



EVALUATION OF THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY AND QUALITY OF LIFE IN 6TH-YEAR MEDICAL STUDENTS

TIP FAKÜLTESİ 6. SINIF ÖĞRENCİLERİNDE FİZİKSEL AKTİVİTE İLE YAŞAM KALİTESİ İLİŞKİSİNİN DEĞERLENDİRİLMESİ

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ABSTRACT

Introduction: The aim of this study is to examine the relationship between physical activity (PA) and quality of life (QoL) in 6th-year medical students and to explore the impact of various factors on this relationship.

Methods: This study was conducted between May 1, 2024, and November 1, 2024, on a voluntary basis on 169 6th year medical students working at Selçuk University Medical Faculty hospital. The study was cross-sectional and descriptive in nature. All participants completed a general information form consisting of 8 questions. Data on PA were collected using the International Physical Activity Questionnaire (IPAQ) Short Form. To assess the participants' QoL, the Short Form 36 Quality of Life Scale was used. All data were collected through face-to-face interviews.

Results: In this study with 169 students, it was found that levels of PA had a statistically significant relationship with gender, marital status, and alcohol consumption. Levels of PA were also found to be significantly related to students' QoL. More active students had higher scores on QoL subscales, such as physical functioning and energy.

Conclusion: A positive relationship was determined between levels of PA and QoL in 6th-year medical students. The study's findings show that higher levels of PA are strongly associated with an increase in QoL.

Keywords: Physical activity (PA), quality of life (QoL), medical students.

ÖZET

Giriş: Bu çalışmanın amacı, tıp fakültesi 6. sınıf öğrencilerinde fiziksel aktivite ve yaşam kalitesi arasındaki ilişkiyi incelemek ve çeşitli faktörlerin bu ilişki üzerindeki etkisini araştırmaktır.

Yöntemler: Bu çalışma 1 Mayıs 2024 ile 1 Kasım 2024 tarihleri arasında Selçuk Üniversitesi Tıp Fakültesi hastanesinde çalışan 169 adet 6.sınıf tıp fakültesi öğrencisi üzerinde gönüllülük esasına göre yürütülmüştür. Çalışma kesitsel ve tanımlayıcı niteliktedir. Tüm katılımcılar 8 sorudan oluşan bir genel bilgi formu doldurmuştur. Fiziksel aktiviteye ilişkin veriler Uluslararası Fiziksel Aktivite Anketi (IPAQ) Kısa Formu kullanılarak toplanmıştır. Katılımcıların yaşam kalitesini değerlendirmek için Kısa Form 36 (SF-36) Yaşam Kalitesi Ölçeği kullanılmıştır. Tüm veriler yüz yüze görüşmeler yoluyla toplanmıştır.

Bulgular: 169 öğrenci ile yapılan bu çalışmada, fiziksel aktivite düzeylerinin cinsiyet, medeni durum ve alkol tüketimi ile istatistiksel olarak anlamlı bir ilişkisi olduğu bulunmuştur. Fiziksel aktivite düzeyinin öğrencilerin yaşam kalitesi ile de anlamlı bir ilişkisi olduğu bulunmuştur. Daha aktif öğrenciler, fiziksel işlev ve enerji gibi yaşam kalitesi alt ölçeklerinde daha yüksek puanlara sahiptir.

Sonuç: Tıp fakültesi 6. sınıf öğrencilerinin fiziksel aktivite düzeyleri ile yaşam kaliteleri arasında pozitif bir ilişki saptanmıştır. Çalışmanın bulguları, daha yüksek fiziksel aktivite düzeylerinin yaşam kalitesindeki artışla güçlü bir şekilde ilişkili olduğunu göstermektedir.

Anahtar Kelimeler: Fiziksel aktivite, yaşam kalitesi, tıp öğrencileri.

INTRODUCTION

PA is a factor that significantly affects the overall health status and QoL of individuals. Regular PA improves muscle and bone health, strengthens the cardiovascular system and supports the immune system (1). PA is also a powerful method for addressing psychological issues like depression and anxiety. (2). In this context, PA plays a vital role in enhancing general health and QoL .

Recent research has shown that levels of PA in adolescents decrease by approximately 7% each year and this decrease is more pronounced especially in girls. The rapid development of society has a negative impact on the participation of youthful population in PA . For example, factors such as orientation towards transportation vehicles instead of walking, social media making sedentary lifestyle attractive with the development of technology, and long

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academic studies prevent participation in PA (3). All these conditions are more common in medical students who are exposed to intensive and long working conditions both in theoretical and practical periods.

Medical students may have difficulty in maintaining their levels of PA due to their intensive academic programs and stressful working conditions. Long hours of lectures, clinical internships and exam preparations are the main factors that make it difficult for students to be physically active (4). In addition, these students face high stress levels, sleep problems and time management difficulties. It is common for these students to not get enough rest and neglect their PA while coping with long working hours and high academic demands. These challenges may jeopardize both the physical and mental health of medical students, and this may reduce the capacity of individuals who will serve as health professionals in the future to protect their own health (5).

This study aimed to explore the association between PA and QoL among 6th-year medical students.

METHODS

Written permission for this study was granted by the Non-Interventional Clinical Research Ethics Committee of Selcuk University with the decision dated 07.05.2024 and numbered E.752833. This observational and cross-sectional study was planned on all 6th-year students working at Selcuk University Medical Faculty Hospital between 01.06.2024 and 01.11.2024. The study included 169 actively working, volunteer, 6th grade medical school students. While conducting the study, care was taken to exclude participants who had any musculoskeletal system disease, who required continuous and medication use, who had cardiopulmonary disease and who did not answer most of the questions. As a result of all these criteria, all but 29 of the 198 6th grade students in the Faculty of Medicine were reached and all data were collected by face-to-face interviews. The interviews were conducted in a quiet and comfortable environment of our university according to a pre-prepared interview protocol. This protocol ensured that each participant was asked the same questions in the same order.

Information on PA was collected using the International Physical Activity Questionnaire Short Form. Students' QoL was assessed using the 'Short Form 36 (SF-36) Quality of Life Scale'.

Sociodemographic Form: In this form, students were asked about gender, age, marital status, smoking and alcohol use, height and weight.

International Physical Activity Questionnaire (IPAQ)

This form, used to assess the students PA levels, contains a total of 7 questions. The students were inquired about the amount of time they dedicated to physical activities over the past week.

Within the scope of this study, the levels of PA of 6th-year medical students were evaluated on the basis of having performed PA for a minimum of 10 minutes during the last week. The overall PA score (MET-minutes per week) was calculated based on the amount and duration of vigorous and moderate PA in the questionnaire.

The Total Physical Activity Score (TPA) was foot up by taking into account the amount of vigorous and moderate PA and the duration of walking that the students did in the last 7 days.

Students were divided into three groups as "low, moderate and high" PA performers according to their total PA scores. Accordingly, those with <600 MET-min/week were classified as low, those with 600-3000 MET-min/week as moderate, and those with >3000 MET-min/week as high level PA (6).

Short Form 36 Quality of Life Scale

The SF-36, created by Ware et al. in 1992 to measure QoL (7). The questionnaire is composed of 36 items in total and these items are designed as a self-assessment tool evaluating 8 different dimensions (9,10). These domains include physical functioning, social functioning, role limitations due to physical health, role limitations due to emotional problems, vitality, mental well-being, pain, and overall health perception.

The Turkish adaptation, including validity and reliability analyses, was carried out by Koçyiğit et al. (10). While the questions of the scale are evaluated based on the students' status in the last four weeks, only the second questions the students' perception of the general change in their health in the last one year.

The subscales of the questionnaire evaluate health status on a scale from 0 to 100, with 100 representing the optimal health level and 0 representing the poorest health level.

Statistical Analysis

Statistical analysis was performed with SPSS 25.0. Statistical significance tests were evaluated by Chi-square (χ^2) test for comparisons of quantitative data, Mann-Whitney U test between two groups that did not show normal distribution for comparisons of continuous variables, and Kruskal-Wallis H test for comparisons of three or more groups. The association between quantitative variables was evaluated using Spearman's correlation analysis. When interpreting the correlation coefficient (r), a value between 0.00 and 0.25 was considered a very weak, 0.26 to 0.49 as a weak, 0.50 to 0.69 as a moderate, 0.70 to 0.89 as a strong, and 0.90 to 1.0 as a very strong correlation.

Kolmogorov-Smirnov normality test was used for normality of the data. All analyses were conducted with a 95% confidence interval, and a p-value of less than 0.05 was regarded as statistically significant.

RESULTS

The sociodemographic characteristics of the students are shown in Table 1. Among 169 final-year medical students, 51.5% were female (n=87) and 48.5% were male (n=82). 15.4% were married (n=26) and 84.6% were single (n=143). The average age of the students was 24.72 ± 1.52 (min:22, max:31) years. 76.3% of the students were non-smokers (n=129), while 23.7% were smokers (n=40). 92.9% of the students did not use alcohol (n=157), while 7.1% used alcohol (n=12). The average body mass index (BMI) of the students was determined as 23.84 ± 4.03 (min:15, max:37.5) kg/m². The mean weekly TPA score of the students according to the IPAQ was 1760.46 ± 1646.08 MET-min/week. While 20.7% of the students were in the 'inactive' group (n=35), 53.8% had 'minimally active' (n=91) and 25.5% had high PA (n=43) levels of PA (Table 1).

Notable differences were identified in students' levels of PA when analyzed based on gender ($p < 0.05$). The post hoc analysis revealed that women were more dominant in the inactive group and men were more dominant in the very active group. Significant differences were observed when students' marital status was compared according to PA level ($p < 0.05$). The post hoc analysis revealed that married individuals were more likely to be in the inactive group. Crucial differences were observed when the alcohol use status was compared according to the PA level of the

students ($p < 0.05$). Based on the post hoc analysis, it was determined that the majority of alcohol users were in the very active group. No significant relationship was found between smoking and BMI and PA level ($p > 0.05$) (Table 2).

Based on the results of the Kruskal-Wallis H test conducted to determine whether the PA levels of the students differed as per the subscales of the SF-36; a statistically significant difference was observed between PA levels and physical function ($p = 0.011$) and energy ($p = 0.026$) subscale mean scores. As a result of the analysis, it was determined that the difference was between the physical functioning subscale and the groups with PA levels of inactive (a)-very active (c) ($U = 484.5$, $Z = -2.912$, $p = 0.004$) and min. active (b)-very active (c) ($U = 1555.5$, $Z = -2.082$, $p = 0.037$). An important difference was also detected between the energy (vitality) subscale ($p = 0.026$) and PA level min. active (b)-very active (c) groups ($U = 1394.5$, $Z = -2.689$, $p = 0.007$) (Table 3).

In Table 4, the relationships between the sections of the SF-36 and TPA and BMI values were analyzed. There was a weak positive and statistically meaningful relationship between physical functioning and physical role difficulty ($r = 0.271$, $p < 0.001$). There was a weak positive correlation, which was statistically relevant, between emotional difficulty and physical role difficulty ($r = 0.418$, $p < 0.001$). There was a

Table 1. Sociodemographic characteristics of students

Variable	Category	n	%
Gender	Female	87	51.5
	Male	82	48.5
Age Mean \pm SD (min-max) years		24.72 \pm 1.52 (22-31)	
Marital Status	Married	26	15.4
	Sinngle	143	84.6
Smoking Status	No	129	76.3
	Yes	40	23.7
Alcohol Consumption	No	157	92.9
	Yes	12	7.1
BMI Mean \pm SD (min-max)		23.84 \pm 4.03 (15-37.5)	
BMI Groups	<18.5	14	8.3
	18.5-24.9	101	59.8
	25.0-29.9	42	24.8
	≥ 30	12	7.1
PA Score Mean \pm SD (min-max)		1760.46 \pm 1646.08 (115-9438)	
PA Level	Inactive	35	20.7
	Minimally Active	91	53.8
	Highly Active	43	25.5
Total		169	100

Mean \pm SD: Mean \pm Standard Deviation, BMI: Body Mass Index

Table 2. Comparison of students' various characteristics by levels of physical activity (n=169)

Variable	Category	IPAQ							
		Inactive		Minimally Active		High Active			
		n	%	n	%	n	%	x2	p
Gender	Female	24	27.6	49	56.3	14	16.1	10.461	0.005 ^e
	Male	11	13.4	42	51.2	29	35.4		
Marital Status	Married	10	38.5	10	38.5	6	23.1	6.094	0.048 ^e
	Single	25	17.5	81	56.6	37	25.9		
Alcohol Consumption	Yes	1	8.3	4	33.3	7	58.3	6.123	0.034 ^e
	No	34	21.7	87	55.4	36	22.9		
Smoking Status	Yes	7	17.5	18	45	15	37.5	4.016	0.134
	No	28	21.7	73	56.6	28	21.7		
BMI Groups	<18.5	4	28.6	9	64.3	1	7.1	8.754	0.173
	18.5-24.9	19	18.8	57	56.4	25	24.8		
	25.0-29.9	8	19	18	42.9	16	38.1		
	≥30	4	33.3	7	58.3	1	8.3		

BMI: Body mass index, IPAQ: International PA Questionnaire, e: Statistically Significant

weak positive and statistically relevant relationship between emotional difficulty and energy ($r=0.409$ $p<0.001$).

There was a highly statistically meaningful positive correlation between vitality and mental health and a weak statistically meaningful correlation between social function and mental health ($r=0.761$ $p<0.001$, $r=0.449$ $p<0.001$, respectively). There was a weak statistically meaningful positive correlation between social function and pain ($r=0.362$ $p<0.001$). There was a positive weak statistically significant relationship between general health and mental health ($r=0.446$ $p<0.001$). There was a positive weak statistically meaningful relationship between physical functioning and TPA ($r=0.288$ $p<0.001$). There was a negative very weak statistically meaningful relationship between BMI and physical role difficulty ($r= -0.151$ $p=0.049$).

DISCUSSION

As a result of easy access to food with the development of technology and increasing technology addiction, it is an inevitable result that people's PA decreases. This situation is among the main reasons for the decrease in PA in 6th-year medical students with intense work tempo, exam stress and stressful working conditions. According to the results of the "Chronic Diseases Risk Factors Survey" performed by the Ministry of Health in 2011 in Turkey, 87% of women and 77% of men do not perform adequate physical activity(13). In this study, the relationship between levels of PA and QoL

in 6th-year medical students was examined and the factors affecting this relationship were evaluated.

In this study, age, marital status, gender, smoking and alcohol use, body mass index and PA levels of the students were compared. As a result of this comparison, relevant differences were detected between gender, marital status and alcohol use and PA.

According to the IPAQ score of the students, 20.7% were inactive, 53.8% had minimal activity and 25.5% were in the very active group and performed adequate physical activity. In research conducted by Bulgurcu et al. involving 179 healthcare professionals, it was found that 25% of the students performed regular physical activity, while 75% did not perform sufficient PA (14). In another study in which a total of 235 female students participated, it was found that 7.2% of the students showed low activity, 80.4% showed moderate activity and 12.3% showed high activity(15). In research performed by Keohane et al. with 219 physicians, 21% of the physicians were found to be 'inactive', 30% 'low level active' and 49% 'active'(16).

When PA was compared according to gender in the study, it was found that women were more likely to be inactive. In research performed by Genç et al. on 710 young adults, males had significantly higher levels of VPA, MPA and TPA compared to females (17). In a study conducted by Savcı et al. in 1097 university students, total, moderate and vigorous PA and walking scores of males were found to

Table 3. The relationship between levels of PA and the life quality subscales of the Short Form-36

SF-36 Subscales	PA Level	n	Mean±SD	χ^2	p†
Physical Functioning	Inactive	35	86.73±16.60 ^a	9.002	0.011 0.004^{ac} 0.037^{bc}
	Min. Active	91	92.11±11.47 ^b		
	High Active	43	97.27±5.05 ^c		
Physical Role Difficulty	Inactive	35	67.30±39.22	3.881	0.144
	Min. Active	91	71.63±38.35		
	High Active	43	85.22±29.53		
Emotional Difficulty	Inactive	35	51.26±45.43	1.134	0.567
	Min. Active	91	58.96±43.59		
	High Active	43	48.92±41.57		
Vitality (Energy)	Inactive	35	48.65±19.57 ^a	7.335	0.026 0.007^{bc}
	Min. Active	91	49.42±18.38 ^b		
	High Active	43	57.04±17.50 ^c		
Mental Health	Inactive	35	57.34±14.61	4.743	0.093
	Min. Active	91	59.40±18.40		
	High Active	43	59.86±22.71		
Social Function	Inactive	35	67.21±18.59	1.220	0.543
	Min. Active	91	66.82±23.59		
	High Active	43	71.93±17.97		
Pain	Inactive	35	65.48±23.00	2.464	0.292
	Min. Active	91	68.65±20.54		
	High Active	43	76.02±17.17		
General Health	Inactive	35	60.00±18.00	1.931	0.381
	Min. Active	91	61.34±18.68		
	High Active	43	63.63±20.48		

SF-36: Short Form-36, Mean±SD: Mean±Standard Deviation a-c :Inactive- High Active , b-c: Min. Active-High Active

be higher than females (18). Von Bothmer et al. found that PA status did not show any difference according to gender in a study applied to university students in Sweden (19). According to many studies, men have higher PA levels than women. In our study, men were found to be significantly more active than women, and the reason why men were in the very active group may be due to the fact that they are more likely to participate in team sports involving vigorous PA such as soccer and basketball.

In our study, when PA levels were compared according to alcohol use status, it was found that the majority of alcohol users were in the very active group 8 of the 16 studies in the review by Dodge et al. in 2016 were conducted in university students, while the other 8 were conducted in non-student adults. A favorable association with PA alcohol consumption was reported in seven of eight studies (87.5%) in university students. A positive association with PA and alcohol use was documented in six of eight studies (75%) in non-student adults (20).

In research performed by Korkmaz et al. in 2013 in 501 individuals, it was concluded That the levels of PA individuals who used alcohol were lower than those of individuals who did not use alcohol (21). In research performed by Şahin et al. in 2017, it was found that alcohol use did not affect physical activity (22). Although the result

reached in our study is compatible with the majority of the studies in the literature, the reason why it is different from the 2 studies conducted in our country may be due to the limited sample. The clustering of alcohol users in the 'highly active' group may be explained by factors such as higher social interaction or the fact that alcohol consumption temporarily makes individuals feel more energetic. Conflicting findings in the literature may be due to factors such as sample characteristics, geographical differences or frequency of alcohol consumption.

In our study, when PA levels were compared according to marital status, it was shown that those who were single were more physically active levels than those who were married. In another research by Özüdoğru et al. in which a total of 278 university personnel participated; it was found that married people had significantly higher PA levels than single people (23). Yıldırım et al. showed that single people had significantly higher PA levels than married people (24). The finding of different results from the literature in our study may be due to the difference in sample groups. The fact that single students participate in PA more than married students may be positively affected by the fact that single students have more time to spare for themselves.

Table 4. The relationship between SF-36 subscales, Total PA(TPA) and BMI values

SF-36 Subscales	1	2	3	4	5	6	7	8	9	10
Physical Functioning	1									
Physical Role Difficulty	0.271**	1								
Emotional Difficulty	0.224**	0.418**	1							
Vitality/Energy	0.136	0.314**	0.409**	1						
Mental Health	0.135	0.238**	0.302**	0.761**	1					
Social Function	0.218**	0.331**	0.397**	0.449**	0.431**	1				
Pain	0.213**	0.337**	0.295**	0.286**	0.259**	0.362**	1			
General Health	0.321**	0.307**	0.232**	0.417**	0.446**	0.289**	0.315*	1		
Total PA	0.288**	0.053	-0.020	0.131	0.158*	0.054	0.131	0.105	1	
BMI	-0.084	-0.151*	0.009	0.112	0.111	0.108	-0.039	-0.108	0.064	1

PA: Physical activity, BMI: Body mass index, SF-36: Short Form-36, * Correlation is meaningful at the 0.05 level, ** Correlation is highly meaningful at the 0.01 level.

In the comparison of the examination of the connection between students' PA levels and the subdimensions of QoL, it was determined that the PA level had a significant relationship with vitality (energy) and physical functioning, which are among the QoL subscales. While there was a significant correlation between PA level inactive-minimal active and minimal active-very active and physical functioning, there was a significant correlation between PA level minimal active-very active and vitality (energy). Studies show that PA is positively linked to many dimensions of QoL. For example, it has been reported that sub-dimensions such as physical functioning and vitality reach higher values when PA increases (25). As per a study performed by Hao et al. in China, PA was demonstrated to have a positive link with SF-36 subscales such as vitality (energy) and physical functioning (25). Comparable findings were reported by Dosic et al (26). Another study stated that higher PA levels were significantly associated with better physical functioning and general health, and also had a positive effect on vitality. In the study carried by Su et al., it was shown that the level of PA was parallel with the physical and mental feature of QoL, and the active PA group scored higher in all other subscales of QoL except physical functioning (24). The fact that there was no significant difference in other subscales

such as mental health and pain in our study may be related to the characteristics of our sample. Medical students may experience chronic fatigue, sleep disorders and mental health problems due to their busy academic programs and high stress levels. These factors may be masking the positive effects of physical activity on mental health. In addition, the fact that our sample consisted of young and relatively healthy individuals may have contributed to the lack of a significant difference in the pain subscale.

In studies comparing minimally active and very active groups, those who were very active showed significant improvements in QoL dimensions (vitality). Similarly, when compared with inactive individuals, significant improvements were recorded in areas such as physical functioning even in those who reached the minimally active level (27). In our study, similar results to those in the literature were obtained and it can be stated that PA may provide not only physical but also psychological benefits and may reduce conditions such as depression and anxiety. In this context, it is thought that improvements in dimensions such as vitality and energy may be related to these effects.

In this study, we aimed to understand the interactions between physical and psychosocial factors affecting health status by examining the relationships between the subscales

of the SF-36 and TPA and BMI values. The highly positive association between vitality and mental health suggests that vitality is strongly linked to mental well-being. The weak positive association between pain and social functioning draws attention to how pain may affect social life. It shows that there is an indirect link between pain management, social participation and general health (28). The finding of a weak positive correlation between TPA and physical functioning indicates that increased PA levels may increase the functional capacity of individuals. This result is aligned with the literature supporting the benefits of PA on health (29). Indeed, in the study performed by Genç et al., it was concluded that more PA in men increased the QoL and this showed results consistent with our study(17).

A very weak negative relationship between BMI and physical role difficulty suggests that obesity or a high BMI may adversely affect physical functioning. Researches in the literature frequently highlight the relationship between excess weight and increased physical role difficulty (30). These findings indicate a complex interaction between the factors affecting individuals' physical and psychosocial health.

In conclusion, although PA is a fundamental necessity for individuals of all age groups, most studies conducted up to now have concentrated on individuals outside the medical field. However, enhancing the QoL and increasing the PA levels of medical students, who are viewed as role models and health guides for society, should be a priority.

The demanding working hours and intense schedules, which occupy a significant part of the day, limit students' participation in physical activities after work. As a result, physical activities are largely confined to walking.

In this context, opportunities such as walking tracks, outdoor sports areas, and exercise facilities around hospitals can be increased to encourage students to participate in physical activities. Additionally, providing time management training to students could encourage them to incorporate short exercise sessions into their daily routines.

Study Limitations

Some students could not participate in the study due to their involvement in different internships and on-call work hours. Individuals with musculoskeletal or cardiopulmonary problems were excluded because they may have additional limitations that may significantly affect their physical activity levels. This may limit the generalizability of our findings because the relationship between physical activity and quality of life may be different in these individuals. 11 students were excluded as a result of all these criteria. Participants maintained similar physical activity habits regardless of seasonal changes due to similar working conditions and busy academic schedules. Moreover, since most of the participants performed physical activity indoors (gym, home exercise, etc.), the potential impact of seasonal changes on outdoor activities was minimized.

CONCLUSION

This study demonstrated that PA levels of 6th-year medical students affect their QoL. The study revealed that PA contributed significantly to enhancing QoL subscales, notably energy and physical functioning. These results highlight the significance of encouraging PA to enhance the QoL for healthcare workers. We believe that such studies will make important contributions to the literature and provide a more effective basis for the development of policies to protect healthcare workers.

Ethics Committee Approval: Written permission for this study was granted by the Non-Interventional Clinical Research Ethics Committee of Selcuk University with the decision dated 07.05.2024 and numbered E.752833.

Informed Consent: Informed consent was acquired, and only voluntary participants were included in the study.

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