

Comparison of Attitudes towards Sports, Physical Activity Levels and Sleep Quality of University Students in Different Departments after the COVID-19 Pandemic**

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ABSTRACT:

Purpose: With closure of universities and lockdown during COVID-19 period, time spent at home has increased and physical and social activity has decreased. This situation caused mental problems, especially sleep disorders, in students. With restriction of physical activity during COVID-19 period, number of individuals doing sports decreased, and number of inactive individuals increased. Aim of this study is to compare attitudes towards sports, physical activity levels and sleep quality of students of Physiotherapy and Rehabilitation Department and Coaching Department.

Material and Methods: 25 Physiotherapy and Rehabilitation and 25 Coaching students included in our study. Demographic information of participants was recorded in form prepared by researchers. Attitudes towards sports were evaluated with Attitude Towards Sports Scale, physical activity levels were evaluated with International Physical Activity Questionnaire, and sleep quality was evaluated with Pittsburgh Sleep Quality Index. SPSS 24.0 program was used for statistical analysis and significance value was accepted as $p < 0.05$.

Results: Age, height, weight, body mass index and gender values of participants were similar between groups. When their attitudes towards sports were examined, there was a significant difference in favour of Coaching students in total score, sub-dimension of being interested in sports and sub-dimension of doing active sports ($p < 0.05$). No significant difference was found in sub-dimension of living with sports of Attitudes Towards Sports Scale, physical activity levels and sleep quality ($p > 0.05$).

Conclusion: Results we obtained show that attitudes towards sports of students of Coaching department are higher than students of Physiotherapy and Rehabilitation department, but there is no difference in their physical activity levels and sleep quality.

Keywords: Attitudes towards sports; COVID-19; physical activity; sleep quality

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INTRODUCTION

Coronaviruses are viruses that induce conditions ranging from the common cold to more dangerous conditions like Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). World Health Organization (WHO) published examples (on 31.12.2019) of pneumonia

of unexplored etiology in Wuhan, China. Virus was specified (on 07.01.2020) as a brand-new coronavirus type that has not been observed in people before. After that, name of 2019-nCoV disease was took as COVID-19, then virus was named SARS-CoV-2 because of its similarity to SARS-CoV (T. C. Sağlık Bakanlığı Halk Sağlığı Genel Müdürlüğü,

2020). COVID-19 disease has affected the entire world in a short time and has become a global health problem by being declared a pandemic. In addition to affecting health and survival, the disease has caused many changes in social and economic life, creating a period of social distancing (Alaca et al., 2022; Zalewska et al., 2021). These changes were caused by both the disease itself and the measures taken to prevent its spread.

As a result of COVID-19, many educational institutions have canceled face-to-face education and adopted the online education style. The move of both education and a huge variety of activities to the online world has caused many people to start spending more time with computers, smartphones and other electronic devices (Garrett, 2020; Siste et al., 2020). The transition of universities to online education in Türkiye from March 2020 to June 2021 caused university students to spend more time with devices such as computers and smartphones and receive online education. (Yükseköğretim Kurulu, 2020). With the closure of universities and lockdown on the agenda, the time spent at home has increased and physical and social activity has decreased. This situation caused mental problems, especially sleep disorders, in students (Dong et al., 2020; Qiu et al., 2020; Xiang et al., 2020; Wolf et al., 2021; Stanton et al., 2020).

With the restriction of physical activity in the COVID-19 period, the number of individuals doing sports decreased, and the number of inactive individuals increased. Sport is defined as a pedagogical, biological and social phenomenon that improves the physical and mental health of the individual, regulates social behaviors, and raises mental and motor features to a certain level (Varol et al., 2017). The concept of attitude is defined as a cognitive, emotional and behavioral predisposition that a person organizes based on his/her experience, motivation and knowledge towards himself/herself or any social subject, object or event around him/her (İnceoğlu, 2011).

When the literature is examined, although there are many studies on university students after COVID-19, to our knowledge, there is no study comparing the attitudes towards sports, physical activity levels and sleep quality of students studying in two different

departments. In this direction, the aim of our study is to compare the attitudes towards sports, physical activity levels and quality of sleep of the students of the Physiotherapy and Rehabilitation Department (PRD) and the Coaching Department (CD).

The hypotheses of our study; attitudes towards sports, physical activity levels and quality of sleep of the students of the CD are higher than the students of the PRD.

MATERIAL AND METHODS

Purpose and Type of the Study

This article was produced from the corresponding author's (first author) bachelor degree thesis. This research was presented as an oral presentation at the 2nd International Eurasian Health Sciences Congress held on 15-16 June 2023 as an abstract. Our study was designed as prospective and parallel study. Our study was carried out at Istanbul Gelişim University in May - June 2023 in accordance with the Helsinki Declaration. Snowball randomization method was used in our study and data were gathered through face-to-face meetings with participants. Study's aim and content were explained to the individuals participating in our study, and both verbal and written consent was received.

Sampling and Participants

While students from the PRD and the CD were included in our study, students who did not want to complete the questionnaires and didn't volunteer to participate in study were excluded. The sample size of our study was decided at the end of the G*Power analysis for 80% power, using the data obtained as a result of the pilot study we conducted at the beginning of the study. Sample size was decided as 20 for each group, with a total of 40 participants. Considering the possibility of missing data, the study was terminated with 25 participants for each group and 50 participants in total. During the study, 58 students were interviewed, but 8 students were not included because they did not volunteer to participate in the study (Figure 1).

Data Collection Tools

The demographic characteristics of the individuals were recorded using a form prepared by the

researchers of this study. The primary output of our study was the students' attitudes towards sports, while the secondary outcome were physical activity level and sleep quality.

Students' attitudes towards sports were evaluated with the "Spora Yönelik Tutum Ölçeği" (Attitude Towards Sports Scale – ATSS) developed by Şentürk (2015). This scale consists of 3 sub-dimensions (interest in sports, living with sports, doing active sports) and 25 items which is a 5-point Likert-type scale (Şentürk, 2015).

Student's physical activity levels were examined with the International Physical Activity Questionnaire (IPAQ), which has Turkish validity and reliability (Craig et al., 2003; Sağlam et al., 2010; Öztürk, 2005).

In the last 7 days with the questionnaire, the duration (min.) of vigorous physical activity, the duration (min.) of moderate physical activity, duration of (min.) walking and sitting for one day were questioned. The results obtained were calculated by the original calculation method described by Craig et al. According to the total physical activity score, the physical activity levels of the participants were categorized as low (below 600 metabolic equivalents [METs]), medium (between 600-3000 METs) and high (above 3000 METs) (Craig et al., 2003). The quality of sleep of the students was examined with the Pittsburgh Sleep Quality Index (PSQI), which was validated and reliable in Turkish (Buysse et al., 1989; Ağargün, 1996).

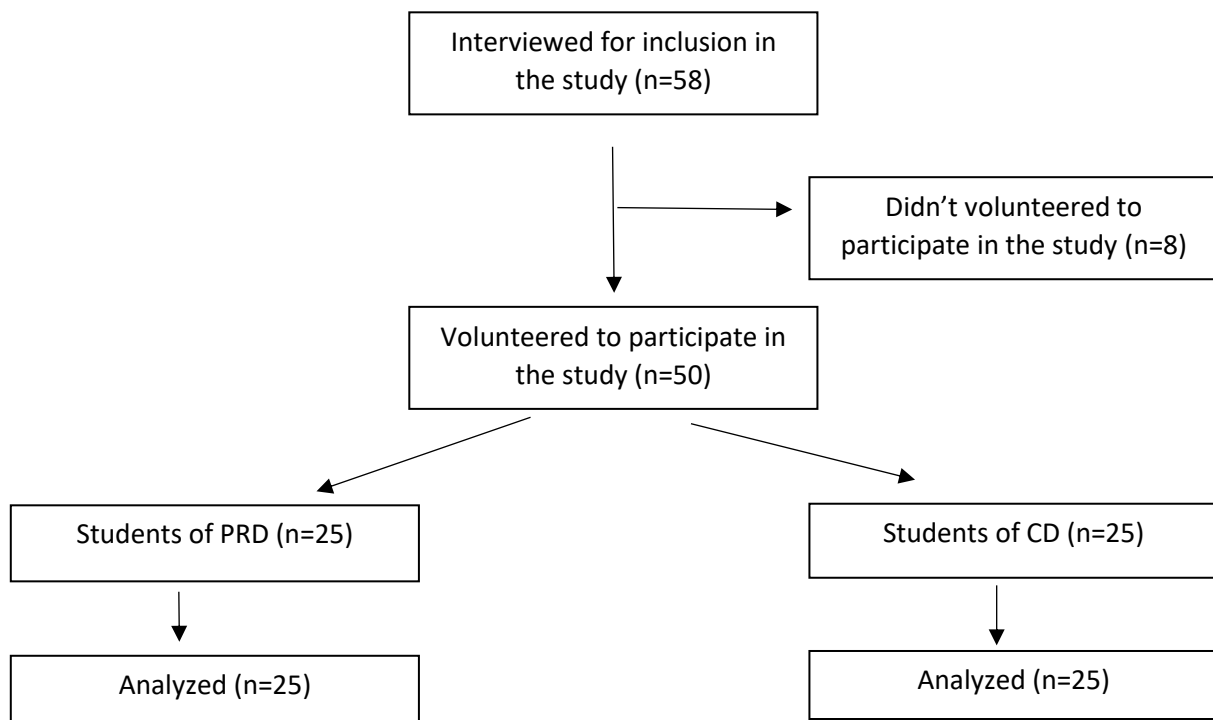


Figure 1. Flow Diagram

PSQI, which examines the sleep quality of the person for the last 1 month, comprises 24 questions. 19 of these are self-report questions and are responded by the participant himself. 5 questions are responded by the roommate of participant and are not involving in the total score. Self-report questions include various factors affiliated with sleep quality. The 18 items participating in the scoring are grouped as 7 component points. These components supplies

information about subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping pills and daytime sleep function. Each question is evaluated from 0 to 3. The aggregation of the scores of the 7 components provides the total PSQI score. The total PSQI score ranges from 0 to 21. Quality of sleep of those with a total score of 5 and less is deliberated "good", and those with a total score more than 5 are deliberated

as “poor”. PSQI score more than 5 indicates that the person has severe trouble in at least 2 areas of sleep or mild or moderate trouble in more than 3 areas.

Statistical Analyses

The data collected from this study were analyzed using version 24.0 of the IBM SPSS package program, which is a statistical analysis program. The suitability of the data to the normal distribution was evaluated with the Kolmogorov – Smirnov test. Descriptive features were given with mean and standard deviation. Mann-Whitney U test was used for comparisons between two groups and Chi-Square test was used for comparison of qualitative data. Statistical significance was evaluated at the $p < 0.05$ level.

Ethical Approval

Ethics committee approval was received from Istanbul Gelişim University Non-invasive Studies Ethics Committee for the study (19.04.2023 / 2023-04).

RESULTS

50 individuals, 20 male (10 PRD, 10 CD), 30 female (15 PRD, 15 CD) participated in the study. The groups were almost identical in terms of demographic

characteristics (Table 1).

When the attitudes towards sports of the students participating in the study were examined, a statistically significant difference was observed in favour of the Coaching department students in the first sub-dimension ($p=0.010$). In the second sub-dimension, it was not statistically significant between the groups ($p=0.104$). A statistically significant difference was observed in favour of the students of the Coaching department in the third sub-dimension ($p=0.003$). When the total score was examined, the attitudes towards sports of the students of the CD were observed to be statistically higher than the students of the PRD ($p=0.005$) (Table 2).

Although there was no statistically significant difference in physical activity levels evaluated with IPAQ between the groups, there was a numerical difference in favour of the students of the Coaching department ($p=0.680$) (Table 3).

There was no statistically significant difference between the groups in the level of sleep quality examined by PSQI ($p=0.747$). It was observed that the mean scores of the two groups were similar (Table 4).

Table 1. Students’ Demographic Characteristics

	Department	n	Mean ± (SD)	p
Age	Physiotherapy and Rehabilitation	25	22.60 ± (2.23)	0.809 ¹
	Coaching	25	22.44 ± (1.55)	
Height	Physiotherapy and Rehabilitation	25	169.08 ± (7.51)	0.869 ¹
	Coaching	25	169.04 ± (8.93)	
Weight	Physiotherapy and Rehabilitation	25	62.40 ± (8.57)	0.712 ¹
	Coaching	25	64.60 ± (12.23)	
BMI	Physiotherapy and Rehabilitation	25	21.96 ± (1.66)	0.502 ²
	Coaching	25	22.33 ± (2.18)	

SD: Standart deviation, BMI: Body mass index, p¹: Mann-Whitney U test, p²: Students’ t test

Table 2. Students’ Attitudes Towards Sports

	Department	Median (IQR)	p
ATSS 1st Sub-Dimension (interest in sports)	Physiotherapy and Rehabilitation (n=25)	45 (11)	0.010
	Coaching (n=25)	52 (10)	
ATSS 2nd Sub-Dimension (living with sports)	Physiotherapy and Rehabilitation (n=25)	25 (8)	0.104
	Coaching (n=25)	29 (3)	
ATSS 3rd Sub-Dimension (doing active sports)	Physiotherapy and Rehabilitation (n=25)	21 (6)	0.003
	Coaching (n=25)	25 (5)	
ATSS Total Score	Physiotherapy and Rehabilitation (n=25)	93 (21)	0.005
	Coaching (n=25)	106 (18)	

ATSS: Attitude Towards Sports Scale, IQR: Interquartile range, p: Mann-Whitney U test

Table 3. Students' Physical Activity Level

	Inactive	Minimally Active	High Active	p
Physiotherapy and Rehabilitation (n=25)	11 (44%)	8 (32%)	6 (24%)	0.680
Coaching (n=25)	6 (24%)	5 (20%)	14 (56%)	

p: Chi-square test

Table 4. Students' Sleep Quality

	n	Mean ± (SD)	p
Physiotherapy and Rehabilitation	25	13.7 ± (3.13)	0.747
Coaching	25	13.5 ± (1.96)	

SD: Standard deviation, p: Independent samples t test

DISCUSSION

As a result of the statistical analysis of the data acquired in our study, which was conducted to compare the attitudes towards sports, physical activity levels and quality of sleep of the students of the PRD and the CD, it was found that the attitudes towards sports of the students of the CD were higher than the students of the PRD. Thus, our first hypothesis was accepted. However, there was no difference in physical activity level and sleep quality between the groups. Therefore, our other two hypotheses were rejected.

Sport is a concept that brings individuals together, socializes them and unites them for the same purpose. Sports not only strengthens the individual physically but also helps make him/her mentally and psychosocially stronger. Sports has many positive contributions to human life, one of the most important of these contributions is the development of a positive attitude towards sports in the individual by uniting individuals towards a specific goal (Efe, 2023). In the study conducted in Ankara Yıldırım Beyazıt University to determine the attitudes towards sports of university students studying in faculties other than Sports Sciences Faculty, it was found that university students studying outside the field of sports generally had high attitude scores towards sports (Koçak, 2014). In another study, the attitudes towards sports of students studying at different faculties at Marmara University were compared. The study group of the research consists of 195 people (91 female and 104 male) in total, including Marmara University PRD (44 students), CD

(89 students), Nutrition and Dietetics Department (62 students). As a result of the research, a significant relationship was observed among students who are interested in sports as an amateur or professional in their families and their attitudes towards sports. In addition, it was observed that there was a significant difference among students of the PRD and the CD in favour of the students of the PRD. The reason for this is interpreted as PRD students have more knowledge about sports injuries and are more interested in the improvement of sports-related disorders (Göksel et al., 2017). Our study and the results of these studies are not parallel. We think that the reason for this is the enlarge in the time spent at home with the pandemic period and the students directing themselves to different activities that they can do at home. Because these individuals are restricted from leaving their homes by governments all over the world to prevent the spread of the disease. In addition, the concept of e-sports, which has become popular in recent years, causes the time spent in front of the computer to increase. As the time spent at home increased during the pandemic period, individuals showed more interest in this area. For all these reasons, university students' attitudes towards sports differ before and after the pandemic period. In a study comparing the physical activity prominence of individuals before and during the COVID-19 pandemic, a total of 870 individuals, 413 female and 457 male, living in different cities of Turkey, over the age of 18, were included in the study. As a result, a significant decrease was found in

the physical activity levels of individuals during the pandemic compared to the pre-pandemic period (Ünlü et al., 2020). In a systematic review of studies investigating the physical activity levels of university students during the pandemic period, 9 studies (Ács et al., 2020; Alarcón et al., 2021; Barkley et al., 2020; Gallè et al., 2020; Gallo et al., 2020; Karuc et al., 2020; Maher et al., 2021; Sañudo et al., 2021; Savage et al., 2020) stated that the level of physical activity decreased, while only 1 study (Romero-Blanco et al., 2020) stated that it increased (López-Valenciano et al., 2021). These results are parallel with the results of our study. The physical activity level of the students in these two departments, where it is known how important physical activity is, is not at the expected level. Because during the COVID-19 pandemic, the symptoms affecting the musculoskeletal system and mobility of individuals with the disease, as well as the measures taken by local and general government authorities to prevent the spread of the disease, caused the life style of almost everyone to change and reduced the level of physical activity during this period.

Researching the quality of sleep of university students in the COVID-19 period, Marelli et al. (2021) stated that the social isolation experienced during this period had a significant effect on both sleep quality and psychosocial aspects of 307 Italian university students, and that female students were more affected than male students. In another study, Dongol et al. (2022), in their study with 2474 university students, showed that insomnia problem and stress level increased and quality of sleep decreased in the COVID-19 period. Martínez-de-Quel et al. (2021), in their study involving 693 university students, reported that the rapid lifestyle change with the COVID-19 period adversely affected sleep quality. Although there was no difference between departments in our study, when the results of the questionnaire were evaluated, it was observed that the quality of sleep was low. Therefore, our study is parallel with the sources in the literature. A systematic review and meta-analysis, including 63 studies to examine and synthesize changes in sleep quality and sleep disorders in the general population from before the COVID-19 lockdown, stated that sleep quality decreased and the rate of individuals

with poor sleep quality increased during the COVID-19 pandemic period. Approximately 57% of the participants in the studies included in the research stated that their sleep quality changed during the pandemic period, while approximately 37% of them stated that their sleep quality changed for the worse. Additionally, the studies included in the study reported a decrease in sleep efficiency and an increase in sleep disorders and sleeping pill consumption (Limongi et al., 2023). The COVID-19 pandemic has been characterized by multiple waves, and several sleep variables appear to be weakened by the repeated implementation of strict restrictive measures that can initiate or aggravate sleep disorders.

As a limitation of our study, we can say that only students from one of the departments of the Faculty of Health Sciences and Faculty of Sport Sciences are included. In future studies, we suggest adding all departments in these faculties and conducting research with more participants.

CONCLUSION

With the closure of universities and lockdown during the COVID-19 period, the time spent at home has increased and physical and social activity has decreased. This situation caused mental problems, especially sleep disorders, in students. With the restriction of physical activity in the COVID-19 period, the number of individuals doing sports decreased, and the number of inactive individuals increased. The results we obtained show that the attitudes towards sports of the students of the CD are higher than the students of the PRD, but there is no difference in their physical activity levels and sleep quality.

Conflict of Interest

Authors declare that there are no conflict of interest between them. Also, we note that our manuscript contains original material.

REFERENCES

- Ács, P., Prémusz, V., Pálvölgyi, Á., Trpkovici, M., Elbert, G., Melczer, C., & Makai, A. (2020). Effects of COVID-19 on physical activity behavior among university students: Results of a Hungarian online survey. *Health Problems of Civilization*, 14(3), 174-182.

- Ağargün, M.Y. (1996). Pittsburgh uyku kalitesi indeksinin geçerliliği ve güvenilirliği. *Türk Psikiyatri Dergisi*, 7, 107-115.
- Alaca, N., Yıldız, A., Zeytin, Y., Karaca, M., & Dilek, B. (2022). COVID-19 Pandemisi Sürecinde Fizyoterapi Ve Rehabilitasyon Bölümü Öğrencilerinin Fiziksel Aktivite, Uyku Kalitesi Ve Zaman Yönetimi Becerilerinin Değerlendirilmesi. *Gevher Nesibe Journal of Medical And Health Sciences*, 7(16), 49-59.
- Alarcón, E. I., Meza, H. L., & Arturo, J. (2021). Actividad física en estudiantes deportistas universitarios, previo y en el confinamiento por pandemia asociada al COVID-19 (Physical activity in university student athletes, prior and in confinement due to pandemic associated with COVID-19). *Retos*, 572-575.
- Barkley, J. E., Lepp, A., Glickman, E., Farnell, G., Beiting, J., Wiet, R., & Dowdell, B. (2020). The acute effects of the COVID-19 pandemic on physical activity and sedentary behavior in university students and employees. *International journal of exercise science*, 13(5), 1326.
- Buysse, D. J., Reynolds III, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry research*, 28(2), 193-213.
- Craig, C. L., Marshall, A. L., Sjöström, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., ... & Oja, P. (2003). International physical activity questionnaire: 12-country reliability and validity. *Medicine & science in sports & exercise*, 35(8), 1381-1395.
- Dong, H., Yang, F., Lu, X., & Hao, W. (2020). Internet addiction and related psychological factors among children and adolescents in China during the coronavirus disease 2019 (COVID-19) epidemic. *Frontiers in psychiatry*, 11, 751.
- Dongol, E., Shaker, K., Abbas, A., Assar, A., Abdelraoof, M., Saady, E., ... & Leschziner, G. (2022). Sleep quality, stress level and COVID-19 in university students; the forgotten dimension. *Sleep Science*, 15(Spec 2), 347.
- Efe, M. (2023). Examination of Physical Education and Sports School Students of Social Integration Levels and Attitudes Towards Sports: The Case of Batman University. *Journal of Population Therapeutics and Clinical Pharmacology*, 30(11), 292-300.
- Gallè, F., Sabella, E. A., Ferracuti, S., De Giglio, O., Caggiano, G., Protano, C., ... & Napoli, C. (2020). Sedentary behaviors and physical activity of Italian undergraduate students during lockdown at the time of COVID-19 pandemic. *International journal of environmental research and public health*, 17(17), 6171.
- Gallo, L. A., Gallo, T. F., Young, S. L., Moritz, K. M., & Akison, L. K. (2020). The impact of isolation measures due to COVID-19 on energy intake and physical activity levels in Australian university students. *Nutrients*, 12(6), 1865.
- Garrett, L. (2020). COVID-19: the medium is the message. *The Lancet*, 395(10228), 942-943.
- Göksel, A. G., Çağdaş, C. A. Z., Yazıcı, Ö. F., & İkişler, H. C. (2017). Farklı bölümlerdeki öğrencilerin spora yönelik tutumlarının karşılaştırılması: marmara üniversitesi örneği. *Spor ve Performans Araştırmaları Dergisi*, 8(2), 123-134.
- İnceoğlu, M. (2011). *Tutum, Algı, İletişim*. 6. Baskı. Ankara: Siyasal Kitabevi.
- Karuc, J., Sorić, M., Radman, I., & Mišigoj-Duraković, M. (2020). Moderators of change in physical activity levels during restrictions due to COVID-19 pandemic in young urban adults. *Sustainability*, 12(16), 6392.
- Koçak, F. (2014). Üniversite öğrencilerinin spora yönelik tutumları: bir ölçek geliştirme çalışması. *Sporometre Beden Eğitimi ve Spor Bilimleri Dergisi*, 12(1), 59-69.
- Limongi, F., Siviero, P., Trevisan, C., Noale, M., Catalani, F., Ceolin, C., ... & Maggi, S. (2023). Changes in sleep quality and sleep disturbances in the general population from before to during the COVID-19 lockdown: a systematic review and meta-analysis. *Frontiers in psychiatry*, 14, 1166815.
- López-Valenciano, A., Suárez-Iglesias, D., Sanchez-Lastra, M. A., & Ayán, C. (2021). Impact of COVID-19 pandemic on university students' physical activity levels: an early systematic review. *Frontiers in psychology*, 11, 3787.
- Maher, J. P., Hevel, D. J., Reifsteck, E. J., & Drollette, E. S. (2021). Physical activity is positively associated with college students' positive affect regardless of stressful life events during the COVID-19 pandemic. *Psychology of sport and exercise*, 52, 101826.
- Marelli, S., Castelnovo, A., Somma, A., Castronovo, V., Mombelli, S., Bottoni, D., ... & Ferini-Strambi, L. (2021). Impact of COVID-19 lockdown on sleep quality in university students and administration staff. *Journal of neurology*, 268, 8-15.
- Martínez-de-Quel, Ó., Suárez-Iglesias, D., López-Flores, M., & Pérez, C. A. (2021). Physical activity, dietary habits and sleep quality before and during COVID-19 lockdown: A longitudinal study. *Appetite*, 158, 105019.
- Öztürk, M. (2005). Üniversitede eğitim-öğretim gören öğrencilerde uluslararası fiziksel aktivite anketinin geçerliliği ve güvenilirliği ve fiziksel aktivite düzeylerinin belirlenmesi. Sağlık Bilimleri Enstitüsü, Fiziksel Tıp ve Rehabilitasyon Anabilim Dalı, Yüksek Lisans Tezi: Hacettepe Üniversitesi, Ankara – Türkiye.
- Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B., & Xu, Y. (2020). A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *General psychiatry*, 33(2).
- Romero-Blanco, C., Rodríguez-Almagro, J., Onieva-Zafra, M. D., Parra-Fernández, M. L., Prado-Laguna, M. D. C., & Hernández-Martínez, A. (2020). Physical activity and sedentary lifestyle in university students: changes during confinement due to the COVID-19 pandemic. *International journal of environmental research and public health*, 17(18), 6567.
- Sağlam, M., Arikan, H., Savci, S., Inal-Ince, D., Bosnak-Guclu, M., Karabulut, E., & Tokgozoglu, L. (2010). International physical activity questionnaire: reliability and validity of the Turkish version. *Perceptual and motor skills*, 111(1), 278-284.

- Sañudo, B., Fennell, C., & Sánchez-Oliver, A. J. (2020). Objectively-assessed physical activity, sedentary behavior, smartphone use, and sleep patterns pre-and during-COVID-19 quarantine in young adults from Spain. *Sustainability*, 12(15), 5890.
- Savage, M. J., James, R., Magistro, D., Donaldson, J., Healy, L. C., Nevill, M., & Hennis, P. J. (2020). Mental health and movement behaviour during the COVID-19 pandemic in UK university students: Prospective cohort study. *Mental Health and Physical Activity*, 19, 100357.
- Siste, K., Hanafi, E., Sen, L. T., Christian, H., Adrian, Siswidiani, L. P., ... & Suwartono, C. (2020). The impact of physical distancing and associated factors towards internet addiction among adults in Indonesia during COVID-19 pandemic: a nationwide web-based study. *Frontiers in psychiatry*, 11, 580977.
- Stanton, R., To, Q. G., Khalesi, S., Williams, S. L., Alley, S. J., Thwaite, T. L., ... & Vandelanotte, C. (2020). Depression, anxiety and stress during COVID-19: associations with changes in physical activity, sleep, tobacco and alcohol use in Australian adults. *International journal of environmental research and public health*, 17(11), 4065.
- Şentürk, H. E. (2015). Sportif tutum ölçeği: geliştirilmesi, geçerliliği ve güvenilirliği. *CBÜ Beden Eğitimi ve Spor Bilimleri Dergisi*, 7(2), 8-18.
- T. C. Sağlık Bakanlığı Halk Sağlığı Genel Müdürlüğü. (2020). Covid-19 Rehberi. Available from: https://hsgm.saglik.gov.tr/tr/?option=com_sppagebuilder&view=page&id=63.
- Ünlü, H., Öztürk, B., Aktaş, Ö., & Büyüктаş, B. (2020). Bireylerin COVID-19 sürecinde fiziksel aktivite düzeylerindeki değişimin incelenmesi. *Türkiye Spor Bilimleri Dergisi*, 4(2), 79-87.
- Varol, R., Varol, S., & Türkmen, M. (2017). Bartın üniversitesinde öğrenim gören öğrencilerin spora yönelik tutumlarının belirlenmesi. *Uluslararası Kültürel ve Sosyal Araştırmalar Dergisi*, 3(2), 316-329.
- Xiang, M. Q., Tan, X. M., Sun, J., Yang, H. Y., Zhao, X. P., Liu, L., ... & Hu, M. (2020). Relationship of physical activity with anxiety and depression symptoms in Chinese college students during the COVID-19 outbreak. *Frontiers in psychology*, 11, 582436.
- Wolf, S., Seiffer, B., Zeibig, J. M., Welkerling, J., Brokmeier, L., Atrott, B., ... & Schuch, F. B. (2021). Is physical activity associated with less depression and anxiety during the COVID-19 pandemic? A rapid systematic review. *Sports Medicine*, 51(8), 1771-1783.
- Yükseköğretim Kurulu. Basın açıklaması. (2020). Available from: <https://www.yok.gov.tr/Sayfalar/Haberler/2020/universitelerde-uygulanacak-uzaktan-egitime-iliskin-aciklama.aspx>.
- Zalewska, A., Gałczyk, M., Sobolewski, M., & Białokoz-Kalinowska, I. (2021). Depression as compared to level of physical activity and internet addiction among polish physiotherapy students during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, 18(19), 10072.