

Changes in the Time Spent on Physical Activities of University Students Before and During the COVID-19 Outbreak

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Abstract

In Spring 2020 in many countries various restrictions were implemented to try to prevent the spread of the coronavirus disease. Among these Covid-19 measures lockdowns had a big impact on people's lives. The opportunities for physical activities have been reduced since people had to manage working or learning from their homes. This research paper focuses on the changes of the time spent on physical activities of university students. Our intention is to reveal the enhancing factors for a positive and negative change in the frequency of physical activity. The analyses are based on the data for the University of Szeged of the *COVID-19 International Student Well-Being Study* elaborated and conducted by the University of Antwerp in Spring 2020. The online questionnaire, filled out by 1808 students from the University of Szeged, included two questions concerning the frequency of doing moderate and vigorous physical activity before and during the COVID-19 outbreak. The analyses of the changes in the time spent on physical activities focuses on the associations with socio-demographic factors and health status. Results indicate that increase in physical activity was typical for women, students in a relationship, and those who moved from their place of residence. A decline in physical activity has been found to be characteristic for younger students. Having a health risk condition turned out to have no effect on changes in physical activity, but satisfaction with health is associated with the increase or decline in physical activity.

Keywords: physical activity, COVID-19, lockdown, university students, health status

Introduction

During the COVID-19 pandemic, especially in the beginning, time became an important dimension from various perspectives. In December 2019 the whole world learned that the severe acute respiratory syndrome coronavirus (SARS-Covid-2) infection developed in China,

spreading rapidly and causing a serious disease. At that moment the rest of the world was concerned about the time the disease would reach other countries and continents. The expansion of and the destruction by the virus was unexpectedly fast, so on 11 March the World Health Organization declared the coronavirus disease a global pandemic (COVID-19).¹ Governments implemented various measures to try to stop the rapid spread of the virus, like social distancing, lockdowns, travel restrictions etc. Among these, lockdowns had a big impact on people's lives, their perception of time and their time management. During the curfew people had to schedule their time differently than before. The daily routine necessarily changed as most people were working and learning from their homes. The time spent on work, necessities and leisure somewhat mixed up as they were carried out at the same place. The time spent on physical activity has also been affected by the COVID-19 measures. Both moderate and vigorous physical activities were discouraged by the limitation of training and sport facilities, social distancing and the lockdown.

The World Health Organization claims that for adults regular physical activity implicates among others the following health benefits: improved all-cause mortality, cardiovascular disease mortality, cognitive and mental health (WHO, 2020). Among the medical explanations of the positive relationship between physical activity and health status one is the boosting effect on the immune system. This relationship has been investigated from different perspectives for more than a decade by now (Nieman & Wentz, 2019). During the coronavirus pandemic physical activity was considered a means to reduce the susceptibility to the infection (Halabchi et al., 2020; Nigro et al., 2020). Studies confirmed that in first case moderate physical activity lowers the risk of getting infected (Forte et al., 2022; Seidu et al., 2021; Wimalawansa, 2020). Therefore mostly virtual sport events were organized to keep the population fit even during the times of lockdown when outdoor physical activity was limited (Elmagd, 2020). The positive outcomes of doing physical activity are not limited to the health of the body but also of the mind. Mental health is also kept fit by regularly exercise (Stanton et al., 2014; Paluska & Schwenk, 2000). During the coronavirus pandemic the possibilities to carry out regular physical activity were reduced. Gyms, sport halls and training facilities were closed down, even the use of parks, or outdoor sport facilities was unfavourable.

Especially the population of students was found to have reduced their physical activity due to the lockdown and the forced e-learning (Castaneda-Babarro et al., 2020). There were a few investigations on the changes of physical activity habits of higher education students.

¹ WHO Director Media Briefing on COVID-19 available at <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>

An investigation of the physical activity habits of Spanish students revealed that there was a considerable decline in both moderate and vigorous physical activity. However women managed to keep doing exercises better, by using social media, and they enjoyed it also more than men (Rodríguez-Larrad et al., 2021). The results of the *COVID-19 International Student Well-Being Study* also confirmed the changes of physical activity in higher education students' lives after the COVID-19 outbreak, during the lockdowns. The main findings for the university students from the Greek sample showed that there was an increase in the daily performance of vigorous physical activity, however frequent moderate physical activity was reduced (Stathopoulou et al., 2020). For students from the University of Bern no significant change was detectable for vigorous physical activities, however again moderate physical activities declined (Rüegg & Eggli, 2020). The pattern of changes in physical activity was similar for students from the University of Birmingham, as a reduction of vigorous physical activity was prevalent for students exercising less than once a week, but the frequency of doing moderate physical activities declined for almost half of the students (Rabbie-Khan & Biernat, 2020). For Hungarian students also a significant decrease in physical activity has been observed for moderate physical activity, which has been associated with a negative effect on psychological well-being (Lukács, 2021).

In this paper we aim to investigate the changes in the time spent with physical activities, both vigorous and moderate. We intend on the one hand to find socio-demographic characteristics for those who increased or reduced the frequency of doing physical activity and on the other hand to explore one possible driver for the changes, namely health status.

Materials and Methods

The analyses are based on the data for the University of Szeged of the *COVID-19 International Student Well-Being Study* elaborated and conducted by the University of Antwerp in Spring 2020.² Thus results reflect the situation during the first wave of the COVID-19 pandemic. The aim of the study was to reveal the effects of the COVID-19 pandemic on higher education students' lives from various perspectives. Research objectives included the examination of the changes in living conditions, workload, well-being and mental health and the associations with various factors like stress, social support,

² Reports on the first results of the study are available for some countries or universities, e.g.: Stathopoulou et al. (2020): Student Well-Being during the COVID-19 pandemic in Greece. Results from the C19 ISWS Survey. <https://zenodo.org/record/4038321#Y3dzDMeZPIU>; Rüegg & Eggli (2020): COVID-19 Studierenbefragung. Bericht der Berner Fachhochschule zur "International COVID-19 Student Well-Being Study." <https://zenodo.org/record/4422660#Y3d0OseZPIU>; Rabbie-Khan & Biernat: Student Well-Being During The First Wave of COVID-19 Pandemic in Birmingham, UK. Results from the C19 ISWS Survey. https://zenodo.org/record/4572408#Y3d0_MeZPIU. For more available reports see: https://zenodo.org/communities/c19-isws/search?page=1&size=20&access_right=open

COVID-19 knowledge, etc. (Van de Velde et al., 2021). In the study 27 countries were involved. From Hungary four universities joined the research: Corvinus University of Budapest, University of Debrecen, University of Miskolc and the University of Szeged.³

This paper investigates the data on the students from the University of Szeged where the response rate was the highest⁴ (9.71%) among the four universities. The online questionnaire, filled out by 1808 students from the University of Szeged, included two single item questions concerning the frequency of doing physical activity before and during the COVID-19 outbreak. Two forms of physical activity were investigated: vigorous and moderate physical activity. The questions were the following:

1. "On average, how often did you perform vigorous physical activities like lifting heavy things, running, aerobics, or fast cycling for at least 30 minutes?"
2. "On average, how often did you perform moderate physical activities like easy cycling or walking for at least 30 minutes?"

Respondents indicated their answer by picking one of the categories: "(almost) never," "less than once a week," "once a week," "more than once a week" and "(almost) daily" prior to and during the COVID-19 outbreak. To analyze the changes in the frequency of doing physical activity two new variables have been computed, one for the changes in doing vigorous physical activity and one for the changes in doing moderate physical activity.⁵

The new variables were recoded into three categories, which indicated whether the (vigorous or moderate) physical activity increased, reduced or remained unchanged during the COVID-19 outbreak in comparison to before the pandemic. The analyses focused on the following research questions:

1. What is the socio-demographic profile of those who increased or reduced their physical activity?

For the description of these groups we investigated the associations with gender, age, relationship status, parents' education and the change in living conditions.⁶

³ Methodological details on the Hungarian data collection at the different universities can be found in Arnold et al. (2021).

⁴ The average response rate of web surveys is approximately 10% (Fan & Yan 2010), which is almost met by the response rate from the University of Szeged. The response rates from other universities in Hungary were even lower (see Arnold et al. 2020).

⁵ The computational method was the same for both variables: frequency of doing physical activity during COVID-19 minus frequency of doing physical activity before COVID-19.

⁶ The association with economic status was not possible as the questionnaire didn't include any question about the income level.

2. What is the relationship between health status and the changes in the frequency of physical activity?

We assume that as physical activity is enhancing health by boosting the immune system, students with health risks or a lower satisfaction with their health will increase their physical activity to make themselves more resistant to the COVID infection.

We explored the relationships of the variables by applying Chi-square tests and ANOVA-tests. The significance level for the analyses is $p = 0.05$.

Results

Descriptive Statistics for Doing Vigorous and Moderate Physical Activity Before and During the COVID-19 Outbreak

The frequency of both vigorous and moderate physical activity shows a different pattern before and during the COVID-19 pandemic (see Figure 1). Only a small part of the students (15.3%) admitted (almost) never doing vigorous physical activity. Most of the respondents (30.6%) spent time on lifting heavy things, running, fast cycling or other vigorous physical activities for at least 30 minutes more than once a week. A significant part (24.1%) was involved in vigorous physical activities once a week, another 20% less than once a week. The (almost) daily practicing of vigorous physical activities was typical for a smaller part of the students (9.7%) before the lockdown. The percentages of the different categories somewhat changed during the confinement. There was a decline in the percentage of students doing vigorous physical activity once a week (17.2%) and more than once a week (23.6%). However, the proportion of the students (almost) never practicing vigorous physical activity (23.5%) and of those who (almost) daily dedicated time to it (16.8%) increased during the lockdown due to COVID-19.

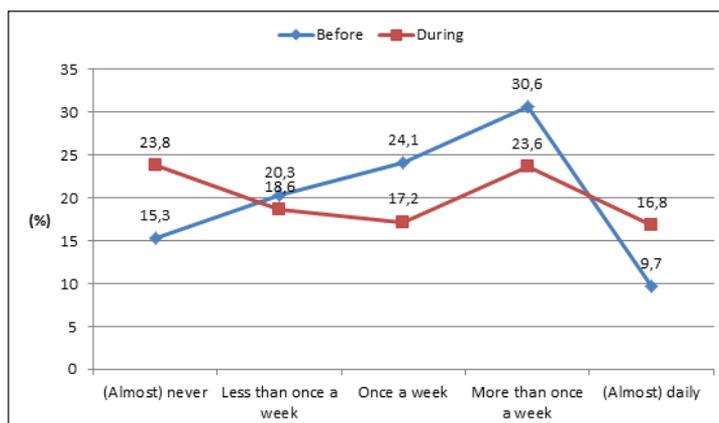


Figure 1

Percent (%) of Students Doing Vigorous Physical Activity Before and During the COVID-19 Outbreak

Note. N = 1397

Investigating the changes of the time spent on vigorous physical activity at the group level we have found that mostly there was a decline, since the proportion of those never doing vigorous physical activity rose and of those doing it once a week or more than once a week shrank. However, at the same time there was a growth in the proportion of students practicing vigorous physical activity daily. To study the changes properly we have to look at the individual level.

The categories regarding the changes in doing vigorous physical activity (Table 1) among the students of the University of Szeged show an almost even distribution. One third of the respondents (33.1%) reduced their vigorous physical activity during the COVID-19 outbreak. Another 30%, however, increased the frequency of doing vigorous physical activity. More than one third of the students (36.6%) did vigorous physical activity at the same frequency during the COVID-19 outbreak as before.

Table 1
Changes in Vigorous Physical Activity

	Frequency (N)	Percent (%)
reduced	462	33.1
unchanged	511	36.6
increased	424	30.4
Total	1397	100

Note. N = 1397

As for the changes in doing moderate physical activity we found different trends both at the group level (see Figure 2) and at the individual level (see Table 2). Easy cycling or walking for at least 30 minutes was quite frequent among the students before the COVID-19 outbreak, almost 33% reported doing it more than once a week and another 33% (almost) daily. A quite small part of the students (6.4%) (almost) never did moderate physical activity by their own admission. The proportion of students doing moderate physical activity less than once a week and once a week both were also relatively modest (12.3% and 15.5%). Nevertheless, during the COVID-19 outbreak—not surprisingly—the proportion of those (almost) never doing moderate physical activity or practicing it less than once a week or once a week somewhat increased. A little decline is detectable in the ratio of those who were practicing moderate physical activity more than once a week

during the lockdown (28.3%) in comparison to before. There is a significant decrease in the proportion of students doing moderate physical activity (almost) daily (16.1%) during the COVID-19 outbreak in comparison to before.

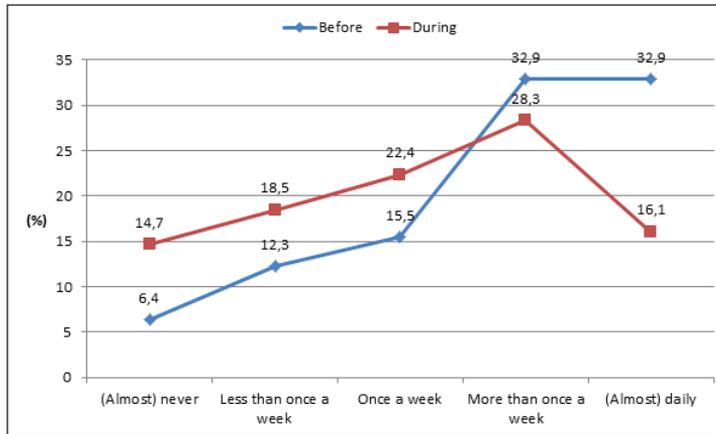


Figure 2

Percent (%) of Students Doing Moderate Physical Activity Before and During the COVID-19 Outbreak

Note. N = 1397

At the individual level the patterns of changes in the time spent on doing moderate physical activity (Table 2) reflect the trends at the group level. Almost half of the students (47.8%) reduced doing moderate physical activities and only 17.7% increased their moderate physical activities during the COVID-19 outbreak. For one third of the respondents the frequency of moderate physical activity remained unchanged.

Table 2

Changes in Moderate Physical Activity

	Frequency (N)	Percent (%)
reduced	668	47.8
unchanged	482	34.5
increased	247	17.7
Total	1397	100

Note. N = 1397

Socio-demographic Characteristics

In this section the socio-demographic characteristics of those reducing, unchanging and increasing their vigorous or moderate physical activity is being explored.

Gender

As for gender it seems that women tend to rather increase their physical activity—both vigorous and moderate—during the COVID-19 outbreak than men (see Figure 3 and Figure 4). Especially for vigorous physical activity we found a considerable drop in the proportion of men increasing it when compared to women. The percentage of those whose physical activity remained unchanged is higher among men than among women.

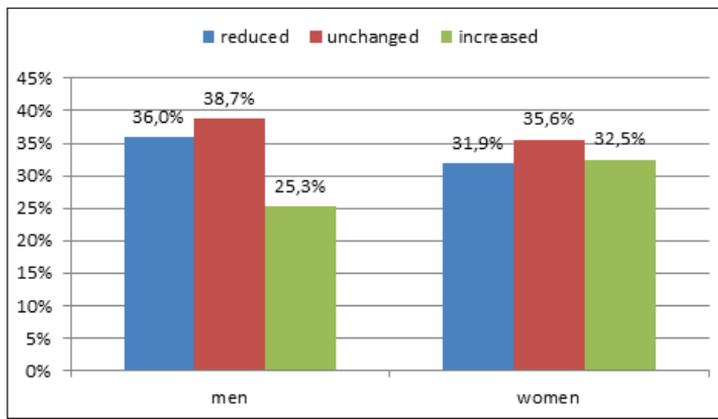


Figure 3
Changes in Vigorous Physical Activity by Gender

Note. Pearson Chi-Square = 7.191

p = 0.027

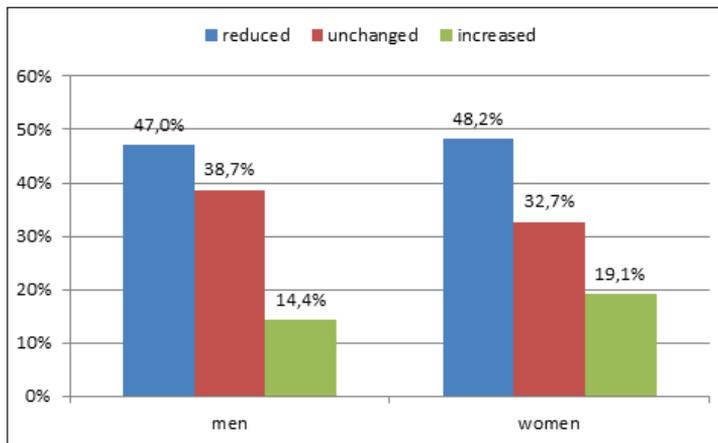


Figure 4
Changes in Moderate Physical Activity by Gender

Note. Pearson Chi-Square = 6.785

p = 0.034

Can these trends be explained by the differences in the frequency of physical activity before the COVID-19 of men and women? One explanation for the above trends could be that men are generally more physically active, therefore a part of them was not able to increase

their physical activity during the pandemic. The data, however, just partly support this suggestion. Among the students who reduced their vigorous physical activity the categories of “once a week,” “more than a week” and “daily” altogether give 91.9% of men and just 83.3% of women. This trend might have been influenced by the reduced training facilities. However, among those who increased their vigorous physical activity the proportion of those being physically active before the COVID-19 pandemic altogether is 76.8% for men and 83.1% for women. Only the proportion of those who shifted their frequency of doing vigorous physical activity from more times a week to daily among men is higher (24%) than among women (18.9%). At the same time the proportion of those daily or more times a week performing vigorous exercises among those who didn’t change their physical activity habits is very close to each other among men (16.4%; 25.2%) and women (13.2%; 24.4%). Therefore we cannot claim that men were generally more physically active than women. Other factors, like consciousness about the importance of physical activity in health might be important; however, this couldn’t be explored through the data at hand, and it needs further investigation.

Age

The relationship between age and changes in physical activity has been explored in three age groups (see Table 3): 17–20 years, 21–24 years and above 25 years.

Table 3

Descriptive Statistics on Age Groups

	Frequency (N)	Percent (%)
17–20 years	509	28.2
21–24 years	862	47.7
above 25 years	437	24.2
Total	1808	100

For changes in vigorous physical activity (Figure 5) we found that the decline was highest among the younger students (36.9%) and the increase among the 21–24 year old (34.3%). A big part of the students 25 years and above didn’t change their vigorous physical activity (47.9%) due to the COVID-19 outbreak.

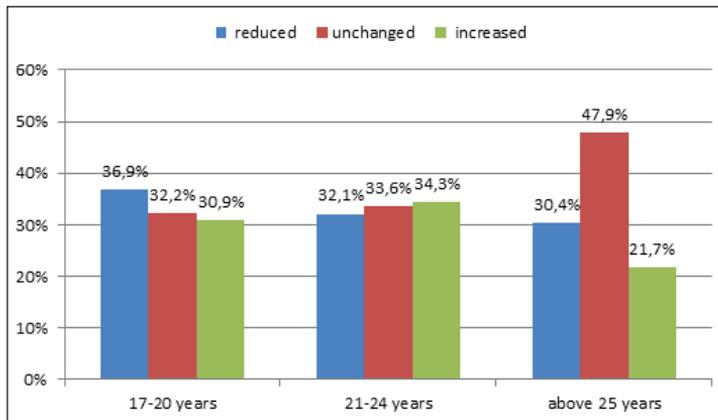


Figure 5
Changes in Vigorous Physical Activity by Age Groups

Note. Pearson Chi-Square = 29.778 p = 0.000

In case of moderate physical activity, again the students aged 17–20 years reduced their activities mostly (54.5%) (see Figure 6). The proportion of the “unchanged” category is again the highest (46.4%) among the 25 year and above old students.

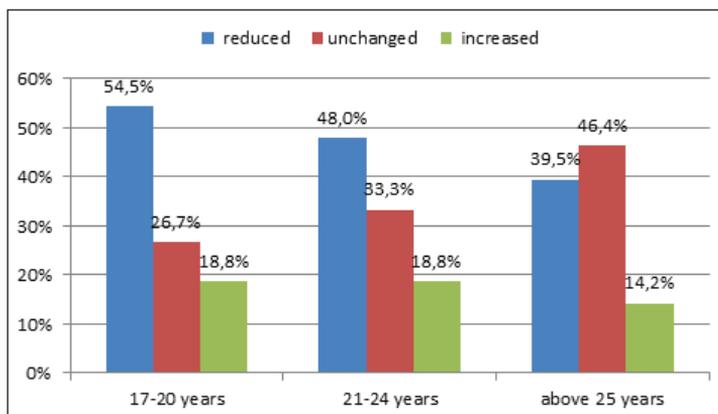


Figure 6
Changes in Moderate Physical Activity by Age Groups

Note. Pearson Chi-Square = 32.579 p = 0.000

The associations with age might be affected by the changes of the living circumstances of the students. It is possible that for the younger students there were more changes in the living circumstances, i.e. they had to move to their parents from a student hall or an apartment while for the “elder” students the place of living mostly remained unchanged. This will be investigated when exploring the relationship between the changes in the place of residence and changes in physical activity.

Relationship Status

In the survey students were asked whether they were single or had a partner at the time of the investigation. They could also indicate that the situation was “complicated” (see Table 4). The category of having a partner and a complicated relationship status has been merged⁷ for the analysis.

Table 4

Descriptive Statistics on Relationship Status

	Frequency (N)	Percent (%)
single	825	45.6
partner or complicated	983	54.4
Total	1808	100

A significant correlation between relationship status and changes in physical activity was only detectable in the case of moderate physical activity (Figure 7). A reduction was more typical for single students (51.7%) while an increase was more prevalent for students in a relationship (or complicated) (20.9%). Thus being in a relationship enhances moderate physical activity. The motivation to go for a walk or an easy cycling might be stronger with the partner or to see the partner than alone.

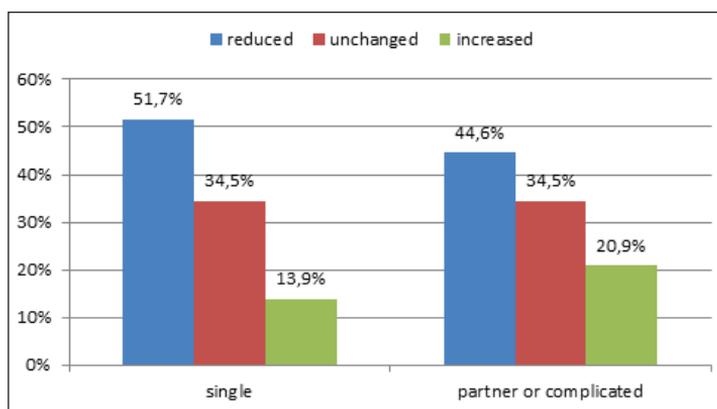


Figure 7

Changes in Moderate Physical Activity by Relationship Status

Note. Pearson Chi-Square = 13.205

p = 0.001

⁷ The frequency for the category “complicated” was N = 89, 4.9% of the whole sample.

Changes in the Place of Residence

Due to the COVID-19 outbreak the place of residence has changed for many students. Student halls, dormitories closed, rental agreements were quitted, therefore many had to move to their original homes, to their parents. The survey investigated the place of living of the students before and during the COVID-19 outbreak. Based upon the answers we created a new variable, which indicates whether the residence of a student has changed or not due to the COVID-19 outbreak. Almost half of the students had to move from their place of living (48.6%) and the other half stayed at the place where they were living before the COVID-19 outbreak (Table 5).

Table 5

Descriptive Statistics on the Change of Residence

	Frequency (N)	Percent (%)
place of residence did not change	724	51.4
place of residence changed	685	48.6
Total	1409	100

The change in the place of living is significantly associated with both vigorous and moderate physical activity. Those students who didn't move from their place of stay mostly practiced vigorous physical activity at the same frequency as before (40.8%). A relatively higher proportion of the students who had to change their residence increased their vigorous physical activity (34.4%). The percentage of those who reduced their vigorous physical activity is almost the same in the two categories (Figure 8).

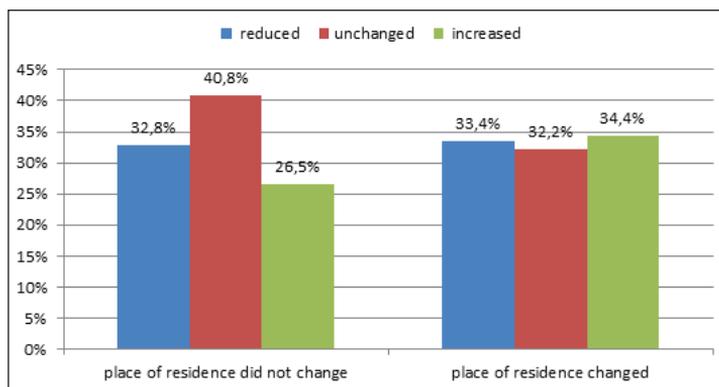


Figure 8
Changes in Vigorous Physical Activity by the Change in Place of Residence

Note. Pearson Chi-Square = 14.253

p = 0.001

As for the changes in moderate physical activity we found that more students who moved from their place of living (52.6%) reduced the frequency of walking or easy cycling than those who didn't (43.3%). Again the moderate physical activity habits remained unchanged for a relatively higher proportion of the students who didn't move from their place of living (Figure 9).

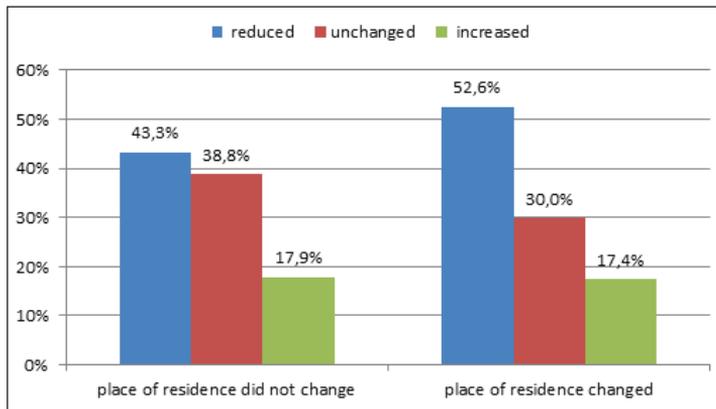


Figure 9
Changes in Moderate Physical Activity by the Changes in Place of Residence

Note. Pearson Chi-Square = 14.145

p = 0.001

The data support the suggestion that the habits in the frequency of physical activity both vigorous and moderate could be kept mostly for those who didn't have to change their place of living. The change in residence is associated with different changes in vigorous and moderate physical activity. Vigorous physical activity rather increased and moderate physical activity rather declined for those who moved from their place of living. This difference might be influenced by the type of residence, whether it's in a big city or a smaller town. Also the constitution/structure of the household they were moving to could have an impact on the direction of change of physical activity, whether they moved to their parents or were living alone etc. These assumptions need further investigation.

Health Status as Driver of Changes in Physical Activity

In the next section we are exploring the role of one possible factor, namely health status, in influencing the trends of changes in both vigorous and moderate physical activity. Our assumption is that health status had an impact on physical activity habits for students during the COVID-19 outbreak by enhancing it if the health status was not satisfying. Health status of the students has been explored by the online survey from two perspectives.

First students have been asked to rate on a scale from zero to ten how satisfied they were with their health before and during the COVID-19 outbreak.⁸ Another question that investigated health status focused on possible health risk conditions. Students were able to pick any of the health risk conditions listed that applied to them.⁹ Thus the analyses explored the relationship between health status and physical activity at two levels: the objective health status and the satisfaction with health status. Students with a poor health status are more at risk to get infected, therefore we hypothesize that having one or more health risk condition or a low satisfaction with health is enhancing doing physical activity to minimize the risk of getting infected by the coronavirus and of becoming severely ill.

Results on Health Status and Changes in Physical Activity

Most of the respondents were free from health risk conditions (84.1%). A small part (15.9%) had one or more risk conditions. Among those with at least one health issue obesity is the most common health problem (56.7%), followed by lung disease (16.9%) and high-blood pressure (14.1%).¹⁰ When exploring the relationship between having any risk condition and the changes in doing physical activity during the COVID-19 outbreak we found no significant correlation. Thus there is no significant difference in the proportion of those reducing, unchanging or increasing their physical activity between the students without any health risk condition and those who suffer from one (or more) health issue.

However, there might be differences due to the type of health issue. Therefore we selected the three most prevalent health problems in the sample—obesity, lung disease and high blood pressure—to find out about the correlation with changes in physical activity.¹¹ The data show that the pattern is somewhat different for moderate and for vigorous physical activity. The increase in vigorous physical activity is typical for students with lung disease (39.6%). Obesity, however, rather contributes to the reduction of vigorous physical activity (39.1%). At the same time the proportion of those who increased their vigorous physical activity is relatively the highest (23.6%) among students struggling with obesity compared to the other health issues (Figure 10).

⁸ The wording in the questionnaire was: "During the last week."

⁹ The health risk conditions listed were: a recent cancer diagnosis, diabetes, heart disease, high blood pressure, immunocompromised conditions, kidney disease, lung disease, obesity.

¹⁰ The percentages for the whole sample (N = 1808) are: obesity (8.9%), lung disease (2.7%), high blood pressure (2.2%).

¹¹ As the subsamples were too small statistical tests were not relevant to apply. However, the trends can be a starting point for further investigation.

In what regards moderate physical activity we found that changes are typical for the students with obesity, altogether 68.1% increased or reduced their physical activity. For obese students the proportion of those who decreased their physical activity is the highest (44.7%) out of the three groups. However, the increase of physical activity is also relatively the highest among students with obesity (23.6%) (Figure 11). It seems that the type of health issue is indicative for the changes in physical activity; however, since the subsamples are quite small, these trends need further investigation.

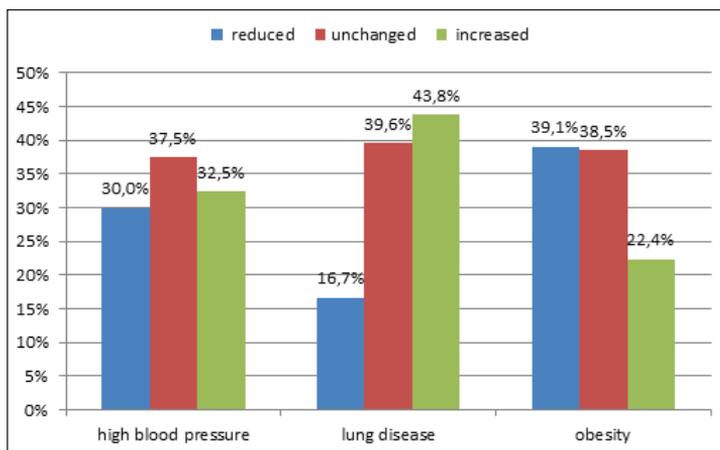


Figure 10
Changes in Vigorous Physical Activity by the Type of Health Risk Condition

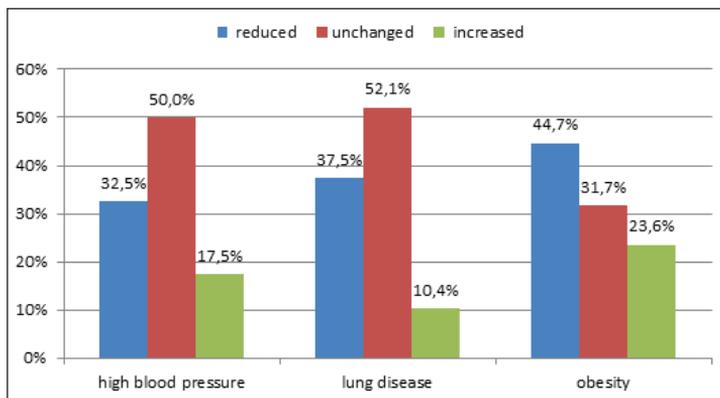


Figure 11
Changes in Moderate Physical Activity by the Type of Health Risk Condition

All in all, having a risk condition doesn't seem to have an influence on the change of doing physical activity during the COVID-19 disease but differences by the type of health issue can be detected. Our previous investigation (Vincze, 2021) revealed that worries about getting infected or severely ill from the coronavirus disease is significantly higher in the group of students who suffer from one or more health risk condition.

Therefore, the lack of correlation between having any health risk condition and the change in physical activity habits suggests that students who have any kind of health issue might not consider physical activity an effective means to fight against the virus.

The ratings of satisfaction with health status show differences between the categories of physical activity change. In case of both moderate and vigorous physical activity the mean of the ratings on satisfaction with health grows from the category “reduced” to “increased” (see Table 6 and Table 7). That is, those who reduced their physical activity (both moderate or vigorous) were less satisfied with their health “during the last week” than those who unchanged or who increased their physical activity. Nevertheless, this result might refer to an inverse association: the changes in physical activity influence the satisfaction with health and not the other way round. Therefore, this outcome needs further exploration to find out the causal relationship between satisfaction with health and the changes in the frequency of physical activity.

Table 6

Mean Values of Satisfaction With Health “During the Last Week” by Changes in Vigorous Physical Activity

	N	Mean	Std. Deviation
reduced	371	7.26	2.22
unchanged	424	7.67	2.11
increased	356	7.85	1.95
Total	1151	7.59	2.11

Note: F = 7.636

p = 0.001

Table 7

Mean Values of Satisfaction With Health “During the Last Week” by Changes in Moderate Physical Activity

	N	Mean	Std. Deviation
reduced	550	7.39	2.21
unchanged	404	7.75	2.03
increased	197	7.84	1.95
Total	1151	7.59	2.11

Note: F = 5.043

p = 0.007

Conclusions

Our investigation focusing on the changes in the time spent on vigorous and moderate physical activities, among university students during the COVID-19 outbreak, revealed some interesting patterns regarding the socio-demographic associations and the relationship with health status. We found that women, rather than men, tended to increase their both vigorous and moderate physical activity. To explain this trend the frequency of doing exercise before the COVID-19 outbreak has been explored among men and women who increased their physical activity. It turned out that men and women in this group were almost equally physically active before the COVID-19 outbreak. Therefore, we suppose that the gendered differences of other factors, like the type of motivations for doing physical activity, could influence this trend. There are studies which revealed that women of that age-group tend to be more motivated by extrinsic factors to do exercise, like the avoidance of ill-health (Egli et al., 2011). This motivation could have had an effect on the increase of physical activity for women during the COVID-19 outbreak. A tendency of the reduction of physical activity has been revealed for younger students, aged 17–20.

Relationship status of the students also affected changes but only for moderate physical activity. Having a partner enhanced doing moderate physical activity. To go for a walk or an easy cycling could have been more motivated with a partner than alone. The changes of the place of residence influenced changes in moderate and vigorous physical activity differently. Those students who moved from their place of stay due to the COVID-19 outbreak rather increased their vigorous physical activity, but reduced their moderate physical activity. This difference might have been influenced by the type of residence, whether it was in a big city or a smaller town. Also the constitution/structure of the household they moved to could have had an impact on the direction of change of physical activity, whether they moved to their parents or were living alone. However, due to lack of information these assumptions could not be tested on the present data.

We assumed that health status is an important driver for changes in physical activity. Having any health risk condition didn't have an influence on the changes of physical activity. Nevertheless, when focusing on the groups with the most common health problems among the respondents, some interesting patterns outline. Although the subsamples are too small to draw a conclusion for the entire population, we found that students struggling with obesity rather reduced their vigorous physical activity and increased their moderate physical activity during the COVID-19 outbreak. At the same time respondents who were having a lung disease seem to have increased their vigorous physical activity.

The satisfaction with health status was also associated with the changes in physical activity, however the causal relationship might be inverse: changes in physical activity influencing the rate of satisfaction with health status and not the other way round.

When interpreting the results we need to consider that the data are limited to the students from the University of Szeged. However, the trends found can be an appropriate starting point for further, deeper investigation on the topic.

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