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Comparison of pain, posture, physical activity and sleep quality of undergraduate and graduate students of health sciences

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ABSTRACT

Background: The aim of this study was to investigate pain, posture, levels of physical activity, and sleep quality in undergraduate and postgraduate students along with determine how educational differences affect these parameters.

Study Design: A cross-sectional study.

Materials and Methods: This study conducted with the participation of 60 undergraduate, 58 graduate students. The Short-Form McGill pain questionnaire was used to assess pain, the New York Posture assessment for posture assessment, the International Physical Activity Questionnaire (IPAQ) to determine physical activity levels, and the Pittsburgh Sleep Quality Scale to determine sleep quality.

Results: A total of 118 participants (mean age =24.07 years, 72.9% women) were included in the study. Posture and the low IPAQ score had significant differences between undergraduate and graduates ($p<0.05$), whereas pain, IPAQ total score, and sleep quality were similar ($p>0.05$).

Conclusion: When the literature is briefly mentioned, there are general studies about university students, but it was not clear how the undergraduate and postgraduate status of the students affected the health related factors. Therefore, based on the results of this study, necessary evaluations and improvements should be made regarding the risk factors faced by the students, taking into account the pain, posture, physical activity levels, and sleep quality of undergraduate and postgraduate students.

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1. Introduction

Students need to adapt to university life in a moment by undertaking their individual life responsibilities in a different social environment they are foreign to. Adaptation to university, is critical for students' academic and social futures, individual happiness and psychological health.^{1,2}

At university, there are changes in students' life as well as changes in their health behavior. The habits acquired in university life also affects their future life.³ According to Moller (1996), the future welfare of the nation is contingent on student well-being.⁴ World Health Organization (WHO),

defined health as being “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” in 1948. In other words, a healthy lifestyle should include not only protection from diseases, but also behaviors that increase well-being throughout life. These behaviors increase the well-being of the individual and provide self-realization and include examples such as balanced diet, stress management, regular exercise, not smoking, health responsibility and hygienic issues.⁵

Factors such as postural impairments, computer use, sitting duration, exercise habit, anxiety, depression and academic stress take place as a source of pain among university students. Furthermore, it has been reported that

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pain experiences are seen in various regions.⁶ Pain is one of the major public health problems which prevalence' raising around the World.⁷ Although it is associated with musculoskeletal problems, it can affect muscles, tendon, joints, nerves and bones and causes loss of function.⁸

Students of health sciences are particularly at risk of Musculoskeletal Diseases (MSD) due to their exposure to physical and psychosocial risk factors during intensive courses. Studies show that, daily computer use, physical inactivity, non-ergonomic desks with prolonged sitting during lectures and academic stress during exam periods make health sciences students at higher risk for developing MSD.⁹

A study conducted by Wami et al.¹⁰ included health sciences students and showed that the most frequently pain regions were lower back (54.0%), followed by neck pain (36.70%), hand - wrist pain (14.9%), shoulder pain (12.3%), and elbow - forearm pain (10.4%). Also this study highlights that when the academic year increases, the probability of seeing musculoskeletal disorders is high.¹⁰ In addition, the increased use of computers among university students causes musculoskeletal problems in several areas such as waist, neck and elbow regions, and one of the most important reasons for this is working in uneven postures.¹¹ The American Orthopedic Association defines posture as “a state of balance sufficient to protect muscles and bones from injury in standing, sitting and lying positions”. Conditions in a resting position or standing still are called static postures, while conditions in motion are called dynamic postures.¹² No study has been found showing whether the posture changes with academic load.

According to the WHO, physical activity is defined as any body movement produced by skeletal muscles that requires energy expenditure. It is protective in muscle and bone health, improve in quality of life and against diseases and reduces the risk of disease.¹³ For adults aged 18-64 years, at least 150 minutes of moderate intensity or at least 75 minutes of vigorous aerobic exercise per week is recommended, and activity duration should be at least 10 minutes at a time.¹⁴ Studies in various countries have reported that university students of health sciences have low levels of physical activity.^{15–20}

Factors such as facility, tools, infrastructure, instructor, excessive lecture hours for students, the mismatch between the course hours and schedules of university facilities, gender, income and age are among some of the problems which students encounter in participating in physical activity. In order to eliminate or minimize these problems, various encouraging organizations should be made. Therefore, universities play an important role in this regard.²¹ Moreover, there are studies reporting that physical activity is associated with concentration and sleep quality.^{22,23}

Even though 7 to 9 hours of sleep is recommended for adults, studies have shown that university students sleep less than the recommended.²⁴ Although the sleep disturbances vary according to culture, socioeconomic status and gender in worldwide, however it is a common complaint among university students and it is considered a serious health risk by the American Medical Association and the American Academy of Sleep Medicine. Intensive schedules and new social environments may create changes on sleep patterns.^{25,26}

Most studies mentioned above investigated various factors among university students, but there is not adequate information about the differences of undergraduates and graduates.²⁷ Thus, the purpose of this study is to investigate pain, posture, sleep quality and physical activity levels in undergraduate and postgraduate students of health sciences and to determine how the differences in academic load affects these parameters.

2. Materials and Methods

The study received approval from the Research Ethics Committee of Eastern Mediterranean University on 28.12.2020 (ETK00-2020-0286). All participants provided written informed consent. The research data collected from 118 students; undergraduate (n=60) and postgraduate (n=58) in Eastern Mediterranean University. 50 participants work, whereas remaining 68 participants do not have any job.

The inclusion criteria were: continuing education at Eastern Mediterranean University Faculty of Health Sciences and having a body mass index (BMI) between 20-25 (kg/m²). Participants with any neurological disorder, visual, hearing and / or communication impairment were excluded.

2.1. Demographic information

Data such as age, gender, workplace, marital status, presence of children, chronic illness, smoking / alcohol use, participation in sports / exercise, time spent on the computer were collected from all participants. Then, the participants were asked to fill the scales given by the researcher, except postural analysis which was conducted by the observation of the researcher.

2.2. Pain

Short Form McGill (SF-McGill) is a pain assessment questionnaire developed by Melzack in 1987. It consists of 15 (11 sensory, 4 perceptual) words used to describe pain. The intensity of pain is evaluated between 0 and 3 (0 = none, 1 = mild, 2 = moderate and 3 = severe.). These adjectives are ranked according to patient's pain severity so higher scores indicates, more pain experience. SF-McGill also includes visual analog scale in order to determine severity of pain

with a numeric scale. SF-McGill Questionnaires has been translated into various languages also Turkish validity and reliability studies were performed by Yakut et al. in 2007 on rheumatoid patients.^{28,29}

2.3. Posture

New York Posture Index published in 1958 and it's used for a subjective postural assessment. The rating chart is used to assess 13 areas of the body and provide to assess in two different positions as lateral and posterior. A scoring represents: 5 points to the correct position; 3 points for slight deviation, and 1 point for a pronounced deviation. Total score is between 13 - 65 points. Higher the points indicates better postural alignment.^{30,31}

2.4. Quality of sleep

Pittsburgh Sleep Quality Index (PSQI), as a self reported index, was developed by Buysse et al. in 1991 and the Turkish validity and reliability of the index was performed by Ağargün et al. in 1996. It measures sleep quality and sleep disturbances over the last month. PSQI consisting of 24 questions; 19 questions are answered by the person, while 5 questions are answered by the person's bedmate/roommate which these are not scored. 19 questions that will be included in the scoring are divided into 7 subheadings such as "subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction over the past month." The scores range between 0 to 21 points and high points show bad sleep quality.³²

2.5. Physical activity

In this study, the "International Physical Activity Questionnaire Long Form (IPAQ-Long Form)" was used to determine the physical activity level. IPAQ was developed by Craig et al. in 2003 and the Turkish validity and reliability of the index was performed by Ağargün et al. in 1996.^{33,34} IPAQ is used to identify the physical activity level of participants' aged between 15-65. Activities which are less than 10 minutes at one time are not counted. MET method used for determine level of physical activity. "MET-minute/week" score is achieved by multiplying; MET value, day and minute for every activity level. Obtained score classified as physically inactive (MET=<600 energy level), insufficient activity level (MET=600-3000 energy level) and physically sufficient activity level (MET=>3000 energy level).³⁵

2.6. Statistical analysis

SPSS 20.0 (Statistical Package for the Social Sciences) package program was used for the statistical analysis of the study. Evaluation parameters were presented as

arithmetic mean (\bar{x}), standard deviation (ss), frequency (f) and percentage (%) values. Since the Kolmogorov-Smirnov results showed that all variables were not distributed normally, Mann-Whitney U test was used for the comparisons between the groups. Chi square test was conducted to compare the categorical data. A value below $p<0.05$ was considered significant.

3. Results

The participant's average age was 24.07 ± 4.01 years (Table 1). This study was carried out with the participation of 118 people. Eighty-six people (72.9%) were female, while 32 (27.1%) were male. Comparison of the variables between the undergraduate students (n=60) and postgraduate students (n=58) were shown in Table 1. Working status, chronic disease, marital status, child, and sports participation were statistically different in the groups ($p<0.05$), whereas both undergraduate and graduate students smoke and took alcohol with similar percentages ($p>0.05$).

Table 2 showed the results regarding the comparisons of pain, posture, sleep quality, and physical activity. Although both undergraduates and graduates had high scores from posture assessment, graduates had better posture than undergraduates ($p=0.004$). Moreover, IPAQ low scores were higher in undergraduates than the IPAQ low scores in graduates ($p<0.001$).

4. Discussion

This paper showed that pain experiences and sleep quality were similar among undergraduate and graduate students, while posture and physical activity levels had differences.

Sociodemographic information presents important results about the lives of people as presence of child or any chronic disease gradually affects livings. Thus, when we look at the results related to this information, most of the sociodemographic findings were different between the undergraduates and graduates so some outcome measures like physical activity could be affected by these differences.

McGill scores about pain was low among the university students included in the study and pain was found to be similar between undergraduates and graduates. This may be related to the low levels of pain. Pain increases while the academic years increase according to the study by Wami et al.¹⁰ but the academic increase was not a change in the academic degree, so we did not find any difference in pain between undergraduates and graduates.

Prolonged computer use is found as an associated factor with postural problems so university students who have academic load on computers may have these problems.¹¹ In this study, the students in both groups had very good postures according to the New York Posture scale, but the postures of graduates were better than undergraduates. This

Table 1: Comparison of the sociodemographic information between undergraduates and graduates.

		Undergraduate (n)	Graduate (n)	P
Working Status	Yes	2	48	0.000*
	No	58	10	
Chronic Disease	Yes	7	1	0.032*
	No	53	57	
Marital Status	Single	60	42	0.000*
	Married	0	15	
	Divorced/Widowed	0	1	
Child	Yes	0	6	0.012*
	No	60	52	
Smoking	Yes	18	10	0.103
	No	42	48	
Alcohol	Yes	20	24	0.368
	No	40	33	
Sports participation	Yes	10	22	0.009*
	No	50	36	

Table 2: Comparison of the pain, posture, sleep quality, and the level of physical activity between undergraduates and graduates.

	Undergraduate (X ± SD)	Graduate (X ± SD)	p
McGill Pain	7.71 ± 15.69	4.88 ± 9.72	0.301
Newyork Posture Score	56.25 ± 6.66	59.29 ± 6.31	0.004*
Pittsburgh Sleep Quality	5.78 ± 2.95	5.23 ± 3.05	0.363
IPAQ low	1492.73 ± 1362.45	731.13 ± 565.88	0.000*
IPAQ medium	208 ± 696.17	264.28 ± 515.84	0.061
IPAQ vigorous	341.33 ± 1033.66	315.86 ± 610.26	0.270
IPAQ total	1935.13 ± 2188.63	1343.21 ± 1003.56	0.252

X: Mean, SD: Standart Deviation, *: Statistically significant (p<0.05)

may be related to the faculty of the students as students of health sciences have more active courses and needs less computer use according to students of some other faculties like architecture.

Physical activity is an important parameter to determine a healthy living so it is more popularly investigated in the papers today.^{15–20} Similar to our paper, Gravers et al. compared the undergraduates and graduates in terms of physical activity and showed that undergraduates tended to be more physically active. Although they did not use any questionnaire, they had similar results with this paper. Graduates have more responsibilities as they probably work and some have responsibilities about their child so they only focus on completion of their responsibilities about their livings, whereas undergraduates have more time to be mobile during their lives. These factors may result in higher level of physical activity in the low parameter (walking, cleaning home etc.) of physical activity.³⁶

Sleep problems are frequently observed have showed university students and studies showed that these may be associated with academic load, so we investigated whether the degree would affect the quality of sleep. Both student groups had a score around 5 and Pittsburgh has a sensitivity above 5 points so this result shows that students in both groups had difficulties and/problems about sleep. Oswalt

et al. also compared the sleep habits of undergraduate and graduate students and showed that graduates had better sleep.³⁷ However, in this paper, there was no difference between the sleep quality of undergraduates and graduates. In the paper by Oswalt et al., structured questions were used instead of a specific questionnaire so different results may be caused with this factor. Nevertheless, more research may be conducted with larger sample sizes to conclude in more accurate results.

This paper presents information about the effects of studying in different academic degrees on various health parameters. We can conclude that both undergraduates and graduates had low pain and good posture, whereas their physical activity and sleep quality required interventions. Furthermore, according to the comparisons, undergraduates had higher physical activity level, whereas graduates had better postures.

5. Conflict of Interest

None.

6. Source of Funding

None.

References

- Haas J, Baber M, Byrom N, Meade L, Nouri-Aria K. Changes in student physical health behaviour: an opportunity to turn the concept of a Healthy University into a reality. *Perspect Public Health*. 2018;138(6):316–24.
- Dyson R, Renk K. Freshmen adaptation to university life: Depressive symptoms, stress, and coping. *J Clin Psychol*. 2006;62(10):1231–44.
- Nesrin İ, Serap B, Nadire ET. Determination of the relationship between mental status and health behaviors of university students. *Clin Exp Health Sci*. 2014;4(4):207–15.
- Moller V. Life satisfaction and expectations for the future in a sample of university students. *S Afr J Sociol*. 1996;27(1):16–26. doi:10.1080/02580144.1996.10430699.
- Duran Ü, Öğüt S, Asgarpour H, Kunter D. Sağlık Çalışanlarında Sağlıklı Yaşam Biçimi Davranışlarının Değerlendirilmesi. *Adnan Menderes Üniversitesi Sağlık Bilimleri Fakültesi Dergisi*. 2018;2(3):138–47.
- Aydın S, Bahadır H, Günay T. Dokuz Eylül Üniversitesi Eğitim Fakültesi ikinci sınıfa devam eden öğrencilerde kas iskelet sistemi ağrıların varlığı ve ilişkili etmenler. *Dokuz Eylül Üniversitesi Tıp Fakültesi Dergisi*. 2018;32(2):89–97.
- Özdiç SO, Turan FN. Sağlık Bilimleri Fakültesi Öğrencilerinde Kas İskelet Sistemi Problemleri ile Fiziksel Aktivite ve Stres Düzeyi Arasındaki İlişkinin İncelenmesi. *Sağlık Bilimleri ve Meslekleri Dergisi*. 2019;6(2):1–9.
- Arslan I, Atici E. Fizyoterapistlerin İş Yüküne Bağlı Kas-İskelet Sistemi Yaralanmalarının Sağlık Hizmeti Sunumu Üzerine Etkileri. *Düzce Üniversitesi Sağlık Bilimleri Enstitüsü Dergisi*. 2019;9(2):76–85.
- Desai M, Jain S. Prevalence of Musculoskeletal Problems in Physiotherapy Students. *Int J Health Sci Res*. 2020;10(4):59–64.
- Wami SD, Mekonnen TH, Yirdaw G, Abere G. Musculoskeletal problems and associated risk factors among health science students in Ethiopia: a cross-sectional study. *J Public Health*. 2020;29(2):1–7. doi:10.1007/s10389-020-01201-6.
- Osama M, Ali S, Malik RJ. Posture related musculoskeletal discomfort and its association with computer use among university students. *J Pak Med Assoc*. 2018;68(4):639–41.
- Başarı GÖ, Balcı P, Nohutlu E, Ulusoy S, Vayvay ES, Sertoğlu E. Fizyoterapi Öğrencilerinde Mesleki bilincin postür üzerine etkisi. *Türkiye Klinikleri Spor Bilimleri Dergisi*. 2009;1(1):31–7.
- Sklempe IK, Znika M, Brummic V. Physical activity, health-related quality of life and musculoskeletal pain among students of physiotherapy and social sciences in Eastern Croatia-Cross-sectional survey. *Ann Agric Environ Med*. 2019;26(1):182–90. doi:10.26444/aaem/102723.
- WHO; 2010. Available from: <https://www.who.int/news-room/fact-sheets/detail/physical-activity>.
- Pengpid S, Peltzer K, Kassean HK, Tsala JPT, Sychareun V, Müller-Riemenschneider F, et al. Physical inactivity and associated factors among university students in 23 low-, middle-and high-income countries. *Int J Public Health*. 2015;60(5):539–49.
- Varela-Mato V, Cancela JM, Ayan C, Martín V, Molina A. Lifestyle and health among Spanish university students: differences by gender and academic discipline. *Int J Environ Res Public Health*. 2012;9(8):2728–41.
- Hürer C, Senol EA, Zabit F, Topcu ZG. Determining the physical activity level and social media addiction of physiotherapy and rehabilitation students who receive online education during the Covid-19 pandemic. *J Educ Technol Health Sci*. 2021;8(2):53–8.
- 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. *Baltic J Health Phys Act*. 2020;12:33–40.
- Burke SM, Carron AV, Eys MA. Physical activity context and university student's propensity to meet the guidelines Centers for Disease Control and Prevention. *Med Sci Monitor*. 2005;11(4):171–6.
- Sıdika O, Çamcı G, Yılmaz RK. Üniversite öğrencilerinin fiziksel aktivite yapma durumu ve fiziksel aktivitenin kalp sağlığına etkisini bilme durumu. *Gümüşhane Üniversitesi Sağlık Bilimleri Dergisi*. 2018;7(1):54–61.
- Öztürk MA. Üniversite öğrencilerinin rekreasyonel fiziksel aktivitelere katılım engellerinin karşılaştırılması. *Gelecek Vizyonlar Dergisi*. 2019;3(1):12–9.
- Alapın I, Fichten CS, Libman E, Creti L, Bailes S, Wright J, et al. How is good and poor sleep in older adults and college students related to daytime sleepiness, fatigue, and ability to concentrate? *J Psychosom Res*. 2000;49(5):381–90.
- Wunsch K, Kasten N, Fuchs R. The effect of physical activity on sleep quality, well-being, and affect in academic stress periods. *Nat Sci Sleep*. 2017;9:117–26. doi:10.2147/NSS.S132078.
- Yılmaz A. Üniversite Öğrencilerinde Fiziksel Aktivite, Sedanter Süre ve Yaşam Kalitesi İlişkisinin Değerlendirilmesi. *OPUS Uluslararası Toplum Araştırmaları Dergisi*. 2019;10(17):1433–53. doi:10.26466/opus.532283.
- Pascoe MC, Hetrick SE, Parker AG. The impact of stress on students in secondary school and higher education. *Int J Adolescence Youth*. 2020;25(1):104–12.
- Salmani AA, Shidhani A, Qassabi SA, Yaaribi SA, Musharfi AA. Prevalence of sleep disorders among university students and its impact on academic performance. *Int J Adolescence Youth*. 2020;25(1):974–81.
- Graves RJ, Williams SG, Hauff C, Fruh SM, Sims B, Hudson GM, et al. Undergraduate versus graduate nursing students: Differences in nutrition, physical activity, and self-reported body mass index. *J Am Coll Health*. 2020;p. 1–6. doi:10.1080/07448481.2020.1842421.
- Yakut Y, Yakut E, Bayar K. Reliability and validity of the Turkish version Short-Form McGill Pain Questionnaire in patients with rheumatoid arthritis. *Clin Rheumatol*. 2007;26(7):1083–7. doi:10.1007/s10067-006-0452-6.
- Melzack R. The Short Form McGill Pain Questionnaire. *Pain*. 1987;30(2):191–7. doi:10.1016/0304-3959(87)91074-8.
- Gultekin Z, Tonga E, Yavuz B, Sarac ET, Atay F, Yilmazer A, et al. New York posture evaluation, quality of life, depression and anxiety status in university students. *Fizyoterapi Rehabilitasyon*. 2007;18(2):137.
- Rajakumari DL, Alagesan S. Survey of Posture using Newyork Postural Rating Scale-Impact of Corrective and Aerobic Exercise on Posture and Physiological Variables. *Int J Innov Res Dev*. 2012;1(6):527–32.
- Smyth C. The Pittsburgh sleep quality index (PSQI). *J Gerontological Nurs*. 1999;25(12):10–1. doi:10.3928/0098-9134-19991201-10.
-
- Craig CL, Marshall AL, Sjöström M, Bauman AE, Booth ML, Ainsworth BE, et al. International physical activity questionnaire: 12-country reliability and validity. *Med Sci Sports Exerc*. 2003;35(8):1381–95. doi:10.1249/01.MSS.0000078924.61453.FB.
- Ştefan L, Vrgoč G, Rupčić T, Sporiš G, Sekulić D. Sleep duration and sleep quality are associated with physical activity in elderly people living in nursing homes. *Int J Environ Res Public Health*. 2018;15(11):2512. doi:10.3390/ijerph15112512.
- Graves RJ, Williams SG, Hauff C, Fruh SM, Sims B, Hudson GM, et al. Undergraduate versus graduate nursing students: Differences in nutrition, physical activity, and self-reported body mass index. *J Am Coll Health*. 2020;p. 1–6. doi:10.1080/07448481.2020.1842421.
- Oswalt SB, Wyatt TJ. Who Needs More Sleep? Comparing Undergraduate and Graduate Students' Sleep Habits in a National US Sample. *Int J Higher Educ*. 2015;4(1):77–85.

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