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Investigation of Physical Activity Level, Smartphone Addiction and Quality of Life of University Students

Üniversite Öğrencilerinin Fiziksel Aktivite Düzeyi, Akıllı Telefon Bağımlılığı ve Yaşam Kalitesinin İncelenmesi

Meriç ÖDEMİŞ[1], Emriye GÜMÜŞ[2], Samantha DENAMI[3]

[1]Alanya Alaaddin Keykubat Üniversitesi Alanya
· **meric.odemis@alanya.edu.tr** · ORCİD > 0000-0002-2034-4295

[2]Alanya Alaaddin Keykubat Üniversitesi Alanya
· **emriye.gumus@alanya.edu.tr**· ORCİD > 0000-0002-2125-5059

[3]...
· **samanthadenami@gmail.com** · ORCİD > 0009-0001-5117-8605

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Sorumlu Yazar/Corresponding Author: Meriç ÖDEMİŞ

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INVESTIGATION OF PHYSICAL ACTIVITY LEVEL, SMARTPHONE ADDICTION AND QUALITY OF LIFE OF UNIVERSITY STUDENTS

ABSTRACT

The aim of the study is to examine the physical activity level, smartphone addiction and quality of life of university students and to determine the relationship between them. A total of 397 participants, 221 women and 182 men participated in the study. Participants filled out the international physical activity scale (short form), smartphone addiction, and quality of life scales. In the analysis of the data, in addition to descriptive statistics through SPSS 24 statistical program, Independent T test was applied for the comparison of independent binary variables according to the result of normal distribution, and Pearson correlation test was applied for the relationship between variables. At the end of the study, it was seen that the majority of the participants had a moderate level of physical activity. In addition, when quality of life, physical activity level, and smartphone addiction were compared in terms of gender, it was determined that there was a statistically significant difference ($p<0.05$). While there was a significant positive correlation between the participants' physical activity scores and quality of life scores, a very significant negative correlation was found between quality of life and smartphone addiction scores ($p<0.05$). By providing seminar and similar training on smartphone, internet and similar addictions, university students can be made aware of and their quality of life can be improved. In addition, by creating or increasing recreational areas on campus, motivation or habits for physical activity can be increased.

Keywords: Physical Activity, Smartphone Addiction, Quality of Life**,** University Students.

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ÜNİVERSİTE ÖĞRENCİLERİNİN FİZİKSEL AKTİVİTE DÜZEYİ, AKILLI TELEFON BAĞIMLILIĞI VE YAŞAM KALİTESİNİN İNCELENMESİ

ÖZ

Çalışmanın amacı üniversite öğrencilerinin fiziksel aktivite düzeyi, akıllı telefon bağımlılığı ve yaşam kalitesinin incelenmesi ve aralarındaki ilişkiyi belirlemektir. Çalışmaya 216 kadın ve 181 erkek olmak üzere toplam 397 katılımcı katılmıştır. Katılımcılar uluslararası fiziksel aktivite ölçeği (kısa form), akıllı telefon bağımlılığı ve yaşam kalitesi ölçeklerini doldurmuştur. Verilerin analizinde SPSS 24 istatistik programı aracılığıyla tanımlayıcı istatistiklerin yanı sıra, normal dağılım sonucuna göre bağımsız ikili değişkenlerin karşılaştırılması için Bağımsız T testi,

değişkenler arasındaki ilişki için Pearson korelasyon testi uygulanmıştır. Çalışma sonunda katılımcıların çoğunluğunun fiziksel aktivite düzeylerinin orta düzeyde olduğu görülmüştür. Ayrıca yaşam kalitesi, fiziksel aktivite düzeyi ve akıllı telefon bağımlılığı cinsiyet açısından karşılaştırıldığında istatistiksel olarak anlamlı bir fark olduğu tespit edilmiştir ($p<0,05$). Katılımcıların fiziksel aktivite puanları ile yaşam kalitesi puanları arasında pozitif yönde anlamlı bir ilişki bulunurken, yaşam kalitesi ile akıllı telefon bağımlılığı puanları arasında negatif yönde çok anlamlı bir ilişki bulunmuştur ($p<0,05$). Akıllı telefon, internet vb. bağımlılıklar hakkında seminer ya da eğitimler verilerek üniversite öğrencilerinin bilinçlendirilmesi ve bu sayede yaşam kalitelerinin iyileştirilmesine yardımcı olunabilir. Bunun yanı sıra kampüs içi rekreatif alanlarının oluşturulması veya arttırılmasıyla fiziksel aktivite yapma motivasyonu veya alışkanlığı arttırılabilir.

Anahtar Kelimeler: Fiziksel Aktivite, Akıllı Telefon Bağımlılığı, Yaşam Kalitesi, Üniversite Öğrenci.

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INTRODUCTION

Physical activity as activities that may cause changes in our cardiovascular and musculoskeletal systems in our daily lives (Frontera, 2010). According to the definition made by the US Department of Health and Human Services, physical activity is physical movements that occur as a because of skeletal muscle contraction and significantly increase energy expenditure (Miles, 2007). University students spend an average of 68.9% of their days in sedentary behaviors (Peterson et al., 2018). Although public health physical activity guidelines worldwide address the exercise needs of children and adolescents, widely accepted exercise recommendations for young people include at least 1 hour of age-appropriate, fun aerobic exercise per day and strengthening exercises at least 3 times per week (Landry, 2012). Physical inactivity is a serious health problem (Vanhees, 2005). In this regard, regular physical activity has numerous health benefits such as reducing the risk of chronic diseases, improving cardiovascular health, weight management, and increasing muscle strength and endurance (Warburton & Bredin, 2016). Furthermore, engaging in physical activity has positively influenced several aspects of academic performance, including a significant positive effect on attention, which is crucial for academic success (Álvarez-Bueno et al., 2017; De Greeff et al., 2018).

In today's technological age, cell phones have been transformed into smart phones by adding many different features, not just phone features (Karaaslan and Budak, 2012). In relation to this situation, smartphone addiction, which is a type of addiction that develops as a because of the increasing use and frequency of smartphones, has become an important research topic (Kuyucu, 2017). In addition to

offering various conveniences in human life, smartphones also have different negative effects. Smartphone addiction, which is the most concerning negative aspect, is a phenomenon related to the uncontrollability of smartphone use. People who experience this problem face psychological, health, and social problems (Cha and Seo, 2018). While using smartphones appropriately can improve our quality of life, overuse is likely to lead to negative health consequences. Excessive smartphone use is associated with sedentary lifestyles, poor sleep habits, and increased fatigue while awake. It has also been reported that increased time spent on smartphone use before bedtime will shorten one's total sleep time and time spent in physical activity (Lee et al., 2016). Sedentary behaviors such as smartphone use, browsing the internet, and social networks can lead to a decrease in energy expenditure, which can lead to obesity and other metabolic disorders. These behaviors may also be associated with lower levels of physical activity, as they lead to a reduction or cessation of activities such as outdoor play, walking, and other forms of exercise (Haripriya et al., 2019). In this context, smartphone addiction and low physical activity may have an impact on individuals' quality of life.

Quality of life is a multidimensional concept that reflects an individual's overall well-being in different aspects of life, including satisfaction, health, relationships, surroundings, and personal accomplishment. It is influenced by factors like health, economic conditions, and opportunities for participation (Costa et al., 2021). Assessing quality of life can be done through objective and subjective approaches. The objective approach examines available resources, while the subjective approach focuses on psychological well-being. Combining both approaches creates a more holistic understanding of quality of life (Sinha, 2019).

The aim of this study is to examine the physical activity level, smartphone addiction and quality of life of university students and to determine the relationship between them.

METHOD

Research Model

This research is a descriptive study in the type of relational survey to examine the physical activity level, quality of life and smartphone addiction of university students.

Sample Group

The population of this study consists of university students in Turkey in the year 2024, while the sample of the study consists of the students of Alanya Alaaddin Keykubat University. Within the scope of the study, 406 people participated

voluntarily, but a total of 397 people participated due to the exclusion criteria. It was reported that the sample size should be 384 participants for an unknown population of n>100,000 people at a 95% reliability interval and a 5% margin of error (Sekaran, 1992). Therefore, it can be said that the results obtained from the sample can be generalized to the population. The participants consisted of 216 women and 181 men, with an average age of 20.69±1.79 years. Among the participants, 126 were smokers and 277 were non-smokers.

Research Publication Ethics

The research was conducted in accordance with the ethical standards of the Declaration of Helsinki with the permission of the scientific research ethics committee of Alanya Alaaddin Keykubat University in the field of social sciences and humanities (date: 12.07.2023 decision number 2023/04). Participants were given detailed information before the study and were asked to fill out an informed consent form including information about the study. The participants were asked to fill in a demographic information form, physical activity scale (short form), smartphone addiction and quality of life scale.

Inclusion criteria: Being a university student, between the ages of 18 and 27 participating voluntarily, having a smartphone, no health barriers to physical activity.

Exclusion criteria: Not completing the scales completely, If participants leave the study at any time, If the participant is 28 years of age or older.

Measurement Tools

Demographic form: Demographic information included questions about gender, age, and smoking status.

International Physical Activity Questionnaire (IPAQ): International Physical Activity Questionnaire Short form (7 questions) provides information about time spent walking, time spent in moderate and vigorous activities, and time spent sitting. The International Physical Activity Questionnaire (IPAQ-SF) was developed by Craig et al. (2003). The Turkish validity and reliability of the short form was conducted by Sağlam (2010). The calculation of the total score of the scale includes the sum of duration (minutes) and frequency (days) of walking, moderate activity, and high activity. The energy required for the activities is calculated with MET-minute score. The categorical score is proposed in three levels. These are;

Category 1: Low

This is the lowest level of physical activity. Those individuals who not meet criteria for categories 2 or 3 are considered low/inactive.

Category 2: Moderate

Any one of the following three criteria:

- 3 or more days of vigorous activity of at least 20 minutes per day or
- 5 or more days of moderate-intensity activity or walking of at least 30 minutes per day or
- 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 600 MET-min/week.

Category 3: High

Any one of the following two criteria:

- Vigorous-intensity activity on at least 3 days and accumulating at least 1500 MET-minutes/week or
- 7 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 3000 MET-minutes/week

Smartphone Addiction Scale: Smartphone Addiction Scale-Short Form (SAS-SF) is a scale developed by Kwon et al. (2013) to measure the risk of smartphone addiction, consisting of 10 items and assessed on a six-point Likert scale. Scale items are scored from 1 to 6. Scale scores range from 10-60. The higher the score obtained from the test, the higher the risk for addiction. The scale has one factor and no subscales. The Chronbach's alpha coefficient showing the reliability of the Turkish version of the ATBÖ-KF was measured as 0.867. The test/retest reliability coefficient is 0.926 (Noyan et al., 2015).

SF-36 Quality of Life Scale: Quality of Life (Short Form 36) Form developed by Ware and Sherbourne (1992) and adapted into Turkish by Koçyiğit et al. (1999) was used. The reliability coefficient of the data collection tool used in the study was analyzed by Cronbach Alpha test and the reliability coefficient was calculated as .83 for the pre-test and .92 for the post-test. This data collection tool is a self-assessment scale and consists of eight sub-dimensions and 36 items in total. The questions in the scale were prepared in three, five, or six-point Likert type; the fourth and fifth question groups were prepared as yes-no. In the calculation, it gives the total score separately for each sub-dimension. The sub-dimensions are named as physical function, physical role, emotional role, vitality, mental health, social functionality, pain and general health.

Analysis: IBM SPSS Statistics 24 program was used for statistical analysis. Mean, standard deviation, frequency, and percentage values of the participants'

data were given. Since the data showed normal distribution after Skewness-Kurtosis and Kolmogorov Smirnov normality test, Independent T-test was used for the comparison of binary variables, while Pearson correlation test was used for correlation analysis. The statistical significance level was accepted as $p<0.05$.

RESULTS

Table 1. Categorical assessment of participants' physical activity levels

	WOMEN		MEN		TOTAL	
Level	**F**	**%**	**F**	**%**	**F**	**%**
Low	26	12	12	6.6	38	9.6
Moderate	133	61.6	80	44.2	213	53.7
High	57	26.4	89	49.2	146	36.8
Total	216	100	181	100	397	100

It was determined that 53.7% of the participants' physical activity levels were moderate level, 36.8% were high level and 9.6% were low level. In addition, 61.6% of women were determined as moderate level, and 49.2% of men were determined as high level.

Table 2. Mean physical activity scores of participants (Met-minute/week)

	Gender	n	Mean±Sd
Vigorous (Met-min/week)	Women	216	327.03±873.24
	Men	181	1457.32±2002.96
	Total	397	842.35±1598.53
Moderate (Met-min/week)	Women	216	387.77±727.13
	Men	181	582.20±976.95
	Total	397	476.42±854.57
Walking (Met-min/week)	Women	216	1821.34±1670.62
	Men	181	1695.47±1581.77
	Total	397	1763.95±1629.88
Sitting (min)	Women	216	5833.75±1566.02
	Men	181	5795.80±1675.98
	Total	397	5816.44±1615.13
IPAQ (Met-min/week)	Women	216	2536.17±2211.22
	Men	181	3735.03±3093.01
	Total	397	3082.76±2713.04

IPAQ: International physical activity questionnaire

The mean weekly physical activity score of the participants was 3082.76±2713.04 Met-min/week. The mean of vigorous activity of female participants was 327.0370±873.24 Met-min/week, while the mean of males was 1457.3260±2002.96 Met-min/week. In addition, in moderate activity, female participants had 387.7778±727.13 Met-min/week while male participants had 582.2099±976.95 Met-min/week, and in walking, female participants had 1821.3403±1670.62 Met-min/week while male participants had 1695.4707±1581.77 Met-min/week.

Table 3. Comparison of participant data on quality of life, physical activity and smartphone addiction by gender variable

	Gender	n	Mean±Sd	t	df	p
Physical Function (1)	Women	216	84.88±15.35	-1.996	395	**.047**
	Men	181	88.28±18.61			
Physical Role (2)	Women	216	72.10±31.99	-1.357	395	.176
	Men	181	76.38±30.35			
Emotional Role (3)	Women	216	47.05±39.06	-2.693	395	**.007**
	Men	181	57.66±39.16			
Vitality (4)	Women	216	48.88±19.53	-3.335	395	**.001**
	Men	181	55.44±19.46			
Mental Health (5)	Women	216	55.96±17.39	-1.625	395	.105
	Men	181	58.87±18.21			
Social Functionality (6)	Women	216	65.21±21.61	-2.751	395	**.006**
	Men	181	71.27±22.08			
Pain (7)	Women	216	69.08±21.23	-3.820	395	**.000**
	Men	181	77.22±21.03			
General Health (8)	Women	216	57.47±19.99	-3.194	395	**.002**
	Men	181	63.89±19.86			
Ipaq (Met-minute/week)	Women	216	2536.17±2211.22	-4.490	395	**.000**
	Men	181	3735.03±3093.01			
Smartphone Addiction	Women	216	33.10±11.10	3.550	395	**.000**
	Men	181	29.31±9.90			

Quality of life sub-dimensions (1, 2, 3, 4, 5, 6, 7, 8), p<0,05

According to Table 3, it was determined that there was a statistically significant difference in the other components of the quality of life of female and male participants, except for the physical role and mental health sub-dimensions (p<0.05). It was also observed that there was a statistically significant difference between female and male participants in terms of physical activity average and smartphone addiction (p<0.05).

Table 4. Comparison of the data of the participants in terms of quality of life and physical activity average according to smoking variable

	Cigarate	n	Mean±Sd	t	df	p
Physical Function	No	274	86.51±17.93	0.138	395	.890
	Yes	123	86.26±14.69			
Physical Role	No	274	75.63±30.59	1.507	395	.133
	Yes	123	70.52±32.64			
Emotional Role	No	274	54.74±38.71	2.164	395	**.031**
	Yes	123	45.52±40.37			
Vitality	No	274	53.52±19.85	2.494	395	**.013**
	Yes	123	48.21±19.06			
Mental Health	No	274	59.98±16.99	4.616	395	**.000**
	Yes	123	51.28±18.17			
Social Functionality	No	274	69.84±22.06	2.539	395	**.012**
	Yes	123	63.82±21.40			
Pain	No	274	73.95±20.59	1.600	395	.110
	Yes	123	70.22±23.26			
General Health	No	274	63.97±19.85	3.857	395	**.000**
	Yes	123	54.67±19.74			
IPAQ (Met-minute/week)	No	274	3185.07±2767.04	1.122	395	.263
	Yes	123	2854.84±2585.10			

p<0,05

According to Table 4, there was a statistically significant difference between smokers and non-smokers in the emotional role-vitality-spiritual health-social functioning and general health components of quality of life (p<0.05).

Table 5. The relationship between the mean scores of participants' quality of life, physical activity average and smartphone addiction

		1	2	3	4	5	6	7	8	9	10
Physical Function (1)	r	1									
Physical Role (2)	r	.352**	1								
Emotional Role (3)	r	.219**	.361**	1							
Vitality (4)	r	.122**	.220**	.301**	1						
Mental Health (5)	r	.089	.229**	.286**	.718**	1					
Social Functionality (6)	r	.237**	.323**	.383**	.345**	.369**	1				
Pain (7)	r	.271**	.307**	.218**	.261**	.240**	.350**	1			
General Health (8)	r	.404**	.317**	.268**	.403**	.381**	.356**	.400**	1		
Ipaq (9)	r	.126*	0.077	0.096	0.054	0.022	0.088	-0.001	.123*	1	
Smartphone Addiction (10)	r	-0.086	-0.036	-.237**	-.203**	-.235**	-.149**	-.180**	-.251**	-0.097	1

According to Table 5, there was a significant positive correlation between the mean physical activity (IPAQ) scores of the participants and quality of life physical functioning (r:.126*) and general health component (r:.123*) ($p<0.05$), while there is a highly significant negative relationship between smartphone addiction and the emotional role (r: -.237), vitality (r: -.203**), mental health (r: -.235**), social functioning (r: -.149**), pain (r: -.180**) and general health (r: -.251**) components of quality of life ($p<0.01$).

DISCUSSION

In the study, it was determined that 53.7% of the participants' physical activity levels were moderate level, 36.8% were high level and 9.6% were low level. In addition, 61.6% of women were determined as moderate level, and 49.2% of men were determined as high level. In a study, it was reported that 15% of the participants were inactive, 68% had low physical activity level and 18% had adequate physical activity level (Savcı et al., 2006). In this direction, even Manuela and Gheorghe (2020), Nikitara et al. (2021) showed that the moderate level of physical activity in one week are predominant, with a score of 52.5% falling within this moderate level. According to a study conducted for Harran University students, while 16.8% of males and 28.0% of females were inactive, 42.1% of males and 50.6% of females were minimally active, 41.0% of males and 20.6% of female students were highly active, almost half of the rate of males (Kartal, 2018).

When this study was examined, it was found that the mean weekly physical activity score of the participants was 3082.7607±2713.04 Met-min/week. The mean of vigorous activity of female participants was 327.0370±873.24 Met-min/week, while the mean of males was 1457.3260±2002.96 Met-min/week. In addition, it was determined that in moderate activity, female participants were 387.7778±727.13 Met-min/week while males were 582.2099±976.95 Met-min/week, and in walking, females were 1821.3403±1670.62 Met-min/week while males were 1695.4707±1581.77 Met-min/week. Looking at the literature, it was reported in one study that the average physical activity of university students was 1958±1588 Met-min/week (Savcı et al., 2006). In Büke et al. (2021) study, it was found that the mean of vigorous activity of female participants was 1655.08±1976.73 Met-min/week while that of male participants was 2535.28±2524.22 Met-min/week, in moderate vigorous activity female participants was 891.27±1046.93 Met-min/week while that of male participants was 707.37±981.58 Met-min/week, in walking activity female participants was 1791.08±1765.4 Met-min/week while that of male participants was 1633.85±1647.96 Met-min/week. Moreover, our study shows that men have higher physical activity scores than the female gender. These results support the findings of Çiçek (2018), Manuela and Gheorghe (2020), according to which higher physical activity scores emerge in the male gender than in the female gender.

In this study, it was observed that there was a statistically significant difference between the mean physical activity scores of male and female participants ($p<0.05$). It was observed that the mean physical activity scores of males were higher. In their study, researchers have stated that the physical activity level of male university students is higher than female students (Savcı et al., 2006; Çiçek, 2018; Manuela and Gheorge, 2020). Kargün et al. (2016) found that men's physical activity scores were higher than women's at all activity levels, and while there was no significant difference between genders at high, medium and low activity levels, a statistically significant difference was found in the total physical activity variable.

In this study, it was determined that there was a statistically significant difference in the other components of the quality of life of female and male participants, except for the physical role and mental health sub-dimensions ($p<0.05$). According to these findings, it was determined that the mean score of quality of life was higher in men. In a study conducted on Saudi adult individuals, it was reported that male participants had higher mean scores in quality of life components, but female participants had higher mean scores in social relationship components (Al-Mohaimeed et al. 2022). In another study, it was observed that male university students had higher mean scores in general health, physical health, and culturally standardized sub-dimensions, while female university students had higher mean scores in the environmental health sub-dimension (Ulutaş et al. 2020). Chraif and Dumitru (2015), in their study on the quality of life levels of psychology students, found that

the difference in favor of men in the quality of life level was statistically significant. It can be said that their quality of life is also negatively affected due to low physical activity level.

In this study, it was determined that female participants had higher mean scores in smartphone addiction. In some studies, it has been stated that there is a difference between male and female university students in terms of smartphone addiction, and the result of this difference is that female participants use smartphones more than males (Lee et al. 2016; Taiwade and Khubalkar 2019; Shahrestanaki et al. 2020; Baloğlu et al. 2020). In this respect, it is parallel to the findings of our study. However, in other studies, it was reported that male students were more addicted to smartphones compared to females (Basu et al. 2018; Awasthi et al. 2020). It has been determined that as internet addiction increases, physical activity level decreases and neck pain scores increase due to smartphone and internet use (Alaca, 2022). The social environment, daily habits and lower physical activity levels of female university students compared to males may have contributed to the higher rate of smartphone addiction among male students.

In this study, it was determined that there was a statistically significant difference between smokers and non-smokers in the emotional role-vitality-spiritual health-social functioning and general health components of quality of life ($p<0.05$). Efendi et al. 2018 in their study confirm how smokers can have a negative impact on overall Health-Related Quality of Life by affecting various aspects of an individual's well-being, including physical, mental, and social dimensions. Recently, Shandu et al. (2013), have shown that regular physical activity can lead to improvements on physical health, social interactions, psychological state, and environmental factors in college-aged smokers. According to the findings of the study, it can be said that smoking has a negative effect on quality of life.

While there was a significant relationship between the mean physical activity (ıpaq) scores of the participants in the study and quality of life physical function (r:.126*) and general health component (r:.123*) ($p<0.05$), it was determined that there was a very significant relationship between smartphone addiction and quality of life emotional role(r:-.237), vitality (r: -.203**), mental health (r: -.235**), social functionality (r: -.149**), pain (r:-.180), and general health (r: -.251**) components ($p<0.05$). Shahrestanaki et al. (2020) determined that there was a very significant negative relationship between smartphone addiction and quality of life in their study on university students. In this respect, it contains the same result as our study. In the other study, researchers found that smartphone addiction was negatively correlated with quality of life (Awasthi et al., 2020). In the study conducted in Malaysia, it was reported that excessive smartphone use by the participants was negatively correlated with quality of life components (Mohd Salleh Sahimi et al., 2022). Regular physical activity has been associated with positive effects on mental

health and enhance social interaction (Marquez et al., 2020). Furthermore, college students with higher level of physical activity tend to have better Health-Related Quality of Life compared to those with lower levels of physical activity (Ge et al., 2019). According to the findings of the study, it can be said that as the level of physical activity increases, the quality of life increases, but as smartphone use increases, the quality of life decreases.

CONCLUSION AND RECOMMENDATIONS

At the end of the study, it was found that the majority of the participants had a moderate level of physical activity. It was determined that male university students had a higher quality of life and physical activity level than female students, but female university students were more dependent on male students in terms of smartphone addiction. In addition, it was found that smokers had a lower quality of life than non-smokers. In addition, it was observed that as the participants' physical activity levels increased, their quality of life also increased, while as smartphone addiction increased, there was a decrease in the quality of life and physical activity level. It can be ensured that university students have elective courses in their curricula where they can do physical activity and their physical activity levels can be increased through these courses. Raising awareness of university students about smartphone, internet and similar addictions through seminars and similar trainings can help improve their quality of life. In addition, the motivation or habit of doing physical activity can be increased by having sufficient physical activity areas on the university campus.

Limitations: In this study, some variables such as height, weight, and BMI were not examined in the demographic information section of the university students. In addition, the sample is limited to students at Alanya Alaaddin Keykubat University.

Conflict of Interest Declaration

There is no personal and financial conflict of interest within scope of study.

Author Contribution Rates

Design of Study: MÖ(%50), EG(%25), SD(%25)

Data Acquisition: EG(%60), SD(%40)

Data Analysis: MÖ(%100)

Writing Up: MÖ(%50), EG(%25), SD(%25)

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