants who accepted to participate in the study were told in detail the information about the tests and training content to be applied before the study, and the exercises used in the study were shown and taught in practice one week before the study. Anthropometric, vertical jump, and strength measurements were taken respectively to obtain the pre-test data of the participants.

Afterward, basketball training sessions of 60 minutes were applied to both groups 3 days a week and continued for 8 weeks. However, in addition to basketball training, the experimental group was given bosu ball exercises for 30 minutes before starting their training. At the end of the eighth

week, anthropometric, vertical jump, and strength measurements were taken again respectively to obtain the post-test data of both groups.

Data Collection Tools

Height, Weight, and Body Mass Index: The weight measurements of the participants were measured with the Inbody brand Tanita body analyzer with an accuracy of ± 1 mm and were registered in kg. Heights were measured as volunteers were asked to hold their breath, be in the anatomical posture position, bare feet, heels together, the head in the frontal plane, and the overhead table touching the vertex point and the values were recorded in cm. The body mass index of the athletes was calculated by dividing the body weight (kg) by the square of the height (m) value (kg/m^2) (Sever, 2018).

Vertical Jump Measurements: Microgate Witty jumping mat was used to determine the vertical jump measurements of the participants. Vertical jump performance was measured with this instrument, which measures the hang time. Two different jumping test protocols were applied.

Countermovement Jump (CMJ) Test: The hands are placed on the hips and remain there throughout the test. When the subject is ready, the subject squats until his knees are bent 90 degrees, then immediately jumps vertically as high as possible and falls back on the mat on both feet at the same time (Sharma et al., 2020).

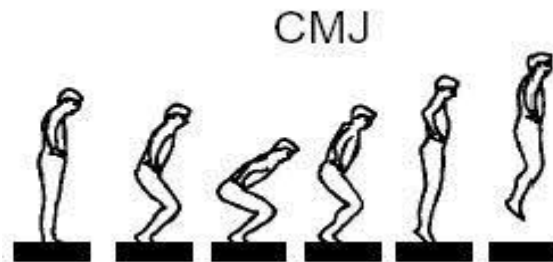


Figure 1. Countermovement Jump

Squad Jump (SJ) Test: It starts in a fixed position by bending the knee joint until 90 degrees. When the subject is ready after the bent, it is performed by opening the knee joint with the feet pushing the ground and getting strength from the ground. It is a test protocol in which the jump strength is measured vertically. In the test, 2 attempts were given, and the highest score was considered valid.

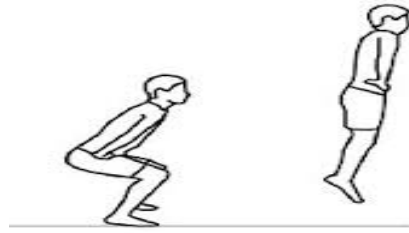


Figure 2. Squad Jump

Measurement of Leg Strength: Measurements were made using Takei TKK 5402 Japan brand back and leg dynamometer for the leg strength measurements of the volunteers. After placing their feet on the dynamometer bench with their knees straighten, the volunteers grasped the dynamometer bar firmly with their hands and pulled it vertically upwards as much as possible in the position of the arms stretched, the back straight and the body slightly bent forward (Zorba, 2017). The volunteers were given two attempts, and the best rating was calculated.

Back Strength: Takei TKK 5402 Japan brand back muscle dynamometer was used. Volunteers were asked to pull the bar toward themselves with all their strength, with the chest bent forward 90 degrees on the hips, and knees in the full extension position (Zorba, 2017). Two attempts were given, and the best score was recorded in kg.

Table 1. Bosu ball exercises and training schedule

1st Move: Squat with arms in front and two feet on the bosu ball placed upside down				
2nd Move: Squat with arms in front and one foot on the bosu ball placed upside down				
3rd Move: Respectively opening the legs to the right and left in 5 repetitions with both feet on the bosu ball placed upside down.				
4th Move: Bending forward while lifting one leg backward 90 degrees with both feet on the bosu ball placed upside down.				
5th Move: Push-ups with both arms on the bosu ball				
6th Move: Sit-ups with the back on the bosu ball				
7th Move: Lunge towards front and back by changing feet on the bosu ball				
8th Move: Pulling the knees up respectively with both feet on the bosu ball				
Week	Days	Moves	Reps and Sets	Rest
8 Weeks	Monday	1-2-3 rd moves	12 x 3 sets	30 sec rest
	Wednesday	4-5-6 th moves	12 x 3 sets	30 sec rest
	Friday	7-8 th moves	12 x 3 sets	30 sec rest

Ethical Approval

Before starting the research, approval was obtained from Bingöl University Health Sciences Scientific Research and Publication Ethics Committee on 07.04.2023, with Resolution 11 with a meeting numbered 23/08.

Data Analysis

The obtained data were evaluated with SPSS 25 statistical package software. The pre-test and post-test distribution of the variables of the research data according to the groups were examined, and the normality of the distributions and the homogeneity of the variances were determined via Mauchly Sphericity Test and Levene Test. According to the test results, Paired-Sample T-test was performed to compare the dependent variables in the group. In addition, comparisons between groups were made with Repeated Measure. All tests taken were expressed as arithmetic mean \pm standard deviation ($\bar{X}\pm sd$) and the significance level was accepted as $p<0.05$.

FINDINGS

Table 2. Arithmetic averages of age, height, weight, and BMI values of the participants

Variables	Experimental $\bar{x}\pm sd$	Control $\bar{x}\pm sd$
Age (years)	14.75 \pm 0.78	14.75 \pm 0.17
Height (cm)	1.69 \pm 0.09	1.64 \pm 0.05
Weight (kg)	53.48 \pm 9.62	47.94 \pm 7.79
BMI (kg/cm ²)	18.61 \pm 2.19	17.67 \pm 2.05

In Table 2, the average age of the experimental group was 14.75 \pm 0.78 (years), height was 1.69 \pm 0.09 (cm), weight was 53.48 \pm 9.62 (kg), the BMI average was 18.61 \pm 2.19 (kg/cm²), and the average age of the control group was 14.75 \pm 0.17 (years), height was 1.64 \pm 0.05 (cm), weight was 47.94 \pm 7.79 (kg), and the BMI average was 17.67 \pm 2.05 (kg/cm²).

Table 3. Comparisons of CMJ and SJ pre-test and post-test of the participants

Variables	Group	Pre-Test $\bar{x}\pm sd$	Post-Test $\bar{x}\pm sd$	Within-group variance (%)	t	p	Between-Groups	
							F	p
CMJ	Experimental	36.31 \pm 7.30	38.29 \pm 7.04	-1.98 (-5.45)	-5.174	0.000	5.737	0.022*
	Control	29.74 \pm 5.45	30.54 \pm 4.98	-0.8(-2.68)	-2.553	0.019		
SJ	Experimental	30.27 \pm 6.29	32.02 \pm 5.83	-1.75 (-5.78)	-3.266	0.004	0.65	0.801
	Control	26.02 \pm 4.91	27.58 \pm 3.92	-1.56(-5.99)	-3.163	0.005		

\bar{x} : Arithmetic Mean, SD: Standard Deviation, * $p<0.05$

When the vertical jump (CMJ) values of basketball players were examined in Table 3, it was found that there was a statistically significant difference in the comparison between the pre-test and post-test groups of the experimental and control group ($p<0.05$). In the within-group comparison of the

experimental group, an improvement of -5.45% was found and a statistically significant difference was identified ($p < 0.000$). In the within-group comparison of the control group, an improvement of -2.68% was found and a statistically significant difference was identified ($p < 0.01$). When the vertical jump (SJ) values of basketball players were examined, no statistically significant difference was found in the comparison between the pre-test and post-test groups of the experimental and control group ($p < 0.05$). In the within-group comparison of the experimental group, an improvement of -5.78% was found and a statistically significant difference was identified ($p < 0.004$). In the within-group comparison of the control group, an improvement of -5.99% was found and a statistically significant difference was identified ($p < 0.005$).

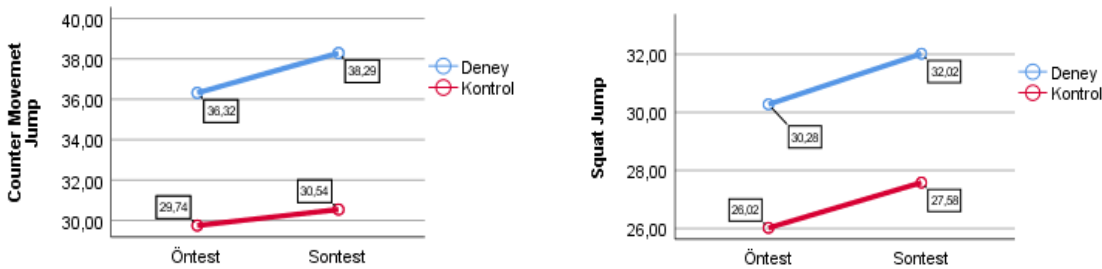


Figure 3. CMJ and SJ chart

Table 3. Comparisons of the strength pre-test and post-test of the participants

Variables	Group	Pre-Test $\bar{x} \pm sd$	Post-Test $\bar{x} \pm sd$	Within-group variance (%)	t	p	Between-Groups	
							F	p
Back Strength (kg)	Experimental	70.99±19.67	75.28±19.62	-4.29 (-6.04)	-1.967	0.064	1.743	0.195
	Control	69.40±20.53	70.64±19.42	-1.24 (-1.78)	-1.665	0.112		
Leg Strength (kg)	Experimental	58.05±15.38	66.91±16.12	-8.86 (-15.26)	-3.707	0.001	5.033	0.031*
	Control	62.65±16.47	64.67±14.62	-2.02 (-3.22)	-1.071	0.298		

\bar{x} : Arithmetic Mean, SD: Standard Deviation, * $p < 0.05$

When the back strength values of the basketball players were examined in Table 4, no significant differences were found in the pre-test and post-test within-group comparisons of the experimental and control group ($p > 0.05$). When the leg strength values were examined, a statistically significant difference was found in the comparison between the pre-test and post-test groups of the experimental and control groups ($p > 0.05$). In the within-group comparison of the experimental group, an improvement of -15.26% was found and a statistically significant difference was identified ($p < 0.001$). Although there was -3.22% improvement in the within-group comparison of the control group, no statistically significant difference was found ($p > 0.05$).

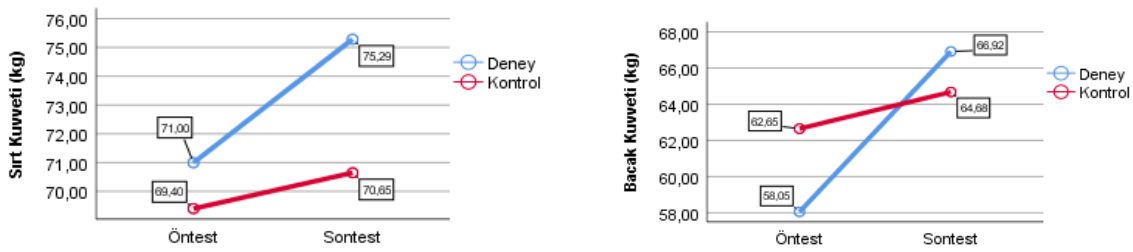


Figure 4. Back and leg strength chart

DISCUSSION AND CONCLUSION

Performance is the score that the athlete has concretely revealed as a result of the combination of physical, physiological, biomotoric, psychological, mental, technical, and tactical factors. Multiple factors affect this score obtained by the athlete. Researchers in many sports branches have worked on performance analysis with a holistic approach. In addition to determining the strengths and weaknesses of athletes, it is important to determine the training plans and programming according to the data obtained (Ostojic et al., 2006).

In this study, the vertical jump and strength improvements of bosu ball exercises performed for eight weeks on basketball players were examined. According to the results of the statistical analysis, statistically significant differences were found in the within-group comparison of the basketball players' experimental and control groups' vertical jump CMJ and SJ pre-test, and post-test. In the between-group comparison, a statistically significant difference in CMJ values was found between the experimental and control groups. And there was no statistically significant difference in SJ values between the experimental and control groups. According to the literature review, Gidu et al., (2018) reported in their study titled "The Effects of Proprioceptive Training on Balance, Strength, Agility and Dribbling in Adolescent Male Soccer Players" that there was a significant difference in CMJ values between the experimental and control group after 8 weeks of bosu exercise. Son et al., (2018) compared the effect of lower body strength training on vertical jump capacity with proprioceptive exercises in their study and they applied 4 supervised proprioceptive exercises including the Bosu ball stance, Rocket board, Bodyblade, and 4-minute single-leg stance exercises per workout station 3 days a week to the participants, and they reported that although there was an improvement in vertical jump SJ values, there was no significant difference. Aysan (2019) applied bosu ball strength exercises for 8 weeks in his study titled "Investigation of the Effect of Bosu Ball Strength Training on Some Parameters of 14-Year-Old Children" and obtained a statistically significant difference in vertical jump data $P < 0.05$. Safci (2018) used bosu ball in resistance training in his study titled "The Effect of 8-week Resistance Training on Some Strength Parameters in Male Basketball Players Aged 14-16" and according to

the study result, he reported a significant difference in vertical jump values between experimental and control group. Salot et al., (2020) reported in another study that the bosu exercise program applied for 6 weeks was effective in improving the vertical jump height of male soccer players. In the literature research conducted, it is seen that the bosu exercise program has a positive effect on vertical jump performance. In this study, it was found that it has a positive effect on the vertical jump performance of basketball players. While there was a significant difference in CMJ values in the experimental and control groups, no significant difference was found in SJ values although there was an increase. Despite the fact that the Bosu exercises have a positive effect on jumping performance, the reason for this difference may be that the rest period between two jumps is not well adjusted. As a result, it was observed that the bosu exercise program had a positive effect on vertical jump performance.

According to the statistical analysis results, when the back strength values of the basketball players were examined, there was no significant difference in the pre-test and post-test within-group and between-group comparison of the experimental and control groups ($p>0.05$). When the leg strength values were examined, a statistically significant difference was found in the comparison between the pre-test and post-test groups of the experimental and control groups ($p>0.05$). According to the result of the literature review, Safçi (2018) in his study reported that there was no significant difference in the back strength pre-test comparison between the experimental and control groups, and there was a significant difference in the leg strength post-test comparison between the experimental and control groups. Özdoğru (2018) stated in his study that there was no statistically significant difference in the back strength performances of the pre-test and post-test measurements of the swimmers in the experimental and control groups participating in the study. Sarıkaya (2022) in his study stated that there was no statistically significant difference in the back strength values of Taekwondo in (Taekwondo practitioners) after eight weeks of bosu ball exercise in the pre-test and post-test between-groups comparison of the experimental and control groups. Bayrakdar (2020) stated in his study on child swimmers that there was a statistically significant difference in the back and leg strength parameters between the stable ground group, the unstable ground group and the control group of calisthenic exercises. Cosio-Lima et al., (2023) reported an increase in back strength values as a result of 5 weeks of core training programs.

It is said that sports branches with high anaerobic intensity, leg volume, muscle mass, muscle fiber length, and muscles that take an active role in the power generated by the muscle are important. As a result of the studies, it is stated that athletes with greater muscle mass, leg volume, and leg mass exhibit better anaerobic performance (Özkan, 2010).

As a result, the development of strength and jumping in children differs according to age groups. In addition, there is a significant relationship between the content of strength training applied to children and strength improvement. It is an important matter to adjust the strength training to be

applied to children according to individual differences between children and the psychomotor development period. We can say that strength training consciously applied to children increases strength development. We believe that the bosu ball exercises we have done can significantly affect the vertical jump and strength performance of athletes since the muscles in the leg area affect strength. It is thought that bosu ball exercises performed in addition to eliminating mediocrity in the planning of training and in line with the principle of versatility will provide an increase in performance criteria, as well as being an alternative study for athletes.

Conflict of Interest: There is no personal or financial conflict of interest between the authors of the paper.

Researchers' Statement of Contribution: Research Design-MS, Data Collection-MS; GK, statistical analysis- AA; Preparation of the article, MS; PA, GK.

Ethical Approval

Ethics Committee: Bingöl University Health Sciences Scientific Research and Publication Ethics Committee

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Number: 23/08

Sarıkaya, M., Kılınçarslan, G., Avcı, P., & Bayrakdar, A. (2023). Do Bosu ball exercises affect countermovement jump and squad jump performance in basketball players?. *Eurasian Journal of Sport Sciences and Education*, 5(2), 258-270.

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Gender Effect on Motion Sickness Susceptibility

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Original Article

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Abstract

The study aimed was to determine whether there was a gender difference in sensitivity to visual stimulation-induced motion sickness (MS). Forty-nine participants (Female: 24, Male: 25) volunteered to join in the study. Participants were exposed to a visual video-recording stimulus to evoke the MS. Simulator Sickness Questionnaire (SSQ) was administered before, after, and 30 min after the MS stimulation to determine MS symptoms. Participants' self-report was used to identify motion sickness. Postural sway (PS) was measured before and immediately after MS stimulation. 58.3% of the female and 48.0% of the male reported that they had MS, while 41.7% of the female and 52.0% of the male reported that they did not have MS. Gender and MS distributions were not significant ($p=0.469$). Participants with MS before the stimulation had higher PS than those who declared no MS ($p=0.008$), but PS was not different after the stimulation ($p=0.102$). Although there was no difference in the pre-test ($p=0.231$), men with MS had higher PS than women with MS at the post-test ($p=0.013$). There was a significant increase in PS of men who declared that they had MS after the stimulation ($p=0.012$). The pre-test ($p=0.899$) and post-test ($p=0.434$) SSQ scores of men and women with MS were not different, while women had higher SSQ scores than men at the post-test 30 ($p=0.020$). Finally, there was no correlation between gender and rates of MS. In terms of symptom severity, females appear to be more susceptible to MS. PS may be a precursor to MS.

Keywords: Gender, Motion sickness, Sensitivity, Postural instability

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INTRODUCTION

Motion sickness is thought to be caused by a conflict between the vestibular, visual and proprioceptive sensory systems (Yardley, 1992). Overstimulation of the balance system due to a physical movement (e.g. passive transportation) is the main factor causing the motion sickness (Reason and Brand, 1975). Visually evoked motion sickness (viewing moving visual scenes involving perceptual systems) is a phenomenon similar to traditional motion sickness, but in individuals susceptible to motion sickness, gastric activity (e.g., nausea, vomiting), autonomic responses (e.g., paleness, sweating), arousal (e.g. fatigue, lethargy, difficulty concentrating), disorientation (e.g. dizziness, vertigo) and/or oculomotor problems (e.g. eye strain, blurred vision, headache) (Bos et al., 2008; Golding & Gresty, 2015; Keshavarz et al., 2014; Owen et al., 1998). The symptoms of MS are uncomfortable (Lawson, 2014), and yet MS is known to negatively affect various areas of human performance (Colwell et al., 2009; Smyth et al., 2018). Nevertheless, most scientists in this field do not agree on a common theory that leads to the development of motion sickness, nor do they agree on a single method to mitigate the negative effects on individuals susceptible to motion sickness.

Almost everybody has experienced motion sickness at least once in his/her lifetime (Herron, 2010). Since the incidence of motion sickness in individuals is very high, this concept should not be thought of as a sickness, but as a normal response to an abnormal environment, that is, as the organism's response to a movement stimulus to which it cannot adapt (Gahlinger, 1999; Treisman, 1977). The exact prevalence of motion sickness (visually induced motion sickness) remains unclear, but laboratory studies suggest that the percentage of people with motion sickness can range from 1% (Klüver et al., 2015) to 80% under certain conditions (Cobb, 1999; Stanney et al., 1999).

It is known that susceptibility to motion sickness is influenced by different conditions such as age (Lawther and Griffin, 1987; Özkan and Köse Özkan, 2014; Paillard et al., 2013), gender (Lawther and Griffin, 1987), genetics (Murdin et al., 2011; Oman 2012), difficulties in body movements and postural control (Henriques et al., 2014; Riccio and Stoffregen, 1991). In addition, it is reported that the young age group is most affected among the child, young and elderly population (Domeyer et al., 2013; Keshavarz et al., 2018) and in terms of gender, women are more susceptible to motion sickness than men (Flanagan et al., 2005; Klosterhalfen et al., 2006; Stanney et al., 2020), but the certainty of this finding remains uncertain, given that some studies have not been able to determine gender-related differences (Curry et al., 2020; Klosterhalfen et al., 2006). In addition, the number of studies that reveal and directly examine this distinction is quite small.

Motion sickness, which is a condition faced by people all over the world, is a phenomenon that is frequently exposed in our country. However, there is a lack of information on the level of susceptibility of individuals in our country to motion sickness. The historical progression of motion sickness symptoms, which started with traveling in various vehicles, is now reported with

the widespread use of developing technology. This study, which will help to determine the effect of gender difference on susceptibility to motion sickness and postural sway, is important in terms of revealing the data on the susceptibility to motion sickness of male and female individuals in our country for the first time and comparing the data obtained from the study with the motion sickness data of individuals of other races.

In order to further develop the literature on the role of gender difference in motion sickness, gender effect was taken into account in this study. For these reasons, the study aims to evaluate the role of gender in susceptibility to motion sickness as well as the postural sway of men and women susceptible to motion sickness.

METHODS

Participants

A total of 49 participants (female: 24; male: 25) who did not have vestibular or neurologic diseases and were not actively involved in sports participated in the study. The mean age of the female participants was 20.21 ± 1.77 years, mean height 162.79 ± 5.27 cm, and body weight 52.87 ± 5.53 kg; the mean age of the male participants was 21.32 ± 2.90 years, mean height 177.68 ± 5.96 cm, and body weight 73.89 ± 15.52 kg.

Participants participated in the study voluntarily after their informed consent was obtained. Before the study, each participant was informed that they could withdraw from the study at any time. Participants who were taking any medications known to cause dizziness were excluded from the study. All participants were informed in detail about the risks they might encounter and the tests to be performed before the study.

Ethical Approval

The study was approved by the Non-Interventional Ethics Committee of the Faculty of Sports Sciences of Selcuk University ethics committee (Approval Date: 04.23.2022; Decision number: 28). It was carried out in accordance with the Code of Ethics of the World Medical Association also known as a declaration of Helsinki.

Experimental Design

Symptom Severity Measurement

The video image of motion sickness was shown in a laboratory environment where lighting and ventilation could be controlled. The Simulator Sickness Questionnaire (SSQ), a validated and widely used assessment method, was used to measure motion sickness (Kennedy et al., 1993). The SSQ is a questionnaire consisting of 16 symptoms rated on a 4-point scale of none, mild, moderate, and severe to report the presence and severity of various symptoms after exposure to motion

sickness. Motion sickness susceptibility with SSQ was assessed 3 times: Before, after, and 30 minutes after watching the video. Immediately after the SSQ, participants answered the question "Do you have motion sickness?" 3 times as "Yes or No". Participants were informed that they could discontinue the test if they experienced symptoms of motion sickness severe enough to stop watching the stimulus video.

Postural Sway

The Biodex Balance System (BBS, Biodex Medical Systems Inc, Shirley, NY), which measures and records participants' ability to maintain their posture under dynamic stress, was used to determine postural sway performance. There are studies showing that this system is a reliable tool for determining dynamic postural performance (Arnold and Schmitz, 1998; Cachepe et al., 2001; Hinman, 2000). High scores obtained from the BBS indicate decreased balance performance. Postural sway measurements were taken before and immediately after watching the stimulus video record on the dominant leg in the eyes-open condition as "difficulty level 8" of the measurement tool, after the participants' dominant legs were determined according to their answers to the question "which leg do you use first when kicking a ball". The participants were allowed to move the platform freely while looking at the screen in order to determine the coordinates of the foot position and determine the ideal foot position. They were asked to adjust the position of the support leg until they reached a balanced position and to place their hands diagonally on their right and left shoulders to eliminate the influence of the arms during the tests. After the appropriate position was found, the platform was locked according to the participants' foot position, and the test was performed after the coordinates of this position were recorded by the device. In order to evaluate the postural sway performance of the participants, postural sway measurements on both legs were taken twice, before and after the stimulation of motion sickness, for 20 seconds in eyes open (GA) condition. Participants were asked to participate in all tests barefoot and in comfortable sportswear and to practice sufficiently before the measurement in order to get used to the measurement tool.

Apparatus and Stimuli

The study was conducted in a laboratory with controlled ambient lighting. The stimulus video consisted of a video of cycling recorded from a first-person perspective captured by a video camera mounted on the handlebars of the bicycle. Each participant was shown a total of 23 minutes of video recording of a non-stop bicycle ride in a mountainous terrain to induce motion sickness, including bicycle sounds to enhance immersion, on a 65-inch monitor (Vestel 65U9500 65" 4K SMART TV) with wireless on-ear headphones (JBL, Tune500BT). Original video links; <https://www.youtube.com/watch?v=IAuLM9LPe7Q>, <https://www.youtube.com/watch?v=8a4gQp-wzbuU> (Hemmerich et al., 2019). The stimulation of motion sickness in the participants was created with this method after the pre-tests. This video record, which has been used in previous studies, was chosen because it is highly effective in inducing nausea due to the vibration caused by the absence of any processing to stabilize the recording process (Keshavarz and Hecht, 2012) and because it can adequately stimulate motion sickness visually (Hemmerich et al., 2019).

Data Analysis

The variables measured in the study were summarized as mean and standard deviation (SD). Normality distribution was tested by Shapiro Wilk test. According to the results of the normality analysis, t-test for independent samples and Mann Whitney U test were used to compare independent paired groups. Wilcoxon Paired Two-Sample Test was used to compare two dependent groups and Friedman test was used to compare more than two dependent groups. Chi-Square test was used to determine whether the rates of motion sickness varied according to gender. SPSS 26.0 package program was used in all statistical calculations and statistical significance level was accepted as 0.05.

RESULTS

Table 1. Descriptive characteristics of the participants

Variables	Gender	n	Mean	SD
Age (year)	Female	24	20.21	1.77
	Male	25	21.32	2.90
	Total	49	20.78	2.45
Height (cm)	Female	24	162.79	5.27
	Male	25	177.68	5.96
	Total	49	170.39	9.36
Body Weight (kg)	Female	24	52.87	5.53
	Male	25	73.89	15.52
	Total	49	63.60	15.74

Table 1 presents the descriptive characteristics of the participants. There was no difference between the ages of male and female participants ($t=-1.613$; $p=0.113$). As expected, the height ($t=-9.255$; $p=0.000$) and body weight ($t=-6.263$; $p=0.000$) of male participants were statistically higher than female participants.

Table 2. Motion sickness statements of the participants according to the tests

			Gender		Total
			Female	Male	
Pre Test	Sick	n	0	0	0
		%	0	0	0
	Well	n	24	25	49
		%	49.0	51.0	100.0
Post Test	Sick	n	14	11	25
		%	56.0	44.0	100.0
	Well	n	10	14	24
		%	41.7	58.3	100.0
Post Test 30	Sick	n	9	4	13
		%	69.2	30.8	100.0
	Well	n	15	21	36
		%	41.7	58.3	100.0

Table 3. The overall incidence of motion sickness

Variables		Sick	Well
Female	n	14	10
	%	58.3	41.7
Male	n	12	13
	%	48.0	52.0
Total	n	26	23
	%	53.1	46.9

Table 2 shows the MS statements for each measurement. Table 3 shows the MS statements during the entire test period. As a result of the application to induce motion sickness, 26 (53.1%) of the 49 participants declared that they had motion sickness, while 23 (46.9%) declared that they did not have motion sickness. While 14 (58.3%) of the female participants declared that they had MS, 10 (41.7%) declared that they did not have MS. Among the male participants, 12 (48.0%) reported having MS. 13 (52.0%) declared that they did not have MS. According to the results of Chi-Square analysis, the distributions of gender and having motion sickness were not statistically significant (Pearson Chi-Square=0.525; p=0.469).

Table 4. Postural sway scores in the pretest and posttest

Gender		Pre Test		Post Test	
		Mean	SD	Mean	SD
Female	Sick	1.74	0.87	2.14	1.35
	Well	1.21	0.44	1.73	1.06
	Total	1.52	0.76	1.97	1.23
Male	Sick	2.14	1.04	3.09	1.11
	Well	1.38	0.42	2.09	0.77
	Total	1.74	0.86	2.57	1.06
Total	Sick	1.92	0.95	2.58	1.31
	Well	1.30	0.43	1.93	0.90
	Total	1.63	0.81	2.28	1.17

Table 5. Comparisons of the postural sway scores in female and male participants

	Gender	Mean Rank	Sum of Ranks	U	p
Pretest	Female	22.81	547.50	247.500	0.293
	Male	27.10	677.50		
Posttes	Female	20.00	480.00	180.000	0.016*
	Male	29.80	745.00		

While pretest postural sway scores did not differ between men and women regardless of MS statements (U=247.500; p=0.293), posttest postural sway scores of female participants were significantly lower than those of men (U=180.000; p=0.016).

Table 6. Comparisons of the postural sway scores between pretest and posttest

	Mean Rank	Sum of Ranks	Z	p
All participants	15.29	183.50	-4.031	0.000*
	26.99	944.50		
Female	9.38	75.00	-1.918	0.055
	13.40	201.00		
Male	6.25	25.00	-3.576	0.000*
	13.75	275.00		

* p<0.05

There was a significant increase in the postural sway scores of the participants in the posttest (Z=-4.031; p=0.000). This increase in postural sway scores was not significant in female participants (Z=-1.918; p=0.055) but statistically significant in male participants (Z=-3.576; p=0.000).

Table 7. Comparisons of the postural sway scores between sick and well participants in pretest and posttest

			Mean Rank	Sum of Ranks	U	p
All participants	Pretest	Sick	30.06	781.50	167.500	0.008*
		Well	19.28	443.50		
	Posttest	Sick	28.13	731.50	217.500	0.102
		Well	21.46	493.50		
Female	Pretest	Sick	14.71	206.00	39.000	0.074
		Well	9.40	94.00		
	Posttest	Sick	13.93	195.00	50.000	0.259
		Well	10.50	105.00		
Male	Pretest	Sick	16.29	195.50	38.500	0.030*
		Well	9.96	129.50		
	Posttest	Sick	16.13	193.50	40.500	0.040*
		Well	10.12	131.50		

* p<0.05

Sick participants had higher pre-test postural sway scores than well participants (U=167.500; p=0.008) but there was no difference between post-test postural sway scores of sick and well participants (U=217.500; p=0.102). The postural sway scores of female participants at the pretest (U=39.000; p=0.074) and posttest (U=50.000; p=0.259) were not different between sick and well participants. Both pre-test (U=38.500; p=0.030) and post-test (U=40.500; p=0.040) postural sway scores of sick male participants were higher than those of wells.

Table 8. Comparison of postural sway scores of male and female participants with and without motion sickness

		Gender	Mean Rank	Sum of Ranks	U	P
Sick	Pretest	Female	11.82	165.50	60.500	0.231
		Male	15.46	185.50		
	Posttest	Female	10.07	141.00	36.000	0.013*
		Male	17.50	210.00		
Well	Pretest	Female	10.60	106.00	51.000	0.410
		Male	13.08	170.00		
	Posttest	Female	10.20	102.00	47.000	0.284
		Male	13.38	174.00		

* p<0.05

There was no significant difference between the pretest postural sway scores of sick women and sick men ($U=60.500$; $p=0.231$), but the posttest postural sway scores of sick men were higher than sick women ($U=36.000$; $p=0.013$). There was no significant difference between the postural sway scores of well women and well men both at pretest ($U=51.000$; $p=0.410$) and posttest ($U=47.000$; $p=0.284$).

Table 9. Comparisons of the postural sway scores between the pretest and posttest in sick and well participants

		Mean Rank	Sum of Ranks	Z	p
Female	Sick	5.63	22.50	-1.610	0.107
		7.61	68.50		
	Well	4.00	16.00	-1.174	0.241
		6.50	39.00		
Male	Sick	3.50	7.00	-2.514	0.012*
		7.10	71.00		
	Well	2.00	4.00	-2.751	0.006*
		7.40	74.00		

* $p<0.05$

The increase in postural sway scores of sick women after motion sickness stimulation was not significant ($Z=-1.610$; $p=0.107$), and the increase in postural sway scores of well women after stimulation was not significant ($Z=-1.174$; $p=0.241$). There was a statistically significant increase in postural sway scores of sick men after motion sickness stimulation ($Z=-2.514$; $p=0.012$). The increase in postural sway scores of well men after stimulation was statistically significant ($Z=-2.751$; $p=0.006$).

Table 10. The SSQ scores of the sick and well participants

Gender		Pretest		Posttest		Posttest 30	
		Mean	SD	Mean	SD	Mean	SD
Female	Sick	1.64	2.37	15.36	7.40	7.79	7.42
	Well	0.20	0.42	3.40	2.84	1.10	1.20
	Total	1.04	1.94	10.38	8.39	5.00	6.56
Male	Sick	1.55	1.86	14.00	9.35	4.27	6.13
	Well	0.69	1.97	3.69	3.92	1.38	2.66
	Total	1.08	1.93	8.42	8.58	2.71	4.71
Total	Sick	1.60	2.12	14.76	8.16	6.24	6.98
	Well	0.48	1.50	3.57	3.42	1.26	2.11
	Total	1.06	1.92	9.40	8.45	3.85	5.77

Table 11. Comparisons of the SSQ scores between sick and well participants

			Mean Rank	Sum of Ranks	U	p
All Participants	Pretest	Sick	30.04	781.00	168.000	0.003*
		Well	19.30	444.00		
	Posttest	Sick	34.22	855.50	44.500	0.000*
		Well	13.93	320.50		
	Posttest 30	Sick	31.81	827.00	122.000	0.000*
		Well	17.30	398.00		
Female	Pretest	Sick	15.00	210.00	35.000	0.042*
		Well	9.00	90.00		
	Posttest	Sick	17.29	242.00	3.000	0.000*
		Well	5.80	58.00		
	Posttest 30	Sick	16.75	234.50	10.500	0.000*
		Well	6.55	65.50		
Male	Pretest	Sick	15.46	185.50	48.500	0.110
		Well	10.73	139.50		
	Posttest	Sick	17.27	190.00	19.000	0.002*
		Well	8.46	110.00		
	Posttest 30	Sick	15.42	185.00	49.000	0.123
		Well	10.77	140.00		

* p<0.05

The SSQ scores of the participants according to their report of motion sickness are given in Table 10 and comparisons are given in Table 11. Sick participants had statistically higher SSQ scores at the pretest (U=168.000; p=0.003), posttest (U=44.500; p=0.000), and posttest 30 (U=122.000; p=0.000) than well participants. Similarly, the pretest SSQ (U=35.000; p=0.042), posttest SSQ (U=3.000; p=0.000) and posttest 30 SSQ (U=10.500; p=0.000) scores of patient women were statistically higher than those of well women. While the pretest SSQ (U=48.500; p=0.110) and posttest 30 SSQ (U=49.000; p=0.123) scores of sick and well men were not different, the posttest SSQ scores of sick men were statistically higher than well men (U=19.000; p=0.002).

Table 12. Comparisons of the SSQ scores in all participants

		Mean Rank	Chi-Square	df	p	Difference
All Participants	Pretest	1.28	66.880	2	0.000*	Pretest - Posttest
	Posttest	2.82				Pretest - Posttest 30
	Posttest 30	1.90				Posttest - Posttest 30
Female	Pretest	1.27	35.024	2	0.000*	Pretest - Posttest
	Posttest	2.85				Pretest - Posttest 30
	Posttest 30	1.88				Posttest - Posttest 30
Male	Pretest	1.29	31.902	2	0.000*	Pretest - Posttest
	Posttest	2.79				Pretest - Posttest 30
	Posttest 30	1.92				Posttest - Posttest 30

* p<0.05

There was a significant difference between the SSQ scores of the participants at pretest, posttest and posttest 30 (Chi-Square=66.880; p=0.000). According to pairwise comparisons, SSQ scores at posttest (Z=-5.716; p=0.000) and posttest 30 (Z=-4.488; p=0.000) were statistically higher than SSQ scores at pretest, and SSQ scores at posttest 30 (Z=-5.266; p=0.000). There was a significant difference between the pretest SSQ, posttest SSQ and posttest 30 SSQ scores of female participants

(Chi-Square=35.024; p=0.000). According to pairwise comparisons, it was determined that women's SSQ scores in the posttest (Z=-4.109; p=0.000) and posttest 30 (Z=-3.370; p=0.001) were statistically higher than those in the pretest, and SSQ scores in the posttest were statistically higher than those in the posttest 30 (Z=-3.829; p=0.000). There was a significant difference between the pre-test SSQ, post-test SSQ, and posttest 30 SSQ scores of male participants (Chi-Square=31.902; p=0.000). According to pairwise comparisons, it was determined that the SSQ scores of men in the posttest SSQ (Z=-4.020; p=0.000) and posttest 30 (Z=-3.153; p=0.002) were statistically higher than the pretest, and the SSQ scores in the posttest 30 (Z=-3.675; p=0.000) were statistically higher than the posttest 30 (Table 12).

Table 13. Comparisons of the SSQ scores between the tests in sick and well participants

			Mean Rank	Chi-Square	df	p	Difference
Sick	All Participants	Pretest	1.20	37.389	2	0.000*	Pretest - Posttest
		Posttest	2.88				Pretest - Posttest 30
		Posttest 30	1.92				Posttest - Posttest 30
	Female	Pretest	1.18	21.444	2	0.000*	Pretest - Posttest
		Posttest	2.89				Pretest - Posttest 30
		Posttest 30	1.93				Posttest - Posttest 30
	Male	Pretest	1.23	15.951	2	0.000*	Pretest - Posttest
		Posttest	2.86				Pretest - Posttest 30
		Posttest 30	1.91				Posttest - Posttest 30
Well	All Participants	Pretest	1.37	29.606	2	0.000*	Pretest - Posttest
		Posttest	2.76				Pretest - Posttest 30
		Posttest 30	1.87				Posttest - Posttest 30
	Female	Pretest	1.40	13.867	2	0.001*	Pretest - Posttest
		Posttest	2.80				Posttest - Posttest 30
		Posttest 30	1.80				
	Male	Pretest	1.35	15.951	2	0.000*	Pretest - Posttest
		Posttest	2.73				Pretest - Posttest 30
		Posttest 30	1.92				Posttest - Posttest 30

* p<0.05

A statistically significant difference was found between the pretest SSQ, posttest SSQ and posttest 30 SSQ scores of the well participants (Chi-Square: 37.389; p=0.000). Posttest SSQ (Z=-4.289; p=0.000) and posttest 30 SSQ (Z=-3.603; p=0.000) scores were statistically higher than pretest SSQ scores and posttest SSQ scores were statistically higher than posttest 30 SSQ (Z=-4.132; p=0.000). There was a statistically significant difference between the SSQ scores of sick women at the pretest, posttest, and posttest 30 (Chi-Square: 21.444; p=0.000). SSQ scores at posttest (Z=-3.298; p=0.001) and posttest 30 (Z=-2.871; p=0.004) were statistically higher than those at the pretest and SSQ scores at posttest 30 (Z=-3.081; p=0.002). There was a statistically significant difference between the SSQ scores at the pretest, posttest, and posttest 30 (Chi-Square: 15.951; p=0.000). The posttest SSQ (Z=-2.298; p=0.005) and posttest 30 SSQ (Z=-2.354; p=0.019) scores were statistically higher than the pretest SSQ and the posttest SSQ scores were statistically higher than the posttest 30 SSQ (Z=-2.805; p=0.005). There was a statistically significant difference between the pre-test SSQ, post-test SSQ, and posttest 30 SSQ scores of all participants who had no motion sickness (Chi-Square: 29.606; p=0.000). Posttest SSQ (Z=-3.835; p=0.000) and posttest 30 SSQ (Z=-2.797; p=0.005) scores were statistically higher than pretest SSQ scores and posttest

SSQ scores were statistically higher than posttest 30 SSQ ($Z=-3.437$; $p=0.001$). There was a statistically significant difference between the SSQ scores of well women at the pretest, posttest, and posttest 30 (Chi-Square: 13.867; $p=0.001$). SSQ scores at posttest were higher than those at pretest ($Z=-2.524$; $p=0.012$) and posttest 30 ($Z=-2.536$; $p=0.011$). The difference between posttest SSQ and posttest 30 SSQ scores was not significant ($Z=-1.913$; $p=0.056$). There was a statistically significant difference between the pretest, posttest, and posttest 30 SSQ scores of the well male participants (Chi-Square: 15.951; $p=0.000$). Posttest SSQ ($Z=-2.944$; $p=0.003$) and posttest 30 SSQ ($Z=-2.124$; $p=0.034$) scores were statistically higher than pretest SSQ scores, and posttest SSQ scores were statistically higher than posttest 30 ($Z=-3.437$; $p=0.001$) (Table 13).

Table 14. Comparisons of the SSQ scores according to the gender

		Gender	Mean Rank	Sum of Ranks	U	p
Sick	Pretest	Female	13.71	192.00	81.000	0.899
		Male	13.25	159.00		
	Posttest	Female	14.04	196.50	62.500	0.434
		Male	11.68	128.50		
	Posttest 30	Female	16.71	234.00	39.000	0.020*
		Male	9.75	117.00		
Well	Pretest	Female	12.10	121.00	64.000	0.976
		Male	11.92	155.00		
	Posttest	Female	12.15	121.50	63.500	0.927
		Male	11.88	154.50		
	Posttest 30	Female	12.55	125.50	59.500	0.738
		Male	11.58	150.50		

The pretest ($U=81.000$; $p=0.899$) and posttest ($U=62.500$; $p=0.434$) SSQ scores of patient women and patient men were not statistically different, whereas the SSQ scores of patient women were higher than patient men at posttest 30 ($U=39.000$; $p=0.020$). The pretest ($U=64.000$; $p=0.976$), posttest ($U=63.500$; $p=0.927$), and posttest 30 ($U=59.500$; $p=0.738$) SSQ scores of well women and well men were not statistically different (Table 14).

DISCUSSION

The first aim of the study was to determine whether there is a difference (superiority) in sensitivity to motion sickness between men and women, and the second aim was to determine whether motion sickness impacts how well people perform in postural sway tests when they are vulnerable to it. In keeping with these objectives, the current study examined the role of gender in motion sickness susceptibility as well as whether it affects how men and women who are vulnerable to motion sickness perform during postural sway tests.

To induce motion sickness, an approximately 23-minute motion sickness-inducing video was watched by two different groups of participants (24 women, and 24 men). At the end of the induction, 26 out of 49 participants (53.1%) reported having motion sickness (sick) and 23 (46.9%) reported not having motion sickness (well). There was no statistically significant difference

between gender and the incidence of motion sickness, although the proportion of female participants (58.3%) reporting a motion sickness was higher than that of male participants (48.0%). Munafo et al., (2017) reported that after the first game using a virtual reality screen, 22% of the participants reported motion sickness and the difference in the rate between men and women was not significant; after the second game, 56% of the participants reported motion sickness and the rate among women (77.78%) was significantly higher than men (33.33%).

It has also been speculated that women may be more open and willing to report motion sickness as a result of visual stimulation than men (Ladwig et al., 2000), but the scientific evidence supporting this claim is weak (Dobie et al., 2001; Curry et al., 2020). Nevertheless, one study reviewed 46 studies examining gender differences in motion sickness and found that only 26/46 (56.5%) reported higher levels of sensitivity in women compared to men (Lawson, 2014).

A recent study found results that support the idea that women are more susceptible to motion sickness. However, a person's history of motion sickness was not associated with cybersickness symptoms. Accordingly, it was reported that the difference in the history of motion sickness between genders did not translate into cybersickness experiences as men and women experienced similar levels of cybersickness (Pöhlmann et al., 2023).

Authors studying many forms of motion sickness (Cooper et al., 1997; Dobie et al., 2001; Flanagan et al., 2005; Klosterhalfen et al., 2006; Lawther and Griffin, 1986; Lawther and Griffin, 1987; Munafo et al., 2017; Stanney et al., 2003; Turner et al., 2000) have documented gender differences in previous studies, with the majority finding women more susceptible to motion sickness than men across different stimulus types. While the exact cause of these gender differences is unknown, hormonal influences have been investigated as a possible cause, as the menstrual cycle has been shown to affect women's susceptibility to motion sickness (Golding et al., 2005; Hemmerich et al., 2019; Matchock et al., 2008; Schwab, 1954). In addition, it has been stated as another reason that women exhibit wider fields of vision than men in terms of environmental space (Burg, 1968).

In the study evaluating what triggers gender-based differences in the experience of cybersickness (motion sickness) in virtual environments, it was found that interpupillary distance mismatch was the primary cause of gender differences in cybersickness and was defined as the secondary cause of susceptibility to motion sickness. Women with poorly fitting interpupillary distance to the visual reality headset and a high prevalence of a history of motion sickness were most affected by cybersickness, and women did not fully return to normal within 1 hour of exposure. It was reported that women experienced cybersickness similar to men when their interpupillary distance was appropriately positioned on the VR headset, experienced high cybersickness immediately after cessation of VR exposure, but recovered within 1 hour of exposure (Stanney et al., 2020).

In this study, the pretest SSQ, posttest SSQ and posttest 30 scores of sick participants were statistically higher than those of well participants. Similarly, sick women had statistically higher pretest SSQ, posttest SSQ and posttest 30 SSQ scores than well women. In sick and well men, pre-

test SSQ and post-test 30 SSQ scores were not different, while sick men had statistically higher post-test SSQ scores than well men. This emphasizes that women are more sensitive to motion sickness. Similar findings to the current study were reported in the study by Koslucher et al., (2016). It was stated that SSQ symptom severity scores were higher among those who reported being sick after visual motion stimuli. Unlike this study, SSQ scores did not differ between sick and well men and women, and there was no gender difference in the severity of motion sickness, but the difference was in the incidence of motion sickness.

When the temporal changes of SSQ symptom severity (sensitivity), another finding of this study, were evaluated, it was found that there was a significant difference between the pretest SSQ, posttest SSQ and posttest 30 SSQ scores of both female and male participants. For both genders, posttest SSQ and posttest 30 SSQ scores were higher than pretest SSQ, and posttest SSQ scores were higher than posttest 30 SSQ. This finding confirms the results of Bos et al., (2013) who reported that motion sickness symptoms increased immediately after exposure to the stimulus (or immediately after the end of the exposure) and that this increase occurred immediately after exposure to the stimulus. In general, the severity of motion sickness symptoms decreases rapidly after the end of the movement stimulus (Kousoulis et al., 2016). In this study, posttest 30 SSQ scores were lower than posttest scores, indicating that motion sickness symptoms tended to decrease as time progressed for both male and female participants. Keshavarz et al., (2023) reported that the sensitivity of female participants was higher than that of male participants and that women reported significantly higher visually evoked motion sickness scores compared to men for all symptoms except nausea. The most noticeable symptom was reported to be eye fatigue.

Motion sickness symptoms can occur during or after exposure to certain dynamic visual displays (Hettinger and Riccio, 1992). Symptoms can be caused by visually perceived motion and are classified as the effects of visually evoked motion sickness (Kennedy et al., 2010). Visually evoked motion sickness can worsen an underlying medical condition such as migraine and vestibular disorders, especially symptoms such as nausea, headache, or dizziness, and may pose a danger to people with health problems (Keshavarz et al., 2023).

When the findings of motion sickness on postural sway in terms of gender were examined; the pretest and posttest postural sway scores of female participants were not different between sick and well participants. As expected, both pretest and posttest postural sway scores of sick men were higher than those of well men. There was no significant difference between the pretest postural sway scores of sick women and sick men, but the posttest postural sway scores of sick men were higher than those of sick women. This result shows that the postural sway of sick men is more affected by the stimulation. The increase in postural sway scores of sick and well women after motion sickness stimulation was not significant. On the other hand, sick and well men showed a significant increase in postural sway scores after stimulation. It is understood that the present study shows that gender has mixed results in terms of postural sway scores in motion sickness. It is also known that motion sickness is highly influenced by individual differences (Golding, 2006). We

think that individual differences rather than gender may have contributed to these complex results in our study.

Munafò et al., (2017) reported that postural sway patterns before and after using the display system differed between sick and well participants. In addition, the results of other studies linking postural activity with motion sickness suggest that postural sway may be a defining feature of susceptibility to motion sickness and that gender differences in postural sway may be related to gender differences in susceptibility (Koslucher et al., 2016; Stoffregen et al., 2013; Villard et al., 2008).

CONCLUSION

In this study, we first investigated the effect of gender difference on motion sickness susceptibility and secondly, whether postural sway is a predictor of motion sickness. The results showed that although female participants had a higher rate of motion sickness than male participants, gender differences had no effect on motion sickness. When the symptom severity of motion sickness was evaluated, it was found that women were more sensitive to motion sickness. In the temporal changes of SSQ symptom severity (sensitivity), it was observed that both female and male participants showed an increase in symptom severity immediately after exposure to the motion sickness stimulus and this increase occurred immediately after exposure to the stimulus, and as time progressed, symptoms tended to decrease for both female and male participants. Motion sickness did not affect women's postural sway performance; whereas it was found to affect men's postural sway more. The motion sickness literature suggests that women are more susceptible to motion sickness. While this was expected to result in a negative outcome for women in terms of postural sway scores, the findings of this study resulted in a lower postural sway performance of sick men. The fact that postural sway before the motion sickness stimulus was higher in patients compared to well men suggests that postural sway may be a predictor of motion sickness. More comprehensive and systematic studies are needed to clarify these complex relationships and the mechanism of motion sickness and to better understand the relationship between gender and motion sickness.

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Sosyal Bilgiler Öğretmenlerinin Geleneksel Sporlara Yönelik Tutum ve Görüşlerinin İncelenmesi

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Öz

Yaklaşık 5000 yıl öncesine dayanan Türk spor kültürü geçmişten günümüze farklı evrelerden geçmiştir. Modern sporları geleneksel sporların devamı niteliğinde değerlendirmek mümkün olmasa da spor kültürüne yönelik tarihsel arka planın geleneksel sporlar ile oluştuğu söylenebilir. Geleneksel sporları farklı değişkenler açısından konu edinen derslerden bir tanesi ise sosyal bilgiler dersi. Sosyal bilgiler dersinin bireyi yaşadığı toplumun kültürel temellerine ilişkin bilinçlendirme misyonu ve bu bağlamda spor kültürü ile geleneksel sporlara ilişkin barındırdığı içerik bu çalışmanın ortaya çıkış motivasyonlarından biri olmuştur. Karma yöntem metodolojisine uygun olarak yürütülen bu çalışmada sosyal bilgiler öğretmenlerinin geleneksel sporlara yönelik tutumları belirlenmeye çalışılmış, geleneksel sporlara yönelik tutum ölçeği ve yarı yapılandırılmış görüşme formu ile veri toplama süreci gerçekleştirilmiştir. Araştırmanın nicel veri toplama sürecine 120, nitel veri toplama sürecine ise 10 öğretmen dahil edilmiştir. Elde edilen bulgular doğrultusunda tutum ölçeğine göre sosyal bilgiler öğretmenlerinin geleneksel spora yönelik tutumlarının orta düzeyde olduğu belirlenmiş, katılımcıların önemli bir kısmının geleneksel sporların bireyin fiziksel gelişimine katkı sağlayacağını düşündükleri tespit edilmiştir. Elde edilen sonuçlar doğrultusunda spor kültürünün geliştirilmesine, bu yönde öğrenci ve öğretmenler ile gerçekleştirilecek bilinçlendirme yaygınlaştırma faaliyetlerinin yürütülmesine ilişkin önerilerde bulunulmuştur.

Anahtar kelimeler: Spor kültürü, Geleneksel sporlar, Sosyal bilgiler

An Investigation of Social Studies Teachers' Attitudes and Opinions Towards Traditional Sports

Abstract

Turkish sports culture, which dates back to approximately 5000 years ago, has gone through different phases from past to present. Although it is not possible to evaluate modern sports as a continuation of traditional sports, it can be said that the historical background for sports culture is formed by traditional sports. One of the courses that deals with traditional sports in terms of different variables is the social studies course. The mission of the social studies course to raise awareness of the individual about the cultural foundations of the society in which he/she lives, and in this context, the content related to sports culture and traditional sports has been one of the motivations for the emergence of this study. In this study, which was conducted in accordance with the mixed method methodology, it was tried to determine the attitudes of social studies teachers towards sports and sports culture, and the data collection process was carried out with a scale of attitudes towards traditional sports and a semi-structured interview form. A total of 120 teachers were included in the quantitative data collection process and 10 teachers were included in the qualitative data collection process. In line with the findings obtained, it was determined that the attitudes of social studies teachers towards traditional sports were at a moderate level according to the attitude scale, and a significant part of the participants thought that traditional sports would contribute to the physical development of the individual. In line with the results obtained, suggestions were made regarding the development of sports culture and the implementation of awareness-raising dissemination activities to be carried out with students and teachers in this direction.

Keywords: Sports culture, Traditional sports, Social studies

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GİRİŞ

Türk tarihinin geniş bir coğrafyaya ve sürece yayılan tarihi incelendiğinde Türk kültürünün pek çok kültür ile etkileşim yaşadığı görülmektedir. Bu etkileşimin savaşlar, ticaret, yurt arayışı gibi farklı sebeplerle ortaya çıkması gibi aynı zamanda yaşam tarzının getirdiği ihtiyaçlar ile zaruri olarak ortaya çıkmış olduğu da söylenebilir (Başaran, 2015; Kan, 2015). Bu etkileşimin ortaya çıkardığı kültürleşmenin izlerini günümüzde hala görmek mümkündür. Geçmişten günümüze taşınan ve kültürel bir miras unsuru olarak korunarak varlığı devam ettirilen, devlet kurumları ya da sivil toplum kuruluşları aracılığıyla yeni nesillere tanıtılmaya çalışılan geleneksel sporlar bu konulardan biri olarak karşımıza çıkmaktadır (Karcıoğlu ve Söylemez, 2022).

Geçmişten günümüze toplumları bir arada tutan en önemli değişkenler ortak ülkü ve yurttaşlık aidiyeti olarak ifade edilebilir. Bu birliktelik ise toplumu ve toplumu oluşturan insanların farklı amaçları gerçekleştirebilmek için bir araya getirdikleri somut ve somut olmayan farklı öğelerin ortaya çıkmasını sağlamıştır (Güngör, 2017). Türk tarihinin geniş bir coğrafyaya yayılmış olması kültürel birikiminin oldukça çeşitli olmasını sağlamıştır (Yetişgin, 2007). Türkçe sözlük niteliğinde Kaşgarlı Mahmut tarafından kaleme alınan Divânü Lugâti't-Türk adlı eserde bulunan Türk kültürüne ait zengin içerik bunu kanıtlar niteliktedir. Divânü Lugâti't-Türk'te günümüz geleneksel sporları olarak anılan bazı sporlara da oyunlar adı altında yer verildiği görülmektedir. Çevgen oyunu, ok atma yarışları, at yarışı, güreş, salıncak oyunu, müngüz müngüz, köçürme, çelik çomak, ceviz oyunu, karagun, çengli mengli bunlardan bazılarıdır (Türkteş, 1999). Yaşayışın getirdiği ihtiyaçlara bağlı olarak bireyin kendini eğitmesi, canlı tutması, güçlü kalması gibi sebeplerle hayat bulan bu oyunların zaman içinde gelenekselleşerek Türk kültür hayatının bir parçası haline geldikleri görülmektedir (Gültekin vd., 2018). Günümüzde geleneksel sporlar adı altında yaşatılan bu sporlara ilişkin 1996 yılında Gençlik ve Spor Bakanlığı Spor Hizmetleri Genel Müdürlüğü çatısı altında kurulan Geleneksel Spor Dalları Federasyonu hizmet yürütmektedir. Federasyon çatısı altında Atlı Cirit, Rahvan Binicilik, Atlı Okçuluk, Aba Güreşi, Şalvar Güreşi, Kuşak Güreşi, Geleneksel Kızak, Atlı Kızak ve Kökbörü dallarında faaliyetler yürütülmektedir. Federasyonun temel olarak belirlediği Ata sporlarının farklı arenalarda tanıtılması, yaygınlaştırılması ve gelecek nesillere aktarılması hedefleri ise Dünya Etnospor Konfederasyonu ile gerçekleştirilen iş birlikleri ile her geçen gün hayat bulmaktadır. Geleneksel spor ve oyunların günümüzde her geçen gün unutulma ve yok olma tehlikesi ile karşı karşıya kalması ve bireylerin keşfedici yönlerinin ortaya çıkartılması hedefleri bu kurum ve kuruluşlar için çıkış noktası olarak görülmektedir. Bu bağlamda aynı zamanda bir kültür ögesi olarak varlığını sürdürmeye devam eden geleneksel sporların yaşatılması ve canlı tutulması için eğitim öğretim süreçlerine önemli bir görev düşmektedir. Ulusal veya bölgesel olarak düzenlenen etkinlik, yarışma vb., faaliyetler ile yeni nesillerin tanınması sağlanan geleneksel sporların aynı zamanda beden eğitimi, sosyal bilgiler ve Türkçe derslerinde kendisine yer bulduğu görülmektedir.

Literatür incelendiğinde geleneksel sporlar ve oyunlara ilişkin pek çok çalışma bulunduğu görülmektedir. Türk kültüründe yer alan geleneksel oyunlar ve sporların değerlendirilmesi, Türk kültüründe geleneksel sporlar ve oyunların yeri, geleneksel spor ve oyunların günümüze

uyarlanması çalışmaları, geleneksel sporlar ile e-sporun karşılaştırılması, lise düzeyindeki öğrencilerde geleneksel Türk sporlarına ilişkin eğilimin belirlenmesi, diğer soydaş Türk devletlerinde geleneksel sporların yeri gibi çalışmalar bunlardan bazıları olarak sayılabilir (Gençay vd., 2019; Güler, 2022; Gültekin vd., 2018; Karahüseyinoğlu, 2008; Koçan, 2007; Menteş ve Saygın, 2019; Türkmen ve Useev, 2019). Öte yandan geleneksel sporların ve oyunların folklorik öğeler olarak ders kitaplarındaki varlığına yönelik çalışmalara da rastlanmaktadır (Demircioğlu ve Altuntaş Gürsoy, 2022; Yıldırım, 2022). Ancak sosyal bilgiler öğretmenlerinin geleneksel sporlar ve oyunlara ilişkin tutum ve görüşlerini konu edinen herhangi bir çalışmaya rastlanmamıştır. Sosyal bilgiler eğitiminin vatanını ve milletini severek, milli bilince sahip olan ve tarihini bilen, kültürünü koruyan, farklı kültürleri tanıyan birey yetiştirme amaçları göz önüne alındığında geleneksel sporların yaşatılması adına önemli bir misyona sahip olduğu söylenebilir. Sosyal bilgiler ders kitaplarında 6. sınıf ve 7. sınıf ders kitaplarında okçuluk, cirit, güreş gibi geleneksel sporlardan bahsedildiği görülmektedir. Sosyal bilgiler eğitiminin geleneksel sporlara ilişkin öğrencilerde farkındalık oluşturma ve bu kültürel öğelerin tanıtılması, yaşatılması adına sahip olduğu misyon bu çalışmanın temel motivasyonunu oluşturmuş, bu doğrultuda sosyal bilgiler öğretmenlerinin geleneksel sporlara yönelik tutum ve görüşleri merak konusu olmuştur. Belirlenen ana amaç doğrultusunda şu alt problemlere yanıt aranmıştır;

1. Sosyal bilgiler öğretmenlerinin geleneksel sporlara yönelik tutumları ile ilgili olarak;
 - a) Sosyal bilgiler öğretmenlerinin geleneksel spora yönelik tutumlarında demografik değişkenlerin etkisi nasıldır?
 - b) Sosyal bilgiler öğretmenlerinin geleneksel sporlara yönelik tutum düzeyleri nasıldır?
2. Sosyal bilgiler öğretmenlerinin geleneksel sporlara ilişkin görüşleri nelerdir?

METOT

Araştırma Modeli

Sosyal bilgiler öğretmenlerinin geleneksel sporlara yönelik tutum ve görüşlerinin belirlenmeye çalışıldığı bu araştırma karma yöntem metodolojisine uygun olarak gerçekleştirilmiştir. Karma yöntem araştırmalarının nicel veya nitel olarak elde edilen veriler ile problemin çözümüne ilişkin birbirlerini destekleyen ve tamamlayan yapısı karma yöntemin tercih edilmesinde etkili olmuştur. Bu araştırmada karma yöntem desenlerinden açıklayıcı ardışık desen kullanılmıştır. Açıklayıcı ardışık desen araştırmada nicel veri toplama araçları ile elde edilen verilerin açıklanmasında nitel verilerin kullanılmasına imkân sağlamaktadır (Kara, 2023). Katılımcı öğretmenlerin geleneksel sporlara ilişkin tutum ölçeğinden elde ettikleri sonuçların açıklanmasında görüşmeler ile elde edilen verilerden faydalanılmıştır.

Araştırma Grubu

Araştırma evreni Millî Eğitim Bakanlığı'na bağlı devlet okullarında görev yapan öğretmenler olarak belirlenmiştir. Araştırmanın çalışma grubu olarak ise yine devlet okullarında görev yapan sosyal bilgiler öğretmenleri olarak belirlenmiştir. Katılımcılarda aranan temel kriter sosyal bilgiler

öğretmeni olarak görev yapmaları olmuştur. Araştırmanın nicel boyutuna dahil edilecek sosyal bilgiler öğretmenlerinin belirlenmesinde uygunluk örnekleme tercih edilmiş, çalışma sosyal bilgiler öğretmenlerinin yer aldığı çevrimiçi gruplar aracılığıyla katılımcılara ulaştırılmıştır. Araştırmanın nitel kısmında ise kotalı örnekleme yöntemi tercih edilmiş, görüşmelerin gerçekleştirileceği katılımcılar tutum ölçeğinden yüksek sonuç elde edenler, ortalama sonuç elde edenler ve düşük sonuç elde edenler içerisinde üçer kişi olmak üzere belirlenmiştir. Gerçekleştirilecek görüşmelerde elde edilen verilerin yeterli doygunluğa ulaşmadığı düşünülürse 4. ve 5. görüşme kişileri yedek olarak belirlenmiş ancak yapılan görüşmelerde yeterli doygunluğa ulaşıldığı düşünüldüğünden dolayı yedek görüşme için belirlenen katılımcıların görüşlerine başvurulmamıştır.

Tablo 1’de araştırmaya katılan sosyal bilgiler öğretmenlerinin demografik özelliklerine ait frekans ve yüzde dağılımına yer verilmiştir.

Tablo 1. Katılımcıların demografik özelliklerine göre dağılımı

Demografik Özellik	Gruplar	n	%
Mesleki kıdem	1-5 yıl	14	11,7
	6-10 yıl	24	20,0
	11-15 yıl	28	23,3
	16-20 yıl	16	13,3
	21 yıl ve üstü	38	31,7
Cinsiyet	Kadın	81	67,5
	Erkek	39	32,5
Görev yaptığı il	İstanbul	83	69,2
	Diğer	37	30,8
Mezun olduğu lisans bölümü	Sosyal bilgiler	67	55,8
	Tarih	34	28,3
	Diğer	19	15,8
Öğrenim durumu	Lisans	98	81,7
	Lisansüstü	22	18,3
Daha önce geleneksel spor yapmış olma durumu	Evet	22	18,3
	Hayır	98	81,7
Daha önce yaptığı geleneksel spor (N=22)	Güreş	7	31,8
	Okçuluk	6	27,3
	At biniciliği	3	13,6
	Atlı cirit	2	9,1
	Atlı kızak	2	9,1
	Gülle atma	2	9,1

Araştırmaya katılan 120 sosyal bilgiler öğretmenin %11,7’sinin mesleki kıdemi 1-5 yıl, %20’sinin 6-10 yıl, %23,3’ünün 11-15 yıl, %13,3’ünün 16-20 yıl, %31,7’sinin mesleki kıdemi 21 yıl ve üstüdür. Katılımcıların %67,5’i kadın, %32,5’i erkektir. Katılımcıların %69,2’si İstanbul’da, %30,8’i diğer illerde görev yapmaktadır. Katılımcıların %55,8’i sosyal bilgiler, %28,3’ü tarih, %15,8’i diğer lisans bölümlerinden mezun olmuştur. Katılımcıların %81,7’si lisans, %18,3’ü lisansüstü düzeyde öğrenim görmüştür. Katılımcıların %18,3’ü daha önce geleneksel spor yapmış

olup geleneksel spor yapan katılımcıların (N=22) 7'si güreş, 6'sı okçuluk, 3'ü at biniciliği, 2'si atlı cirit, 2'si atlı kızak, 2'si gülle atma sporlarını yapmıştır.

Veri Toplama Araçları

Araştırma karma yöntem ilkeleri doğrultusunda yürütülmüş olup veri toplama sürecine ilişkin iki veri toplama aracı kullanılmıştır. Araştırmada nicel veri toplama aracı olarak iki bölümden oluşan anket formundan yararlanılmıştır.

Anket formunun birinci bölümünde katılımcıların mesleki kıdem, cinsiyet, görev yaptığı il, mezun olduğu lisans bölümü, öğrenim durumu, daha önce geleneksel spor yapma durumu ve daha önce geleneksel spor yapıldıysa branşı bilgilerinden oluşan demografik bilgi formu yer almaktadır.

Geleneksel Sporlara Yönelik Tutum Ölçeği: Anket formunun ikinci bölümünde geleneksel spora yönelik tutumları değerlendirmek amacıyla Evli vd. (2021) tarafından geliştirilen Geleneksel Sporlara Yönelik Tutum Ölçeği yer almaktadır. Ölçekte beşli likert tipinde (1: Katılmıyorum, 5: Tamamen katılıyorum) 21 madde ve 5 boyut (psikolojik gelişim, fiziksel gelişim, sosyal gelişim, bilişsel gelişim, kültürel gelişim) bulunmaktadır. Ölçek ve boyutlarda elde edilen yüksek puan geleneksel sporlara yönelik tutumun yüksek düzeyde olumlu olduğunu ifade etmektedir. Bu çalışmada ölçeğin Cronbach Alpha katsayısı 0,99; alt boyutların Cronbach Alpha katsayıları 0,97 / 0,97 / 0,97 / 0,98 / 0,97 olarak tespit edilmiştir.

Araştırmanın nitel verileri ise araştırmacılar tarafından hazırlanan 9 soruluk görüşme formu ile toplanmıştır. Görüşme formunun hazırlık süreci iki aşamada tamamlanmıştır. Taslak olarak hazırlanan forma ilişkin uzman görüşü alınmış, gerekli ekleme ve çıkarmalar yapılarak son uzman görüşü doğrultusunda ve forma son hali verilmiştir. Görüşme formu doğrultusunda katılımcı öğretmenler ile birebir görüşmeler gerçekleştirilmiştir.

Araştırma Yayın Etiği

Bu araştırma için Yıldız Teknik Üniversitesi Sosyal ve Beşerî Bilimler Araştırmaları Etik Kurulu'ndan 19/07/2023 tarihinde 2023/07 toplantı numarası etik izin alınmıştır.

Verilerin Toplanması

Araştırmanın nicel verileri google form aracılığıyla toplanmıştır. Formun dağıtımını farklı okul whatsapp grupları aracılığıyla gerçekleştirilmiştir. Form ile araştırmaya katılım gönüllük esasına uygun olarak gerçekleştirilmiştir. Nicel verilerin toplanması sürecine farklı il ve okullardan 120 öğretmen dahil olmuştur. Çalışmanın nitel kısmında ise elde edilen öğretmen görüşleri ise yüz yüze gerçekleştirilmiştir. Görüşmelere katılacak öğretmenlerin belirlenmesinde yine gönüllük esasına uygun olarak hareket edilmiş, bu kapsamda 5 kadın 5 erkek olmak üzere 10 sosyal bilgiler öğretmeni ile görüşmeler gerçekleştirilmiştir.

Verilerin Analizi

Verilerin analizi sürecinde nitel verilerin analizinde içerik analizi yöntemi kullanılmış, görüşmelerden elde edilen kayıtlar yazıya aktarılarak kodlamalar gerçekleştirilmiştir. Yapılan

kodlamalara ilişkin görüş birliği sağlanan kodlamalar kullanılmış ve kodlamalara kaynaklık eden ifadeler ile birlikte uzman görüşüne sunulmuştur.

Nicel verilerin analizinde ise SPSS 21.0 istatistik yazılımından yararlanılmıştır. Katılımcıların demografik özelliklerine ilişkin bilgiler frekans ve yüzde tablosunda gösterilmiştir. Ölçeklerin toplam ve alt boyut puanlarının normallik sınavında çarpıklık katsayısı (skewness) ve basıklık (kurtosis) katsayıları kullanılmıştır. Sürekli bir değişkenden elde edilen puanların normal dağılım özelliğinde kullanılan çarpıklık ve basıklık katsayılarının ± 1 sınırları içinde kalması puanların normal dağılımdan önemli bir sapma göstermediği şeklinde yorumlanabilir. Normal dağılım göstermeyen puanların karekök, logaritmik veya ters dönüşümlerden uygun olanları yapılarak puanların normal dağılımı sağlandıktan sonra parametrik testler yapılabilir (Büyüköztürk, 2011). Normal dağılım göstermeyen puanların logaritmik dönüşümleri yapıp normal dağılımları sağlanarak (Tablo 2) ölçek ve alt boyut puanlarının cinsiyet, görev yaptığı il, öğrenim durumu, daha önce geleneksel spor yapma durumu değişkenlerine göre karşılaştırılmasında bağımsız iki örneklem t testinden; mesleki kıdem ve mezun olduğu lisans bölümü değişkenlerine göre karşılaştırılmasında ANOVA testinden yararlanılmıştır. ANOVA testinde anlamlı farklılık görüldüğünde farkın hangi gruplar arasında olduğunu belirlemek amacıyla LSD post hoc testinden yararlanılmıştır. Geleneksel spora yönelik tutum puanları arasındaki ilişki testinde Pearson korelasyon testinden yararlanılmıştır. Analizlerde istatistiksel anlamlılık düzeyi 0,05 ($p < 0,05$) olarak kabul edilmiştir.

BULGULAR

Katılımcıların Geleneksel Sporlara Yönelik Tutum Puanlarına Ait Betimsel Bulgular

Tablo 2’de geleneksel sporlara yönelik tutum puanlarına ait betimsel istatistiklere yer verilmiştir.

Tablo 2. Geleneksel sporlara yönelik tutum puanlarına ait betimsel istatistikler

Alt Boyutlar	N	Alınabilecek		Elde Edilen		\bar{X}	SS	Ç. ¹	B. ¹
		Min.	Maks.	Min.	Maks.				
Psikolojik Gelişim	120	4	20	4	20	12,53	5,17	-0,40	-0,74
Fiziksel Gelişim	120	4	20	4	20	12,91	5,24	-0,37	-0,92
Sosyal Gelişim	120	4	20	4	20	12,18	5,24	-0,48	-0,67
Bilişsel Gelişim	120	5	25	5	25	15,28	6,50	-0,33	-0,87
Kültürel Gelişim	120	4	20	4	20	12,76	5,38	0,87	-0,75
Geleneksel Sporlara Yönelik Tutum	120	21	105	21	105	65,66	26,41	-0,34	-0,92

Ç: Normal dağılım için çarpıklık

B: Normal dağılım için basıklık

¹: Logaritmik dönüşüm uygulandı.

Geleneksel sporlara yönelik tutum ölçeği toplam puanı $65,66 \pm 26,41$ olarak tespit edilmiş olup ölçekten alınabilecek en düşük (21) ve en yüksek (105) puanlara göre araştırmaya katılan sosyal bilgiler öğretmenlerinin geleneksel sporlara yönelik tutumunun orta düzeyde olumlu olduğu tespit edilmiştir. Alt boyutlar düzeyinde incelendiğinde en yüksek düzeyde olumlu tutum puanlarının sırasıyla fiziksel gelişim ($12,91 \pm 5,24$), kültürel gelişim ($12,76 \pm 5,38$), psikolojik gelişime

(12,53±5,17) yönelik olduğu; en düşük düzeyde tutum puanlarının bilişsel gelişim (15,28±6,50) ve sosyal gelişime (12,18±5,24) yönelik olduğu tespit edilmiştir.

Geleneksel Sporlara Yönelik Tutum Puanlarının Demografik Özelliklere Göre Karşılaştırılmasına Ait Bulgular

Tablo 3'te geleneksel sporlara yönelik tutum puanlarının mesleki kıdeme göre karşılaştırılmasına ait ANOVA testi sonuçları yer almaktadır.

Tablo 3. Geleneksel sporlara yönelik tutum puanlarının mesleki kıdeme göre karşılaştırması

Alt Boyutlar	Mesleki Kıdem	N	\bar{X}	SS	F	p	Anlamlı Fark
Psikolojik Gelişim	A-1-5 yıl	14	13,93	5,08	1,44	0,225	
	B-6-10 yıl	24	11,71	5,13			
	C-11-15 yıl	28	14,29	5,31			
	D-16-20 yıl	16	12,06	5,25			
	E-21-25 yıl	38	11,45	4,91			
Fiziksel Gelişim	A-1-5 yıl	14	14,79	5,03	2,61	0,039	C>D,E
	B-6-10 yıl	24	11,96	5,43			
	C-11-15 yıl	28	15,14	5,00			
	D-16-20 yıl	16	11,88	5,19			
	E-21-25 yıl	38	11,61	4,91			
Sosyal Gelişim	A-1-5 yıl	14	13,50	5,02	2,43	0,052	
	B-6-10 yıl	24	10,79	5,26			
	C-11-15 yıl	28	14,46	4,90			
	D-16-20 yıl	16	10,50	5,03			
	E-21-25 yıl	38	11,58	5,19			
Bilişsel Gelişim	A-1-5 yıl	14	16,57	5,56	2,34	0,059	
	B-6-10 yıl	24	13,92	7,00			
	C-11-15 yıl	28	18,07	6,24			
	D-16-20 yıl	16	13,44	6,32			
	E-21-25 yıl	38	14,39	6,32			
Kültürel Gelişim	A-1-5 yıl	14	14,36	4,83	1,22	0,308	
	B-6-10 yıl	24	11,58	5,31			
	C-11-15 yıl	28	14,46	5,59			
	D-16-20 yıl	16	12,50	5,10			
	E-21-25 yıl	38	11,76	5,38			
Geleneksel Sporlara Yönelik Tutum Toplam	A-1-5 yıl	14	73,14	24,73	2,14	0,080	
	B-6-10 yıl	24	59,96	26,96			
	C-11-15 yıl	28	76,43	25,65			
	D-16-20 yıl	16	60,38	25,41			
	E-21-25 yıl	38	60,79	25,86			

Geleneksel sporlara yönelik tutum ölçeği toplam puanı ve psikolojik gelişim, sosyal gelişim, bilişsel gelişim ve kültürel gelişim alt boyut puanlarının mesleki kıdeme göre anlamlı farklılık göstermediği ($p>0,05$) tespit edilmiştir. Fiziksel gelişim alt boyut puanının mesleki kıdeme göre anlamlı farklılık gösterdiği tespit edilmiştir ($F=2,61$; $p<0,05$). Farkın hangi gruplar arasında olduğunu belirlemek amacıyla yapılan LSD post hoc testi sonuçlarına göre mesleki kıdemi 11-15 yıl arası olan katılımcıların fiziksel gelişime yönelik tutum puanı, mesleki kıdemi 16 yıl ve üstü olan katılımcıların tutum puanına göre anlamlı düzeyde daha yüksektir.

Tablo 4'te geleneksel sporlara yönelik tutum puanlarının cinsiyete göre karşılaştırılmasına ait bağımsız iki örneklem t testi sonuçları yer almaktadır.

Tablo 4. Geleneksel sporlara yönelik tutum puanlarının cinsiyete göre karşılaştırması

Alt Boyutlar	Cinsiyet	N	\bar{X}	SS	t	p
Psikolojik Gelişim	Kadın	81	12,58	5,22	0,15	0,883
	Erkek	39	12,44	5,13		
Fiziksel Gelişim	Kadın	81	12,93	5,31	0,04	0,967
	Erkek	39	12,87	5,15		
Sosyal Gelişim	Kadın	81	12,42	5,41	0,51	0,614
	Erkek	39	11,67	4,87		
Bilişsel Gelişim	Kadın	81	15,57	6,72	0,49	0,628
	Erkek	39	14,69	6,06		
Kültürel Gelişim	Kadın	81	12,98	5,39	0,52	0,606
	Erkek	39	12,31	5,42		
Geleneksel Sporlara Yönelik Tutum Toplam	Kadın	81	66,47	26,96	0,40	0,689
	Erkek	39	63,97	25,49		

Geleneksel sporlara yönelik tutum ölçeği toplam ve alt boyut puanlarının cinsiyete göre anlamlı farklılık göstermediği ($p>0,05$) tespit edilmiştir.

Tablo 5'te geleneksel sporlara yönelik tutum puanlarının görev yaptığı ile göre karşılaştırılmasına ait bağımsız iki örneklem t testi sonuçları yer almaktadır.

Tablo 5. Geleneksel sporlara yönelik tutum puanlarının görev yaptığı ile göre karşılaştırması

Alt Boyutlar	Görev Yaptığı İl	N	\bar{X}	SS	t	p
Psikolojik Gelişim	İstanbul	83	12,34	5,26	-0,72	0,472
	Diğer	37	12,97	5,01		
Fiziksel Gelişim	İstanbul	83	12,82	5,46	-0,52	0,603
	Diğer	37	13,11	4,78		
Sosyal Gelişim	İstanbul	83	12,35	5,37	0,41	0,684
	Diğer	37	11,78	4,96		
Bilişsel Gelişim	İstanbul	83	15,27	6,62	-0,15	0,884
	Diğer	37	15,32	6,31		
Kültürel Gelişim	İstanbul	83	12,41	5,41	-0,95	0,343
	Diğer	37	13,54	5,32		
Geleneksel Sporlara Yönelik Tutum Toplam	İstanbul	83	65,18	27,17	-0,48	0,630
	Diğer	37	66,73	24,96		

Geleneksel sporlara yönelik tutum ölçeği toplam ve alt boyut puanlarının görev yaptığı ile göre anlamlı farklılık göstermediği ($p>0,05$) tespit edilmiştir.

Tablo 6’da geleneksel sporlara yönelik tutum puanlarının mezun olduğu lisans bölümüne göre karşılaştırılmasına ait ANOVA testi sonuçları yer almaktadır.

Tablo 6. Geleneksel sporlara yönelik tutum puanlarının mezun olduğu lisans bölümüne göre karşılaştırması

Alt Boyutlar	Mezun Olduğu Lisans Bölümü	N	\bar{X}	SS	F	p	Anlamlı Fark
Psikolojik Gelişim	A-Sosyal bilgiler	67	13,12	5,39	0,78	0,461	
	B-Tarih	34	12,21	5,35			
	C-Diğer	19	11,05	3,76			
Fiziksel Gelişim	A-Sosyal bilgiler	67	13,42	5,49	0,85	0,432	
	B-Tarih	34	12,79	5,08			
	C-Diğer	19	11,32	4,47			
Sosyal Gelişim	A-Sosyal bilgiler	67	12,63	5,44	1,06	0,351	
	B-Tarih	34	12,26	5,12			
	C-Diğer	19	10,42	4,55			
Bilişsel Gelişim	A-Sosyal bilgiler	67	15,69	6,71	0,76	0,472	
	B-Tarih	34	15,65	6,63			
	C-Diğer	19	13,21	5,32			
Kültürel Gelişim	A-Sosyal bilgiler	67	13,01	5,48	1,01	0,367	
	B-Tarih	34	13,09	5,51			
	C-Diğer	19	11,26	4,81			
Geleneksel Sporlara Yönelik Tutum Toplam	A-Sosyal bilgiler	67	67,87	27,44	0,78	0,460	
	B-Tarih	34	66,00	26,80			
	C-Diğer	19	57,26	21,01			

Geleneksel sporlara yönelik tutum ölçeği toplam ve alt boyut puanlarının mezun olduğu lisans bölümüne göre anlamlı farklılık göstermediği ($p>0,05$) tespit edilmiştir.

Tablo 7’de geleneksel sporlara yönelik tutum puanlarının öğrenim durumuna göre karşılaştırılmasına ait bağımsız iki örneklem t testi sonuçları yer almaktadır.

Tablo 7. Geleneksel sporlara yönelik tutum puanlarının öğrenim durumuna göre karşılaştırması

Alt Boyutlar	Öğrenim Durumu	N	\bar{X}	SS	t	p
Psikolojik Gelişim	Lisans	98	12,43	5,14	-0,36	0,722
	Lisansüstü	22	13,00	5,43		
Fiziksel Gelişim	Lisans	98	12,86	5,31	-0,36	0,719
	Lisansüstü	22	13,14	5,02		
Sosyal Gelişim	Lisans	98	12,23	5,36	0,02	0,981
	Lisansüstü	22	11,91	4,76		
Bilişsel Gelişim	Lisans	98	15,32	6,56	0,08	0,937
	Lisansüstü	22	15,14	6,39		
Kültürel Gelişim	Lisans	98	12,43	5,40	-1,52	0,131
	Lisansüstü	22	14,23	5,19		
Geleneksel Sporlara Yönelik Tutum Toplam	Lisans	98	65,27	26,74	-0,46	0,647
	Lisansüstü	22	67,41	25,43		

Geleneksel sporlara yönelik tutum ölçeği toplam ve alt boyut puanlarının öğrenim durumuna göre anlamlı farklılık göstermediği ($p>0,05$) tespit edilmiştir.

Tablo 8’de geleneksel sporlara yönelik tutum puanlarının daha önce geleneksel spor yapmış olma durumuna göre karşılaştırılmasına ait bağımsız iki örneklem t testi sonuçları yer almaktadır.

Tablo 8. Geleneksel sporlara yönelik tutum puanlarının daha önce geleneksel spor yapmış olma durumuna göre karşılaştırması

Alt Boyutlar	Daha Önce Geleneksel Spor Yapma	N	\bar{X}	SS	t	p
Psikolojik Gelişim	Evet	22	13,68	5,62	0,91	0,363
	Hayır	98	12,28	5,06		
Fiziksel Gelişim	Evet	22	13,50	5,47	0,45	0,656
	Hayır	98	12,78	5,21		
Sosyal Gelişim	Evet	22	12,32	5,13	0,21	0,834
	Hayır	98	12,14	5,28		
Bilişsel Gelişim	Evet	22	16,36	6,34	0,89	0,373
	Hayır	98	15,04	6,54		
Kültürel Gelişim	Evet	22	13,73	5,67	0,95	0,345
	Hayır	98	12,54	5,32		
Geleneksel Sporlara Yönelik Tutum Toplam	Evet	22	69,59	27,47	0,65	0,516
	Hayır	98	64,78	26,23		

Geleneksel sporlara yönelik tutum ölçeği toplam ve alt boyut puanlarının daha önce geleneksel spor yapmış olma durumuna göre anlamlı farklılık göstermediği ($p>0,05$) tespit edilmiştir.

Geleneksel Sporlara Yönelik Tutum Puanları Arasındaki İlişkiye Ait Bulgular

Tablo 9’da geleneksel sporlara yönelik tutum puanları arasındaki ilişkiye ait Pearson korelasyon analizi sonuçlarına yer verilmiştir.

Tablo 9. Geleneksel sporlara yönelik tutum puanları arasındaki ilişki

Alt Boyutlar	1	2	3	4	5	6
1-Psikolojik Gelişim	1	0,94**	0,86**	0,91**	0,79**	0,97**
2-Fiziksel Gelişim		1	0,87**	0,91**	0,77**	0,97**
3-Sosyal Gelişim			1	0,91**	0,72**	0,93**
4-Bilişsel Gelişim				1	0,78**	0,96**
5-Kültürel Gelişim					1	0,82**
6-Geleneksel Sporlara Yönelik Tutum Toplam						1

*: $p<0,05$

** : $p<0,01$

Tablo 9’a göre psikolojik gelişim tutum puanı ile fiziksel gelişim ($r=0,94$; $p<0,05$), sosyal gelişim ($r=0,86$; $p<0,05$), bilişsel gelişim ($r=0,91$; $p<0,05$), kültürel gelişim ($r=0,79$; $p<0,05$) tutum puanları arasında pozitif yönlü ve anlamlı ilişki olduğu tespit edilmiştir.

Tablo 9’a göre fiziksel gelişim tutum puanı ile sosyal gelişim ($r=0,87$; $p<0,05$), bilişsel gelişim ($r=0,91$; $p<0,05$), kültürel gelişim ($r=0,77$; $p<0,05$) tutum puanları arasında pozitif yönlü ve anlamlı ilişki olduğu tespit edilmiştir.

Tablo 9'a göre sosyal gelişim tutum puanı ile bilişsel gelişim ($r=0,91$; $p<0,05$), kültürel gelişim ($r=0,72$; $p<0,05$) tutum puanları arasında pozitif yönlü ve anlamlı ilişki olduğu tespit edilmiştir.

Tablo 9'a göre bilişsel gelişim tutum puanı ile kültürel gelişim ($r=0,78$; $p<0,05$) tutum puanı arasında pozitif yönlü ve anlamlı ilişki olduğu tespit edilmiştir.

Sosyal Bilgiler Öğretmenlerinin Geleneksel Sporlara Yönelik Görüşleri ile İlgili Bulgular

Sosyal bilgiler öğretmenleriyle yüz yüze görüşmeler yapılmıştır. 5 kadın, 5 erkek olmak üzere toplam 10 sosyal bilgiler öğretmeniyle yapılan görüşmeler neticesinde birtakım veriler elde edilmiştir. Bu veriler geleneksel spora dönük tutumlarının ve görüşlerinin tespit edilmesine kaynaklık etmiştir. Sosyal Bilgiler öğretmenleriyle yapılan görüşmede elde edilen veriler aşağıdaki tablolarda detaylı bir biçimde görülmektedir.

Tablo 10. Geçmişte sporla ilgilenme durumu

Tema	Kodlar	f
Geçmişte yaptığınız herhangi bir spor türü	Hayır, yapmadım	2
	Evet, yaptım.	8

Tablo 10'da da görüldüğü üzere katılımcılarla yapılan görüşmeler neticesinde 2 öğretmenin herhangi bir sporla ilgilenmediği belirtilmiştir. Buna karşılık 8 katılımcı ise sporla ilgilendiğini belirterek bunun hala sürdürdüğünden bahsetmiştir.

Tablo 11. Yapılan spor türleri

Tema	Kodlar	f
Yapılan spor türü	Futbol	5
	Voleybol	4
	Basketbol	4

Tablo 11'den hareketle katılımcılardan gelen yanıtlara bakıldığında basketbolu oynayan 4, futbol oynayan 5, voleybol oynayan 4 katılımcı tespit edilmiştir. Yanıtlar bazı katılımcıların birden çok spor dalıyla yakından ilgilendiğini göstermektedir.

Tablo 12. Spor kültürü ve eğitim ilişkisi

Tema	Kodlar	f
Spor kültürü ve eğitim ilişkisini kurma	Spor kültürü eğitimi desteklemektedir.	8
	Birbirini tamamlayıcı öğelere sahip	7
	İkisi de birbiriyle doğrudan ilişkili	6
	Aralarında çok sınırlı bir ilişki kurulabilir	3

Tablo 12'ye bakıldığında spor kültürü ve eğitim ilişkisine dair öğretmen görüşleri incelenmiş olup katılımcıların 8'i iki sürecin de birbirini desteklediğini ifade etmiştir. 7 katılımcı eğitim ve spor kültürünün birbirini tamamlayan unsurlar içerdiğini belirtmiştir. 6 katılımcı ise spor kültürünün eğitimle doğrudan ilişkili olduğunu beyan etmiştir. Öte yandan 3 katılımcı öğretmen ise eğitim ile

spor kültürü arasında çok sınırlı bir ilişki olduğunu ifade etmiştir. Söz konusu maddeye dair katılımcılardan elde edilen bazı alıntılar şöyledir:

K1: Bireyin sosyalleşmesini sağlayarak ve kültürün benimsenmesini kolaylaştırarak eğitime katkı sağlar. Eğitim seviyesi arttıkça spor kültürü de yaygınlaşır. Spor kültürü arttıkça da eğitimin kalitesi artar.

K2: Bir spor dalı ile ilgilenen ve uğraşan öğrencilerin bedenlen daha rahat ve sağlıklı olmaları, zihnen daha dinç olmalarını sağlamakta ve öğrenme süreçlerini olumlu etkilemektedir.

K5: Birtakım etik değerler başta olmak üzere sporun ruhuna uygun bir eğitim anlayışıyla sporcuların mental anlamda kendilerini rahat hissedebilmeleri için iyi bir eğitim ortamında yer almaları gerektiği fikrindeyim.

K8: Eğitim ve bilim geliştikçe bireysel ve takım sporlarında başarı gitgide artmaktadır. Sporun en üst düzeyde gerçekleştirilebilmesi için eğitimden yararlanır.

K9: Spor kültürü oluşturmak ve davranış haline getirmek için en etkili yol eğitimidir. Eğitim yoluyla sağlıklı bireyler ve nesiller oluşturulur.

Tablo 13. Spor kültürünün sosyal bilgiler dersi öğretimindeki yeri ve önemi

Tema	Kodlar	f
Spor kültürünün sosyal bilgiler dersi öğretimindeki yeri ve önemi	Spor kültürü derste çok az öneme sahip	4
	Derste yer verilme sıklığı azdır	3
	Spor kültürü ve sosyal bilgiler iç içedir	4
	Spor sayesinde ülkeleri ve bayrakları tanır	5
	Spor kültürü ile sosyal bilgilerin temel değerleri öğretilebilir	4

Spor kültürünün sosyal bilgiler dersi öğretimindeki yerine ve önemine dönük katılımcı öğretmenlerin görüşleri analiz edilmiştir. Bu doğrultuda Tablo 13'te de görüldüğü üzere 4 katılımcı öğretmen spor kültürünün sosyal bilgiler dersinde öneminin çok az olduğunu belirtmiştir. Buna ek olarak 3 katılımcı spor kültürünün derste çok sınırlı biçimde yer verildiğini ifade etmiştir. Öte yandan 4 katılımcı sosyal bilgiler dersiyse spor kültürünün iç içe olduğunu vurgulamıştır. Nitekim aynı katılımcılar spor kültürü sayesinde öğrencilerin ülke bayraklarını daha iyi tanıdığını, derse ait temel değerleri de daha kolay benimsediğini belirtmiştir. Söz konusu maddeye dair katılımcılardan elde edilen bazı alıntılar şöyledir:

K2: Sosyal hayatında başarılı bireyler olmaları için spora önem verilmesi, Beden eğitimi zümresi ile iş birliğine gidilerek Sosyal Bilgiler dersinde öğrencilerin ilgi ve yetenekleri doğrultusunda spor yapılabilir. Etnospor Festivaline öğrencilerin katılımı sağlanabilir. Bu tarz etkinliklerin sayısı artırılabilir.

K3: Özellikle geleneksel sporlarımızın genç sporcular tarafından tanınması bu vesileyle kültürel renklerimiz belli bir bölümünün kazandırılması açısından Sosyal Bilgiler dersi içerisinde bu yönüyle olumlu adımlar atılabilir.

K7: Başarı kazanan sporcuların ülkelerini merak eden öğrenciler o ülkelerin bayraklarını tanırlar; dünya üzerindeki konumlarını öğrenirler, yine o ülkelerin iklimlerini, nüfuslarını, kültürel değerlerini öğrenirler. Sosyal Bilgiler ders kitaplarına başarılı sporcuların hayat

hikayelerinden bir bölüm eklenerek o sporcuların ülkelerinin coğrafi, tarihi ve kültürel özellikleri öğretilir.

K8: Spor kültürünün bireylere kazandıracağını düşündüğüm şeylerin başında “fairplay” yani centilmenlik geliyor. Bu da Sosyal Bilgiler Öğretiminin değer aktarımına verdiği öneme ilişkilendirilebilir.

K10: Sosyal Bilgiler dersinin öğretiminde maalesef spora yeteri kadar yer verilmediğini düşünüyorum. Bu da öğrencilere spor ile sosyal bilgiler ilişkisini neredeyse hiç kurmadığımızı göstermektedir. Özellikle Atatürk’ün spora değer vermesiyle ilgili konuya geldiğimizde spordan kısaca bahsediyoruz. Ama sporun sosyal bilgiler dersiyile ilişkisi çok güçlü olmalıdır.

Tablo 14. Katılımcıların geleneksel sporlara dair görüşleri

Tema	Kodlar	f
Geleneksel sporlar hakkındaki görüşler	Hiç ilgim yok	1
	Orta düzeyde ilgim var	6
	Çok fazla ilgileniyorum	3

Tablo 14’ten hareketle katılımcılarla yapılan görüşme neticesinde 1 öğretmen geleneksel sporlara hiç ilgi duymadığını belirtirken 6 öğretmen orta düzeyde; 3 öğretmen ise yüksek düzeyde ilgi duyduğunu ifade etmiştir.

Tablo 15. Katılımcıların bildikleri geleneksel sporlar

Tema	Kodlar	f
Bilinen Geleneksel sporlar	Cirit Atma	8
	Kuşaklı yağlı güreş	7
	Atlı Binicilik	7
	Okçuluk	7
	Kılıç-Kalkan	2
	Mangala	2
	Atlı Kızak	2

Katılımcılara bildikleri geleneksel sporların hangileri olduğu sorulmuştur. Tablo 15’te de görüldüğü üzere katılımcı öğretmenlerden 8’i cirit atma, 7’si Kuşaklı yağlı güreş, 7’si Atlı Binicilik, 7’si Okçuluk, 2’si Kılıç-Kalkan, 2’si Mangala, 2’si ise Atlı kızak bildiğini belirtmiştir.

Tablo 16. Katılımcıların yaptıkları geleneksel spor türleri

Tema	Kodlar	f
Yapılan Geleneksel Spor	Yağlı güreş	2
	Okçuluk	2
	Mangala	1
	Cirit Atma	1

Katılımcılara hangi geleneksel sporları aktif biçimde yaptıkları sorulmuştur. Tablo 16'ya göre görüşmeler neticesinde yalnızca 4 katılımcı geleneksel sporları aktif biçimde yürüttüğünü ifade etmiştir. Bunların 2'si yağlı güreş, 2'si okçuluk, birer katılımcı ise mangala ve cirit atma sporu ile ilgilendiğini belirtmiştir. Söz konusu maddeye dair katılımcılardan elde edilen bazı alıntılar şöyledir:

K1: Geleneksel spor olarak Etnospor organizasyonunu söyleyebilirim. Güreş, ok atma, cirit, ata binme, mangala gibi sporları biliyorum. Okulumuzda bu sene karne haftasında geleneksel sporlar yapılmıştı oradan biliyorum.

K2: Etnospor Festivalini önemsiyorum. Hem çocuklarımı bu festivale götürüyorum hem de öğrencilerimi yönlendiriyorum.

K5: Okulumuzda ok atma ve mangala oyunları yapılmıştı. Bu geleneksel sporları yapma fırsatı elde etmiştim. Çok güzel bir faaliyetti.

K6: Geleneksel sporlar bizim kültürümüzü yansıtan sporlardır. Cirit, yağlı güreş, okçuluk sporlarını tanıyorum. Daha çok televizyon aracılığı ile geleneksel sporlarla tanıştım.

K7: Etnospor sayesinde pek çok insan Türk geleneksel sporları ve oyunları hakkında birinci elden bilgi edinmiş oldu. Atlı cirit sporu ile ilgilenmiştim. Bundaki temel sebep bedensel gelişim ile sosyalleşme imkânı yakalamaktı. Ayrıca atlara karşı da ilgim olduğu için bu sporu tercih etmiştim.

K9: Cirit ve güreş en tanıdığım sporlardır. Güreş özellikle popüler olması ve yaşadığım yere özgü köklü bir spor olmasından dolayı yakından bildiğim ve takip ettiğim geleneksel spor dalıdır.

K10: Bildiğim geleneksel spor dalları, Türk kültürünün vazgeçilmezi atçılık ve binicilik ilk sırada gelmektedir. Bunu okçuluk, güreş ve cirit gelmektedir. İlk olarak sosyal bilgiler dersinde tanışma fırsatı buldum daha sonra birçok festival ve şenliklerde izleme fırsatı buldum.

Tablo 17. Geleneksel sporun olası faydalarına dair görüşler

Tema	Kodlar	f
Geleneksel sporun olası faydaları	Kültür aktarıcısı	3
	Milli kültürü tanıtır	4
	Sosyalleşmeyi artırır	5
	Fiziksel gelişimi artırır	6
	Öz disiplini geliştirir	4
	Tarihsel olaylara ilgiyi artırır	4
	Toplumsal aidiyeti güçlendirir	5
	Türkçeyi koruyup geleceğe taşır	2
	Farklı spor dallarıyla tanıştırır	2

Tablo 17'den hareketle geleneksel sporun olası faydalarıyla ilgili katılımcı görüşleri analiz edildiğinde 3 kişi kültür aktarıcısı olduğunu; 4 kişi milli kültürü tanıttığını; 5 kişi sosyalleşmeyi artırdığını; 6 kişi fiziksel gelişimi hızlandırdığını; 4 kişi öz disiplini geliştirdiğini; 4 kişi tarihsel olaylara ilgiyi artırdığını; 5 kişi toplumsal aidiyeti güçlendirdiğini; 2 kişi Türkçeyi koruyup geleceğe taşıdığını; 2 kişi ise farklı spor dallarıyla tanıştırdığını vurgulamıştır.

Tablo 18. Geleneksel sporun sosyal bilgiler dersindeki önemine dair katılımcı görüşleri

Tema	Kodlar	f
Geleneksel sporun sosyal bilgiler dersindeki önemi	Kültür aktarımından dolayı önemlidir	7
	Gelenekler adetlerden ötürü derste sıkça yer almalı	6
	Türk tarihiyle ilişkili olduğu için fazlaca yer almalı	6
	Sosyal iletişimi güçlendirdiği için derse önem katar	5
	Eski Türk yaşam tarzını yansıtmasından dolayı derste sıkça yer verilmeli	3
	Ekonomik kazanç özelliğinden dolayı derste finans okuryazarlığını güçlendirir	2

Geleneksel sporun sosyal bilgiler dersindeki önemine dair görüşler analiz edildiğinde 7 katılımcı kültür aktarımını güçlendirmesinden ötürü geleneksel sporları değerli görmüştür. 6 katılımcı Türk örf, adet ve göreneklerin korunması gerekliliğini vurgulayıp geleneksel sporların sosyal bilgiler dersinde sıklıkla yer alması gerektiğine değinmiştir. 6 katılımcı geleneksel sporların Türk tarihine dair anekdotlar taşıdığını belirtmiş olup bu yüzden sosyal bilgiler dersinde işlenmesi gerektiğini belirtmiştir. 5 katılımcı geleneksel sporların sosyal bilgiler dersinde yer alan sosyal iletişim konusuna katkı sağlayacağını vurgulamış ve bu yüzden dersteeki öneminin fazla olduğunu ifade etmiştir. 3 katılımcı eski Türk yaşam tarzını yansıtması açısından önemli gördükleri geleneksel sporların sosyal bilgiler dersindeki yerinin kıymetli olduğunu vurgulamıştır. Geleneksel sporun ekonomik kazanç özelliğinin de olmasından ötürü bu durumun sosyal bilgiler dersindeki finansal içeriklerle ilişkilendirilebileceğini belirtmiştir. Söz konusu maddeye dair katılımcılardan elde edilen bazı alıntılar şöyledir:

K1: Sosyal Bilgiler müfredatında yer alan Türk dünyası ile ilgili konularda öğrencilerin kazanımlarının artmasında geleneksel sporların katkısının olacağını düşünüyorum.

K3: Geleneksel spor tarihini öğrenmek sosyal bilgiler açısından son derece yararlıdır. Somut yaşantılardan yola çıkarak eski Türklerin sosyal yaşantısı hakkında bilgi sahibi olabiliriz.

K4: Türklerin cirit, güreş ve okçuluk sporlarında başarılı olmalarından yola çıkarak öğrencilere geçmişte Türklerin askeri ve toplumsal yaşamlarında başarılı oldukları bu geleneksel spor dalları ile desteklenebilir.

K8: Dayanışma, barışseverlik, empati, hoşgörü, birlik/beraberlik gibi duyguları güçlendiren geleneksel sporlar sosyal bilgiler dersinin pek çok ünitesiyle ilişkilidir.

K9: Sosyal Bilgiler dersinin bir bölümünü tarih ve kültür oluşturmaktadır. Geleneksel sporların varlığı Türk tarihinin, milletinin bir yönünü oluşturduğu için anlatılması elzemdir. Geleneksel sporların anlatılmaması kültürün bir parçasının es geçilmesi olurdu.

Tablo 19. Geleneksel sporun milli kültür ve tarih bilincine yönelik etkisiyle ilgili görüşler

Tema	Kodlar	f
Geleneksel sporun milli kültür ve tarih bilincine yönelik etkisi	Etkisi yoktur	2
	Oyunların doğuş hikayesi kültüre ilgiyi artırır	4
	Milli kültürün yaşatılıp geleceğe aktarımında etkilidir	5
	Milli değerleri benimsetir	5
	Milli tarihin zenginliğini sunar	4
	Toplumsal aidiyet hissini artırıp kültüre adapte eder	4
	Türk savaş taktiklerini öğretir	3
	Türk bozkır yaşam anlayışını tanıtır	3

Tablo 19 incelendiğinde geleneksel sporun milli kültür ve tarih bilincine yönelik etkisiyle ilgili katılımcı öğretmenlerden 2'si olumsuz yanıt vererek bu durumun etkisiz kaldığını belirtmiştir. Öte yandan 5 katılımcı milli değerlerin benimsetilmesinde ve milli kültürün yaşatılmasında geleneksel sporların önem ar ettiğini vurgulamıştır. Bunun yanı sıra katılımcıların 4'ü geleneksel oyunların doğuş hikayelerinin kültüre olan ilgiyi artıracaklarını belirtmiştir. Katılımcı öğretmenlerden 4'ü milli tarihin zenginliğini örneklemesinde ve toplumsal aidiyet hissini güçlendirmesinden ötürü geleneksel sporların milli kültüre ve tarih bilincine katkı sağlayacağını ifade etmiştir. 3 katılımcı ise Türk savaş taktiklerini yansıttığından bu sporların tarih bilincini artıracaklarını vurgulamıştır. Ayrıca 3 katılımcı geleneksel sporların Türk bozkır yaşamından kesitler sunduğunu belirterek bu durumun milli kültüre ve tarih bilincine olumlu yansıdığını belirtmiştir. Söz konusu maddeye dair katılımcılardan elde edilen bazı alıntılar şöyledir:

K1: Biniciliğin, cirit atmanın, okçuluğun Türk kültüründe yaygın almasının sebebini anlayacaktır. Bu da kendisinde milli bir bilincin oluşmasında etkili olacaktır.

K4: Milli kültürün yaşatılması ve sonraki kuşaklara aktarılmasında geleneksel sporlar önem taşımaktadır. Spor yaparken öğrencilere "geleneklerine sahip çıkma ve milli değerlerini yaşatma" misyonu kazandırılmaktadır.

K5: Milli kültürümüz son derece zengindir. Tarihimiz milattan öncesine dayanmaktadır. Geleneksel sporları öğrendikçe milli kültürümüzün ne kadar geniş olduğunu ve tarihimize gurur duyacağımızı öğreniriz.

K7: Aidiyet duygusu, duygudaşlık, vatandaş olma gibi değer ve becerilerin gelecek nesiller tarafından özümsemesi geleneksel sporlar sayesinde mümkün olabilir.

K8: Geleneksel sporların öğrenciler tarafından araştırılması öğrencilerin Türklerin tarihi ile ilgili bilgi edinmelerini sağlar. Öğrenciler seyahatnameyi okuduklarında o dönemki Türklerin sosyal, ekonomik, kültürel yaşamları ile ilgili bilgi edinmiş olurlar böylece öğrencilerde tarih bilinci oluşturmuş da oluruz.

K9: Türk bozkır kültürünü, savaş yeteneğini, Türkçe dil zenginliğini bugünlere getirmek hususunda geleneksel sporların önemli katkısı olduğunu düşünüyorum.

K10: Kültürün devamını sağlamakta. Geçmiş ile bugün arasında bağ kurulmasına olanak sağlamakta. Geleneksel sporların varlığı Türk tarihinin, milletinin bir yönünü oluşturduğu için anlatılması elzemdir.

Katılımcı öğretmenlerden elde edilen veriler doğrultusunda bir kelime havuzu oluşturulmuştur. Spor kültürü ve geleneksel spora dair ifade edilen kelimelerin sıklığına göre WordArt web 2.0 aracı kullanılarak bir kelime bulutu oluşturulmuştur. Şekil 1’de kelime bulutu görülmektedir.



Şekil 1. Spor kültürü ve geleneksel spora dair kelime bulutu

Şekil 1’de görüldüğü üzere katılımcı öğretmenlerin sıklıkla Etnospor, sosyalleşme, okçuluk, bozkır yaşamı, cirit atma, kültür aktarıcısı gibi kelimelerin kullanıldığı tespit edilmiştir.

TARTIŞMA VE SONUÇ

Bu araştırma kapsamında sosyal bilgiler öğretmenlerinin geleneksel spora yönelik tutumlarının ve görüşlerinin nasıl olduğunu tespit etmek amaçlanmıştır. Bu doğrultuda nicel ve nitel veri toplama araçlarından yararlanılarak önemli bulgular elde edilmiştir.

Araştırma neticesinde elde edilen nicel verilere göre katılımcıların geleneksel spora yönelik tutumları orta düzeyde olduğu görülmüştür. Katılımcıların önemli bir kısmı geleneksel sporların ağırlıklı olarak fiziksel gelişim boyutunda katkı sunabileceğini belirtmiştir. Yarı yapılandırılmış görüşmelerde de katılımcı öğretmenlerin çoğu geleneksel sporların özellikle fiziksel boyutta bireyleri geliştirebileceğini belirtmiştir. Bu durum nicel ve nitel verilerin birbirini tamamladığını göstermektedir.

Geleneksel sporlara yönelik tutum ölçeği toplam puanı ve psikolojik gelişim, sosyal gelişim, bilişsel gelişim ve kültürel gelişim alt boyut puanlarının mesleki kıdeme, cinsiyete, görev yapılan ile, mezun olunan lisans bölümüne, öğrenim durumuna ve daha önce geleneksel spor yapmış olma durumuna göre anlamlı bir farklılık göstermediği tespit edilmiştir. Öte yandan fiziksel gelişim alt boyut puanının mesleki kıdeme göre anlamlı farklılık gösterdiği, mesleki kıdemi 11-15 yıl arası olan katılımcıların mesleki kıdemi 16 yıl ve üstü olan katılımcılara göre tutum puanlarının daha yüksek olduğu belirlenmiştir.

Öğretmenler ile yapılan görüşmeler neticesinde sosyal bilgiler ders kitabında geleneksel spora ve spor kültürüne dair kavramlara yer verilme sıklığının az olduğuna değinilmiştir. Ders işlerken bu spora yönelik etkinliklerin çok sınırlı kaldığı belirtilmiştir. Tel'in (2019) doküman analizinde elde ettiği sonuçlarda da sporla ilişkili etkinliklerin, içeriklerin ortaokul 6.ve 7. sınıf sosyal bilgiler ders kitabında yeterli düzeyde yer almadığı ortaya konulmuştur. Öğretmenlerin geleneksel spor olarak gördüğü yağlı güreş, okçuluk, cirit, atlı kızak gibi etkinliklere dair ders kitaplarında yalnızca iki kez yer verildiği tespit edilmiştir.

Katılımcı öğretmenlerle yapılan görüşmede eğitim sürecinin spor kültürü ile doğrudan ilişkili olduğu ve bunların birbirini tamamladığı vurgulanmıştır. Öğretim programlarında da spor kültürünün beceri eğitimi aracılığıyla benimsetilmesinin gereğine değinilmiştir (MEB, 2018). Öğretim programlarında sporun başta fiziksel olmak üzere duyuşsal ve bilişsel kazanımların elde edilmesinin önemi vurgulanmıştır. Eğitimle spor ilişkisinin yüksek çıktığı bu araştırma bulguları ilgili alan yazında ulaşılan sonuçlarla paralellik göstermektedir (Ayyıldız, 2021). Nitekim düzenli bir şekilde eğitim sürecine dahil olup öğrenim gören bireylerin spor kültürüne yönelik tutumlarının ve bilgi düzeylerinin daha yüksek çıktığı tespit edilmiştir (Borowiecki & Castiglione, 2014; Eurobarometer, 2014; Humphreys & Ruseski, 2011).

Katılımcı öğretmenlerin büyük çoğunluğu geleneksel sporun; milli değerleri, Türk tarihini ve kültürel geçmişi korumaya yönelik önemli bir rol üstlendiğini belirtmiştir. Böylece öğrencilerin birtakım geleneksel spor aracılığıyla Türk savaş tarihi hakkında bilgi elde edip milli tarih bilincine erişeceği ifade edilmiştir. Nitekim Özer ve Gül (2020) ile Yağmur'un (2020) bulgularında da ata sporlarından güreş, okçuluk, at binicilik, cirit vb. sporlara gerekli önemin verilmesi durumunda milli kültüre sahip çıkılması ve tarih bilincinin elde edilmesi mümkün görülmüştür.

Çalışma neticesinde katılımcı öğretmenlerin büyük çoğunluğu aktif olarak herhangi bir spor dalıyla uğraşmadığı tespit edilmiştir. Şirinkan ve diğerlerinin (2010) bulgularında da katılımcıların %83'ünün sporla aktif şekilde uğraşmadığı görülmüştür. Bununla birlikte çalışmamızda öğretmenlerin geleneksel spor türlerine dair bilgi düzeylerinin düşük olduğu tespit edilmiştir. Nitekim Ağırbaş ve diğerlerinin (2011) bulgularında spor eğitimi hususunda kendilerini yetersiz gören öğretmenlerin aynı zamanda spor bilgi düzeyi puanlarının düşük olduğu görülmüştür.

Sonuç itibariyle söz konusu araştırma sosyal bilgiler öğretmenlerinin geleneksel spora dönük tutumlarının düşük düzeyde çıktığını göstermektedir. Benzer durum ilgili alan yazında da tespit edilmiştir. Görüşlerde ders kitabı içeriğinde (görsel, metin, etkinlik vb.) spor kültürüne ve

geleneksel sporlara çok az yer verildiği ifade edilmiştir. Ayrıca milli tarih ve kültürel miras açısından önemli bir unsur olarak görülen geleneksel sporların etkinlikler yoluyla öğretilmesinin gereğine değinilmiştir. Etnospor gibi faaliyetlerin daha kapsayıcı ve sürdürülebilir bir biçimde yapılmasına dönük ortak görüş beyan edilmiştir. Eğitim ve spor kültürü ilişkisinin büyük önem arz ettiğini ifade eden katılımcılar okul paydaşlarının bu süreçte öğretmenlere ve öğrencilere dönük çeşitli çalışmalar yapması gerektiğini vurgulamıştır. Katılımcı sosyal bilgiler öğretmenlerinin %15'i aktif bir biçimde sporla uğraştığını belirtmiştir. Katılımcı sosyal bilgiler öğretmenlerinin %90'ı geleneksel sporların derste yer alıp etkinliklerle işlenmesi gerektiğini vurgulamıştır. Bununla birlikte katılımcılar geleneksel sporlara orta düzeyde ilgili duyarken yine aynı katılımcıların %85'inin aktif spor yapmadığı görülmüştür. Bu durum benimsenen ve savunulan görüşün eylem boyutunda noksanlık taşıdığını göstermektedir.

Çalışmadan elde edilen bulgulardan hareketle oluşturulan öneriler şöyledir:

- ✚ Sosyal bilgiler öğretmenlerine hizmet içi eğitim kapsamında en az bir geleneksel sporun öğretilmesi tavsiye edilebilir.
- ✚ Sosyal bilgiler ders kitaplarındaki içeriğin geleneksel sporlara dönük farkındalık oluşturacak biçimde güncellenmesi gerekmektedir.
- ✚ Geleneksel sporların eğitimle ilişkisinin önemine binaen okullar ile paydaşların ortak biçimde sportif faaliyetleri koordine etmesi tavsiye edilebilir. Böylece okullarda geleneksel spor anlayışının yaygınlaştırılması mümkün hale gelebilir.
- ✚ Eğitim fakültesi ile Spor Bilimleri alanında eğitim veren kurumlar arasındaki ilişkinin güçlendirilip öğretmen adaylarına hizmet öncesi spor kültürü ve geleneksel sporun önemi hakkında farkındalık oluşturacak eğitimler planlanabilir.

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Etik Kurul İzni ile ilgili Bilgiler

Kurul Adı: Yıldız Teknik Üniversitesi Sosyal ve Beşerî Bilimler Araştırmaları Etik Kurulu

Tarih: 19/07/2023

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Investigation of the Relation Between Sports Awareness and Life Satisfactions of Young Generations

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Abstract

The purpose of this study was to investigate the association between young generations sports awareness levels and their life satisfaction. Human resource management is an important trend in today's business environment. In this research, the life satisfaction of young generations, who will be the future human resource of the business world, was examined from the perspective of sports awareness. It is thought that the research will provide important benefits for the young generations, who will play an important role in the future, to be healthy and happy individuals, social welfare and production. The quantitative research method was used in the study. Descriptive scanning was used in the study to identify people's attitudes and behaviors. Within the scope of the research, a questionnaire including a personal information form and sports awareness and life satisfaction scales was applied to individuals aged 12-25. A total of 1.102 people, 751 women and 351 men, participated in the research. The research findings and the obtained data were obtained by ANOVA test and correlation analysis in SPSS program. The study's findings show a considerable difference between the young generation's relation with sports, life satisfaction and sports awareness, as well as a weak and positive relation between sports awareness and life contentment. As a result, it can be said that the status of the participants' relation with sports has an effect on their awareness of sports and their life satisfaction and state of sports awareness also contributes positively to the life satisfaction of the participants.

Keywords: Sports, Sports awareness, Life satisfaction

Genç Kuşakların Spor Farkındalığı ile Yaşam Doyumları Arasındaki İlişkinin İncelenmesi

Öz

Bu çalışmada, genç kuşakların spor farkındalık düzeyleri ile yaşam doyumları arasındaki ilişkinin incelenmesi amaçlanmıştır. Günümüz iş dünyasının önemli trendlerinden birisi de insan kaynakları yönetimidir. Yapılan bu çalışmada, iş dünyasının gelecekteki insan kaynağı olacak genç kuşakların yaşam doyumları spor farkındalık perspektifinden ele alınarak incelenmiştir. Araştırmanın, gelecekte önemli rol oynayacak genç kuşakların sağlıklı ve mutlu bireyler olmasına, toplumsal refah ve üretim için önemli yararlar sağlayacağı düşünülmektedir. Araştırmada nicel araştırma yöntemi kullanılmıştır. Araştırmada, kişilerin tutum, görüş, beklenti ve davranışlarını belirlemek için betimsel tarama yapılmıştır. Araştırma kapsamında, 12-25 yaş arasında yer alan bireylere kişisel bilgi formu ile spor farkındalık ve yaşam doyumunu ölçeklerini içeren anket uygulanmıştır. Araştırmaya 751 kadın, 351 erkek olmak üzere toplam 1.102 kişi katılmıştır. Araştırma bulgularına elde edilen verilerin SPSS istatistik programında ANOVA testi ve korelasyon analizi yapılarak ulaşılmıştır. Araştırma sonuçları, genç kuşak olarak nitelendirilen ortaokul, lise ve üniversite çağındaki bireylerin spor ilişki durumları ile yaşam doyumunu ve spor farkındalıkları arasında anlamlı bir fark olduğunu, spor farkındalık durumları ile de yaşam doyumları arasında ise zayıf ve pozitif yönde bir ilişkinin var olduğunu ortaya koymaktadır. Sonuç olarak çalışmada yer alan katılımcıların sporla ilişki durumlarının spor farkındalığı ve yaşam doyumları üzerinde etkisinin olduğu, spor farkındalık durumlarının da katılımcıların yaşam doyumlarına olumlu olarak katkısının bulunduğu söylenebilir.

Anahtar kelimeler: Spor, Spor farkındalığı, Yaşam doyumunu

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INTRODUCTION

In literature numerous studies have been carried out on ensuring happiness and welfare in human life, and on living a healthy and peaceful life. In this sense, together with science fields such as sociology and philosophy, sports sociology and sports philosophy, which are sub-branches of these disciplines, deal with the importance of sports in human life and the change in people and societies from past to present within social structures and institutions (Yetim, 2006; Erdemli, 2002). The place and importance of sports in human life is increasing day by day. While in the past, sports were only considered as bodily physical activity, today sports emerges as an interdisciplinary field with the contribution of many scientific fields. Sport is seen that it gains importance as an interdisciplinary field that finds its place in medicine, politics, economy, religion, sociology, philosophy, culture and many other fields.

In sports, physical activities and physical exercises and training the body have been important research topics of sports sciences. Today, sport is recommended and encouraged to be done in many areas such as entertainment, health, work, money earning tool, competition, being healthy, looking good, socializing, acculturation, advertising tool, providing corporate reputation, increasing the motivation of employees and ensuring that they are effective and productive. It is considered as an indispensable activity for life and on which serious investments are made.

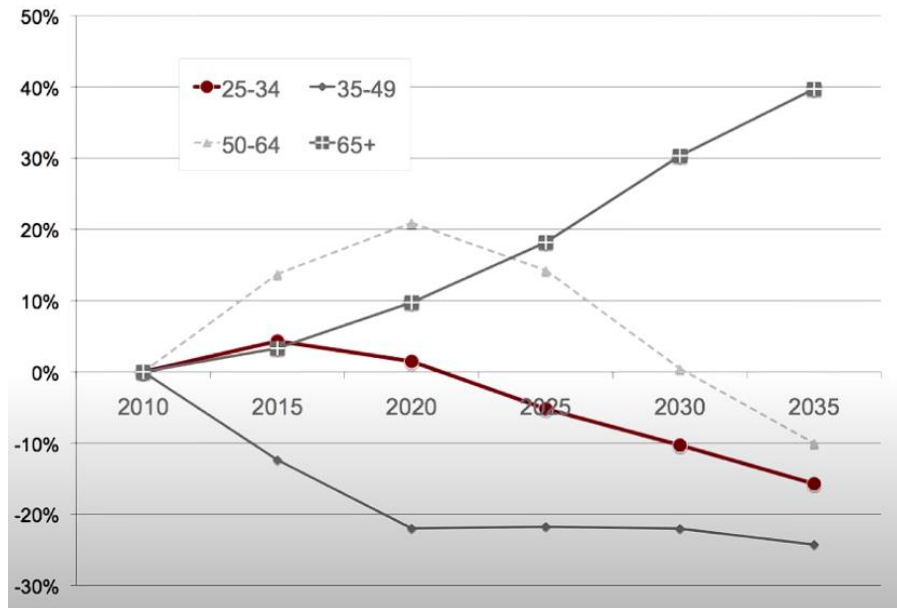
Considering that sports has a comprehensive field of interaction and various benefits, its place and importance in human life is indisputable. Several study have shown that physical activity is connected with happiness, health, quality of life and life satisfaction (Brown et al., 2015; Sigvartsen et al., 2016). In this field, which has been shown to have so many social benefits, it has been seen that it is painful to investigate the level of social awareness and its effects on life satisfaction, and it is considered that the research reveals the importance of this aspect.

The fact that the research sample is made up of young people is regarded as significant in terms of shaping society's future. Societies create long-term, medium-term, and short-term strategies for the future. In this way, societies try to shape their futures by means of social engineering or human engineering in order to ensure their sustainability and gain competitive advantage over the societies they compete with.

Administrations have physical, financial and human resources (Eren, 2011). Human resources, which are expected to use physical and financial resources effectively and efficiently are of importance. Talented, dynamic and innovative young people also come to the fore in human resources. Many businesses strive to have young, talented, pleasant, harmonious, healthy human resources in order to increase their profitability and market share and to carry their assets to the future (Benligiray, 2013). The fact that countries have a young population is seen as one of the important factors affecting their future. Countries are doing different studies to increase the young population rates. In Türkiye, the rulers of the period underline the importance of this with the

slogan "at least three children". Having a young population can be considered as a golden resource today.

Along with this, social changes both in the world and in Türkiye have brought demographic changes as well. Especially the decrease in the young population in European countries draws attention. German management scientist Trost (2021) shows that in the demographic change graph of Germany between 2010 and 2035, the 25-34 age group and the 34-49 age group decreased over the years, while the age group over 65 years of age increased over the years (Graph 1). Trost also states that during his visit to Istanbul, he observed that Türkiye has a young population while he was wandering around the streets of Istanbul, and when he returned to Germany, when compared to this situation, the elderly population was higher in the streets. This is one of the megatrend issues in human resources management emphasized by German management scientist Trost (Trost, 2021). Trost emphasizes that this demographic change is the same in many western country and that this will lead to a lack of talent over time and states that companies will increasingly need skilled, young and qualified people, as there is a change from physical labor to knowledge (Trost, 2021; Trost, 2023).



Graph 1. Graph of demographic change in Germany between 2010-2035

In addition, when the young population ratio of Türkiye is compared with the young population ratio of European countries, the ratio of Türkiye's young population to the overall population is 15.4%, which is higher than the ratio of 27 European Union member countries' young population populations (Table 1). When we look at the young population rates of European Union member countries in 2020, the Greek Cypriot Administration and Ireland have the highest young population with 12.7%, Denmark with 12.5%, and the Netherlands with 12.3%, respectively. Bulgaria has a youthful population of 8.8%, Czechia has a population of 9.0%, and Latvia has a population of 9.1% (Eurostat, 2020).

Table 1. Young population ratio by age groups in Türkiye, 2020

Age group	Population ratio %	Non-young population ratio %	Young population ratio %
15-17 Age group	28,6		
18-19 Age group	19,8	84,6	15,4
20-22 Age group	31,3		
23-24 Age group	20,4		

According to Turkish Statistical Institute (TÜİK) 2020 data, 12 million 893 thousand 750 people (15.4%) of Türkiye's population, which is 83 million 614 thousand 362 people, consists of young people between the ages of 15-24 (Table 1). This population of 28.6% is 15-17 age group, 19.8% is 18-19 age group, 31.3% is 20-22 and 20.4% is 23-24 age group (TÜİK, 2021).

Table 2. Life satisfaction survey results and general happiness level of youth, 2019, 2020

Years	Happy	Medium	Unhappy
2019	%56,7	%33,8	%9,6
2020	%47,2	%38,6	%14,2

According to the life satisfaction survey conducted by TÜİK on 18-24 age group youth in 2020, the rate of those who consider themselves happy is 47.2% (Table 2). According to the life satisfaction survey this rate is 56.7% in 2019). In 2020, while the rate of those who see themselves as happy in young men is 41.4%, this rate is 53.2% in young women (TÜİK, 2020).

Table 3. Values of young people as sources of happiness by gender, 2020

Gender	Health	Love	Success	Money	Other
Male	41,9	12,7	28,0	10,7	6,7
Female	54,4	18,6	21,1	3,0	3,0
Average	48,0	15,6	24,6	7,0	4,9

According to the life satisfaction survey conducted by TÜİK (2020), health was the first source of happiness for the youth with 48.0%, success was the second with 24.6%, love was the third with 15.6%, and money was at the fourth place (Table.3). According to the results of the source of happiness in terms of gender, in men, health ranked first with 41.9%, success with 28.0% and love with 12.7%. As for women, health was the first with 54.4%, the second was success with 21.1%, and the third was love with 18.6% (TÜİK, 2020).

Today, it is seen that technological developments and city life, which lead to unhealthy nutrition and decrease in movement and sports opportunities, increase obesity and sedentary (sedentary) life. However, in the light of the data above, it can be said that people's efforts for a healthy and natural life have increased. In sports, individuals, the smallest unit of society, increase their

importance as much as societies. It is seen that the culture of doing sports has evolved in societies and has begun to be used as a means of socialization, looking good, self-realization, reputation and advertising among young people.

Life satisfaction is thought to have significant psychological variability, especially during adolescence (Leung & Leung, 1992). Life satisfaction during adolescence; Physical and positive self-perception can also be affected by environmental factors (Dewt & Huebrer, 1994). In this process where the adolescent questions himself and tries to adapt to his physical changes, it may cause problems if he is not happy with his life (Yiğit, 2010). Life satisfaction has been defined with different approaches. In general terms, life satisfaction is defined as meeting the things that are expected to happen, needs and desires, a state of well-being, being happy, receiving pleasure, being pleasant and motivated, being away from emotions such as sadness and pain, physical health, and psychological well-being (Karadayı, 2018). Throughout the life of individuals in the 12-21 age group, also referred to as the adolescent age group, they have the ability to be successful in school and in their fields of interest (sports, music, painting), to be appreciated, admired, respected by their environment (friends, family, social circle), to be financially successful. It is evaluated that they achieve life satisfaction in situations such as meeting their spiritual expectations and needs (Karadayı, 2018; Yiğit, 2010).

In this study, the effect of awareness in sports on the life satisfaction of young people is being investigated. The results of the study reveal the importance of popularizing sports among young people, who are the guarantee of the future of societies, and the importance of sports awareness and life satisfaction levels in order for the adults of the future, who will take different roles in social institutions, to fulfill these roles effectively and efficiently.

METHODS

Research Method

Quantitative research method was used in the research. In the research, descriptive survey was conducted to determine the attitudes, opinions, expectations and behaviors of the people (Gürbüz & Şahin, 2018). The first part of the research consists of information and data obtained from the literature. In the second part of the study, the data obtained from the sports awareness and life satisfaction scales were analyzed and the findings were reached.

Research Group

The population of the research, according to TÜİK (2021) data, consists of 19 million 409 thousand 441 people in the 12-25 age group in Türkiye (TÜİK, 2022). The sample of the research consists of 1.252 people determined by the snowball sampling method, which can be used in cases where it is difficult to form a sample circle (Okumuş, 2022).

Taştan, H.Ş., & Alkan, A.D. (2023). Investigation of the relation between sports awareness and life satisfactions of young generations. *Eurasian Journal of Sport Sciences and Education*, 5(2), 311-327.

In determining the sample size, ready-made tables that were calculated and prepared before were used (Karagöz, 2016a; Karagöz, 2016b; Gürbüz & Şahin, 2018). According to the minimum sampling table accepted for different universes, the 99% confidence interval was calculated as 665 in the population with 10.000.000 (Gürbüz & Şahin, 2018). This sample size was considered sufficient as 1.102 people participated in the study. The questionnaires applied to the participants were applied electronically and simultaneously through the Google Forms application.

Data Collection Tools

Awareness and life satisfaction scales in sports were applied to the participants. In order to save time and money in their research, researchers can benefit from scales that are generally developed or scales whose validity and reliability have been proven in previously completed studies (Gürbüz & Şahin, 2018). In this study, data collection tools that were previously applied or developed with this method were used.

Sports Awareness Scale: In the research, the “Sports Awareness Scale” developed by Uyar and Sunay (2020) was used. The scale consist of 30 items prepared with a 5-point Likert answer option and has two sub-dimensions. While the first dimension, called Sports Knowledge and Distinguishment of Knowledge (SBBAE), consists of 21 items, the second dimension, called Social and Individual Benefit (SBF), consists of 9 items (Uyar & Sunay, 2020).

Life Satisfaction Scale: In the research, the “Life Satisfaction Scale”, which was adapted to Turkish by Dağlı and Baysal (2016) and whose validity and reliability were demonstrated, was used. It has been revealed that the Life Satisfaction Scale, like the original scale, has a single-factor structure and consists of 5 items, as in the original scale (Dağlı & Baysal, 2016).

In the questionnaires used in the research, a total of 54 questions were asked to the participants in 3 separate sections. Within the scope of the research, demographic information (19 questions), awareness in sports (30 questions) and life satisfaction scale (5 questions) were applied to the participants.

Ethical Approval

Ethical approval of the research was obtained with the decision of Niğde Ömer Halisdemir University Ethics Committee dated 06.04.2021 and numbered E-86837521-050.99-45226.

Data Collection

The research data were collected in electronic environment around Türkiye, after obtaining the necessary permissions and approval of the ethics committee.

Analysis of Data

In the research, the data collection tools were applied to the sample group with a simple random method from the universe and the collected data were transferred to the electronic environment through the Microsoft Office program. The data transferred to the electronic media were analyzed

in the IBM SPSS (Statistical Package for the Social Sciences) 18 statistical program and the findings were reached. The findings obtained from the analysis were interpreted and reported.

In the research, frequency analysis, percentage trend analysis, factor analysis, ANOVA test and correlation analysis were performed descriptively. Since kurtosis and skewness values are between ± 1.5 , it can be said that the data are normally distributed (Tabachnick & Fidell, 2013).

In the study, ANOVA test was performed to test the difference at a certain significance level by comparing the averages of more than two groups. Correlation analysis was performed to determine the existence and severity of a mutual relation between two variables or multiple variables (Gürbüz & Şahin, 2018).

FINDINGS

In this part of the research, the results of the analysis on the relation between sports awareness levels and life satisfaction are included. The demographic findings of the participants are presented in Table 4.

Table 4. Descriptive statistical distribution of demographic information

Demographic Variables	Groups	Frequency (n) (%)	Percent (%)
Age / Educational status	12-14 aged Middle school	46	4,2
	15-18 aged High School	325	29,5
	19-25 aged Universty	731	66,3
	Total	1.102	100,0
Gender	Female	751	68,1
	Male	351	31,9
	Total	1.102	100,0

Table 4 contains descriptive statistical data about the demographic features of the younger generations who participated in the research. A total of 1.102 people participated in the research. According to the findings, 751 (68.1%) of the participants were female and 351 (31.9%) were male. Age and educational status distribution of the participants, 46 (4.2%) in secondary school between the ages of 12-14, 325 people (29.5%) in high school between the ages of 15-18, 731 people (66.3%) in the university between the ages of 19-25.

Using the data obtained, it was examined whether the participants showed a significant difference in their life satisfaction according to their relations with sports (I have no relation with sports, spectator, participant, both spectator and participant). The research results are presented in Table

5. While 239 of the participants were not related to sports, 202 of them were related to sports as spectators, 227 participants and 434 both as spectators and participants.

Table 5. One- Way ANOVA test results (Relation with sports/ life satisfaction)

Relationship with sports	N	\bar{x}	SD	df	F	p
I'm not involved in sports	239	3,63	1,48			
Spectator	202	3,69	1,38			
Participant	227	4,05	1,47	3,1098	8,108	0,000*
Both spectator and participant	434	3,91	1,43			

*p<0.05, n=1.102

According to the One-Way ANOVA test analysis results presented in Table 5, there is a significant difference between the participants' relation with sports and their life satisfaction ($F_{(3,1098)} = 8,108$, $p < 0,05$). In other words, the life satisfaction of the participants; it differs depending on whether they are a participant, a spectator, or both a spectator and a participant, that is, their relation with sports.

According to the participants' sports relation status (I have no relationship with sports, spectator, participant, both spectator and participant), whether there is a significant difference in sports awareness status was investigated from the data obtained. The research results are presented in Table 6.

Table 6. One- Way ANOVA test results (Relation with sport/sports awareness)

Relation with Sports	N	\bar{x}	SD	df	F	p
I'm not involved in sports	239	2,79	1,48			
Spectator	202	3,20	1,38			
Participant	227	3,70	1,47	3,1098	117,545	0,000*
Both spectator and participant	434	3,91	3,35			

*p<0.05, n=1.102

According to the One-Way ANOVA test analysis results presented in Table 6, there is a significant difference between the participants' relation with sports and their sports awareness ($F_{(3,1098)} = 117,545$, $p < 0,05$). In other words, the sports awareness of the participants differs significantly depending on whether they are a participant spectator or both a spectator and a participant, that is, their relation with sports.

Table 7. Results of correlation analysis between research variables

Variables	\bar{x}	SD	1	2
1. Life Satisfaction	3,93	1,45	-	
2. Sports Awareness	3,35	0,71	0,09**	-

**p< 0.01, n=1.102

Table 7 shows the correlation between the factors of the research dimensions. According to the results in the table 7; there is a significant and positive weak correlation ($p<0.01$) between the participants' awareness of sports and their life satisfaction ($r=0.09$). Participants' sports awareness, can be shown as an important proof of their awareness of the benefits of sports, meeting their expectations from life and being satisfied with what they have in their lives.

Table 8. Results of correlation analysis between sub-dimensions of research variables

Variables	\bar{x}	SD	1	2	3
1. Life Satisfaction	3,93	1,45	-		
2. Sports Awareness – Sub-Dimension 1 Distinguish between Sports Information	2,98	0,82	0,10**	-	
3. Sports Awareness – Sub-Dimension 2 Social and Individual Benefit	3,74	0,66	0,02	0,45**	-

** p< 0.01, n=1.102

Table 8 shows the correlation relations and significance levels between the factors of the research sub-dimensions. According to the results in the table; there is a significant and positive weak correlation ($p<0.01$) between the participants' life satisfaction and the sub-dimension of sports awareness, sport knowledge and distinguishing knowledge ($r=0.10$). However, no significant relation was found between the social and individual benefit sub-dimension of sports awareness ($p>0.05$). In addition, there is a moderate and positive relation ($p<0.01$) between the sports awareness sub-dimension, sports knowledge and distinguishing knowledge, and the sports awareness sub-dimension, social and individual benefit ($r=0.45$). It is seen that the participants contribute to their life satisfaction thanks to their sports knowledge rather than the social and individual benefits of sports.

DISCUSSION AND CONCLUSION

The correlation between sports awareness levels and life satisfaction of individuals aged 12 to 25 was investigated in this study. The statistical analysis of the data obtained from the participants revealed a significant difference between the sports relation status, life satisfaction and sports awareness of the middle school, high school and university aged individuals, referred to as the young generation and a weak positive relation between their sports awareness status and their life satisfaction. In other words, it can be said that the status of the participants' relation with sports

has an effect on their awareness of sports and life satisfaction, and their state of sports awareness also contributes positively to the life satisfaction of the participants.

At the same time, the research results of twelve master's and five doctoral thesis conducted by other researchers on the relation between life satisfaction and sports in the last five years were compared with this research. In the research conducted on the effect of sports awareness of students studying at high schools (different types) in Kocaeli on life satisfaction, it was revealed that as the economic status and educational status of parents increase, participation in regular sports activities increases and this contributes to life satisfaction (Öztürk, 2019).

In the research conducted to reveal the relation between life satisfaction, leisure time satisfaction and self-esteem levels of Bartın University Faculty of Sports Sciences students, it was stated that there is a significant difference between recreational activities and life satisfaction (Özel, 2019). Another study investigated at high school students opinions regarding physical education and sports instruction in relation to their life satisfaction levels. According to the findings of the study, students' demographic features were an essential role in their attitudes toward physical education and sports classes, as well as their life satisfaction, and positive views toward this lesson boosted life contentment (Atik, 2020). In the research conducted with the aim of "Examination of the relation between the motivation to participate in sports and life satisfaction of students in provincial sports centers", it is said that although there is no gender difference on life satisfaction, life satisfaction is effective in increasing the motivation to participate in sports (Aytaş, 2020). In the research conducted with the aim of "Examination of the happiness levels and life satisfaction of individuals who exercise for recreational purposes", it has been revealed that physical satisfaction in individuals who exercise has a positive effect on the happiness of individuals and indirectly on life satisfaction (Önmen, 2021). In addition, in another study on recreational activities, it was found that as university students' sports participation levels increase, self-respect and careful decisions of students increase, and procrastination and panic decisions decrease in decision-making (Yiğit & Yurtseven, 2019).

In the research conducted on determining the sportive life satisfaction and school experiences of athlete students within the scope of coach-athlete relations, it was stated that sportive activities can be a significant predictor of life satisfaction in high school students (Somoğlu, 2021).

In the research titled "*Examination of Perceived Health Outcomes, Perception of Being Bored in Leisure and Life Satisfaction Levels of Individuals Participating in Recreational Tennis*", it is stated that there is an interaction between life satisfaction and daily tennis playing time and club membership (Kayapınar, 2021). In the study on "*The effect of regular exercise on some physical fitness parameters and life satisfaction*", it was statistically revealed that there is no significant difference between life satisfaction and whether the participants do sports or not (Turak, 2021). An other in the research conducted on the life satisfaction of university students who do sports, it has been determined that there is a relational situation between life satisfaction, career anxiety and hopelessness level (Küçükkeskin, 2021).

In one study, researchers looked at the association between leisure time and life happiness in volleyball players, it is stated that leisure time satisfaction is an element that increases life satisfaction in volleyball players (Sönmez, 2022). In the medical specialty thesis conducted to examine the school success, school satisfaction and life satisfaction of primary school age professional wrestlers, it was determined that primary school age wrestlers had higher school and life satisfaction but low school achievement compared to the control group (Ay, 2022).

In a study on the association between physical activity levels and life happiness of those who exercise regularly in sports centers, there was no statistical difference in life satisfaction of those who regularly do physical activity (Taştan, 2022). In the study of "*Examination of the effectiveness of the mindfulness-based exercise program on the psychological well-being and life satisfaction of university students*", it was revealed that this situation has a significant effect on increasing the level of life satisfaction of university students who exercise for two months (Terzioğlu, 2022).

In another study that examined at the relation between university students' recreation awareness and higher education life satisfaction, it was found that as participants' recreational awareness levels improved, so did their life happiness levels (Geven, 2022). Another study found a statistically significant difference between psychological well-being and life satisfaction in university students who participate in sports on a regular basis. Furthermore, it was found that participants who spent more time doing sports had better levels of life satisfaction than those who spent less time doing sports (Tufan, 2022).

In the study on the examination of happiness levels and life satisfaction of sports high school and science high school students, it was determined that there was a significant difference between students' grade levels, weekly sports activities and life satisfaction (Başdemir, 2022). In another study, as a result of investigating the quality of life and life satisfaction levels of individuals who go to gyms for recreational purposes, it was concluded that quality of life variables such as income, age, sex, marital status, etc. did not have an effect on life satisfaction (İnce, 2022). In the research conducted by Başar in 2018, it was concluded that those who do sports regularly have better psychological well-being and happiness than those who do not do regular sports (Başar, 2018). According to Mutz et al. (2021), observations and studies found that Leisure Time Sports Activities (LTSA) were associated with the well-being and well-being of the participants, but the study results showed that the LTSA's overall life satisfaction and domain-specific satisfaction, connections, relations, view, leisure, work, and health, but the relation is most evident for leisure satisfaction. The relations between sport and life satisfaction, leisure satisfaction, and subjective health are non-linear, and we are approaching the point where further LTSA is no longer advantageous. Furthermore, the data support the notion that diversity in the LTSA is significant, as persons who participate in a wider range of sporting activities are happier. Finally, findings concerning the spatial and organizational environment imply that outdoor sports and club-organized sports have extra advantages (Mutz et al., 2021). Positive links have been found between physical activity and health in all age groups, including youth (McMahon et al. 2016; Jetzke & Mutz 2019).

The social benefits of sports have been generally accepted for many years (Coalter, 2007). It is stated that individuals can improve their physical and mental well-being through sports activities, as well as socialize during sports activities, strengthen friendship bonds, and increase the individual's life satisfaction with all these effects such as belonging and identification and positive psychological well-being (Wann et al., 2015). In other words, participating in sports activities can lead to the development of an individual's personal-psychological capital, increased psychological well-being and positive evaluation of living conditions. As a result, a feeling of satisfaction may occur in the individual's living spaces (Bockorny & Youssef-Morgan, 2019). In addition, research shows that although individuals' participation in sports does not directly increase life satisfaction, it mediates positive results in the development of psychological capital (Park et al., 2022).

Another study which examined differences in life satisfaction between adolescents who participated in sports programs and those who did not, found that participants who participated in sports programs had higher life satisfaction rates than those who did not participate in such extracurricular activities. recommends promoting sports education among children and adolescents (Šimunović, & Olčar, 2022). Another study aiming to examine the link between physical activity and life satisfaction on adolescents revealed that there is a positive connection between physical activity and life satisfaction through the mediating role of perceptions of thinness and overweight, and emphasizes that it mediates the effect of physical activity on life satisfaction (Meyer et al., 2021). Another study conducted on young people revealed the effect of physical activity on the well-being of young people and that young people's life satisfaction and socialization are the main factors affecting well-being (Tao et al., 2022). These results can be used to develop youth education policy, such as promoting sports in schools or conducting awareness campaigns about participation in out-of-school leisure activities (Canal-Domínguez et al., 2017).

When the above-mentioned findings are evaluated as a result of the literature review, it is seen that there are studies that show less contrast with this study and produce more similar results. It is thought that these differences may be caused by different variables and factors such as the frequency of doing sports and the branch of sports.

One of the important trends of today's business world is human resources management. In this research, the life satisfaction of young generations, who will be the future human resource of the business world, was examined from the perspective of sports awareness. He evaluates that the life satisfaction and happiness of young generations will have positive reflections on work performance and social life. In this context, it is considered that in the planning for the determination of sports policies, incentives and preparations for young people to do sports should be included as well as the studies to be done for academic success.

RECOMMENDATIONS

Countries are trying to predict the future of their demographic structures with various researches. It is thought that the sustainability of the countries will be possible with the quality human resources they have. In this sense, it is considered that the life satisfaction and happiness of young generations will contribute positively to social life and work performance. Sport is an important source of life for societies. In this context, it is recommended to encourage young people to do sports and to provide opportunities in addition to the studies to be carried out for the academic success of the youth in the education policies of the country. For this purpose, Sports activities and sports organizations can be organized by school administrations to increase the sports awareness levels of young people. In schools, each student may be asked to choose a sport from among individual or team sports. Students who are successful in a sports branch in the education system may be given additional points in the university entrance exam. Additionally, sports-related life satisfaction of individuals with high academic success can be investigated in the future.

Conflict of Interest: There is no personal or financial conflict of interest between the authors in this study.

Authors' Contribution: The design of the research (HŞT), collection of data (ADA), statistical analysis (HŞT) interpretation of the findings obtained from the analysis (HŞT), reporting and preparation of the article were carried out by the (HŞT). The authors have read and accepted the published version of the article.

Ethical Approval

Ethics Committee: Niğde Ömer Halisdemir University Ethics Commission

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The Effect of Perceived Service Quality on Customer Loyalty in Sports-Fitness Facilities

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Abstract

This research aimed to investigate the effect of service quality on customer loyalty in sports-fitness facilities. The sample of the research consisted of 311 individuals, 165 males and 146 females, who were members of 6 sports – fitness centers in Istanbul and Niğde. In the research, a questionnaire containing 3 parts was used as a data collection tool. In the first part, the items defining the research group were included. In the second part, "Scale of Perceived Service Quality of Sports-Fitness Centers" developed by Uçan (2007) was used. In the third part, the "Customer Loyalty Scale" developed by Zeithaml et al., (1996) and adapted into Turkish by Savaş (2012) was used. SPSS 22 program was used in the analysis of the data, while detailed graphic statistics were used for demographic data, scale scores, and regression analysis was used for relational analysis. When the descriptive statistics results of the research were examined, it was observed that the perceived service quality sub-dimension scores and customer loyalty scale scores were above the mean. Looking at the relational analysis part of the research, it was determined that interaction, output and program quality in sports-fitness facilities had a significant positive effect on customer loyalty. According to these results, it was suggested that sports facilities should give importance to interaction, output and program quality to ensure customer loyalty.

Keywords: Sports facilities, Sports facility management, Service quality, Customer loyalty

Spor- Fitness Tesislerinde Algılanan Hizmet Kalitesinin Müşteri Sadakatine Etkisi

Öz

Bu araştırmanın amacı spor- fitness tesislerindeki hizmet kalitesinin müşteri sadakatine olan etkisinin araştırılmasıdır. Araştırmanın örneklemini İstanbul ve Niğde ilinde bulunan 6 spor – fitness merkezine üye 165 erkek, 146 kadın toplam 311 birey oluşturmaktadır. Araştırmada verilerini toplamak için içeriğinde 3 bölüm yer alan bir anket kullanılmıştır. İlk bölümde araştırma grubunu tanımlayan maddelere yer verilmiştir. İkinci bölümde Uçan (2007) tarafından geliştirilen "Spor- Fitness Merkezlerinin Algılanan Hizmet Kalitesi Ölçeği" yer almıştır. Üçüncü bölümde de Zeithaml vd., (1996) geliştirilen Savaş'ın (2012) Türkçeye uyarladığı "Müşteri Sadakati Ölçeği" bulunmaktadır. Verilerin analizinde SPSS 22 programı kullanılmış, demografik veriler ve ölçek puanları için tanımlayıcı istatistiklerden faydalanılırken, ilişkisel analizler için çoklu regresyon analizinden faydalanılmıştır. Araştırma tanımlayıcı istatistik sonuçları incelendiğinde algılanan hizmet kalitesi alt boyut puanları ve müşteri sadakati ölçeği puanlarının yüksek olduğu gözlemlenmiştir. Araştırmanın ilişkisel analiz kısmına bakıldığında Spor-fitness tesislerinde etkileşim, çıktı ve program kalitesinin müşteri sadakati üzerinde anlamlı bir pozitif etkiye sahip olduğu tespit edilmiştir. Bu sonuçlara göre spor tesislerinin müşteri sadakati sağlayabilmek adına etkileşim, çıktı ve program kalitelerine önem vermeleri önerilmektedir.

Anahtar kelimeler: Spor tesisleri, Spor tesis işletmeciliği, Hizmet kalitesi, Müşteri sadakati

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INTRODUCTION

Nowadays, in all service sectors, service quality is the most demanded by consumers. A high level of unique quality is an important way to win customers and make them loyal for a long time (Urban, 2009). For this reason, managers aim to provide high-quality sports services with a good atmosphere and a pleasant ambience to obtain loyal customers in sports facilities. Considering the service sector, the fact that finding a new customer is financially and organisationally much more difficult than maintaining an existing customer is accepted by service providers (Caslavova et al., 2018). With the increasing interest in fitness facilities, competition has begun to emerge among businesses providing fitness services. For this reason, meeting customer expectations with customer-oriented approaches has become important in terms of sustainability in fitness facilities (Çatı et al., 2010; Çiftçi & Çakmak, 2018). Based on this, the theoretical foundations of this research were determined as sports facilities, service quality and customer loyalty.

Rapidly developing sports centers have to meet the needs of consumers in order to satisfy them (Howat et al., 1996; Yıldız et al., 2018). For this reason, sports facility businesses, regardless of public or private, had to constantly renew themselves and increase their service diversity to achieve their goals such as social integration and spreading sports. This necessity leads to the emergence of more modern and high-quality facilities and causes the standards to rise (Ceyhun, 2008). We can define sports facilities as all kinds of structures that can organise sportive activities (Güçlü, 1998; Sunay, 2016). Sports facilities include all kinds of building groups designed for exercise, sports training and sports competitions in different sports branches. There are many different sports facilities such as stadiums, arenas, gymnasiums, tracks, open spaces, pools and support facilities (Wondemagnegn & Zemikael, 2022). Fitness facilities are also service-oriented businesses. They provide their consumers with an experience by providing sports services (Eskiler & Safak, 2022). The sports facility business is defined as units that can produce and at the same time offer sportive services by bringing together elements related to production (Serarslan, 1998). From a broad perspective, Katırcı (2012) defined the sports facility business as "a social, economic and technical unit that enables the implementation of sports activities, brings together production factors to obtain social benefits and/or profit and produces sports services". Even though sports facility enterprises make a profit from the services they provide, their main aim is to meet the sportive needs of individuals. Especially in sports facility enterprises established by the state, the primary aim is providing social benefit by spreading sports to large masses (Ekenci & İmamoğlu, 2002). For this reason, service quality is seen as an important competitive tool for sports facilities.

Based on this, the concept of quality has many different dimensions and also a very comprehensive structure. For this reason, when the literature has been examined, we observe that there are many studies on conceptualising and explaining the concept of quality (Goestch & Davis, 2003). The concept of quality can be evaluated in two groups: Product and service quality. Qualities such as durability, appearance, functionality, interchangeability, repairability, storage and testability are the characteristics of product quality. When we look at service quality, it is expressed as a measure

of the extent to which the service provided meets the expectations of consumers. Providing a quality service can be considered as meeting consumer expectations (Akgül et al., 2009; Parasuraman et al., 1994). Although the concept of service quality is an element that has recently gained popularity around the world, it is gaining importance as one of the main components of organisational structures (Gürbüz & Gücal, 2020; Peitzika et al., 2020). When we look at the origin of the concept of service quality, we see that there are service and quality concepts (Ramya et al., 2019). Service can also be defined as activities or benefits that do not result in any property offered by one group to another (Kotler & Armstrong 2003; Yıldız, 2009). Quality is defined as a dynamic process that can meet or even exceed expectations depending on the product, people, service, process and environment, as well as adding value to products in a way that provides a competitive advantage (Goestch & Davis 2010; Knowles, 2011). In general, service quality can be expressed as the result of the comparison of consumers' experiences and expectations for the service they will consume with the quality of the service they have received (Naik et al., 2010). When we investigate the concept of service quality in the literature, we observe that "SERVQUAL", "SERVPERF" and "Grönroos" models appear (Gürbüz & Ergülen, 2006). While the studies on service quality in the business world have been increasing continuously since the early 1980s, the value of this issue in the field of recreation and sports services has started to gain importance in recent years. For this reason, it has recently started to become one of the topics of interest in the sports marketing literature (Tsitskari et al., 2006). If we conceptualize the service quality in sports services in terms of literature, we can define it as the degree to which the sportive services can meet and exceed the expectations of the customers (Çimen & Gürbüz, 2007). Sports services are generally evaluated in two categories as sports services for spectating and participation (Chelladurai, 1994; Yıldız, 2009). Many service quality models for both categories have been developed and continue to be developed by researchers working in this field.

Fitness centers are a developing area in the sports and health sector, and the positive effects of these centers on human physiology and psychology (Yıldız, 2011). Considering the changing situation and increasing competition of sports organizations, it has become necessary to understand both the needs and demands of customers (Farrelly et al., 2008; Pashaie et al., 2022). Therefore, good relationships with sports consumers can increase both customer satisfaction and customer loyalty (Kumar & Reinartz, 2012). Customer loyalty is perhaps considered as the most essential structure that enables customers to purchase a product again (Caruana, 2002; Javadein et al., 2008). It is very important to understand the factors associated with customer loyalty in fitness centers (Garcia-Fernandez et al., 2018). In this respect, customer loyalty is seen as a key factor that provides a competitive advantage (Bharadwaj et al., 1993; Javadein et al., 2008). Sports - fitness businesses operating in the form of service businesses are institutions where the needs related to healthy living and sports are met. Like businesses in other sectors, fitness businesses have to meet the demands and needs of consumers. For this reason, studies to measure and increase customer satisfaction and loyalty are important in terms of profitability and competitive advantage (Yıldız, 2012). Customer loyalty can be defined as the continuity of repurchasing a product that the consumer has purchased (Chiou et al., 2002). Customer loyalty can also be defined as the state of having positive intentions towards the product and experiencing psychological commitment in

addition to purchasing the product (Yıldız, 2012). In another definition, customer loyalty is defined as the consumer's determination to use the goods or services of an enterprise without being affected by sectoral competition factors (Baytekin, 2005). Yurdakul (2007) stated the components of the customer loyalty concept as "customer satisfaction, service quality, market share, customer value and replacement cost". In this research, the relational effect between service quality and customer loyalty in sports-fitness facilities will be examined.

This research aimed to investigate the effect of service quality on customer loyalty in sport-fitness facilities. When the literature is examined, there are few studies on the effect of service quality on customer loyalty in sports-fitness facilities. For this reason, it is thought that this study will be academically useful in terms of contributing to and updating this relational model. Besides, it is also important to make suggestions for the interaction of service quality and customer loyalty for sports facility businesses in the sectoral sense.

Study Hypotheses

- H₁. Interaction quality of sports-fitness facilities have a positive effect on customer loyalty of members.
- H₂. Output quality of sports-fitness facilities have a positive effect on customer loyalty of members.
- H₃. The physical environment quality of sports-fitness facilities has a positive effect on the customer loyalty of members.
- H₄. Exercise equipment quality of sports-fitness facilities has a positive effect on customer loyalty of members.
- H₅. Program quality of sports-fitness facilities has a positive effect on customer loyalty of members.
- H₆. The quality of ambient conditions of sports-fitness facilities has a positive effect on the customer loyalty of the members.

METHOD

Research Model

In the research, quantitative surveys and relational models were used in scientific research methods.

Research Group

The population of the study consisted of 1525 individuals who were members of 6 sports-fitness centres located in Istanbul and Niğde. The sample of the research consisted of 311 individuals, 165 males and 146 females, selected by simple random method within this population. Using Roasoft (2023) sampling volume calculation engine, it was determined that 308 individuals would be sufficient for the sample group with a margin of error of 0.05 for a population of 1525 people. In our research, 311 individuals were reached.

Data Collection Tools

To collect the research data, a questionnaire consisting of 3 sections was prepared and applied to the participants. The first section included demographic items for the participants. In the second part, the "Perceived Service Quality Scale of Sports-Fitness Centres" developed by Uçan (2007) was included. The third section includes the "Customer Loyalty Scale" developed by Zeithaml et al., (1996) and adapted into Turkish by Savaş (2012) was used.

Demographic Data: In the demographic information section of the data collection tool, questions related to demographic variables such as age, gender, educational status, and marital status were included for the members of the sports-fitness centres participating in the study.

Perceived Service Quality Scale of Sport-Fitness Centres (PSQ-SFC): Uçan (2007) developed the "Perceived Service Quality Scale of Sport-Fitness Centres " which consisted of 31 items and 6 dimensions ("Interaction quality, outcome quality, physical environment quality, equipment quality, program quality and, ambient condition quality). The scale was a 5-point Likert-type scale. The scale was rated from "completely agree" to "strongly disagree" and scored from 5 to 1. For the whole scale, $\alpha=0,95$. It was also observed that the reliability coefficient values of the sub-dimensions of the scale ranged between $\alpha= 0,77$ and 0,95. This situation showed that this scale was usable.

Customer Loyalty Scale: The Customer Loyalty Scale developed by Zeithaml et al., (1996) and adapted into Turkish by Savaş (2012) consisted of 5 items and one dimension. The statements of the 5-point Likert-type scale was rated from strongly disagree to strongly agree. The reliability coefficient of the scale was determined as $a= 0,77$. This result showed that the scale was reliable and usable.

Ethical Approval

During the research, "Higher Education Institutions Scientific Research and Publication Ethics Directive" and "Helsinki Declaration" has been taken into consideration. The ethical approval of the research was approved by the Niğde Ömer Halisdemir University Ethics Committee with the date 01.06.2023 and the decision number 08-21.

Data Collection

During the research, the data were collected by applying face-to-face and online questionnaires to the members of 6 sports-fitness centers in Niğde and Istanbul.

Analysis of Data

SPSS 22 program was used for data analysis. Descriptive statistics were used in the evaluation of demographic information, perceived service quality and customer loyalty scores in sports-fitness centres. To reveal the effect of service quality on customer loyalty, multiple regression analysis was used considering that the data were normally distributed (skewness and kurtosis values were within ± 1.5) and there was no multicollinearity problem (VIF value was 10 and above).

Table 1. Distribution of skewness and kurtosis values of the dependent and independent variables of the study

Variables	Skewness	s	Kurtosis	s
Interaction quality	-1,06	0,13	0,06	0,27
Output quality	-1,19	0,13	0,26	0,27
Physical environment quality	-0,57	0,13	-0,50	0,27
Equipment quality	-0,65	0,13	-0,27	0,27
Program quality	-0,79	0,13	0,60	0,27
Ambient condition quality	-0,91	0,13	0,14	0,27
Customer Loyalty	-1,22	0,13	0,49	0,27

When Table 1 is examined, it is observed that the skewness and kurtosis values of the dependent and independent variables of the study are between +1.5 and -1.5. According to these results, we can say that the data of the research show a normal distribution.

RESULTS

Table 2. Demographic Information distribution of the participants in the study

Demographic Information		f	%
Gender	Male	165	53,1
	Female	146	46,9
	Total	311	100,0
Age	18 and below	41	13,2
	19-24	88	28,3
	25-35	92	29,6
	36-50	74	23,8
	51 and older	16	5,1
	Total	311	100,0
Marital Status	Married	150	48,2
	Single	161	51,8
	Total	311	100,0
Educational Status	Primary education	11	3,5
	Secondary education	96	30,9
	Bachelor's degree	154	49,5
	Master's degree	50	16,1
	Total	311	100,0

When Table 2 was analysed, it was seen that 53% (n=165) of the individuals participating in the study were male and 46,9% (n=146) were female. Regarding the age variable, it was observed that 13,2% (n=41) of the participants were 18 years old or below, 28,3% (n=88) were between 19-24 years old, 29,6% (n=92) were between 25-35 years old, 23,8% (n=74) were between 36-50 years old, and 5,1% (n=16) were 51 years old and above. In terms of the marital status variable, 48,2% (150) of the participants were married and 51,8% (n=161) were single. According to the educational status variable, 3,5% (n=11) of the participants were primary education graduates,

30,9% (n=96) were secondary education graduates, 49,5% (n=154) had bachelor's degrees, 16,1% (n=50) had master's degree.

Table 3. Analysis of the arithmetic mean of the scores obtained from the perceived service quality scale and customer loyalty scales of sports-fitness centres

	n	Min.	Max.	\bar{x}	s
Interaction quality	311	2,40	5,00	4,11	0,76
Output quality	311	2,40	5,00	4,35	0,69
Physical environment quality	311	2,00	5,00	4,03	0,79
Equipment quality	311	1,67	5,00	3,93	0,83
Program quality	311	1,00	5,00	4,02	0,82
Ambient condition quality	311	1,67	5,00	3,98	0,89
Customer Loyalty	311	1,00	5,00	4,11	0,95

In Table 3, when the mean arithmetic means of the scores of the participants from the Perceived Service Quality of Sports-Fitness Centres scale were examined, it was seen that the mean scores of the service quality sub-dimensions [Interaction quality (M=4,11, SD=0,76), output quality (M=4,35, SD=0,69), physical environment quality (M=4,03, SD=0,79), exercise equipment quality (M=3,93, SD=0,83), program quality (M=4,02, SD=0,82), environmental conditions quality M=3,98, SD=0,89)] received scores above 3 and 4. These results showed that service quality evaluations were considered as good and excellent. When the arithmetic mean of the participants' scores from the Customer Loyalty scale was analysed, it was observed that they received scores above 4 (M=4,11, SD=0,95). This result showed that customer loyalty was high in the facilities.

Table 4. Analysis of the relationship between service quality and its sub-dimensions in sports-fitness centres and customer loyalty

	1	2	3	4	5	6	7
1-Interaction quality	1						
2- Output quality	0,579**	1					
3- Physical environment quality	0,663**	0,681**	1				
4- Equipment quality	0,684**	0,683**	0,860**	1			
5- Program quality	0,585**	0,572**	0,728**	0,775**	1		
6- Ambient conditions quality	0,627**	0,599**	0,710**	0,796**	0,565**	1	
7- Customer loyalty	0,707**	0,767**	0,724**	0,777**	0,752**	0,665**	1

**p<0,01

When Table 4 was examined, high-level positive relationships were observed between service quality sub-dimensions (interaction quality 0,707, output quality 0,767, physical environment quality 0,724, exercise equipment quality 0,777, program quality 0,752, ambient conditions quality 0,665) and customer loyalty in sport-fitness centres.

Table 5. Analysis of the effect of sport-fitness centre service quality sub-dimensions on customer loyalty

	B	S.H	β	t	p
Interaction quality	0,27	0,04	0,21	5,55	0,00
Output quality	0,51	0,05	0,37	9,70	0,00
Physical environment quality	-0,08	0,06	-0,06	-1,21	0,22
Equipment quality	0,13	0,08	0,12	1,72	0,08
Program quality	0,37	0,05	0,32	7,31	0,00
Ambient conditions quality	0,07	0,05	0,07	1,56	0,12

R= 0,88, R²= 0,77, Adjusted R²= 0,77, F_(6,304)=178,54, p=0,00

When Table 5 was examined, it was observed that a significant regression model [$F_{(6,304)}=178,54$, $p=0,00<0,05$] and 77% of the variance in the dependent variable (Adjusted R²= 0,77) could be explained by the independent variables in the investigation of the effect of sport-fitness centre service quality sub-dimensions on customer loyalty. Interaction quality ($\beta=0,27$, $p<0,05$), output quality ($\beta=0,51$, $p<0,05$) and program quality ($\beta=0,37$, $p<0,05$) dimensions had a positive and significant effect on customer loyalty ($\beta=0,27$, $p<0,05$). Other service quality sub-dimensions (physical environment quality, exercise equipment quality and ambient conditions quality) did not have a significant effect on customer loyalty ($p>0,05$).

DISCUSSION AND CONCLUSION

When the descriptive analyses of the research were examined, it was observed that the arithmetic means of the scores obtained from the service quality and customer loyalty scales of the participants who were members of sports-fitness facilities were above 3 and 4. According to these results, it can be said that individuals who were members of these facilities were satisfied with the service quality of the facilities and their customer loyalty levels were high. Yıldız et al. (2016) found in their study that the perceived service quality and sub-dimension (interaction quality, outcome quality, programme quality, exercise tools and equipments, environmental conditions quality) ratings in fitness centers were good. In their study, Korkmaz and Utlu (2021) determined that the scores of the 4 sports facilities members in Bursa municipality were above 3 and 4 and stated that the members perceive the service quality as good and excellent. In the thesis study conducted by Mansur (2021), considering the mean scores of the participants from the service quality sub-dimensions of the participants in recreational sports enterprises, it was observed that scores above 3 and 4 were obtained. Yıldız et al., (2018) in their studies on sports centers, they observed that the service quality in these facilities was good, as the service quality and sub-dimension (interaction quality, outcome quality, programme quality, exercise tools and equipments, environmental conditions quality) averages were above 3. They also stated that if the service quality level in sports centers increases, their service quality expectations also increase. These results showed similar qualities to the results of our study. Akgül et al., (2009) stated in their study on recreational sports facilities that the service quality of the facilities could not meet the

expectations of the members. This result differed from our results. It was thought that the difference was due to the sample group to which the study was applied. In the thesis study conducted by Receptoğlu (2022), it was determined that the level of service quality and customer loyalty in businesses that provide recreational activities was at medium levels. Katırcı and Oyman (2013) examined the loyalty status of members in sports centres and revealed that the level of loyalty was high. The results of this study also showed similarities with our study in terms of customer loyalty in sports facilities.

In the relational analysis part of the research, it was determined that interaction, output and program qualities, which were among the sub-dimensions of service quality, had a significant positive effect on customer loyalty. According to these results, it can be said that increasing interaction, output and program quality in sports-fitness facilities will increase customer loyalty. Eskiler and Şafak (2022) In their studies on fitness services, they observed that customer-staff interaction quality, customer-customer interaction quality and service output quality positively affect customer loyalty. Yıldız and Duyan (2019) In their study where they examined the relationships between service quality, customer satisfaction and customer loyalty in the sports and physical activity sector, they observed that service quality significantly and positive affects customer loyalty in a direct and indirect way through customer satisfaction. Akbulut and Yıldız (2021), in their study on water sports businesses, found that service quality sub-dimensions such as personnel, physical characteristics and program in water sports facilities had a strong effect on customer loyalty. Avourdiadou and Theodorakis (2014) in their study on sports and fitness centers, they observed that service quality for new members is an important factor for customer loyalty. Gürbüz and Gücal (2020) observed a highly positive relationship between service quality and customer loyalty in their study conducted in health and fitness clubs. Savaş (2012) revealed in his master's thesis that there was an positive interaction between the service quality sub-dimensions such as personnel, physical features and program of the members in the fitness centre with their customer loyalty. In order to improve customer loyalty, it was mentioned that the necessity of giving importance to service quality. In a research, Lee (2017) stated that service quality in sports centres had a positive effect on customer loyalty. Septarini et al., (2023) observed that service quality positively affected customer loyalty in fitness centres for female customers in Bandung City. Bandyopadhyay (2018) In his study, he found that sub-dimensions of service quality in fitness services such as reliability, customer orientation, comfort and ambiance have a positive effect on customer loyalty. Huang and Kim (2023) In their study on how service quality in sports-fitness centers will affect customer loyalty, they observed that service quality sub-dimensions such as tangibility, reliability, responsiveness, assurance and empathy positively affect customer loyalty through the satisfaction, trust and commitment variables. The results obtained from these studies were in parallel with the results obtained from our research.

As a result, it has been observed that interaction, output and program quality dimensions have a positive effect on customer loyalty in sports-fitness facilities. Based on this, it is understood that in order to create loyal customers in the sports-fitness facilities sector, it is necessary to attach importance to service quality, especially interaction, output and program quality. This study also

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contributed to the literature by revealing the effects of different service quality dimensions on customer loyalty. According to the results of the research, it is suggested to increase the interaction, output and program quality in these facilities to improve customer loyalty, which will create an important competitive advantage in sports-fitness facilities.

Conflict of Interest: There is no conflict of interest between the authors of the article.

Researchers' Statement of Contribution Rate: Research Design-OY, Data Collection-OY, statistical analysis-OY; Preparation of the article, OY-AS.

Ethical Approval

Name of Board: Niğde Ömer Halisdemir University Ethics Committee

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65 Yaş ve Üstü Bireylerin Yaşam Kalitesini Etkileyen Değişkenlerin Çoklu Regresyon Analizi ile Belirlenmesi

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Öz

Bu araştırmanın amacı, serbest zamanlarını rekreasyonel aktivitelerle geçiren 65 yaş ve üstü bireylerin yaşam kalitelerini etkileyen değişkenleri belirlemektir. Araştırma nicel araştırma yöntemlerinden ilişkisel tarama modelinde desenlenmiştir. Çalışma grubu amaçsal örneklem yöntemlerinden tipik durum örneklem yöntemi ile belirlenen 264 gönüllü katılımcıdan oluşmaktadır. Çalışmada veri toplama aracı olarak demografik bilgi formu, "Sürekli Umut Ölçeği" ve "Yaşlılarda Yaşam Kalitesi Ölçeği" kullanılmıştır. Yapılan çoklu regresyon analizinde bağımlı değişken olarak yaşlıların yaşam kalitesi alınırken, bağımsız değişkenler olarak yaşlıların sürekli umut düzeyleri, yaptıkları aktivite türü, yaşı ve eğitim düzeyi modele dahil edilmiştir. Analiz sonucunda modelin istatistiksel olarak anlamlı olduğu ($F_{(4,259)}=110.108$, $p<0.05$) ve yaşlıların yaşam kalite düzeyindeki varyansın %63'ünün bağımsız değişkenler tarafından açıklandığı görülmüştür ($R^2=0.63$). Modelde eğitim düzeyi, aktivite türü ve sürekli umudun yaşlılarda yaşam kalitesini anlamlı olarak yordadığı görülmüşür; yaş değişkeninin ise istatistiksel olarak anlamlı olmadığı bulunmuştur. Sonuç olarak eğitim düzeyi, planlı aktivite türü ve umut düzeyi yaşlılarda yaşam kalitesinde pozitif bir etki oluşturmaktadır.

Anahtar kelimeler: Yaşlılık, Umut, Rekreasyon, Yaşam kalitesi, Rekreasyonel aktivite

Determination of Variables Affecting the Quality of Life of Individuals 65 Years and Older by Multiple Regression Analysis

Abstract

The aim of this study is to determine the variables affecting the quality of life of individuals aged 65 and over who spend their leisure time with recreational activities. The research was designed in the relational survey model from quantitative research methods. The study group consists of 264 voluntary participants determined by typical case sampling method from purposive sampling methods. Demographic information form, "Dispositional Hope Scale" and "Quality of Life Scale in Older People" were used as data collection tools in the study. In the multiple regression analysis, the quality of life of the elderly was taken as the dependent variable, while dispositional hope, type of activity, age and education level of the elderly were included in the model as independent variables. As a result of the analysis, the model was statistically significant ($F_{(4,259)}=110.108$, $p<0.05$) and 63% of the variance in the quality of life of the elderly was explained by the independent variables ($R^2=0.63$). In the model, education level, activity type and dispositional hope were found to significantly predict quality of life in the elderly, while the age variable was not statistically significant. In conclusion, level of education, type of planned activity and level of hope have a positive effect on quality of life in the elderly.

Keywords: Aging, Hope, Recreation, Quality of life, Recreational activity

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GİRİŞ

Dünya çapında artan ömür beklentisi paralelinde günümüz nüfusunun önemli bir kısmı yaşlı bireylerden oluşmaktadır. Yaşam süresinin artması 21. yüzyılın en büyük başarılarından biri olarak kabul edilirken, bu sürenin uzaması gelecekteki toplumlar için hem fırsatlar hem de zorluklar doğurma potansiyeline sahiptir (Zannella vd., 2021). Bu bağlamda demografik ve epidemiyolojik değişimler, bir toplumun yaşlanan nüfusuyla başa çıkabilmesi için stratejik planlar geliştirmesini gerektirebilir. Bu tür değişimler, toplumun yaş yapısının zaman içinde nasıl değiştiğini ve bu değişimin toplum sağlığına, sağlık hizmetlerine ve yaşam kalitesine nasıl etki ettiğini ifade eder. (Aktaş vd., 2013).

Yaşlanma ve yaşlılık, içerisinde birden fazla değişkeni barındıran ve bireye özgü nitelikler taşıyan olgulardır. İncelenen alan yazında yaşlılık dönemi yalnızca kayıplar ve geri döndürülemeyen fizyolojik, biyolojik bozulmalar ile ilişkilendirilmektedir. Ancak kayıpların, bozulmaların yaş ile ilişkisi oldukça zayıftır ve yaş ile doğrusal olarak artış göstermemektedir (Bilir, 2018). İlerleyen yaş beraberinde yeni kayıplar getirme potansiyeline de sahiptir. Lakin bu dönemin yalnızca kayıplar ile ilişkilendirilmesi yerinde bir söylem değildir. İlerleyen yaş ile birlikte doğabilecek kayıpların azaltılması ve tolere edilmesi noktasında yaşlı nüfusun topluma entegre olması ve bireylerin bağımsızlıklarını olabildiğince koruması etkili bir opsiyon olabilmektedir. Dünya Sağlık Örgütü (World Health Organisation- WHO); sağlıklı yaşlanma deklarasyonunda bireyin fiziksel ve mental işlev rezervlerini korumaları, iyileştirmeleri, aktif kalıp üreterek toplum ile bütünleşmesi gerektiğini sağlıklı yaş alabilmenin koşulu olarak belirlemiştir (Öztürk ve Oran, 2004). Bu kapsamda sağlıklı yaşlanma, aktif yaş alma, olumlu bir benlik duygusu, esenlik, anlam ve amaç ile de yakından ilişkilidir (Bryant vd., 2001). Bu açıdan bakıldığında rekreasyonel uğraşların yaşlı bireylerin kaliteli yaş almalarında oldukça önemli olduğundan söz edilebilir.

Çalışma hayatının sona ermesiyle beraber, yaşlı bireylerin serbest zamanlarında bir artış gözlenmesi muhtemeldir. Bu nedenle yaşlılar için serbest zamanlarını nitelikli geçirmelerine yardımcı olabilecek rekreasyonel aktivitelerden faydalanmaları önem taşımaktadır. Bağımsızlığı idame ettirme ve kaliteli yaşam rehberliği için rekreasyonel faaliyetler her yaş grubunda olduğu gibi yaşlılık evresinde de destekleyici niteliktedir. Arslan (2015) tarafından belirtilen rekreasyonel aktivitelerin faydaları; obezite, depresyon, kronik hastalık riskini azaltma ve sosyal bağları güçlendirerek sosyal izolasyonun önüne geçmedir. Belirtilen yararlar yaşlılık döneminde yaşam kalitesini sürdürmeyi sağlayarak yaşanabilecek geriatrik sendromların önlenmesi, azaltılması noktasında önleyici ve koruyucu bir müdahale olacaktır. Böylelikle rekreasyon, yaşam kalitesi, iyilik hali, umut düzeyi gibi kavramlarla etkileşime girerek bireyin yaşam standartlarını idealize etmeye olanak sağlayacaktır.

Genel anlamda rekreasyon; insanların boş zamanlarında katılmayı seçtikleri, keyif aldıkları ve tatmin duydukları aktiviteleri içerir. Bu aktiviteler bireylere fiziksel rahatlama sağlayabileceği gibi, ruhsal ve zihinsel açıdan da olumlu etkiler yaratabilir. Rekreasyon aktiviteleri, insanların günlük yaşamdaki stresi ve yorgunluğu azaltmalarına yardımcı olabilir. Bu aktiviteler; bedensel hareket, zihinsel uyarım, yaratıcılık ve toplumsal etkileşim gibi çeşitli alanları kapsayabilir.

Özellikle boş zamanlarda katılım gösterilen rekreasyon aktiviteleri, bireylerin enerjilerini yeniden doldurmalarına, zihinsel tazelik kazanmalarına ve genel yaşam kalitesini artırmalarına yardımcı olabilir (Beşikçi, 2016). Rekreasyonel aktiviteler, pozitif çıktılar boyutuyla insan hayatının her evresinde olduğu gibi yaşlılık dönemi için de oldukça kıymetli bir opsiyondur. Yaşlılık döneminde değişen sosyal rollerin, oluşan kayıpların telafi edilmesinde yeni rollerin ve kazançların sağlanmasında rekreasyonel aktiviteler etkili olabilmektedir. Bu bağlamda Gabriel ve Bowling (2004) tarafından yapılan çalışmada, yaşlılarda serbest zaman katılımının yeni roller kazanabilme, meşguliyet edinme ve verimli sosyal ilişkiler kurma gibi katkılar sağladığı belirlenmiştir. Başka bir ifade ile yaşlı bireyler için rekreasyonel aktiviteler, fiziksel sağlıklarını korumanın ve sosyal bağlarını güçlendirmenin mükemmel bir yolunu sunar. Kültürel, sanatsal ve sosyal etkinliklere katılarak; zihinsel ve duygusal olarak aktif kalmalarını teşvik ederler. Açık hava etkinliklerine katılmak, taze hava solumalarını, doğanın güzelliklerinin tadını çıkarmalarını ve fiziksel olarak aktif kalmalarını sağlar. Turistik etkinliklere katılmak ise yeni yerler keşfetmelerine ve farklı kültürlerle etkileşimde bulunmalarına olanak tanır, bu durum da yaşam deneyimlerini zenginleştirir. Bu çeşitlilik, yaşlı bireylerin yaşam kalitesini artırırken bedensel ve zihinsel sağlıklarını korumalarına yardımcı olur (Kurtkapan, 2018; Michèle vd., 2019).

Yaşlanma sürecinde bireylerin üretici konumdan çıkıp tüketici konumuna geçmeleri ve bunun sonucunda yaşadıkları duygusal ve sosyal değişimler, yaşam kalitesini etkileyebilir (Ayna ve Gümüş, 2021). Bu doğrultuda yaşam kalitesinin önemli göstergelerinden biri serbest zaman aktiviteleri olarak değerlendirilebilmektedir (Aydın-Boylu ve Paçacıoğlu, 2016). Yaşlılık dönemine geçiş ile bireyin kayıplarının telafisi ve bu döneme adaptasyonun sağlanması noktasında rekreasyonel aktiviteler kilit rol oynayarak bireylerin yeni amaçlar edinip tatmin edici yeni kazanımlar edinilmesinde yer alır.

Yaşam kalitesinin bileşenleri dahilinde, sosyal rolü yerine getirebilmeyi içeren işlevsel yetenekler, toplumla entegrasyon, mental sağlık, fiziksel yeterlilik ve yaşamdan duyulan memnuniyet yer almaktadır (Öksüz ve Malhan, 2005). Esenay (2007), yaşam kalitesinin ve umudun birbiriyle sıkı bir etkileşim içinde olduğunu ve hastalık, kayıp süreçleri, adaptasyon ve iyileşme gibi faktörlerle ilişkili olduğunu vurgulamaktadır. Aynı zamanda umut yaşanan değişimlere uyumun sağlanmasında anahtar kavram olarak kabul edilmektedir. Yaşlılık dönemine özgü problemler çatısı altında değerlendirilen eş kaybı, statü kaybı, rol kaybı vb. durumları neticesinde birey fiziksel ve psikososyal kayıplar yaşarken bunlar karşısında umudunu koruma görevi ile de karşı karşıya kalmaktadır (Herth, 1989). Bu noktada umut; yeni olasılıklar yaratır ve insanları hayata yenilenmiş enerjile devam etmek için güç, cesaret ve mutlulukla doldurur (Safri, 2016). İncelenen literatürde de umut düzeyi yüksek olan bireylerin daha hızlı iyileştiklerini, kronik hastalıklara daha iyi uyum sağladıklarını, daha az depresyon ve fiziksel acı deneyimlediklerini gösteren araştırmalar bulunmaktadır. Ayrıca, bu acıları daha etkili bir şekilde yönetebildikleri de görülmüştür. (Seçer ve Yazıcı, 2018). Yaşamın doğal getirileri olarak pozitif ve negatif yönlü değişimler karşısında umudu sürdürmek, mental ve fiziksel sağlığın belirleyicisi olarak da değerlendirilebilmektedir (Wu ve Koo, 2016). Umut, hayatı zenginleştirebilen ve hayata alternatif bakış açıları sunmaya yardım eden içsel bir kaynaktır. Umut düzeyi ve yaşam kalitesi üzerindeki etkisini değerlendirmek

için yapılan çalışmalar, umut düzeyleri ve yaşam olayları ile başa çıkma arasında güçlü bir bağlantı olduğunu göstermektedir (Abraham, 2023).

Günümüzde artan yaşlı nüfusu paralelinde ileri yaş dönemi ve yaş alma sürecini inceleyen çalışmaların sayısı artmaktadır. Lakin bu noktada gerek bilim dünyasında gerek toplumda yaşlılığa ve yaşlanmaya olan bakış açısı, yaşlılığın zayıf yönlerine veya işlev bozukluklarına odaklandığından, yaşlılarda dayanıklılığa ve esenliğe katkıda bulunan kaynakların sınırlılığı söz konusudur (Fry ve Debats, 2010). Bu bağlamda yapılan bu çalışmanın amacı, serbest zamanlarını rekreasyonel aktivitelerle geçiren 65 yaş ve üstü bireylerin yaşam kalitelerini etkileyen demografik özellikleri belirlemek, bu demografik değişkenlerin ve umut düzeylerinin yaşam kalitesi üzerindeki etkisini ortaya koymaktır. Bu sonuçların yaşlı bireylerle ilgilenen meslek personellerine, yaş alan bireyler ve yaşlanma ile ilgili konular üzerinde çalışan araştırmacılara/akademisyenlere yol gösterici nitelikte olması ve literatüre yaşlılarda rekreasyon boyutunda katkı sağlaması beklenmektedir.

Bu bağlamda çalışmada aşağıdaki sorulara cevap aranmıştır:

1. Yaşlıların yaşam kalite düzeyleri cinsiyet değişkenine göre istatistiksel olarak anlamlı bir farklılık gösterir mi?
2. Yaşlıların yaşam kalite düzeyleri medeni durum değişkenine göre istatistiksel olarak anlamlı bir farklılık gösterir mi?
3. Yaşlıların yaşam kalite düzeyleri aktivite türü değişkenine göre istatistiksel olarak anlamlı bir farklılık gösterir mi?
4. Yaşlıların yaşam kalite düzeyleri eğitim düzeyi değişkenine göre istatistiksel olarak anlamlı bir farklılık gösterir mi?
5. Yaşlıların yaşam kalite düzeyleri yaş değişkeni ile istatistiksel olarak anlamlı bir ilişki gösterir mi?
6. Yaşlıların yaşam kalite düzeyleri sürekli umut değişkeni ile istatistiksel olarak anlamlı bir ilişki gösterir mi?
7. Cinsiyet, medeni durum, aktivite türü, eğitim düzeyi, yaş, sürekli umut değişkeni yaşlıların yaşam kalite düzeylerinin anlamlı bir yordayıcısı mıdır?

METOT

Araştırma Modeli

Nicel araştırma paradigmasına sahip olan bu çalışmada, rekreasyonel aktivitelere katılan bireylerin yaşam kalitesi ile cinsiyet, medeni durum, etkinlik türü, eğitim düzeyi, yaş, sürekli umut arasındaki ilişkinin belirlenmesi amaçlanmıştır. Nicel araştırmalar, sayısal verilerin toplanması, analizi ve yorumlanması yoluyla gerçekleştirilen araştırmalardır (Aslan, 2018). Bu tür araştırmalar, istatistiksel yöntemlerle sayısal olarak ifade edilebilen değişkenler arasındaki ilişkileri incelemeyi amaçlar. Bu çalışmada, genel tarama modelleri arasında ilişkisel tarama modeli tercih edilmiştir. İlişkisel tarama modeli iki veya daha çok sayıdaki değişkenin aralarındaki değişim varlığı ile derecesini belirleme gayesiyle kullanılmaktadır (Karasar, 2012). Bu tür bir model genellikle değişkenler arasındaki ilişkileri ve bu ilişkilerin doğasını anlamak ve değişkenler arasındaki etkileşimleri değerlendirmek için kullanılır.

Araştırma Grubu

Bu çalışmanın evrenini 65 yaş ve üstü bireyler oluşturmaktadır. Araştırmanın evreninde en alt sınır olarak 65 yaşın seçilmesinin nedeni Dünya Sağlık Örgütü'nün 65 yaş ve üzerini yaşlı olarak tanımlamasıdır. Örneklem grubu ise amaçsal örneklem yöntemleri arasında yer alan tipik durum örneklem yöntemi ile belirlenen, Manisa/Akhisar ilçesinde ikamet eden, serbest zamanlarını rekreasyonel aktivitelerle değerlendiren 65 yaş ve üstü toplam 264 gönüllü bireyden oluşmaktadır. Tavşancıl (2002), örneklem büyüklüğünün toplam ölçek maddeleri sayısının beş, hatta on katı olması gerektiğini savunmaktadır. Bu kapsamda çalışma için 264 katılımcı sayısı yeterli görülmektedir. Katılımcıların demografik özelliklerine ilişkin bilgileri Tablo 1'de gösterilmektedir.

Tablo 1. Katılımcıların demografik özelliklerine ilişkin bilgiler

Değişken	Kategori	f	%
Cinsiyet	Kadın	131	49.6
	Erkek	133	50.4
Medeni durum	Evli	156	59.1
	Bekar-Dul	108	40.9
Eğitim düzeyi	İlköğretim	88	33.3
	Lise	76	28.8
	Üniversite	100	37.9
Yaş	65	46	17.4
	66	69	26.1
	67	41	15.5
	68	38	14.4
	69	33	12.5
	70 ve Üzeri	37	14.0
Aktivite türü	Plansız	178	67.4
	Planlı	86	32.6

Tablo 1 incelendiğinde katılımcıların cinsiyete göre 131'i (%49.6) kadın ve 133'ü (%50.4) erkek; medeni duruma göre 156'sı (%59.1) evli ve 108'i (%40.9) bekar ya da dul; eğitim düzeyine göre 88'i (%33.3) ilköğretim, 76'sı (%28.8) lise ve 100'ü (%37.9) üniversite mezunu; yaşa göre 46'sı (%17.4) 65 yaş, 69'u (%26.1) 66 yaş, 41'i (%15.5) 67 yaş, 38'i (%14.4) 68 yaş, 33'ü (%12.5) 69 yaş ve 37'si (%14.0) ise 70 yaş ve üzeri; aktivite türüne göre 178'si (%67.8) plansız aktivite ve 86'sı (%32.6) planlı aktivite yaptıkları görülmektedir. Burada plansız aktivite ev içi aktiviteler ve açık hava aktiviteleri olarak tanımlanırken planlı aktiviteler ise kültürel, sanatsal, sosyal ve turistik aktiviteler olarak tanımlanmıştır.

Veri Toplama Araçları

Çalışmada ölçme aracı olarak cinsiyet, yaş, medeni durum, eğitim durumu, emeklilik durumu, sosyo-ekonomik düzey, serbest zaman aralığı, rekreasyonel faaliyetlere ayırdığı zaman ve serbest zamanda yapılan rekreasyonel aktivite türleri ile ilgili bilgileri tespit etmek amacıyla toplamda 9 maddeden oluşan demografik bilgi formu, "Sürekli Umut Ölçeği" ve "Yaşlılarda Yaşam Kalitesi Ölçeği" kullanılmıştır.

Sürekli Umut Ölçeği: Snyder ve diğerlerinin (1991) umut düzeyini ölçmek için geliştirdiği orijinal ölçeğin Türkçeye uyarlanması Tarhan ve Bacanlı (2015) tarafından yapılmıştır. Ölçek, bireylerin umut düzeyini ölçmek amacıyla kullanılır ve iki ana alt boyutu olan "Alternatif Yollar Düşüncesi" ve "Eyleyici Düşünce"yi içerir. Ölçekte toplamda 12 madde yer almaktadır ve her bir madde, dört farklı maddenin birleşimiyle oluşturulan 8'li likert tipinde bir ölçüm içerir. Ölçeğin alt boyutlarına yönelik maddeler, geçmiş, içinde bulunulan zaman ve geleceğe yönelik ifadeler içerir. Kalan dört madde, umut özelliği ile ilişkisi olmayan dolgu maddeleri (puan tanımlanmayan) olarak kullanılır. Ölçeğin toplam puanı, ölçek üzerindeki 8 maddeye verilen puanların toplamıyla hesaplanır. Bu puan bireyin sürekli umut düzeyini belirtir ve en düşük puan 8, en yüksek puan ise 64'tür. Yüksek puan, bireyin umut düzeyinin yüksek olduğunu gösterir. Ölçeğin iç tutarlılık katsayıları ise alternatif yollar düşüncesi alt boyutu için 0.78, eyleyici düşünce alt boyutu için 0.81 ve ölçeğin toplamı için 0.86 olarak bulunmuştur. Bu değerler, ölçeğin istikrarlı ve güvenilir olduğunu göstermektedir (Tarhan ve Bacanlı, 2015). Bu çalışmada ise ölçeğin cronbach alfa güvenilirlik katsayıları, ölçeğin bütünü için 0.82 olarak bulunmuştur. Bu değer alt boyutlar için hesaplandığında alternatif yollar düşüncesi alt boyutu için 0.93 ve eyleyici düşünme boyutu için 0.96 olarak bulunmuştur.

Yaşlılarda Yaşam Kalitesi Ölçeği: Bu ölçek Hyde ve diğerleri tarafından yaşlıların yaşam kalitelerini belirlemek amacıyla 2003 yılında geliştirilmiştir. Orijinal ölçekte toplamda 19 madde yer alırken Türkçe form 13 maddeden oluşmaktadır. Türkçeye uyarlama çalışmaları ise Türkoğlu ve Adıbelli (2014) tarafından gerçekleştirilmiştir. Ölçeğin her bir maddesi "hiçbir zaman," "ara sıra," "bazen" ve "her zaman" gibi yanıt seçenekleri için 0-3 arasında puanlama ile derecelendirilmiştir. Ölçek 13 madde içermekte olup olumlu anlam içeren 3, 5, 6, 7, 8, 9, 10, 11, 12 ve 13. maddeler "özerklik ve memnuniyet algısı" alt faktörünü, olumsuz anlam içeren 1, 2 ve 4. maddeler ise "engel algısı" alt faktörünü oluşturmaktadır. 1, 2 ve 4. maddeler ters kodlanmıştır. Toplam puanın artması yaşam kalitesinin arttığını ifade etmektedir. Faktör 1, yaşlı bireylerin

özgürlüklerini ve geçmişlerini olumlu bir şekilde algıladıkları "özerklik ve memnuniyet algısı" olarak adlandırılmıştır. Bu faktörde yer alan maddeler, yaşlı bireylerin geçmiş deneyimlerine ve geleceğe dair umutlarına odaklandığını göstermektedir. Faktör 2 ise yaşlı bireylerin yapmak istedikleri şeylerde engel algıladıkları "engel algısı"nı temsil etmektedir. Bu faktörde yer alan maddeler, yaşlı bireylerin karşılaştıkları zorlukları ve engelleri ifade etmektedir. Ölçeğin Cronbach's alfa katsayısının 0.91, alt boyutlarının Cronbach's alfa katsayılarının sırasıyla 0.93-0.75 olduğu bulunmuştur. Bu çalışmada ise ölçeğin cronbach alfa güvenirlik katsayıları, ölçeğin bütünü için 0.94 olarak bulunmuştur. Bu değer alt boyutlar için hesaplandığında özerklik ve memnuniyet algısı boyutu için 0.96 ve engel algısı boyutu için 0.65 olarak bulunmuştur. Ölçekten elde edilen toplam puanın yükselmesi yaşam kalitesinin artış gösterdiği sonucu vermektedir.

Araştırma Yayın Etiği

Bu çalışmanın etik onayı, Manisa Celal Bayar Üniversitesi Sosyal ve Beşeri Bilimler Bilimsel Araştırma ve Yayın Etiği Kurulu'nun 31.03.2023 tarihli ve 2023/04 sayılı toplantısında ele alınmış ve çalışmanın etik açıdan uygunluğuna oy birliğiyle karar verilmiştir.

Verilerin Toplanması

Ölçek uygulaması için ölçekleri geliştiren yazarlardan gerekli izinler alınmıştır. Araştırmaya katılım gönüllülük esasına dayandırılmış ve ilk olarak katılımcılara yönelik hazırlanmış olan gönüllü onam formu ile katılımcılardan araştırmaya katılım onayı alınmıştır. Gönüllü onam formunda araştırmaya dair bilgiler yer verilmiştir. Bununla birlikte, katılımcılara yanıtlarının gizli tutulacağı ve araştırma amacı dışında kullanılmayacağı belirtilmiş ve araştırma ile ilgili detaylı bilgi veya herhangi bir sorunda araştırmacıya ulaşabilecekleri iletişim bilgileri eklenmiştir. Veriler birebir görüşme yöntemi ile toplanmıştır.

Verilerin Analizi

Verilerin analizinde kullanılacak olan parametrik ve parametrik olmayan testlere karar vermek için öncelikle bağımlı değişken olan yaşlılarda yaşam kalitesi ölçeği ve alt boyutları için normallik testi yapılmıştır. Verilerin parametrik testlerin ön şartlarını sağlayıp sağlamadığına Skewness (çarpıklık) ve Kurtosis (basıklık) (verilerin normal dağılım durumu) değerleri ve Levene (varyansların eşitliği) testi sonuçları incelenerek karar verilmiştir. Yaşlılarda yaşam kalitesi ölçeğinin "özerklik ve memnuniyet algısı" alt boyutunda çarpıklık değeri -0.621, basıklık değeri -0.518, "engel algısı" alt boyutunda çarpıklık değeri -1.344, basıklık değeri -1.373, ölçek toplamında ise çarpıklık değeri -0.703, basıklık değeri -0.304 olarak bulunmuştur. Elde edilen değerler -1.5 ile +1.5 aralığında olduğunda normal dağılımı doğrulamaktadır (Büyüköztürk, 2018). Bu bağlamda parametrik testlerden bağımsız örneklem t testi, tek yönlü varyans analizi (ANOVA) ve değişkenler arası ilişkinin incelenmesi için Pearson Korelasyon analizi uygulanmıştır. Burada ilk üç araştırma sorusu için t-testi, 4. araştırma sorusu için ANOVA, 5. ve 6. sorular için korelasyon analizi ve son soru için çoklu regresyon analizi kullanılmıştır.

BULGULAR

Bu bölüm iki kısımdan oluşmaktadır. İlk kısım ilk 6 araştırma sorusunun test edilmesi için yapılan t-testi, ANOVA ve Pearson korelasyon analiz sonuçlarındaki bulguları; ikinci kısım ise çoklu regresyon analizine yönelik bulguları göstermektedir.

Araştırma Sorularına Yönelik Bulgular

Tablo 2 ilk dört araştırma sorusuna yönelik yapılan analiz sonuçlarını göstermekte olup bu tabloda yaşlılarda yaşam kalitesinin cinsiyet, medeni durum, aktivite türü ve eğitim düzeyi değişkenlerine göre t-testi ve ANOVA sonuçları verilmektedir.

Tablo 2. Yaşlılarda yaşam kalitesinin demografik özelliklere göre t testi ve ANOVA testi sonuçları

Ölçekler ve alt boyutları	Değişken	Kategori	N	X	S	t/F	p
Özerklik ve Memnuniyet Algısı		Kadın	131	2.57	0.44	1.52	0.129
		Erkek	133	2.48	0.49		
Engel Algısı	Cinsiyet	Kadın	131	2.64	0.38	0.04	0.964
		Erkek	133	2.64	0.39		
Yaşlılarda Yaşam Kalitesi Ölçeği Toplam		Kadın	131	2.61	0.41	1.30	0.193
		Erkek	133	2.54	0.44		
Özerklik ve Memnuniyet Algısı		Evli	156	2.57	0.41	1.57	0.116
		Bekar	108	2.47	0.54		
Engel Algısı	Medeni Durum	Evli	156	2.71	0.28	3.30	0.001*
		Bekar	108	2.54	0.49		
Yaşlılarda Yaşam Kalitesi Ölçeği Toplam		Evli	156	2.62	0.36	1.97	0.051
		Bekar	108	2.51	0.50		
Özerklik ve Memnuniyet Algısı		Plansız	178	2.39	0.47	-8.89	0.000*
		Planlı	86	2.83	0.32		
Engel Algısı	Aktivite Türü	Plansız	178	2.57	0.41	-8.99	0.000*
		Planlı	86	2.79	0.30		
Yaşlılarda Yaşam Kalitesi Ölçeği Toplam		Plansız	178	2.45	0.43	-5.05	0.000*
		Planlı	86	2.84	0.29		
Özerklik ve Memnuniyet Algısı		İlköğretim	88	2.27	0.46	40.81	0.000*
		Lise	76	2.48	0.45		
		Üniversite	100	2.81	0.33		
Engel Algısı	Eğitim Düzeyi	İlköğretim	88	2.48	0.45	18.11	0.000*
		Lise	76	2.62	0.34		
		Üniversite	100	2.80	0.30		
Yaşlılarda Yaşam Kalitesi Ölçeği Toplam		İlköğretim	88	2.34	0.43	40.73	0.000*
		Lise	76	2.53	0.40		
		Üniversite	100	2.83	0.30		

*p<0.05

Tablo 2'ye göre yaşlılarda yaşam kalitesi düzeyinde cinsiyet değişkenine göre yapılan t-testi sonucunda istatistiksel olarak anlamlı farklılığın olmadığı görülmektedir, [t(262) = 1.305; p=0.193]. Yine benzer şekilde yaşlıların "özerklik ve memnuniyet algısı" ve "engel algısı" alt boyutlarının cinsiyete göre anlamlı bir farklılık göstermediği bulunmuştur (p>0.05). Medeni

durum değişkenine göre yapılan t-testi sonucunda yaşlıların yaşam kalitesi düzeyinde istatistiksel olarak anlamlı farklılığın olmadığı görülmektedir [$t(262) = 1.973$; $p=0.051$]. Benzer şekilde yaşların “özerklik ve memnuniyet algısı” alt boyutu medeni durum değişkenine göre anlamlı farklılık göstermezken ($p>0.05$), “engel algısı” alt boyutunda medeni durum değişkenine göre anlamlı bir farklılığın olduğu ve bu farkın evlilerde daha yüksek olduğu bulunmuştur ($p<0.05$). Aktivite türü değişkenine göre yapılan t-testi sonucunda yaşlıların yaşam kalitesi düzeyinde istatistiksel olarak anlamlı farklılık görüldüğü ve bu farkın planlı aktiviteler yapanların lehine olduğu bulunmuştur [$t(262) = -5.054$; $p<0.05$]. Ayrıca yaşların “özerklik ve memnuniyet algısı” ve “engel algısı” alt boyutlara göre yaşlılarda yaşam kalitesi düzeyi benzer şekilde anlamlı bir farklılık gösterdiği bulunmuştur ($p<0.05$). Son olarak eğitim düzeyi değişkenine göre yapılan ANOVA sonucunda yaşlıların yaşam kalitesi düzeyinde istatistiksel olarak anlamlı farklılık görülmüştür [$F_{(2,261)} = 40.73$, $p<0.05$]. Gruplar arası farkı test edebilmek için yapılan Tukey testi sonucunda üniversite düzeyi eğitim düzeylerinin lise eğitim düzeylerine göre; lise eğitim düzeylerinin ilköğretim eğitim düzeylerine göre yaşam kalitelerinin daha yüksek olduğu bulunmuştur.

Tablo 3’te 5. ve 6. araştırma sorularına yönelik analiz bulguları gösterilmektedir. Bu bağlamda Tablo 3’te yaşlılarda yaşam kalitesi düzeyinin yaş ve sürekli umut düzeyleri arasındaki ilişkiyi bulmak için yapılan Pearson Korelasyon analizi sonuçları gösterilmektedir.

Tablo 3. Yaşlılarda yaşam kalitesinin sürekli umut ve yaş değişkenleri ile ilişkisi

	Sürekli Umut	Yaş
Özerklik ve Memnuniyet Algısı	0.75*	-0.21*
Engel Algısı	0.68*	-0.35*
Yaşlılarda Yaşam Kalitesi Ölçeği Toplam	0.77*	-0.23*

* $p<0.05$

Tablo 3’e göre yaşlılarda yaşam kalitesi düzeyinin sürekli umut düzeyi ile ilişkisinin pozitif ve anlamlı olduğu ($r=.77$, $p<0.05$); yaş ile ilişkisinin ise negatif ve anlamlı olduğu ($r=-.23$, $p<0.05$) görülmektedir.

7. Araştırma Sorusuna Yönelik Bulgular

Bu bölümde öncelikle çoklu regresyon analizine yönelik varsayımlardan bahsedilecek ardından çoklu regresyon modeline yönelik bilgiler verilecektir.

Çoklu Regresyon Analizi Varsayımları

Çoklu regresyon analizi için öncelikle çoklu regresyon varsayımlarının sağlanması gerekmektedir (Field, 2013). Bu varsayımlara ve veriye uygulanmasına aşağıda değinilmiştir.

- Bunun için ilk varsayım olarak modele konulacak bağımsız değişkenlerin bağımlı değişken ile anlamlı ve doğrusal bir ilişkisinin olması gerekmektedir. Burada Tablo 2 ve Tablo 3 sonuçları kullanılarak modele “aktivite türü”, “eğitim düzeyi”, “sürekli umut” ve “yaş” değişkeni eklenmiştir.

- İkinci varsayım ise bağımsız değişkenler arasındaki ilişkinin yüksek düzeyde olup olmamasını gösteren çoklu doğrusallıktır. Bunun için modelde her bir değişkenin VIF (Variance Inflation Factor) değerine bakılır. Bu değer 10'dan küçük olmalı hatta 1 civarında olmalıdır. Tablo 4 her bir değişken için VIF değerlerini göstermektedir.

Tablo 4. Çoklu doğrusallık istatistiği

	VIF	Hata Payı
Aktivite türü	1.11	0.901
Yaş	1.05	0.957
Sürekli Umut	1.20	0.834
Eğitim düzeyi	1.08	0.922

Tablo 4'e göre aktivite türü, yaş, sürekli umut ve eğitim düzeyi değişkenleri için VIF değerleri 10'dan küçük ve 1 civarında olduğundan çoklu doğrusallık göstermediği bulunmuştur.

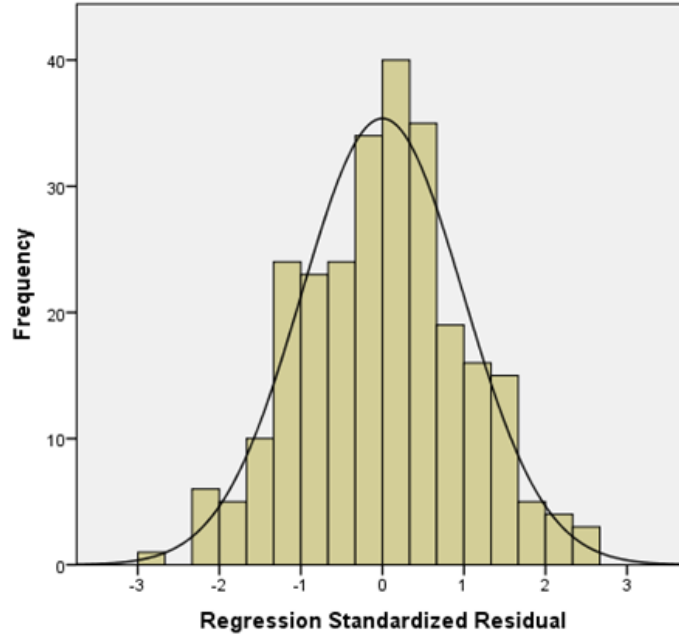
- Diğer bir varsayım ise modelde bağımlı değişkende uç değerlerin olmamasıdır. Bunun için gizil olarak tanımlanan "Cook Uzaklığı (Cook's Distance)" değerlerine bakılır. Eğer tüm bu değerler 1'den küçük ise uç değer olmadığı söylenebilir. Tablo 5'te bu değerler gösterilmektedir.

Tablo 5. Cook uzaklık değerleri

Ortalama	Ortanca	Serbestlik Derecesi	Aralık	
			Minimum	Maksimum
0.00407	0.00170	0.00595	0.00001	0.0421

Tablo 5'e göre Cook uzaklık değerleri ortalamasının 0.00407 olduğu ve maksimum değeri ise 0.0421 olduğu görülmektedir. Buna göre Cook uzaklık değerlerinin 1'den küçük olduğu görülmektedir.

- Çoklu regresyon analizinde kullanılan diğer bir varsayım ise hataların normal olarak dağılım göstermesidir. Şekil 1 hataların dağılımını göstermektedir.



Şekil 1. Hataların dağılımı

Şekil 1 incelendiğinde hataların normal şekilde dağıldığı görülürken yapılan normallik testi ise bu durumu desteklemektedir (Shapiro-Wilk=0.995; $p=0.624$).

Yukarıda bahsedilen doğrusallık, çoklu doğrusallık, uç değerlerin belirlenmesi ve hataların dağılımı varsayımları sağlandığından çoklu regresyon modeli uygulanarak aşağıda tanıtılmıştır.

Çoklu Regresyon Analizi Modeli

Çoklu regresyon modelinde bağımlı değişken olarak yaşlıların yaşam kalitesi düzeyi alınırken, bağımsız değişkenler olarak yaşlıların sürekli umut düzeyi, yaptıkları aktivite türü, yaşı ve eğitim düzeyi alınmıştır. Çoklu regresyon analizi sonucunda modelin istatistiksel olarak anlamlı olduğu bulunmuştur ($F_{(4,259)}=110.108$, $p<0.05$). Modelde yaşlıların yaşam kalite düzeyindeki varyansın %63'ünün bağımsız değişkenler tarafından açıklandığı görülmüştür ($R^2=.63$). Tablo 6'da modelde yer alan bağımsız değişkenler ve bu değişkenlerin etki büyüklükleri yer almaktadır.

Tablo 6. Çoklu regresyonda modeli ve değişkenlere ilişkin katsayı bilgileri

	Standart olmayan katsayılar		Standart katsayılar	t	p
	B	Std. Hata	Beta		
Sabit değer	0.86	0.72		1.191	0.235
Eğitim düzeyi	0.06	0.02	0.11	2.568	0.011*
Yaş	-0.01	0.01	-0.05	-1.166	0.245
Aktivite türü	0.13	0.04	0.14	3.401	0.001*
Sürekli umut düzeyi	0.35	0.03	0.65	14.352	0.000*

* $p<0.05$

Tablo 6'ya göre modelde yaşlıların eğitim düzeyi, aktivite türü ve sürekli umut düzeyi istatistiksel olarak anlamlı; yaş değişkeninin ise istatistiksel olarak anlamlı olmadığı bulunmuştur. Çoklu regresyon modeline ait denklem aşağı gösterilmektedir.

$$\text{“Yaşam kalitesi} = 0.86 + 0.06 \times \text{Eğitim düzeyi} + 0.13 \times \text{Aktivite türü} + 0.35 \times \text{Sürekli umut} \text{”}$$

Bu modele göre yaşlılarda eğitim düzeyi 1 derece arttığında, yaşam kalite düzeylerinin 0.06 birim arttığı; planlı aktivite yapmanın plansız aktivite yapmaya göre yaşlıların yaşam kalitesini 0.13 birim artırdığı; süreklilik düzeylerinin 1 birim artmasıyla yaşam kalite düzeylerinin 0.35 birim yükseldiği görülmektedir.

TARTIŞMA VE SONUÇ

Çalışmanın bu bölümünde, çalışmaya dâhil olan 65 yaş ve üstü bireylerin demografik özellikleriyle birlikte umut düzeylerinin yapılan analizler sonucunda yaşam kalitelerini ne derecede etkilediğine ilişkin bulgular tartışılarak yorumlanmıştır.

Yaşlıların yaşam kalitesi düzeylerinin ilişkili olduğu demografik özellikleri belirleyip bu değişkenlerin yaşam kalite düzeylerindeki değişimin ne kadarını açıkladığını bulmak çalışmanın temel amacını oluşturmaktadır. Bunun için öncelikle veri setinde bulunan cinsiyet, medeni durum, aktivite türü, eğitim düzeyi, yaş ve sürekli umut düzeyi değişkenlerinin yaşlıların yaşam kalitesi ile ne derece ilişkili olduğunu belirlemek için istatistiksel analizler yapılmıştır. Öncelikle yaşlılarda yaşam kalite düzeyinin cinsiyet, medeni durum ve aktivite türü değişkenlerine göre farklılık gösterip göstermediğini bulmak için bağımsız örneklem t-testi; eğitim düzeyi değişkenine göre farklılık gösterip göstermediğini bulmak için ANOVA; yaş ve sürekli umut değişkeni ile anlamlı ilişkisi olup olmadığını bulmak için Pearson Korelasyon analizi yapılmıştır. Bu analizler sonucunda yaşlıların yaşam kalite düzeyi aktivite türü ve eğitim durumuna göre anlamlı farklılık gösterdiği; yaş ve sürekli umut ile de anlamlı ilişkisi olduğu bulunmuştur. Bu doğrultuda bu dört değişken çoklu regresyon modeline bağımsız değişken olarak dahil edilmiştir. Ardından bu değişkenlerle kurulan çoklu regresyon analizinin varsayımları test edilip bu varsayımların tümünün sağlandığı görülmüştür. Son olarak yapılan çoklu regresyon analizi sonucunda modelin anlamlı olduğu ve modelde eğitim düzeyi, aktivite türü ve sürekli umut değişkenlerinin anlamlı olduğu, yaş değişkeninin ise anlamlı olmadığı görülmüştür.

Cinsiyet değişkeninde 65 yaş ve üstü katılımcılarda yaşam kalitesi ortalama puanlarında istatistiksel olarak anlamlı fark bulunmamıştır. Literatür incelediğinde bu çalışma ile örtüşen benzer sonuçların olduğu çalışmalar mevcuttur. Örneğin, Altay ve diğerlerinin (2016) yaptığı kapsamlı bir çalışma, yaşlı erkekler ve kadınlar arasında yaşam kalitesi açısından anlamlı bir fark bulunmadığını ortaya koymuştur. Aynı şekilde, yerli literatürde bu alanda çalışmaları olan Kozak-Çevik ve Akyıl (2021) ile Tavşanlı'nın (2013), yürüttüğü çalışmalarda da cinsiyet değişkeninin yaşlı bireylerin yaşam kalitesine etkisinin istatistiksel olarak anlamlı olmadığı sonucuna ulaşılmıştır. Bu çalışmalar, yaşam kalitesinin yaşlılık döneminde cinsiyetle ilişkilendirilmediğini ve yaşlı erkekler ile kadınların benzer yaşam kalitesi deneyimleri yaşadığını desteklemektedir. Bu

bulgular literatürle karşılaştırıldığında, yaşlılıkta yaşam kalitesinin daha çok sağlık durumuna (Ceremnych, 2003; Telatar ve Özcebe, 2004) ve sosyal faktörlere (Akal, 2005; Çalıştır vd., 2006) bağlı olarak şekillendiğini göstermektedir. Cinsiyetin yaşam kalitesi üzerindeki etkisinin sınırlı olduğu bu bulgular, yaşlılık döneminde sağlık hizmetlerinin ve sosyal desteklerin yaşam kalitesini artırmada daha büyük bir rol oynayabileceğini öne sürmektedir. Bu nedenle, yaşlı bireylerin yaşam kalitesini artırmak için cinsiyet dikkate alındığında daha spesifik stratejilere ihtiyaç olduğu görülmektedir.

Yaşlılık, sağlık durumu, sosyal ilişkiler, kişisel memnuniyet gibi faktörlerin birleşimiyle şekillenir (Tereci vd., 2016) ve bu faktörlerin etkisi genellikle cinsiyetle değil, bireysel deneyimlerle ilişkilendirilir. Cinsiyet farklılıkları genellikle biyolojik ve sosyal faktörlerden kaynaklanırken yaşlı bireylerin yaşam koşulları, sağlık durumları, sosyal destek ve yaşam tatmini gibi etkenler, umut düzeylerini daha fazla etkileyebilir. Bu faktörler bireysel deneyimlerde ve yaşamın çeşitli alanlarında ortak olabilir, bu nedenle cinsiyet ayrımı yaşlılarda yaşam kalitesi düzeyinde belirgin bir farklılık yaratmayabilir. Bu bağlamda, gelecekteki araştırmaların, yaşlı bireylerin cinsiyete özgü ihtiyaçlarını ve yaşam kalitelerini iyileştirmek için özelleştirilmiş programlar geliştirmeye odaklanması önemlidir.

Medeni durum değişkenine göre yapılan fark testi sonuçlarında, yaşlılarda yaşam kalitesi ölçeğinin "engel algısı" alt boyutunda istatistiksel olarak anlamlı farklılık bulunduğu görülmüştür. Bu sonuç, evli ve bekar yaşlı bireyler arasında "engel algısı" konusunda farklı deneyimler olduğunu işaret etmektedir. Detaylı bir şekilde incelendiğinde, evli bireylerin bu alt boyuttaki engel algıları ortalama değerlerinin bekar bireylere göre daha yüksek olduğu gözlemlenmiştir. Bu farklılık, bekar bireylerin kendilerini daha özgür hissetmeleri ve sorumluluk yükünün daha düşük olması gibi faktörlere bağlı olabilir. Medeni durumun yaşlı bireylerin yaşam kalitesi algısı üzerindeki bu spesifik etkisi, yaşam koşullarının ve ilişkilerin karmaşıklığını yansıtabilir. Bu alt boyut içinde "yaşam yapmak istediğim şeyleri yapmama engel oluyor", "bana olan şeylerin kontrolüm dışında olduklarını hissediyorum", "sağlığım yapmak istediğim şeyleri yapmama engel oluyor" şeklinde ifadeler bulunmaktadır. Bu ifadeler, yaşlı bireylerin yaşam kalitesi algısını etkileyen ve "engel algısı" alt boyutunu oluşturan temel düşünceleri yansıtır. Bu düşünceler, evli ve bekar bireyler arasında farklılık göstererek medeni durumun yaşlı bireylerin yaşam kalitesi algısında değişkenlik yaratabilir (Hyde vd., 2003; Türkoğlu ve Adıbelli, 2014). Yaşlı çiftlerin yaşlarına bağlı olarak sağlık durumlarını göz önünde bulundurursak eşlerden birinin sağlığının yerinde olmaması diğer eşi de olumsuz etkileyeceğinden yapmak istenilen şeylerin (fiziksel aktivite, serbest zaman aktiviteleri, sosyal faaliyetler, fiziksel ihtiyaçlar vb.) yapılmasında engel durumunun bekar olanlara kıyasla ihtimaller dahilinde daha fazla olacağından söz edilebilir.

Elde edilen bulgular neticesinde bir diğer istatistiksel farklılık yapılan rekreasyonel aktivitenin türüne göre anlam kazanmıştır. Karaküçük'ün (2014), "Rekreasyon: boş zamanları değerlendirme" isimli eserinde rekreasyon türlerinin sınıflandırılmasında esas alınan prensip kişinin rekreasyon aktivitelerine katılmasını sağlayan amaçlar, istekler ve zevkler olduğu vurgulanmıştır. Her bireyin farklı amaç ve istekleri olabileceğinden kesin bir gruplama ve çeşitlendirmenin zor olacağı açıkça ifade edilmiştir. Söz konusu bu eserde genel hatlarıyla

rekreasyon aktiviteleri amaçlarına ve çeşitli kriterlere göre incelenerek açıklanmıştır. Buradan hareketle yaşlıların katıldıkları rekreasyonel aktivite türü değişkenini plansız ve planlı yapılan aktiviteler olarak ikiye ayırmak yanlış olmayacaktır. Daha anlaşılır şekilde ifade edilirse plansız aktiviteler genellikle spontane olarak gerçekleşir ve kişilerin serbest zamanlarını değerlendirmek için kendi istekleri doğrultusunda yaptıkları uğraşları kapsar. Örneğin, bir kişi evde kitap okuyabilir (ev içi etkinlik), yürüyüşe çıkabilir (açık alan aktivitesi) veya kapalı bir mekânda grup egzersizlerine katılabilir (fiziksel aktivite). Planlı yapılan rekreasyonel aktiviteler ise genellikle önceden planlanır ve toplumsal etkileşimi artırmayı, yeni deneyimler kazanmayı veya belirli bir amaç doğrultusunda eğlenmeyi temel alır. Örnekler arasında tiyatro oyunlarına gitmek (kültürel aktivite), bir resim kursuna katılmak (sanatsal aktivite), arkadaşlarınızla bir sosyal etkinlik düzenlemek veya tatile çıkmak (turistik aktivite) gösterilebilir. Bu araştırmaya katılan yaşlı bireylerin planlı aktivite tercihlerinin yaşam kalitelerinde daha yüksek ortalama değerleri istatistiksel olarak göstermesi bu aktivitelerin belirli bir yaş üzeri kişileri daha fazla tatmin etmesinden kaynaklanıyor olabilir (Michèle vd., 2019). Ayrıca planlı aktiviteler çok fazla efor gerektirmediğinden yaşlı bireylerin tercihlerinde önemli olurken yaşam kalitelerini de artırabilir. Kruvazier (Gemi) turlar planlı olarak gerçekleştirilen turistik aktivite başlığı altında değerlendirilerek bu duruma örnek olarak verilebilir.

Flanagan (1978) tarafından geliştirilen yaşam kalitesi ölçüsü, 26 farklı alanda 15 yaşam kalitesi ögesini kapsayan bir ölçü olarak oluşturulmuştur. Bu ölçüm aracı, geniş bir yelpazedeki yaşam kalitesi faktörlerini değerlendirmeyi amaçlamaktadır. Flanagan'ın bu ölçüm aracı, yaşam kalitesinin sadece bir boyutta değil, birden fazla boyutta değerlendirilmesine imkân tanır ve bireylerin yaşam deneyimini daha geniş bir açıdan anlamamıza yardımcı olabilir. Bu boyutlar içerisinde “rekreasyon” başlığı altında sosyalleşme, pasif ve gözlemsel eğlence aktiviteleri, aktif ve katılımcı eğlence aktiviteleri şeklinde ifadeler yer almaktadır. Bu ifadeler, yaşam kalitesinin farklı yönlerini yansıtan aktiviteleri içermektedir ve yaşlı bireylerin yaşam kalitesini artırmada önemli bir rol oynayabileceği gibi yaşlıların genel yaşam memnuniyeti üzerinde olumlu etkileri olabilir. Bu çalışmada her ne kadar daha az fiziksel efor gerektiren aktivitelere katılanların yaşam kalitesi ölçeğine yönelik ortalama puanları yüksek çıksa da fiziksel aktivitenin veya egzersizin her yaştaki birey için yaşam kalitesini olumlu yönde artırdığı çalışmalara da rastlamak mümkündür (Cummins, 1996; Dinç vd., 2018; Soyuer ve Soyuer, 2008; Toper, 2023). Buna ek olarak, yaşam kalitesini belirleyen faktörlerin karmaşıklığı nedeniyle, rekreasyonel aktivitelerle diğer yaşam kalitesi boyutları arasındaki ilişkinin çok yönlü ve kişisel deneyimlere bağlı olarak değişebileceği de unutulmamalıdır.

Eğitim düzeyi değişkenine göre yapılan analiz sonucunda yaşlıların yaşam kalitesi düzeyinde istatistiksel olarak anlamlı farklılıklar eğitim seviyesi yüksek olanların lehine değer kazanmıştır. Literatürle uyumlu olarak ilkökul, lise ve üniversite mezunu olarak yapılan değerlendirmede eğitim seviyesine paralel olarak yaşam kalitesi düzeyinde artış olduğu görülmüştür (Arslantaş vd., 2006; Değer ve Ordu, 2022; İnal vd., 2003). Daha yüksek eğitim düzeyine sahip bireyler genellikle daha iyi iş fırsatlarına erişim sağlayabilirler, daha yüksek gelir elde edebilirler ve daha sağlıklı yaşam tarzları benimseyebilirler. Bu faktörler yaşam kalitesini artırabilir. Ayrıca eğitim düzeyi,

bireylerin sağlık hizmetlerine erişimini ve sağlık bilincini artırabilir, bu da yaşam kalitesini iyileştirebilir. Günümüzde, iyi bir işte çalışarak emekli olmak, gazete ve kitap okumak, başka yerlere seyahat etmek, serbest zamanı bilinçli olarak değerlendirmek gibi örnekleri artırabileceğimiz birçok eylem, eğitim seviyesi ile yakından ilişkilendirilebilir. Ancak, yaşam kalitesi üzerindeki etkiyi anlamak için diğer faktörlerin de dikkate alınması gereklidir. Örneğin, sosyoekonomik durum, yaş, cinsiyet, coğrafi bölge ve genetik faktörler gibi diğer değişkenler de yaşam kalitesini etkileyebilir. Yaşlılarda eğitim düzeyinin yaşam kalitesi üzerinde olumlu bir etkiye sahip olduğu yaygın bir gözlem olsa da bu etkiyi değerlendirmek için diğer faktörlerin de göz önünde bulundurulması önemlidir. Her durumda, eğitim düzeyinin yaşam kalitesini artırabileceğine dair güçlü bir kanıt vardır (Tsakos vd., 2009). Bu nedenle, bu çalışmada eğitim seviyeleri arasındaki farkın anlamlı olması yaşam kalitesi seviyesine yönelik beklenen bir sonuç olarak kabul edilebilir.

Bu araştırmada elde edilen bir başka önemli bulgu ise yaşam kalitesinin yaş değişkeni ile ilişkisinin negatif ve anlamlı olmasıdır. Yaş değişkeni ile yapılan korelasyon analizi sonuçları anlamlı çıkmış olsa da etki düzeyini belirlemek için yapılan regresyon analizinde yaş değişkeninin yaşam kalitesi üzerinde etkiye sahip olmadığı görülmüştür. Literatürdeki çalışmalara bakıldığında yaşlılarda yaşa bağlı olarak yaşam kalitesinin azaldığı sıkça gözlemlenen bir durumdur (Chang vd., 2006; Rocha vd., 2015; Vitorino vd., 2012). Ancak bu durum her birey için geçerli olamayabilir. Yaşa bağlı olarak yaşam kalitesindeki azalma, çeşitli faktörlere bağlı olarak değişiklik gösterebilir. Yaşlanma süreci vücutta çeşitli fizyolojik değişikliklere yol açabilir. Kas kütlesi kaybı, kemik yoğunluğunun azalması, görme ve işitme yeteneklerinde azalma gibi fiziksel değişiklikler yaşam kalitesini etkileyebilir (Akdeniz vd., 2019; Williams vd., 2002). Bununla birlikte, yaşla bağlı olarak deneyim sahibi olma, hayatta daha fazla özgürlük ve bağımsızlık kazanma, aile ve arkadaş ilişkilerini sürdürme, emeklilikten keyif alma gibi olumlu deneyimler de yaşanabilir. Sağlıklı yaşlanma için düzenli egzersiz yapma, sağlıklı beslenme, doktor kontrollerini takip etme ve sosyal bağlantıları sürdürme gibi önlemler alınabilir. Ayrıca yaşlı bireylerin yaşam kalitesini artırmak için ilgi duydukları rekreasyonel aktivitelere zaman ayırmaları ve sosyal destek sistemlerini güçlendirmeleri de önemlidir.

Yaşlılarda yaşam kalitesini etkileyen faktörler üzerine çalışan İlhan ve diğerleri (2016), yaşla birlikte yaşam kalitesi puanlarının düşmesinin gözlemlendiğini ve 85-94 yaş aralığındaki yaşlı bireylerin "duyusal yetiler" alanında diğer yaş gruplarına göre daha düşük puanlar aldığını göstermektedir. Bu tür bulgular yaşlanmanın yaşam kalitesi üzerinde olumsuz etkileri olabileceğini gösterir. Örneğin, yaşın artmasıyla birlikte işitme kaybı iletişim sorunlarına neden olabileceği gibi, görme problemleri de bağımsızlığı kısıtlayabilir ve günlük yaşam aktivitelerini etkileyebilir.

Ölçekler arasındaki ilişkiyi yorumlamak için yapılan korelasyon analizi sonucunda, iki ölçek arasında pozitif yönde yüksek düzeyde anlamlı ilişki olduğu bulunmuştur. Bu sonuç, yaşam kalitesi ve sürekli umut düzeyi arasında güçlü bir bağlantının olduğunu ve daha yüksek umut düzeyine sahip bireylerin genellikle daha yüksek yaşam kalitesi algısına sahip olduğunu göstermektedir. Bu bulgu, umudun yaşam kalitesini olumlu şekilde etkileyebileceğini ve yaşlı

bireylerin umut düzeyinin yaşam kaliteleri üzerinde önemli bir rol oynayabileceğini düşündürmektedir. Literatürde yaşam kalitesi ve umut düzeyinin birlikte incelendiği çalışmalar mevcuttur (Hawro vd., 2014; Sigstad vd., 2005). Bu çalışmaların ortak noktalarına bakıldığında kaliteli yaşamın umut düzeyiyle ilişkili olduğu görülmektedir. Esbensen ve Thomsen (2011), kanser hastası yaşlı bireylerde yapmış oldukları çalışmada umut düzeyi yüksek olanların yaşam kalite düzeylerinin de yüksek olduğuna dair veriler elde etmişlerdir. Yaşlı bireylerde umut düzeyi ile yaşam kalitesi arasında pozitif bir ilişki olduğunu gösteren bu tür veriler oldukça anlamlıdır. Umut, kişinin geleceğe yönelik olumlu beklentiler taşıması ve yaşamla ilgili umutlu bir tutum sergilemesi anlamına gelir. Bu, yaşlı bireyler için yaşam kalitesini artırabilir ve yaşlılık döneminde daha olumlu bir deneyim yaşamalarına yardımcı olabilir. Umut düzeyi ile yaşam kalitesi arasındaki pozitif ilişki, psikolojik faktörlerin yaşam kalitesi üzerindeki etkisini gösteren bir bulgu olarak değerlendirilebilir. Umut düzeyinin yüksek olması, olumlu bir yaşam görüşüne sahip olmayı ve zorluklarla başa çıkmayı kolaylaştırabilir. Dolayısıyla bu durum genel yaşam kalitesini olumlu yönde etkileyebilir.

Yaşlı bireylerin yaşam kalitesini birçok değişken (cinsiyet, yaş, eğitim durumu, sosyal güvence, kronik hastalık sayısı, maddi durum, memnuniyet algısı, ilaç kullanımı, boş zaman aktiviteleri, vb.) tek başına olumlu veya olumsuz yönde etkileyebilir, ancak yaşam kalitesi birçok faktörün karmaşık bir sonucu olabileceği gibi her birey için farklı çıktılar da oluşturabilir. Bu çalışmada yaşam kalitesi değişkeninde eğitim düzeyi, yaş, umut düzeyi ve rekreasyonel aktivite türüne bağlı olarak farklı sonuçlar ortaya çıkmıştır. Bu faktörler sadece bir etkenken, yaşam kalitesini artırmak için birden fazla faktörün bir araya gelmesi genellikle daha etkili olabilir. Bu doğrultuda çalışmada yaşam kalitesini etkileyebilecek bu dört değişken çoklu regresyon modeline bağımsız değişken olarak dahil edildikten sonra yapılan analiz sonucunda modelin anlamlı olduğu ve modelde eğitim düzeyi, aktivite türü ve sürekli umut değişkenlerinin anlamlı olduğu, yaş değişkeninin ise anlamlı olmadığı görülmüştür. Bu modele göre yaşlılarda eğitim düzeyi 1 derece arttığında, yaşam kalite düzeylerinin .06 birim arttığı; planlı aktivite yapmanın plansız aktivite yapmaya göre yaşlıların yaşam kalitesini 0.13 birim arttırdığı; sürekli umut düzeylerinin 1 birim artmasıyla yaşam kalite düzeylerinin 0.35 birim yükseldiği sonucuna ulaşılmıştır. Modelde sürekli umut düzeyi en fazla etki büyüklüğüne sahip değişkendir. Bu gösterge umut düzeyi arttıkça yaşam kalitesindeki artışın daha belirgin olduğuna, yaşlı bireylerin umut dolu ve pozitif bir tutuma sahip olmalarının yaşam kalitelerini önemli ölçüde artırabileceğine işaret etmektedir. Model genel olarak yorumlandığında, yaşlı bireylerin yaşam kalitesini artırmak için eğitim, planlı aktiviteler ve umut dolu bir tutuma odaklanmanın önemini vurgulamaktadır. Literatüre bakıldığında Altuğ ve diğerleri (2009) “Evde yaşayan yaşlılarda yaşam kalitesini etkileyen faktörlerin incelenmesi”ne yönelik yaptıkları çalışmada çoklu regresyon modeli ile eğitim durumu, kronik hastalık sayısı, depresyon gibi faktörlerin yaşam kalitesini etkilediğine dair sonuçlar elde etmişlerdir. Özerdoğan ve diğerleri (2018) ise lojistik regresyon analizi ile yapmış oldukları daha güncel bir çalışmada yaşlılarda kronik hastalık varlığını risk faktörü olarak belirleyip yaşam kalitesi üzerinde önemli bir etkiye sahip olduğunu ortaya koymuşlardır.

Bu araştırmada serbest zamanlarını rekreasyonel aktivitelerle geçiren 65 yaş ve üstü bireylerin yaşam kalitelerini etkileyen faktörler araştırılmış ve önemli sonuçlara ulaşılmıştır. Yaşlı nüfusun arttığı ve bu yaşlı nüfusun sosyomedikal sorunlarının diğer gruplardan daha yaygın olduğu bir gerçektir. Bununla birlikte, yaşam kalitesi kavramının çoğu zaman kümülatif etki gösteren risk faktörleri tarafından etkilendiği göz önüne alındığında, yaşlanma süreciyle birlikte rekreasyonel aktivitelerin azalması veya fiziksel hareketliliğin yavaşlaması gibi faktörler de düşünüldüğünde, yaşam kalitesinin karmaşık bir konu olduğunu kabul etmek ve bu risk faktörlerini ele alan önlemler geliştirmek önemlidir. Bu araştırmaya göre yaşlanma, sürekli umut düzeyinin ve eğitim seviyesinin düşük olması, planlı yapılmayan rekreasyonel aktiviteler gibi faktörlere bağlı olarak yaşam kalitesinin iyi düzeyde olduğundan söz etmek mümkün değildir. Bu değişkenlerden olumsuz etkilenen yaşlı bireylerin yaşam kalitesi düzeylerinin riskli olduğunu söylemek yanlış olmayacaktır.

Öneriler

Yaşlı bireylerin yaşam kalitelerini etkileyen diğer faktörlerin daha derinlemesine incelendiği araştırmalar yapılabilir. Araştırma kapsamında, yaşlı bireylerin sağlık durumu, sosyal ilişkileri, geçmiş deneyimleri gibi etkenlerin yaşam kalitelerine olan etkisi incelenebilir. Bu faktörlerin yaşam kalitesi üzerindeki etkisi daha geniş bir perspektif sunabilir.

Ayrıca, rekreasyonel aktivitelere katılan 65 yaş üstü evli bireylerin engel algısının bekar bireylere kıyasla daha yüksek olduğu gözlemlenmiştir. Bu bulgu, evli bireylerin yaşam koşulları ve sorumlulukları nedeniyle engel algısını farklı şekillerde deneyimlediklerini gösteriyor olabilir. Bu noktada öneri, evli bireylerin engel algısının arkasındaki faktörleri daha detaylı bir şekilde analiz etmek olabilir. Bu faktörler arasında evlilikteki paylaşımlar, destek sistemleri ve yaşam koşulları yer alabilir.

Planlı rekreasyonel aktiviteler (kültürel, sosyal, sanatsal ve turistik aktiviteler) katılan bireylerin diğer aktivitelerle göre yaşam kalitesi ortalama puanlarının daha yüksek olduğu bulgusu da dikkat çekicidir. Bu sonuçlar, bu tür aktivitelerin yaşlı bireylerin yaşam kalitesine olumlu katkılar sağladığını gösteriyor. Bu noktada öneri, yaşlı bireylerin bu tür aktivitelerle daha fazla katılımını teşvik etmek için yöntemler geliştirmek olabilir. Bu aktivitelerin erişilebilirliğini artırmak, ilgi çekici programlar düzenlemek veya katılım teşvikleri sağlamak gibi adımlar yaşlı bireylerin yaşam kalitesini destekleyebilir.

Son olarak, yaşam kalitesinin artışının umut seviyeleriyle yakından ilişkili olduğu bulgusu da önemlidir. Bu ilişkinin altında yatan mekanizmaları daha ayrıntılı olarak anlamak, yaşlı bireylerin yaşam kalitesini artırmak ve umutlarını güçlendirmek ve sürekliliği sağlamak için etkili stratejiler geliştirmeye yardımcı olabilir. Bu bağlamda, psikolojik destek programları, yaşam kalitesini artıracak aktiviteler ve umut düzeyini yükseltecek yaklaşımlar geliştirilebilir.

Beşikçi, T. (2023). 65 yaş ve üstü bireylerin yaşam kalitesini etkileyen değişkenlerin çoklu regresyon analizi ile belirlenmesi. *Avrasya Spor Bilimleri ve Eğitim Dergisi*, 5(2), 341-362.

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Etik Kurul İzni ile ilgili Bilgiler

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Examination of Physical Education and Sports Teachers' Intelligence Areas Based on the Theory of Multiple Intelligence

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Abstract

Whether inherited or acquired, intelligence has always been the subject of debate. Educators have accepted and widely applied Howard Gardner's theory of multiple intelligence. Physical education and sport is one of the most crucial teaching fields for individuals' healthy development and efficient education. The study intended to analyse the relationship among the multiple intelligence areas of physical education teachers and their demographic characteristics. The research universe consists of physical education and sports teachers working in the Turkish Republic of Northern Cyprus (TRNC). By the stratified sampling method in the research, 168 teachers were reached out of 182 physical education teachers working in the 2019-2020 academic year. The Multiple Intelligence Scale adapted into Turkish by Babacan (2012) and the personal information data prepared by the researchers were applied in the research. While evaluating the data, the means and the standard deviations of the demographic characteristics of the research group were extracted. T-test, ANOVA, and MANOVA were used to determine group differences. Tukey and post hoc tests were used to define in which groups the differences were. The outcomes showed that the school teachers graduated from can affect intelligence. The findings also show that different factors can affect teachers in different ways.

Keywords: Physical education and sports teachers, Multiple intelligence theory, Intelligence areas

Beden Eğitimi ve Spor Öğretmenlerinin Çoklu Zekâ Kuramına Göre Zekâ Alanlarının İncelenmesi

Öz

İster kalıtsal ister sonradan kazanılmış olsun zekâ her zaman tartışma konusu olmuştur. Howard Gardner'ın Çoklu Zekâ Kuramı, eğitimdeki çoğu eğitimci tarafından geniş çapta kabul görmüş ve uygulanmıştır. Beden eğitimi ve spor, bireylerin sağlıklı gelişimi ve verimli eğitim için en önemli öğretim alanlarından biridir. Araştırmada beden eğitimi öğretmenlerinin çoklu zekâ alanları ile demografik özellikleri arasındaki ilişkinin belirlenmesi hedeflenmiştir. Araştırma grubu Kuzey Kıbrıs Türk Cumhuriyeti (KKTC) 'nde görevli beden eğitimi ve spor öğretmenleridir. Çalışmada tabakalı örnekleme yöntemi ile 2019-2020 eğitim öğretim yılında görev yapan 182 beden eğitimi öğretmeninden 168 öğretmene ulaşılmıştır. Araştırmada Babacan (2012) tarafından Türkçe'ye uyarlanan Çoklu Zekâ Envanteri ve araştırmacılar tarafından hazırlanan kişisel bilgi formu uygulanmıştır. Veriler değerlendirilirken araştırma grubunun demografik özelliklerinin ortalama ve standart sapma değerleri çıkarılmıştır. Grup farklılıklarının tespitinde, t-testi, ANOVA ve MANOVA kullanıldı. Farklılığın hangi gruplarda olduğunu belirlemek için Tukey ve Post-hoc testleri kullanıldı. Sonuçlar, mezun olunan lise öğretmenlerinin türünün zekâ alanını etkileyebileceğini göstermiştir. Bulgular ayrıca farklı faktörlerin öğretmenleri farklı şekillerde etkileyebileceğini göstermektedir. araştırma grubunun demografik özelliklerinin ve yüzdelik dağılımları çıkarılmıştır. Gruplar arasındaki farklılıkları belirlemek için T-testi, ANOVA ve MANOVA kullanıldı. Farklılığın hangi gruplarda olduğunu belirlemek için Tukey ve Post-hoc testleri kullanıldı. Sonuçlar, mezun olunan lise türünün öğretmenlerin zekâ alanını etkileyebileceğini göstermiştir. Bulgular ayrıca farklı faktörlerin öğretmenleri farklı şekillerde etkileyebileceğini göstermektedir.

Anahtar kelimeler: Beden eğitimi ve spor öğretmenleri, Çoklu zekâ kuramı, Zekâ alanları

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INTRODUCTION

The 21st Century has experienced many new applications in all areas, especially in education, where innovations and different practices are emphasized in the teaching process. This change has brought about a new system that focuses on the learner by adopting the concept of modern education. The contemporary education approach eliminates the learner's negativities by defending the learner-centered approach's importance. The fact that each individual has different points of development, intelligence, interest, readiness, and ability increases the importance of individual differences in education (Bağçeci & Demir, 2011; Serrat, 2017; Septiera et al., 2021). The teaching profession finds practical solutions to problems related to educational activities and requires some field-specific skills. Students' cognitive and associative skills are the main focus and assessment in the traditional education system (Sahay, 2019). In the conventional understanding of education, since the teaching environments are organized according to teacher-centered teaching, the inability to carry out teaching activities according to learner characteristics has revealed some negativities. Therefore, teachers should be aware of the educational value of knowledge and provide practical guidance on how to reach it (Numanoğlu, 1999).

In this changing system, students' interests, needs, and abilities have an essential role, so teachers need to be competent and equipped to meet the different needs of their pupils (Tschannen Moran & Woolfolk Hoy, 2001). Also, teachers should know the strengths and characteristics of each student and should appreciate all individual situations to build learning confidence (Moncada & Mire, 2017). Although many of the elements taught are objective subjects, the teacher's main job is related to student and student behavior and requires observing mostly abstract facts. Teachers' multiple intelligence domains received less attention than emotional intelligence and other variables (Chan, 2004; Moafian & Ghanizadeh, 2009; Rastegar & Memarpour, 2009). For this reason, teachers who organize learning-teaching environments should recognize students' learning styles and different intelligence areas (Güven, 2005; Prayitno et al., 2020).

Psychologist Alfred Binet, who stated that intelligence is undeveloped, introduced the "multiple intelligence theory" approximately 85 years after developing the first intelligence test. According to Gardner (2006), intelligence is the capacity of people to produce a product that finds value in one or more cultures, deliver effective and efficient solutions to the problems they encounter in real life, and discover complex issues they need to solve. This theory, emerging from cognitive research, has "documented that students have different types of minds and therefore learn, remember, notice, and understand in different ways." (Peariso & Jamon, 2008). The theory argues that all individuals have several autonomous intelligences that they apply in various combinations to find solutions for problems or be creative to find valuable products in more cultures (Kornhaber, 2022). Multiple intelligence theory consists of verbal-linguistic, logical-mathematical, visual (shape-spatial), musical-rhythmic, bodily-kinesthetic, interpersonal-social, personal (internal, self-directed), and natural. It consists of 8 types of intelligence that work independently but together (Campbell, 1992). In addition, Gardner (2011) mentioned that spiritual intelligence (or existential intelligence) is the ninth possible intelligence but still needs to include it officially in his theory (Temiz, 2007). The nine intelligence areas constantly interact, and each has sufficient competence.

According to Gardner, each individual has more than one independently functioning knowledge area. These are Existentialist, Naturalistic, Intrinsic, Interpersonal, Visual, Kinesthetic, Musical, Mathematical-Logical, and Linguistic (Mangal, 2002). However, intelligence works within a system that is different in every human.

The purpose of the multiple intelligence theory is about what can be done in education rather than what individuals can do. In multiple intelligence theory, students actively participate in their learning. This theory allows us to move away from rote learning, increases the success rate, makes the lessons exciting and fun, and provides meaningful learning. Students can become aware of their intelligence characteristics and develop the ability, skill, and sense of self-confidence. Minnier et al., (2019) stated that multiple intelligence differs from traditional teaching practice, indicating the effectiveness of instructional strategies with multiple intelligences. Lei et al., (2021) noted that multiple intelligences can be used to reveal gifted students and provide them with appropriate development opportunities to grow. Kornhaber (2019) stated that applying multiple intelligence helps increase test scores, positively changes student and parent behaviours, and means improvement for students with disabilities. Multiple intelligence can also support students with problems and adopt more appropriate learning methods. According to Flynn (2007), skills are not a designated list. Those who have them often create new performances and discover unknown problems that have just been known. In this context, many issues related to learning (distraction, undesirable behavior, cooling off from learning, thinking that one has failed) can be eliminated if daily plans and practices in physical education courses are made with the field of intelligence in mind (Selçuk & Kayılı, 2002).

Within the context, the study aimed to investigate the relationship among the multiple intelligence areas of physical education and sports teachers and their demographic characteristics; the main problem of the study was determined as the relationship between the multiple intelligence areas of physical education teachers and their demographic characteristics. Depending on the main problem identified, the study aimed to investigate the relationship between physical education and sports teachers' multiple intelligences and their demographic characteristics.

METHODS

Research Model

In this study, questionnaires were used to collect data. The study is a descriptive survey model that questions the multiple intelligence areas of physical education teachers.

Research Group

The research universe comprises physical education and sports teachers working in the Turkish Republic of Northern Cyprus (TRNC). By the stratified sampling method in the research, 168 teachers were reached out of 182 physical education teachers working in the 2019-2020 academic year.

Data Collection Instruments

As an instrument for data collection, a personal data form consisting of 18 items was prepared by the researcher, and the Multiple Intelligence Scale was designed by McClellan and Conti (2008) and validated by Babacan and Dilci (2012) and adapted into Turkish. Babacan and Dilci (2012) point out that the scale consists of 27 items covering the nine areas of intelligence (Verbal Intelligence, Mathematical-Logical Intelligence, Bodily Intelligence, Rhythmic-Musical Intelligence, Visual Intelligence, Social-Interpersonal Intelligence, Inner-personal intelligence, Natural intelligence, and Existential intelligence) that Gardner has covered. Scale is aimed at determining which intelligence students dominate. The fact that substances on the scale represent areas of intelligence is as follows (McClellan & Conti, 2008):

Article 1.-10.-19: Bodily intelligence

Article 2.-11.-20: Existential intelligence

Article 3.-12.-21: Interpersonal intelligence

Article 4.-13.-22: Inner intelligence

Article 5.-14.-23: Logical intelligence

Article 6.-15.-24: Musical intelligence

Article 7.-16.-25: Natural intelligence

Article 8.-17.-26: Verbal intelligence

Article 9.-18.-27: Visual intelligence

Low scores indicate tending to multiple intelligence, and highest scores indicate that this area of multiple intelligences does not apply to the participant. The area with the lowest score was determined to be the area of multiple intelligence. The Multiple Intelligence Scale's reliability coefficient (Cronbach alpha) in this study is 0.70.

Ethical Approval

The local ethics committee (Girne American University Ethics Committee) approved (Ethics committee approval ID 5/20-70) all experimental procedures, and all data were collected following the Helsinki Declaration.

Data Collection

The study group is teachers in schools affiliated with the TRNC Ministry of National Education (MNE). Therefore, necessary approvals were obtained from the Girne American University Ethics Committee and TRNC MNE to apply the scales. After the application approvals, the scale was sent to the teachers via "Google Forms" since the research was carried out during the pandemic.

Analysis of Data

Data were evaluated with the IBM SPSS (Ver.25) statistical program. While evaluating the data, the means and the standard deviations of the demographic characteristics of the study group were extracted. T-test, ANOVA, and MANOVA were the usual methods of analysis. Tukey and post hoc tests were used to determine in which groups the differences were. Before parametric tests, the Shapiro-Wilk test verified the normality assumption. The alpha level was set at 0.05. Since the study is based on quantitative data, it does not include any other analysis other than statistical analysis.

RESULTS

Table 1. Mean and standard deviation of intelligence

Intelligence	Mean	SD
Verbal	12.94	5.58
Logical	6.85	5.80
Visual	10.07	5.72
Musical	10.71	6.18
Natural	7.96	5.60
Interpersonal	6.48	5.86
Intrapersonal	8.01	6.27
Bodily	7.38	6.48
Existential	7.80	5.85

When the intelligence areas of physical education and sports teachers are analyzed, it is seen that their average verbal/linguistic intelligence is the highest (12,94) and their average interpersonal intelligence is the lowest (6,48). According to the data, teachers are also predisposed to visual(10,07), musical (10,71), and intrapersonal (8.01) intelligence. According to the scores that can be obtained from the scale, it can be stated that teachers are at an advanced level in all intelligence areas.

Table 2. Independent sample t-test for gender and multiple intelligence comparison

	Gender	N	Mean	Std. Deviation	t	Sig.
Bodily	Female	96	7.84	6.883	1.084	.280
	Male	72	6.75	5.881		
Existential	Female	96	7.78	5.903	-.057	.955
	Male	72	7.83	5.826		
Interpersonal	Female	96	8.59	6.470	1.379	.170
	Male	72	7.25	5.938		
Intrapersonal	Female	96	6.63	5.773	.364	.717
	Male	72	6.29	6.017		
Logical	Female	96	6.53	5.958	-.841	.402
	Male	72	7.29	5.588		
Musical	Female	96	12.50	6.160	-3.338	.001*
	Male	72	9.38	5.792		
Nature	Female	96	7.53	6.202	-1.158	.249
	Male	72	8.54	4.669		
Verbal	Female	96	13.44	5.719	1.320	.189
	Male	72	12.29	5.356		
Visual	Female	96	10.03	6.340	-.105	.917
	Male	72	10.13	4.823		

Table 2 shows the t-test results of 96 female and 72 male physical education and sport teachers related to multiple intelligence fields. Results showed that only musical intelligence varies significantly by gender. Depending on gender, a differentiation is observed in the field of musical intelligence in favor of female teachers. Therefore, we can say that female teachers are more developed in the field of musical intelligence than male teachers.

Table 3. Multiple intelligence averages according to high school type

	School Type	N	Mean	Std. Deviation	Sig.
Bodily	Vocational	27	4.22	2.136	.395
	General	105	7.63	6.000	
	Sport	15	3.80	1.014	
	Anatolian/Science	15	15.60	10.649	
	College	6	5.50	2.739	
Existential	Vocational	27	4.22	1.908	.190
	General	105	7.37	4.987	
	Sport	15	10.20	1.014	
	Anatolian/Science	15	15.60	10.649	
	College	6	6.00	3.286	
Interpersonal	Vocational	27	6.56	2.636	.946
	General	105	7.60	6.063	
	Sport	15	6.00	.000	
	Anatolian/Science	15	16.00	10.163	
	College	6	7.00	1.095	
Intrapersonal	Vocational	27	4.11	1.948	.721
	General	105	6.03	4.890	
	Sport	15	4.80	1.521	
	Anatolian/Science	15	15.60	10.649	
	College	6	6.50	3.834	
Logical	Vocational	27	4.33	1.861	.302
	General	105	6.11	4.838	
	Sport	15	8.00	2.535	
	Anatolian/Science	15	15.60	10.649	
	College	6	6.50	1.643	

Table 3 (Continued). Multiple intelligence averages according to high school type

	School Type	N	Mean	Std. Deviation	Sig.
Musical	Vocational	27	8.44	4.108	.290
	General	105	10.77	5.430	
	Sport	15	10.00	7.606	
	Anatolian/Science	15	16.80	9.221	
	College	6	6.50	3.834	
Nature	Vocational	27	5.67	2.253	.129
	General	105	7.20	4.408	
	Sport	15	10.00	5.071	
	Anatolian/Science	15	16.20	9.894	
	College	6	6.00	3.286	
Verbal	Vocational	27	12.00	4.899	.064
	General	105	12.11	5.083	
	Sport	15	17.20	1.014	
	Anatolian/Science	15	17.40	8.870	
	College	6	10.00	3.286	
Visual	Vocational	27	8.33	4.377	.113
	General	105	9.31	4.950	
	Sport	15	14.00	.000	
	Anatolian/Science	15	16.40	9.723	
	College	6	5.50	.548	

Table 3 shows the relationship between multiple intelligences and the type of school graduated from. The results show that there is no significant relationship between multiple intelligences and the type of school graduated from, but anatolian/science high school graduates are less developed in intelligence areas compared to other high school graduates. Since each school provides education in line with its objectives, it is thought that the fact that it reveals its dominance in certain intelligence areas and that the school distribution is not homogeneous may have affected the possible result.

Table 4. Average of multiple intelligence areas by sport type

	Sport	N	Mean	Std. Deviation	Sig.
Bodily	Individual	72	10.50	8.619	
	Team	33	5.82	3.206	.001*
	Both	60	4.70	1.499	
Existential	Individual	72	8.46	8.370	
	Team	33	8.18	3.432	.445
	Both	60	6.85	2.169	
Interpersonal	Individual	72	10.58	8.682	
	Team	33	5.91	1.958	.001*
	Both	60	6.35	1.921	
Intrapersonal	Individual	72	8.63	8.364	
	Team	33	5.82	1.424	.002*
	Both	60	4.45	1.171	
Logical	Individual	72	8.83	8.023	
	Team	33	5.73	1.989	.001*
	Both	60	5.30	2.612	
Musical	Individual	72	11.29	6.931	
	Team	33	8.18	4.216	.002*
	Both	60	10.90	5.605	
Nature	Individual	72	9.13	7,593	
	Team	33	5.91	2.006	.048*
	Both	60	7.65	3.626	
Verbal	Individual	72	12.67	6.697	
	Team	33	13.27	3.994	.431
	Both	60	12.85	4.902	
Visual	Individual	72	10.83	7.375	
	Team	33	9.18	3.770	.329
	Both	60	9.50	4.200	

In Table 4, ANOVA results according to sport type showed that there were significant differences in the areas of physical, interpersonal, intrapersonal, logical, musical, and naturalistic intelligence.

The fact that multiple intelligences differ according to the type of sport shows that teachers who do individual sports are more prone to existential and visual intelligence.

Table 5. Independent samples t-test for having a physical education and sports teacher family member and multiple intelligences comparison

	Physical Education and Sport Teacher Family Member	N	Mean	Std. Deviation	t	Sig.
Bodily	No	126	7.36	6.098	-.062	.951
	Yes	42	7.43	7.581		
Existential	No	126	7.17	5.253	-2.480	.014*
	Yes	42	9.71	7.100		
Interpersonal	No	126	7.95	5.817	-.234	.815
	Yes	42	8.21	7.527		
Intrapersonal	No	126	6.05	5.217	-1.673	.004*
	Yes	42	7.79	7.400		
Logical	No	126	6.50	5.417	-1.387	.167
	Yes	42	7.93	6.773		
Musical	No	126	11.00	6.281	1.037	.301
	Yes	42	9.86	5.875		
Nature	No	126	8.00	5.726	.143	.887
	Yes	42	7.86	5.285		
Verbal	No	126	13.29	5.638	1.369	.173
	Yes	42	11.93	5.335		
Visual	No	126	9.57	5.797	-1.978	.042*
	Yes	42	11.57	5.283		

Table 5 illustrates the T-test results related to becoming a physical education and sports teacher in the family. According to these results, it was determined that there was a differentiation in the fields of existentialist, intrapersonal, and visual intelligence. Accordingly, we can say that the existential, social, and visual intelligence field scores of the teachers who have physical education and sports teachers in their families are higher than the other teachers.

DISCUSSION

One of the main aims of this study is to compare the multiple intelligence areas of physical education and sports teachers according to gender, school type, sport type, and whether there is a physical education teacher in the family or not and to reveal whether there is any difference in intelligence areas. Most of the studies were on applying multiple intelligences in teaching environments and were conducted with students studying in teaching departments. The data obtained from the multiple intelligences scale were collected to express each intelligence domain. The findings showed that all pre-service teachers' scores on the multiple intelligence subscales were moderate. Working with a sample of pre-service teachers, Yenice and Aktamış (2010) as well as Durmaz and Özyıldırım (2005) both arrived at comparable conclusions. Although the teachers scored moderately in the intelligence domains, their weakest areas were the intrapersonal and logical domains.

The findings of the correlation between gender and multiple intelligences demonstrate that female educators exhibit a greater inclination towards musical intelligence compared to their male peers. There was a significant difference in favour of female teachers in the field of musical-rhythmic intelligence that gender affects intelligence areas, as stated by Gardner (1983). This result aligns with the conclusions of Looi (2005), Ahanbor and Sadighi (2014), Çeliköz (2017) and Sahay (2019), Erdem and Keklik (2020), who found that male participants tend to outperform female participants on certain types of intelligence tests, while female participants tend to exhibit superior performance on others. The underdevelopment of physical education teachers regarding physical intelligence based on gender is attributed to the education system's lack of encouragement towards successful women in physical education and sport, particularly in their tertiary education specialisation. This lack of encouragement results in women having a less favourable attitude towards sports and underperformance.

Therefore, girls do not see a future in physical education and sports and lose their motivation towards sports. This phenomenon may be due to the lack of female teachers who are role models for girls in middle and high schools and the fact that girls are in the same class as boys who receive more constructive feedback. This phenomenon is rarely, if ever, observed in sex-segregated systems concerning the cultural structure. The literature reviewed in this study provides us with some explanation as to the differences between the genders in their preferences for physical education and sports.

Although we initially hypothesized a potential link between multiple intelligence fields and graduation from different types of schools, our findings demonstrate no significant correlation between multiple intelligence and type of school. This result aligns with Ersoy and Malkoç's (2021) study on music teachers. We analyzed the predisposition to high school types and multiple intelligence fields to test our hypothesis using the MANOVA test. Data gathered from physical education teachers revealed that anatolian or science high school graduates had lower inclinations in several areas of intelligence than other teachers. Although this situation is fascinating, it can be

attributed to the fact that the education in anatolian high schools is multifaceted. When examining the literature on physical education and sports students and the secondary education institutions they attend (Karademir et al., 2010; Kayisoglu et al., 2014), it is notable that, despite varying rates, the majority of students tend to be graduates from general state high schools. In their study, Akkaya and Memnun (2015) showed that the mean scores of prospective elementary mathematics teachers related to only bodily-kinesthetic intelligence areas among multiple intelligence areas differed significantly according to the high school types they graduated from. Yenice and Aktamış (2010) identified variations in musical-rhythmic intelligence among Anatolian high school graduates in their research with potential primary school teachers. In their study, Güllü and Tekin (2009) supported the finding that we wanted to reach in the study but could not determine due to the lack of sports high schools in TRNC by determining that the physical-kinesthetic intelligence of sports high school graduates was higher than other areas. The areas of intelligence of students graduating from different types of schools may develop differently according to the education they receive, so the intelligence area to which they are predisposed will change accordingly. In this case, analyzing the types of upper secondary schools may give more clues as to the reasons for the differentiation.

ANOVA analysis has been the subject of whether intelligence areas of physical education teachers differ according to sports branches. Results revealed a significant difference in physical/bodily, interpersonal, intrapersonal, logical, natural, and musical intelligence domains. There was no significant difference in verbal, existential, and visual intelligence. It was found that the multiple intelligence areas were significantly different according to the type of sport; teachers who do individual sports have higher internal and physical intelligence scores than those who participate in team sports.

Sevinç and Şıktar (2016) investigated the relationship between intelligence and different sports branches, including swimming, badminton, taekwondo, and soccer. The highest scores were obtained in personal intelligence in football and badminton and logical intelligence in swimming and taekwondo. Nikolaenko and Kolosova (2020) investigated team and individual athletes between the ages of 12-15; while social intelligence areas of judo and wrestling players were higher, physical kinesthetic intelligence areas of football and basketball players were higher. Şentürk and Yazıcı (2020) found that the verbal, logical, and visual intelligence scores of judo athletes were the highest, while musical and intrapersonal intelligence were the highest in basketball players. In this case, it can be said that there may be a relationship between the type and practice of the sport and the difference in intelligence areas. It can be noted that physical and social intelligence levels are positively affected in individuals who do sports. It is thought that it will be helpful to benefit from sports activities to increase physical intelligence.

The t-test results examine whether having a teacher in the family significantly affects multiple intelligences. A statistically significant difference was found between those who had another physical education teacher in their family and those who did not in the areas of existential, intrapersonal, and visual intelligence. Since no study examined the relationship between being a

teacher in the family and the intelligence field to support our findings, a negative or positive interpretation could not be made. However, having a physical education teacher in the family ensures that children are interested and talented in physical education and sports. Although different areas of intelligence are dominant in every person, the development of these areas also depends on some variables. Armstrong (2006) states that environmental factors create advantages or disadvantages in intelligence development. Instead of classical teaching, it is left to the learning in which the students act with their talent, skill, and intelligence. The fact that it has an advanced structure in all dimensions in all areas of education and training requires questioning and raising the teacher's qualifications, which has the most critical role in this process when doing his profession (Hamari et al., 2016).

CONCLUSIONS

The apparent detection of factors affecting multiple intelligence areas will effectively guide students and accurately update educational methods. Those who carry out teaching should teach subjects with multiple intelligence adaptations (Kezar, 2001). The fact that multiple intelligence areas affect individuals' behavior and approach patterns reveals the importance of planning the teaching process by considering individual differences and the importance of intelligence areas used by teachers.

In this study, physical education and sports teachers working in TRNC aimed to determine multiple intelligence areas and whether some variables have a meaningful relationship. The study's findings demonstrate that teachers achieved advanced scores on the multiple intelligence subscales, with their weakest areas being the interpersonal and logical domains. Given that teaching relies heavily on communication and problem-solving, the study's findings indicate lower scores in the interpersonal and logical fields and higher scores in the interpersonal/linguistic domain. This situation raises concerns for teacher training programs, and intervention programs should be developed to enhance this domain. Therefore, faculties of education must integrate current research findings (including those of the present study) to improve the quality of teacher training programs. Ultimately, the quality of future education in the country will rely on the excellence of teacher education. Results indicated a significant difference between teachers in musical intelligence by gender. In this field of intelligence, the predispositions of female teachers were higher. A certain rhythm and harmony accompany movements that require skill. Women's sense of rhythm may develop more than men's, leading to higher musical/rhythmic intelligence. As a result of the analyses for another sub-problem, it was concluded that physical education teachers who graduated from anatolian or science high schools were more disadvantaged in many areas of intelligence than other teachers. The data collected from teachers showed that teachers who do individual sports are more prone to existential and visual intelligence than others. Still, their tendency toward inner intelligence is lower than that of other teachers.

With the idea that having a teacher in the family may differ in the tendency towards the fields of intelligence, the scale scores of individuals in multiple intelligence fields and whether they are teachers in their families were analyzed. The results are that a teacher's presence in the family leads to meaningful differentiation in logical, musical, natural, bodily, existential, intrapersonal, and interpersonal intelligence. Future studies in this field can contribute to the education system by illuminating that the types of high school graduates lead to a difference in the multiple intelligence fields of existing teachers. The apparent detection of factors affecting multiple intelligence areas will effectively guide students and make accurate updates to the education system. It was demonstrated in this study that sporting activities carried out outside of physical education make a meaningful difference in multiple intelligence areas. Future studies will reveal the mechanism of influence of the types of sports operating on multiple intelligence fields, enabling athletes to develop more versatily. In this way, students, teachers, and athletes can develop themselves and their students more effectively.

Although the multiple intelligence theory is familiar, applying it in kindergartens, high schools, and universities would be helpful. Accordingly, it could be a starting point for further research into using multiple intelligences in teaching in schools, high schools, and universities. Sahay (2019) stated that multiple intelligence is also a meaningful contributor to teacher competence. Knowing the types of our multiple intelligences, our interests, and our and students' dominant intelligence styles adapts our teaching techniques so that students learn in the most valuable ways. Identifying the areas of intelligence of the teachers who raised future generations and presenting them in these areas will ensure that they are professionally successful. If a nation desires high education standards, teacher competencies should be developed under a specified professional development portfolio identified by proper needs analysis (Lakshminarayanan et al., 2016). It should be noted that intelligence and intelligence fields are determining factors in the development of individuals in all aspects. As Robinson (2009) points out, we must promote the importance of developing each individual's ability and understand that this is expressed differently in each individual.

Although there have been numerous results on applying multiple intelligence in educational settings, more studies are needed to consolidate the findings related to teachers and pre-service teachers and translate this knowledge into practice.

RECOMMENDATIONS

This study has some limitations due to pandemic conditions. Firstly, it cannot establish any causal relationships as a non-experimental study. Secondly, only self-report measures were used, which may not accurately represent functional intelligence domains. It may be more informative to conduct separate activities for each intelligence domain. Thirdly, the sample was comprised solely of TRNC teachers. Future research should utilize a larger sample to enhance the generalizability of the findings.

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Extended longitudinal studies involving teachers could offer in-depth insights into potential adaptations in multiple intelligence profiles. For this reason, the following recommendations are presented on some issues. Teachers should realize their multiple intelligences and use them in teaching. Teachers should know the intelligence areas of their students and give them equal importance. Teachers must use multiple intelligence theories in lesson plans. It is essential to inform teachers about multiple intelligences. Future studies should examine the issue with larger samples. Studies in education, sports science, multiple intelligences, or related fields may focus on revealing the reasons for the differences. Finally, in the future, the hypotheses examined in this study can be re-examined with different tools, methods, examples, and possibilities, some of which have not been investigated before.

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Ethical Approval

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The Effect of Adapted Physical Activities on an Individual with Special Need's Turn-Taking Skills

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Abstract

This study adopts a qualitative approach and uses a case study design to examine the potential benefits of Adapted Physical Activities (APA) in improving turn-taking skills in children diagnosed with Autism Spectrum Disorder (ASD). A 12-year-old female participant with moderate intellectual disability participated in a 12-week APA training program. Researchers conducted one-hour interviews with his family and three teachers to gain in-depth information about his experiences and perceptions. Interview data transcribed with participants' consent showed that APA contributed to a potential improvement in skills vital to social and academic abilities, including turn-taking and waiting. As a result, the findings obtained from this study showed that APA positively contributes to taking turns and waiting, which are of great importance in interpersonal interaction, especially in terms of communication rhythms and mutual exchanges. In this context, educators can enhance the quality of life for individuals with special needs in educational settings through UFA.

Keywords: Adaptive physical activity, Turn-taking skills, Autism spectrum disorder

INTRODUCTION

Social skills are determinative in fostering positive interpersonal relationships, allowing individuals to establish effective social interactions and avoid unacceptable behaviours. Examples of Social Skills include helping, initiating relationships, requesting help, giving compliments, and using expressions like “please” or “thank you”. The acquisition of these skills usually occurs through observing others, trial and error, and guidance from experienced individuals and requires a continual learning process (Gresham & Elliot, 1990).

Social skills denote a series of verbal and non-verbal abilities used for interpersonal interaction and communication. These skills are crucial for establishing and maintaining positive relationships and adjusting to the environment. Acquiring social skills is generally shaped by experiences gained from interactions with parents, family members, teachers, friends, and the general community. Exhibiting acceptable social behaviours aids an individual's acceptance within society. Furthermore, having well-developed social skills supports individuals with special needs to establish healthy and positive peer relationships, succeed in school, and explore adult roles (such as worker, coworker, family member, and community member).

Typically, children exhibiting typical developmental patterns acquire social skills during their maturation, whereas children with exceptional needs tend to exhibit comparatively slower advancement in this domain. Social skills deficiency in children with special needs often results from cognitive impairments and a lack of opportunities and education. Teachers, parents, and family members should support these children in practising and enhancing social skills, providing opportunities for their application. This support and practice will increase children's social interactions and participation, aiding them to become active community members. Social skills training is a significant need for individuals with complex special needs (Liber et al., 2008; Zanolli et al., 1996).

Students with special needs may struggle to interact with their peers, showing normal development. These students are generally at risk of social skills deficiency (Greenspan & Granfield, 1992; Harrell & Kamps, 1997; Monchy et al., 2004; Scheepstra et al., 1999). This often results from a lack of capacity to learn the necessary social skills or the exhibition of adverse behaviours that hinder relationship building. Social skills lead to difficulties establishing social relationships, resulting in students with less or lower-quality social experiences needing more social skills (King et al., 1997; Spence et al., 1999).

For instance, many children have been found to struggle with waiting, sharing, and turn-taking skills (Vygotsky, 1978). It has been observed that children with autism struggle with taking turns and do not understand the importance of turn-taking in games or rule-based activities (Razhiyah, 2008). This is also true for children with Attention Deficit Hyperactivity Disorder (ADHD), who may act impulsively without thinking, causing them to transition from one activity to another and

unable to wait for their turn (Barkley, 2015). Teaching and appropriately applying this skill allows children to meet their basic human needs and actively participate in classroom and community activities (DeLuzio & Girolametto, 2011). In this context, children with learning difficulties need help not only with immediate attention but also understanding, responding, and taking turns during a conversation (Brown et al., 2008).

Turn-taking is essential to social skills and plays a significant role in children's communication development. As children acquire the skill of turn-taking, they understand the basic rhythm of communication and mutual exchanges among people. Turn-taking is an essential skill that children need to develop to participate in effective social communication. Children who lack this skill may interrupt the speaker or fail to listen effectively. Children who struggle with taking turns in social settings may also struggle to form friendships in the classroom. In this context, this study aims to examine the changes in the turn-taking skill of a 12-year-old individual diagnosed with "Autism Spectrum Disorder (ASD)" through adapted physical activities (APA).

METHODS

Research Model

Turn-taking is essential to social skills and plays a significant role in children's communication. This qualitative study adopts a case study design to understand and elucidate individuals' perceptions, experiences, and perspectives by implementing a detailed and in-depth data collection process (Patton, 2023). The most distinctive feature of a case study is that it performs a thorough analysis by focusing on a particular phenomenon, case, individual, or group (Yin, 2014). The research focuses on determining the changes in the Turn-taking skills of a girl with ASD who participated in adaptive physical activity training for 12 weeks, with two sessions per week, each lasting 60 minutes.

The research process used qualitative methodology and a semi-structured interview technique. This technique, which allows participants to express their experiences and meanings, has been preferred for a more in-depth understanding (Braun & Clarke, 2013). The interviews focused on the participation of individuals with ASD in APA activities (e.g., sports, physical games, and exercises) and the impact of these activities on their Turn-taking skills.

Research Group

This study aims to test the thesis that physical activity may help improve the Turn-taking skills of individuals with ASD (Bremer et al., 2015). Participants' thoughts on the effects of APA on the Turn-taking skills of these activities were also collected. A mother, a father, and three different teachers and interviews were involved in the study. Each interview was conducted in an

environment comfortable for the participant and lasted about an hour. Interviews were recorded with the participant's consent and were later transcribed.

The child participating in the research is a 12-year-old child selected using a purposive sampling method diagnosed with ASD. The collected data were analyzed using the thematic analysis method (Liamputtong, 2009). This process starts with identified themes and continues with identifying new themes (Merriam, 2015). The participating child attended a 12-week adaptive physical activity program with two sessions per week, each lasting 60 minutes.

Table 1. Demographic information and characteristics of a child diagnosed with ASD

Information	Details
Age	12
Gender	Girl
Disability Percentage	50%
Disability Type	Autism Spectrum Disorder
Behavioural Characteristics	Difficulty in social interaction, repetitive behaviours, focus and attention problems
Communication Skills	Advanced vocabulary but struggles in reciprocal conversations
Physical Skills	Delay in motor skills, balance problems
Turn-taking skills	Difficulty in taking a turn

Table 1 provides demographic information and characteristics of a 12-year-old child diagnosed with ASD. Among the child's behavioural features are difficulties in social interaction, repetitive behaviours, and problems with focus and attention. These are characteristic traits associated with ASD, often impacting education, social interaction, and life skills. The child's communication skills have also been highlighted: Despite having an advanced vocabulary, the child struggles with reciprocal conversations. This suggests that while the child faces various difficulties in language and communication skills, there are also areas of strength.

In the context of physical skills, it has been noted that the child experiences a delay in motor skills and has balance problems. These observations indicate potential challenges the child might face regarding physical activities and applying specific skills. Lastly, it is noted that the child experiences difficulty with taking turn skills. This aligns with the everyday struggle individuals with ASD face in learning social skills and rules of social interaction. Taking turns requires discipline, patience, and social interaction skills, suggesting this child needs support.

Table 2. Demographic characteristics and years of experience of participants

Participant's Role	Age	Relationship with Child	Years of Experience (for Teachers)
Mother	43	Mother	-
Father	45	Father	-
Physical Education Teacher	30	Teacher	8 years
Special Education Teacher	35	Teacher	13 years
Art Teacher	32	Teacher	10 years

Table 2 presents the study participants' demographic characteristics and years of experience. The study involved a mother, a father, and three different teachers. The ages of the mother and father are 43 and 45, respectively. The Physical Education Teacher is 30 years old and has eight years of teaching experience. The Special Education Teacher is 35 years old with 13 years of teaching experience, while the Art Teacher is 32 years old with 10 years of teaching experience.

The participants' years of experience and ages may influence the quality and accuracy of their observations and assessments. In particular, the teachers' years of experience can significantly affect their ability to evaluate the impact of adapted physical activities. The teachers' experiences can enhance their ability to interpret and evaluate practices. Furthermore, the participation of the mother and father also provides an assessment from a family perspective. Compared to the teachers' views, this offers a more comprehensive and diversified perspective on the effects of adapted physical activities. On the other hand, this table also displays each teacher's relationship with the child, another factor affecting their observations and interpretations. Because of their direct interactions with students, educators may be best positioned to observe changes in a student's behaviours and skills.

Ethical Approval

All subjects gave informed consent for inclusion before participating in the study. The Declaration of Helsinki conducted the study, and the protocol was approved by the Ethics Committee of Istanbul Aydın University no. 2022/22 from 22.08.2022

Data Collection Tools

During the research process, the child and participants' demographic information and parent views on the impact of APA on the child were collected through a qualitative interview. This interview uses open-ended questions to identify experiences, knowledge, attitudes, and emotions (Fraenkel et al., 2012; Hatch, 2002; Patton, 2023).

Collection of Data

Data for this study was collected through semi-structured interviews with each participant. Each interview session ranged in duration between 45 minutes and 1 hour. This allowed ample time to delve into the experiences and perceptions of the participants, ensuring a comprehensive understanding of their interactions with APA and the subsequent influence on their turn-taking abilities. The extended duration of the interviews also allowed participants to articulate their thoughts, feelings, and experiences in detail, offering richer insights for the study.

Analysis of Data

In this qualitative research study, semi-structured interviews were employed to explore the experiences of individuals with ASD as they engaged in APA. The primary objective was to discern how these activities influenced their turn-taking abilities. Following data collection, the

thematic analysis approach was adopted for interpretation, as delineated by Braun & Clarke (2006). The initial step involved transcribing each interview verbatim, after which the transcriptions were reviewed multiple times to grasp the narratives' depth and nuances.

The analysis began by generating initial codes highlighting salient features across the dataset. These preliminary codes served as indicators of emerging patterns, subsequently grouped to form potential themes. An exhaustive cross-reference of these tentative themes against the entire dataset ensured their authenticity and relevance. Specific themes were merged, bifurcated, or discarded throughout this iterative process to align more closely with the data's narrative. Upon finalization of the themes, each was further refined to ensure precision and clarity in its representation. In the resulting report, findings were meticulously tied back to the foundational research question, grounding them within existing literature and the study's theoretical framework. Direct quotes from participants were integrated to bolster and illustrate the identified themes.

RESULTS

Table 3. APA program, observations of the educator providing APA training, and the child's progress

Week	Activity 1 - Observations and Progress	Activity 2 - Observations and Progress	Behavioural Problems and Situations
1	Running and Stretching: The student needed help understanding the new program and activities on the first day. However, this did not dampen their energy and enthusiasm.	Ball Dribbling: On the second day, we observed some progress in our dribbling activity.	The child was observed to have difficulty adhering to classroom rules.
2	Jumping and Bouncing: The student's natural energy and enthusiasm came to the forefront with jumping and bouncing activities.	Team Games: It took a little time for them to adapt to team games. However, with time and patient work, they understood the importance of cooperation and progressed in this area.	They also needed help participating in team tasks and group activities.
3	Balanced Walking: The balanced walking activity enhanced the student's attention and concentration skills.	Ball Throwing: We achieved impressive success in our work on the ball-throwing activity.	Weaknesses in their attention, concentration and focus on a particular topic became apparent.
4	Rope Skipping: Rope skipping was challenging for the student initially. However, they did not give up and made significant progress over time.	Ball Dribbling: We continued to work on ball dribbling activity and further developed their skills in this area.	They faced challenges learning new skills.
5	Fun Course: The student participated in the fun course activity with great joy and energy.	Team Games: Progress in team games and the ability to cooperate also improved their interactions with other participants and developed their social skills.	They struggled in situations that required a particular order and discipline in the classroom, especially lining up and waiting their turn.

Table 3 (Continued). APA program, observations of the educator providing APA training, and the child's progress

Week	Activity 1 - Observations and Progress	Activity 2 - Observations and Progress	Behavioural Problems and Situations
6	Running and Stretching: The student efficiently carried out stretching and running activities.	Jumping and Bouncing: Our work on the jumping and bouncing activity improved their physical skills.	Their short attention span and easy boredom negatively affected their efficiency in activities.
7	Ball Throwing: The student's skill and abilities in ball-throwing activity developed over time.	Balanced Walking: We focused on improving attention and focus skills in the balanced walking activity.	They continued to struggle with waiting their turn.
8	Rope Skipping: The student's rope-skipping ability improved further with continuous practice.	Fun Course: They exhibited an energetic and joyful performance in the fun course.	They still had difficulties acquiring new skills and developing these skills.
9	Ball Dribbling: Ball dribbling was another area where the student consistently improved.	Running and Stretching: We achieved significant success in our work on stretching and running activities.	They lost emotional control during activities where their energy was high.
10	Team Games: Team games provided another opportunity to develop the student's cooperation skills.	Jumping and Bouncing: The progress in the jumping and bouncing activity helped improve their physical abilities and coordination.	-
11	Balanced Walking: Work continued to improve the student's attention and concentration skills in balanced walking activity.	Rope Skipping: In our work on the rope skipping skill, we further improved their coordination and attention skills.	-
12	Fun Course: Lastly, the student exhibited an energetic and enjoyable performance in the fun course.	Ball Throwing and Team Games: Their progress in ball throwing and team games was quite noticeable throughout the last week.	-

Throughout the 12-week APA program, we can observe significant overall progress made by the child. The initial weeks were marked by difficulties understanding new activities and adapting to teamwork. However, this did not curtail the child's energy and enthusiasm. The child has demonstrated marked enthusiasm and skill in energetic activities, such as jumping and hopping. In addition, the child has made significant strides over time in activities that require focus and coordination, such as balance walking and skipping rope.

However, we also observed various behavioural challenges the child experienced throughout the program. These include adhering to rules within the classroom, dealing with situations requiring a particular order and discipline, difficulties concentrating and focusing on a particular topic, challenges in learning new skills and losing emotional control during high-energy activities. These behavioural challenges could have influenced the child's overall progress in the program. Toward the end of the program, we can observe the child attaining more excellent skills and experience in various areas. Notably, progress in activities such as team games and ball throwing has contributed to developing the child's social and physical abilities.

In conclusion, this program has generally enhanced the child's physical and social skills, proving beneficial for the child's education and overall development. However, the behavioural challenges experienced throughout the program should be considered for future programs and training. Overcoming such challenges and fostering the child's development in this area may necessitate additional support and interventions.

Table 4. Evaluation of APA's turn-taking skills of the individual with ASD from changes in the child's turn-taking skills, causes of the changes, and impact of APA

Participant's Name and Position	Changes in The Child's Turn-taking skills	Causes of the Changes	Impact of Adapted Physical Activities
Physical Education Teacher	"The student's Turn-taking skills have noticeably improved. The student, who previously had difficulty understanding and implementing this process, can now take their turn in a more disciplined and orderly manner. This has increased student interaction with their environment and overall sense of discipline."	This change is a direct result of the APA we implemented. These activities improved the student's physical coordination and perceptual abilities and increased their ability to adhere to a particular order and discipline."	"The APA had a very positive impact on the student. It increased the student's self-confidence and improved their ability to act disciplined. In addition, such activities improved the student's overall physical health and endurance."
Special Education Teacher	"The student's ability to queue has shown significant progress. The student, who previously struggled to wait their turn and participate in activities, can now wait their turn and join the activity more successfully and harmoniously."	"These changes are seen as a direct result of the APA implemented. These activities provided a suitable environment for the student to learn how to queue and wait."	"The APA noticeably improved the student's Taking Turns skill. Moreover, these activities strengthened students' self-control and increased their self-confidence."
Art Teacher	"There is a noticeable improvement in the student's Turn-taking skills. The student, who previously exhibited a hasty and careless attitude, has become more conscious. They can patiently wait their turn and interact better with other students during this period."	"I attribute this positive change in my student to the APA we implemented. These activities improved my student Turn-taking skills and increased their social interaction abilities."	"Physical activities significantly enhanced the student's self-control and social interaction abilities. These activities helped students improve their Turn-taking skills and become more careful and patient."
Father	"My daughter can now wait her turn more patiently and organized. She used to be a child who quickly got bored and lost focus, but now she has become more patient and orderly."	"I attribute this positive change in my daughter to the adapted physical activities we implemented. These activities improved my son's Turn-taking skills and helped him act more orderly and organized."	"Physical activities significantly increased my daughter's patience and organizational skills. These activities helped my son improve his Turn-taking skills and become more patient and organized."
Mother	"I noticed a significant improvement in my child's Turn-taking skills. They previously needed help understanding and practising taking turns and waiting. However, now they can wait their turn, and I see they understand this situation better."	"I associate this improvement in my child with the adapted physical activities we implemented. Through these activities, my child improved their taking turns skill and increased their understanding."	"APA had a positive impact on my child. They improved their Turn-taking skills and increased their understanding ability. In addition, these activities positively affected my child's overall physical development."

Table 5. Evaluation of APA's turn-taking skills of the individual with ASD from social and academic impacts, continuation of APA and suggestions or additions

Participant's Name and Position	Social and Academic Impacts	Continuation of Adapted Physical Activities	Suggestions or Additions
Physical Education Teacher	"Physical activities improved students' ability to wait in line and overall social skills. The student became successful by improving their attention span and focus. Their ability to communicate and work with other students also increased."	"Given the positive impact of these activities on the student, it is important that such practices continue. Regular and continuous activities will reinforce the skills the student has acquired and assist in gaining new ones."	"It is recommended further to investigate the impact of APA on different skill groups. We need more information on how these activities can improve social and academic skills. Also, more training and resources should be provided for implementing and assessing these activities."
Special Education Teacher	"As a result of APA, the student's social skills also improved. In addition, there was an increase in the attention span and learning efficiency, which positively affected academic success."	"Considering these observed positive effects, it is thought that APA should continue."	"To further improve the student's ability to wait in line, it is suggested that more activities requiring waiting in line be included in the program. Thus, the student can better learn to wait and share the line with others."
Art Teacher	"The impact of these activities on social skills is significant. I observed an increase in my student's attention span, and generally, they showed better social interaction."	"Considering the positive impact of the physical activities implemented on my student, I support continuing such activities. They should be regularly implemented to reinforce the skills my student has acquired and gain new skills."	"I suggest expanding the implemented APA so that more students can benefit. This provides an opportunity to assess the impact of these activities on a wider student population and for more students to experience these benefits."
Father	"The impact of these activities on social and academic skills is significant. My daughter's social skills showed noticeable progress, improving her academic performance. Being more patient and regular helped her focus on a topic for extended periods."	"Considering the positive impact of the physical activities implemented on my son, I support continuing such activities. They should be regularly implemented to reinforce the skills my daughter has acquired and gain new skills."	"I do not have any specific suggestions for now, but providing all the necessary support and resources for my son to benefit from these activities is important."
Mother	"I see that adapted physical activities not only improved line-up skills but also social skills. My child can interact more socially, and I see improved academic performance."	"Considering the positive impacts of the adapted physical activities on my child, I support continuing such activities. These activities will continuously contribute to my child's development."	"I do not have any additional suggestions for now. However, I am open to any developments and innovations that could further enhance the effects of these adapted physical activities and improve our children's development."

In Tables (5, 6) above, we can observe the variations in the participants' turn-taking skills, the influence of adapted physical activities, social and academic impacts, the continuation of APA, and their suggestions. The perspectives and responses of each participant are presented in the same table.

According to the information presented in various charts, it has been observed that the APA program has a significant and positive impact on a student. The student has shown marked improvements in Turn-taking skills, discipline, social interaction, and overall academic performance. These effects were corroborated by the student's educators (Physical Education and Sports Teacher, Special Education Teacher, and Art Teacher) and family (father and mother).

Both educators and families attributed these developments directly to the APA program. The APA enhanced the student's physical coordination and perception abilities and increased their skills in adhering to a particular order and discipline. Furthermore, it was noted that this program positively influenced the student's social skills and academic performance. However, the educators and the student's family agreed that such activities should continue. It was expressed that continuity would reinforce the skills the student has acquired and assist in gaining new ones. In the suggestions and additions section, proposals emerged, such as implementing the APA on a broader student population and incorporating more activities into the program to enhance social skills, especially Taking Turns and sharing the queue with others.

In light of these findings, it is evident that the APA has a significant and positive impact, particularly on social skills and disciplined behaviour. Expanding and continuing such practices can aid students in developing these skills. Nevertheless, it was noted that more research is needed to evaluate the effectiveness and application of such programs. There was also a consensus that more training and resources must be provided for these programs to be effectively implemented.

DISCUSSION AND CONCLUSION

Firstly, upon examining the existing literature regarding APA, there is a consensus that these activities significantly influence children's physical and cognitive abilities. Particularly for children requiring special education, these activities have been reported to impact overall child development and self-confidence positively (Bremer & Lloyd, 2016).

Upon comparing the impact of APA on turn-taking skills with existing literature, it is discernible that these observations are congruent with prevailing findings. APA has been shown to promote the development of disciplined behaviour among students. This coincides with the observations of the Physical Education and Sports Teacher and other teachers. Additionally, ample evidence is found in the literature that APA enhances students' social skills (Breslin & Rudisill, 2011;

Pellegrini & Smith, 1998), aligning with the Art Teacher's observations, who reported improved interaction of the student with others.

Specifically looking at the case of students requiring special education, numerous studies indicate that APA is an effective tool for enhancing these students' abilities (Block & Obrusnikova, 2007; Murphy & Carbone, 2008). This is consistent with the observations of the father and mother, who reported noticeable improvements in their children's turn-taking abilities. In summarizing the discourse, the insights from the participants resonate with existing scholarly works, thereby suggesting that the application of APA enhances students' proficiency in the exchange of conversational turns. This strongly supports that APA can be an effective tool for improving students' social and academic skills.

The current literature on APA supports that these activities can enhance the various skills of students. In particular, these skills include significant abilities such as physical coordination, perception abilities, and adherence to a particular order (Block, 2007; Wilson, 2014). This research supports the results mentioned in the reports of teachers and parents: the implemented APA has helped the students develop these skills. There are research studies on the impact of APA on social interaction abilities. It has been found to play a significant role in developing social skills and improving the student's overall academic performance (Murphy & Carbone, 2008). These findings support the reports of teachers and parents that APA is an essential tool for improving students' social interaction skills and enhancing academic performance.

Mainly focusing on social skills like taking turns and waiting, many studies support that APA effectively improves these skills (Lang et al., 2010). Teachers and parents report that students have become more disciplined and orderly through these activities, improved their turn-taking skills, and increased their comprehension abilities. As stated in the literature (Stodden et al., 2008), such activities can enhance children's general physical health and resilience. This is important for directing children towards a healthier lifestyle and developing physical activity habits. The existing literature shows that APA positively impacts individuals requiring special education (McNamara & Haegele, 2021). For example, the experiences mentioned above indicate that students' social skills, discipline and self-control abilities, turn-taking and comprehension abilities have improved thanks to APA. These skills significantly improve the student's academic success and general quality of life (Must, 2002). Regarding boosting the student's self-confidence, the literature states that adapted physical activities are essential (Goodway & Branta, 2003). Seeing the student develop their skills during physical activities and thereby increase their self-confidence supports this idea.

Additionally, developing the student's ability to act disciplined is consistent with the potential of adapted physical activities to teach order and discipline. Physical activities, especially team sports, can teach students social and individual skills such as turn-taking, patience, and cooperation (Block & Obrusnikova, 2007). The observations that APA has improved the child's overall physical health

and resilience align with the current literature. Physical activity can significantly affect overall health and physical fitness (Strong et al., 2005). Improvements in the physical health of an individual with special needs can positively affect academic performance and overall quality of life. As expressed by the participants, the positive effects of APA on children have been widely accepted in the literature. APA effectively enhances students' fundamental skills, such as turn-taking, waiting their turn, and social interaction (Block, 1994; Obrusnikova & Cavalier, 2011). Regularly implementing these activities can help students reinforce these skills and acquire new ones (Sherrill, 2004).

The unanimous agreement among the participants that APA should continue illustrates the importance of these activities in child development. Various studies also support this. For instance, works by Bailey (2006) and Ketcheson et al., (2017) demonstrate that APA enhances children's social, physical, and cognitive skills and improves their overall quality of life. This makes the demand for the continuity of APA understandable. However, access to the resources and specialists necessary for these activities' regular and continuous implementation can sometimes be a barrier. Therefore, governments and educational institutions should support and expand these programs and provide the training and resources necessary to implement these activities (Goodway & Branta, 2003).

In conclusion, the role of Adapted Physical Activities (APA) in improving children's social and academic skills is indisputable. The continuity of these activities is fundamental for students to reinforce these skills and acquire new ones. Maintaining APA is the common point of literature and participant opinions in this context. Feedback from parents and teachers about the impact of APA on students is significant and valuable. The development of turn-taking and waiting skills provides essential insights into the potential of APA to enhance children's social and academic skills.

As stated in the first recommendation, the need for further investigation of the impact of APA on different skill groups is widely expressed in the literature (Block, 2007; Bremer & Lloyd, 2016). The question of how different APAs target different skill groups and how these skill groups can be developed requires extensive and detailed research. Similarly, it has been noted that more information is needed on developing social and academic skills. While literature generally focuses on the impact of APAs on physical skills, recent studies have also increased the effect on social and academic skills (Goodway & Branta, 2003; Ulrich, 2000). However, it is noted that more in-depth and comprehensive research is needed on this issue. In addition to the suggestions, there is a recommendation to include more activities to improve turn-taking and waiting skills in the programs. Studies in this area show that turn-taking and waiting skills can enhance group social interaction and cooperation skills (Bulotsky-Shearer et al., 2012). Therefore, incorporating activities that develop such skills into programs can allow students to practice more in this area. Lastly, the need to reach more students with APAs has been highlighted. Literature also indicates that implementing APAs on a broad student audience will help students and educators better

understand the effects of these activities (Block & Obrusnikova, 2007). In short, these recommendations underscore the need to examine APAs from a broader perspective and implement them to benefit more students. More research and practice in this area can help students and educators gain greater awareness and knowledge.

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Ethical Approval

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