Content available at: https://www.ipinnovative.com/open-access-journals

IP Journal of Nutrition, Metabolism and Health Science

Journal homepage: https://www.jnmhs.com/

Original Research Article

Investigation of the ergonomic suitability and the health related quality of life among the students in online education during the COVİD-19 pandemic

Cemaliye Hürer[1], **Ferdiye Zabit Özdemir**[1], **Emine Ahsen Şenol**[1], **Zehra Güçhan Topcu**[2,*]

[1]*Dept. of Physiotherapy and Rehabilitation, Cyprus Health and Social Sciences University, Güzelyurt, Turkey*
[2]*Dept. of Physiotherapy and Rehabilitation, Eastern Mediterranean University, Famagusta, Cyprus*

ARTICLE INFO

Article history:
Received 03-08-2021
Accepted 22-12-2021
Available online 07-02-2022

Keywords:
Computer
Distant learning
Faculty of Health Sciences
Pain

ABSTRACT

Background: Students suddenly came across with a new education system due to pandemic. Health education needs practices including manual skills so education method is totally affected in Faculties of Health Sciences.
Aims: The aim of this study is to examine the ergonomic suitability of the studying posture and health-related quality of life of the students during the COVID-19 pandemic.
Setting and Design: Faculties of Health Sciences of the Universities in Northern Cyprus, a cross-sectional study design
Materials and Methods: Ergonomic designs were evaluated from five pictures and a total score was obtained. Nottingham Health Profile was used to determine the quality of life during this new education version.
Results and Conclusions: Only 12.8% of the students used a great posture and some parameters of quality of life were found different between female and males ($p<0.05$). 73.0% of the students who received online education had an increase in the level of musculoskeletal pain during the pandemic. The students stated that they have pain in the shoulder area with almost 30%. Very few students perceived adequate postures during online lectures. Some gender related differences were found in quality of life. The study will guide managements of universities and health professionals in terms of workload of online health education and its risks to musculoskeletal system of young population.

1. Introduction

The New Coronavirus (SARS-CoV-2) emerged in Wuhan, China in late December 2019 and was effective all over the world, especially in Europe.[1] Since coronavirus is a virus transmitted from person to person by direct contact or droplet, radical decisions have been taken by the authorities in many countries. In this context, schools, universities and other educational institutions have been temporarily closed in many countries in order to reduce the spread.[2,3]

In order to provide a quick solution to the crisis caused by COVID-19, universities that provide formal education have started to work on continuing courses and programs with web-based distance education instead of face-to-face education, and so switched to online education.[4] During the COVID-19 period, many innovative solutions were introduced to ensure the continuity of education, and this process was supported by new technologies such as Zoom (Zoom Video Communications, San Jose, California), Microsoft Teams, Google Meets and Slack (Slack Technologies, San Francisco, California). In the new education model, tools like computer, smart phone etc. have

* *Corresponding author.*
E-mail address: zehra.guchan@emu.edu.tr (Z. Güçhan Topcu).

https://doi.org/10.18231/j.ijnmhs.2021.029

become an essential need for students. In individuals who continue their education with a computer, phone or tablet, staying in a static posture with repetitive movements such as using a keyboard, clicking the mouse or touching the screen, using the body in wrong positions and inadequate ergonomic conditions can cause musculoskeletal system disorders.[5,6] In a study conducted on university students, it was reported that there was a relationship between the use of mobile phones and musculoskeletal problems, increased complaints in the neck and shoulder areas after using technological equipment, and a relationship between screen size and back pain.[7] It has been shown that physical activity levels of students are also significantly affected in this process, especially since the courses in the field of health sciences continue for long times and the courses usually have intensive theory hours so the students should take notes while listening.[8] Based on this information, the home quarantine applied to prevent the epidemic and ensure social isolation, the increase in physical inactivity, the use of screen based tools for online education and the increase in sitting time in static posture may cause musculoskeletal problems and postural disorders in university fields.

The individual and social duties of the young population have also decreased due to the pandemic. In addition to the fact that the pandemic is still uncontrolled and the severity of the disease, young individuals are affected by psychological aspects such as anxiety and depression as well as physical exposure.[7,9] Accordingly, considering that young individuals in the online education process of the pandemic are affected by physical, social and emotional aspects, the status of their quality of life should be investigated. The purpose is to determine levels of the ergonomic conditions and the quality of life of the students who have long intensive theory and practice based courses in front of screens during online education in pandemic.

2. Materials and Methods

2.1. Study design

This study was carried out in a descriptive manner in order to investigate the ergonomic suitability of the studying posture and health-related quality of life in the students of the Faculty of Health Sciences of different universities of Northern Cyprus during the Covid-19 pandemic. This study was carried out between 12/11/2020 and 12/12/2020. The sample of the research consists of students studying at the Faculty of Health Sciences at various universities in Northern Cyprus. A total of 196 students, 125 females (63.8%) and 71 males (36.2%), between the ages of 17-35, who voluntarily accepted to participate in this study were included. The study included students at different grade levels, studying as a full-time student at faculties of health sciences, receiving online education, and listening to lectures on a computer at the desk.

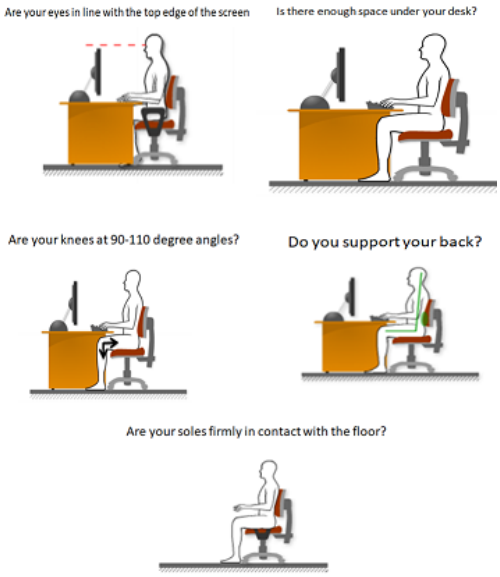

Fig. 1: Evaluation of the ergonomic suitability of the studying postuire

The exclusion criteria of our study were having any orthopedic, rheumatic or neurological problems that would prevent students from listening to lectures at the desk, and not using technological equipment in the online education process. In addition, students who were in the first year of their university in Faculty of Health Sciences were excluded as they did not experience any change in education system.

2.2. Data collection

The evaluation forms and questionnaires were sent to the participants by sharing the form link prepared using the "Google Forms" application. The questionnaire form used in the study consisted of four parts. In the first part of this form, the students were informed about the purpose of the research and were asked to approve the voluntary consent form. The students who gave their consent were transferred to the second part of the questionnaire form. In the second part of the questionnaire, demographic information such as the students' age, gender, school, and the department they studied were recorded. Additionally, some more information such as the presence of orthopedic, rheumatic or neurological diseases, pain in the musculoskeletal system during the pandemic process, the joints where pain occurs, and the duration of computer use at the desk were questioned. In the third part of the questionnaire form, there were figures regarding the ergonomic suitability of the studying posture. In the fourth part of the study, Nottingham Health Profile was used in order to evaluate the quality of life.

Table 1: Frequency and percentage values of gender and some characteristics of students

n=196		**f**	**%**
Gender	Woman	125	63.8
	Man	71	36.2
Change in pain during pandemic	Gradual increase	143	73.0
	No change	53	27.0
The joints where pain occurs	Shoulder	59	30.1
	Wrist	20	10.2
	Arm	9	4.6
	Low back	25	12.8
	Upper back	39	19.9
	Neck	20	10.2
	Knee	24	12.2
Duration of laptop/computer use at the desk	Less than 1 hour	89	45.4
	1 hour or more	107	54.6

Table 2: Correct postures of students while studying

n=196	**F**	**%**
No correct posture	0	0
One correct posture	26	13,3
Two correct postures	32	16.3
Three correct postures	81	41.3
Four correct postures	32	16.3
Five correct postures	25	12.8

Table 3: Comparison of students by gender with the correct number of postures and quality of life results during the study

	All students n=196	**Women (n=125) x±sd**	**Men (n=71) x±sd**	
Point from correct postures	2.99± 1.17	2.89±1.15	3.17±1.21	0.119*
Physical mobility	12.16±13.27	11.07±12.33	14.07±14.68	0.265*
Energy	70.65±27.47	71.30±27.85	69.52±26.95	0.574*
Pain	11.84±16.19	13.00±16.19	9.80±16.09	0.044*
Sleep	36.08±31.28	31.24±30.10	44.71±31.71	0.004*
Social Isolation	50.34±27.24	48.13±26.19	54.24±28.77	0.091*
Emotional Reactions	31.43±29.23	31.44±28.41	31.41±30.83	0.774*
Total score	212.12±59.121	206.12±58.83	222.68±58.56	0.059¥

x±ss: average ± standart deviation, p: statistical significant, *:Mann Whitney U test, ¥: Independent t-test

2.3. Ergonomic suitability of studying posture

In order to evaluate the ergonomic suitability of the studying posture, the pictures in Figure 1 were added to the Google questionnaires. Students were asked to answer the 5 questions stated in the figures as "yes" or "no" while they were working at the desk. In line with the answers, the number of ergonomic postures that the students applied correctly at the desk was recorded. Accordingly, they were scored out of 0 if they were all wrong, 1 if one was correct, 2 if two were correct, 3 if three were correct, 4 if four were correct, and 5 if all were correct.

2.4. Nottingham health profile (NHP)

The Nottingham Health Profile (NHP) scale, which evaluates the health problems perceived by the individual and the effect of these problems on activities of daily living, was used to evaluate the quality of life of the students. The Turkish version of the NHP was used to assess health-related quality of life. The Turkish validity and reliability study of the questionnaire was performed by Küçükdeveci et al. It consists of 38 items: physical mobility (8 items), pain (8 items), sleep (5 items), emotional reactions (9 items), social isolation (5 items), and energy level (3 items). Each item is answered as yes or no. Positive answers given to certain areas have a defined scoring scale, and the sum of these scores indicates the severity. The total score for each sub-category is 100. High scores indicate poor quality of life.[10]

2.5. Statistical analysis

SPSS 18.0 (Statistical Package for the Social Sciences) package program was used for the statistical analysis of the study. Descriptive findings were presented as average (x), standard deviation (SD), frequency (f) and percentage (%), minimum-maximum (min-max) values. The compliance of the data to normal distribution was evaluated by the Shapiro Wilk Test. Mann Whitney-U test was used for the analysis of non-parametric variables and Independent T-test was used for the analysis of the parametric variables. Values below p <0.05 were considered significant.

3. Results

196 students, whose age was 22.12 ± 2.17 years, participated in the study. Table 1 shows that 125 of 196 participants were female (63.8%) and 71 (36.2%) were male. When examining the pain status of the students participating in the study during the pandemic, it is seen that 143 people (73.0%) had a noticeable increase in pain in the musculoskeletal system during pandemic. When the joints where pain occurred were examined, it was determined that 59 people (30.1%) had in the shoulder area, 39 people (19.9%) in the back area, 25 people (12.8%) in the waist area, 24 people (12.2%) in the knee area, 20 people (10.2%) had pain in the wrist and neck area, and 9 people (4.6%) in the arm area. When laptop/computer usage times at the desk were examined, 89 (45.4%) of 196 people were found to use computers for less than 1 hour and 107 (54.6%) for 1 hour or more.

hows the frequency and percentage values according to the number of ergonomic postures used by the students during their study. No student was found who did not pay attention to any of the 5 postures specified in the questionnaire. During the study, 26 students (13.3) used 1 correct, 32 students (16.3%) 2 correct, 81 students (41.3%) 3 correct, and 25 students (12.8%) used five correct postures according to the figured parameters.

Shows the posture scores of all students out of 5 and the average and standard deviation valuesof their quality of life scores. In addition, distribution and differences according to the gender factor are shown in the Table 3. The number of correct postures that students pay attention to during the time they work at the desk was 2.99 ± 1.17, while it was determined that female students were 2.89 ± 1.15 and that of males was 3.17 ± 1.21. In the comparison between the genders, it was found that there was no difference in the number of correct postures that male and female students pay attention to at the desk (p = 0.119). A statistically significant difference was found in the Nothingham Health Profile pain (p = 0.044) and sleep (p = 0.004) sub-parameters of female and male students. This difference was found in favor of men in pain and women in sleep. When other sub-parameters and total score were compared according to gender, no difference was found (p> 0.05).

4. Discussion

In this study, only 12.8% of the students used a great posture according to the ergonomic parameters questioned and the health-related quality of life was found as 212,12±59,121 according to the NHP. It was also found that 73.0% of the students who received online education had an increase in the level of musculoskeletal pain during the pandemic according to the face-to-face education duration. The students stated that they have pain in the shoulder area with almost 30%. Considering the duration of students' use of computers at their desk, it was found that 54.6% used laptops/computers for 1 hour or more. When the ergonomic fit of the postures of female and male students during studying were compared, it was found that there was no difference between the genders. In addition, when health-related quality of life was compared, pain and sleep sub-parameters were found to be different between genders, while other parameters were determined to be similar.

In the literature, various researches have been carried out in a short time, especially in the field of health sciences, in the pandemic process. Many of them are oriented towards satisfaction of students from the new education model and the quality of education perceived by students.[11,12]The number of studies showing how students' health is affected in this process, in which students continue with a full-time online education, is limited. The fact that no study was found regarding the ergonomic suitability of the studying postures in their living environment shows the leading data of our study. Moreover, some papers showed the effects of new life on the anxiety and many other dimensions of health among students of faculty of health sciences, but no paper showed their quality of life.[8,13] Thus, another important result of our study is that the quality of life was also indicated in this paper.

Computers have become increasingly common in both workplaces and homes over the past 20 years. Although recommendations during computer use are ubiquitous among computer users between posture and musculoskeletal health, it is not well characterized. Those with greater computer use may be more likely to report symptoms than those with less computer use.[14] Noack Cooper et al. reported that students use their computers in poor postures and they feel discomfort in one or more body parts by adapting to this posture, so that ergonomic arrangement is also important to reduce this discomfort.[15] In addition, Royster and Yearout reported that students were not informed about ergonomic regulations regarding healthy computer use in their education programs, and therefore 67% of them felt pain while using computers.[2] Ariens et al. found that flexion posture of the neck and sitting posture during computer use are associated with neck pain and

that 95% of the working hours are sitting and more than 70% of the one hour working time has working with neck flexion of at least 20 ° which usually causes neck pain.[16] According to our findings, less students stated increase in neck pain, whereas increase in shoulder pain was reported in more students. Further research is required to investigate the reasons as pandemic period may cause to this different result as while the students listen in front of their computers, they should take notes on an incorrect position for long times.

In general, it has been shown that long-term computer use significantly increases the risk of musculoskeletal system problems in the upper extremities.[17,18] Thus, our results also showed that most students have inadequate postures on their computers while studying. Moreover, most of them stated that they have a remarkable increase in the level of musculoskeletal pain. Poor posture while using a computer at a desk during the online education period can cause musculoskeletal problems. Especially in a study conducted by Pınar et al., it was shown that working without taking a break in positions that would cause postural disorders for a long time can cause musculoskeletal problems,[19] while in another study by Kuo et al., the desk and computer positions did not have individual settings and, accordingly, inadequate postures for long times can cause musculoskeletal problems.[20] Although the severity of pain was not measured in our study, many of the students stated that there was an increase in pain, and many of them were found to be in the wrong posture on the computer. Accordingly, we think that the increase in musculoskeletal pain may be due to non-ergonomic training conditions.

Differences in anthropometry and biomechanics between men and women may create some differences in the symptoms that may arise during desk work. Won et al. compared the muscle activities and forces of upper extremity during desktop computer use according to gender and it was found that while typing on the computer, women had significantly higher keyboard pressing force and higher upper extremity muscle activities than men and also less neutral.[21] Nevertheless, in our study, it was observed that similar postures were used on the desktop during the pandemic process among men and women. The difference here may be due to the study methods, because while Won et al. investigated the muscle activation and force used in keyboard use, we examined the posture used during online education. Accordingly, we think that as kinetic and kinematic values differ from each other, the findings may be different.

Developments in social, cultural, economic and technology in recent years have led to great changes in the structure of society. These changes have a negative impact on the quality of life of the individuals and most of the young people. For this reason, determining the problems that arise in the youth period is important in terms of increasing the quality of life.[22] In the young population who is active in their daily lives, their quality of life also changes with the change of biological, physical and mental lifestyle. Decreased cardio respiratory fitness and muscular endurance, as well as increased BMI due to physical inactivity, together with the uncertainty of the pandemic process, cause the quality of life to be negatively affected.[23]

The difference between men and women throughout the world continued during the quarantine period in terms of household and care work and it was shown that the quality of life was also affected in different ways.[24] The fact that families are in the quarantine process due to the COVID-19 outbreak further increases the workload of women. In particular, universities' interrupting face-to-face education and conducting a large part of the spring semester of the 2019-2020 academic year and the entire fall semester of 2020-2021 online with distance education also leads to a critical change in the lives of female students. Female students, who generally live in university life away from their home and create their own lifestyles, shape their personalities and establish their future returned to their homes during the pandemic period and stayed indoors at home. Therefore, they had to take part in housework and care roles.[25] When comparison in terms of gender difference was conducted for the Nottingham Health Profile used in the assessment of quality of life, it was observed that pain parameter was higher in women. We think that this result may be due to lifestyle differences between men and women and women feel more pressure on themselves in the new life. However, more paper is required to show the causes of this difference.

During the Covid-19 pandemic, loneliness, less exposure to the sun, increased use of electronic devices and inactive living caused the sleep pattern to be negatively affected by the stress on individuals. The use of electronic devices such as computer and phones, especially by university students in the online education process, has caused them to be more affected in this context.[26–29]

The higher number of household responsibilities of female students compared to male students may lead to a difference in the duration of electronic device use and, accordingly, sleep states. In the study conducted by Buysse et al., a significant difference was found in sleep quality between women and men in favor of men.[30] The difference found in our study resulted in favor of women. We think that this difference is due to the increase in domestic activities of female individuals which results in emergence of fatigue during the quarantine process and thus the need for sleep.

4.1. Limitations

There are a few limitations of this paper. First of all, due to the quarantine conditions, it was conducted online based so more objective assessment methods like Rapif Upper Limb Assessment (RULA) could have been used for desk posture. Secondly, although gender comparisons

were not the primary aims in our paper, differences were shown according to gender. However, gender numbers were not homogeny so the results related to gender needs more research to generalise. Lastly, we had to do the survey in the same days of the semester to make academic pressure as similar as possible and the participation was voluntary. In this way, we did not have power analysis for an adequate sample size.

The curriculum of many programs in health education includes long practical and theory based lectures.[8] Theory based lectures may be presented in online system as the system permits recording and students can listen and take their notes with resting periods. Thus, they may have a good satisfaction from the theory based lectures in online education instead of listening these types of courses in a classroom environment. However, practical lectures need observing from all direction of the lecturer so lecturers try to show practices from different angles and try to find solutions to see their students' learning level. Satisfaction of students from online practical courses are low due to these problems and they try to understand courses. Low satisfaction may increase anxiety of students during lectures as they suffer from diffucult learning and limited experiences of practices which are observed by their lecturers.[8,12]

Many studies were conducted about the difficulties and the consequences of passing to a sudden intensive online education among students of faculty of health sciences during pandemic. This study presents information about the ergonomic suitability and quality of life of these students as ergonomic conditions lead to better/worse environment in the productivity of people so both learning and quality of life of students may probably be affected by these conditions. In conclusion, this paper shows the ergonomic posture and quality of life of the students who continue online education during pandemic. These results will guide managements of universities and health professionals in terms of workload of online education and its risks to musculoskeletal system of young population.

5. Ethical Statement

Since this is a web based research, informed consent is taken from the students before starting the questions included in the study.

6. Source of Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

7. Conflict of Interest

None.

References

1. Organization WH. WHO Director-General's remarks at the media briefing on 2019-nCoV on 11; 2020. Available from: https://www.who.int/director-general/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020.
2. Royster L, Yearout A. A computer in every clasroom-are schoolchildren at risk for repetive stres injuries (RSIs)? in: Advances in Occupational Ergonomics and. *IOS Pres*. 1999;48(12):407–12.
3. Gamage KA, Wijesuriya DI, Ekanayake SY, Rennie AE, Lambert CG, Gunawardhana N. Online delivery of teaching and laboratory practices: continuity of university programmes during COVID-19 pandemic. Education Sciences. *Educ Sci*. 2020;10(10):291. Available from: https://doi.org/10.3390/educsci10100291.
4. Gewin V. Five tips for moving teaching online as COVID-19 takes hold. *Nature*. 2020;580(7802):295–6. doi:10.1038/d41586-020-00896-7.
5. Rempel DM, Krause N, Goldberg R, Benner D, Hudes M, Goldner GU. A randomized controlled trial evaluating the effects of two workstation interventions on upper body pain and incident musculoskeletal disorders among computer operators. *Occup Environ Med*. 2006;63:300–6.
6. Work-related musculoskeletal disorders in the EU-Facts and figures; 2010. Available from: https://osha.europa.eu/en/publications/osh-figures-work-related-musculoskeletal-disorders-eu-facts-and-figures/view.
7. Kim HJ, Kim JS. The relationship between smartphone use and subjective musculoskeletal symptoms and university students. *J Phys Ther Sci*. 2015;27:575–579.
8. Topcu ZG, Kaygısız BB, Demiralp C. How are the physical activity and anxiety levels of the university students affected during the coronavirus (Covid-19) pandemic? *Balt J Health Phys Act*. 2020;1:33–40.
9. Zandifar A, Badrfam R. Iranian mental health during the COVİD-19 epidemic. *Asian J Psychiatr*. 2020;51:101990. doi:10.1016/j.ajp.2020.101990.
10. Kücükdeveci AA, Mckenna SP, 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):31–9. doi:10.1097/00004356-200023010-00004.
11. Ansari KA, Farooqi F, Khan SQ, Alhareky M, Trinidad M, Abidi T, et al. 2021. Available from: https://doi.org/10.12688/f1000research.28178.1.
12. Abbasi MS, Ahmed N, Sajjad B, Alshahrani A, Saeed S, Sarfaraz S, et al. E-Learning perception and satisfaction among health sciences students amid the COVID-19 pandemic. *Work*. 2020;67(3):549–56.
13. Yadav RK, Baral S, Khatri E, Pandey S, Pandeya P, Neupane R, et al. Anxiety and depression among health sciences students in home quarantine during the COVID-19 pandemic in selected provinces of Nepal. *Front Public Health*. 2021;9:137. doi:10.3389/fpubh.2021.580561.
14. Gerr F, Marcus M, Monteilh C, Hannan L, Ortiz D, Kleinbaum D. A randomised controlled trial of postural interventions for prevention of musculoskeletal symptoms among computer users. *Occup Environ Med*. 2005;62(7):478–87. doi:10.1136/oem.2004.015792.
15. Cooper KLN, Sommerich CM, Mirka GA. College students and computers: Assessment of usage patterns and musculoskeletal discomfort. *Work*. 2009;32(3):285–98. doi:10.1177/154193120404801215.
16. Ariëns G, Borghouts J, Koes BW. The epidemiology of pain; 1999. p. 235–55.
17. Hannan LM, Monteilh CP, Gerr F, Kleinbaum DG, Marcus M. Job strain and risk of musculoskeletal symptoms among a prospective cohort of occupational computer users. *Scand J Work Environ Health*. 2005;31(5):375–86. doi:10.5271/sjweh.921.
18. Lassen CF, Mikkelsen S, Kryger AI, Brandt LP, Overgaard E, Thomsen JF. Elbow and wrist/hand symptoms among 6,943 computer operators: a 1-year follow-up study. *Am J Ind Med*. 2004;46(5):521–33. doi:10.1002/ajim.20081.
19. Pınar T, Cakmak ZA, Saygun M, Akdur R, Ulu N, Keles I. Symptoms of musculoskeletal disorders among ammunition factory

workers in Turkey. *Arch Environ Occup Health*. 2013;68(1):13–21. doi:10.1080/19338244.2011.627893.
20. Kuo YL, Huang KY, Kao CY, Tsai YJ. Sitting Posture during Prolonged Computer Typing with and without a Wearable Biofeedback Sensor. *Int J Environ Res Public Health*. 2021;18(10):5430. doi:10.3390/ijerph18105430.
21. Won EJ, Johnson PW, Punnett L, Dennerlein JT. Upper extremity biomechanics in computer tasks differ by gender. *J Electromyogr Kinesiol*. 2009;19(3):428–36. doi:10.1016/j.jelekin.2007.11.012.
22. Kahya Y. Life Quality of Youth and Future Expectations. *Business Manag Stud An Int J*. 2020;8(1):950–68.
23. Nguyen HC, Nguyen MH, Do BN, Tran CQ, Nguyen TT, Pham KM, et al. People with suspected COVID-19 symptoms were more likely depressed and had lower health-related quality of life: the potential benefit of health literacy. *J Clin Med*. 2020;9(4):965. doi:10.3390/jcm9040965.
24. Yerkes MA, André SC, Besamusca JW, Kruyen PM, Remery CL, Zwan RVD. 'Intelligent' lockdown, intelligent effects? Results from a survey on gender (in)equality in paid work, the division of childcare and household work, and quality of life among parents in the Netherlands during the Covid-19 lockdown. *PLoS One*. 2020;15(11):242249. doi:10.1371/journal.pone.0242249.
25. Yıldırım-Şahin E. Effects of the Pandemic Process on the Female University Students and Problems They Lived with the Implemented Distance Education Model. . *OPUS Uluslararası Toplum Araştırmaları Dergisi*. 2020;17:3245–75. Available from: https://doi.org/10.26466/opus.828394.
26. Zhang C, Yang L, Liu S, Ma S, Wang Y, Cai Z, et al. Survey of Insomnia and Related Social Psychological Factors Among Medical Staff Involved in the 2019 Novel Coronavirus Disease Outbreak. *Psychiatry*. 2020;14:306. doi:10.3389/fpsyt.2020.00306.
27. Altena E, Baglioni C, Espie CA, Ellis J, Gavriloff D, Holzinger B, et al. Dealing with sleep problems during home confinement due to the COVID-19 outbreak: Practical recommendations from a task force of the European CBT-I Academy. *J Sleep Res*. 2020;29(4):e13052. doi:10.1111/jsr.13052.
28. Orgilés M, Morales A, Delvecchio E, Mazzeschi C, Espada JP. Immediate Psychological Effects of the COVID-19 Quarantine in Youth From Italy and Spain. *Front Psychol*. 2020;11:2986. doi:10.3389/fpsyg.2020.579038.
29. Abdulah DM, Musa DH. Insomnia and Stress of Physicians During Covid-19 Outbreak. *Sleep Med*. 2020;20(2):100017. doi:10.1016/j.sleepx.2020.100017.
30. Buysse DJ, Hall ML, Strollo PJ, Kamarck TW, Owens J, Lee L. Epworth Sleepiness Scale (ESS), and clinical/polysomnographic measures in a community sample. *J Clin Sleep Med*. 2008;4(6):563–71.

Author biography

Cemaliye Hürer, Lecturer https://orcid.org/0000-0002-9412-829

Ferdiye Zabit Özdemir, Lecturer https://orcid.org/0000-0003-2390-3002

Emine Ahsen Şenol, Lecturer https://orcid.org/0000-0002-6367- 0664

Zehra Güçhan Topcu, Assistant Professor https://orcid.org/0000-0001-8587-7407

Cite this article: Hürer C, Zabit Özdemir F, Ahsen Şenol E, Güçhan Topcu Z. Investigation of the ergonomic suitability and the health related quality of life among the students in online education during the COVİD-19 pandemic. *IP J Nutr Metab Health Sci* 2021;4(4):164-170.