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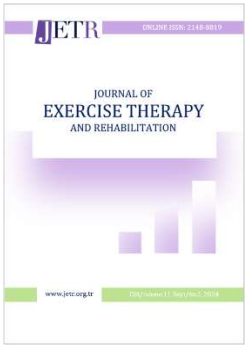

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- *Journal of Exercise Therapy and Rehabilitation (JETR) is published three times yearly, in April, August and December.*
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CASE REPORT

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ORIGINAL ARTICLE

Analysis of functional hop test with dual task on injured and uninjured athletes

Yaralanma geçmişi olan ve olmayan sporcularda fonksiyonel sıçrama testlerinin ikili görev ile analizi

Aysen Elif YILMAZ[1], Muhammed TEKNAZ[1], Sertaç YAKAL[1], Mehmet Güven GÜNVER[2], Türker ŞAHİNKAYA[1], Gökhan METİN[1]

Abstract

Purpose: Maladaptive neuroplasticity may develop after injury. However, most of the test applications in the return to the sport process mainly focus on the motor end of the sensorimotor system. In this study, we aimed to examine the performance outputs of the functional hop tests with the dual task methodology.

Methods: Triple hop for distance (THD), crossover hop for distance (CHD) and 6-meter hop for timed (6MHT) tests were done. For the cognitive task the backward digit span test of the Wechsler intelligence scale was preferred. Nineteen athletes with a history of unilateral lower extremity injuries were assigned to the previously injured group (PIG), and 20 athletes with no previous injury were assigned to the control group (CG).

Results: There were no significant differences between the results of the cognitive task levels and Mini Mental State Examination scores of the athletes in our study ($p>0.05$). PIG athletes showed significantly lower jump performances compared to CG athletes; in the injured extremity side, differences were found between the groups' THD, CHD, and 6MHT values during a single task ($p<0.05$) and differences were also found between the THD and CHD values of the groups during the dual task ($p<0.05$). In the non-injured extremity side, differences were found between the THD, CHD and 6MHT values of the groups during a single task ($p<0.05$) and differences were also found between the groups' THD, CHD, and 6MHT values during dual task ($p<0.05$).

Conclusion: Results of this study indicated that some functional/cognitive deficits were still not recovered or/and differentiated neuromuscular control that may develop after injury. The dual task should be preferred during functional performance tests due to its beneficial contributions in the evaluation of athletes.

Keywords: Dual task, Functional hop tests, Sport injuries.

Öz

Amaç: *Yaralanma sonrası mal-adaptif nöro-plastisite gelişebilir. Ancak spora dönüş sürecindeki test uygulamalarının çoğu, ağırlıklı olarak duyu-motor sistemin motor ucuna odaklanır. Bu çalışmada ikili görev metodolojisi ile ölçüldüğünde fonksiyonel sıçrama testlerinin performans çıktılarının incelenmesi amaçlandı.*

Yöntem: *Üç adım sıçrama (Triple Hop Distance- THD), çapraz sıçrama (Crossover Hop Distance-CHD) ve 6-metre sıçrama (6-m Hop for Timed-6MHT) testleri yapıldı. Bilişsel görev için Wechsler zekâ ölçeğinin geriye doğru rakam aralığı testi tercih edildi. Tek taraflı alt ekstremite yaralanması öyküsü olan 19 sporcu daha önce yaralanması olan gruba (PIG) ve daha önce yaralanması olmayan 20 sporcu kontrol grubuna (CG) ayrıldı.*

Bulgular: *Çalışmamızda sporcuların bilişsel görev düzeyleri ve Mini Mental Durum değerlendirmesi puanları arasında anlamlı fark yoktu ($p>0.05$). PIG sporcuları, CG sporcularına kıyasla önemli ölçüde daha düşük atlama performansları gösterdi; yaralanmalı ekstremite tarafında grupların tek görev sırasındaki THD, CHD ve 6MHT değerleri arasında farklılık bulundu ($p<0,05$) ve ikili görev sırasında grupların THD ve CHD değerleri arasında da farklılıklar bulundu ($p<0,05$). Yaralanmayan ekstremite tarafında grupların tek görev sırasındaki THD, CHD ve 6MHT değerleri arasında farklılık bulundu ($p<0,05$) ve ikili görev esnasında grupların THD, CHD ve 6MHT değerleri arasında da farklar bulundu ($p<0,05$).*

Sonuç: *Bu çalışma, yaralanma sonrası bazı fonksiyonel ve/veya kognitif eksikliklerin henüz düzelmediğini ve/veya yaralanma sonrası gelişebilecek farklılaşmış nöromüsküler kontrolün olduğunu gösterdi. Sporcuların değerlendirilmesinde faydalı katkıları nedeniyle ikili görevin fonksiyonel performans testleri sırasında tercih edilmesi önerilmektedir.*

Anahtar kelimeler: *İkili Görev, Fonksiyonel sıçrama testleri, Spor yaralanmaları.*

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INTRODUCTION

Lower extremity injury rates are high during sportive activities where jumping and sudden deflected movements are high (basketball, football etc.). It has been reported that maladaptive neuroplasticity that can develop after injury.[1]

Strong evidence has been presented that the risk of subsequent injuries in different body parts is increased, especially in athletes who have undergone inadequate rehabilitation process.[2] As a possible reason for this situation, unlike the clinical environment, where the internal focus instructions are more intense, during athletic competition the stimuli from the external environment increase and/or the cognitive demand levels for the function to be performed increase, the athletes cannot demonstrate appropriate movement pattern -as they are still internally focused-.[3]

Every healthy individual has a limited cognitive processing capacity, defined as 'attention', and each task demands a portion of this overall processing capacity.[4] If more than the total attention capacity is needed while performing two different cognitive/motor tasks simultaneously, the performance of one or both tasks may deteriorate.[5]

Learning of a performance progress from the cognitive level to the autonomous, from the declarative stage to procedural stage or from the controlled stage to the automatic one.[6-8] At the expert level, motor skills are generally believed to work "automatically" and require little conscious control.[9]

The dual task methodology, used to both monitor and improve the management of attention demands, is a testing and training model that requires a person to perform two tasks at the same time. The secondary task also acts as an external focus.

Under certain circumstances performance may become automatic, implying less involvement of attention and executive resources and less susceptibility to interference from a secondary task.[10] When this automation process is gained due to repetitions, less brain activation was found in expert/experienced athletes performing sports-related motor tasks than novice athletes.[11] This situation is called neural efficiency.[12] A person who demonstrates neural efficiency uses less of his attention for the relevant motor task than the novice. Thus, it is more effective if it responds adequately and accurately to future demands for additional attention and new tasks. In a dual task condition, the level of expertise in neural efficiency or motor skill has a significant impact. Especially considering that the motor learning process is restructured after injury, the managing such dual task conditions becomes even more critical in injured athletes.

However, many RTS (Return the Sport) processes mainly focus on the motor end of the sensorimotor system, and it has been reported that these tests may fail to detect athletes' biological, functional and psychological deficiencies.[13] Also, most RTS tests are performed in a predictable, stable, or closed environment. Additionally, most athletes are familiar with this type of testing.

Also, athletes may be aware of the criteria for performing these tests with an optimal quality of movement. This may lead to situations where clinicians evaluate the athlete's conscious, internally focused, and learned movement behaviour rather than his/her dynamic abilities concerning real game conditions. In support of the proposition, a study found that recovery athletes typically have an increased internal focus of attention.[14]

Unlike studies in the literature examining the potential changes in RTS test results in athletes with a dual task, in this study athletes with a history of only one side lower extremity injury were compared both between their legs and with healthy controls. This study aimed to examine the performance outcomes of athletes in the presence of an external focus. Therefore, functional hop tests were measured with a dual task. The study hypothesizes that athletes with a history of injury show a decrease in performance with dual task compared to healthy controls.

METHODS

Participants

Athletes (11 women, 28 men) who are still active in team sports that involve sudden physical changes of direction and jumps (basketball, volleyball, and football) were included in our study. Among the participants,

19 athletes (mean age; 19.05±3.71) with a history of unilateral lower extremity injury were examined under the previously injured group (PIG), and 20 athletes (mean age;16.95±1.39) without any previous lower extremity injury were examined under the control group (CG). Of the PIG athletes, 10 were basketball players, 4 were volleyball players and 5 were football players. Sixteen of these athletes are right-leg dominant, three are left-leg dominant. Of the CG athletes, 1 was a volleyball player and 19 were football players. Fifteen of these athletes were right-leg dominant and five were left-leg dominant. Demographic characteristics of the participants are shown in Table 1.

The inclusion criteria for this study were: the athlete had only one side initial or moderate lower extremity musculoskeletal injury before and having to stay away from sportive activities for at least one and at most six weeks in this one side injury history, and not having suffered a lower extremity injury for the last six months before the test was applied.

Exclusion criteria were: a history of bilateral lower extremity injuries, vestibular, respiratory and visual disorders, diabetes, auditory or cognitive deficits, use of drugs that affect balance, cognition and attention, pain in injured lower extremity (at least 2/10 according to VAS -Visual Analogue Scale), a history of lower extremity or spine surgery, a pathology or neurological disorders that may affect balance, head injury or symptoms related to head trauma were accepted.[15]

At the beginning of study, the ethics committee approval was obtained with the letter of Istanbul University Istanbul Medical Faculty Ethics Committee dated 21/04/2021 and numbered 182659, and the "Informed Consent Form" was signed by the participants and/or their parents before starting the measurements in line with the Declaration of Helsinki.

Pre-test period

Mini Mental State Test (MMSE) were administered to the participating athletes before starting their performance measurements. This assessment was used to determine the cognitive homogenization of the groups. The internal consistency of this scale was found to be moderate, and the test-retest reliability was high.[16]

For the cognitive task, one of the subtests of a short form of the fourth edition of the Wechsler intelligence scale (WAIS-IV) suggested by Ward, was used.[17] The backward digit span test of the WAIS-R was preferred.[18] Many authors have stated the reliability and validity of this scale.[19,20]

For the randomized number sequence to be used during dual task measurements to be of suitable difficulty for the cognitive level of the participant, a 2-digit randomized number sequence was first told once, as one digit per second, and he/she was asked to say the same number sequence in reverse. For each correct answer, the number of digits in the number sequence was increased by one. The number of digits in which the participant made a mistake was recorded and one more digit of this number was used during the measurements.

Functional tests

1- Triple hop for distance (THD): Athletes jumped as far as possible in 3 steps in a straight line from the starting point determined on the jumping ground, and the distance was measured and recorded.

2- Crossover hop for distance (CHD): Athletes jumped as far as possible by taking three consecutive diagonal steps to the medial-lateral-medial side of the line on the midline (width 15 cm) of the jumping floor. The distance reached by the athlete was measured and recorded.

3- 6-meter hop for timed (6MHT): Athletes jumped in one leg in the fastest way to the finish point, which is 6 meters away from the starting point marked on the jumping floor. The time elapsed from the start to the end of 6 meters was recorded with a stopwatch.

It has documented that this hop test is sensitive and specific for post-injury deficits[21], and reliability has been established for these tests by other authors.[22]

All hop tests were applied to both legs. Each test was performed three times (1 trial). The average of two measurements was taken. The test was repeated in cases where the athlete touches the ground with his/her other foot and/or his/her hand during jumping or landing, and incomplete or incorrect more than 50% of the number sequence in the cognitive task.

The athletes hop test performances were evaluated at two conditions for pre and post-test values. Firstly, the athletes were asked to do only the hop test without a cognitive task in the classical way. The results from this

measurement formed the pre-test values. Then, for the dual task condition, they were asked to do the hop test together with the cognitive task. While applying the dual task, the previously determined randomized number sequence was told to the athlete at the starting line twice. After the second repetition, the athlete was asked to jump and keep the number in mind. At the end of the jump, the athlete was asked to say the previously given number sequence in reverse and recorded as he/she said it. The results from this measurement formed the post-test values. These pre- and post-test results were compared for comparison and interpretation of results.

Compound Hop Index (CHI) was used to prevent the significant difference between the height values of the groups affecting the jump test scores and to standardize the data. Therefore, the distance (m) reached by the athlete in the jump tests (THD and CHD) was divided by his/her own height (m).[23] The numerator and denominator values in the LSI calculation, as used and specified in this index, in order to use in comparisons of lower extremities of the groups; the worse performing extremity side with the extremity side with a history of injury, and the better performing extremity side with the extremity side without injury were matched.

Statistics analysis

Statistical analyses were processed using IBM SPSS Statistics, version 22.0 (Statistical Package for Social Sciences Inc.; Chicago, IL, USA). Shapiro Wilk test was used to evaluate the fit for normal distribution. It was found that the data showed normal distribution. Repeated measures ANOVA analysis were used for group comparisons of the variables. Paired sample T-test was used for before-after comparisons without group separation. $p<0.05$ was taken as statistical significance level. Cohen d effect sizes were calculated for interpretation of statistical results.

RESULTS

The demographic characteristics, cognitive task difficulty levels and MMSE scores of the athletes are given in Table 1.

The values of the hop distances in the THD and CHD measurements and the durations of the 6MHT measurements of the injured extremity side of the PIG group and the worse performing extremity side of the CG group are shown in Table 2.

Significant differences were found between the groups' THD, CHD, and 6MHT values during a single task (respectively, p=0.006; p=0.011; p=0.011). Significant differences were also found between the THD and CHD values of the groups during the dual task (respectively, p=0.014; p=0.007). CG achieved higher scores in all parameters in the table.

The values of the hop distances in the THD and CHD measurements and the durations of the 6MHT measurements of the non-injured extremity side of the PIG group and the better performing extremity side of the CG group are given in Table 3. Cohen-d values are given in Table 2 and Table 3.

Significant differences were found between the THD, CHD and 6MHT values of the groups during a single task (respectively, p=0.011; p=0.013; p=0.023). Significant differences were also found between the groups' THD, CHD, and 6MHT values during dual task (respectively, p=0.007; p=0.021; p=0.027). CG achieved higher scores in all parameters in the Table-2 and Table-3

DISCUSSION

The dual-task model we preferred in our study, directs the athlete's attention towards an external source. This allows us to observe and measure the unconscious movement patterns of the athlete. In this context, it was determined that compared to the CG group, the PIG group showed statistically significant lower jump performances on both the injured and the non-injured extremity sides in dual task conditions.

It is noteworthy that compared to CG athletes jumping ability, which is very important for many sports, lags in PIG athletes with a history of injury. This situation makes us think that although at least six months have passed since the athletes' injuries, some functional deficits may still be present, or the effect of an altered neuromuscular control that developed after the injury may be ongoing.

Among functional tests, hop tests are the most common assessments used to determine the return to play.[21] However, these hop tests

Table 1. Athletes' demographics, cognitive task difficulty levels, and Mini Mental State Examination (MMSE) scores.

	Previously Injured Group	Control Group	
	Mean±SD	Mean±SD	p
Height (m)	1.80±0.20	1.75±0.13	0.049*
Body weight (kg)	69.64±2.96	69.62±1.28	0.996
Body mass index (kg/m²)	21.12±0.55	22.66±0.52	0.050*
Cognitive task difficulty levels	6.53±1.02	6.30±0.80	0.375
Mini Mental State Examination score	28.84±0.68	29.35±0.74	0.071

*p≤0.05.

Table 2. Results of Previously Injured Group (PIG) injured extremity side and Control Group (CG) extremity side with worse performance score.

	Previously Injured Group	Control Group		
	Mean±SD	Mean±SD	p	Cohen's d
THD single task (m/m)	2.53±0.42	2.93±0.44	0.006*	0.933
THD dual task (m/m)	2.53±0.43	2.90±0.47	0.014*	0.828
CHD single task (m/m)	2.36±0.47	2.79±0.51	0.011*	0.861
CHD dual task (m/m)	2.36±0.43	2.77±0.46	0.007*	0.916
6MHT single task (sec)	2.64±0.33	2.37±0.01	0.011*	1.119
6MHT dual task (sec)	2.73±0.40	2.49±0.45	0.103	0.545

*p<0.05. THD: Triple Hop Distance. CHD: Crossover Hop Distance. 6MHT: 6 Meter Hop for Timed.

Table 3. Results of Previously Injured Group (PIG) injured extremity side and Control Group (CG) extremity side with better performance score.

	Previously Injured Group	Control Group		
	Mean±SD	Mean±SD	p	Cohen's d
THD single task (m/m)	2.56±0.44	2.95±0.45	0.011*	0.859
THD dual task (m/m)	2.54±0.44	2.96±0.48	0.007*	0.909
CHD single task (m/m)	2.35±0.52	2.75±0.44	0.013*	0.836
CHD dual task (m/m)	2.40±0.48	2.77±0.46	0.021*	0.773
6MHT single task (sec)	2.64±0.36	2.37±0.37	0.023*	0.716
6MHT dual task (sec)	2.75±0.40	2.46±0.37	0.027*	0.748

*p<0.05. THD: Triple Hop Distance. CHD: Crossover Hop Distance. 6MHT: 6 Meter Hop for Timed.

may not reveal the risk of injury related to neuro-cognitive deficits or the neurophysiological dysfunction that continues after injury.[24]

Because in these hop tests, athletes are aware of showing their 'best performance' and are used to these 'expected' jumps. Therefore, adding neurocognitive dimensions to these tests during measurements will help us obtain more realistic performance outcomes.

Therefore, it was emphasized that protocols for rehabilitation after sports injury should

include not only classical physical manoeuvres associated with recovery and injury risk, but also cognitive challenges induced by reactive visuospatial stimuli, including the neuro-cognitive side of athletic performance.[25]

Supporting this idea, a study found that athletes who had undergone ACL reconstruction showed an altered neuromuscular response.[26] The reconstructed group was found to be less adaptable to perturbed tasks than healthy controls, possibly because of changing proprioceptive inputs. In addition to this claim, the reinvestment theory, which can occur after injury and, claims that people can impair physical performance by directing attention internally to movement control, we can think that our athletes in the PIG group still focus internally on their movement control. Therefore, they are insufficient to meet the possible attention demands.[27]

Also, in a study conducted in individuals with ligament injuries found that the cerebral structure of individuals with injury shows potentially maladaptive neuroplasticity, therefore the motor and premotor areas of the cortex are more active during simple movement tasks.[3] In other words, more brain activation was seen, just as in the early times of motor learning.

Even if PIG athletes have physically recovered from their injuries and can return to the athletic field, their altered cortical activation has likely led them to a dual-task intervention in dual-task situations. The capacity-sharing theory or the bottleneck theory explains this situtation.[28,29] Capacity-sharing theory assumes that attentional resources are limited and performing a particular task involves some of this limited information-processing capacity.[28-30] Therefore, it indicates that if two tasks are performed simultaneously that exceed one's processing capacity, the performance of one or both tasks will decrease. Also, the bottleneck theory assumes that the sources of attention are limited and only a certain amount of information can be processed at a time.[29] Therefore, when two tasks that require the same compute resources are performed simultaneously, one or both tasks will be delayed or corrupted, thus causing dual task interference.

In addition to these theories, Wulf, McNevin, and Shea proposed the constrained action hypothesis to explain the benefits of motor learning and performance often observed when physically performing individuals adopt an external focus compared to an internal focus of attention.[31] This hypothesis proposes that consciously directing attention internally interferes with automatic-that is, unconscious-processes of motor behaviour. This interruption in automatic processing restricts the motor program and causes the person's motor performance to decrease. In contrast, automatic control processes are facilitated when individuals concentrate on the effects of a movement-that is, external focus. This facilitation allows the motor control system to self-organize more naturally without overloading the central and peripheral nervous systems.

The dual-task model directs athlete's attention towards an external source of attention while performing a task. According to the action-restricted hypothesis, this attentional change may allow motor systems to operate automatically, resulting in more efficient performance.[31]

Studies explaining why the internal attention focus, one of the focus types used by the individual during a physical movement, causes a decrease in performance. According to one of the theories explaining this, attention is required in physical movements to control the performance of the task in the first stage of acquiring motor skills. As knowledge of the process accumulates through practice, performing the task automatically without conscious control becomes possible.[33]

The priority preferences of individuals during the task may also change due to altered cortical activation that develops with injury.[28,31,33] In our study, it is difficult to determine whether the athletes prioritize the cognitive or the motor task. However, a study in the literature indicated that it is possible for participants to choose to prioritize lesser-known cognitive tasks when presented with a more familiar motor task.[34]

The athletes of the PIG group might have prioritised the cognitive task that they are new to instead of paying attention to the jumping movement, which we think they were more familiar, and therefore might have shown poor physical performance during the dual task.

In addition, research on skill acquisition

and automaticity has documented differences in the attention needs of novice and experienced skill performance. This suggests that the cognitive mechanisms governing task execution depend on the level of expertise.[35] It should also be considered that this neural efficiency observed in expert skill performers may affect the occurrence of dual-task intervention.

Limitations

Neurocognitive functions have many dimensions. However, in our study, kinematic test analyses could only be performed with the dual task method. It is also possible to add measures, including visual-motor and cognitive-motor function, to these tests. Neuro-muscular deficits do not only affect the injured extremity but also affect bilaterally. For this reason, pre-injury data of the athletes should be obtained to make more appropriate comments, and comparisons should be made accordingly. The branch distribution of the athletes in the groups was not homogeneous. Also, considering the effects of factors such as sleep and psychological state on cognitive performance, it should be noted that questionnaires that follow these variables can also be used.

Conclusion

As a result, the tests that will be preferred within the framework of cognitive and functional combinations for athletes can make valuable contributions providing a more comprehensive detection of deficits developing after injury. Therefore, we suggest that dual-task tests and studies related to their results will contribute to evaluations in the RTS process.

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Ethical Approval: The protocol of the present study was approved by Istanbul Faculty Of Medicine Clinical Research Ethics Committee (issue: 182659, date: 21/04/2021).

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ORIGINAL ARTICLE

Comparison of adolescent and parental perception of health-related quality of life of adolescents with idiopathic scoliosis

İdiyopatik skolyozlu adölesanların sağlıkla ilgili yaşam kalitesine ilişkin adölesan ve ebeveyn algılarının karşılaştırılması

Merve KARATEL[1], Yavuz YAKUT[1], Gözde YAĞCI[2]

Abstract

***Purpose**: Evaluation of the health-related quality of life (HRQoL) of individuals with idiopathic scoliosis (IS) is important because of the physical and psychosocial problems caused by IS. In general, children interact closely with their parents and are thus influenced by their parents' opinions. It is thus useful to examine adolescent and parental perceptions of the adolescent's HRQoL for the rehabilitation of individuals with IS.*

***Methods:** This study compared the adolescents' and their parents' perceptions of the adolescent's HRQoL including 65 individuals with IS (10–18 years). It was used the pediatric quality of life inventory (PedsQL) to assess the adolescents' HRQoL and to examine the domains of physical health, emotional functioning, social functioning, school functioning, and psychosocial health.*

***Results:** The results showed that the scores of the adolescents were higher than their parents' in social functioning. Scores of social functioning and HRQoL were higher in girls than in their parents.*

***Conclusion:** This discrepancy between the adolescents and their parents may have a negative effect on their rehabilitation, healthy social integration, and adaptation of individuals with IS. Shedding light on the reasons for this discrepancy would be beneficial for raising the awareness of parents with children with IS about this issue.*

***Keywords:** Scoliosis, Health-related quality of life, Parent-child relations, Social participation, Social desirability.*

Öz

Amaç: İdiyopatik skolyozlu (İS) bireylerin sağlıkla ilişkili yaşam kalitesinin (SİYK) değerlendirilmesi, İS'nin neden olduğu fiziksel ve psikososyal sorunlar nedeniyle önemlidir. Genel olarak, çocuklar ebeveynleriyle yakın etkileşim içindedir ve ebeveynlerinin görüşlerinden etkilenirler. Bu nedenle, İS'li bireylerin rehabilitasyonu için adölesanın SİYK'sine ilişkin adölesan ve ebeveyn algılarını incelemek yararlı olacaktır.

Yöntem: Bu çalışma 65 İS'li bireyi (10-18 yaş) dahil ederek, adölesanların ve ebeveynlerinin adölesanın SİYK'sine ilişkin algılarını karşılaştırdı. Adölesanların SİYK'sini değerlendirmek ve fiziksel sağlık, emosyonel işlevsellik, sosyal işlevsellik, okul işlevselliği ve psikososyal sağlık alanlarını incelemek için Çocuklar için Yaşam Kalitesi Envanteri (ÇİYKÖ) kullanıldı.

Bulgular: Sonuçlar, adölesanların sosyal işlevsellik puanlarının ebeveynlerin verdiği puandan daha yüksek olduğunu göstermiştir. Sosyal işlevsellik ve SİYK puanları kızlarda ebeveynlerinden daha yüksekti.

Sonuç: Adölesanlar ve ebeveynleri arasındaki bu uyuşmazlık, İS'li bireylerin rehabilitasyonlarını, sağlıklı sosyal entegrasyonlarını ve uyumlarını olumsuz yönde etkileyebilir. Bu farklılığın nedenlerinin aydınlatılması, İS'li çocuğa sahip ebeveynlerin bu konuda bilinçlendirilmesi açısından faydalı olacaktır.

Anahtar kelimeler: Skolyoz, Sağlıkla ilgili yaşam kalitesi, Ebeveyn-çocuk ilişkileri, Sosyal katılım, Sosyal istenirlik.

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INTRODUCTION

Health-related quality of life (HRQoL) is a concept that includes mental, physical and social well-being. Also, HRQoL domains are associated with well-being and functioning of physical, emotional, social, psychosocial, and school.[1] Idiopathic scoliosis (IS) is a complex deformity involving three planes of the vertebral column. This deformity affects the physical and psychosocial functioning of the individual.[2] In IS, body dysmorphism has a negative effect on the development of the body image. In addition, low self-esteem, low social adaptation ability, mood disturbances, and worry over peer relations have been reported in individuals with IS. Thus, IS might occur unfavorable effects on HRQoL due to physical and psychosocial problems.[3] Previous studies have strongly underlined the fundamental role of family in the development of the behavior and attitudes of children and adolescents.[4,5] IS research has indicated that mothers' attitudes have a significant effect on their child's attitudes.[6] Some studies have detected similar perceptions between children and their parents about HRQoL and spinal appearance,[7,8] while others have reported a difference in the perceptions of trunk deformity and HRQoL.[9,10] Furthermore, it has been shown that discrepancies in the perception of trunk deformity between adolescent girls and their parents influenced HRQoL scores.[11] However, past researches regarding the discrepancy between adolescents with IS and their parents did not examine psychosocial, social, emotional, and school functioning of the adolescents. Ultimately, the interaction between parents and individuals in terms of HRQoL perception in IS remains controversial.

HRQoL can be evaluated with disease-specific instruments or general instruments. Specific instruments to assess HRQoL are specifically designed for a specific disease, such as spinal deformity,[6] foot-related disorders,[12] knee injuries,[13] or musculoskeletal diseases.[14] Specific instruments enable comprehensive assessment of the HRQoL of the patients and also aim to understand the perceptions of the patient regarding their current condition and measure their satisfaction with IS management.[9,15] However, as general instruments are designed to capture all aspects of HRQoL, they provide a wider context in which to construe information about the change in HRQoL.[15] Scoliosis-specific questionnaires, such as Scoliosis Research Society-22, Bad Sobernheim Stress Questionnaire, and Brace Questionnaire,[16-18] have been developed specifically for individuals with scoliosis. However, these instruments are inadequate for examining psychosocial functioning, peer relations, and detailed social functioning.

Several studies have investigated the HRQoL of individuals with IS using scoliosis-specific instruments.[9,19] However, few existing IS literature has investigated individuals' HRQoL using general questionnaires. The most common questionnaires used to assess general health are the Short Form-36 Health Survey (SF-36) and Nottingham Health Profile; however, as these are designed for use with adults, they are less appropriate for pediatric and adolescent scoliosis individuals.[20,21] Pediatric quality of life inventory (PedsQL) is the widely used general instrument for evaluating HRQoL among children and adolescents.[22] Compared to other disease-specific instruments, the PedsQL has the advantage because it questions relationships with peers, difficulties at school, social problems, and emotional problems in children and adolescents. Knowing the general HRQoL perception of the individual is important for following the health status of individuals and their level of satisfaction with their lives in several ways.[6]

There is a gap in the literature, the lack of study investigating the discrepancy of perception of parents and adolescents about adolescents' HRQoL using the PedsQL. This study investigates (a) whether a difference exists between the parents' and adolescents' perceptions of the general HRQoL of the adolescent with IS, (b) whether the perceived HRQoL of the adolescent relates to the adolescent's gender, and (c) whether the perceived HRQoL depends on the adolescent's age.

METHODS

Participants

The study included 65 adolescents with IS

who has been diagnosed for their scoliosis in different centers and their parents. The participants' mean age was 14.1±2.0 years (range: 10–18 years), and the participants consisted of 52 girls and 13 boys. While composing the PedsQL, it was created forms for different age groups, considering that children and adolescents may have different concerns about health and disease.[23] Fourteen (21%) of the participants were assigned to the 10-12 age group, and 51 (79%) were assigned to the 13-18 age group. The inclusion criteria were as follows: aged 10–18 years; a Cobb angle for the main curve of least 10 degrees; no prior history of scoliosis treatment; and a double curve, a single thoracic curve, or a single lumbar curve. We excluded participants partaking in regular sports activities or with other patterns of scoliosis from the analysis.

The University of Hasan Kalyoncu Research Ethics Committee (2019/08 on 5 February 2019) approved the study protocol. After ethics committee approval, patients who agreed to participate in the study between February 2019 and May 2019 were included. Participants and their parents were informed about the study, and signed informed consent forms were obtained prior to participation from both the participants and their parents.

Measures and procedures

It was recorded demographic data and participant characteristics, including age, weight, height, and body mass index. Also, it was recorded clinical data regarding scoliosis using assessments of the curve pattern, Cobb angle, and axial trunk rotation and calculated the PedsQL scores. The curve pattern expression is used to express the number of curvatures (such as single, double) and its region (such as thoracic, lumbar) in the spine. The Cobb angle is expressed the magnitude of the curve, and axial trunk rotation is the amount of the turning (rotation) of the trunk because of deformity.

The curve pattern was classified as either a single (thoracic or lumbar) or double (right thoracic and left lumbar) curve. The Cobb angles were calculated using a postero–anterior standing radiograph to determine the magnitude of the spinal curve.[24] We measured the axial trunk rotation via the forward bending test and placed a Bunnell scoliometer on the convex side apex of the curve.[25]

We used the PedsQL to assess the general HRQoL of the participants in the study, which was designed for application in healthy and patient children/adolescents.[23] The PedsQL consists of 23 items in the following four domains: physical functioning (8 items), emotional functioning (5 items), social functioning (5 items), and school functioning (5 items). The scores for each item range from 0 to 100 and are calculated as follows: never a problem: 100 point, almost never a problem: 75 point, sometimes a problem: 50 point, often a problem: 25 point and almost always a problem: 0 point.[23] We recorded scores for physical functioning, emotional functioning, social functioning, and school functioning. We also obtained a psychosocial health summary and total score for all participants. The total scale score was derived by the mean of all items, and the psychosocial health summary score comprised the means of the items in the emotional functioning, social functioning, and school functioning subscales. Higher PedsQL scores indicate better HRQoL.[23, 26] The PedsQL comprised the child/adolescent self-report and the parent proxy report that assessed parents' perceptions of their child's HRQoL. This instrument has different versions for children aged 2–4, 5–7, 8–12, and 13–18 years. The scale for the 2–4 age group has only a parent proxy report.[23] When composing the PedsQL, Varni et al. considered that children and adolescents may have different concerns about health and illness and enounced that the contents of items were kept as similar as possible across different age forms, allowing for developmental differences in cognitive ability.[23] Therefore, this study investigated the scores of the 10- to 12-year-old age group and 13- to 18-year-old age group participants separately and in total in this study.

Previous studies have confirmed the validity and reliability of the PedsQL for evaluating the life quality of 8-12-year-old Turkish children and 13-18-year-old Turkish adolescents. The internal consistency of the PedsQL was calculated with the Cronbach's alpha method and the level of significance was determined to be $p<0.05$ within a 95% CI. Cronbach's alpha value was found ranged between 0.60 and 0.87 in the 13-18-year-old form and ranged between 0.84 and 0.86 in the 8-12-year-old form.[27, 28]

Statistical analysis

We performed a statistical analysis using SPSS software version 23 (SPSS Inc., Armonk, New York, USA). Data were expressed as mean (standard deviation) and minimum-maximum values. The alpha level was 0.05 for all tests of statistical significance. Because the data were not normally distributed, we conducted the Wilcoxon Signed Ranks Test to compare the results of the adolescents and parents, the girls and the boys, and the two age groups (10–12 and 13–18).

RESULTS

Table 1 shows the descriptive characteristics of the adolescents in the study, and Table 2 shows a comparison of the parents' and adolescents' report scores in the PedsQL subscales. The only significant difference among the parents and adolescents report scores was in the social functioning summary score (p<.05), where the score of the adolescents' reports was higher than that of their parents.

Table 1. Descriptive and clinical characteristics of the participants.

	Mean±SD
Age (years)	14.1±2.0
Body weight (kg)	49.2±11.6
Height (cm)	160.7±10.2
Body mass index (kg/m^2)	18.8±3.0
Thoracic Cobb angle (°)	26.1±9.2
Lumbar Cobb angle (°)	21.8±6.7
Thoracic rotation angle (°)	7.2±3.3
Lumbar rotation angle (°)	6.2±2.6

As shown in Table 3, no significant difference existed between parents' and adolescents' report scores among the boys (p>.05). However, among the girls, a significant difference was observed between parents' and adolescents' report scores in the social functioning summary score and total scale score (p<.05). The scores of the adolescents' were higher than their parents' in the social functioning summary score and total scale score. Additionally, there was no significant difference in the physical health summary score, emotional functioning summary score, school functioning score, and psychosocial health summary score between the parents' and adolescents' report scores for the girls.

As depicted in Table 4, significant differences existed between the parents' and adolescents' social functioning summary scores for both age groups (p<.05). In both groups, the score of the adolescents' reports was higher than that of the parents in the social functioning score.

DISCUSSION

This study investigated the differences between the perceptions of adolescents' and parents' toward the general HRQoL of the individual with IS and explored whether their perceptions related to the adolescent's gender and age group. The findings of this study demonstrated that the opinions of the adolescents and their parents in the study about the adolescent's HRQoL conflicted in relation to social functioning. However, the perceptions relating to the parameters of physical health, emotional functioning, school functioning, psychosocial health, and total score were similar between the adolescents and their parents. Although the results related to adolescent gender seem to reveal that this discrepancy was specific to the girls, we cannot state that directly because the number of boys in the study was not insufficient. The results relating to age group showed no differences between children (10–12-year-old) or adolescents (13–18-year-old) in terms of the perceptions obtained from the adolescents and their parents. These results can indicate that adolescents with IS tended to overestimate their level of social functioning or that their parents underestimated it.

Our study found that the social functioning scores of individuals with IS were higher than those reported by their parents. Several previous studies have also shown that children with chronic diseases reported higher social functioning scores than did their parents.[29,30] Bridwell et al. found that parents showed greater concern about the disease than their

children in their study about adolescents with IS.[31] Thus, the parents may have negatively exaggerated the level of social functioning of their children in our study due to the scoliosis condition and concern. In addition, Sawyer et al. suggested that children may have difficulty communicating with others about their disease.[30] Similarly children may be bashful when explaining their responses in connection with their perceptions of social functioning in our study. However, in their study of 3,195 healthy children, Gaspar et al. reported that parents tend to perceive the HRQoL of their children as higher than do their children.[32] Silva et al. found no significant differences in the HRQoL perceived by the individuals and their parents and claimed that the disease has an impact on the perception of HRQoL.[33] The results of another systematic review about social functioning and peer relations in children with chronic pain specify that the pain resulted in reduced opportunities to interact with friends and increased peer victimization, which affected their social functioning.[34] In our study, the parameters of the social functioning assessment included such issues as get along with peers, make friends, peer victimization, rejection by peers, and activity participation with peers. Adolescents may have problems with social functioning due to psychosocial problems caused by scoliosis, such as body image disturbance, low self-image, low social adaptation ability, and worry over peer relations. While parents may have realized these problems, the adolescents may not have admitted these effects to themselves, thus leading to a discrepancy in the social functioning score between the adolescents and their parents. However, since our study does not evaluate these parameters that not included in PedsQL, it is not possible to make certain inferences about them. Further, Arabiat et al. investigated social desirability in children with chronic illnesses and found that the chronically ill group had higher social desirability than the control group.[35] We also consider that adolescents with IS may not have been realistic in expressing their social functionality due to social desirability. However, future research is needed to question the social desirability of adolescents with IS. In addition, the findings of this study showed that physical, emotional, school functioning, psychosocial health and total score were similar between participants and their parents. Varni et al. reported a high correlation between pediatric cancer patients (8-18 ages) and their parents for physical functioning in their study.[23] According to the results of a systematic review, there was a great agreement for observable functioning such as physical HRQoL, less agreement for non-observable functioning such as emotional or social HRQoL between children and their parents.[36] Consistent with these studies, parents may have the chance to observe their children's physical and school functions more easily and therefore they may have similar scores on subscales in our study.

The present study found that no significant difference existed between the adolescents' and parents' scores among the boys. However, the scores for the girls' reports were higher than those of their parents in the social functioning summary score and the total HRQoL score. Abbott et al. collected data from 1,342

Table 2. Comparison of the parents' and adolescents' report scores in the Pediatric Quality Of Life Inventory (PedsQL) subscales.

	Parent report	Child/Adolescent report		
Pediatric Quality Of Life Inventory (PedsQL)	Mean±SD	Mean±SD	z	p
Physical health summary score	70.0±23.1	75.2±13.8	-1.314	0.189
Emotional functioning summary score	71.1±24.1	74.5±18.3	-0.891	0.373
Social functioning summary score	85.5±18.3	92.4±11.3	-3.065	0.002*
School functioning scores	76.9±19.0	73.3±17.0	-1.268	0.205
Psychosocial health summary score	77.8±17.3	80.1±13.3	-0.925	0.355
Total scale score	74.5±17.2	78.2±12.0	-1.616	0.106

*p<0.05. z: Wilcoxon Signed Ranks Test.

Table 3. Comparison of the Parents' and Adolescents' Report Scores within the girls and the boys.

	Parent report	Child/Adolescent report		
Pediatric Quality Of Life Inventory (PedsQL)	Mean±SD	Mean±SD	z	p
Girls (N=52)				
Physical health summary score	68.9±23.9	75.7±13.4	-1.668	0.095
Emotional functioning summary score	69.2±24.7	75.2±18.8	-1.579	0.114
Social functioning summary score	84.2±17.8	93.4±10.3	-3.725	<0.001
School functioning scores	77.3±18.8	75.3±16.3	-0.568	0.570
Psychosocial health summary score	76.7±17.4	81.3±12.7	-1.671	0.095
Total scale score	74.5±17.2	78.2±12.0	-1.616	0.106
Boys (N=13)				
Physical health summary score	74.2±19.2	73.0±15.4	-0.356	0.722
Emotional functioning summary score	78.4±20.0	71.5±16.5	-1.848	0.065
Social functioning summary score	90.7±19.5	88.0±14.2	-0.423	0.672
School functioning scores	75.0±20.4	64.1±17.5	-1.589	0.112
Psychosocial health summary score	81.7±17.1	75.1±14.5	-1.483	0.138
Total scale score				

*p<0.05. z: Wilcoxon Signed Ranks Test.

Table 4. Comparison of the parents' and within the different age groups adolescents' report scores.

	Parent report	Child/Adolescent report		
Pediatric Quality Of Life Inventory (PedsQL)	Mean±SD	Mean±SD	z	p
10-to 12-year-old age group (N=14)				
Physical health summary score	62.7±22.8	73.7±14.0	-1.195	0.232
Emotional functioning summary score	66.1±26.0	76.4±19.7	-0.981	0.327
Social functioning summary score	77.5±19.7	89.6±12.0	-2.105	0.035*
School functioning scores	77.3±18.3	76.1±13.3	-0.585	0.558
Psychosocial health summary score	73.2±19.0	80.7±12.9	-0.945	0.345
Total scale score	67.0±16.4	77.3±11.2	-1.712	0.087
13-to 18-year-old age group (N=51)				
Physical health summary score	71.9±22.9	75.6±13.9	-0.678	0.498
Emotional functioning summary score	72.4±23.5	74.0±18.1	-0.423	0.673
Social functioning summary score	87.7±17.4	93.1±11.0	-2.314	0.021*
School functioning scores	76.7±19.4	72.5±17.9	-1.131	0.258
Psychosocial health summary score	79.0±16.8	79.9±13.4	-0.415	0.678
Total scale score	76.4±17.0	78.4±12.2	-0.886	0.376

*p<0.05. z: Wilcoxon Signed Ranks Test.

Australian adolescents and reported that girls had lower functional and aesthetic body satisfaction than boys.[37] Additionally, in their study investigating the social functioning quality of life and self-esteem in girls and boys with disabilities taking part in adapted

competitive sport, Dinomais et al. found that girls had significantly reduced self-esteem and 'attractive body' scores.[38] When considering the social status and functions seen according to gender difference, girls tend to have more problems with self-esteem and sociality than boys. The lack of self-confidence can result in anxiety and may lead to isolation in social functioning.[2] The girls' parents may have noticed these social problems, or the girls responded with inaccurate answers due to social desirability. Future studies should include larger sample size, for can generalize the results regarding gender difference. In addition, there was a trend toward changes in the physical and psychosocial health summary scores between the girls and their parents. Bisegger et al. assessed the HRQoL of 3,710 children and adolescents and found that the physical and psychological dimensions decrease more with increasing age for girls than for boys.[39] According to these mentioned studies, whether girls are healthy or have different pathologies, they seem to have more disadvantages than boys. Future studies should examine whether these disadvantages or other factors cause the different perceptions of HRQoL parameters between girls and their parents.

When examining the results relating to the individuals' age group, the results did not differ. Both groups obtained higher social functioning scores than their parents. Bisegger et al. found that scores decreased with increasing age, especially after age 12, for the physical and psychological dimensions of HRQoL in 3,710 children and adolescents.[39] Gaspar et al. reported that children had higher HRQoL scores than adolescents.[32] The findings of this study showed that a difference exists between the perceptions of girls and their parents about the social functioning of the adolescent with IS. These results suggest that either the adolescents overestimate their perceived HRQoL or their parents underestimate it. However, parents consider their child's HRQoL to be worse than do their children. Since this discrepancy between the adolescents and their parents may have negative effects on the healthy social integration and adaptation of the adolescent with IS. More studies are needed that shed light on the factors that cause this discrepancy. In addition, social functioning and the HRQoL of the adolescent may also affect participation in treatment by the adolescent with IS. Also, it is needed future studies investigated results of this discrepancy between adolescents and their parents for shed light on how health professionals and parents should approach adolescents during the treatment process regarding their developmental stages and functioning. We consider that, regardless of age group, the social functioning, social issues, and social desirability of adolescents with IS should be comprehensively examined.

Limitations

A limitation of the study is that there was no control group that included healthy individuals and their parents for comparison purposes. Therefore, the comparison could not be made between in the perceptions of scoliosis individuals and their parents and differences in the perceptions of healthy individuals and their parents. In addition, the questionnaires did not include open questions about the factors that caused the parents to perceive the HRQoL of their child as worse than their children in the study. The future studies that will be planned by considering the limitations of this study and included a larger sample for gender comparison are needed.

Conclusion

To our knowledge, this is the first study to explore the comparison of adolescent and parental perception of general HRQoL of individuals with IS using the PedsQL. The perception of physical health, emotional functioning, school functioning, and psychosocial health regarding the girls were similar between girls and their parents. Girls with IS perceived their level of social functioning and HRQoL higher than their parents. The perceptions relating to the parameters of HRQoL were similar between boys with IS and their parents. Implications from this study include the discrepancy between the individuals and their parents about individuals' HRQoL may have a negative effect on their rehabilitation, healthy social integration, and adaptation of individuals with IS to the social environment. This subject should be taken into account during the rehabilitation process.

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ORIGINAL ARTICLE

Kanserden sağ kalanlarda uyku kalitesi ve sedanter davranış: olası bir bağlantı var mı?

Sleep quality and sedentary behavior among cancer survivors: is there a possible link?

Alper TUĞRAL[1], Yeşim BAKAR[1], Murat AKYOL[2]

Öz

Amaç: Kanserden kurtulanlarda yalnızca tedavi sırasında değil, hayatta kalma sırasında da uyku düzeninin bozulması sıklıkla görülebilmektedir. Bu çalışma, kanser hastalarında uyku kalitesi ile sedanter davranış arasındaki olası bağlantıyı analiz etmeyi amaçladı.

Yöntem: Demografik ve klinik bilgiler değerlendirme formu aracılığıyla elde edildi. Uyku kalitesi ve fiziksel inaktivite düzeyi sırasıyla Pittsburgh Uyku Kalitesi İndeksi (PUKİ) ve Sedanter Davranış Anketi (SBA) ile değerlendirildi. Bu kesitsel çalışma İzmir Bakırçay Üniversitesi Tıp Fakültesi Tıbbi Onkoloji ünitesinde Nisan-Haziran 2023 tarihleri arasında gerçekleştirildi.

Bulgular: Bu çalışma, çoğunluğu meme kanseri (n=55) olmak üzere toplam 80 hasta ile tamamlanmıştır. Ortalama PUKİ skoru 7,68±4,02 idi. SDA skorları hafta içi ve hafta sonu sırasıyla 8,16±3,90 ve 6,85±3,86 saat idi. PUKİ ve SDA toplam puanları arasında anlamlı bir ilişki gözlenmedi. (p>0,05). Yaş uyku bozuklukları (r=-,24, p=0,03), gündüz işlev bozukluğu (r=-,34, p=0,002), ve SDA'nın "TV izleme" maddesi ile sırasıyla hem haftaiçinde (r=,35, p=0,001) hem de haftasonunda (r=,38, p=0,001) ilişkili bulundu.

Sonuç: Bu çalışma, kanser hastaları arasında sedanter davranış ile uyku kalitesi arasında anlamlı bir ilişki olmadığını göstermiştir, ancak bu örneklemde önemli derecede kötü uyku kalitesi oranı dikkat çekicidir. Bununla birlikte, ekran süresi ve yaş arasındaki önemli ilişkiler nedeniyle özellikle yaşlı kanser hastaları için artan ekran süresinin iyi yönetilmesi gerektiğini ve daha genç kanserden kurtulanlar arasında ise uyku hijyeni ve gündüz işlev bozukluğunun daha fazla dikkate alınması gerektiğini önermek mantıklı olabilir.

Anahtar kelimeler: Kanserden sağ kalanlar, Uyku kalitesi, Fiziksel inaktivite.

Abstract

***Purpose**: Disrupted sleep patterns can be frequent in cancer survivors not only during treatment but also during survival. This study aimed to analyze the possible link between sleep quality and sedentary behavior among cancer patients.*

***Methods:** Demographic and clinical information was obtained through an assessment form. Sleep quality and physical inactivity level were assessed by the Pittsburgh Sleep Quality Index (PSQI) and Sedentary Behavior Questionnaire (SBQ), respectively. This cross-sectional study was conducted between April and June 2023 in the Medical Oncology unit of Izmir Bakırçay University Faculty of Medicine.*

***Results:** This study was completed with a total of 80 patients with most of the types of cancer being breast (n=55). The mean PSQI score was 7.68±4.02. SBQ scores were 8.16±3.90, and 6.85±3.86 hours on weekdays and weekends, respectively. No significant association was observed between PSQI and SBQ total scores (p>.05). Age was correlated with sleep disturbances (r=-.24, p=0.03), daytime dysfunction (r=-.34, p=0.002), and first item of SBQ (watching TV) both on weekdays (r=.35, p=0.001) and weekends (r=.38, p=0.001), respectively.*

***Conclusion:** This study showed that there was no significant relationship between sedentary behavior and sleep quality among cancer patients, however, the remarkable rate of poor sleep quality was evident in this sample. However, it might be reasonable to suggest that the increased screen time especially for older cancer patients due to significant associations between screen time and age, should be well managed while sleep hygiene and daytime dysfunction should be considered further among younger cancer survivors.*

***Keywords**: Cancer survivors, Sleep quality, Physical inactivity.*

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INTRODUCTION

Cancer is the leading cause of death worldwide according to the World Health Organization report in which nearly seven million deaths occur due to cancer globally, annually.[1] On the other hand, thanks to early screening and interventional procedures, the ten-year disease-free survival time was nearly reached up to 90% in the most frequently seen type of cancer such as breast.[2] This increased ratio of survivors of cancer also brings the need for thorough management strategies due to experienceable and various side effects of cancer treatment such as sleep problems. It is stated that the management of sleep problems is of utmost importance among cancer patients since these problems can persist for up to years after discontinuation of systemic therapy.[3] Reports also highlighted that sleep problems can have an impact on the survival rate among cancer survivors.[4]

Sleep is a vital part of a healthy life in order to maintain and physiological and psychological balance of human nature. Disrupted sleep patterns and diminished sleep quality are well-known problems among cancer patients consequently contributing to multimodal treatment.[5] The incidence of sleep problems can be as high as over 90%.[6] Not only cancer treatment itself, but also other factors such as experienced symptoms and lifestyle factors can exacerbate sleep problems.[7-9] Disrupted sleep is known to have an impact on cancer recurrence, productivity, participation, and increased healthcare costs among cancer patients.[10] Though there might be numerous reasons for poor sleep quality among cancer survivors,[11] the share of physical inactivity cannot be underestimated. Regular physical activity was shown to be beneficial for improved sleep quality irrespective of its duration, density, and type.[12] Huang et al.[13] reported that the deleterious effect of poor sleep was exacerbated by physical inactivity in the context of all causes and disease-specific mortality with an above ten-year follow-up in a sample of nearly four hundred thousand people. Yonenaga et al.[14] also reported that poor physical activity patterns were highly associated with diminished disability and survival among lung cancer patients. Tabaczynski et al.[15] reported that even ten minutes of decreased physical inactivity daily leads to increased quality of life among kidney cancer survivors. Decreased physical activity patterns are also notable among cancer patients from diagnosis, during, and end of the treatment.[16-18] Yet, possible synergistic effects of the level of physical inactivity and sleep quality on the clinical outcomes still need to be studied to maintain the well-being level of patients with cancer not only during the treatment but also in survivorship.

To date, there is a need for a detailed snapshot of the patterns of physical inactivity instead of physical activity among cancer patients. Therefore, we aimed to cross-sectionally assess the sleep quality and sedentary behavior of cancer patients in this study. We hypothesized that poor sleep quality is significantly associated with increased time spent in physical inactivity patterns.

METHODS

Study design

This cross-sectional descriptive study was conducted between April and June 2023 with the approval of Izmir Bakircay University Ethical Board of Clinical Studies (954/934/29032023). The non-probability purposive sampling method was used. This study was performed according to the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Participants

Patients who had cancer and were referred to the medical oncology unit whether for systemic chemotherapy or routine control were screened and invited to participate. Being a volunteer to participate, aged between 18 and 75 years old, and having communication skills in the mother language were set as inclusion criteria. Cognitive and mental deficits, having an active infection, having orthopedic and/or neurological conditions that might hamper participation in any physical activity pattern, having an advanced disease stage, comorbidities, and/or distant metastasis were set as exclusion criteria. For each patient willing to participate in this study, a signed informed consent was obtained.

Assessments

Demographic information

Patients' demographics (age, body mass index, gender, marital status, etc.) and clinical

conditions (surgical operation, chemotherapy situation, etc.) were assessed and gathered via a simple data form.

Pittsburgh Sleep Quality Index

The sleep quality was assessed via the Turkish version of the Pittsburgh Sleep Quality Index (PSQI) questionnaire. The PSQI has 19 items that assess sleep quality over the past month. Subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction were the subcomponents of PSQI which are all added together to achieve the total score of PSQI. The total score ranges from 0 to 21, while each component score ranges from 0 to 3. Higher scores indicate worse sleep quality or vice versa. In addition, scores higher than 5 in total indicate poor sleep quality. The PSQI has been validated among cancer patients.[19]

Sedentary Behavior Questionnaire

The Sedentary Behavior Questionnaire (SBQ) is a valid and reliable questionnaire that consists of a total of 9 items, and each of them is scored for both "on a typical weekday" and "on a typical weekend". Each item is scored from "None" to "6 hours or more. The Turkish reliability and validity of SBQ were studied by Bakar et al.[16] The higher scores indicate more sedentary behavior. Scores for calculated for both weekdays and weekends.[20]

Statistical analysis

The data was shown as mean and standard deviation or numbers and percentages according to the data whether continuous or categorical. The normality was checked via the Kolmogorov Smirnov test along with skewness and kurtosis. Bivariate correlations between demographical (age, BMI, etc.), and clinical data (surgical operation) were performed via Pearson's r or Spearman's rho according to the normality assumptions or with point-biserial correlation. Between-group differences were assessed via independent samples t-tests or Mann-Whitney U tests. A priori power calculation was performed according to the medium effect size for bivariate correlations (Cohen's d: 0.3) in 95% CI aiming at least to reach 80% power, the output yielded that there was a need for a total of 84 participants needed. However, according to the post-hoc power calculation when considering the retrieved correlation between age and the "Watching TV" parameter, we achieved 83% of power. The calculations were performed via GPower 3.1.9.[21] The p-value below 0.05 was accepted as statistically significant. All analyses were performed via IBM SPSS v.20 (IBM Corp, New York).

RESULTS

A total of 92 patients with different kinds of cancer were screened. However, according to the predefined inclusion and exclusion criteria, 12 of them were excluded due to various reasons. A detailed participation process is illustrated as a flow-chart in Figure 1. Therefore, this study was completed with a total of 80 patients with most of the types of cancer being breast (n=55, 68.7%). Only 5 patients did not have a history of chemotherapy. Nearly half of the patients (46.2%) were under the active chemotherapy process. 59 out of 80 patients had a surgical operation history. Detailed clinical and sociodemographic characteristics of patients are shown in Table 1.

Table 1. Sociodemographic and clinical characteristics of the patients (N=80).

Patients (N=80)	Mean±SD
Age (years)	52.87±12.01
Body mass index (kg/m^2)	27.10±5.28
Gender	n (%)
Female	67 (83.7)
Male	13 (16.3)
Marital status	
Married	66 (82.5)
Single or divorced	14 (17.5)
Type of cancer	
Breast	55 (68.7)
Colon	13 (16.3)
Rectum	2 (2.5)
Stomach	3 (3.7)
Lung	3 (3.7)
Kidney	1 (1.3)
Prostate	2 (2.5)
Uterus	1 (1.3)
History of surgical operation	
Yes	59 (73.7)
No	21 (26.3)
History of chemotherapy	
Under active chemotherapy	37 (46.2)
Having completed	38 (47.5)
None	5 (6.3)

The mean sleeping time of patients was found as 6.83±1.73 hours. The mean time spent falling asleep was found 25.20±19.82 minutes. The total PSQI score was found as 7.68±4.02. According to the scoring guideline of PSQI, 52 out of 80 patients (65%) showed poor sleep quality by having a PSQI score above 5. Patients who had surgical operations showed higher PSQI scores than those without (7.91 vs 7.30), but it did not reach the significance (t=-.590, p=.557). Patients who were under active chemotherapy showed lower scores in PSQI than those who had completed their chemotherapy (7.17 vs. 8.12), it also showed no significance (t=-1.046, p=.299). When patients with BC and those with other cancer types were analyzed, no significant difference was observed in PSQI (t=.424, p=.67) and SBQ (t=-.906, p=.368). In the total group, the highest and lowest mean scores were obtained in the "sleep disturbances" and the "use of sleeping medication" components, respectively. A significant correlation was found between time spent falling asleep (minutes) and PSQI total score (r=.495, p<0.001). The details of PSQI as well as its subcomponents are shown in Table 2.

The mean sedentary time on weekdays and weekends was found as 8.16±3.90 and 6.85±3.85 hours, respectively. The major contribution to the sedentary time was "watching TV" both on the weekdays and weekends (3.36±1.93 for weekdays and 2.85±2.03 hours for weekends, respectively). The least contribution to the sedentary time was found to "playing a musical instrument" for both weekdays and weekends (0.003±0.02 for weekdays and 0.01±0.11 hours for weekends, respectively). Patients who were under active chemotherapy showed higher levels of sedentary time for both weekdays (8.57 vs. 7.80 hrs), and weekends (7.20 vs. 6.54 hrs), compared to patients who had completed their chemotherapy. However, it was not significant (t=.881 p=.38; t=.757, p=.45). The details of sedentary time are shown in Table 3.

No significant correlations were found between PSQI and SBQ total scores (r=.058, p=.611 for PSQI and SBQ weekdays and r=.019, p=.870 for PSQI and SBQ weekend, respectively). Likewise, total scores of PSQI and SBQ did not show any significant correlations with age, BMI, and surgical operation history. The details of the correlation analysis between PSQI, SBQ age, BMI, and surgical operation history are presented in Table 4. However, there were significant correlations to which need attention between sub-components of PSQI and SBQ. Age was significantly correlated with "sleep disturbances" (r=-.246, p=0.03) and "daytime dysfunction" (r=-.339, p=0.002) subcomponents of PSQI. Age was also significantly correlated with items "Watching TV", "Playing on a computer/video game" and "Sitting listening to music" of SBQ in both weekdays and weekend sedentary time (r=.319 p=0.004; r=-.267 p=0.018; r=-.240, p=0.03 for weekdays and r=.393 p<0.001; r=-.256 p=0.023; r=-.247, p=0.028 for weekends, respectively). "Subjective sleep quality" and "sleep latency" components of PSQI did not show significant correlations between any of the items of SBQ (p>.05). The "Sleep disturbances" subcomponent was significantly correlated with the weekday "Sitting and talking/being busy on the phone" item of SBQ (r=.229, p=0.042) as well as the weekdays and weekend "Doing handicraft or handiworks" item of SBQ (r=.451, p<0.001; r=.337, p=0.002). The significant correlations are shown in Table 5

DISCUSSION

The present cross-sectional study showed the poor quality of sleep among cancer survivors in parallel with the literature findings.[9,22,23] We think that significant associations between age and specific sleep quality parameters should be seriously taken into account to manage sleep problems among cancer survivors. Due to the insignificant association between sleep quality and physical inactivity level, it might be reasonable to conclude that different features associated with physical inactivity should be considered when assessing sleep quality in cancer survivors.

There might be numerous symptoms or complaints experienced by cancer patients during cancer treatment due to its burdensome nature. However, poor sleep was reported to be the most frequent symptom among cancer patients from diagnosis to the end of life.[10,24-26] According to US data, poor sleep quality can affect up to nearly 75% of cancer survivors. In parallel with this, we also found that nearly 65% of our patients suffer from poor sleep quality by having a PSQI score over 5. We found the mean

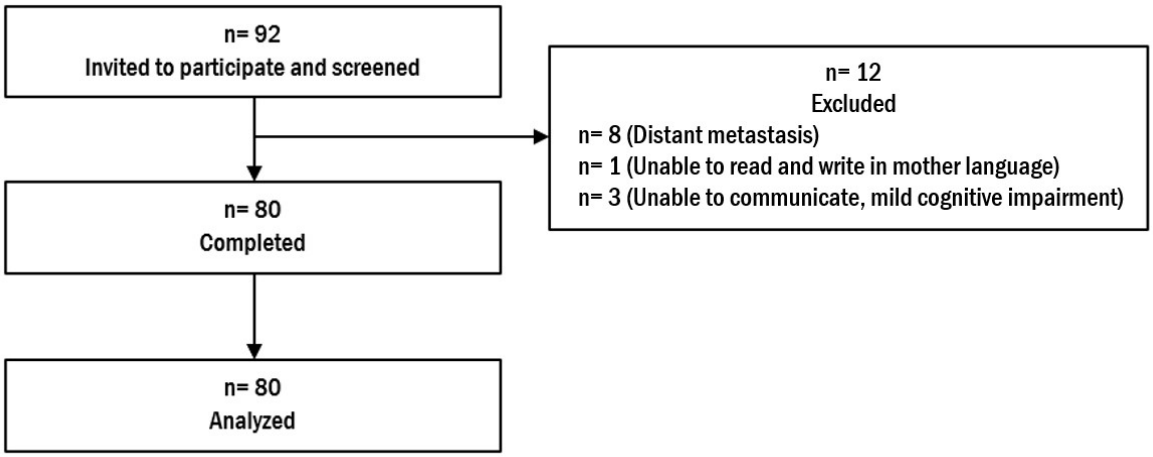

Figure 1. Flow chart of the study participation process.

Table 2. The mean scores of patients in subcomponents of the Pittsburgh Sleep Quality Index and the Sedentary Behavior Questionnaire (N=80).

Pittsburgh Sleep Quality Index (PSQI)	Mean±SD	
Subjective Sleep Quality	1.15±0.74	
Sleep Latency	1.39±0.90	
Sleep Duration	1.06±1.06	
Habitual Sleep Efficiency	0.96±1.17	
Sleep Disturbances	1.63±0.70	
Use of Sleeping Medication	0.56±1.12	
Daytime Dysfunction	0.91±0.95	
Total PSQI Score	7.68±4.02	
	Weekdays (hours)	Weekend (hours)
Sedentary Behavior Questionnaire (SBQ)	Mean±SD	Mean±SD
1. Watching TV	3.36±1.93	2.85±2.03
2. Playing on a computer/video game	0.41±0.85	0.39±0.90
3. Sitting listening to music	0.64±1.03	0.51±0.81
4. Sitting and talking/being busy on the phone	1.14±0.94	1.09±0.86
5. Doing paperwork or computer work	0.23±0.65	0.09±0.30
6. Sitting reading a book or magazine	0.74±1.03	0.62±0.78
7. Playing a musical instrument	0.003±0.02	0.01±0.11
8. Doing handicraft or handiworks	0.87±1.67	0.72±1.58
9. Sitting and driving in a car, bus, or train	0.76±0.91	0.56±0.75
Total SBQ Score	8.16±3.90	6.85±3.86

Table 3. Correlation analysis between age, body mass index, surgical operation history, the Pittsburgh Sleep Quality Index, and the Sedentary Behavior Questionnaire.

		BMI (kg/m²)	Surgical operation	PSQI	SBQ-Weekday	SBQ-Weekend
Age (years)	r	0.133	0.196	-0.128	0.040	0.114
	p	0.250	0.084	0.265	0.970	0.310
Body Mass Index (kg/m²)	r	-	0.102	-0.080	-0.040	-0.063
	p		0.370	0.940	0.710	0.580
Surgical operation	r		-	0.091	0.058	0.054
	p			0.423	0.608	0.630
PSQI	r			-	0.058	0.019
	p				0.611	0.870
SBQ-Weekday	r				-	0.790
	p					<0.001

BMI: Body mass index. PSQI: Pittsburgh Sleep Quality Index. SBQ: Sedentary Behaviour Questionnaire. r=Spearman's rho.

score of PSQI was over 7.5, which was relatively comparable to the findings of the study of Courneya et al.[23] in which the mean score was found over 6 with nearly the same standard deviations as ours (4.02 vs 4.10). Fox et al.[9] also reported that the mean score of PSQI was 7.31 in patients with BC during chemotherapy which was also in parallel with ours. Divani et al.[22] reported that poor sleep quality is the most prominent during active therapy compared to baseline and completion of the therapy among cancer survivors. (8.31 vs 7.11-7.33). The results are seen as in parallel with each other, however, only half of our sample was under active chemotherapy compared to other studies in which their total sample was under active chemotherapy. On the other hand, Lopez et al.[8] reported that results can be biased since the treatment itself solely can cause sleep disturbances. Although it was reported that 80% of cancer patients think that sleep problems occur due to the treatment, values prior to the treatment were already worse.[27] Yet, it should also be noted that not only chemotherapy but also cancer itself could devastatingly contribute to decreased sleep quality.[22] In contrast, we found that our patients who were under active chemotherapy showed better scores than patients who had completed their chemotherapy although the results were insignificant. This finding can be attributed to the relatively younger age of our patients and the timing of application of the PSQI since Jim et al.[28] reported that the "roller coaster" effect which delineates the symptoms highest soon after the chemotherapy infusion and then decline is observed till the next infusion. In a meta-analysis,[29] it was reported that the sleep quality decreased after the first months of the initiation of treatment.

On the other hand, patients who had a positive surgical history showed worse scores in PSQI than those without. This might be an expectable result due to surgery can cause additional symptoms such as pain.[30] Sanford et al.[7] also reported worse scores (PSQI>5) in patients with BC who had surgery during the whole trajectory of the treatment. We found the highest and lowest scores in the "sleep disturbances" and "use of sleeping medication" sub-components of PSQI in our patients. Our results are comparable with the study of Demiralp et al.[31] in which the lowest scores were obtained in sleeping medication and they also reported a mean of nearly 1.5 units in the sleep disturbances subcomponent (1.5 vs. 1.63). It was also expectable since Roscoe et al.[32] reported the change in circadian rhythm in patients with cancer right after the initiation of the treatment. This change could naturally affect sleep hygiene by having an impact on autonomic responses. The subcomponent of "sleep disturbances" of PSQI covers mostly during or initiation/maintenance of sleep. Our finding

which indicates that the moderately significant correlation between time spent falling asleep and PSQI also supports this situation. Fleming et al.[33] reported that the prevalence of sleep disorders increased from 8% to 46% in patients with newly diagnosed nonmetastatic cancer. Although numerous factors can have an impact on poor sleep quality, however, it was reported that cancer patients cannot be adequately referred to sleep medicine specialists.[10,34]

Cancer etiology can be complex. However, environmental and lifestyle factors have been extensively studied in the last decades not only improving health outcomes but also investigating the risk factors.[35] Physical inactivity is extensively known as one of the major risk factors for cancer.[36] To improve the clinical outcomes of cancer, such factors have been widely studied. For instance, McTiernan et al.[37] reported that all types of physical activity reduce the risk of many types of cancer including breast and colon cancer. Not only aerobic exercise but also leisure and occupational physical activity were reported as significantly associated with reduced cancer risk.[38] Friedenreich et al.[39] also highlighted the significant effect of physical activity levels after cancer diagnosis which reduces all causes and cancer-specific mortality in different kinds of cancer at the rate of 30%. Yet, it is a well-known fact that cancer patients tend to reduce their physical activity level after diagnosis for several reasons. There are a lot of studies in which it was reported that cancer patients reduced their physical activity by up to 80%.[40,41] Adherence rates to the recommended levels of physical activity are also detrimentally low among cancer survivors.[16-18,42] Side effects of cancer treatment were the most reported barriers to failed adherence to physical activity.[40] To integrate a desired physical activity level among cancer survivors, varied barriers should be studied in detail.[43,44] In this regard, we chose to assess physical inactivity instead of physical activity in cancer patients. Surprisingly, there was no significant correlation between sleep quality and sedentary time in our patients. This result might have originated for some reasons. First, questionnaires used in this study need to be filled out by considering the last four weeks and the last week for PSQI and SBQ, respectively. This could have caused a recalling bias among patients by over or underestimating the levels of sleep quality and sedentary behavior. Second, because the majority of our patients were unemployed or retired and also lacked the ability to play a musical instrument, some items of the SBQ, such as "playing a musical instrument" and "doing paperwork or computer work," may not have been inclusive for our patients. Although there were no significant relationships among the total scores of SBQ and some socio and clinical demographic characteristics of patients (BMI, age, surgical history, etc.), age was significantly correlated with each item of SBQ in which screen time (TV and computer) and media (Listening music) is scored. A positive significant correlation between the age and the first item of SBQ indicates that increased TV time among older cancer survivors should be thoroughly assessed to improve physical inactivity levels. However, weak but negative correlations between age, the "Playing on a computer/video game" and "Sitting listening to music" items of SBQ should also be taken into account for younger patients for the same reason. On the other hand, the "sleep disturbances" score was significantly and positively correlated with the "Sitting and talking/being busy on the phone" item of SBQ in which "being busy on the phone" is questioned. This might be an expectable result due to the increased time spent with smartphones can cause sleep problems by affecting visual and postural problems. Although much research on this topic has been studied with healthy and young populations (adolescents, college students, etc.),[45,46] as far as we know, there was no research on this topic in patients with cancer associated with sleep and physical activity. Metin et al.[47] recently reported that increased smartphone usage was significantly correlated with musculoskeletal problems among university students. Similarly, "sleep disturbances" was significantly and moderately correlated with the "Doing handicraft or handiworks" item of SBQ in our study. In Eastern societies such as Turkey, knitting lace and some wearable stuff is quite common. A majority of our patients were female, and this result can be based on this occasion. We think that prolonged times of spending with a relatively constant posture as well as repetitive fine motor movements of hand, finger, and wrist may contribute to the potential musculoskeletal complaints and pain, and therefore the

significant correlation between the "sleep disturbances" and "Doing handicraft or handiworks" item of SBQ might be the one which highlights and supports our interpretation.

This study has some strengths. However, questionnaires were applied in real-time, and we tried to emphasize the possible connection between sedentariness and sleep quality among cancer patients can be accepted as a possible strength of this study.

Limitations

This was a single-centered cross-sectional study. Therefore, the results of this present study may not be generalizable to the cancer populations. Second, a small heterogeneity of types of cancer included in this study can also be accepted as a limitation. In addition, the majority of our sample was female, therefore the generalizability of these results to males might be arguable. Third, relatively all our patients were white and Caucasian, therefore, the generalizability of the results can be arguable. Recall bias due to the cross-sectional nature of this study can also be counted as a limitation. Fourth, some items of the SBQ may not have been relatively comprehensive for all patients, as noted previously.

Conclusion

Since the survival of cancer has increased in the last decades thanks to the advancement of the treatment and early diagnosis of cancer, managing short- and long-term side effects is of utmost importance. To maximize patients' benefits from treatment, the significance of maintaining a healthy lifestyle factor such as sleep quality and desired physical activity are indisputable. In this regard, determining the potential effects of failed adherence to physical activity might carry a critical role in other parameters such as sleep quality. We suggest that increased screen time especially for older cancer patients should be thoroughly considered to prevent physical inactivity. We may also offer usage of smartphones should also be thoroughly investigated in further studies among the cancer population since increased time with the phone caused decreased sleep quality in the context of sleep disturbances. In fact, since the great majority of our sample was based on patients with breast cancer, the findings of this study are relatively limited for patients with other types of cancer. Future studies with a more homogenous sample might contribute further to these findings. We think this study also contributed to the knowledge by relatively underlining the need for specific tools and instruments associated with the assessment of physical inactivity among cancer patients.

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ORIGINAL ARTICLE

Bebek spa merkezleri hakkında bir inceleme: Türkiye örneği

A review about baby spa centers: Turkey Case

Aslı YILMAZ[1], Kübra OKUYUCU[2]

Öz

Amaç: Bu çalışma, Türkiye'de faaliyet gösteren bebek spa merkezlerinin verdiği hizmetleri, spa terapisini gerçekleştiren kişilerin niteliklerini belirlemeyi amaçlamaktadır.

Yöntem: Kesitsel ve tanımlayıcı bir çalışmadır. Çalışmanın evrenini, 9 Eylül 2021 tarihinde Türkiye'de faaliyet gösterdiği tespit edilen 180 bebek spa merkezi oluşturmaktadır. Çalışmanın verileri, araştırmacıların geliştirdiği anket formu kullanılarak telefonla görüşme yöntemiyle toplanmıştır. Anket formunda, kurum ve kurum yöneticisi, uygulayıcı ve uygulamalarla ilgili sorular bulunmaktadır.

Bulgular: Çalışma 49 merkezin katılımı ile tamamlanmıştır. Kurumların ortalama hizmet süresi 2,27 yıl olup en eski kurum 5 yıldır faaliyet göstermektedir. Yaş ortalaması 29,07 olan uygulayıcıların (n=55) büyük çoğunluğu kadın (%98) ve ön lisans mezunudur (%80). Uygulayıcıların, %31'i çocuk gelişimi, %23'ü fizyoterapi, %16'sı hemşirelik mezunu olup, %96'sının masaj eğitimi, %33'nün hidroterapi ve %24'ünün ilk yardım eğitimi bulunmaktadır. Uygulamalar ayda ortalama 2,93 kez yapılıp, spa uygulaması ortalama 31,98 ve masaj 18,65 dakika sürmektedir.

Sonuç: Bu çalışma, yakın zamanda faaliyete başlayıp popülerliği artan bebek spa merkezlerinin faaliyetleri ve uygulayıcıları ile ilgili bir profil sunmaktadır. Uygulayıcı eğitimlerinin geliştirilip, uygulamalar ile ilgili standardizasyon ve düzenli denetleme getirilmesi gerektiği sonucuna varılmıştır.

Anahtar kelimeler: Bebek, Çocuk, Hidroterapi, Masaj.

Abstract

***Purpose**: This study aims to explore the services provided by the baby spa centres in Turkey and the qualifications of the practitioners.*

***Methods:** This is a cross sectional and descriptive study. The universe of the study consisted of 180 baby spa centres that were found to be operating in Turkey on September 9, 2021. The data were collected by telephone interview method using a questionnaire developed by the researchers. The questionnaire included questions about the centres, managers, practices, and practitioners.*

***Results:** The study was completed with 49 centres. The mean service period of the centres was 2.27 years and the earliest founded centre has been operating for 5 years. The majority of practitioners (n=55), with a mean age of 29.07, were female (98%) and had an associate degree (80%). Of the practitioners, 31% had degree in child development, 23% in physiotherapy, 16% in nursing and 96% of the practitioners reported having massage training, 33% hydrotherapy and 24% first aid training. The practices were performed a mean of 2.93 times a month, the average spa practice time was 31.98 minutes and the massage was 18.65 minutes.*

***Conclusion:** This study presents a profile of the practices and practitioners of baby spa centres, which have recently started to operate and are increasing in popularity. It was concluded that the training of practitioners should be improved and there should be standardisation in practices and inspected regularly.*

***Keywords**: Infant, Child, Hydrotherapy, Massage.*

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GİRİŞ

Antik çağdan günümüze dek su terapi amacıyla kullanılmaktadır. "Su ile gelen iyilik–sudan gelen sağlık" anlamlarına gelen ve Latince "Salus Per Aquam" teriminin baş harflerinden oluşan SPA kelimesi suyun farklı şekillerde kullanımı sonucunda gerçekleşen iyileşme anlamında kullanılmaktadır.[1,2] Günümüzde ise su terapilerinin yanı sıra çeşitli masaj terapileri, aroma terapi, güzellik ve bakım gibi sağlık kür hizmetleri veren tesislerin ismi olarak da geçmektedir.[1] Spa ortamlarının genel şartlarına ilişkin özelliklerin aynı zamanda doğal açık alanlara maruz kalma, suyun varlığı, fiziksel aktivitelere erişim, fizyoterapiler ve sağlık eğitimi yoluyla sağlığın geliştirilmesine yönelik holistik bir yaklaşımı destekleyebileceği olduğu literatürde belirtilmiştir.[3]

İnsan yaşamının en duyarlı dönemlerinden biri olan bebeklik döneminde de spa uygulamasının yapıldığı gözlenmektedir. Bebeklere uygulanan SPA terapisinin kilo alımını, kaba motor gelişimini, uyku kalitesini olumlu yönde desteklediği yapılan bilimsel araştırmalarla gösterilmiştir.[4-7] Ülkemizde bebeklere yönelik 180 spa merkezi olduğu tespit edilmiştir.[8] Bu merkezlerde yapılan uygulamalar çeşitlilik (bebek masajı, emzirme danışmanlığı, aile eğitimleri) göstermektedir. Ülkemizde 2010 yılı 2010/671 karar sayılı "İşyeri Açma ve Çalışma Ruhsatlarına İlişkin Yönetmelikte Değişiklik Yapılmasına Dair Yönetmelik"e göre güzellik uzmanlarının spa bakımı ve masaj yapma yetkisi bulunmaktadır.[9] Milli Eğitim Bakanlığı onaylı kurslar, mesleki ve anadolu teknik liselerinde yer alan "güzellik ve saç bakım hizmetleri", yükseköğretim kurumlarında "saç bakımı ve güzellik hizmetleri" bölümleri aracılığı ile bu eğitimin alınabileceği saptanmıştır.[10-12] Bebek masajı uygulamasında, göz teması, duygusal iletişim, hijyenle ilgili konular, masajın yapıldığı ortam, masajın zamanlaması, bebeğin pozisyonlanması, bebeğin masaja verdiği tepkilerin gözlenmesi, masajın süresi, masajın basıncı, masajda kullanılacak yağlar, masajın planlanması çok büyük önem taşımakta ve bu amaçla düzenlenen kurslar bulunmaktadır.[13] Verilen bilgiler doğrultusunda ülkemizde bulunan bebek spa merkezlerinin verdiği hizmetleri, spa terapisini gerçekleştiren kişilerin profilini belirlemek çalışmanın amacını oluşturmaktadır.

YÖNTEM

Bu çalışma kesitsel ve tanımlayıcı tipte yapıldı. Araştırmacılar tarafından Google Search aracılığıyla 9 Eylül 2021 tarihinde "baby spa merkezi" ve "bebek spa merkezi" anahtar kelimeleriyle Türkiye'de faaliyet gösteren 180 bebek spa merkezi saptandı. Araştırmanın evrenini Türkiye'de faaliyet gösterdiği belirlenen 180 bebek spa merkezi oluşturmaktadır. Örneklem seçimine gidilmeyip, evrenin tamamına ulaşılması hedeflendi.

Araştırmacılar, literatür araştırması,[4,7] ilgileri ve bilimsel yaklaşımları doğrultusunda bir anket formu geliştirdi. Anket formunda, kurum ve kurum yöneticisinin özellikleri; kurumun bulunduğu il, ilçe ve kaç yıldır hizmet verdiği; uygulayıcı özellikleri, uygulayıcının yaşı, cinsiyeti, eğitim durumu, mesleği ve aldığı eğitimler ve; kurumda yapılan uygulamalara yönelik, sıklığı, süresi ve uygulama yapılan bebeklerin özellikleri ile ilgili sorular bulunmaktadır. Veriler, araştırmacılar tarafından görüşme yöntemi ile etik kurul onayı alındıktan sonra (18.04.2022-28.06.2022 tarihleri arasında) toplandı. Google Search aracılığıyla iletişim numaralarına erişilen ilgili merkezler araştırmacılar tarafından telefonla aranarak anket formu ile veriler toplandı. Çalışma hakkında yapılan bilgilendirmeden sonra katılmayı kabul eden kurum çalışanı gönüllülerle görüşüldü. Her bir görüşme yaklaşık 10 dakika sürdü. Katılımcılara soruları yanıtlamaları için gerekli süre tanındı. Elde edilen veriler araştırmacılar tarafından kaydedildi.

Araştırmanın yürütülebilmesi için Amasya Üniversitesi Etik Kurulundan gerekli izin alındı (11.10.2021 tarih, E-76988455-044-37447 sayı). Ayrıca, görüşmeler sırasında gönüllülük ilkesi gözetilip, katılımcılar çalışmaya katılıp katılmama konusunda serbest bırakılıp, sözel onam alınarak çalışmaya devam edildi.

İstatistiksel analiz

Toplanan veriler SPSS 20.0 paket programına kaydedilip, analiz edildi. Tanımlayıcı testler kullanılarak, sayılar, yüzdelik, ortalama ve standart sapma değerleri verildi.

BULGULAR

Bu çalışma, Türkiye'de faaliyet gösterdiği tespit edilen 180 merkezden 49'u (%27) ile tamamlandı. Kurumların bölgelere dağılımı Tablo 1'de verildi.

Yapılan analiz sonuçları Tablo 1'de gösterildi. Kurumların ortalama hizmet süresinin 2,27 yıl (±1,07) olup en eski kurumun 5 yıldır faaliyet gösterdiği ve kurum yöneticilerinin büyük çoğunluğunun (%78) lisans mezunu olduğu belirlendi.

Kurumlarda uygulayıcı olarak toplamda 55 kişi çalışmaya katıldı. Uygulayıcıların ortalama yaşının 29,07 (±3,92), çok büyük çoğunluğunun kadın (%98), ve yine çoğunluğunun ön lisans mezunu (%80) olduğu tespit edildi. Uygulayıcıların ortalama yaşı 29,07 (±3,92), %98'i kadın, %80'i ön lisans mezunu, %31'i çocuk gelişimci, %23'ü fizyoterapist, %16'sı hemşire olup, yaygın olarak aldıkları eğitimlerin masaj (%96), hidroterapi (%33), ilk yardım (%24) olduğu saptandı.

Merkezlerde yapılan uygulamaların sıklığının ayda ortalama 2,93 (±1,58) kez olup, spa uygulamasının ortalama 31,98 (±6,66) ve masaj uygulamasının ortalama 18,65 (±5,02) dakika sürdüğü belirtildi. Uygulama yapılan bebeklerin yaş aralığına kısıtlama getiren kurumlar olup, çoğunlukla (%43) 0-3 yaş grubu kabul edilmektedir.

TARTIŞMA

Bu çalışma, bebek spa merkezlerinin verdiği hizmetleri ve bu merkezlerde uygulayıcı olarak görev alan kişilerin niteliklerini belirleyen ilk çalışmadır. Çalışma kapsamında Türkiye'de faaliyet gösterdiği belirlenen merkezler incelenmiştir.

Literatürde bebek spa merkezleri ile yapılan bir çalışmada ailelerin tercihleri doğrultusunda merkezlerin uygulamaları şekillendirebildikleri, geleneksel uygulamalardan 40 banyosunun, bebeğe özel süslemelerle ortamın kişiselleştirilip profesyonel fotoğraf, video çekimlerinin yapılabildiği merkezler olarak da tanıtımlarının yapıldığı aktarılmıştır.[18] Çalışma kapsamında merkezlerin tamamında havuz içinde spa uygulaması ve ardından masaj uygulaması

Tablo 1. Kurum ve uygulayıcı özellikleri.

	n (%)	X±SD
Hizmet Süresi (yıl) (n=49)		2,2±1,0
Yönetici Eğitim Seviyesi (n=49)		
Lise	3 (6)	
Önlisans	5 (10)	
Lisans	38 (78)	
Yüksek lisans	3 (6)	
Yaşı (n=55)		29,1±3,9
Cinsiyeti (n=55)		
Kadın	54 (98)	
Erkek	1 (2)	
Eğitim Seviyesi (n=55)		
Lise	5 (9)	
Önlisans	44 (80)	
Lisans	5 (9)	
Yüksek lisans	1 (2)	
Meslek (n=55)		
Çocuk gelişimci	17 (31)	
Fizyoterapist	13 (23)	
Hemşire	9 (16)	
İktisadi ve idari bilimler mezunu	6 (11)	
Öğretmen	4 (7)	
Psikolog	1 (2)	
Güzel sanatlar mezunu	1 (2)	
Masaj uzmanı	1 (2)	
Tıbbi sekreter	1 (2)	
Mühendis	1 (2)	
Kimyager	1 (2)	
Alınan eğitimler (n=55)		
Masaj	53 (96)	
Hidroterapi	18 (33)	
İlk yardım	13 (24)	
Yenidoğan bakımı	3 (5)	
Oyun adası	2 (4)	
Hijyen eğitimi	4 (7)	
Emzirme danışmanlığı	1 (2)	
Aile danışmanlığı	1 (2)	
Sağlıklı yaşam koçluğu	1 (2)	
Uygulamalar		
Spa	49 (100)	
Masaj	49 (100)	
Fizik tedavi	3 (6)	
Doğuma hazırlık eğitimi	3 (6)	
Oyun terapisi	1 (2)	
Yoga	1 (2)	
Sıklık (ayda) (n=43) *		3 (1-8)
Süre (Spa) (dk) (n=48)		32,0±6,7
Süre (Masaj) (dk) (n=48)		18,7±5,0

Tablo 1. Kurum ve uygulayıcı özellikleri *(Devam)*.

	n (%)	X±SD
Uygulama yapılan bebekler		
Yaş aralığı (n=46)		
1 yaşa kadar	16 (35)	
2 yaşa kadar	3 (7)	
3 yaşa kadar	20 (43)	
3 yaş üzeri	7 (15)	
Sağlık veya özel durumlu olma (n=47)		
Sadece sağlıklı bebekler	2 (4)	
Hem sağlıklı hem özel dur. bebekler	45 (96)	
Spa merkezlerinin coğrafi dağılımı (N=49)		
Akdeniz	7 (14)	
Doğu Anadolu	- (0)	
Ege	6 (12)	
Güneydoğu Anadolu	1 (2)	
İç Anadolu	13 (27)	
Karadeniz	6 (12)	
Marmara	16 (33)	

*Medyan (min-maks).

yapıldığı saptanmıştır (Tablo 1). Bebeklere ortalama 18,65±5,02 dakika masaj uygulandığı ve uygulayıcıların aldığı eğitimler arasında en yüksek oranda (%96) masaj eğitiminin olduğu saptanmıştır. Tamamlayıcı bir terapi olarak görülen masajın ağrıyı azaltmada, anksiyete, depresyon, post travmatik stres bozukluğu, kabızlık ve ishal gibi gastrointestinal sorunları, cerebral palsy, down sendromunu içeren kas tonusu ve hareket bozuklukları üzerine olumlu etkilerinin olduğu, özellikle yenidoğan döneminde ağrıyı azaltmada etkili olduğu ve kilo alımını destekleyici, yenidoğan sarılığının iyileşmesine katkı sağlayıcı bir girişim olarak görülebileceği belirtilmiştir.[14-17] Bununla birlikte dikkat edilmesi gereken önemli bir nokta masajın mastitis/apse, osteomiyelit, popliteal arter psödoanevrizması, akut tek taraflı nörosensori işitme kaybı, skrotal hematom, oksijen desatürasyonu, deri döküntüsü gibi yan etkilerinin görülebileceğidir.[19] Lisanslı veya tescilli bir masaj terapisti tarafından sağlandığında masajla ilgili herhangi bir yan etki bildirilmediği de literatürde belirtilmiştir.[19] Bu doğrultuda masaj uygulamasında vücudun belirli bölgelerine önerilen sürelerde ve sıra ile taktil ve kinestetik uyarım yapılırken aynı zamanda ortam ışığı, ısısı, gürültüsü ile ilgili de düzenlemelerin yapılması gerektiği için[20] masajın profesyonel kişilerce uygulanması gerektiği çok açık bir gerçek olarak görünmektedir. Ek olarak spa merkezlerinde yürütülen hizmetler incelendiğinde masajla birlikte suya daldırma, yüzdürme işleminin güvenliği de hayati önem arz etmektedir. Güncel olarak yapılan bir sistematik derlemede, 0-36 aylık bebeklerle, kontrol gruplu ve su aktivitesini içeren doğal ve etnografik ilişkili bağlamlarda bebek spaları veya su ortamları, hatta su ortamına maruz kalma ile ilgili olarak bebek güvenliği (boğulmayı önleme) ile ilgili çalışma bulunmadığı aktarılmıştır.[21] Su içinde yapılan aktivitelerde Amerika Birleşik Devletleri (ABD) Gıda ve İlaç İdaresi (FDA) tarafından özellikle gelişimsel gecikmeleri veya spina bifida, spinal müsküler atrofi gibi özel ihtiyaçları olan bebeklerde, su terapisi müdahaleleri için boyun yüzdürücü kullanılmaması gerektiği, ölüm ve ciddi yaralanma ile sonuçlanabileceği aktarılmaktadır.[22] Bebekler ve çocuklar için hayati öneme sahip bir konu olması nedeniyle güncel bilgilerin takip edildiği, alanında eğitimli kişilerin bu uygulamaları yapması gerektiği çok açıktır. Ancak çalışmada elde edilen bir diğer sonuç ise spa uygulaması için hidroterapi eğitimi alan katılımcıların oranındaki düşüklüktür (%33, Tablo 1). Spa hizmeti sunan beş yıldızlı otellerde yapılan farklı bir çalışmada katılımcıların %15,6'sının spa eğitimi almadığı aktarılmıştır.[23] Gerenaz vd. çalışmasında, katılımcılardan spa hizmetini başarısız değerlendirenler olduğu gibi bu hizmetleri başarılı değerlendirenlerin de olduğu ve spada çalışan personelin profesyonel oldukları belirtilmiş ancak yapılan çalışmada uygulayıcılar ile ilgili eğitim detayı bulunmadığı gözlenmiştir.[24] Merkezlerdeki gerek uygulama gerek uygulayıcılar açısından standardizasyonu sağlamak için Avrupa Spalar Birliği (European Spas Association, ESPA) kalite değerlendirilmesinin önemli olduğunu belirtmektedir. Bu değerlendirme kapsamında uluslararası yasa ve yönergeler doğrultusunda hazırlanmış kriterler kullanılmaktadır. Emniyet, acil durum yönetimi, hijyen, tedavi ve sağlıklı yaşam kalitesi kriterleri baz alınarak yapılan değerlendirmeler sonrasında ESPA tarafından uluslararası kalite sertifikası verilmektedir ve bu sertifikanın Avrupa'da

yüksek itibara sahip olduğu aktarılmıştır. Almanya, Danimarka, Estonya ve Fransa'nın da aralarında bulunduğu 23 ülkeden üye kuruluşu olan ESPA spa hizmetinin ülkelerin yasal kurallarıyla birlikte bilimsel kanıtlar doğrultusunda profesyonel bir şekilde verilmesini sağlamayı amaçladığını belirtmektedir.[25]

Buna ek olarak yapılan dikkat çeken bir diğer bulgu ilkyardım eğitimi olduğunu beyan eden katılımcıların (%24) oranıdır. Uygulamalar esnasında bebeğin veya çocuğun hayatını tehlikeye atabilecek bir durum olduğunda temel ilkyardım becerisinin uygulanması hayat kurtarıcı olabilecekken, ilk yardım eğitiminin olmaması durumunda çocukların güven altında olmadığı düşünülebilir. Otel çalışanlarının ilkyardım bilgilerini inceleyen bir çalışma sonucunda katılımcıların %61,5'i ilkyardım bilgisi olduğunu belirtirken, %82,5'i ilkyardım sertifikasının olmadığını belirtmiştir.[26] Bire bir insanla çalışan merkezlerin, yöneticilerin ve denetleyicilerin bu konuyu daha ciddi bir şekilde ele alması gerektiği açık bir şekilde görünmektedir.

Araştırma kapsamında hizmet verilen yaş grubunun 0-3 yaş (%85) olduğu saptandı. Uygulayıcıların meslekleri değerlendirildiğinde medikal dışı ya da çocukların gelişimsel özelliklerinden uzak meslekler olduğu (güzel sanatlar, iktisadi idari bilimler mezunu, mühendis, kimyager) saptanmıştır. Uygulama yapılan merkezlerde sadece sağlıklı bebekler değil, özel gereksinimi olan bebek veya çocuklara da hizmet verildiği göz önüne alınırsa bu konunun dikkatle incelenmesi gerektiği düşünülmektedir.

Limitasyonlar

Çalışmaya katılmayı kabul eden merkezlerin oranı sınırlı kalmıştır. Her merkez tüm sorulara yanıt vermemiştir. Dolayısıyla bu araştırmadan çıkan sonuçlar verilerin toplandığı merkezlere genellenebilir.

Sonuç

Sonuç olarak, bu çalışma sayesinde ülkemizdeki bebek spa merkezlerinde verilen hizmetler ve uygulayıcılar hakkında bir profil oluşturulmuştur. Ailelerin hoşça zaman geçirebilecekleri, spa ve masaj uygulamalarının yapıldığı, farklı meslek gruplarının bu merkezlerde istihdam edildiği, verilen hizmet yılı dikkate alındığında da oldukça yeni ve popüler (en fazla 5 yıl) merkezler olduğu saptanmış ve uygulayıcı eğitimlerinin geliştirilmesi gerektiği düşünülmektedir. Elde edilen sonuçların genellenebilirliğini arttırmak için daha fazla sayıda merkezle benzer nitelikte yapılmış çalışmalara ihtiyaç duyulmaktadır. Ayrıca gelecek çalışmalarda bu merkezlerde sunulan hizmetlerin etkinliği ve memnuniyetinin değerlendirilmesi önerilmektedir.

Teşekkür: Bu çalışmaya veri sağlayarak destek olan bebek spa merkezleri çalışan ve yöneticilerine teşekkür ederiz.

Yazarların Katkı Beyanı: AY: Fikir, tasarım, danışmanlık/denetleme, veri toplama ve işleme, sonuçları yorumu, kaynak taraması, makale yazımı, eleştirel inceleme; **KO:** Fikir, tasarım, danışmanlık/denetleme, veri toplama ve işleme, analiz ve yorum, makale yazımı, eleştirel inceleme.

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ORIGINAL ARTICLE

Uzaktan eğitimin fizyoterapi ve rehabilitasyon lisans öğrencilerinin akademik beklentisi, emosyonel durumu ve sosyal etkileşim düzeyine etkisi: kesitsel bir çalışma

Effect of distance education on academic expectation, emotional status, and social interaction level of physiotherapy and rehabilitation undergraduate students: a cross-sectional study

Cemre Yaren GÜNGÖRENLER[1], Ayşe TÜRKMEN[2], Feride AKBAŞ[2], Tülay TARSUSLU[3]

Öz

Amaç: Bu çalışmanın amacı; Fizyoterapi ve Rehabilitasyon bölümü öğrencilerinde Covid-19 pandemi sürecinde uygulanan uzaktan eğitimin öğrencilerin akademik beklentisi, emosyonel durumu ve sosyal etkileşim düzeyi üzerindeki etkisini incelemekti. Çalışmanın bir diğer amacı akademik beklenti, emosyonel durum ve sosyal etkileşim düzeyinin cinsiyet, uzaktan eğitim deneyimi ve akademik sınıf derecesine göre farklılıklarını incelemekti.

Yöntem: Gözlemsel kesitsel olarak planlanan çalışmaya uzaktan eğitim gören Fizyoterapi ve Rehabilitasyon bölümü lisans öğrencilerinden oluşan 244'ü kadın (%84,4), 45'i erkek (%15,57) toplam 289 kişi katıldı. Google Forms üzerinden oluşturulan anket formuyla öğrencilerin sosyo-demografik özellikleri ve uzaktan eğitimin emosyonel etkilenim, sosyal etkileşim düzeyi ve akademik beklentiye etkisi sorgulandı.

Bulgular: Katılımcıların emosyonel etkilenim, sosyal etkileşim düzeyi ve akademik beklentiye yönelik toplam skor puanlarında cinsiyet ve pandemi dönemi öncesi uzaktan eğitim deneyimi varlığına göre gruplar arasında anlamlı bir farklılık bulunmadı (p>0,05). Akademik sınıf derecesine göre gruplar arasında emosyonel etkilenim (p=0,268) ve sosyal etkileşim düzeyi (p=0,634) skor puanlarının ortalamaları arasında anlamlı bir farklılık yoktu. Akademik beklenti skor puanı ortalamaları arasında ise istatistiksel olarak anlamlı bir farklılık bulundu (p=0,035).

Sonuç: Fizyoterapi ve Rehabilitasyon bölümü öğrencilerinde uygulamalı dersler için uzaktan eğitimin yetersiz kaldığı görülmüştür. Uzaktan eğitim uygulamalarında öğrencilerin akademik beklentisi kadar emosyonel ve sosyal etkileşim düzeylerinin de etkilendiği göz ardı edilmemelidir.

Anahtar kelimeler: Akademik başarı, Pandemik, Uzaktan eğitim.

Abstract

Purpose: *The aim of the study was to examine how distance education has affected the academic expectation, emotional status and social interaction level of Physiotherapy and Rehabilitation students during the pandemic. Another aim of the study was to examine the differences in the fields mentioned above according to gender, distance education experience and academic class level.*

Methods: *A total of 289 people, 244 women (84.4%) and 45 men (15.57%), consisting of undergraduate Physiotherapy and Rehabilitation students who received distance education, participated in the planned observational cross-section study. The socio-demographic characteristics of the students, effect of distance education in said areas were questioned with a questionnaire created via Google Forms.*

Results: *There was no significant difference between the groups in terms of emotional status, social interaction level and academic achievement according to gender and the presence of distance learning experience before the pandemic period (p>0.05). There was no significant difference between the mean scores of emotional status (p=0.268) and social interaction level (p=0.634) scores between the groups according to academic grade. A statistically significant difference was found between the academic expectation score averages (p=0.035).*

Conclusion: *It is revealed that distance learning is insufficient for applied courses in the Physiotherapy and Rehabilitation department. It should not be ignored that the emotional and social interaction levels of the students are affected as much as the academic expectation by the distance learning applications.*

Keywords: *Academic success, Pandemic, Distance education.*

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GİRİŞ

Covid-19; 2019 yılında, Çin'in Wuhan kentinde ortaya çıkmış, yüksek bulaşma özelliğine sahip bir virüstür ve başta Avrupa olmak üzere tüm dünyada hızla yayılmıştır. Covid-19 pandemisi tüm dünyada sağlık, eğitim ve ekonomi gibi birçok alanda sorunlara sebep olmuş ve Dünya Sağlık Örgütü tarafından ülkemizde ilk vakanın görüldüğü 11 Mart 2020'de virüsün binlerce kişiye bulaşması ve ölümlere sebep olması sebebiyle "pandemi" olarak ilan edilmiştir.[1] Sonrasında, vaka sayılarının giderek artmasıyla beraber işyerleri, toplu hizmet veren işletmeler, okullar ve eğitim kurumları 25 Mart 2020 itibariyle geçici olarak kapatılmıştır.[1,2] Pandemi nedeniyle yaşanan mağduriyet birçok çalışma alanını önemli derecede etkilemiştir. Eğitim ve öğretim faaliyetleri de yaşanan pandemi nedeni ile çok ciddi şekilde etkilenmiştir.[3,4] Diğer ülkelerde olduğu gibi ülkemizde de okullar kapatılmış, virüsün yayılım hızını yavaşlatmak amacıyla Yükseköğretim Kurulu tarafından yüz yüze eğitime (örgün eğitime), uzaktan (online) eğitim olarak devam edilmesi kararı alınmıştır.[1,3,5] Bu kararla beraber örgün eğitime göre planlanan eğitim sisteminin hızlıca uzaktan eğitim sistemine uyarlanması gerekmiştir.[6,7]

Uzaktan eğitimde öğrencilerin akademik beklenti ve başarısının değerlendirilmesi/ ölçülmesi önem verilen konular arasındadır.[8] Öğrenciler başarılı oldukları zaman mutluluk, güven ve kişisel doyum; başarısızlık durumunda ise üzüntü, hayal kırıklığı ve depresyon gibi duygusal tepkiler vermektedir. Bu duygusal cevaplar, başarı-başarısızlık nedenlerinin algılanma durumuna göre de değişim göstermektedir.[9]

Eğitimin kalitesini artırmada teknoloji ile etkileşim kaçınılmaz olup, öğrencilerin öğrenme stratejilerini kullanma durumları ve bilgisayar kaygı durumlarının ortaya konması önemlidir.[10] Öğrencilerin bireysel farklılıklarından olan strateji kullanımları ve kaygıları öğrenmeyi etkilemektedir. Bireyselleştirilmiş öğretim ortamlarından olan uzaktan eğitimin farklılıkları göz önüne alınarak düzenlenmesinin daha nitelikli bireyler yetişmesine yardımcı olacağı düşünülmektedir.[11] Literatürde, başarı-kaygı, öğrenme stratejileri-başarı, uzaktan eğitimin öğrenme stratejileri gibi bir ya da iki değişkenin bir arada ele alınarak incelendiği çalışmalar bulunmaktadır.[12,13] Ancak, pandemi sürecinde zorunlu olarak hızlı bir geçiş yapılan uzaktan eğitim modellerinin etkinliği ile ilgili daha çok çalışmaya ihtiyaç olduğu vurgulanmaktadır.

Öte yandan, pandemi dönemiyle birlikte fiziksel aktivite seviyelerinde azalma meydana gelmiş ve uzaktan eğitim süreci insanları hareketsizliğe yöneltmiştir. Pandemi dönemi öncesinde bireyler hem ev içi hem de ev dışı ortamlarda fiziksel olarak aktifken, pandemi dönemi ile aktivite durumları yalnızca ev içi aktiviteler olarak sınırlanmıştır. Fiziksel aktivite; günlük yaşam içinde kas ve eklemleri kullanarak enerji tüketimi ile gerçekleşen, kalp ve solunum hızını artıran ve farklı şiddetlerde farklı yorgunlukla sonuçlanan aktiviteler olarak tanımlanmaktadır.[14] Örneğin; yürüme, koşma, sıçrama, dans, egzersiz, bisiklete binmek, parkta oynamak, bahçede çalışmak, ev işi yapmak fiziksel aktivite olarak kabul edilmektedir. Bu kapsamda pandemi sürecinde uzaktan eğitimin, bir teknolojik cihaz başında gerçekleşmesi fiziksel aktivite olarak tanımlanan aktivitelerde gözle görülür bir azalmaya neden olmuştur.

Uzaktan eğitimin getirmiş olduğu tüm bu kaygılar göz önüne alınarak çalışmanın hipotezleri şu şekilde sıralanmıştır;

H1: Uzaktan eğitimin, Fizyoterapi ve Rehabilitasyon bölümü lisans öğrencilerinin akademik beklentisi, emosyonel durumu ve sosyal etkileşim düzeyi üzerinde herhangi bir etkisi yoktur.

H2: Uzaktan eğitimin, Fizyoterapi ve Rehabilitasyon bölümü lisans öğrencilerinin akademik beklentisi, emosyonel durumu ve sosyal etkileşim düzeyi üzerinde herhangi bir etkisi vardır.

H3: Uzaktan eğitimde, Fizyoterapi ve Rehabilitasyon bölümü lisans öğrencilerinin akademik beklentisi, emosyonel durumu ve sosyal etkileşim düzeyinin cinsiyet, akademik sınıf derecesi ve daha önceki uzaktan eğitim deneyimi varlığı açısından farklılık göstermez.

H4: Uzaktan eğitimde, Fizyoterapi ve Rehabilitasyon bölümü lisans öğrencilerinin akademik beklentisi, emosyonel durumu ve sosyal etkileşim düzeyinin cinsiyet, akademik sınıf derecesi ve daha önceki uzaktan eğitim deneyimi varlığı açısından farklılık gösterir.

Planlanan çalışmanın amacı, Covid-19 pandemi döneminde, fiili olarak uzaktan eğitimle tanışan Fizyoterapi ve Rehabilitasyon bölümü öğrencilerinin, uzaktan eğitim sistemi ve uzaktan eğitimle aldıkları teorik ve uygulamalı derslerin öğrencilerin akademik beklentisi, emosyonel durumu ve sosyal etkileşim düzeyi üzerindeki etkisini incelemektir. Bunlarla ilişkili olarak çalışmanın bir diğer amacı ise akademik beklenti, emosyonel durum ve sosyal etkileşim düzeyinin cinsiyet, daha önceki uzaktan eğitim deneyimi varlığı ve akademik sınıf düzeyine göre farklılıkları incelemektir.

YÖNTEM

Çalışma, gözlemsel araştırma yöntemlerinden kesitsel bir araştırma olarak planlanmıştır. Literatürdeki konu ile ilgili anketlerin maddeleri kullanılarak hazırlanan anket yoluyla verilerin toplandığı çalışma, Mart 2021-Kasım 2021 tarihleri arasında yapıldı. Çalışmanın evrenini Fizyoterapi ve Rehabilitasyon bölümünde uzaktan eğitim alan lisans öğrencileri oluşturdu. Bu evreni temsil eden örnek büyüklüğü ise genel kullanıma açık Open Source Epidemiologic Statistics for Public Health (Openepi Sample Size, 2013, 3.01 sürüm) programında kesitsel çalışmaların örnek hesaplaması menüsünde, benzer bir çalışmanın verisi[15] olan uzaktan eğitim modeli için beklenen memnuniyet prevalansı %26,77 olarak alındı. Çalışmanın gücü %80 ve alfa hata oranı %5 olacak şekilde ayarlandı ve minimum örnek büyüklüğü 264 olarak hesaplandı. Olası takipte kayıp durumu göz önüne alınarak çalışmaya en az 280 bireyin dahil edilmesi planlandı.

Çalışmaya gönüllü olarak katılmayı kabul eden; 18 yaş ve üzeri Covid-19 pandemi sürecinde Türkiye'de bulunan üniversitelere kayıtlı uzaktan eğitim alan, anket sorularını cevaplamaya engel olabilecek iletişim, emosyonel ve nörolojik problemi olmayan Fizyoterapi ve Rehabilitasyon bölümü lisans öğrencileri dahil edildi. Anket sorularını eksik olarak cevaplayan bireyler çalışma dışı bırakıldı.

Araştırmacılar tarafından uzaktan eğitimi konu alan literatürdeki anket önermelerinden bir önerme havuzu oluşturuldu.[15-19] Literatürdeki anketlerden elde edilen havuzdan Fizyoterapi ve Rehabilitasyon bölümüne uygun olanlar seçildi ve bir anket taslağı oluşturuldu. Oluşturulan bu taslak konu ile ilgili alanında uzmanlar tarafından dil özellikleri ve konuya uygunluğu bakımından değerlendirildi. Uzman değerlendirmeleri sonrasında, hedef popülasyon tarafından önermelerin anlaşılabilirliği ile Fizyoterapi ve Rehabilitasyon bölümüne uygunluğu çalışmanın örneklemini temsil eden küçük bir popülasyona yapılan ön uygulama ile değerlendirildi. Alınan geri bildirimler göz önünde bulundurularak ankete son şekli verildi. Oluşturulan anketin güvenilirliği, verilen cevapların tutarlılığı ve bölüme uygunluğunu belirlemek amacıyla çalışmanın örneklemini temsil eden aynı popülasyon üzerinde test tekrar test uygulaması yapıldı. Çalışmada kullanılan anket için Web Tabanlı Öğretime Tutum Ölçeği'nden,[18] Akademik Başarı Değerlendirme Anketi'nden,[17] e-öğrenme hakkında sağlık bilimleri öğrencilerine özel geliştirilmiş anketten[19] ve Covid-19 sürecinde klinik tıp eğitiminde uzaktan eğitimin değerlendirildiği anketten[16] yararlanıldı. Maddeleri kullanılan anketlerin kullanımı konusunda anketleri geliştiren yazarlardan gerekli izinler alındı. Google Forms uygulaması kullanılarak internet ortamında uygulanan ve araştırmacılar tarafından hazırlanan anket formu öğrencilere sosyal medya yolu ile ulaştırıldı. Öğrencilere gönderilen ankette yer alan bilgilendirilmiş gönüllü olur formu ile çalışmaya katılım konusunda öğrencilerin onamı alındı. Öğrencilerden ankette bulunan soruları eksiksiz bir biçimde ve öğrencisi oldukları Fizyoterapi ve Rehabilitasyon bölümünü bir bütün olarak düşünerek cevaplamaları istendi. Anket, toplamda 4 ana bölümden ve 49 sorudan oluşacak şekilde düzenlendi. İlk bölümde; katılımcıların cinsiyetleri, yaşları, medeni durumları, pandemi öncesi ve sırasında nerede yaşadığı, hangi üniversitede öğrenim gördükleri, sınıf kademeleri, daha önceki uzaktan eğitim deneyimleri, uzaktan eğitim sürecinde kullanılan teknolojik araç, eğitim için ekran başında geçirilen süre, pandemi öncesi ve sırasında fiziksel aktiviteye katılım sıklığı gibi özellikleri sorgulayacak şekilde oluşturuldu. İkinci bölüm; uzaktan eğitimin emosyonel etkilenimi üzerine etkisini sorgulayan 10 sorudan, üçüncü bölüm; uzaktan eğitimin öğrencilerin sosyal etkilenim düzeyini nasıl

etkilediğini sorgulayan 6 sorudan oluşturuldu. Dördüncü bölümde ise uzaktan eğitimin öğrencilerin teorik ve uygulamalı derslerdeki okul başarısına etkisini değerlendiren 16 sorudan oluşturuldu. Anket uygulamasında, ilk bölüm hariç diğer bölümlerde bulunan soruların ölçeklendirilmesinde 5'li likert tipte ölçek kullanıldı. Maddeler, 'Kesinlikle Katılmıyorum', 'Katılmıyorum', 'Ne Katılıyorum Ne Katılmıyorum', 'Katılıyorum' ve 'Tamamen Katılıyorum' olarak derecelendirildi. Ölçekte 'Kesinlikle Katılmıyorum' ifadesi 1, 'Tamamen Katılıyorum' ifadesi ise 5 olacak şekilde puanlandı.

Pandemi döneminde uzaktan eğitim sürecini aile evinde geçiren öğrencilerden, aile evinde geçirilen bu süreçteki memnuniyet seviyelerini ankette yer alan 1-10 arası derecelendirilen (1: hiç memnun değilim, 10: çok memnunum) memnuniyet ölçeğine göre puanlamaları istendi.

Çalışma, Dokuz Eylül Üniversitesi Girişimsel Olmayan Araştırmalar Etik Kurulu 29.03.2021 tarih ve 2021/10-52 onay numarası ile etik açıdan uygun bulundu ve Helsinki Deklerasyonu prensiplerine uygun olarak yürütüldü.

İstatistiksel analiz

Elde edilen verilerin analizi için Statistical Package for Social Sciences (IBM Corp., Armonk, NY, 2019) versiyon 26.0 programı kullanıldı. Verilere ait tanımlayıcı istatistikler ve öğrencilerin yanıtlarının dağılımları sayı ve yüzdeler ile incelendi. Öğrencilerin anket sorularına verdikleri yanıtlar tablolar halinde sunuldu. Ancak sonuçların tartışılmasını kolaylaştırmak amacıyla 5'li likert tipteki soruların cevapları 'Kesinlikle Katılmıyorum' ile 'Katılmıyorum' ifadeleri ve 'Tamamen Katılıyorum' ile 'Katılıyorum' ifadeleri birleştirilerek tartışıldı. Öğrencilerin ankette bulunan emosyonel, sosyal ve akademik beklenti etkilenimi bölümleri için verdikleri cevapların ortalama skorları ve standart sapmaları hesaplandı. Anketin test tekrar test güvenilirliğini belirlemek için %95 güven aralığında sınıf içi korelasyon katsayısı (ICC) hesaplandı. 0,75 ve üzeri değerlerin mükemmel güvenilirliği, 0,74 ile 0,40 arasındaki değerlerin orta düzeyde güvenilirliği ve 0,40'ın altındaki değerlerin zayıf güvenilirliği temsil ettiği kabul edildi.[20] Anket sonuçlarının güvenilirliğinin belirlenmesinde Cronbach alfa katsayısı kullanıldı. Cronbach alfa katsayısının değerlendirilmesinde 0,80 üzeri yüksek, 0,80 ile 0,60 arası orta, 0,60 altı düşük değerler olarak kabul edildi.[21] Sayısal özelliklerin normal dağılım gösterip göstermediği Kolmogorov-Smirnov testi ile incelendi. Emosyonel, sosyal ve akademik beklenti etkilenimi bölümlerinin her biri için cevapların cinsiyet ve pandemi dönemi öncesindeki uzaktan eğitim deneyimi varlığına göre farklılık gösterip göstermediği Mann-Whitney U testi ile, akademik sınıfa göre farklılık gösterip göstermediği ise Kruskal Wallis testi ile analiz edildi. $p<0,05$ değeri anlamlı olarak kabul edildi.

BULGULAR

Türkiye'de Fizyoterapi ve Rehabilitasyon bölümü bulunan üniversitelerde öğrenim gören Fizyoterapi ve Rehabilitasyon lisans öğrencilerinde uygulanan anket çalışması ile pandemi döneminde uygulanan uzaktan eğitim hakkında bilgiler toplandı.

Çalışmaya, ülkemizde bulunan 41 üniversiteden toplam 289 Fizyoterapi ve Rehabilitasyon lisans öğrencisi katıldı. Katılımcıların yaş ortalaması 21,26 yıl olup 244'ü (%84,42) kadın, 45'i (%15,57) erkektir.

Yapılan anket çalışmasında 249 öğrencinin pandemi öncesinde uzaktan eğitim deneyiminin olmadığı görülmüştür. Uzaktan eğitim kapsamında öğrencilerin çoğunluğunun (%69,55) bilgisayar başında 4 saatten fazla vakit geçirdiği tespit edildi. Pandemi öncesinde katılımcıların %76,45'i haftada 2 gün ve üzeri fiziksel aktiviteye katılım gösterirken pandemi döneminde bu oranın %34,58 oranına gerilediği görüldü (Tablo 1).

Pandemi öncesi eğitim döneminde öğrencilerin %38,75'i aile evinde yaşarken, pandemi dönemiyle beraber bu oran %92,38'e yükselmişti. Pandemi sürecini ailesi ile birlikte geçiren öğrencilerin memnuniyet seviyeleri ortalama değeri 5,22 olarak belirlendi. Pandemi döneminde uzaktan eğitim sürecini aile evinde geçirdikleri için hiç memnun olmadıklarını belirterek 1 puan veren öğrenci sayısı 36 (%12,45), 2 puan veren öğrenci sayısı ise 24 (%8,30)'tür. Bu süreçten çok memnun olduklarını belirterek 10 puan veren öğrenci sayısı 23 (%8), 9 puan veren öğrenci sayısı ise 11 (%3,80)'dir.

Tablo 1. Katılımcılara ait tanımlayıcı veriler (N=289).

	X±SD
Yaş (yıl)	21,3±1,8
	n (%)
Cinsiyet	
Kadın	244 (84,4)
Erkek	45 (15,6)
Medeni durum	
Bekar	285 (98,6)
Evli	4 (1,4)
Akademik yıl	
1. sınıf	44 (15,2)
2. sınıf	67 (23,2)
3. sınıf	98 (33,9)
4. sınıf	80 (27,7)
Yaşadığı yer	
Köy	24 (8,3)
Kasaba	30 (10,4)
Şehir merkezi	235 (81,3)
Pandemi öncesi uzaktan eğitim deneyimi	
Evet	40 (13,8)
Hayır	249 (86,2)
Uzaktan eğitime katılımda kullanılan teknolojik cihaz	
Bilgisayar	210 (72,7)
Tablet	6 (2,1)
Telefon	72 (24,9)
Diğer	1 (0,3)
Uzaktan eğitim için tekn. cihazların başında geçirilen süre	
4 saatten az	41 (14,2)
4 saat	47 (16,3)
4 saatten fazla	201 (69,5)
Pandemi öncesi eğitim döneminde yaşanılan yer	
Aile evi	112 (38,7)
Yurt	126 (43,6)
Öğrenci evi	47 (16,3)
Diğer	4 (1,4)
Pandemi sırasında eğitim döneminde yaşanılan yer	
Aile Evi	267 (92,4)
Yurt	10 (3,5)
Öğrenci Evi	11 (3,8)
Diğer	1 (0,3)
Pandemi dönemi öncesi fiziksel aktiviteye katılım sıklığı	
Hiç	15 (5,2)
Haftada 1 kez	53 (18,3)
Haftada 2-3 kez	107 (37,0)
Haftada 4-5 kez	76 (26,3)
Her gün	38 (13,2)
Pandemi döneminde fiziksel aktiviteye katılım sıklığı	
Hiç	91 (31,5)
Haftada 1 kez	98 (33,9)
Haftada 2-3 kez	63 (21,8)
Haftada 4-5 kez	24 (8,3)
Her gün	13 (4,5)

Emosyonel etkilenime yönelik sorulan anket soruları cevaplarına göre öğrencilerin %75,08'i internet üzerinden ders çalışmanın sıkıcı olduğunu belirtirken öğrencilerin %69,85'i uzaktan eğitim nedeniyle kaygı seviyesinin arttığını belirtti. 230 öğrencinin (%79,58) pandemi dönemindeki uzaktan eğitim nedeniyle sosyal hayatının bittiğini düşündüğü belirlendi. Ayrıca, öğrencilerin %70,23'ü kendilerini okudukları üniversiteye ait hissetmediklerini belirtti (Tablo 2).

Sosyal etkilenime yönelik sorulan anket soruları cevaplarına göre öğrencilerin %85,11'i pandemi dönemindeki uzaktan eğitimi sadece hoca ve öğrenci arasında bir akış olarak görmüştür. Ayrıca, öğrenciler uzaktan eğitimin kişileri bireyselliğe ittiğini (%66,77) ve sosyal realiteyi önemli ölçüde etkileyebilecek bir faktör olduğunu (%78,88) belirttiler. 218 katılımcı (%75,43) öğrenci merkezli ortamlardaki etkileşimin öğrenme sonuçlarını etkilediği gibi öğrenme süreçlerini de etkilediği görüşünü belirtti (Tablo 3).

Akademik beklenti etkilenimine yönelik sorulan sorulara verilen yanıtlara göre öğrencilerin büyük çoğunluğu (%76,47) pandemi döneminde uygulanan uzaktan eğitim sisteminden memnun olmadığını ve örgün eğitim sistemini uzaktan eğitim sisteminden daha verimli (%84,76) bulduklarını belirtti. Öğrencilerin %91,34'ü (264 öğrenci) uzaktan eğitimin pratik dersler için uygun olmadığı görüşündeyken %90,3'ü uzaktan eğitimle dersleri anlamakta zorlandığını belirtti. 258 öğrencinin (%89,27) uzaktan eğitim kapsamında uygulama derslerindeki eksikliğin meslek hayatlarını olumsuz yönde etkileyeceğini düşündüğü ve yine pratik uygulama eksikliği nedeniyle 252 (%87,19) öğrencinin hastalar ile olan iletişim becerilerinin olumsuz yönde etkilendiği görüldü. Öğrencilerin %46,36'sının ise uzaktan eğitim sisteminin not ortalamalarını kötü etkilemeyeceğini düşündüğü görüldü (Tablo 4).

Anketin test tekrar test güvenilirliği ICC değeri 0,79 (%95 güven aralığında 0,45-0,92) olarak bulunarak mükemmel güvenilirlik düzeyi gösterdiği tespit edildi. Ayrıca anket sonuçlarının Cronbach alfa katsayısı 0,91 olarak bulunarak anket sonuçlarının yüksek güvenilirlik gösterdiği görüldü.

Katılımcıların cinsiyete ve pandemi dönemi öncesi uzaktan eğitim deneyimi varlığına göre

emosyonel, sosyal ve akademik etkilenim skorlarında anlamlı bir farklılık görülmedi (p>0,05). Yapılan analizler sonucu akademik sınıf derecesine göre emosyonel etkilenim (p=0,268) ve sosyal etkilenim (p=0,634) skorlarında anlamlı bir farklılık görülmezken, akademik beklenti etkileniminde anlamlı bir farklılık saptandı (p=0,035). Akademik sınıfa göre yapılan ikili karşılaştırmalar sonucu anlamlı farklılığın ikinci sınıf öğrencilerinden kaynaklandığı; ikinci sınıftaki öğrencilerin diğer sınıf derecelerindeki öğrencilere göre akademik beklenti anlamında daha fazla etkilendiği görüldü (Tablo 5).

TARTIŞMA

Covid-19 pandemi sürecinde uzaktan eğitim ile ilk defa karşılaşan birçok öğrenci için uzaktan eğitim, rutinde bir uygulama olmaması ve bu uygulamaya hazırlıksız yakalanmış olunması, uzaktan eğitimin etkilerini bir kere daha sorgulamaya neden olmuştur. Fizyoterapi ve Rehabilitasyon gibi teorik eğitimin yanı sıra pratik uygulamaların da ağırlıklı olarak yer aldığı sağlık bilimleri bölümlerinde yaşanan aksaklıklar önemli ölçüde gündeme gelmiştir. Yapılan bu çalışmanın sonuçları, pandemi sürecinde uzaktan eğitim yöntemi ile devam eden eğitim-öğretim yaşantısında öğrencilerin akademik, sosyal ve emosyonel bazı etkilenimleri olduğunu, özellikle akademik beklenti konusunda sınıf bazında etkilenimlerin olduğunu göstermiştir. Ayrıca çalışmanın en çarpıcı sonucu Fizyoterapi ve Rehabilitasyon bölümü öğrencilerinin pandemi dönemindeki uzaktan eğitim sisteminden memnun olmadıkları, dersleri anlamakta zorlandıkları, bölüm dersleri bazında (özellikle pratik dersler için) uzaktan eğitimin uygun olmadığı görüşüdür. Hızlıca adapte olmaya çalışılan uzaktan eğitimde, Fizyoterapi ve Rehabilitasyon bölümü sadece teorik dersleri değil, aynı zamanda, birçok pratik dersi ve stajları içeren bir bölüm olduğundan; uzaktan eğitimle ilişkisinin araştırılması, sistemin geliştirilip iyileştirilmesi, eksiklerin giderilmesi için ayrıca önem taşımaktadır.

Çalışmamıza katılan öğrencilerin %38,75'inin pandemi öncesi eğitim döneminde aile evinde kaldığı, pandemi süreci eğitim döneminde bu oranın %92,38'e yükseldiği görülmüştür. Öğrenciler pandemi dönemini aile evinde geçirmelerinden dolayı memnuniyet seviyelerine ortalama 5,22 puan vermiştir. Sakarya (2021) çalışmasında, eğitim sürecini aile evinde geçirmenin her öğrenci için uygun olamayacağını ve öğrencilerin aile evinde arkadaşları ile sosyalleşme ortamının bulunmamasının öğrencilerin motivasyonunu düşüreceğini belirtmiştir.[22] Terkeş vd. hemşirelik ve ebelik bölümü öğrencileri ile yaptıkları çalışmalarında; katılımcılarının %89,4'ünün Covid-19 sürecini aile evinde geçirdiği ve öğrencilerin %41,2'sinin ev ortamında derslere konsantre olamadıkları göstermiştir.[23] Bizim çalışmamızda da diğer çalışmalarla tutarlı olarak öğrencilerin %52,24'ünün çevrimiçi yapılan sınavlarda odaklanma problemi yaşadığını belirttiği görülmüştür. Çalışmamızdan elde edilen sonuçlara göre katılımcılara ait konsantrasyon probleminin aile ile birlikte yaşamak, sınavdan hemen sonra elde edilecek bilginin sorgulanacak olması, aile ile birlikte yaşandığında mutlak başarı sağlama zorunluluğu hissetmek ve/veya başarısız olabilme kaygısının yoğun bir şekilde yaşanmasından kaynaklanmış olabileceği düşünülmüştür. Ayrıca, Terkeş ve Sakarya'nın çalışmalarında olduğu gibi evde ailesi ile birlikte yaşayan öğrencilerde akranları ile yeterince sosyalleşme fırsatı bulamamanın da konsantrasyon güçlüklerine neden olmuş olabileceği düşünülmüştür.

Pandemi öncesinde katılımcıların %76,45 gibi yüksek bir oran ile haftada iki gün ve daha fazla düzeyde fiziksel aktiviteye katıldığı, bununla birlikte, pandemi döneminde bu oranın %34,58'e düştüğü görülmüştür. Öğrencilerin, üniversite yaşantısında yüz yüze işlenen ders aralarında ve sonrasında fiziksel aktivite içerikli girişimlerinin daha fazla olduğu, öte yandan, pandemi sürecinde hem yasaklar hem de evde olmanın verdiği rahatlık ve ders yoğunluğunun fazla olması nedeniyle fiziksel aktiviteye yeterince vakit ayıramadığı belirlenmiştir. Ayrıca, öğrencilerin eğitim faaliyetleri kapsamında katılımcıların %69,55'nin teknolojik aletlerin başında 4 saatten fazla vakit geçirdiği tespit edilmiştir. Bütün bu sebepler göz önünde bulundurulduğunda, pandemi sürecinde sosyalleşme becerisine de katkıda bulunan fiziksel aktivite katılımının da önemli ölçüde

düştüğü sonucuna varılmıştır. Yapılan çalışmalarda, fiziksel aktivite bilinçli ve düzenli olarak yapıldığında emosyonel duruma etki ederek depresyon düzeyinin düşmesine katkı sağladığı belirtilmiştir. Emosyonel durumun, stresin ve yaşam kalitesinin fiziksel aktivite

Tablo 2. Uzaktan eğitim modelinin üniversite fizyoterapi ve rehabilitasyon bölümü öğrencilerinde emosyonel etkilenim üzerine etkileri.

	1 (Kesinlikle Katılmıyorum) n (%)	2 (Katılmıyorum) n (%)	3 (Kararsızım) n (%)	4 (Katılıyorum) n (%)	5 (Tamamen Katılıyorum) n (%)
A	120 (41,52)	78 (26,98)	55 (19,03)	18 (6,22)	18 (6,22)
B	78 (26,98)	74 (25,60)	66 (22,83)	39 (13,49)	32 (11,07)
C	17 (5,88)	15 (5,19)	40 (13,84)	50 (17,30)	167 (57,78)
D	54 (18,68)	63 (21,79)	82 (28,37)	47 (16,26)	43 (14,87)
E	190 (65,74)	58 (20,06)	24 (8,30)	8 (2,76)	9 (3,11)
F	25 (8,65)	21 (7,26)	52 (17,99)	52 (17,99)	139 (48,09)
G	20 (6,92)	24 (8,30)	43 (14,87)	61 (21,10)	141 (48,78)
H	12 (4,15)	7 (2,42)	25 (8,65)	33 (11,41)	212 (73,35)
I	18 (6,22)	14 (4,84)	27 (9,34)	60 (20,76)	170 (58,82)
J	19 (6,57)	25 (8,65)	42 (14,53)	37 (12,80)	166 (57,43)

A. Uzaktan eğitim kendime olan özgüvenimi artırıyor.
B. Uzaktan eğitimde düşüncelerimi özgürce ifade edebiliyorum.
C. İnternet üzerinden ders çalışırken sıkılıyorum.
D. Uzaktan eğitim ile yapılan ders ortamında kendimi rahat hissediyorum.
E. Uzaktan eğitim ile yapılan derslerde diğer öğrencilerle aramda sıkı bir duygusal bağ oluştuğunu hissediyorum.
F. İnternet üzerinden yapılan sınavlarda gözetmen baskısı yaşamıyorum.
G. Uzaktan eğitim nedeniyle kaygı düzeyim arttı.
H. Uzaktan eğitim döneminde dışarı çıkamamak beni mutsuz ediyor.
I. Uzaktan eğitim ile sosyal hayatımın bittiğini düşünüyorum.
J. Uzaktan eğitim sebebiyle kendimi okuduğum üniversiteye ait hissetmiyorum.

Tablo 3. Uzaktan eğitim modelinin üniversite fizyoterapi ve rehabilitasyon bölümü öğrencilerinde sosyal etkileşim durumu üzerine etkileri.

	1 (Kesinlikle Katılmıyorum) n (%)	2 (Katılmıyorum) n (%)	3 (Kararsızım) n (%)	4 (Katılıyorum) n (%)	5 (Tamamen Katılıyorum) n (%)
A	6 (2,07)	8 (2,76)	29 (10,03)	56 (19,37)	190 (65,74)
B	5 (1,73)	11 (3,80)	45 (15,57)	84 (29,06)	144 (49,82)
C	45 (15,57)	46 (15,91)	96 (33,21)	56 (19,37)	46 (15,91)
D	45 (15,57)	65 (22,49)	85 (29,41)	56 (19,37)	38 (13,14)
E	6 (2,07)	8 (2,76)	57 (19,72)	84 (29,06)	134 (46,36)
F	17 (5,89)	20 (6,92)	59 (20,41)	64 (22,14)	129 (44,63)

A. Okul demek sosyallik demektir. Okulda birçok etkinliğe katılıp arkadaş ortamında zamanı aktif ve verimli bir şekilde kullanma imkanı vardır. Uzaktan eğitimde sadece akademisyen ve öğrenci arasında bir akış mevcuttur.
B. Uzaktan eğitim sosyal realiteyi önemli ölçüde etkileyebilecek bir faktör olarak görünmektedir.
C. Uzaktan eğitim döneminde akademisyenler öğrencilerin birlikte çalışması için gerekli çevrimiçi iletişim ve etkileşim araçlarını sağlıyorlar.
D. Öğrenciler internet tabanlı etkileşim ile (uzaktan eğitim) sosyal ortamlarda fikirlerini söyleyememe gibi zorlukların üstesinden gelebilirler.
E. Öğrenci merkezli ortamlarda etkileşimin niteliği ve niceliği, öğrenme sonuçlarına olduğu kadar öğrenme sürecine de çok önemli etki yapar.
F. Uzaktan eğitim kişileri bireyselliğe ittiğinden tasvip etmiyorum.

Tablo 4. Uzaktan eğitim modelinin öğrencilerde akademik beklenti üzerine etkileri (N=289).

	1 (Kesinlikle Katılmıyorum) n (%)	2 (Katılmıyorum) n (%)	3 (Kararsızım) n (%)	4 (Katılıyorum) n (%)	5 (Tamamen Katılıyorum) n (%)
A	221 (76,47) (Hayır)				68 (23,52) (Evet)
B	25 (8,65)	42 (14,53)	64 (22,14)	70 (24,22)	88 (30,44)
C	184 (63,66)	61 (21,10)	26 (8,99)	10 (3,46)	8 (2,76)
D	24 (8,30)	32 (11,07)	50 (17,30)	66 (22,83)	117 (40,48)
E	23 (7,95)	35 (12,11)	66 (22,83)	63 (21,79)	102 (35,29)
F	74 (25,60)	60 (20,76)	85 (29,41)	25 (8,65)	45 (15,57)
G	8 (2,76)	11 (3,80)	6 (2,07)	18 (6,22)	246 (85,12)
H	9 (3,11)	4 (1,38)	15 (5,19)	29 (10,03)	232 (80,27)
I	5 (1,73)	6 (2,07)	11 (3,80)	25 (8,65)	242 (83,73)
J	12 (4,15)	6 (2,07)	19 (6,57)	34 (11,76)	218 (75,43)
K	8 (2,76)	6 (2,07)	17 (5,88)	32 (11,07)	226 (78,20)
L	41 (14,18)	41 (14,18)	56 (19,37)	46 (15,91)	105 (36,33)
M	61 (21,10)	35 (12,11)	61 (21,10)	43 (14,87)	89 (30,79)
N	64 (22,14)	45 (15,57)	70 (24,22)	42 (14,53)	68 (23,52)
O	38 (13,14)	51 (17,64)	65 (22,49)	55 (19,03)	80 (27,68)
P	53 (18,33)	80 (27,68)	81 (28,02)	33 (11,41)	42 (14,53)

A. Pandemi nedeniyle uygulanan uzaktan eğitim sisteminden memnun musunuz?
B. Pandemi nedeniyle uygulanan uzaktan eğitim sistemine düzenli olarak katılıyorum.
C. Uzaktan eğitimin örgün eğitimden daha verimli olduğunu düşünüyorum.
D. Uzaktan eğitimde canlı derslerin kaydedilmesi katılamadığım dersleri sonradan izleme imkanı sağladığından dersleri daha başarılı takip edebiliyorum.
E. Uzaktan eğitimin kullanımı eğitici ile iletişimimi zorlaştırmaktadır.
F. Uzaktan eğitim sisteminin not ortalamamı kötü etkileyeceğini düşünüyorum.
G. Pratik dersler için uzaktan eğitim yönteminin uygun olmadığını düşünüyorum.
H. Uzaktan eğitim ile uygulamalı dersleri anlamakta zorlanıyorum.
I. Uzaktan eğitim nedeniyle hastalar üzerinde uygulama yapamadığım için uygulama becerimin yetersiz olduğunu düşünüyorum.
J. Uzaktan eğitim nedeniyle pratik uygulama yapamadığım için hastalarla iletişim kurma becerimin olumsuz etkilendiğini düşünüyorum.
K. Uzaktan eğitimdeki pratik eğitim eksikliğinin meslek hayatımda beni olumsuz etkileyeceğini düşünüyorum.
L. Sınavların internet tabanlı ortamlarda yapılması sınava odaklanma problemi yaşamama neden oluyor.
M. İnternet tabanlı ortamlarda yapılan sınavlarda kağıt-kalem kullanmamak beni kötü etkiliyor.
N. İnternet tabanlı ortamlarda yapılan sınav için daha az çalışırım.
O. İnternet tabanlı ortamlarda yapılan sınavlarda sınav süremi verimli bir şekilde kullanamıyorum.
P. İnternet tabanlı ortamlarda yapılan sınavlarda daha başarısız olduğumu düşünüyorum.

Tablo 5. Cinsiyet, uzaktan eğitim deneyimi ve akademik sınıfa göre emosyonel durum, sosyal etkileşim düzeyi ve akademik beklenti etkilenimi bölümlerine verilen cevapların ortalama puanları ve test sonuçları.

	Emosyonel Etkilenim X±SD	Sosyal Etkilenim X±SD	Akademik Beklenti Etkilenimi X±SD
Cinsiyet			
Kadın	42±14,53	64±22,14	70±24,22
Erkek	61±21,10	26±8,99	10±3,46
p[a]	0,694	0,641	0,794
Uzaktan eğitim deneyimi	32±11,07	50±17,30	66±22,83
Yok	35±12,11	66±22,83	63±21,79
Var	60±20,76	85±29,41	25±8,65
p[a]	0,384	0,286	0,929
Akademik sınıf	11±3,80	6±2,07	18±6,22
1. Sınıf	4±1,38	15±5,19	29±10,03
2. Sınıf	6±2,07	11±3,80	25±8,65
3. Sınıf	6±2,07	19±6,57	34±11,76
4. Sınıf	6±2,07	17±5,88	32±11,07
p[b]	0,268	0,634	0,035*

*p<0,05. a: Mann Whitney U testi. b: Kruskal Wallis testi.

düzeyinden etkilendiği saptanmıştır.[24] Ek olarak, fiziksel aktivitenin anksiyete, depresyon ve strese hassasiyeti azalttığı ve kognisyonu olumlu yönde etkilediği bildirilmiştir.[25] Bu kapsamda, uzaktan eğitim ile birlikte fiziksel aktivitede meydana gelen kayda değer azalmanın, öğrencileri emosyonel olarak olumsuz yönde etkileyebileceği, öğrencilerin stres ve kaygı düzeyinde artışa sebep olabileceği düşünülmüştür. Öğrencilerde meydana gelebilecek olan bu emosyonel olumsuzlukların akademik beklenti ve akademik motivasyonu olumsuz yönde etkileyebileceği de öngörülmelidir. Kognisyonu olumlu yönde etkilediği bildirilen fiziksel aktivitenin uzaktan eğitim sebebiyle azalmış olması, öğrencilerin akademik beklenti ve akademik başarılarını etkilediği çalışmamızın sonuçları ile desteklenmiştir.

Öğrenciler, pandeminin getirdiği stres faktörlerinin yanı sıra değişen eğitim hayatına da adapte olabilmek için daha fazla çaba göstermek durumunda kalmıştır. Değişen eğitim-öğretim sistemi sadece akademik beklenti açısından değil aynı zamanda sosyal ve emosyonel açıdan da etkilere neden olmuştur. Uzaktan eğitim gereğince öğrenciler okula gitmediği için sınıf ortamındaki gibi bir sosyalleşme ortamına sahip olamamıştır. Çalışmamızda, öğrencilerin büyük çoğunluğu (%79,58) sosyal hayatının bittiğini, ders çalışırken sıkıldığını (%75,08) ve dışarı çıkamadıkları için mutsuz olduğunu (%84,76) belirtmiştir. Elde edilen sonuçlarımız, ev ortamı dışında gerçekleştirilen sosyal etkileşimlerin ruh haline olan olumlu yansımalarının azaldığını ve öğrencilerin emosyonel açıdan kendilerini çok mutsuz hissettiklerini göstermiştir. Çalışmamızın önemli bir sonucu da pandemi döneminde uygulanan uzaktan eğitim modelinin öğrencilerin okudukları üniversiteye olan aidiyet duygusuna zarar verdiğini göstermiştir. Konuyla ilgili yapılan çalışmalardan birinde, uzaktan eğitimin öğrencilerin sorumluluk duygusunu geliştirmediğini ve öğrencilerin uzaktan eğitimle kendilerini yeterince ifade edemediklerini tespit etmiştir.[6] Işık vd. çalışmalarında, öğrencilerin internet üzerinden ders çalışırken sıkıldıklarını,[26] Aktaş vd. de öğrencilerin çoğunluğunun sosyal hayatının geçici olarak bittiğini düşündüğünü saptamıştır.[27] Literatür çalışmaları, uzaktan eğitimin büyük bir oranda üniversite öğrencilerinin sosyal becerilerini önemli derecede olumsuz etkilediğini vurgulamaktadır.[6] Bizim çalışmamızın sonuçları sosyal etkilenim açısından incelendiğinde, katılımcıların %66,77'si uzaktan eğitimin kişileri bireyselliğe ittiği yönünde cevaplar vermiştir. Bu veri, öğrencilerin takım çalışmasından uzaklaşarak bireysel çalışmaya yöneldiği gerçeğini gözler önüne sermektedir. Çalışmamızdaki katılımcıların, öğrenci merkezli ortamlardaki etkileşimin öğrenme sonuçlarına olduğu kadar öğrenme süreçlerini de etkilediği yönünde cevaplar vermesi öğrenci merkezli ortamlarda öğrenim görmenin derslere olan motivasyonu artırmada önemli bir unsur olduğunu göstermektedir. Özses vd. çalışmalarında, öğrencilerin %33,3'ünün çevrimiçi derslerde motivasyonlarını korumakta zorlandıklarını bildirmişlerdir.[28] Avustralya'da fizyoterapi lisans öğrencileri ile yapılan nitel bir çalışmada öğrenciler, uzaktan eğitimdeki üniversite ortamında bulunma eksikliğinin ve uzun süre ekrana bakmanın getirmiş olduğu yorgunluğun öğrenme motivasyonunu azalttığını belirtmişlerdir.[29] Çalışmamızdan elde edilen bulgular, uzaktan eğitimin fizyoterapi ve rehabilitasyon öğrencilerinde sosyal ve emosyonel yönden olumsuz etkilere neden olduğunu, öğrencilerin ders konsantrasyonunu sağlamak ve korumada güçlük çektiğini, öğrencinin okuduğu okula olan aidiyet duygusunda azalmaya neden olduğunu, ders çalışma motivasyonunu düşürdüğünü, grup aktiviteleri yerine bireysel aktivitelere yönelmek zorunda kaldıklarını göstermiştir. Çalışmamızdan elde edilen bu sonuçların, henüz hazır olmayan bir eğitim modelinden mi kaynaklandığı, yoksa yaşanan pandemi süreci ile birleştiğinde uygulanan bir sistem olmasından mı kaynaklandığını net bir şekilde yansıtamamaktadır. Pandeminin azalması ile birlikte, bazı okullarda uygulanan hibrit eğitim modelinin de araştırılarak, uzaktan eğitim sistemine uyum sağlandığı dönemlerde benzer içerikli çalışmaların tekrarlanmasının önemli olacağı düşünülmektedir. Bu durum, uygulanan eğitim modelinin verimliliğinin sorgulanabilmesi bakımından da önemli olacaktır.

Pandemi nedeniyle uygulanan uzaktan eğitim sisteminden öğrencilerin birçoğunun

memnun olmadığı görülmüştür. Elde edilen sonuçlar, özellikle pratik dersler konusunda memnuniyetsizliğin %91,33 oranında olduğu tespit edilmiştir. Uzaktan eğitim sebebiyle öğrenciler üniversite ortamında bulunamamaları ve derslere bireysel olarak katılım sağlamaları nedeniyle pratik uygulama yapma imkanı bulamamışlardır. Bu durum öğrencilerin kendilerini pratik anlamda yetersiz hissetmelerine sebep olabileceğini düşündürmüştür. Bulut vd. çalışmamızın sonuçlarıyla tutarlı olarak uygulamalı eğitimler için uzaktan eğitimin yetersiz olduğunu vurgulamıştır.[30] Odyoloji bölümü öğrencileri ile yapılan bir çalışmada, öğrencilerin büyük çoğunluğu uzaktan yürütülen uygulamalı derslerin verimlilik açısından yetersiz olduğunu belirtmişlerdir.[28] Hemşirelik bölümü öğrencileri ile yapılan başka bir çalışmada, öğrencilerin uzaktan eğitimin uygulamalı bölümler için etkili bir yöntem olmadığını belirttiği görülmüştür.[31] Fizyoterapi bölümü eğitiminde dijital öğrenme yöntemleri ile geleneksel öğrenme yönteminin karşılaştırıldığı meta-analiz sonuçlarına göre geleneksel eğitimin bilgi ve pratik beceri kazanımı açısından uzaktan eğitim yönteminden üstün olmadığı gösterilmiştir.[32] Rossettini vd. Covid-19 pandemi döneminde İtalya'daki bir üniversitenin hazırlık seviyesi fizyoterapi öğrencilerinde yüz yüze ve uzaktan eğitimi değerlendirdikleri olgu-kontrol çalışmalarında, yüz yüze eğitim ile uzaktan eğitim arasında memnuniyet dereceleri açısından farklılık bulamamıştır.[33] Aynı çalışmada, her iki eğitim sistemi için sözel bir sınav ile katılımcıların performansı değerlendirilmiş ve uzaktan eğitim alan öğrencilerin daha yüksek performansa sahip oldukları gösterilmiştir.[33] Ng vd. nitel çalışmalarında öğrenciler, teorik bilgiyi pratiğe dökebilmek amacıyla yüz yüze eğitimi pratik dersler açısından bir gereklilik olarak gördüklerinden bahsetmişlerdir.[29] Konuyla ilgili literatüre bakıldığında farklı sonuçlar gözlense de bizim çalışmamızdan elde edilen sonuçlar, özellikle akademik beklenti kapsamında uygulamalı dersler bakımından uzaktan eğitim modelinin pek uygun olmadığı görüşünü desteklemektedir. Ancak, canlı derslerin kaydedilmesinin dersleri tekrar izleme imkanı sağlaması bakımından uzaktan eğitim modelinin olumlu bir yönü olarak düşünülebilir. İç mimarlık bölümü öğrencileri ile yapılan bir çalışmada, derslerin kayıt altına alınması derslerin kaçırılması durumunda dersleri tekrar izleme imkanı sağladığı için öğrenciler tarafından olumlu olarak değerlendirilmiştir.[22] Aynı çalışmada, derslerin tekrar izleme olanağının bulunmasının derse katılım oranını azalttığı belirtilmiştir. Çalışmamızın sonuçlarına bakıldığında ise öğrencilerin %54,66'sının derslere düzenli olarak katıldığı görülmüştür. Çalışmamızda katılımcılar, uzaktan eğitimdeki pratik eğitim eksikliğinin kendilerini meslek hayatlarında olumsuz yönde etkileyeceğini düşündüklerini belirtmiştir. Ancak, Puljak vd. nin çalışmalarındaki katılımcılar uzaktan eğitimdeki pratik eğitim eksikliğinin gelecekteki meslek hayatlarında kalıcı sonuçlara neden olmayacağı yönünde cevaplar vermiştir.[18]

Çalışmamızda sosyal, emosyonel ve akademik beklenti etkilenimi skorları incelendiğinde, kadın ve erkek cinsiyet açısından anlamlı farklılık görülmemiştir. Barış (2015) üniversite öğrencilerinde uzaktan eğitime karşı tutumlarını incelediği çalışmasında, tutum puanlarında cinsiyet değişkenine göre anlamlı bir fark bulamamıştır.[34] Özüdoğru vd. Fizyoterapi ve Rehabilitasyon bölümü öğrencilerinde uzaktan eğitim deneyimlerini incelediği çalışmasında, cinsiyete göre anlamlı farklılık tespit edilmemiştir.[35] Literatürde, cinsiyet açısından benzer sonuçlara sahip çalışmalar olmasına karşın sonuçlar yine de farklılık göstermektedir. Altuntaş Yılmaz'ın (2020) öğrencilerin uzaktan eğitim tutumlarını incelediği çalışmasında, erkek öğrencilerin kız öğrencilere göre uzaktan eğitime katılımlarının daha az olduğu sonucuna ulaşılmıştır.[36] Aktaş vd. spor bilimleri öğrencilerinin uzaktan eğitime karşı tutumlarını incelediği çalışmasında cevaplar arasında cinsiyete göre anlamlı farklılıklar bulmuştur.[27]

Çalışmamızda, emosyonel ve sosyal etkilenim skorlarında akademik sınıf düzeyi açısından gruplar arasında anlamlı bir farklılık görülmemiştir. Akademik beklenti etkilenimi bölümünde ise ikinci sınıflar anlamlı bir fark oluşturmuştur. Şavkın vd. çalışmalarında, uzaktan eğitim tutum skorlarının birinci ve dördüncü sınıf öğrencilerinde daha yüksek olduğunu bildirmişlerdir.[37] Altuntaş Yılmaz (2020) ise çalışmasında çevrimiçi katılım düzeylerinde ikinci sınıfların derslerini daha az

takip ettiğini, dördüncü sınıfların da anlamlı olarak daha fazla katılım gösterdiğini belirtmiştir.[37] Elde edilen bulgulardaki bu farklılıklar akademik beklenti etkileniminde akademik sınıf derecesinin daha fazla araştırılması gerektiğini düşündürmüştür.

Çalışma, pandemi şartlarında yapıldığı için pandemi şartlarının olmadığı koşullarda da uzaktan eğitimin etkilerinin gelecek çalışmalarda araştırılması önerilmektedir. Ayrıca, çalışmanın sonuçlarında yer alan yüz yüze eğitimin uzaktan eğitimden daha başarılı olması sonucuna istinaden, uzaktan eğitim modelinin iyileştirilmesi ve bölüme uygun hale getirilmesi için neler yapılabileceği gelecekteki çalışmaların konusu olabilir. Bunun yanında, kullanımı yaygınlaşan hibrit eğitim modelinin teorik ve pratik dersleri kapsayan Fizyoterapi ve Rehabilitasyon bölümü için uygunluğu araştırılmalıdır.

Limitasyonlar

Çalışmamızın limitasyonu, anket çalışmasına katılım ve soruların eksiksiz cevaplandırılması konusudur. Her ne kadar hedeflenen örneklem grubuna ulaşılmış olsa da daha çok öğrenciye ulaşılmasının elde edilecek sonuçların yorumlanmasına önemli derecede katkı sağlayacağı düşünüldüğünden daha çok katılımcıya ulaşılması hedeflenmiş, fakat başarılı olunamamıştır. Anket çalışmasına katılım düşünülenin altında kalmıştır. Bireylerin bu tarz anket çalışmalarına vakit ayırmak istemedikleri gözlenmiştir. Bundan sonra yapılması planlanan çalışmalarda, bu durumun göz önünde bulundurulması elde edilen verilerin daha çok genellenebilmesi bakımından önemli olarak düşünülebilir.

Sonuç

Fizyoterapi ve Rehabilitasyon bölümündeki dersler bir bütün olarak düşünüldüğünde temel olarak eğitimin amacı öğrencilerin teorik dersler kadar pratik derslerde de edindikleri kazanımları meslek hayatına entegre edebilmelerini sağlamaktır. Çalışmamızda, katılımcılar uzaktan eğitimle yapılan uygulamalı dersleri anlamakta zorlandıklarını, hastalar üzerinde uygulama yapma imkanı bulamadıkları için uygulama becerilerinin yetersiz kaldığını ve uzaktan eğitimin, temeli pratik uygulama derslerine dayanan Fizyoterapi ve Rehabilitasyon bölümü için uygun olmadığını belirtmişlerdir. Bu sonuçlar doğrultusunda, uygulamalı dersler için uzaktan eğitimin yetersiz kaldığı ortaya konmaktadır. Öğrencilerin uzaktan eğitimden akademik beklenti kadar emosyonel ve sosyal açıdan etkilendiği göz ardı edilmemelidir.

Teşekkür: *Yok*

Yazarların Katkı Beyanı: CYG: konsept/fikir gelişimi, veri toplama/işleme, literatür araştırması, veri analizi/yorumlama, yazma; **AT:** konsept/fikir gelişimi, veri toplama/işleme, literatür araştırması, veri analizi/yorumlama, yazma; **FA:** konsept/fikir gelişimi, veri toplama/işleme, literatür araştırması, veri analizi/yorumlama, yazma; **TT:** konsept/fikir gelişimi, veri toplama/işleme, literatür araştırması, veri analizi/yorumlama, yazma.

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ORIGINAL ARTICLE

Effect of hypertension on muscle strength, balance, and mobility in older adults

Yaşlı erişkinlerde hipertansiyonun kas gücü, denge ve mobiliteye etkisi

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Abstract

Purpose: Hypertension (HT) can exacerbate impaired blood pressure regulation and thus increase the risk of falls. The higher incidence of HT and impaired balance in older adults may lead to the hypothesis of an association between HT and physical function in older individuals. The purpose of this study was to investigate the effects of HT on muscle strength, balance, and mobility in older adults and the relationship between them.

Methods: Sixty-one older adults were included in the study and individuals with systolic blood pressure ≥140 mmHg or diastolic blood pressure ≥90 mmHg formed the Hypertensive group (n=31), while the others formed the Normotensive group (n=30). Quadriceps Femoris (QF) muscle strength was evaluated with a hand-held dynamometer, mobility was evaluated with the Timed Up and Go Test (TUG), balance performance was evaluated with the Nintendo Wii Fit Balance Board (NWBB), and physiological age was evaluated with Wii Fit Age (WFA). The systolic and diastolic blood pressure were measured before the balance test.

Results: TUG and NWBB scores between groups were significantly better in the Normotensive group ($p<0.05$). In both Hypertensive and Normotensive groups, there was a negative correlation between QF muscle strength and TUG score, and a positive correlation between QF muscle strength and NWBB score ($p<0.05$).

Conclusion: HT may worsen mobility and balance in older adults. Further studies are required to better understand HT and establish better appropriate interventions for older hypertensive adults.

Keywords: Hypertension, Postural balance, Functional status, Frail elderly, Exergaming.

Öz

Amaç: *Hipertansiyon (HT), kan basıncı regülasyonunda bozulma ile şiddetlendirerek düşme riskini arttırabilmektedir. Yaşlı erişkinlerde daha yüksek HT insidansı ve bozulmuş denge, HT ile fiziksel fonksiyonlar arasında bir ilişki olduğu hipotezine yol açabilmektedir. Bu çalışmanın amacı, yaşlı erişkinlerde hipertansiyonun kas kuvveti, denge ve mobiliteye etkisini ve onlarla ilişkisini incelemekti.*

Yöntem: *Çalışmaya 61 yaşlı birey dahil edildi ve sistolik kan basıncı ≥140 mmHg veya diyastolik kan basıncı ≥90 mmHg olan bireyler Hipertansif grubu (n=31), diğerleri Normotansif grubu (n=30) oluşturdu. Quadriceps Femoris (QF) kas gücü dinamometre ile, mobilite Zamanlı Kalk ve Yürü Testi (ZKYT), denge performansı Nintendo Wii Fit Balance Board (NWBB) ve fizyolojik yaş Wii Fit Age (WFA) ile değerlendirildi. Denge testinden önce sistolik ve diyastolik kan basıncı ölçüldü.*

Bulgular: *Gruplar arasında ZKYT ve NWBB skorları, Normotansif grubunda anlamlı olarak daha iyiydi ($p<0,05$). Hem Hipertansif hem de Normotansif grubunda, QF kas kuvveti ile ZKYT skoru arasında negatif yönde, QF kas kuvveti ile NWBB skoru arasında pozitif yönde anlamlı ilişki bulundu ($p<0,05$).*

Sonuç: *HT, yaşlı erişkinlerde mobiliteyi ve dengeyi kötüleştirebilmektedir. HT'yi daha iyi anlamak ve yaşlı hipertansif yetişkinleri için daha uygun müdahaleler oluşturmak için daha fazla çalışmaya ihtiyaç vardır.*

Anahtar kelimeler: *Hipertansiyon, Postür dengesi, Fonksiyonel durum, Kırılgan yaşlılar, Exergaming.*

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INTRODUCTION

High blood pressure is a common condition seen mostly in older adults.[1] As a result of aging, a linear increase in systolic blood pressure (SBP) occurs as a result of increasing stiffness in the arteries. Similarly, diastolic blood pressure (DBP) is observed to be plateaued or decreased gradually by aging.[2] Hypertension (HT) is the detection of SBP≥140 mmHg or DBP≥90 mmHg for at least three times, and this definition does not vary depending on age.[3]

Mobility is known as a critical feature of the independent function.[4] Although HT has silent symptoms, it can cause significant symptoms that increase the likelihood of reduced physical activity.[5] Due to the effect of HT on white matter hyperintensities in the brain, cerebrovascular dysfunction, general lean muscle mass, and inflammation or changes in the renin-angiotensin system, the above symptoms can be alleviated in patients with HT.[6] In particular, white matter hyperintensities are closely related to HT and have been associated with impaired mobility.[7]

Maintaining postural balance is one of the most important capabilities to prevent falls in the elderly population.[8] However, sensory and motor control of postural balance is often affected with aging.[9] Cho et al.[10] stated that postural balance control is necessary for mobility as well as stability during functional activities. In addition, they noted that lack of balance depending on loss of muscle strength may lead to falls in older adults. Therefore, a better understanding of the relationship between HT and postural balance control in older adults may help to better determine the risk of falls.[8] Hausdorff et al.[11] evaluated the gait and balance in hypertensive older adults in their study, and although they suggested that HT may increase fall risk by affecting the control of gait and balance, they did not evaluate the relationship between HT and gait and balance in hypertensive and normotensive older adults.

In recent years, video game consoles have become very popular as a means of evaluation and intervention.[12] Nintendo Wii Fit is one of the systems used to assess weight-bearing asymmetry (WBA) in people with impaired balance.[13] The Nintendo Wii Fit Balance Board (NWBB) can provide clinicians with a new way to evaluate the WBA. The sensors on the balance board measure the center of pressure of the user and the amount of weight-bearing on each foot.[14]

To the best of our knowledge, there is no study evaluating the relationship between muscle strength, balance, and mobility in hypertensive and normotensive older adults. The primary purpose of this study was to evaluate the effects of HT on muscle strength, balance, and mobility in older adults, and the secondary aim was to investigate the relationship of HT with these parameters.

METHODS

Study sample

The study was conducted with older adults who followed-up in the internal medicine outpatient clinic of Istanbul Medipol University Hospital. An oral and written informed consent in accordance with the procedures was obtained from each participant before inclusion in the study. This study was approved by the Istanbul Medipol University Non-Invasive Clinical Research Ethics Committee with the approval number 108400987-297. This study is a single-blind (evaluators) cross-sectional study.

Ninety elderly people followed-up in the internal medicine outpatient clinic of Istanbul Medipol University Hospital were evaluated for eligibility for the study. Sixty-one older adults who met the inclusion criteria were included in the study and divided into two groups as Hypertensive Group (n=31) and Normotensive Group (n=30). The flow diagram of the study is shown in Figure 1.

Study design

Inclusion criteria were age 65 and older, scoring 6 points on Katz Basic Activities of Daily Living Scale;[15] and scoring >24 on the Mini-Mental State Examination (MMSE) Test.[16] Individuals with a systolic blood pressure ≥140 mmHg or diastolic blood pressure ≥90 mmHg formed the Hypertensive Group, while the others formed the Normotensive Group. Patients with neurological disorders with continuing disabilities, psychiatric disorders requiring medication, cardiovascular diseases, active cancer, kidney or liver disease, acute diseases, or diabetes requiring insulin or hypoglycemic drugs were excluded from the study. 10 subjects who had psychiatric disorders requiring medication, 12 subjects who had cardiovascular diseases, and 7 subjects who had diabetes requiring insulin were excluded from

the study. The study was completed with 61 participants.

All hypertensive subjects were diagnosed with HT by a cardiologist and were receiving two or fewer anti-hypertensive medications for approximately 5 years under the control of a cardiologist.

Outcome measurements

Participants were evaluated in terms of Quadriceps Femoris (QF) muscle strength, mobility, balance performance, and physiological age. The SBP and DBP were measured before the balance test.

Isometric muscle strength was assessed in both QF muscles with the hand-held dynamometer. The strength of the QF is one of the intrinsic factors that has been shown to affect knee joint function. It is clear that lower extremity strength plays an important role in knee joint shock attenuation during weight-bearing activities. So we measured the QF muscle for lower extremity isometric muscle strength. Evaluations were made using a standard seat. The back of the seat was angled backwards by 105° to allow 75° flex in the body. The knee was positioned at a 60° angle and secured with bands around the body, waist, hip, and ankle. Each participant was asked to hold the sides of the seat with both hands during the test, but attention was paid to compensation. QF isometric muscle strength was measured with three 10-second maximum isometric contractions. Rest periods of 3 seconds were given between each contraction. Verbal encouragement was given throughout the whole test to obtain maximum strength from the participants. The test was performed by applying force to the lower extremity. The measurements were repeated three times, and the mean values were taken.

Mobility was measured with the Timed Up and Go Test (TUG). The test consists of different mobility tasks such as walking with a straight head, turning, sit to stand and stand to sit which require controlling balance. The participant will sit on a standard chair, and then he/she will stand up and walk in the line of 3 meters, then will turn around and walk back to the chair and sit down. The test starts when the examiner says "go" and stops with the participant's buttocks touching the seat. The time of this action was recorded in seconds.[17]

The balance performance was assessed with the NWBB (Figure 2).[17,18] During the Nintendo Wii measurement, a general analysis of the body was performed when the participant stood relaxed looking forward to the screen with both arms in a neutral position on the NWBB. The center of pressure was measured during this step to detect the percentage of weight-bearing distributed to each foot. Then, the participants were asked to stand on one leg to assess their single-leg standing balance. Since the dominant leg in all the participants was the right leg, the single-leg balance test was performed only on the left leg. The situation and the duration of the test were explained to the participants, and all the participants were instructed to stand with their right leg raised but not touching their left leg or the balance board. All the participants were barefoot and were asked to complete the 30-second test but no encouragement was given to them. This balance performance was reported in percentages after finishing the test and performance score was assigned to participants who completed all 30 seconds. At the end of the test, the scores for the "single-leg balance duration (seconds- SLB-S)", the "single-leg balance performance (SLB-P)" and the "Wii Fit Age (WFA)" were obtained.[19] WFA was calculated according to the balance test results, taking into account the actual age of the individual.[20] Additionally, after all participants rested for 5 minutes in the lying position, their blood pressure in sitting position was measured 3 times consecutively and their mean values were taken.

Sample size planning

The sample size was determined using the G*power sample size calculator.[21] The required sample size was 58 with a 85% power and 15.05% confidence interval (α=0.05), considering the minimal clinically detectable change of 0.96 (0.93-0.98) points in the TUG.[22]

Statistical analysis

IBM SPSS (Statistical Package for Social Science) 25.0 for Windows program was used for statistical analysis.[23] The normal distribution of the variables was determined by the Kolmogorov-Smirnov Test. Parametric tests were applied because it was determined that they showed normal distribution. The difference

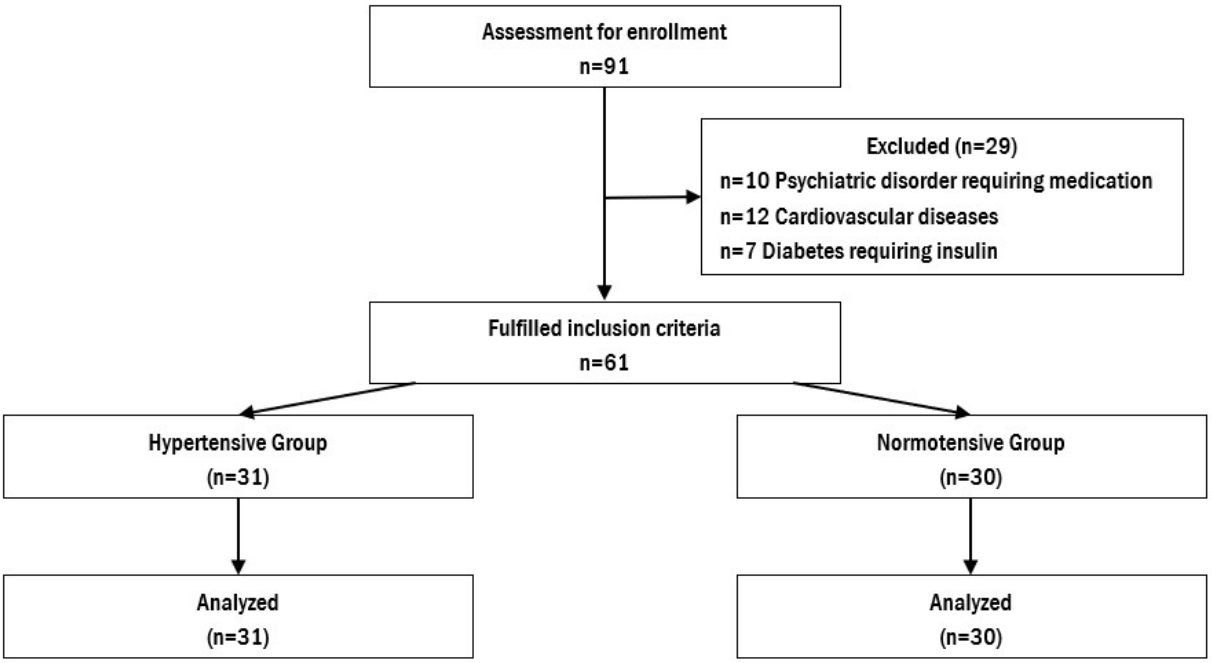

Figure 1. STROBE (Strengthening the Reporting of Observational Studies in Epidemiology Statement) Flow Diagram.

between the groups was analyzed by the Independent Sample t Test. The correlation between the data was evaluated by Pearson Correlation Test. As for cut-off values, the -1.0 correlation was considered a perfect negative correlation, and the 1.0 correlation was considered a perfect positive correlation. Significance value for all tests applied to variables with normal distribution $p<0.05$. It was aimed to enroll at least 60 participants considering the drop-outs.

RESULTS

Sixty-one participants (32 female, 29 male) were included in this study. There was a statistically significant difference in terms of age, SBP, and DBP between groups ($p<0.05$). The distribution of demographic and clinical data was shown in Table 1.

The TUG score, SLB-S time, SLB-P time, and WFA scores were found statistically significant in favor of the Normotensive Group ($p<0.05$). There was no statistically significant

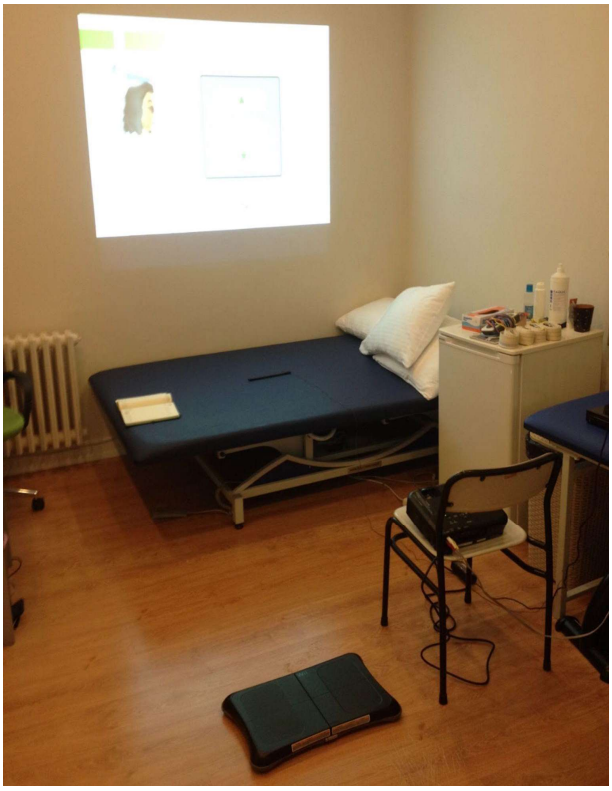

Figure 2. Wii Fit Balance.

difference in terms of QF muscle strength between groups (p>0.05). The differences between groups were shown in Table 2.

Correlations in the Hypertensive Group were shown in Table 3. Significant positive correlations were found between SLB-S time and Right QF (r=0.435), and between SLB-S time and Left QF (r=0.466). Significant negative correlations were found between the Right QF and TUG score (r=-0.555), and between the Left QF and TUG score (r=-0.548) and WFA score (r=-0.372). Correlations in the Normotensive Group were shown in Table 4. Significant positive correlations were found between Right QF and SLB-S time (r=0.459) and SLB-P time (r=0.545), and between Left QF and SLB-S time (r=0.434) and SLB-P time (r=0.516). Significant negative correlations were found between Right QF and TUG score (r=-0.762) and WFA score (r=-0.471), and between Left QF and TUG score (r=-0.676) and WFA score (r=-0.429).

DISCUSSION

In this study, it was aimed to investigate the effects and relationships of HT on muscle strength, balance, and mobility in older adults. Mobility and balance scores were negatively affected in hypertensive than normotensive counterparts. According to our results, it could be observed that HT may more affect mobility and balance than normotensives. There was a negative correlation between muscle strength and mobility, and a positive correlation between muscle strength and balance in both groups. Mobility and balance may be affected by HT in older adults.

Aging is characterized by an accelerated decrease in muscle mass and function, including strength or performance.[24] In particular, the progressive decrease in muscle strength of the lower extremities may affect mobility, causing fragility and functional disability.[25] HT is quite a common disease in older adults and has many consequences.[26] Recent studies reported that high blood pressure is a known risk factor for mobility and disability will increase in older adults with hypertensive compared to normotensives.[27-30] HT has also been strongly associated with rapid decreases in walking speed, an indicator of functional status for the elderly.[31] In our study, there was a significant

Table 1. The demographic data of the groups.

	Hypertensive Group (n=31)	Normotensive Group (n=30)		
	X±SD	X±SD	t	p
Age (year)	76.65±9.24	70.93±9.20	2.418	0.019*
Height (m)	1.62±0.10	1.62±0.11	0.053	0.958
Body weight (kg)	76.72±16.33	77.97±13.99	-0.318	0.751
Body mass index (kg/m^2)	28.93±4.71	29.63±4.25	-0.608	0.546
Blood pressure				
Systolic blood pressure (mmHg)	147.97±19.46	124.17±11.14	5.835	<0.001
Diastolic blood pressure (mmHg)	90.48±14.39	79±16.68	2.881	0.006*
	n (%)	n (%)	x^2	p
Gender				
Female	14 / 45	18 / 60	1.346	0.246
Male	17 / 55	12 / 40		
History of falling				
Yes	13 / 42	7 / 23	2.394	0.122
No	18 / 58	23 / 77		
Balance Problems				
Yes	12 / 39	11 / 37	0.027	0.869
No	19 / 61	19 / 63		

* p<0.05. t: t test. X^2: Chi-Square Test.

Table 2. Muscle strength, mobility balance performance, and physiological age of the groups.

	Hypertensive Group (n=31)	Normotensive Group (n=30)		
	X±SD	X±SD	t	p
Muscle strength				
Right Quadriceps femoris	11.69±3.34	13.29±3.18	-1.919	0.060
Left Quadriceps femoris	11.96±3.26	13.19±3.13	-1.499	0.139
Mobility				
Timed Up and Go Test	17.37±10.06	12.62±6.11	2.220	0.030*
Balance Performance				
Single Leg Balance-Seconds	14.13±9.89	22.62±9.93	-3.344	0.001*
Single Leg Balance-Performance	18.30±20.31	42.87±24.60	-4.259	<0.05
Physiological Age				
Wii Fit Age	72.97±18.19	58.87±15.98	3.211	0.002*

* p<0.05. t: t test.

Table 3. Correlation in the Hypertensive Group and the Normotensive Group.

	Timed Up and Go r (p)	Single Leg Balance-Seconds r (p)	Single Leg Balance-Performance r (p)	Wii Fit Age r (p)
Hypertensive Group				
Right Quadriceps femoris	-0.555 (0.001)*	0.435 (0.014)*	0.300 (0.101)	-0.319 (0.080)
Left Quadriceps femoris	-0.548 (0.001)*	0.466 (0.008)*	0.343 (0.059)	-0.372 (0.039)*
Normotensive Group				
Right Quadriceps femoris	-0.762 (<0.001)	0.459 (0.011)*	0.545 (0.002)*	-0.471 (0.009)*
Left Quadriceps femoris	-0.676 (<0.001)	0.434 (0.017)*	0.516 (0.004)*	-0.429 (0.018)*

* p<0.05. r: Pearson's Correlation Test.

difference in lower extremity major muscle strength in hypertensive older adults compared to normotensives. When the fall history of elderly individuals with HT was examined, it can be declared that the decrease in muscle strength is due to the negative effects on balance and normal walking patterns. The significant age difference between the hypertensive and normotensive groups should also be considered as a factor affecting muscle strength and thus other parameters related to muscle strength.

The balance control is a multifactorial system and is very complex.[32] As a result of HT drug treatment, alterations in blood flow may occur in conjunction with rapid changes in blood pressure, possibly compromising the body's balance control mechanism. Standing balance problems are common in older people, and they're linked to falls, hospitalization, poor quality of life, and high rates of morbidity and mortality.[33] Maintaining postural balance is another important ability to prevent falls in the elderly population.[8] HT can adversely affect balance by damaging large arteries and reducing microcirculation in specific functional areas.[32] Furthermore, in HT, rapid fluctuations in blood pressure followed by rapid decreases in blood flow may interfere with the mechanisms that control postural balance. In a study of Chang et al.[19] the validity and reliability of the NWBB have been investigated whether it can be used in the assessment of balance in older

adults. They suggested that while clinical testing of balance with balance master systems is relatively expensive, spacious and probably not affordable for every clinician and researcher, a somatosensory gaming console named Nintendo Wii which has gained its popularity in recent years could be used to assess balance. To our knowledge, this is the first study to investigate the relationship between balance performance and HT with NWBB. In our study, the evaluation of the NWBB showed that there was a difference in parameters of SLB-S and SLB-P in hypertensives compared to normotensives. This result may indicate that the negative physiological change caused by HT affects balance and mobility. In addition, as a result of this deterioration in balance, it may be said that there may be a higher history of falls especially in older adults with HT.

In the NWBB system, a physiological age calculation is made based on the functional capacities of individuals. Each body test calculates and updates the player's WFA, a rough estimate of the player's physical strength in relation to his/her actual age. Although there was no significant difference between the hypertensive and normotensive groups for body mass index, the significant difference for WFA in favor of individuals in the normotensive group can be considered as an objective result of the negative effects of HT. This finding shows that the interaction of these factors in older adults with HT can cause problems with everyday functioning.

Poor physical function and physical disability are associated with high blood pressure in older adults.[7] The capacity to walk at a moderate pace, which is critical to older adults' community independence, is essential for social and functional activities.[34] Mobility is a critical feature of working independently. Walking speed is regarded as a reliable indicator of physical fitness for predicting negative health effects and mortality.[35] The decrease in gait speed can be an early precursor to the decline in physical function, the development of disability and the loss of independence.[36] Observational evidence suggests a faster decline in walking speed in adults with high blood pressure. In the Cardiovascular Health Study, participants with a blood pressure of >140/90 mmHg had a faster rate of decline in gait speed than those without HT.[7] Similarly, in the LIFE-Pilot study, researchers found that wider pulse pressure was associated with slower gait.[37] Interestingly, in a study of older adults with HT, parameters of walking function were found to be worse, although not slower gait speed.[11] Hausdorff et al.[11] studied 24 community-dwelling 65 to 90 years old healthy subjects with no report of a disturbance in their walking. The results of the TUG test were better in the normotensive group rather than the hypertensive group. In our study, it was concluded that mobility deteriorated in hypertensive group when compared with normotensives. Furthermore, it may be said that the negative correlation between TUG and balance supports these results. It can be hypothesized that this is due to the physiological changes caused by HT in muscle mass and volume and body systems. This condition highlights the importance of muscular strengthening and stretching in hypertensive older adults to prevent loss of balance and falls.

Limitations

The limitation of this study was that balance was not evaluated with a gold standard scale.

Conclusion

In conclusion, it was observed that HT might have a negative effect on balance and mobility, two crucial indicators and mediators of physical function and independence in older adults. Further studies are required to better understand the biological mechanism that associates HT with physical disability and to develop appropriate intervention strategies for hypertensive older adults.

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final approval of the version to be submitted

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ORIGINAL ARTICLE

Reliability and validity of the Turkish version of the Physical Activity Barrier Scale for people who are blind or visually impaired

Kör veya görme engelli bireyler için Fiziksel Aktivite Bariyer Skalası'nın Türkçe versiyonunun güvenirliği ve geçerliği

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Abstract

Purpose: The aim of this study was to investigate the validity and reliability of the Turkish version of the Physical Activity Barrier Scale (PABS) for visually impaired individuals.

Methods: People with visually impaired, low vision (n=53) and blind people (n=84), a total of 137, were participated in the present study. The physical activity barriers of the participants were evaluated with the PABS. The International Physical Activity Questionnaire (IPAQ-Long Form) was used to determine the physical activity level of the participants. Internal consistency was determined by using Cronbach's alpha and test-retest reliability was determined by using the intra-class correlation coefficient (ICC).

Results: The mean age of the participants was 43.03±13.75 years and the mean body mass index was 26.11±4.77 kg/m^2. Cronbach's alpha for the PABS was 0.933 for the test and 0.894 for the re-test measurements. The test-retest ICC values of the PABS varied between 0.563 and 0.950. The mean physical activity level of the participants was found as 4049.43±4956.59 METXminutes/week. There was no statistically significant correlation between the total scores of the PABS and the IPAQ (p>0.05).

Conclusion: There is currently no specific questionnaire regarding physical activity and its barriers for visually impaired individuals in Turkey. The study showed the reliability of the Turkish version of the PABS for individuals with visual impairment.

Keywords: Exercise, Physical activity, Reliability and validity, Visually impaired people.

Öz

Amaç: *Çalışmamızın amacı, görme engelli bireylere yönelik Fiziksel Aktivite Bariyer Skalası (FABS)'nın Türkçe versiyonunun geçerlik ve güvenirliğinin araştırılmasıdır.*

Yöntem: *Çalışmamız az gören (n=53) ve kör (n=84) bireyler olmak üzere toplam 137 katılımcıdan oluşmaktaydı. Fiziksel aktivite bariyerleri FABS kullanılarak değerlendirildi. Uluslararası Fiziksel Aktivite Anketi (IPAQ-Uzun Form) katılımcıların fiziksel aktivite düzeyini belirlemek amacıyla kullanıldı. Cronbach's alpha kullanılarak iç tutarlılık, sınıf içi korelasyon katsayısı (ICC) kullanılarak test-retest güvenirliği belirlendi.*

Bulgular: *Katılımcıların ortalama yaşları 43,03±13,75 yıl, ortalama vücut kütle indeksleri ise 26,11 ± 4,77 kg/m^2'ydi. FABS'ın Cronbach's alpha değerleri test ölçümlerinde 0,933, re-test ölçümlerinde ise 0,894'tü. Katılımcıların ortalama fiziksel aktivite seviyesinin 4049.43±4956.59 METXdakika/hafta olduğu bulundu. FABS'ın test-retest ICC değerleri 0,563 ile 0,950 arasında değişti. FABS ile IPAQ toplam puanları arasında anlamlı bir korelasyon yoktu (p>0,05).*

Sonuç: *Türkiye'de görme engelli bireylerin fiziksel aktivite ve bariyerleri ile ilgili spesifik bir anket bulunmamaktadır. Bu çalışma görme engelli bireyler için FABS'ın Türkçe versiyonunun güvenirlir olduğunu gösterdi.*

Anahtar kelimeler: *Egzersiz, Fiziksel aktivite, Güvenirlik ve geçerlik, Görme engelli bireyler.*

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INTRODUCTION

Visual impairment consists of blindness and low vision. Blindness refers to the complete loss of vision and no perception or projection of light. Low vision, on the other hand, is a visual functional impairment that continues after standard refractive corrections, and a visual acuity of less than 20/60 while still retaining the capacity to plan and perform a task.[1-3] When visually impaired individuals have a loss of vision from birth, their motor development may be delayed. Having problems in reaching and finding objects during activities, difficulty in bringing the hands to the midline due to coordination deficiency and a defect on visual stimuli during mobilization may result in activity limitations.[4,5] Indeed, children and adolescents with visual impairments have low physical activity levels.[6]

Physical activity refers to any movement produced by skeletal muscles that requires energy consumption.[7] The 2013 AHA/ACC/TOS guidelines for the management of weight and obesity in adults recommend to perform physical activity of ≥150 minutes per week.[8]

According to the World Health Organization's International Classification of Functioning, Disability and Health (ICF), the physical functions and physical activity habits of individuals with disabilities are significantly affected by environmental and personal factors, which may act as either facilitators or barriers.[9]

Longmuir and Bar-Or showed that the physical fitness levels of visually impaired individuals were lower than controls.[10] Moreover, they also reported that visually impaired young people are one of the most sedentary groups among other disability groups. It has been predicted that mobilization will be adversely affected as a result of visual impairment.[10,11]

Visually impaired individuals may be unable to participate in physical activities due to personal limitations resulting from general muscle weakness, tightness of muscles and impaired balance.[5] Other barriers for the participation in physical activities may include environmental limitations, such as the lack of physical activity spaces accompanied by professionals and the lack of proper or suitable equipment, halls, or pools suited to people with disabilities.[12]

Perceived barriers for the participation in physical activity and exercises may vary from person to person depending on their demographic characteristics. Although personal and environmental barriers for visually impaired individuals need to be addressed separately, there is insufficient information in the literature about valid and reliable questionnaires which assess the barriers to prevent the regular participation in physical activity and exercises.[13] Therefore, the aim of our study was to develop the Turkish version of the Physical Activity Barrier Scale (PABS) to determine its appropriateness for Turkish society and the effectiveness of its use by researchers.

METHODS

Participants

The study was carried out at Hacettepe University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation between January 2016 and August 2016. Inclusion criteria were being 17 years of age or above; being blind or having low vision; having sufficient cooperation; having no cognitive or emotional problems; participating voluntarily in the study, and signing the informed consent form. The study was approved by the Ethics Committee of Hacettepe University (GO 16 / 79-03).

Measures

The demographic information of the participants, such as their age, gender, weight, body mass index (BMI), diagnoses, occupation, educational status, visual acuity, and the duration of visual impairments etc. were recorded.

Instruments

Physical Activity Barrier Scale for Blind and Visually Impaired Individuals

The PABS for Blind and Visually Impaired Individuals was developed by Lee et al. This scale is composed of 48 questions that investigate the factors that prevent the participation in exercises and ask whether each factor listed is a hindrance to performing physical activities, and if yes, its frequency. The categories of the scale are: environmental

factors (such as exercise facilities or the weather), social influences (such as family support), psychological aspects (such as motivation), personal matters (such as time), health-related factors (such as pain or disabilities), safety factors (such as fear of injury), knowledge related factors (such as a lack of skills), and factors related to visual impairment (such as dim or bright lights).[14] Before starting the present study, approval was obtained to translate the PABS into Turkish.

International Physical Activity Questionnaire

The physical activity level of the participants was assessed by the International Physical Activity Questionnaire-Long Form (IPAQ). With this questionnaire, individuals are asked about the time they have spent on work, transportation, housework, housekeeping and care of the family, rest, and physical activity during the last 7 days. The total physical activity score (MET-min/week) was found by calculating the duration of severe and moderate activity and gait, and converting them to the Metabolic Equivalent (MET) corresponding to the basal metabolic rate. The total sitting time was also recorded. Saglam et al. demonstrated the reliability and validity of the Turkish version of this questionnaire.[15] The Turkish version of the IPAQ was used in the present study, and approval was obtained for its use.

Procedures

We used the guidelines for the cultural adaptation and translation of the PABS. The translation from English to Turkish was performed by two different and independent native authors. The two Turkish forms were compared, and inconsistencies were discussed. Following this, two native English speakers retranslated the Turkish form to English. The English form was then compared with the original English version to detect possible mistakes. The pre-final version of the Turkish PABS was tested on 10 people and it was reviewed for cultural adaptation.

Statistical analysis

We used test-retest reliability and internal consistency to evaluate reliability. The intraclass correlation coefficient (ICC) was used to evaluate test-retest reliability. For test-retest reliability, the form was applied at 1- to 7-day intervals. The ICC can vary from 0.00 to 1.00, where values of 0.60 to 0.80 are considered as the evidence of good reliability and those above 0.80 indicates excellent reliability.[16,17]

The coefficient of internal consistency was assessed with Cronbach's alpha. It is suggested that the value of alpha should be above 0.80 for the acceptance as having high internal consistency.[18] The construct validity was assessed by comparing the scores of the PABS to the scores of the IPAQ. Construct validity coefficients (r) were accepted as follows: 0.81-1.0 as excellent, 0.61-0.80 as very good, 0.41-0.60 as good, 0.21-0.40 as fair, and 0-0.20 as poor. Construct validity was measured by Pearson's correlation coefficient.[19] Mean and standard deviations were determined to describe the demographic data of the participants. All statistical analyses were performed with the Statistical Package for the Social Sciences Version 22.0 (IBM SPSS 22.0 for Windows, IBM Corp, Armonk, NY, USA). A probability value of $p<0.05$ was considered to indicate a significant effect

RESULTS

A total of 137 people with visually impairment living in Ankara participated in the present study. Participants consisted of blind people (n=84) and those with low vision (n=53). The mean age of the participants was 43.03±13.75 years. The mean BMI was 26.11±4.77 kg/m^2. The characteristics of the participants were given Table 1. Participants' physical activity scores are summarized in Table 2. Their total physical activity levels were good, and they were found to spend 374.51 minutes sitting on average per day.

Reliability

Concerning internal consistency, the alpha coefficients (Cronbach's coefficient alpha) of the PABS were 0.933 for the test and 0.894 for the re-test measurements. High internal consistency was found in both the test and re-test scores of the PABS. The test-retest ICC values of the PABS are shown in Table 3. The ICC values of each question and the total score indicate good test re-test reliability.

Validity

There were poor and fair correlations between The Turkish version PABS and subscales of IPAQ (between r=0.031 (p=0.719) and r=0.246 (p=0.004)).

Table 1. Characteristics of the participants (N=137).

	n (%)
Gender	
Female	36 (26.3)
Male	101 (73.7)
Body mass index	
Normal	86 (62.8)
Overweight	39 (28.5)
Obese	8 (5.8)
Unspecified	4 (2.9)
Working status	
Working	46 (33.6)
Retired	34 (24.8)
Student	26 (19.0)
Notworking	26 (19.0)
Unspecified	5 (3.6)
Participants	
Blind	84 (61.3)
Low Vision	53 (38.7)
Visual impairment	
Congenital	76 (55.5)
Acquired	51 (37.2)
Unspecified	10 (7.3)

Table 2. The Physical Activity Levels of the Participants (The International Physical Activity Questionnaire-Long Form (IPAQ)) (N=137).

	X±SD
Transport	858.8±1003.4
Domestic and Garden	894.2±2235.7
Leisure-Time	698.2±1195.0
Vigorous Physical Activity	720.3±2627.0
Moderate Physical Activity	1578.6±3017.7
Walking	1750.6±1787.2
Physical Activity	4049.4±4956.6
Total minutes/week	
Weekday Sitting	1886.7±939.0
Weekend Day Sitting	740.4±417.3
Sitting	2621.6±1198.3

DISCUSSION

Individual participation in physical activity is just as important as collective participation for disabled people as it is a way to exist in society and protect their physical health.[12] Our study has shown that the Turkish version of the PABS for visually impaired individuals was reliable. However, there was no correlation between the PABS and the IPAQ, which was used for validation.

The study set out to include completely blind individuals and those with low vision with variable visual acuity levels. Although this goal was achieved, the majority of participants had congenital disabilities, which are a result of consanguineous marriage in our country. Nevertheless, university graduates and working individuals with more awareness of the importance of physical activity comprised the highest numbers of participants.

Participant BMI showed that one third of the participants were either overweight (28.5%) or obese (5.8%), and the large majority had a normal range. While the IPAQ reports a "good" level of total physical activity, our results suggest that the IPAQ does not accurately reflect the situation of the impairment group. Moreover, when we investigated the total sitting time of the participants, it was found that they spent an average of 374.51 minutes per day sitting.

The reliability level was found to be "good" in this study, therefore indicating that the responses of the participants to the questionnaires were reliable.

In our validation study, no correlation was found between the IPAQ and the Visually Impaired Barrier Scale. The reason for this may have been related to the fact that the IPAQ was used with healthy individuals or chronic patients such as those suffering from schizophrenia or cardiovascular diseases.[20,21] However, it has not been previously used with visually impaired individuals or any other disability group. Considering that visually impaired individuals do not have similar opportunities to perform physical activities as healthy people, the lack of a relationship may be justified. Another explanation for the lack of a relationship between the two scales may be that activities such as cycling, dancing or bowling mentioned in the IPAQ may not be appropriate for each population and especially for each group of impaired individuals.

Miller and Jerome, in their study in which they asked 18 people who were visually impaired about physical activity barriers, they listed these barriers as: people do not have

Table 3. Test-retest reliability for the Turkish version of the Physical Activity Barrier Scale.

Test items	ICC (95% CI)
1- Yeteneğin olmaması	0.874 (0.807-0.918)
2- Egzersiz aletinin olmaması	0.690 (0.548-0.793)
3- Egzersiz yerlerindeki aktivitelerin değişmesi ve duş alma	0.625 (0.464-0.745)
4- Engelimden dolayı fiziksel koşullarım	0.824 (0.734-0.885)
5- Egzersiz için nereye gideceğini bilememek	0.672 (0.526-0.780)
6- Egzersiz ekipmanlarını nasıl kullanacağını bilememek	0.637 (0.480-0.755)
7- Benzer engel durumuna sahip bireylerle egzersiz yapma yerinin olmaması	0.664 (0.514-0.774)
8- Egzersiz veya fiziksel aktivite yapacağım zaman görüntüm hakkında utanmam veya içe kapanıklığımdan	0.904 (0.852-0.938)
9- Egzersiz veya fiziksel aktiviteye ilgimin az olması	0.727 (0.600-0.818)
10- Adapte edilmiş egzersiz aletine ilginin olmaması	0.623 (0.459-0.745)
11- Kişisel disiplinin olmaması	0.698 (0.560-0.798)
12- Yardım için eğitimli personelin olmaması	0.661 (0.512-0.772)
13- Aile desteğinin olmaması	0.589 (0.419-0.719)
14- Egzersiz programını öğrenmedeki güçlük	0.727 (0.600-0.819)
15- Egzersiz veya fiziksel aktivite yaparken eğlencenin olmaması	0.741 (0.618-0.828)
16- Yardım için gönüllülerin olmaması	0.719 (0.588-0.813)
17- Hevesin kırılması	0.665 (0.517-0.774)
18- Engel/durumum için en iyi egzersiz tipini bilmiyor olmak	0.610 (0.446-0.735)
19- Fiziksel durum/becerimi insanlar yanlış anlayacak diye	0.883 (0.821-0.925)
20- Egzersiz uygulamalarına fiziksel ulaşım	0.767 (0.653-0.846)
21- Egzersiz için yer veya uygulamaların olmaması	0.563 (0.387-0.700)
22- Nasıl egzersiz yapacağını bilmiyor olmak	0.950 (0.922-0.968)
23- Duş almanın zaman alıyor olması ve egzersizlerin değişiyor olması	0.704 (0.566-0.804)
24- Zayıf sağlık durumu	0.859 (0.786-0.909)
25- Egzersiz yerine gitmede ulaşımın olmaması	0.701 (0.565-0.800)
26- Ağrı veya rahatsızlık	0.757 (0.641-0.839)
27- Yapacağı şeylerin farkında olmama	0.711 (0.578-0.807)
28- Kendimi hazırlamak çok zahmetli	0.857 (0.783-0.907)
29- Yaralanmadan korkmak	0.618 (0.456-0.740)
30- Motivasyonun olmaması	0.730 (0.604-0.821)
31- Uygun olan aktiviteler ilgimi çekmiyor	0.770 (0.659-0.849)
32- Geçmişte egzersizlerle ilgili hoş olmayan deneyimler	0.636 (0.480-0.754)
33- Egzersiz ücreti	0.696 (0.556-0.798)
34- İnsanların arkadaşça olmayan davranışları	0.854 (0.779-0.906)
35- Duşun veya eğitimin uygun olmaması/zahmetli olması	0.695 (0.555-0.796)
36- Tehlikeden korkma veya güvende hissetmeme	0.839 (0.757-0.895)
37- Egzersiz yapmak için zamanın olmaması	0.790 (0.687-0.862)
38- Sağlığın artırılması için yapılan egzersizin yoğunluğu benim için çok fazla	0.715 (0.586-0.814)
39- Çok soğuk ya da çok sıcak	0.446 (0.245-0.611)
40- Çok hızlı hareket ediliyor olmasından dolayı tereddüt ediyorum	0.742 (0.619-0.829)
41- Beklenmedik engeller	0.730 (0.602-0.822)
42- Kazalardan korkma	0.688 (0.547-0.791)
43- Egzersiz uygulamalarında çok fazla merdiven var	0.667 (0.519-0.776)
44- Loş veya parlak lambalar	0.756 (0.639-0.839)
45- Az görmem veya görme engelli olmam	0.839 (0.755-0.895)
46- Kaybolmaktan korkma	0.653 (0.500-0.766)
47- Yardımcı aletimi (baston) koyacak yerin olmaması	0.874 (0.807-0.918)
48- Ulaşım saatlerinin bilgisi	0.784 (0.679-0.858)
Total Score	0.850 (0.772-0.902)

ICC: Intraclass Correlation Coefficient. CI: Confidence Interval.

enough time, cost, lack of exercise partners and places to exercise and/or these places are not blind-friendly places.[22] In this study, as in Miller and Jerome's study, the responses given by the visually impaired participants showed that they have difficulty in going to appropriate locations for exercise; not know how to use exercise tools or how to exercise; and have problems with their physical condition due to their disability. On the other hand, many factors such as architectural barriers in the environment or inadequacies in auditory stimuli cause limitations in walking activity, which constitutes an important part of physical activity in visually impaired individuals. This may be regarded as a reason why the questions in the IPAQ did not correspond to the existing physical activities of visually impaired individuals.

Although visually impaired individuals are introduced to physical activity and exercise for short durations in the primary school curriculum, it is not possible for them to translate these activities from the school environment into real life. Considering that motor problems may be related to low visual sensation from childhood on, more support is needed in this area at schools.[4,6,12] In addition, it may be difficult for every visually impaired young person and individual to reach these exercises and generalize them to the whole society.[23]

For this reason, it is important to eliminate these barriers in the environment by making new environmental arrangements that provide the visually impaired with a chance to perform physical activity. For example, using other sensory stimuli such as tactile, auditory, and other sensory clues for blind individuals and using contrast-colored materials for individuals with low vision may help to eliminate these barriers and provide the visually impaired with an opportunity to exercise in their adopted environment.[12]

The purpose of this study was to investigate the use of the Turkish version of the PABS, its relevance for Turkish society, and the effectiveness of its clinical use in order to offer it to other researchers. Nevertheless, our data has once again emphasized the importance of developing programs for increasing the physical activity levels of visually impaired individuals.

Limitations

The present study has some limitations. One of them is that as there was no other version of the PABS in other languages, we did not have the opportunity to discuss and compare physical activity barriers between visually impaired individuals living in other countries and our country. Another one is the lack of Turkish versions of questionnaires for individuals with other disabilities as well as the lack of information about the barriers that may vary according to disability type and the participation in physical activity, which also limit our ability to discuss and compare our results.

Conclusion

Visually impaired individuals need to overcome more barriers than healthy people in order to maintain and increase their physical activity. It is thought that the development of the Turkish version of the PABS has produced a feasible and unique scale to determine barriers to physical activity. The use of the PABS may lead to more specific and realistic measurements and help determine the barriers that prevent the visually impaired from participating in physical activities. Moreover, this study will provide an important guide for further studies aiming to research ways of combating these barriers. Future studies are needed to look into ways of increasing the physical activity levels of visually impaired individuals; improving their participation in physical activities starting from a young age; training them to develop appropriate physical activity habits; and showing society that they are our equals and we should all benefit from opportunities together.

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CASE REPORT

Kanserden sağ kalan çocukta COVID-19 pandemisi sırasında sanal egzersiz programının depresyon düzeyine ve ailenin algısına etkisi: olgu sunumu

Effect of virtual exercise program on depression level and family's perception during COVID-19 pandemic in child cancer survivor: a case report

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Öz

Bu çalışmada, çocukluk çağı kanserinden kurtulan bir hastada COVID-19 pandemisi sırasında sanal egzersiz programının depresyon düzeyine etkisini araştırmak amaçlandı. Yaklaşık 4 yıl önce Akut Lenfoblastik Lösemi (ALL) tanısı konulan ve tedavi sonrası sağ kalan 8 yaşındaki erkek hastaya, yüzyüze yapılan değerlendirme sonuçlarına göre 5 haftalık alt-üst ekstremite ve gövdeyi kapsayan sanal aerobik egzersiz programı uygulandı. 5 haftanın sonunda Çocuklar İçin Depresyon Ölçeği (ÇDÖ)'ne göre depresyon düzeyinde azalma olmadı ancak aileye bu programın etkililiği hakkında sözlü sorular soruldu. Aile, COVID-19 pandemisi sürecindeki karantina dönemine rağmen bu egzersiz programının çocuklarının aktivite düzeyini artırdığını ve programın çocuklarının duygusal durumlarına olumlu etkileri olduğunu bildirdi. Gelecekteki çalışmalar için, sağ kalan çocuklarda uygulanan aerobik egzersizler sonrası ağrı ve depresyon düzeyi gibi parametreleri ölçen daha ayrıntılı sorular içeren parametrelere ihtiyaç vardır.

Anahtar kelimeler: Lösemi, Çocuk, Egzersiz, Depresyon, COVID-19.

Abstract

This study aimed to investigated the effect of a virtual exercise program on depression level during the COVID-19 pandemic in a patient who survived childhood cancer. An 8-year-old boy who was diagnosed with Acute Lymphoblastic Leukemia (ALL) about 4 years ago and survived after the treatment underwent a virtual aerobic exercise program tailered to face-to-face evaluations covering the lower and upper extremities and trunk under 5-week supervision. At the end of 5 weeks, his depression level did not decrease according to the Children's Depression Inventory (CDI), but the family was asked verbal questions about the effectiveness of this program. The family reported that despite the quarantine period during the COVID-19 pandemic, this exercise program increased the activity level of their children and that the program had positive effects on their children's emotional state. For future studies, inventories containing more detailed questions that measure parameters such as pain and depression level after aerobic exercises applied in surviving children are needed.

Keywords: *Leukemia, Child, Exercise, Depression, COVID-19.*

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INTRODUCTION

According to the World Health Organization, 300,000 new cases diagnosed with cancer every year in children aged between 0 and 19 years. In the United States, 11.050 new cancer cases were seen in children aged between 0 and 14 years old in 2020 alone.[2] However, as a result of the improved treatment options, it has been shown that the 5-year survival rate has increased from 50% to approximately 80% since the 1970s.[3]

In the report published by the National Cancer Institute in 2014, it was stated that the most common type of cancer in children aged 0-14 is leukemia and the most common of these leukemia subgroups is acute lymphoblastic leukemia (ALL).[4-5] Studies have shown that anxiety problems can often be seen in children with ALL due to the chemotherapy (CT) and also long-term hospitalization, especially in the first year of treatment.[6] In addition, it has been shown that a large percentage of ALL cases whose treatment is terminated experience post-treatment depression problems.[7]

As of November 2020, the number of confirmed cases in the global COVID-19 outbreak is 55.064.128 people.[8] This epidemic affected individuals in the community in different ways. With the closure of schools, problems such as uncertainty, anxiety, socialization, decreased physical activity emerged in children. In some studies, children were reported to shown symptoms such as sleep problems, and attention problems due to anxiety.[9]

After the COVID-19 pandemic, physical activity levels in pediatric cancer survivors decreased further as a result of quarantine and social isolation. It has been thought that prolonged quarantine could make children more prone to sedentary lifestyle, and being depressed, and anxious.[10]

There has been growing interest on tele rehabilitation interventions during the COVID-19 pandemic. Tele rehabilitation provides rehabilitation services by informing, evaluating, treating, and following up individuals in their home or work environment by using technologies such as telephone or video.[11]

When the studies in the literature were examined in the period of COVID-19, it was seen that there were some rehabilitation studies implemented through tele rehabilitation in adults diagnosed with breast cancer[12] or other chronic diseases.[13] However, studies on children during the pandemic are limited.[14-15] Therefore, in this study, in order to reduce the negative effects of ongoing inactivity due to treatment and long-term hospitalization in a child who will go through such a period. In order to increase the level of physical activity and reduce the level of anxiety, it is planned to implement a supervised exercise program via video conferencing. As far as is known, this is one of the few conducted on childhood cancer patients through virtual exercise sessions.

CASE

The patient, 8 years old, diagnosed with Precursor B ALL (Pre-B ALL) as a result of incidental examinations around 4 years ago. He hospitalized immediately after the diagnosis and received intravenous (IV) CT treatment for about 6 months according to the ALL Berlin-Frankfurt-Munich 90 Protocol (ALL BFM 90 Protocol). He continued maintenance CT for 2 years after he discharged from the hospital. He referred to the Hacettepe University Faculty of Physical Therapy and Rehabilitation to increase muscle strength, gross and fine motor functioning. In order to conduct the study, separate consent was obtained from the child and the parent.

The patient was referred to our clinic before COVID-10 pandemic. His needs were determined by the face to face measurements made by the physiotherapist. An exercise program suitable for the patient was prepared by the physiotherapist after muscle strength[15], muscle shortness tests, and balance evaluations.[16] In our interviews with the family, they reported that their child's physical activity level was low. In addition, the Child Depression Inventory (CDI) was used to measure depression that may arise due to low physical activity and the psychological effects of the COVID-19 pandemic, and then to determine the effect of exercise on depression level.[17]

The CDI was created by Kovacs in 1981, based on the Beck Depression Scale (BDS) to measure the level of depression in children and adolescents aged 6 to 17 years. The inventory is

answered with the help of a professional or directly by the child. The questions in the inventory should be answered considering the last 2 weeks. The inventory consists of 27 items and each item consists of 3 sub-items. For example; 1) All bad things are my fault 2) Some bad things are my fault 3) Bad things are usually not my fault. In this way, situations suitable for the child are scored as 0,1,2 according to the severity of the depression. The highest score that can be obtained from the inventory is 54 and the cut-off point is set at 19 points. The higher the score in the inventory, the higher the level of depression. The validity and reliability of this inventory was made in 1991 in Turkey.[18] The evaluation was repeated after the program.

At the end of the exercise program, some questions were asked to the family, and they were asked to score these questions according to the Visual Analogue Scale (VAS).[19] These questions include: [1] Was this program efficient for your child? [2] Do you think that the physical activity level has increased in your child's daily life with the virtual exercise program? [3] Have you observed a difference between tele rehabilitation and face-to-face rehabilitation? [4] Which exercise mode (face to face versus virtual) do you think was more advantageous and efficient?

Face-to-face evaluations were made by a physiotherapist, but since the pandemic occurred we had to do the exercise program using tele rehabilitation during the quarantine. Exercise sessions were applied with the Zoom application. The research was conducted between May and June 2020.

Intervention

Aerobic exercise program was applied as 5 minutes of warm-up, 30 minutes of loading, 5 minutes of cool-down. While the child was exercising, the therapist accompanied the exercise so that the child could see him. This program includes: stepping on the spot as warm-up movements, jogging on the spot with arm movements, lateral trunk stretching with arms up, cat-camel exercise; During the loading phase, up and down stairs, balance exercise on bosu ball, sit-ups exercises, shoulder flexion-abduction-external rotation pattern with yellow Thera band were applied. In the cooling phase of the exercise, quadriceps, hamstring, and gastrocnemius stretching were applied in addition to trunk rotation in the sitting position and the study was completed. Exercises were arranged in 10 repetitions and 10-15 seconds of rest was given between each exercise. In studies conducted with these patients with these findings, exercise intensity was applied as 50–70% with respect to heart rate[20] and 13-15 points in the perceived effort scale (RPE) rating[21], approximating a subjective intensity of "moderate" to "high". Since this study was carried out with tele rehabilitation, it was planned to be 13-15 points according to the rating of the RPE instead of exercise intensity heart rate in terms of comfortable measurement.

Before the implementation, two trial lessons were given to help the child become accustomed to video conferencing. The exercise program was applied 3 days a week for 40 minutes in total for 5 weeks. The child could not attend only one lesson in this 5-week exercise program. Overall, the child's participation in supervised exercise sessions was high, but towards the last weeks of the exercise program, the child's desire to participate decreased.

As a result of the virtual exercise program, only CDI could be re-evaluated among pre-exercise measurements. While the depression level measured after 5 weeks according to CDI was 4, this depression level was recorded as 5 at the end of the exercise study. Due to COVID-19, muscle strength, muscle shortness tests and balance evaluations could not be measured.

DISCUSSION

As a result of this study, which investigated the effect of supervised virtual exercise program on depression levels in childhood cancer survivors during COVID-19, it was found that the exercise program applied caused a slight increase in the level of depression. Coinciding with the COVID-19 pandemic during the disease period may also have caused this increase. The family's answers to the questions asked after the end of the study were that this 5-week exercise period was both emotionally and physically productive for their children.

Survivors of childhood cancers are at greater risk of a sedentary lifestyle[22], anxiety[23] and depression[24] in the future than their healthy peers. This causes impairments in the

Table 1. Questions directed to the family.

Questions	Visual Analogue Scale score /Answers
How much was exercise program efficient for your child? (0-10)	9/10
Do you think that the physical activity level has increased in your child's daily life with the virtual exercise program?	"Physical activity level of my children increased compared to the pre-exercise period and he woke up more vividly in the mornings."
Have you observed any difference between tele rehabilitation and face-to-face rehabilitation?	"Telerehabilitation application was no different from face-to-face application and it was more efficient than we expected." "This application was safer than face-to-face application during the COVID-19 period."
Which exercise mode (face to face versus virtual) do you think was more advantageous and efficient?	"There is no significant advantage between telerehabilitation practice and face-to-face rehabilitation practice."

Table 2. Child Depression Inventory (CDI) of the patient.

Child Depression Inventory (CDI)	Score
Pre-training	4/56
Post-training	5/56

healthy development of children[25] and decreases their quality of life.[26] In the light of all these findings, this study aimed to determine the effect of exercise on depression level with the effect of the COVID-19 pandemic in children who survived cancer. When studies in the literature are reviewed, it has been proven that the depression levels of survivors of childhood cancers decrease as a result of regular exercise.[27-28] However, as a result of the measurements made in this study, it was observed that the exercise program applied did not reduce the level of depression in children. This may be because children recovering from cancer are at risk of depression, separated from their social environments, going through an uncertain process during the COVID-19 pandemic. Additionally, CDI was thought to have serious questions measuring depression level. This scale may be more suitable for children who are intensively treated in hospital. However, for children whose treatment was over and returned to social life, it included questions of severe depression such as death, suicide. This is seen as the reason why the child's depression level does not fully reflect the result.

Studies have proven that exercise contributes to good sleep quality and increased levels of physical activity in children.[29] As a result of the answers they gave to the questions asked to the family, they said that their children spent this period efficiently, sudden emotional state changes decreased, the level of physical activity at home increased and their children woke up more energetic in the morning. This led us to think that exercise has an observed effect on daily activities and mood, but its effects on depression level need to be studied in more detail.

Although tele rehabilitation applications have become more popular with the COVID-19 pandemic, in fact, with the development of technology, it has become a useful tool for evaluation, treatment and follow-up programs of patients. These technology-based apps have been used for many years in exercise studies in both adults[30-31] and children.[32] Since the tele rehabilitation application requires only an internet connection and a video camera, it is both cost-effective and easy to access. In addition, it is an easier and safer tool for individuals who have difficulty reaching the hospital or are worried about the COVID-19 pandemic. This method also provides an advantage in terms of providing isolation conditions and continuation of rehabilitation in children who continue to receive chemotherapy. All of these are thought to be a factor for the family to find the application of tele rehabilitation useful and that there will be an increase in the future studies to be carried out with tele rehabilitation.

The first limitation of the study was related to participation in the exercise program. The boy's participation in the 5-week supervised

exercise program was good, but his participation has declined slightly in recent weeks. Studies in the literature have proven that prolonged screen use causes a decrease in brain functions such as attention.[33] The reason for this reluctance is thought to be that exercise is done through tele rehabilitation, and this result is seen as a disadvantage of tele rehabilitation. The second limitation is that the CDI used to evaluate the depression level is not suitable for determining the emotional state in the case. It was concluded that the questions posed in the inventory were suitable for measuring the level of severe depression, but not very suitable for discriminating the mild depression level. For future research, inventories containing more detailed questions can be developed in measuring depression in children. The third limitation is that because other measurements could not be repeated, only a measurement of depression could be made and the study could be concluded with this result.

Conclusion

As a result, this study is thought to be the first to investigate the effect of supervised exercise on depression through tele rehabilitation in childhood cancer survivors in the COVID-19 pandemic. According to the CDI, the level of depression slightly increased. However, looking at the symptoms, the family's observations were that the child's physical activity increased and his mood improved. It was thought that the cancer burden given by the disease period and the treatment process may have reduced the recovery with isolation. For this reason, more detailed tests are needed to evaluate the level of depression in children who survived cancer in future studies.

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Ethical Approval: Informed consent was obtained from the case in this study.

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