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Original Research Article

Physical Activity Characteristics and Barriers of University Students during the COVID-19 Pandemic in Turkey

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ABSTRACT

Background: Physical activity is an important factor for maintaining health and preventing many diseases. However, it is known that the physical activity level of individuals has decreased considerably due to the pandemic and mandatory restrictions.

Purpose of the study: to investigate the physical activity characteristics and physical activity types of university students during the Covid-19 pandemic, the factors that facilitate and complicate their participation, and their sources of information about the subject.

Material and Method: Students completed the sociodemographic information and data recording form online. The data enrollment form included questions about participation characteristics of students in physical activity before and during the COVÝD-19 pandemic.

Results: A total of 518 physiotherapy and rehabilitation undergraduate students (76.25% female and 23.75% male) were included in the study. During the pandemic period, 44.42% of the students had moderate physical activity. The daily sitting time of the students was 8.3±3.1 hours. During the pandemic period, walking was the most preferred activity except for weekends. Motivation and time from physical activity facilitors had changed during the pandemic period.

Conclusion: As a result of our study, it was found that university students continued walking as a physical activity type, despite restrictions during the pandemic period. While time was not a significant factor that facilitates the participation in physical activity before the pandemic, it became the most important factor during the period of the pandemic. Motivation has lost its importance as a facilitator. We think that it would be a good idea to re-investigate physical activity levels, barriers and facilitators in order to see the effects of the pandemic in the future.

KEYWORDS: Physical Activity, COVID-19, Students.

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INTRODUCTION

With the rapid spread of coronavirus, a pandemic was declared by the World Health Organization in March 2020 [1].

During the pandemic period, restrictions such as distance education method use, travel and curfew were imposed in our country [2]. Such restrictions caused people to spend longer

time at home and increased physical inactivity [3,4,5]. In the literature, it was emphasized that physical inactivity had increased before the pandemic, especially among university students, while it decreased even more with the pandemic [6,7,8,9].

Physical activity is an important part of disease prevention and healthy living. Regular physical activity has many positive effects on the health system such as reducing obesity [10], strengthening the immune system [11], and protecting mental health [12]. However, there is no study showing the change in the barriers and facilitors of physical activity participation characteristics of university students whose physical activity participation decreased before the pandemic.

Therefore, the aim of our study is to reveal the physical activity participation characteristics of university students during the social isolation process experienced within the scope of the protective measures taken against the Covid-19 pandemic, which started on 16.03.2020. In addition, it is aimed to compare the types of physical activity preferred by students during the education process that continues with the distance education method, the factors that facilitate and complicate participation, and the sources of information on the subject with the pre-pandemic period.

METHODS

This cross-sectional study was conducted with the students of Manisa Celal Bayar University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation who volunteered to participate. The study was started after receiving the approval of Manisa Celal Bayar University, Faculty of Medicine, Health Sciences Ethics Committee. Volunteers were invited to participate in the study by sending messages from the social media accounts of each class and to answer the data registration form created with Google forms.

Data Registration Form: Sociodemographic information and physical activity participation characteristics of the students were evaluated using a data form. The form was created by the researchers.

1. Sociodemographic Information: Grade, age (years), height (m), body weight (kg) and gender of the students included in the study were questioned. Body mass index (kg/m2) was calculated using the obtained height (m) and body weight (kg) data.

2. Information on Physical Activity Participation Status: During the 2019-2020 Spring Semester before and after 16.03.2020; questions were asked to assess whether they participated in physical activity; if so, the type, duration, frequency and number of years of participation; the factors that positively and/or negatively affect physical activity participation; their weekday and weekend residence times; their leisure time and transportation activity preferences; their physical activity preferences; their level of satisfaction and satisfaction with their physical activity participation levels; and where and how they obtained information about physical activity participation. The questions created within the scope of the research were pilot tested on 10 students from the program and revised according to the comments of the students. Current level of physical activity participation was evaluated with the International Physical Activity Questionnaire Short Form. This questionnaire was developed to determine the physical activity levels of participants aged between 15-65 years [13].

A reliability and validity study of the Turkish version of the questionnaire was conducted by Saðlam et al. in individuals aged between 18-32 years [14]. There are long and short forms of the questionnaire. It assesses work/school, transportation, household chores, home and family maintenance, recreation, sports and leisure activities performed in the past week, as well as the sitting duration for weekdays and weekends. Data are expressed as MET-min/week. Individuals can be categorized into low, moderate and high levels of physical activity based on the level of physical activity specified in the questionnaire guide.

Statistical Analysis: Statistical analyses were performed using IBM® SPSS® 22 (SPSS Inc., Chicago, IL, USA) software. The conformity of the variables to normal distribution was examined using analytical methods

(Kolmogorov-Smirnov/Shapiro¬Wilk tests). Descriptive analyses were given as mean±std. deviation and min-max. Descriptive statistics of demographic characteristics were given as frequency and percentage values. In continuous data, Wilcoxon signed-rank test was used to compare dependent paired groups (pre-post Covid, etc.) in the case of non-normally distributed data. Pearson's Chi Square or Fisher's Exact Chi Square test was used to analyze categorical data and Mc Nemar's Chi Square test was used for dependent categorical variables. P values below 0.05 were considered statistically significant.

RESULTS

Out of a total of 652 students, 108 (16.56%) did not participate in the study by not answering the online form and 26 (3.99%) did not participate in the study by selecting the "not willing to participate" option. 518 students (79.45%) were included in the study by answering the online form. No missing data were found in the completed forms and all forms were considered valid. Among the students who were included in the study, 395 (76.25%) were female and 123 (23.75%) were male. The mean age was 20.3±1.8 years and body mass index was 21.5±3.3 kg/m^2.

Data on the level of physical activity participation of the students are presented in Table 1. Most of the students (44.4%) had moderate physical activity and their daily sitting time was 8.3±3.1. The sedentary activity preferences of the students were shown in table 2. With the Covid-19 pandemic, only the time spent on the computer during the week increased significantly compared to the pre-pandemic period (p=0.023). The physical activity preferences of the students are presented in Table 3. It was found that students most frequently preferred working with weights, exercises without the use of any auxiliary equipment and walking before the pandemic, and that they continued these activities during the pandemic period, and they also frequently preferred activities such as cleaning, repair/renovation works and playing games with children/siblings/family. However, the pandemic did not significantly change the preference for physical activities (p>0.05).

The physical activity satisfaction levels of the students and the ways of obtaining information are presented in Table 4. The level of satisfaction of students about their physical activity participation decreased significantly in terms of both weekday and weekend activities compared to the pre-Covid-19 pandemic period (p<0.001 / z=-10.06, p<0.001 / z=-11.63, respectively). Compared to pre- Covid-19 pandemic period; the rate of students who found their physical activity participation sufficient in terms of protecting their own health decreased significantly, while the ratio of students who did not find it sufficient had increased significantly (p<0.0001 / x2=16.915, p<0.0001 / x2=7.410, respectively). When the ways of obtaining information about physical activity participation were analyzed, it was observed that the rate of obtaining information from television, social media accounts and mobile applications has increased during the Covid-19 pandemic period compared to the pre-pandemic period, while the rate of obtaining information from classes, family and friends has decreased. However, among the changes in the ways of obtaining information, only the change in obtaining information from university courses was significant (p=0.044).

While factors such as motivation, environment and social life had a positive effect on the physical activity participation of students before the pandemic, only time had a positive effect after the pandemic. The factors that negatively affected physical activity participation were factors related to university and income status before the pandemic, and the conditions due to the pandemic during the COVÝD-19 pandemic (Table 5). In addition, the number of students who stated that there was no reason that facilitated physical activity during the pandemic period has increased significantly compared to the pre-pandemic period (p=0.001). At the same time, the number of students who considered motivation as a facilitator factor for physical activity before the pandemic was significantly higher than post-pandemic period (p=0.001). Another striking finding in our study is the significant increase in the number of students

who stated that pandemic conditions have facilitated physical activity in terms of time (p=0.001).

Table 1: Physical activity participation level.

Activities	Min-Max	X±SD
Vigorous Physical Activity (Day/Week)	0-7	1.9±1.8
Vigorous Physical Activity (Minute/Day)	0-100	24.8±27.2
Moderate to Vigorous Physical Activity (Day/Week)	0-7	2.0±2.0
Moderate to Vigorous Physical Activity (Minute/Day)	0-100	21.9±23.9
Walking Activities (Day/Week)	0-7	4.5±2.1
Walking Activities (Minute/Day)	0-100	40.2±25.5
Sitting duration (h)	2-16	8.3±3.1
Total Physical Activity (Day/Week)	0-7	6.0±1.7
Total Physical Activity (Dk/Week)	0-300	86.6±55.0
Vigorous Physical Activity MET Values	0-4800	632.9±923.4
Moderate to Vigorous Physical Activity MET Values	0-2800	283.2±454.3
Walking Activities MET Values	0-2310	661.2±576.5
Total Activity Duration	0-9910	1577.3±1458.6
Physical Activity Categories	**n(%)**	
Low	151 (29.2)	
Moderate	230 (44.4)	
High	137 (26.4)	

*Min-Max: Minimum-Maximum, X±SD: Mean±Standart Deviation

Table 2: Preferences of Sedentary Activity.

	Mid-week					Weekend				
	Pre-Covid		During Covid Period			Pre-Covid		During Covid Period		
	n	%	n	%	p*	N	%	n	%	p*
Computer uses	21	4.1	139	26.8	**0.023**	32	6.2	70	13.5	0.281
Watching TV	53	10.2	55	10.6	0.946	54	10.4	74	14.3	0.514
Social media uses with mobile phone	142	27.4	154	29.7	0.662	142	27.4	174	33.6	0.236
playing games (while sitting)	45	8.7	28	5.4	0.269	30	5.8	47	9.1	0.601
Reading	87	16.8	41	7.9	0.177	75	14.5	52	10	0.455
Studying at the desk	82	15.8	51	9.8	0.327	60	11.6	32	6.2	0.408
Rest (sitting or lying down)	67	12.9	42	8.1	0.439	84	16.2	56	10.8	0.806
Other (socializing with friends)	21	4.1	8	1.5	0.734	41	7.9	13	2.5	0.458

*Mc-Nemar Chi Square was used and p<0.05 was considered significant

Table 3: Preferences of Physical Activity.

Types of Physical Activities	Mid-week					Weekend				
	Pre-Covid		During Covid Period			Pre-Covid		During Covid Period		
	n	%	n	%	p*	n	%	n	%	p*
Weight training	61	11.8	38	7.3	0.472	49	9.5	28	5.4	0.526
Working with elastic band	24	4.6	36	6.9	0.715	11	2.1	16	3.1	0.877
Exercises without any materials	58	11.2	53	10.2	0.866	44	8.5	29	5.6	0.645
Treadmill	20	3.9	16	3.1	0.899	24	4.6	11	2.1	0.724
Elliptical bike	3	0.6	3	0.6	1	4	0.8	0	0	NC
Stationary bike	2	0.4	7	1.4	0.913	3	0.6	2	0.4	0.978
Dance	32	6.2	24	4.6	0.797	15	2.9	3	0.6	0.822
Pilates	14	2.7	16	3.1	0.949	5	1	11	2.1	0.881
Yoga	11	2.1	14	2.7	0.925	15	2.9	14	2.7	0.974
Doing sports	22	4.2	18	3.5	0.91	28	5.4	10	1.9	0.65
Cycling	14	2.7	9	1.7	0.879	16	3.1	3	0.6	0.812
Walking	63	12.2	82	15.8	0.54	73	14.1	28	5.4	0.226
X-Box/Nintendo Wii	0	0	0	0	NC	2	0.4	0	0	NC
Cooking	15	2.9	20	3.9	0.875	20	3.9	55	10.6	0.369
Do the cleaning	14	2.7	16	3.1	0.949	32	6.2	64	12.4	0.349
Repair works	2	0.4	0	0	NC	2	0.4	8	1.5	0.907
Playing games with family	4	0.8	7	1.4	0.933	11	2.1	43	8.3	0.477
Gardening	1	0.2	2	0.4	0.982	1	0.2	28	5.4	0.821

*Mc-Nemar Chi Square was used and p<0.05 was considered significant. NC; Not Calculated.

Table 4: Participants' physical activity satisfaction levels and ways of obtaining information.

	Pre-Covid	During Covid Period	
Physical activity satisfaction level	**X±SD**	**X±SD**	**p value* / Z score**
Level of satisfaction with your participation in physical activity (Mid-week) 0-10	5.7±2.9	3.9±2.8	**<0.001 / -10.06**
Level of satisfaction with your participation in physical activity (Weekend) 0-10	6.0±3.0	3.8±2.8	**<0.001 / -11.63**
Do you find your physical activity participation sufficient to protect your health?	**n(%)**	**n(%)**	**p value **; X^2**
Yes	241(46.5)	129(24.6)	**<0.0001;16.915**
No	149 (28.8)	286 (55.2)	**<0.0001;27.410**
I am not sure	104 (20.1)	86 (16.6)	0.538; 0.380
I do not know	24 (4.6)	17 (3.3)	0.837; 0.042
Information Resources about Physical Activities			
Programs on TV Channels	30 (5.8)	63(12.2)	0.342
Social media accounts (Instagram, Facebook, Twitter, WhatsApp, Reddit, TikTok vb.)	123(23.7)	160(30.9)	0.18
Mobile Aplications	101(19.5)	123(23.7)	0.45
Course/courses in university education	149(28.8)	89(17.2)	**0.044**
Primary and high school education	53(10.2)	21(4.1)	0.399
Friends/Family	53(10.2)	44(8.5)	0.777
I am not sure	0	0	NC
I do not know	9(1.7)	18(3.5)	0.797
Others	0	0	NC

*Wilcoxon Sign rank test, ** Pearson's Chi Square were used and p<0.05 was considered significant. NC; Not Calculated.

Table 5: Facilitating factors and bariers about physical activity participation.

	Facilitating Factors					Barriers				
	Pre-Covid		During Covid Period			Pre-Covid		During Covid Period		
	n	%	n	%	p	N	%	n	%	p
None	35	6.8	137	36.4	**0.001**	124	23.9	80	15.4	0.144
University	32	6.2	11	2.1	0.6	116	22.4	8	1.5	0.163
Environment	98	18.9	41	7.9	0.105	62	12	33	6.4	0.39
Time	32	6.2	162	31.3	**0.001**	68	13.1	14	2.7	0.266
Social life	94	18.1	32	6.2	0.106	15	2.9	9	1.7	0.857
Health	26	5	25	4.8	0.974	4	0.8	9	1.7	0.903
Social media	10	1.9	14	2.7	0.901	11	2.1	3	0.6	0.867
Money	2	0.4	1	0.2	0.982	86	16.6	58	11.2	0.367
Motivation	185	35.7	36	6.9	**0.001**	17	3.3	20	3.9	0.924
Work, family and home care	4	0.8	8	1.5	0.922	15	2.9	32	6.2	0.637
Covid	0	0	51	9.8	NC	0	0	252	48.6	NC

*Mc-Nemar Chi Square was used and p<0.05 was considered significant. NC; NotCalculated.

DISCUSSION

Our study aims to reveal the physical activity participation of university students during the pandemic period, the types of physical activity they participate in, the factors that facilitate and inhibit their participation, and the sources of information about the subject. The results we have drawn from our study are as follows:

1. University students engaged in moderate physical activity during the pandemic period,

2. They spent the most time on social media with their cell phone as a sedentary time activity, regardless of weekday-weekend, pre-Covid or Covid period,

3. The amount of time university students spent on the computer during the online education was significantly increased compared to the pre-Covid period,

4. In terms of the type of physical activity, students mostly preferred walking in the pre-Covid and Covid period, and they mostly preferred cleaning with restrictions only on the weekend,

5. During the Covid-19 pandemic period, the factors that facilitated physical activity in university students showed an increase in the time factor, but a decrease in the motivation factor,

6. University students are not satisfied with their level of physical activity,

7. While students' sources of information about physical activity were university courses before Covid, it was found that this has decreased during the Covid period.

It is stated that physical activity has decreased during the pandemic period compared to the pre-pandemic period in all countries including our country. In addition, it is also seen that sedentary activity has increased. The results of our study are similar with the literature.

As in the study of Alaca et al [6], we evaluated the physical activity habits of physiotherapy and rehabilitation program students during the Covid period. However, while the total physical activity score was 2071.39±2208.92 in the study of Alaca et al [6]; this value was lower in our study (1577.3±1458.6). In a study conducted in Italy [7], it was reported that the total physical activity value of university students in the Covid period decreased compared to the pre-pandemic period.

Studies showed that people mostly preferred walking as physical activity before the pandemic [15,16].

During the pandemic period in Italy, university students stated that they preferred walking the most [7]. In our study, it is seen that they did not change their weekday preferences before and after the pandemic. However, with the curfew on weekends, students stated that they preferred cleaning at home instead of walking. Our study is the only one that grouped physical activity types as pre-pandemic and post-pandemic, weekdays and weekends.

In our study, sitting time was 8.3±3.1 h per day. Bertand et al. [8] stated that while it was 8.3±3 hours before the pandemic, the sitting time has increased to 11±4 hours during the pandemic period. Alaca et al. [6] stated that the mean sitting time was 12.2 hours per day. Although it was found in our study that students spend a lot of time on the computer and social media, their sitting time is surprisingly lower. The fact that they spend more time on social media leads to many negative conditions such as increased sedentary time and decreased level of physical activity [17,18]. However, with the pandemic, social media has become a source of getting information about physical activity. All these also show that social media have positively increased the awareness [19, 20]. In addition, in our study, university students reported that they were not satisfied with their physical activity participation and did not find it sufficient for health. Since the population of our study was physiotherapy and rehabilitation students, it is normal for them to have high level of awareness.

In the literature, it has been reported that lack of time is one of the factors that prevent the participation of university students in physical activity both before and during the Covid period [21,22,23]. In our study, on the contrary, time abundance was found to be an important facilitating factor during the pandemic period. A review that examined the barriers of physical activity of university students reported lack of motivation as the most common barrier after the time factor [23]. In our study, although motivation seemed to be the most facilitating factor before the pandemic, it became a very insignificant factor during the pandemic.

Similar to some other studies [23,24], school work was reported as an important barrier of physical activity before the pandemic in our study. In our study, the most important barrier during the pandemic period was reported as the Covid-19 pandemic.

In the light of all findings; the restrictions imposed during the pandemic period, together with distance education, show that students spend more time with computers and cell phones. In this case, it is noteworthy that the sources of obtaining information have turned to electronic channels. However, we think that

students have more free time when many factors such as the decrease or absence of time spent in transportation during the pandemic period, sharing care activities with family members are considered. It is obvious that this allows for more time spent at home to be a factor that facilitates physical activity. The pandemic has been added to the literature as the most important barrier that prevents the participation in physical activity. Physiotherapy students are health professionals who are role models for sick or healthy individuals. In the literature, there are numerous studies showing that university students from many different programs are negatively affected by physical activity participation in the pandemic [6,7,8]. Our study is original in terms of the lack of a study comparing the barriers and facilitors of university students before and after the pandemic. It is clear that there is a need for additional studies in the literature to investigate the effects of long-term change in the pandemic period after the pandemic.

CONCLUSION

Despite the restrictions during the pandemic period, it was observed that university students generally preferred to walking. During the pandemic period, it was realized that time is an important factor facilitating physical activity participation.

Conflicts of interest: **None**

Authors' contributions: Concept: O.O., H.K.K., Design: O.O., H.KK., Data Collection and Data processing: O.O., Analysis or Interpretation: O.O., H.K.K., Literature Search: O.O., H.K.K., Writing: O.O., H.K.K.

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