



## PHYSICAL ACTIVITY LEVELS AND ONLINE VIGILANCE STATUS AMONG VOCATIONAL SCHOOL OF HEALTH SERVICES STUDENTS

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### ARTICLE INFO

#### RESEARCH ARTICLE

Article history:

Received: 16 March 2023

Accepted: 21 August 2023

Available : 31 August 2023

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Turkish Journal of Health Science and Life

2023, Vol.6, No.2, 75-82

DOI: <https://doi.org/10.56150/tjhsl.1265749>

### ABSTRACT

**Aim:** This research was planned to determine the physical activity levels and online vigilance status of vocational school of health services students.

**Method:** The research was performed as a cross-sectional descriptive correlational design. 413 students were contacted online and using face-to-face interviews in this descriptive study.

**Results:** The mean age of the participating students was 20.44±2.76 years, the majority being aged 20-22. Analysis showed that 27.4% checked their phones 10-20 times a day, 35.8% went online to search for information, and that 69.7% stated that they used online communication for social media applications. In terms of daily internet use, 65.9% of students spent 1-4 h a day online, while 64.9% spent less than 1 h a day on social media. The mean physical activity score of the participating students was 2482.69±3601.88, and their online vigilance score was 31.82±11.51. no correlation was found between the salience, monitoring, or reactivity sub-dimensions and physical activity ( $r=-.018$ ,  $p=0.716$ ;  $r=.017$ ;  $p=0.733$ ;  $r=.028$ ;  $p=0.57$ )

**Conclusions:** The university students in the research exhibited a moderate level of online vigilance and the majority were found to be physically inactive.

**Key Words:** Physical activity, online vigilance, university, student

## 1. INTRODUCTION

Exercise has been depicted on several tombs from ancient eastern civilizations. The earliest records of organized exercise for the development and improvement of health date back to approximately 2500 BC. Physical activity is important in the cultures of primitive societies, generally being ritualized in the form of dance and similar activities (1). Physical activity is defined as movements that involve the expenditure of energy using the joints and muscles, increase heart and respiration rates, and result in varying degrees of physical fatigue (2). Individuals may be active in four basic spheres during the course of the day – at work, during transportation, during domestic routines, and in their spare time activities (3). Popular forms of being active include walking, cycling, active entertainment, and games, all of which can be

performed at different skill levels (4). The appropriate level of physical activity for societies has not been definitely established. However, there is general consensus on the subject of 30 minutes of average intensity exercise a day (3).

Regular daily physical activity is a very important factor, together with balanced nutrition, in the prevention of chronic disease (3). Regular physical activity has been proved to prevent, and to assist in the management of, heart disease, stroke, diabetes, and various cancers (4). Physical activity is also very important in combatting depression and anxiety, improve the individual's self-confidence, and impact positively on psychosocial development (5). Current global estimates suggest that a quarter of adults are not sufficiently physically active (4). According to the Chronic Diseases and Risk Factors Survey performed in Turkey in 2011, 87% of women and 77%

of men nationwide did not engage in sufficient physical activity (5).

Industrialization and the technological advances in modern life lead to considerable changes in individuals' lives. Thanks to the advantages of technology, people now expend much less physical energy, although this also means a decrease in their physical activity (6). Although the fact that many jobs and activities now require less energy expenditure thanks to equipment of various kinds may appear to improve quality of life, the spare time and energy resulting from this are not generally employed usefully for the enhancement of that quality. A sedentary lifestyle, in which even daily shopping is carried out via computer from on-line stores, is one of the most important problems facing modern society (2). Increasing levels of physical inactivity have adverse effects on health systems, the environment, economic regeneration, and social well-being and quality of life (4). As countries develop economically, levels of inactivity increase, and can be as high as 70%, for reasons such as changing transportation models, the growing use of technology for work and entertainment, cultural values, and increased sedentary behaviors (7). The development and global spread of portable internet technologies, such as smart phones and wireless web connections, lead to profound changes in the manner in which individuals communicate in their daily lives, and in their thoughts and actions. Numerous users of smart phones or other mobile online devices assume that online content and communications are meaningful and respond to their needs, at all places and times (8). Since the internet permits communication that is at first sight independent of place and time, in other words potentially at any time and any place, individuals communicate on an almost permanent basis and are not restricted solely to individual messages (9). Numerous users develop behavior that involves being constantly connected online and in contact with others (10). Online vigilance in the minds of users involves (1) cognitive orientation to her online connectivity at all times and places, (2) sustained attention and responses to online calls and stimuli in their emotions and ideas, and (3) motivational tendencies to the prioritization of online communication over offline behaviors (8). The numbers of social media users are reported to have risen from 2.07 billion in 2015 to 4.48 in 2021. In addition, 93.3% of internet users make use of social media and 85% use the mobile web. Eighty-five percent of mobile web users are also reported to use the internet in an active manner (11). Haug et al.

determined a higher rate of smart phone dependence among individuals reporting a low level of physical activity (12). In addition, individuals experienced a decrease in physical activity and an increase in activities involving looking at computers, tablets, web-connected devices, and TV during the most intense and difficult days of the Covid-19 pandemic (13). For the purpose of the present research, we assumed that a prolonged period spent online will reduce levels of physical activity. The WHO 2018-2030 physical activity action plan recommended that people should be more active for a healthier world and proposed effective and applicable action plans through intersectoral collaboration (7). Although Vorderer et al. (2016) recommended that physical activity be enhanced in order to reduce online vigilance behaviors, we encountered no studies in the literature examining the relationship between physical activity and online vigilance (10).

### 1.1. Research questions

- What are students' online vigilance status and physical activity levels?
- Is there any relationship between students' online vigilance status and physical activity levels?
- Do students' online vigilance status and physical activity levels vary depending on their sociodemographic characteristics?

## 2. MATERIALS AND METHODS

### 2.1. Research Type and Aim

The research was performed as a cross-sectional descriptive correlational design. The study aim was to determine the physical activity levels and online vigilance status of vocational school of health services students. At the same time, it is to determine whether there is any relationship between students' online vigilance status and physical activity levels.

### 2.2. The Research Population and Sample

The research population consisted of 1100 students at the vocational school of health services of a public university located in the southeastern region of Turkey (40). It was calculated that 285 individuals would participate in the research with the known population sampling formula, and 413 students finally took part. The research data were collected online and using the face-to-face interview method between 21 November and 9 December, 2022.

## 2.3. Data Collection Tools

"Descriptive Information Form", Online Vigilance Scale and "International Physical Activity Questionnaire" were used in the study as data collection tools.

### 2.3.1. Descriptive Information Form

The questionnaire produced by the authors following a scan of the relevant literature and consisted of 12 questions investigating descriptive characteristics such as age, sex, height, and weight.

### 2.3.2. Online Vigilance Scale

Originally developed by Reinecke et al. (14), the scale was adapted into Turkish by Karakoyun in 2021. It contains 12 items. The participant's online vigilance status is evaluated using a five-point Likert-type scale (1 = not at all, 5 = completely). The scale consists of three subdimensions, each containing four items (salience, reactivity, and monitoring). The salience subdimension focuses on participants cognitive orientations to the online environment,

while the reactivity subdimension focuses on instant reaction to online messages. The monitoring subdimension measures the routine monitoring of online content and messages. Internal consistencies of  $\alpha = .91$  for salience,  $\alpha = .83$  for reactivity, and  $\alpha = .91$  for monitoring have been calculated. There are no reverse-scored items. When the scores obtained from the scale are classified as  $12 < x < 28$  "low",  $28 < x < 44$  "moderate," and  $45 < x < 60$  "high," achieving high scores on all the scale items indicates an increased state of online vigilance (15).

### 2.3.3. International Physical Activity Questionnaire

The International Physical Activity Questionnaire was developed by Craig et al. (16) to determine the physical activity levels of adults. The validity and reliability of the Turkish language version were later investigated by Öztürk (17). The International Physical Activity Questionnaire is based on physical activity that are performed for at least 10 min. Minute, day, and metabolic equivalent of task (MET) values are multiplied to yield a 'MET-minute/week'

**Table 1.** Descriptive Characteristics of the Students (n=413)

Characteristics		n	%
Age (20.44±2.76)	17-19	159	38.5
	20-22	208	50.4
	23 and up	44	10.7
Gender	Female	308	74.6
	Male	105	25.4
Income	Income<Expense	257	62.2
	Income = Expense	136	32.9
	Income > Expense	20	4.8
Department	Pathology	86	20.8
	Medical Laboratory	98	23.7
	Opticianry	77	18.6
	Child Development	57	13.8
	Paramedic	95	23.0
Class	1. Class	254	61.5
	2. Class	159	38.5
Smartphone Check Frequency (Days)	10 and down	42	10.2
	10-20	113	27.4
	21-30	94	22.8
	31-40	73	17.7
	40 and up	91	22.0
Purpose of Using Online Content	Information Search	148	35.8
	Online News	107	25.9
	Online Video	103	24.9
	Online Music	55	13.3
Purpose of using online communication	Msn Applications	73	17.7
	Social Media Applications	288	69.7
	E-mail	16	3.9
	Microblogging (Twitter, facebook, etc.)	36	8.7
Daily Internet Use	Less than an hour	24	5.8
	1-4 hour	272	65.9
	5 hour and more	117	28.3
Daily Social Media Use	Don't use	80	19.4
	Less than an hour	268	64.9
	Over an hour	65	15.7
Conditions capable of preventing physical activity	Yes	15	3.6
	No	398	96.4
<b>Total</b>		<b>413</b>	<b>100</b>

score. Physical activity levels were classified as not physically active (<600 MET-min/week), low (600 – 3000 MET-min/week), and adequate (in terms of health) (>3000 MET-min/week) (17).

#### 2.4. Data Analysis

The study data were analyzed on Statistical Package for Social Sciences (SPSS) for IBM version 25 software. Skewness and Kurtosis were considered for normality of distribution. (Skewness : 1.01; Kurtosis:1.64 ) Since the data were not normally distributed, analysis was performed using "Non-parametric tests (Mann Whitney U and Kruskal Wallis) was performed for non-normally distributed data". Relationships between continuous variable were examined using Spearman correlation analysis. The results were evaluated based on a 95% confidence interval and a  $p < 0.05$  level of significance.

#### 2.5. Ethical Considerations

Institutional permission for the study was granted by the Adiyaman University, and approval was obtained from the institutional ethical committee (no. 2022/7-8 dated 25.10.2022). During the implementation phase of the research, the principles of the Helsinki Declaration were complied with. In addition, required legal permissions and informed consents were obtained from the institution and students, respectively. The data were collected online and with the face-to-face interview method.

### 3. RESULT AND DISCUSSION

The mean age of the students in the study was  $20.44 \pm 2.76$  years, and the majority were in the 20-22 age range. In addition, 308 (76.4%) were women, 257 (62.2%) reported income lower than outgoings, the largest proportion were medical laboratory students 98 (23.7%) and in their first year 254 (61.5%), 113

(27.4%) checked their phones 10-20 times a day, 148 (35.8%) used the internet to search for information, and 228 (69.7%) used online communications to access social media. In terms of daily internet use, 272 (65.9%) spent 1-4 h a day online, and 268 (64.9%) spent less than 1 h a day on social media. Additionally, no condition capable of preventing physical activity was present in 398 (96.4%) of the students (Table 1).

In terms of physical activity status, 94 (22.8%) of the students in the research were inactive, 225 (54.4%) had a low level of activity, and 94 (22.8%) were sufficiently active (Table 2).

**Table 2.** The Physical Activity Status of the Students

Physical Activity Status	n	%
Inactive	94	22.8
Low	225	54.4
Sufficient	94	22.8
<b>Total</b>	<b>413</b>	<b>100</b>

The Physical Activity Scale and Online Vigilance Scale scores of the students in the study and their reliability coefficients are shown in Table 2. The students' mean physical activity score was  $2482.69 \pm 3601.88$ , and their mean online vigilance score was  $31.82 \pm 11.51$ . The students were determined to be moderately vigilant online, and to be insufficiently active have an inadequate level of physical activity (Table 3).

Spearman correlation analysis revealed no significant relationship between the Physical Activity Scale and online vigilance ( $r = 0.112$ ,  $p = 0.811$ ). In addition, no correlation was found between the salience, monitoring, or reactivity sub-dimensions and physical activity ( $r = -.018$ ,  $p = 0.716$ ;  $r = .017$ ;  $p = 0.733$ ;  $r = .028$ ;  $p = 0.57$ ), (Table 4).

**Table 3.** Students' Physical Activity Scale and Online Vigilance Scale Scores and Their Reliability Coefficients (n=413)

Scale and Sub-dimensions	Questions	$\bar{X} \pm SS$	Min - Max
<b>Physical Activity</b>	1-7	$2482.69 \pm 3601.88$	0.00-3594.00
<b>Online Vigilance Scale</b>	1-12	$31.82 \pm 11.51$	12.00-60.00
<i>Salience</i>	1-4	$9.69 \pm 3.97$	4.00-20.00
<i>Monitoring</i>	5-8	$9.99 \pm 4.33$	4.00-20.00
<i>Reactivity</i>	9-12	$12.12 \pm 4.74$	4.00-20.00

**Table 4.** Correlation Results for the Physical Activity and Online Vigilance Scales

Scale	Online Vigilance Scales	<i>Salience</i>	<i>Monitoring</i>	<i>Reactivity</i>
<b>Physical Activity</b>	$r = .012$ $p = 0.811^*$	$r = -.018$ $p = 0.716^*$	$r = .017$ $p = 0.733^*$	$r = .028$ $p = 0.576^*$
* $p > 0.05$				

A comparison of the students taking part in the research in terms of the online vigilance and physical activity variables revealed statistically significant differences in terms of income status, department, frequency of mobile phone checking, purpose of online communication, daily internet use, daily social media use, and online vigilance ( $p < 0.05$ ), while no significant differences were observed in terms of age, sex, purpose of online communication, and presence of a condition capable of preventing physical activity ( $p > 0.05$ ), (Table 5).

In terms of physical activity status, while statistically significant differences were observed in terms of sex, department, and academic year ( $p < 0.05$ ), no significant differences were found in terms of age, income, frequency of mobile phone checking, purpose of use of online communication, purpose of online content use, daily internet use, daily social media use, or conditions capable of preventing physical activity ( $p > 0.05$ ), (Table 5).

Table 5: A Comparison of the Students in the Study According to the Online Vigilance and Physical Activity Variables

#### 4. Discussion, Conclusion, and Recommendations

In the previous literature, Freytag et al. investigated the effects of permanent online connectedness of users' stress levels (18), Vorderer et al. examined university students' permanent online connectedness and permanent online presence (10), Reinecke et al. investigated the relationship between constant online presence and procrastination and psychological well-being in adult internet users (8), Zhou et al. investigated online status in the context of rushing and fear of missing out in university students in China (19), and Lin examined permanent online presence and permanent connectedness, and the attachment styles, mobile phone use, and health status of university students in Taiwan (20). However, we encountered no studies examining online vigilance status and physical activity.

In terms of the frequency of daily phone checking variable, 22.0% of the students in this study checked their phones 40 or more times a day. In comparison, 54.9% of students in Sarıkaya's study checked their phones 40 or more times a day, 84.7% of those in Gezgin's study checked them 16 times a day or more, and 67.4% of the participants in a study by Gezgin et al. checked their smart phones 16 or more times a day (21-23). The rate in the present research was thus lower than the rates in those studies.

The majority of the students in the present study

(61.7%) stated that they used online content to look for information and news, while 69.7% reported using social media applications for online communication.

Anshari et al. (2016) reported that 38% of their participants used the mobile internet for 6-12 h a day (24), Sarıkaya that 29.2% used it for more than 5 h, Gezgin that 37.4% used it for more than 4 h, and Gezgin et al. that 21.3% used it for longer than 4 h a day (21-23). The rate in the present study was close to that reported by Sarıkaya. Başoğlu and Yanar (25) reported that 46.5% of students spent less than 1 h a day, while 0.7% of the students in Bilge et al.'s study spent less than 1 h daily (26, 27). We think that the fact that 19.4% of the students in our study did not use social media and that the majority used them for less than 1 h a day, figures lower than those in the studies cited above, are particularly noteworthy findings. This study focused on the assumption that a prolonged time spent online will reduce physical activity levels. However, no statistically significant relationship was found between the Physical Activity Scale and online vigilance.

The mean vigilance score of the students in the study was  $31.82 \pm 11.51$ , showing that the students were moderately vigilant.

Physical activity supports young people's healthy growth and development and improves their thinking, learning, and judgment skills (4). Positive habits acquired during this period will take their proper place in their lives. The WHO recommends 150 min of moderate intensity exercise in a one-week period for adults aged 18-64, or at least 75 min of high-intensity aerobic physical activity (4). However, 22.8% of the students in the present research were inactive, while 55.4% exhibited a low level of activity, and 22.8% were sufficiently physically active. In conclusion, a very small proportion of our students were active. In terms of studies of university students in the literature, Liu and Dai reported a low level of activity in Chinese students (27), while in El-Gylany et al.'s study 11.3% of students exhibited a low level of physical activity, 52.0% a moderate level, and 36.7% a high level of activity (28). More than half (52%) of the students in Bednarek et al.'s study engaged in moderate physical activity, while 37% engaged in intensive activity, and 11% in a low level (29). Atıcı reported a low level of physical activity in the students in that study (30), and AYTEKELI reported a low level of physical activity in the majority of participants (31). Arslan et al. stated that 36.6% of students were sufficiently physically active (32), while Erdoğan and

**Table 5.** A Comparison of the Students in the Study According to the Online Vigilance and Physical Activity Variables

Variables		Online Vigilance Scales				Physical Activity			
		X±SS	Median	U / KW	p	X±SS	Me-dian	U / KW	p
Age	17-19	32.68±11.25	33		0.458	2324.15±3272.42	1500		0.816
	20-22	31.04±11.12	31	1.563		2624.15±3652.84	1553	0.408	
	23 and up	32.47±13.78	29			2497.50±4500.74	1326		
Gender	Female	31.62±11.00	33	15742.00	0.685	1970.09±2285.40	1332	12018.00	<b>0.000*</b>
	Male	32.40±12.94	31			3986.33±5737.27	2238		
Income	Income<Expense	31.40±11.39	32		<b>0.026</b>	2531.87±36.08.16	1386		0.594
	Income=Expense	33.34±11.38	34	7.327		2295.58±2502.72	1665	1.041	
	Income>Expense	26.75±12.70	21			3123.20±1318.50	1318		
Department	Pathology	29.27±10.79	29		<b>0.000</b>	1923.61±2557.96	1002		<b>0.011*</b>
	Medical Laboratory	35.03±12.31	36			2960.26±4789.63	1740		
	Opticianry	32.74±10.08	33	36.415		2700.22±2921.44	1746	13.614	
	Child Development	36.35±10.42	38			2578.92±2342.19	2088		
Class	1. Class	32.14±11.47	33	19351.00	0.475	2282.69±6404.20	1365	17811.00	<b>0.043*</b>
	2. Class	31.30±11.60	31			2802.19±3886.68	1695		
Smartphone Check Frequency (Days)	10 and down	26.14±11.17	25		<b>0.000</b>	2745.28±3597.38	1522		0.232
	10-20	26.94±10.39	25			1907.25±2177.84	1154		
	21-30	31.78±10.22	32.5	61.861		2302.97±2698.31	1490	5.595	
	31-40	35.26±9.93	36			2238.36±2143.62	1836		
	40 and up	37.76±11.78	33			3457.72±5907.72	1824		
Purpose of Using Online Content	Information Search	30.48±11.92	29		0.191	2763.83±4568.47	1456		0.914
	Online News	31.91±11.13	33	4.755		2478.05±3620.36	1492	0.524	
	Online Video	33.83±12.20	35			2303.56±2395.54	1759		
	Online Music	31.45±9.36	31			2070.69±2269.17	1387		
Purpose of using online communication	Msn Applications	28.12±11.03	26		<b>0.000*</b>	1939.96±1910.03	1386		0.893
	Social Media Applications	33.43±11.24	34			2401.97±3054.08	1600		
	E-mail	26.06±12.30	25	19.845		2509.43±3820.94	1053	0.616	
	Microblogging (Twitter, facebook, etc.)	28.94±11.66	26			4217.18±7662.11	1389		
Daily Internet Use	Less than an hour	22.41±8.39	20		<b>0.000*</b>	2214.02±3279.44	1108		0.577
	1-4 hour	30.05±10.99	29	55.543		2450.53±3622.12	1485	1.099	
	5 hour and more	37.86±10.50	39			2612.57±3641.61	1593		
Daily social media use	Don't use	25.05±10.35	23		<b>0.000*</b>	2126.93±2550.12	1356		0.256
	Less than an hour	31.89±10.78	32.5	58.185		2608.28±3708.97	1614	2.725	
	Over an hour	39.83±10.65	41			2402.77±1158.00	1158		
Conditions capable of preventing physical activity	Yes	32.26±11.93	33	2883.50	0.823	22.78.73±2819.47	1455	2917.50	0.882
	No	31.76±11.51	32.5			2490.38±3630.67	1485		

\*p&lt;0.05, \*p&lt;0.001

Revan described 23.3% of their participants as inactive, 48.6% as minimally active, and 28.1% as very active (33). In addition, Bulguroğlu et al. reported that 30.7% of the students in their study were not physically active, with 48.5% having a low level of physical activity, and 20.8% have adequate physical activity (34). Similarly, Ertunç et al. determined low physical activity in 24% of students, moderate activity in 54%, and a high level in 22% (35). In studies involving adults other than from the student population, Aktaş et al. reported a sufficient level of physical activity in 14.8% of their adult study, with a low level in 43.5%, and 41.8% being physically inactive (36). In Genç et al.'s study, 16.8% of women and 7.8% of men exhibited a low level of physical

activity, 61.6% of women and 52.2% of men a moderate level, and 21.6% of women and 40% of men a high level (37). The physical activity levels in El-Glany et al. and Bedranek et al.'s studies were higher than those in the present research (28, 29). However, our results were consistent with those of the other studies.

Significant associations were determined between the online vigilance status of the students in this study and the variables of income level, department, frequency of smart phone checking, purpose of use of online communication, daily internet use, and daily social media use. Higher mean Online Vigilance Scale scores were registered

by individuals with income equal to outgoings, those studying in the child development department, those checking their phones 40 or more times a day, those watching online videos, individuals using the internet for 5 h or more, and those spending more than 1 h a day on the social media. We think that the positive association between online vigilance status and individuals who exhibited the highest frequency of daily phone checking, who used the internet most per day, and who spent the most time on social media is an expected finding.

Significant associations were determined between physical activity status and sex, department attended, and academic year.

Previous studies have reported a higher rate of physical activity among men than women (30, 32, 33, 36, 38, 39). A similar finding emerged in the present study, with men registering higher total Physical Activity Scale scores than women.

Physical activity levels in this study varied depending on the departments attended, with medical laboratory students being more active than those in other departments. Erdoğan and Revan and Cengiz and Delen (2019) also reported that physical activity levels varied by departments attended (33, 38).

In addition, students in their second year were found to be more active. This may suggest that students establish their own life adjustments and include sporting activities in those lives as they progress through the academic years.

#### 4. CONCLUSION

In conclusion, the university students in this study exhibited moderate online vigilance, and the majority were found to be physically inactive. As the frequency and duration of daily internet, smartphone and social media use increases, the online online vigilance situation also increases. In order to reduce online alertness, universities and other stakeholders should increase university students' free and accessible sports and cultural activities. We suggest that the university administration, other public institutions, and non-governmental organizations should act together to provide the requisite support, training and opportunity to raise awareness of the importance of physical activity for this population and to create intervention programs for that purpose.

**Financial Support:** This study was not financially supported by any funding.

**Conflicts of Interest:** The authors report no actual or potential conflicts of interest.

**Ethical Statement:** The ethical committee approval dated 25.10.2022 and decision numbered 2022/7-8 was obtained from the Non-Interventional Clinical Trials Ethics Committee of Adıyaman University.

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