

Investigation of the Relationship Between Body Awareness and Physical Activity and Strength Levels of Young Athletes

Genç Sporcuların Vücut Farkındalığı ile Fiziksel Aktivite ve Kuvvet Düzeyleri Arasındaki İlişkinin İncelenmesi

Selim ASAN¹

¹Erzurum Technical University, Sport Science Faculty, Erzurum, Türkiye / selim.asan@erzurum.edu.tr / 0000-0001-6264-1071

Abstract: People can use and accept their bodies at the highest level through body awareness. Someone who is aware of their body and understands its details can see the effects of physical activity on the body. In line with this information, this research aimed to investigate the relationship between body awareness, physical activity, and strength levels of young athletes. Seventy-six male athletes with an average age of 17.30 ± 0.462 , an average body weight of 62.19 ± 6.98 kg, and an average height of 1.73 ± 0.069 cm, and an average BMI of 20.54 ± 1.49 kg.m⁻² participated in the research. As a data collection tool in the study, "Personal Information Form," "Body Awareness Questionnaire (BAQ)," "International Physical Activity Questionnaire Short Form (IPAQ-SF)," "Sitting Medicine Ball Throwing Test," "Hand Grip Strength Test (HGST)" and "Back and Leg Strength Test" was used. The research data were analyzed with the Pearson Correlation Test and One Way ANOVA Test, which are descriptive statistics. As a result, it was determined that as the total physical activity of the individuals increased, their body awareness levels also increased. At the same time, a significant positive correlation ($p < .05$) was found between body awareness level with only dominant hand grip strength and upper extremity strength among five strength measurements. Therefore, talking about a complete relationship between strength and body awareness was impossible.

Keywords: Sports, Body awareness, Physical activity, Muscle strength.

Özet: İnsanların vücudunu en üst düzeyde kullanması ve benimsemesi beden farkındalığı ile mümkündür. Bedenin farkında olan ve detaylarını anlayan biri fiziksel aktivitenin vücut üzerindeki etkilerini görebilmektedir. Bu bilgiler doğrultusunda çalışmanın amacı; genç sporcuların vücut farkındalığı ile fiziksel aktivite ve kuvvet düzeyleri arasındaki ilişkinin incelenmesidir. Araştırmaya yaş ortalaması 17.30 ± 0.462 , vücut ağırlık ortalaması 62.19 ± 6.98 kg., boy uzunluğu ortalaması 1.73 ± 0.069 cm., ve VKİ ortalaması 20.54 ± 1.49 kg.m⁻² olan 76 erkek sporcu katılmıştır. Araştırmada veri toplama aracı olarak; "Kişisel Bilgi Formu," "Vücut Farkındalığı Anketi (VFA)," "Uluslararası Fiziksel Aktivite Anketi Kısa Form (UFAA-KF)," "Oturarak Sağlık Topu Fırlatma Testi," "El Kavrama Kuvvet Testi (EKKT)" ve "Sırt ve Bacak Kuvveti Testi" kullanılmıştır. Çalışma verileri tanımlayıcı istatistiklerden Pearson Korelasyon Testi ve Tek Yönlü ANOVA Testi ile analiz edilmiştir. Sonuç olarak; katılımcıların toplam fiziksel aktivite skoru arttıkça vücut farkındalık düzeylerinin de yükseldiği tespit edilmiştir. Aynı zamanda vücut farkındalık düzeyi ile 5 kuvvet ölçümünden sadece dominant el kavrama kuvveti ve üst ekstremitte kuvveti arasında pozitif yönde anlamlı ($p < .05$) ilişki saptanmıştır. Dolayısıyla kuvvet ve vücut farkındalığı arasında tam anlamı ile bir ilişkiden söz etmek mümkün olmamıştır.

Anahtar Kelimeler: Spor, Vücut farkındalığı, Fiziksel aktivite, Kas kuvveti.

Received: 01.06.2023 / Accepted: 31.08.2023 / Published: 20.10.2023

<https://doi.org/10.22282/tojras.1308696>

Citation: Asan, S. (2023). Investigation of the Relationship Between Body Awareness and Physical Activity and Strength Levels of Young Athletes. *The Online Journal of Recreation and Sports (TOJRAS)*, 12 (4), 502-507.

INTRODUCTION

Physical activity is a concept that has been going on since the existence of human beings and ensures the continuity of life. Any movement that a person can do can be considered physical activity (Aykın, 2018). Physical activity includes various activities such as housework, exercise, school physical work, and sports (Malina et al., 2004). For the human body designed for movement, sedentary life is incompatible with the purpose of creation. Physical activity and exercise support the healthy growth and development of the body (Orhan, 2019; Asan et al., 2021). People became aware of their bodies, understood the details, and identified the effects of physical activity on the body. In addition, exercise and physical activity have become essential concepts in health (Ağırbaş et al., 2021; Turan et al., 2021). Therefore, physical activity is vital in protecting and improving health and preventing diseases caused by inactivity. It is known that regular physical activity has positive effects on many diseases and cancer types (Warburton et al., 2006). Considering the studies conducted in recent years, it has been suggested that people's awareness of their bodies and perception of sensory and physical stimuli can positively improve their quality of life. It also underlined how vital body awareness is for enhancing physical and mental health (Erden et al., 2013; Price & Thompson, 2007).

Body awareness is the subjective and phenomenological aspects of proprioception and interoception which can be changed by cognitive processes such as attention, evaluation, belief, memory, regulation, attitude, and emotion and brought to conscious awareness (Mehling et al., 2009). Body awareness involves paying attention to the body, both actively and inactively. It expresses awareness of sensory input and motor control related to integrating breathing,

movement, coordination, and balance (Gyllensten et al., 2010). In addition, it has been noted that people with higher body awareness have better overall health and feel better emotionally (Gyllensten et al., 2019; Rivest-Gadbois & Boudrias, 2019). Learning how to organize the body during motor learning while executing functional movements is the first step in developing body awareness. The next stage involves the development of elements that impact movement quality, such as speed, distance, coordination, and strength (Özel, 2018). During this process, the interaction between sensory systems, muscle strength, and body structure can directly impact one's consciousness of using their body (Kalkışım et al., 2021). One of the most essential parts of body awareness is using and adopting one's body at the highest level. A person with high body awareness perceives all changes in his/her body and tries to eliminate negative situations through body awareness, individually or with assistance (Miller et al., 1981). According to this information, positive and negative changes in motor skills such as strength, speed, and coordination can be noticed with increased body awareness. Current research mainly concerns obesity, eating disorders, quality of life, and many neurological and psychiatric variables (Koçyiğit et al., 2018; Karabörklü et al., 2022; Ginzburg et al., 2014; Catalan-Matamoros et al., 2011). Body awareness level was also compared with emotional states such as quality of life, depression, and body image (Erden et al., 2013; Pirinççi et al., 2022; Güven & Solmaz, 2022).

Within the researchs, there is a very limited number of studies in the literature examining the relationship between body awareness and strength according to the physical activity level. This study aimed to investigate the relationship

between body awareness and upper and lower extremity strength and physical activity. The study hypothesized that body awareness would increase with increasing physical activity and strength levels in young athletes.

METHODS

Research Group: The research group consisted of healthy male volunteers aged 17-18 years. Participants were required to have no known disease problems and to do recreational sports for at least 1 hour a week. Exclusion criteria were a) not signing the informed consent form, b) having lower or upper extremity disability, c) having pain that prevents sports in the lower and upper extremities and trunk. According to the G*Power analysis, the number of participants required to

Research Model: The research is a correlation study since the relationship between the variables is examined. The relational survey model is designed to determine whether there is a change between two or more variables together or to determine the degree, if any (Karasar, 2016).

participate in the research was determined as 67 athletes with a 95% confidence level, 80% difficulty level, and a 3% acceptable margin of error. To increase the power of the research and prevent possible loss of participants, 76 athletes were included in the research. All participants were informed about the experimental risks, and participants under 18 signed an information agreement for participation in the research after obtaining parental consent. Descriptive information on the participants is given in Table 1.

Table 1. Findings Regarding the Descriptive Information of the Participants

Variables	n	$\bar{X} \pm Sd$	Min/ Max
Age (year)	76	17.30±.462	17- 18
Body weight (kg)	76	62.19± 6.98	47- 84
Height (cm)	76	1.73±.069	1.57- 1.89
BMI (kg.m ⁻²)	76	20.54± 1.49	18.12- 24.02

\bar{X} : Mean, Sd: Standard Deviation, BMI: Body Mass Index, kg: Kilogram, m²: Square meters, Min: Minimum, Max: Maximum, N: The Number of Participants.

When examining Table 1, it was determined that it consisted of 76 male participants with a mean age of 17.30±.462, mean body weight of 62.19±6.98 kg, mean height of 1.73±.069 cm, and a mean BMI of 20.54 ±1.49 kg.m⁻².

Research Procedure: Participants were tested individually in two sessions. In the first session, face-to-face interviews with participants, who fulfilled the research criteria and consented to participate, allowed the researcher to administer the personal information form, body awareness scale, and physical activity scale. A portable scale measured the subjects' weight (kg) and height. BMI was calculated by dividing the weight (in kg) by the square of the height (in meters). Afterward, the participants did a warm-up consisting of jogging. The first session was completed after the warm-up and hand grip strength measurements. Back and leg strength and bilateral upper extremity strength were measured in the second session.

Data Collection Tools: As data collection tools in the research, "Personal Information Form," "Body Awareness Questionnaire (BAQ)," "International Physical Activity Questionnaire Short Form (IPAQ-SF)," "Sitting Medicine Ball Throwing Test," "Hand Grip Strength Test (HGST)" and "Back and Leg Strength Test" were used.

Personal Information Form: The researcher created it to gather descriptive information such as age, height, weight, and BMI.

Body Awareness Questionnaire (BAQ): The Body Awareness Questionnaire (BAQ), developed by Shields et al. (1989), assessed the participants' body awareness. Karaca, (2017) conducted Turkish validity and reliability of the BAQ. The BAQ is a questionnaire used to determine if body composition sensitivity is normal or abnormal. There are 18 statements in the questionnaire, which has 4 Subscale (attention to changes and reactions in the body process, sleep-wake cycle, prediction at the onset of the disease, prediction

of body responses. Each statement was given a rating scale by the participants from 1 to 7, with one denoting "not at all true for me" and seven denoting "completely true for me." Scoring in the survey is done as a general score. The questionnaire has a maximum possible score of 126 and a minimum possible score of 18. According to research, a person's level of body awareness increased with a higher overall questionnaire score. Cronbach's Alpha was calculated as 0.91 to determine internal consistency (Karaca, 2017). In this study, the Body Awareness Questionnaire's Cronbach's Alpha internal consistency coefficient was determined as .87.

International Physical Activity Questionnaire Short Form (IPAQ-SF): The International Physical Activity Questionnaire (IPAQ) Short Form (SF), created by researchers from many countries with support from the World Health Organization and Disease Centers, was used to measure the participant's level of physical activity. International validity and reliability of the questionnaire were conducted by Craig et al. (2003). The Turkish validity and reliability of the questionnaire were conducted by Öztürk (2005). This questionnaire's short form, which asks about time spent walking and engaging in moderate and vigorous activities, is provided. Scores are calculated individually. In the questionnaire, some questions include at least 10 minutes of physical activities done in the last week.

By multiplying the Minute, Day, and MET values from the survey data, a score as "MET-minutes/week" is produced. Multiplying the activity time (minutes) by the number of days yields;

- 3.3 METs for walking,
- 4 METs for moderate-intensity activity,
- 8 METs for vigorous activity.

There are three categories for physical activity levels; Very active (>3000 MET-min/week), Minimally active (600–3000 MET-min/week), and Inactive (600 MET-min/week) (Öztürk, 2005).

Sitting Medicine Ball Throwing Test: The bilateral upper extremity strength of the participants was determined by throwing a 2 kg weight forward as far as possible in the upper extremity abducted at 90°, elbows flexed, back, shoulders, and head in a sitting position against the wall (Borms et al., 2016). The participant was told in this position to maintain head, shoulders, and back contact with the wall and throw the medicine ball straight ahead using the basketball chest pass method (Harris et al., 2011; Cronin & Owen, 2004). After



Figure 1: Medicine Ball Shot (Borms et al., 2016)



Figure 2: Leg Strength



Figure 3: Back Strength (Özer, 2017)

Hand Grip Strength Test: The hand grip strength of the participants was measured with a digital dynamometer (Takei T.K.K. 5401 Grip-D Tokyo, Japan). The participants engaged in it while standing with their arms stretched out and not touching the body. The dynamometer was to be used by each participant three times in a row, three times with each hand, for fewer than three seconds, while being held with as much force as possible. Each trial could be followed by a rest period lasting at least one minute. Kg was used to measure the greatest value (Roberts et al., 2011; Shin & Chang, 2023).

Back and Leg Strength Test: The back and leg strengths of the participants were measured using a digital dynamometer (Takei T.K.K. 5402 Back-D Tokyo, Japan). The participants were asked to put both feet on the dynamometer platform with their knees bent while their arms were stretched, their backs were straight, and their body was slightly bent forward. Afterward, they were asked to pull the dynamometer bar, which they grasped with both hands, vertically using their leg muscles at the highest level (Zorba & Saydın, 2009; Weineck, 2011). The back strength of the participants was calculated by asking them to pull the dynamometer stick they hold with their hands vertically, using their back muscles at the highest level while the legs and arms are tense, the back is straight, and the body is slightly bent forward (Zorba & Saydın, 2009; Weineck, 2011). Participants were asked to do three trials,

three implementation attempts, a 2-minute rest period was given. Participants made four maximum effort shots with 1-minute rest between each shoot. The researcher recorded the appropriate shooting techniques (Borms et al., 2016). Participants were told to adopt the test position with the elbow fully extended and throw the ball directly onto the tape measure to account for changing upper limb lengths (Harris et al., 2011).

with 1-minute rest between each trial. The highest value was recorded in kg.

Data Analysis: Skewness and kurtosis tests were applied to the data obtained from the study to determine whether they were normally distributed. The skewness and kurtosis values of the study were determined as Skewness (-1.182 and .606), Kurtosis (-.761 and 1.349). Since skewness and kurtosis values between +1.5 and -1.5 are accepted as a normal distribution (Tabachnick & Fidell, 2007), the One-Way ANOVA test was used to compare the data, and Pearson Correlation Test was used to determine the relationship between the data. The significance level was accepted as $p < .05$. Frequency (n), mean \pm standard deviation, min (minimum), and max (maximum) values were used as descriptive statistical methods in the evaluation of the data obtained from the study.

RESULTS

When Table 2 is examined, the dominant hand grip strength of the participants was calculated as 37.31, non-dominant hand grip strength as 34.60, upper extremity strength as 4.34, back strength as 113.28, leg strength as 100.67, physical activity level as 3894.91 and body awareness level as 78.99.

Table 2. Body Awareness, Strength, and Physical Activity Scores of Participants

		$\bar{X} \pm SS$	Min / Max
Strength Score (Kg)	DHGS	37.31 \pm 5.88	22.3-55.9
	NDHGS	34.60 \pm 6.03	21.40-50
	UES	4.34 \pm .480	3.30-5.80
	BS	113.28 \pm 18.27	67.5-160
	LS	100.67 \pm 17.93	64.5-141
Scale	IPAQ	3894.91 \pm 2991.21	325-10800
	BAQ	78.99 \pm 15.65	46-113

DHGS: Dominant Hand Grip Strength, NDHGS: Non-dominant Hand Grip Strength, UES: Upper Extremity Strength, BS: Back Strength, LS: Leg Strength, IPAQ: Physical Activity Questionnaire, BAQ: Body Awareness Questionnaire

Table 3. Comparison of Body Awareness of Participants and Their Physical Activity Levels

		Body Awareness Level (BAL)				
		n	X ±SD	f	p	PHT
PAL	Inactive ¹	12	67.17 ±17.33	5.49	.006*	3>1
	Min. Active ²	13	76.15±14.15			
	Very Active ³	51	82.49 ±14.33			

$\bar{X} \pm SD$ = Mean ± Standard Deviation, *n*: Number of Participants, *f*: One Way ANOVA, *PAL*: Physical Activity Level *Min*: Minimum, *PHT*: Post Hoc (Tukey).

**p* < .05

Table 3 shows a significant difference between the body awareness score and level of physical activity (*p* > .006). According to the Tukey test, there was a significant difference between inactive and very active groups.

Table 4. The Correlation between Participants' Body Awareness and Strength and Physical Activity Scores

	DHGS	NDHGS	UES	BS	LS	PAL	BAL
DHGS	1						
NDHGS	.687**	1					
UES	.541**	.510**	1				
BS	.620**	.640**	.371**	1			
LS	.555**	.561**	.534**	.772**	1		
PAL	.296**	.124	.358**	-.023	.020	1	
BAL	.156	.289*	.234*	.046	.030	.470**	1

DHGS: Dominant Hand Grip Strength, *NDHGS*: Non-dominant Hand Grip Strength, *UES*: Upper Extremity Strength, *BS*: Back Strength, *LS*: Leg Strength, *PAL*: Physical Activity Level, *BAL*: Body Awareness Level

p* < .05, *p* < .01

Upon examination of Table 4, several significant correlations were identified. Firstly, a positive correlation was observed between the grip strength of participants' dominant hand and various factors, including non-dominant hand grip strength, upper extremity strength, back strength, leg strength, and body awareness level (*r* = .687, *r* = .541, *r* = .620, *r* = .555, *r* = .296). Additionally, a positive correlation was found between non-dominant hand grip strength and upper extremity strength, back strength, leg strength, and body awareness level (*r* = .510, *r* = .640, *r* = .561, *r* = .289). Furthermore, upper extremity strength positively correlated with back strength, leg strength, physical activity level, and body awareness level (*r* = .571, *r* = .534, *r* = .358, *r* = .234), respectively. Another notable finding was the positive correlation between back and leg strength (*r* = .772). Lastly, a positive correlation was determined between body awareness and physical activity level (*r* = .470).

DISCUSSION

Since "body awareness" is a broad term that refers to an individual's physical, emotional, psychological, and social components, it has recently attracted the attention of scientists working in a variety of health-related sectors (Koçyiğit et al., 2018; Erden et al., 2013; Mehling et al., 2011; Fuchs & Koch, 2014). Similarly, exercise and physical activity are among the topics that many countries focus on. It is known that there are serious problems related to adequate and regular physical activity. Therefore, adopting active lifestyles in the community is part of an important national and international public health recommendation (Vural et al., 2010). However, few studies in the literature examine the correlation between body awareness, physical activity levels, and strength. Based on this knowledge, our study sought to investigate the correlation between young athletes' body awareness and their degree of physical activity and strength, a fundamental motor ability.

The research discovered a positive and significant correlation between body awareness and physical activity levels. This result confirms the hypothesis of the study. When the literature is examined, El Ansari et al. (2011) reported a link between body awareness and physical activity levels. Different research investigating the correlation between physical activity and body awareness concluded that athletes have much higher body awareness than non-athletes (Minev et al., 2017). In their study on women, Gözgen et al. (2020) discovered that as their levels of physical exercise decline, so does their bodily awareness. A study investigating the

connection between young people's body awareness and physical activity discovered a positive correlation between the variables. However, this finding was not considered statistically significant (Pirinççi et al., 2022). Another study found that physical activity levels and body awareness were positively correlated, with the sufficiently active group having higher body awareness than the inactive group (Vatansever, 2018). In a study conducted by Davis (1997) on neurotic and obsessive women, it was reported that exercise increases body awareness and expectations, which makes it difficult to create self-esteem and satisfaction. A review found that exercise can positively change an individual's perception of body and identity (Fox, 1999). It is seen that the results of the existing studies in the literature are consistent with each other and overlap with the results of the study.

The study found a positive correlation between body awareness, dominant hand grip strength, and upper extremity strength. In contrast, no significant difference was found between body awareness, nondominant hand grip strength, back and leg strength. Although these results partially confirmed the study's hypothesis, it was impossible to talk about a complete relationship between strength and body awareness. Although not directly related to strength in the literature, some studies found a significant correlation. El Ansari et al. (2011) found that, regardless of physical activity level, physically active individuals are men who are more aware of their health, are health-conscious, and do strength training. People who practice Pilates may have higher body

awareness, aerobic capacity, and balance than sedentary people, even if the activity intensity is similar, according to a study that is examining the impact of Pilates on body awareness, activity levels, aerobic capacity, and balance in healthy young adults (Zirek et al., 2021). Although not directly related to our study, the increase in body awareness in the group with increased aerobic capacity and balance, which are physiological performance parameters such as strength, is similar to the result of the study.

There are also findings in the literature where no significant differences were found between body awareness and strength. According to Kalkışım et al. (2021), there was no correlation between strength and body awareness levels in their study on the correlation between hand grip strength, lower extremity muscle strength, and body awareness levels. Emirzeoğlu et al. (2019) reported no difference in body awareness levels despite differences in muscle strength between the two groups in their study on sedentary individuals and athletes. The fact that the study's sample group had a high level of physical activity (PAL 3894±2991) suggests that it may cause divergence from the results of these two studies. However, it has been determined that a very limited study in the literature directly examines the level of strength and body awareness. In the literature, it is seen that different studies need to be done in order to form a general opinion.

As a result, it was discovered that the individuals' body awareness levels increased along with their overall physical activity scores. At the same time, a significant positive correlation was found between body awareness level with only dominant hand grip strength and upper extremity strength among five strength measurements. Therefore,

discussing a complete relationship between strength and body awareness was impossible. The study's strength is that it is one of the few that was carried out on strength, and in this way, it will contribute to the literature. One of the study's limitations is that the participants are young athletes, which prevents the variables we investigated from forming a general judgment for other populations. Another limitation is that the emotional and mental states that affect body awareness were not examined. Since mental and emotional states can affect a person's body awareness, it is recommended to include the individual's mental and emotional states in the study while investigating the individual's body awareness in future research.

Research Ethics: The study was carried out after obtaining the necessary official permissions for compliance with publication ethics, with the decision numbered 06 taken at the meeting numbered 04 of Erzurum Technical University Scientific Research and Publication Ethics Committee held on 25.05.2023.

Statement of Researchers' Contribution Rates: The single author of the study conducted the entire study.

Statement of Conflict: Regarding the study, the author has not declared a conflict statement.

Statement of Thanks: I would like to thank the athletes who participated in the research and the physical education teachers who helped make the measurements.

References

- Ağırbaş, Ö., Tatlısu, B., & Karakurt, S. (2021). *Geçmişten günümüze sağlık alanında egzersizlerin rolü. Spor ve Sağlık Araştırmaları. Akademisyen Kitabevi.*
- Asan, S., Çingöz, Y. E., & Paktaş Y. (2021). Takım ve bireysel spor yapan bireylerin bilişsel davranışçı fiziksel aktivite düzeylerinin karşılaştırılması. *Beden Eğitimi ve Spor Bilimleri Dergisi*, 23(2), 167-174.
- Aykın, A.G. (2018). *Fiziksel aktivite ve yaşam kalitesi*. 1. Baskı. İstanbul, Metamorfoz.
- Borms, D., Maenhout, A., & Cools, A. M. (2016). Upper quadrant field tests and isokinetic upper limb strength in overhead athletes. *Journal of athletic training*, 51(10), 789-796. doi: 10.4085/1062-6050-51.12.06.
- Catalan-Matamoros, D., Helvik-Skjaerven, L., Labajos-Manzanares, M. T., Martínez-de-Salazar-Arboleas, A., & Sánchez-Guerrero, E. (2011). A pilot study on the effect of Basic Body Awareness Therapy in patients with eating disorders: a randomized controlled trial. *Clinical Rehabilitation*, 25(7), 617-626. <https://doi.org/10.1177/0269215510394223>.
- Craig, C.L., Marshall, A.L., Sjostrom, M., Bauman, A.E., Booth, M.L., & Ainsworth, B.E. (2003). International Physical Activity Questionnaire: 12-Country Reliability and Validity. *Medicine Science*.
- Cronin, J. B., & Owen, G. J. (2004). Upper-body strength and power assessment in women using a chest pass. *The Journal of Strength & Conditioning Research*, 18(3), 401-404.
- Davis, C. (1997). Body image, exercise, and eating behaviors. *The physical self: From motivation to well-being*, 143-174.
- El Ansari, W., Stock, C., Phillips, C., Mabhala, A., Stoate, M., Adetunji, H., Deeny P., John, J., Davies, S., Parke, S., Hu, X., & Snelgrove, S. (2011). Does the association between depressive symptomatology and physical activity depend on body image perception? A survey of students from seven universities in the UK. *International Journal of Environmental Research and Public Health*, 8(2),281-99. doi: 10.3390/ijerph8020281.
- Emirzeoğlu M., & Erden A. (2019). A comparison of body awareness level and fatigue severity of adolescent athletes and sedentary individuals. *Türkiye Klinikleri J Health Sci* 4(2):155–161. https://doi.org/10.5336/healt_hsci.2018-62900.
- Erden A, Altuğ F., & Cavlak U. (2013). Sağlıklı kişilerde vücut farkındalık durumu ile ağrı, emosyonel durum ve yaşam kalitesi arasındaki ilişkinin incelenmesi. *Kartal Eğitim ve Araştırma Hastanesi Tıp Dergisi*. 24(3):145-150. doi: 10.5505/jkartaltr.2013.20438.
- Fox, K. R. (1999). The influence of physical activity on mental well-being. *Public health nutrition*, 2(3a), 411-418.

- Fuchs, T., & Koch, S. C. (2014). Embodied affectivity: on moving and being moved. *Frontiers in psychology*, 5, 508. <https://doi.org/10.3389/fpsyg.2014.00508>.
- Ginzburg, K., Tsur, N., Barak-Nahum, A., & Defrin, R. (2014). Body awareness: differentiating between sensitivity to and monitoring of bodily signals. *Journal of Behavioral Medicine*, 37, 564-575. <https://doi.org/10.1007/s10865-013-9514-9>.
- Gözgen, H., & Belgen Kaygısız, B. (2020). Analysis of physical activity level and body awareness of mothers of children with special needs. *Health Care for Women International*, 1-13. doi: 10.1080/07399332.2020.1869976.
- Güven, G., & Solmaz, D. Y. (2022). Kadın ve erkek bireylerin fiziksel aktivite düzeyleri ve beden algısı arasındaki ilişkinin incelenmesi. *International Journal of Sport Exercise and Training Sciences-IJSETS*, 8(2), 24-38.
- Gyllensten, A. L., Hui-Chan, C. W., & Tsang, W. W. (2010). Stability limits, single-leg jump, and body awareness in older Tai Chi practitioners. *Archives of Physical Medicine and Rehabilitation*, 91(2), 215-220. <https://doi.org/10.1016/j.apmr.2009.10.009>.
- Gyllensten, A.L., Jacobsen, L.N., & Gard, G. (2019). Clinician perspectives of Basic Body Awareness Therapy (BBAT) in mental health physical therapy: An international qualitative study. *Journal of Bodywork and Movement Therapies*, 23(4), 746-51. doi: 10.1016/j.jbmt.2019.04.012.
- Harris, C., Wattles, A. P., DeBeliso, M., Sevene-Adams, P. G., Berning, J. M., & Adams, K. J. (2011). *The seated medicine ball throws as a test of upper body power in older adults. The Journal of Strength & Conditioning Research*, 25(8), 2344-2348. DOI: 10.1519/JSC.0b013e3181ecd27b.
- Kalkışım, Ş. N., Çan, M. A., Erden, A., Uzun, Ö., Ertemoğlu Öksüz, C., & Zihni, N. B. (2021). Relationships between anthropometric measurements, muscle strength and body awareness. *Acta Neurologica Belgica*, 1-12. <https://doi.org/10.1007/s13760-020-01578-x>.
- Karaböklü Argut, S., & Güngör, F. (2022). Investigation of the relationship between awareness of body perception and physical activity levels. *Aksaray University Journal of Sport and Health Researches*. DOI: 10.541527/asujshr.1154086.
- Karaca, S. (2017). *Vücut farkındalığı anketinin türkçe uyarlaması: geçerlik ve güvenilirlik çalışması*. Yüksek Lisans Tezi, Muğla Sıtkı Koçman Üniversitesi, Sağlık Bilimleri Enstitüsü, Muğla.
- Karasar, N. (2016). *Bilimsel araştırma yöntemi: Kavramlar ilkeler teknikler*. Ankara: Nobel Akademik Yayıncılık.
- Koçyiğit, E., Arslan, N., & Köksal, E. (2018). Yetişkin bireylerde vücut farkındalığı ve antropometrik ölçümlerle ilişkisi. *Beslenme ve Diyet Dergisi*, 46(3). DOI: 10.33076/2018.BDD.317.
- Malina, R. M., Bouchard, C., & Bar-Or, O. (2004). *Growth, maturation, and physical activity*. Human kinetics.
- Mehling, W. E., Gopisetty, V., Daubenmier, J., Price, C. J., Hecht, F. M., & Stewart, A. (2009). Body awareness: construct and self-report measures. *PloS one*, 4(5), e5614. <https://doi.org/10.1371/journal.pone.0005614>.
- Mehling, W. E., Wrubel, J., Daubenmier, J. J., Price, C. J., Kerr, C. E., Silow, T., & Stewart, A. L. (2011). Body Awareness: a phenomenological inquiry into the common ground of mind-body therapies. *Philosophy, ethics, and humanities in medicine*, 6(1), 1-12. DOI <https://doi.org/10.1186/1747-5341-6-6>.
- Miller, L. C., Murphy, R., & Buss, A. H. (1981). Consciousness of body: Private and public. *Journal of personality and social psychology*, 41(2), 397. <https://doi.org/10.1037/0022-3514.41.2.397>.
- Minev, M., Petkova, M., Petrova, B., & Strebkova, R. (2017). Body awareness and responses to experimentally induced pain. *Trakia Journal of Sciences*, 15(3), 244-8. doi: 10.15547/tjs.2017.03.011.
- Orhan, R. (2019). Çocuk gelişiminde fiziksel aktivite ve sporun önemi. *Kırıkkale Üniversitesi Sosyal Bilimler Dergisi*, 9(1), 157-176.
- Özel, Y. (2018). *Farklı enstrüman çalan müzisyenlerde vücut farkındalığı ve üst ekstremite fonksiyonlarının incelenmesi*. Yüksek Lisans Tezi, Hasan Kalyoncu Üniversitesi, Sağlık Bilimleri Enstitüsü, Gaziantep.
- Özer, K.M. (2017). *Kuvvet Kas kuvveti. Kas kuvvet tipleri*. <https://docplayer.biz.tr/108063280-Kuvvet-kas-kuvveti-kas-kuvvet-tipleri-ornekler-eksentrik.html>. Erişim Tarihi: 30.04.2023 saat: 13.59.
- Öztürk, M. (2005). *Üniversitede eğitim-öğretim gören öğrencilerde uluslararası fiziksel aktivite anketinin geçerliliği ve güvenilirliği ve fiziksel aktivite düzeylerinin belirlenmesi*. Yüksek Lisans Tezi, Hacettepe Üniversitesi, Sağlık Bilimleri Enstitüsü, Ankara.
- Pirinççi, C. Ş., Cihan, E., Ünüvar, B. S., & Gerçek, H. (2022). Genç yetişkinlerde vücut farkındalığı ile fiziksel aktivite, depresyon ve yaşam kalitesi ilişkisi. *CBÜ Beden Eğitimi ve Spor Bilimleri Dergisi*, 17(2), 207-215. DOI: 10.33459/cbubesbd.1118305.
- Price, C. J., & Thompson, E. A. (2007). Measuring dimensions of body connection: body awareness and bodily dissociation. *The Journal of Alternative and Complementary Medicine*, 13(9), 945-953. <https://doi.org/10.1089/acm.2007.0537>.
- Rivest-Gadbois, E., & Boudrias, M.H. (2019). What are the known effects of yoga on the brain in relation to motor performances, body awareness and pain? A narrative review. *Complementary Therapies in Medicine*, 44, 129-42. doi: 10.1016/j.ctim.2019.03.021.
- Roberts, H. C., Denison, H. J., Martin, H. J., Patel, H. P., Syddall, H., Cooper, C., & Sayer, A. A. (2011). A review of the measurement of grip strength in clinical and epidemiological studies: towards a standardised approach. *Age and ageing*, 40(4), 423-429. <https://doi.org/10.1093/ageing/afr051>.
- Shields, S. A., Mallory, M. E., & Simon, A. (1989). The body awareness questionnaire: reliability and validity. *Journal of personality Assessment*, 53(4), 802-815. https://doi.org/10.1207/s15327752jpa5304_16.
- Shin, Y., & Chang, E. (2023). Increased Intake of Omega-3 Polyunsaturated Fatty Acids Is Associated with Reduced Odds of Low Hand Grip Strength in Korean Adults. *Nutrients*, 15(2), 321. <https://doi.org/10.3390/nu15020321>.
- Tabachnick, B.G., & Fidell, L.S. (2007). *Using multivariate statistics*. Pearson Education.
- Turan, M., Çingöz, Y. E., Savaş, B. Ç., & Mavibaş, M. (2022). Sporun yaşam becerileri üzerine etkisi: kamu çalışanlarına yönelik bir araştırma. *Akdeniz Spor Bilimleri Dergisi*, 5(Özel Sayı 1), 1-18. <https://doi.org/10.38021/asbid.1199408>.
- Vatanserver, Ö.M. (2018). *The investigation of the relationship between body awareness and balance and posture in healthy individuals with different physical activity levels*. Hacettepe University Institute of Health Sciences, Master Thesis in Physical Therapy and Rehabilitation Program, Ankara.

- Vural, O., Eler, S., & Atalay Guzel, N. (2010). Masa başı çalışanlarda fiziksel aktivite düzeyi ve yaşam kalitesi ilişkisi. *Sportre bedene eğitimi ve spor bilimleri dergisi*, 8(2), 69-75. https://doi.org/10.1501/Sporm_0000000178.
- Warburton, D. E., Nicol, C. W., & Bredin, S. S. (2006). Health benefits of physical activity: the evidence. *Canadian medical association journal*, 174(6), 801-809. DOI: <https://doi.org/10.1503/cmaj.051351>.
- Weineck, J. (2011). *Futbolda Kondisyon Antrenmanı. (Çev. Tanju Bağırhan)*. Spor Yayınevi ve Kitabevi, Ankara.
- Zirek E, Analay Akbaba Y, Emir G.İ, Aslantürk A., & Koyuncu M. (2021). The effect of pilates on body awareness, activity level, aerobic capacity and balance in healthy young adults. *ADYÜ Sağlık Bilimleri Derg.* 2021;7(2):129-135. doi:10.30569.adiyamansaglik.934499.
- Zorba, E., & Saygın Ö. (2009), *Fiziksel Aktivite ve Fiziksel Uygunluk*, İnceler Ofset, İstanbul.

GENİŞLETİLMİŞ ÖZET

Çalışmanın Amacı: İnsanların vücudunu en üst düzeyde kullanması ve benimsemesi beden farkındalığı ile mümkündür. Bedenin farkında olan ve detaylarını anlayan biri fiziksel aktivitenin vücut üzerindeki etkilerini görebilmektedir. Vücut farkındalığı bireyin fiziksel, duygusal, psikolojik ve sosyal yönlerini ifade eden genel bir terim olması nedeniyle günümüzde farklı sağlık alanlarında bilimsel araştırmaların popüler konusu haline gelmiştir (Koçyiğit ve ark., 2018; Erden ve ark., 2013; Mehling ve ark., 2011; Fuchs ve Koch, 2014). Benzer şekilde egzersiz ve fiziksel aktivite de birçok ülkenin odaklandığı konuların başında gelmektedir. Fiziksel aktivitenin yeterli ve düzenli yapılması ile ilgili olarak ciddi problemler olduğu bilinmektedir. Bu nedenle toplumda aktif yaşam tarzının benimsenmesi ulusal ve uluslararası düzeyde önemli bir halk sağlığı önerisinin parçasıdır (Vural ve ark., 2010). Ancak literatürde beden farkındalığı ile fiziksel aktivite düzeyleri ve kuvvet arasındaki ilişkiyi inceleyen çalışma sayısı sınırlıdır. Bu bilgilerden hareketle çalışmamızda genç sporcularda vücut farkındalığı ile fiziksel aktivite düzeyi ve temel bir motor beceri olan kuvvet arasındaki ilişkinin incelenmesi amaçlanmıştır.

Araştırma Sorusu: Vücut farkındalığı ile fiziksel aktivite düzeyi ve kuvvet arasında bir ilişki var mıdır?

Literatür Araştırması: Vücut farkındalığı, fonksiyonel hareket yaparken motor öğrenme sırasında vücudun nasıl organize edileceğini öğrenmekle başlar. Bir sonraki aşama ise hareketin niteliğini etkileyen hız, mesafe, koordinasyon, kuvvet gibi faktörlerin gelişimini içermektedir (Özel, 2018). Bu süreçte kas kuvveti ve vücut yapısıyla duygusal sistemlerin etkileşimi bireyin vücudunu kullanma farkındalığını doğrudan etkileyebilmektedir (Kalkışım ve ark., 2021). Beden farkındalığının en önemli parçalarından biri de kişinin vücudunu en üst düzeyde kullanması ve benimsemesidir. Beden farkındalığı yüksek olan bir kişi vücudundaki tüm değişiklikleri algılar ve olumsuz durumları beden farkındalığı yoluyla yardımcı ya da bireysel olarak ortadan kaldırmaya çalışır (Miller ve ark., 1981). Bu bilgi doğrultusunda vücut farkındalığının artması ile kuvvet, sürat, koordinasyon gibi motorsal becerilerde meydana gelen pozitif ve negatif

değişimler fark edilebilir. Mevcut araştırmalar ağırlıklı olarak obezite, yeme bozuklukları, yaşam kalitesi ve birçok nörolojik ve psikiyatrik değişkenle ilgilidir (Koçyiğit ve ark., 2018; Karabörklü ve ark., 2022; Ginzburg ve ark., 2014; Catalan-Matamoros ve ark., 2011). Beden farkındalığı düzeyi, yaşam kalitesi, depresyon ve beden algısı gibi duygusal durumlar ile de karşılaştırılmıştır (Erden ve ark., 2013; Pirinççi ve ark., 2022; Güven ve Solmaz, 2022).

Yöntem: Araştırmaya yaş ortalaması 17.30±.462, vücut ağırlık ortalaması 62.19±6.98 kg., boy uzunluğu ortalaması 1.73±.069 cm., ve BKİ ortalaması 20.54 ±1.49 kg.m⁻² olan 76 erkek sporcu katılmıştır. Araştırmada veri toplama aracı olarak; “Kişisel Bilgi Formu”, “Vücut Farkındalığı Anketi (VFA)”, “Uluslararası Fiziksel Aktivite Anketi Kısa Form (UFAA-KF)”, “Oturarak Sağlık Topu Fırlatma Testi”, “El Kavrama Kuvvet Testi (EKK)” ve “Sırt ve Bacak Kuvveti Testi” kullanılmıştır. Çalışma verileri tanımlayıcı istatistiklerden Pearson Korelasyon Testi ve Tek Yönlü ANOVA Testi ile analiz edilmiştir.

Katılımcılar iki seansta bireysel olarak test edildi. İlk seansta araştırmacı, çalışma kriterlerini karşılayan ve çalışmaya gönüllü katılmayı kabul eden bireylere yüz yüze görüşme yoluyla kişisel bilgi formu, vücut farkındalık ve fiziksel aktive ölçeklerini uyguladı. Taşınabilir baskül kullanılarak ağırlık (kg) ve mezüre ile boy uzunlukları ölçüldü. BKİ ağırlığın (kg cinsinden) ve boyunun karesi (metre cinsinden) olarak bölünmesiyle hesaplandı. Daha sonra katılımcılar düşük tempolu koşu ve genel egzersizlerden oluşan bir ısınma gerçekleştirdiler. Isınma sonrası, rasgele sıra el kavrama kuvveti ölçümleri yapılarak ilk seans tamamlandı. İkinci seansta ise sırt ve bacak kuvveti ile İki taraflı üst ekstremité kuvvetini ölçümleri yapıldı.

Sonuç ve Değerlendirme: Sonuç olarak; katılımcıların toplam fiziksel aktivite skoru arttıkça vücut farkındalık düzeylerinin de yükseldiği tespit edilmiştir. Aynı zamanda vücut farkındalık düzeyi ile 5 kuvvet ölçümünden sadece dominant el kavrama kuvveti ve üst ekstremité kuvveti arasından pozitif yönde anlamlı (p<.05) ilişki saptanmıştır. Dolayısıyla kuvvet ve vücut farkındalığı arasında tam anlamı ile bir ilişkiden söz etmek mümkün olmamıştır.