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*Research Article*

# THE EFFECTS OF SCREEN USE TIME ON QUALITY OF LIFE AND PAIN IN UNIVERSITY STUDENTS IN THE PANDEMIC

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**Keywords**

Pain,
Pandemics,
Quality of life,
Screen time.

## ABSTRACT

**Purpose:** The study was conducted to examine the effects of screen time on quality of life and pain in university students during the pandemic.
**Methods:** This cross-sectional study included 83 university students (64 F, 19 M). Descriptive features and screen usage times were recorded on an online form. Quality of life was assessed using the Nottingham Health Profile, and pain using the Cornell Musculoskeletal Discomforts Questionnaire.
**Results:** Daily screen time was determined to be 8.06±2.92 hours. The most pain was detected in the back, neck and shoulder regions. It was observed that students with more than eight hours of screen time per day had significantly worse quality of life and pain scores ($p<0.05$).
**Conclusion:** It has been found that university students who spent more than eight hours a day in front of a screen during the pandemic had negative impacts on their quality of life and musculoskeletal health. Daily screen time should be reduced to avoid these negative situations.

## INTRODUCTION

The new type of coronavirus causing COVID-19 disease, which first started in Wuhan, China in December 2019, has led to a dangerous epidemic, which can result in acute respiratory syndrome (1). With the rapid spread of the virus to many countries, COVID-19 was declared a global pandemic by the World Health Organization on March 11, 2020 (2). In order to prevent the spread of the epidemic, many measures and restrictions were implemented in many areas of life. One of these restrictions was the decision to continue education remotely. The first case in Turkey was detected on March 11, 2020, and it was decided to continue university education remotely on March 13, 2020 (3).

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Distance learning has increased the time students spend in front of a screen (4), and this increased screen time due to the pandemic has been reported to have a negative effect on mental health and general health (5). It has also been shown that prolonged screen time is associated with obesity, hypertension, diabetes, depression and sleep disorders (6).

In recent years, a significant increase in screen time and related sedentary behaviors of young people has been detected (7), which has had a negative impact on health and quality of life (8). Screen time is also associated with musculoskeletal problems (9). It has been reported that screen usage time has increased and physical activity levels have decreased in students during the pandemic period (10). Increasing screen time also increases musculoskeletal discomfort (11). Long-term incorrect posture causes pain by straining musculoskeletal system elements such as muscles, tendons, joints and ligaments biomechanically (12).

During the period of pandemic restrictions, the screen time of university students increased rapidly as education was continued online (13). Understanding the effects of increased screen usage time on university students' quality of life and musculoskeletal system will guide the way in which the effects of screen time are observed and the management of distance education processes. The hypothesis of the study was that spending a long time in front of a screen would negatively affect quality of life and musculoskeletal pain.

## METHODS

### Purpose and Type of Research

The aim of this cross-sectional study was to investigate the effects of screen time on the quality of life and musculoskeletal system in university students who received distance education during the Covid-19 pandemic.

### Population and Sample of the Study

The study inclusion criteria were defined as being a university student studying online, using a device with a screen, and voluntary participation in the study. Students were excluded if they had any disease or surgery within the last 6 months that may affect the musculoskeletal system, or if they were not willing to participate.

### Ethical Aspects of the Research

Ethics committee approval was obtained from Ankara Yıldırım Beyazıt University Ethics Committee on 14.06.2021 date with approval number 33. The study sample comprised university students receiving distance education at Ankara Yıldırım Beyazıt University. The

study was carried out in June 2021 with the participation of 83 university students. Before the study, the participants were informed about the content of the study and consent for voluntary participation was provided. All the study procedures were carried out in compliance with the Declaration of Helsinki's principles.

**Data Collection and Analysis**

Due to quarantine measures and isolation, data were collected on an online platform. A link to the evaluation form created by the researchers was sent to the participants who met the inclusion criteria and who provided consent via the online form. Within the scope of this study, demographic information of the participants and information about screen time were recorded, the Nottingham Health Profile (NHP) was used to measure quality of life, and the Cornell Musculoskeletal Discomfort Questionnaire (CMDQ) was used to determine musculoskeletal problems.

The total screen time per day was questioned and the time was recorded in hours. In addition, the daily screen time for online courses and for other digital applications was questioned categorically ( <1 hour, 1-3 hours, 3-5 hours, >5 hours). Evaluation of daily screen time is a frequently used method to evaluate screen exposure (10, 14). In order to investigate the effects of screen time on quality of life and the musculoskeletal system, the students were compared in 2 groups of those with screen time of > 8 hours and those with ≤ 8 hours.

The Turkish version of the NHP was used to assess quality of life. The NHP consists of 38 questions and 6 subsections. This questionnaire includes three items assessing energy level, eight items assessing pain, nine items evaluating emotional reactions, five items evaluating sleep, five items evaluating social isolation, and eight items evaluating physical activity. Items are answered as yes/no. The weighted score of each category ranges from 0-100, and the total score of the scale ranges from 0-600, with lower scores indicating a better quality of life (15).

Musculoskeletal discomfort was evaluated using the Turkish version of the CMDQ. The CMDQ questions pain, ache or discomfort felt in the body parts during the previous week on a body diagram map. The frequency, severity and effect of the pain felt in 20 body regions are examined. The scale score is calculated as the frequency of discomfort for each body area (Never felt=0, Felt 1-2 times during the week=1.5, Felt 3-4 times during the week=3.5, Felt once every day=5 and Several times every day = 10), the severity of the discomfort (Slightly uncomfortable = 1, Moderately uncomfortable = 2, Very uncomfortable = 3) and the state of the discomfort that interfered with work (Not at all = 1, Slightly hindered = 2, Substantially =

3). The total scale score is calculated as the total of the scores of all the body parts. In this study, the right and left shoulder, upper arm, forearm, wrist scores were recorded as right and left upper extremity scores, and the right and left upper leg, knee, and lower leg scores were recorded as right and left lower extremity scores. Accordingly, the upper extremity score was in the range of 0-360, and the lower extremity score was in the range of 0-270. Higher scores obtained from the questionnaire indicate higher levels of pain frequency, severity, and work disability (16, 17).

Statistical analysis of the data obtained in the study was performed using SPSS (Statistical Package for Social Science) version 26 software. As descriptive statistics, categorical variables were presented as frequency (n) and percentage (%), and continuous variables as mean ± standard deviation values. The Mann-Whitney U test was used to compare the quality of life and musculoskeletal discomfort of the participants whose screen usage time was over 8 hours and those with 8 hours or less. Statistical significance level was accepted as $p<0.05$.

GPower 3.1.9.7 (Heinrich-Heine-Universität Düsseldorf) program was used to calculate the power of the study. Considering the difference in quality of life between students with <8 hours of screen time and those with >8 hours, the effect size was 0.446 with 83 participants with a type 1 error margin of 0.05, and the power of the study was calculated as 0.99.

## RESULTS

The descriptive characteristics, NHP scores, and screen usage information of the 83 participants are shown in Table 1. It was observed that all the students used smartphones, and most also used computers (Table 1).

**Table 1.** Demographic Characteristics of the Participants, Nottingham Health Profile Scores, and Screen Usage Information (N=83)

| | **Mean** | **Standard deviation** |
|---|---|---|
| **Age (years)** | 21.79 | 1.66 |
| **Height (cm)** | 167.92 | 7.5 |
| **Weight (kg)** | 61.42 | 13.86 |
| **Daily screen time (hours)** | 8.06 | 2.92 |
| **Daily time spent in front of a screen before the pandemic (hours)** | 4.00 | 1.86 |
| **Nottingham Health Profile Scores** | | |
| **Pain** | 19.93 | 21.18 |
| **Emotional reactions** | 47.98 | 31.81 |
| **Sleep** | 35.15 | 29.10 |
| **Social isolation** | 37.29 | 34.38 |
| **Physical activity** | 13.58 | 13.21 |
| **Energy level** | 63.43 | 38.89 |
| **Total score** | 217.39 | 118.223 |
| | **N** | **%** |
| **Gender** | | |
| **Women** | 64 | 77.1 |
| **Men** | 19 | 22.9 |
| **Type of device used during the day** | | |
| **Computer** | 79 | 95.2 |
| **Phone** | 83 | 100 |
| **Television** | 44 | 53 |
| **Tablet** | 19 | 22.9 |
| **Time spent per day for online courses** | | |
| **Less than one hour** | 9 | 10.8 |
| **1-3 hours** | 38 | 45.8 |
| **3-5 hours** | 21 | 25.3 |
| **More than 5 hours** | 15 | 18.1 |
| **Time spent per day for other digital applications** | | |
| **Less than one hour** | 5 | 6 |
| **1-3 hours** | 31 | 37.3 |
| **3-5 hours** | 26 | 31.3 |
| **More than 5 hours** | 21 | 25.3 |

When the CMDQ scores of the participants were examined, the highest score was related to back pain, followed by neck pain and shoulder pain scores (Table 2).

**Table 2.** Cornell Musculoskeletal Discomfort Questionnaire Scores

| **Cornell Musculoskeletal Disorder Questionnaire Scores** | **Mean** | **Standard Deviation** |
|---|---|---|
| **Neck** | 13.34 | 16.11 |
| **Right shoulder** | 6.97 | 13.55 |
| **Left shoulder** | 6.27 | 12.50 |
| **Back** | 16.27 | 22.98 |
| **Right upper arm** | 2.05 | 9.37 |
| **Left upper arm** | 0.79 | 2.21 |
| **Waist** | 11.87 | 20.05 |
| **Right forearm** | 1.59 | 9.93 |
| **Left forearm** | 0.31 | 1.06 |
| **Right wrist** | 3.24 | 11.33 |
| **Left wrist** | 1.04 | 2.85 |
| **Hip** | 3.21 | 6.99 |
| **Right upper leg** | 1.21 | 3.02 |
| **Left upper leg** | 1.19 | 3.02 |
| **Right knee** | 3.49 | 10.83 |
| **Left knee** | 2.74 | 6.75 |
| **Right lower leg** | 0.72 | 2.10 |
| **Left lower leg** | 0.74 | 2.11 |
| **Right foot** | 1.87 | 7.33 |
| **Left foot** | 1.58 | 7.15 |
| **Total** | 80.59 | 91.66 |

Screen time of >8 hours per day was reported by 34 students and ≤8 hours by 49 students. When the NHP and CMDQ scores were compared between these two groups, a significant difference was determined in respect of NHP emotional reactions, social isolation and total scores, the CMDQ both lower extremities and right upper extremity scores, and the duration of screen use before the pandemic ($p<0.05$, Table 3).

**Table 3.** Comparisons of the Nottingham Health Profile and Cornell Musculoskeletal Disorder Questionnaire scores of the groups of students with >8 hours and ≤ 8 hours screen time per day.

| | | **Screen usage time > 8 hours (N=34)** | | **Screen usage time ≤ 8 hours (N=49)** | | **p** |
|---|---|---|---|---|---|---|
| | | **Mean** | **Standard Deviation** | **Mean** | **Standard Deviation** | |
| **Nottigham Health Profile** | **Pain** | 20.29 | 19.41 | 19.69 | 22.52 | 0.656 |
| | **Emotional reactions** | 57.30 | 29.27 | 41.51 | 32.17 | 0.025* |
| | **Sleep** | 37.82 | 28.77 | 33.30 | 29.48 | 0.42 |
| | **Social isolation** | 49.20 | 37.33 | 29.03 | 29.86 | 0.012* |
| | **Physical activity** | 14.74 | 11.80 | 12.78 | 14.18 | 0.264 |
| | **Energy level** | 68.42 | 40.06 | 59.96 | 38.09 | 0.223 |
| | **Total score** | 247.78 | 103.79 | 196.29 | 123.94 | 0.041* |
| **Cornell Musculoskeletal Disorder Questionnaire Scores** | **Lower extremity-Right** | 7.52 | 9.61 | 3.97 | 13.55 | 0.002* |
| | **Lower extremity-Left** | 7.36 | 10.29 | 2.82 | 7.84 | 0.012* |
| | **Upper extremity-Right** | 21.58 | 35.32 | 8.52 | 21.83 | 0.011* |
| | **Upper extremity-Left** | 14.44 | 20.18 | 4.26 | 6.80 | 0.057 |
| | **Total score** | 102.55 | 115.41 | 65.35 | 67.95 | 0.168 |
| **Daily time spent in front of a screen before the pandemic (hours)** | | 4.97 | 1.89 | 3.32 | 1.52 | <0.001* |

*p<0.05

In both groups the device type most used was determined to be a smartphone. When the time spent in front of a screen during the day for the online course was examined, it was seen that students with screen time of >8 hours per day spent a maximum of ≥5 hours, and those with ≤8 hours per day spent a maximum of 1-3 hours. When examining the time spent in front of the screen for other digital applications, students with screen time of >8 hours per day spent a maximum of ≥5 hours, and those with ≤8 hours per day spent a maximum of 1-3 hours (Table 4).

**Table 4.** Device type, and the time spent on online courses and other digital applications by students with screen time of >8 hours and ≤ 8 hours per day.

| | **Screen usage time > 8 hours (N=34)** | | **Screen usage time ≤ 8 hours (N=49)** | |
|---|---|---|---|---|
| | **N** | **%** | **N** | **%** |
| **Device type used during the day** | | | | |
| **Computer** | 32 | 94.1 | 47 | 95.9 |
| **Phone** | 34 | 100 | 49 | 100 |
| **Television** | 19 | 55.9 | 25 | 51 |
| **Tablet** | 7 | 20.6 | 12 | 24.5 |
| **Screen time spent during the day for online courses** | | | | |
| **Less than an hour** | 4 | 11.8 | 5 | 10.2 |
| **1-3 hours** | 9 | 26.5 | 29 | 59.2 |
| **3-5 hours** | 9 | 26.5 | 12 | 24.5 |
| **More than 5 hours** | 12 | 35.3 | 3 | 6.1 |
| **Screen time spent during the day for other digital applications** | | | | |
| **Less than an hour** | 1 | 2.9 | 4 | 8.2 |
| **1-3 hours** | 8 | 23.5 | 23 | 46.9 |
| **3-5 hours** | 8 | 23.5 | 18 | 36.7 |
| **More than 5 hours** | 17 | 50 | 4 | 8.2 |

## DISCUSSION

The results of this study, in which it was aimed to examine the effect of daily screen time on quality of life and musculoskeletal system discomfort in university students receiving distance education during the COVID-19 pandemic period, demonstrated that the emotional reactions, social isolation, and total quality of life results of the students with >8 hours of screen use per day were worse, and pain was more common in the both lower extremities and the right upper extremity.

Guo et al. reported that the screen time of students increased during the pandemic (10). In the current study, it was determined that screen time increased compared to the pre-pandemic period, in line with these results.

It was found that the students suffered back pain most, followed by neck and shoulder pain. The reason for this is that the static posture for a long time puts excessive strain on the joints and soft tissues in the neck, back and shoulder areas, which are mechanically closely related to each other. Long-term incorrect posture, which occurs with the increase in screen time, disrupts the spine biomechanics and may be the most common cause of pain in the back and neck (18). The interrelatedness of the neck, back and shoulder regions has been emphasized in recent studies. The increase in thoracic kyphosis and anterior tilt of the head change the orientation of the scapula on the thorax, which in turn affects shoulder functions

(19). The most common cause of shoulder pain following spinal pain may be the fact that impaired spinal mechanics affect shoulder mechanics. However, the significantly higher pain in the right shoulder may also be related to increased use of the right extremity.

Increasing screen usage time and decreasing physical activity level negatively affect quality of life (20). Increased screen time is known to cause antisocial behavior (21). The increase in screen time and decrease in physical activity level in university students has been shown to negatively affect mental health (22). In studies by Lavados-Romo et al., it was found that the quality of life of university students with high screen time was low, and psychological health and social relations were negatively affected by the increase in screen time (14). In our study, quality of life scores assessed using the Nottingham Health Profile were found to be higher in students with more than eight hours of screen time, along with emotional reactions and social isolation, and overall scores. We believe that pandemic restrictions, along with the restriction of students' social participation and reduced social interaction with others due to prolonged screen use, are the primary causes of these individuals' emotional and social impacts.

It has been shown in previous studies that prolonged duration of use of cell phones and electronic devices in university students is associated with neck and especially shoulder-related upper extremity pain (23, 24). It has also been found that internet addiction and the duration of phone use are associated with musculoskeletal pain in university students (25, 26). In the current study, the reason for more musculoskeletal pain in the students with screen time of >8 hours may be due to long-term inactivity and incorrect posture. Further studies could explore this relationship by assessing posture in individuals who spend long periods of time in front of a screen. In this context, in terms of biomechanical alignment, it would be beneficial to educate students about the correct posture to be adopted during online lessons and while they are in front of the screen at other times, and exercise training could be given to provide mobility in the neck, back and shoulder area between classes.

Guo et al. determined that the time spent in front of the screen for online lessons was more than five hours in 42.3-48.2% of students (10). In the current study, it was found that most of the students who had a total of >8 hours of daily screen use for online courses and other digital applications spent more than five hours on lessons. The fact that most of the participants exceeded the maximum two hours of screen use recommended for students can cause adverse effects on eye health, sleep and psychosocial health (27-29).

**Limitations of the Study**

The fact that this study was conducted during the pandemic, when university education continued completely remotely, is important in terms of showing the results of long-term screen exposure. A limitation of the study could be said to be that the study was carried out only on students studying at a university. With the digital transformation in universities, the percentage of courses given by distance education is increasing. Elective courses and common compulsory courses in particular are delivered through distance education by many universities (30). Considering this situation, the ideal daily online course duration can be determined by future studies examining the effects of screen usage time in the periods when face-to-face and online education continue together.

## CONCLUSION

In conclusion, it was observed that the increase in screen time in the online education process of university students negatively affected the quality of life and musculoskeletal discomfort. During periods when distance education is required, such as during the pandemic, it may be useful for students to reduce screen time outside of online classes as much as possible, and to do exercises that especially work the back, neck and shoulder areas between classes, in order to reduce the negative effects of screen time on quality of life and musculoskeletal system problems. Apart from during the pandemic, it can be recommended that the online course duration given at universities should not be more than eight hours a day in order not to adversely affect musculoskeletal system problems and quality of life. More precise thresholds need to be determined by future research. It's important to remember that any situation involving prolonged screen time for various reasons (e.g., online work, hybrid learning, or social media use) may have similar negative effects on the musculoskeletal system. Therefore, preventing individuals from prolonged screen time, even outside of mandatory situations like pandemics, is extremely important for preventive health approaches.

**Ethics Committee Approval:** Ethics committee approval was obtained from Ankara Yıldırım Beyazıt University Ethics Comitee on 14.06.2021 date with approval number 33.

**Informed Consent:** Informed consent was obtained from participants.

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**Author Contributions:** Ertuğrul DEMİRDEL: Conception, Desing, Supervision, Materials, Data Collection/Processing, Analysis/Interpretation, Literature Review, Writing, Critical

Review. Ayşe ERYILMAZ: Conception, Design, Materials, Data Collection/Processing, Analysis/Interpretation, Literature Review, Writing. Emine ZEYBEK KURT: Conception, Design, Materials, Data Collection/Processing, Analysis/Interpretation, Literature Review, Writing. Enes BALIKÇI: Conception, Design, Materials, Data Collection/Processing, Analysis/Interpretation, Literature Review, Writing. Senem DEMİRDEL: Conception, Design, Materials, Analysis/Interpretation, Literature Review, Writing, Critical Review.

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**REFERENCES**

1. Lu H, Stratton CW, Tang YW. Outbreak of pneumonia of unknown etiology in Wuhan, China: The mystery and the miracle. J Med Virol. 2020;92(4):401.
2. Organization WH. World Health Organization coronavirus disease (COVID-19) dashboard. World Health Organization. 2020.
3. Dikmen S, Bahçeci F. Covid-19 pandemisi sürecinde yükseköğretim kurumlarının uzaktan eğitime yönelik stratejileri: Fırat Üniversitesi örneği. Turkish Journal of Educational Studies. 2020;7(2):78-98.
4. Keel PK, Gomez MM, Harris L, Kennedy GA, Ribeiro J, Joiner TE. Gaining "The Quarantine 15:" Perceived versus observed weight changes in college students in the wake of COVID-19. Int J Eat Disord. 2020;53(11):1801-8.
5. Colley RC, Bushnik T, Langlois K. Exercise and screen time during the COVID-19 pandemic. Health Rep. 2020;31(6):3-11.
6. Sultana A, Tasnim S, Hossain MM, Bhattacharya S, Purohit N. Digital screen time during the COVID-19 pandemic: A public health concern. F1000Research. 2021;10(81):81.
7. Biddle SJ, Pearson N, Ross GM, Braithwaite R. Tracking of sedentary behaviours of young people: a systematic review. Prev Med. 2010;51(5):345-51.
8. Rezende LFMd, Rodrigues Lopes M, Rey-López JP, Matsudo VKR, Luiz OdC. Sedentary behavior and health outcomes: an overview of systematic reviews. PloS one. 2014;9(8):e105620.
9. Kim H-J, Kim J-S. The relationship between smartphone use and subjective musculoskeletal symptoms and university students. J Phys Ther Sci. 2015;27(3):575-9.
10. Guo Y-f, Liao M-q, Cai W-l, Yu X-x, Li S-n, Ke X-y, et al. Physical activity, screen exposure and sleep among students during the pandemic of COVID-19. Sci Rep. 2021;11(1):1-11.
11. Xie Y, Szeto G, Dai J. Prevalence and risk factors associated with musculoskeletal complaints among users of mobile handheld devices: A systematic review. Appl Ergon. 2017;59:132-42.
12. Tunçay S, Yeldan İ. Kas iskelet sistemi rahatsızlıklarıyla fiziksel inaktivite ilişkili midir. Ağrı. 2013;25(4):147-55.
13. Yazıcı H, Tosun C, Özdemir M, Karsantık Y, Aydın B, Vildan S. COVID-19 Salgın Döneminde Üniversite Öğrencilerinde Kişisel Sağlık Davranışları ve Öznel İyi Oluş. Toplum ve Sosyal Hizmet. 2021:141-59.
14. Lavados-Romo M, Pamela, Andrade-Mayorga M, Omar, Morales P, Gladys, Muñoz P, Sergio, Balboa-Castillo P, Teresa. Association of screen time and physical activity with health-related quality of life in college students. J Am Coll Health. 2021:1-6.
15. Kücükdeveci A, McKenna S, Kutlay S, Gürsel Y, Whalley D, Arasil T. The development and psychometric assessment of the Turkish version of the Nottingham Health Profile. Int J Rehabil Res. 2000;23(1):31-8.
16. Güneş Ü, Ceylan B. Akademisyen hemşirelerin bilgisayarlı çalışma ortamındaki ergonomik koşullarının ve buna bağlı ortaya çıkan kas-iskelet sistemi rahatsızlıklarının incelenmesi. Ege Üniversitesi Hemşirelik Fakültesi Dergisi. 2016;32(2):61-74.
17. Erdinc O, Hot K, Ozkaya M. Turkish version of the Cornell Musculoskeletal Discomfort Questionnaire: cross-cultural adaptation and validation. Work. 2011;39(3):251-60.
18. Nejati P, Lotfian S, Moezy A, Nejati M. The study of correlation between forward head posture and neck pain in Iranian office workers. Int J Occup Med Environ Health. 2015;28(2).

19. Ludewig PM, Reynolds JF. The association of scapular kinematics and glenohumeral joint pathologies. J Orthop Sport Phys Ther. 2009;39(2):90-104.
20. Davies CA, Vandelanotte C, Duncan MJ, van Uffelen JG. Associations of physical activity and screen-time on health related quality of life in adults. Prev Med. 2012;55(1):46-9.
21. Robertson LA, McAnally HM, Hancox RJ. Childhood and adolescent television viewing and antisocial behavior in early adulthood. Pediatrics. 2013;131(3):439-46.
22. Wu X, Tao S, Zhang Y, Zhang S, Tao F. Low physical activity and high screen time can increase the risks of mental health problems and poor sleep quality among Chinese college students. PloS one. 2015;10(3):e0119607.
23. Günal A, Pekçetin S. Üniversite öğrencilerinde akıllı telefon bağımlılığı ile servikal bölge ve üst ekstremite ağrısı arasındaki ilişki. STED/Sürekli Tıp Eğitimi Dergisi. 2019;28(2):114-9.
24. Woo EH, White P, Lai CW. Musculoskeletal impact of the use of various types of electronic devices on university students in Hong Kong: An evaluation by means of self-reported questionnaire. Man Ther. 2016;26:47-53.
25. Kurt S, İbiş S, Aktuğ ZB, Aka H. Üniversite Öğrencilerinin Kas İskelet Sistemi Rahatsızlıkları ile Fiziksel Aktivite Düzeyi ve İnternet Bağımlılığı Arasındaki İlişkinin İncelenmesi. Uluslararası Güncel Eğitim Araştırmaları Dergisi. 2021;7(2):709-21.
26. Özdinç S, Turan FN. Sağlık bilimleri fakültesi öğrencilerinde kas iskelet sistemi problemleri ile fiziksel aktivite ve stres düzeyi arasındaki ilişkinin incelenmesi. Sağlık Bilimleri ve Meslekleri Dergisi. 2019;6(2):247-55.
27. Barlow SE, Committee E. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: summary report. Pediatrics. 2007;120(Supplement_4):S164-S92.
28. Hansen MH, Laigaard PP, Olsen EM, Skovgaard AM, Larsen M, Kessel L, et al. Low physical activity and higher use of screen devices are associated with myopia at the age of 16-17 years in the CCC2000 Eye Study. Acta Ophthalmol. 2020;98(3):315-21.
29. Parent J, Sanders W, Forehand R. Youth screen time and behavioral health problems: The role of sleep duration and disturbances. J Dev Behav Pediatr. 2016;37(4):277.
30. Kapucu NK, Salih U. Üniversitelerde ortak zorunlu derslerin öğretiminde uzaktan eğitim uygulamaları. Açıköğretim Uygulamaları ve Araştırmaları Dergisi. 2020;6(1):8-27.