The impact of the SARS-Cov 2 pandemic on pro-health attitudes, psychophysical condition, and the quality of life of students

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Research

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Abstract

Background: Young people follow a healthy lifestyle by undertaking various forms of physical activity. The emergence of pandemics and changes in the organization of society's life have caused fear and anxiety about health and life. The objective of the study was the assessment of the impact of the SARS-CoV-2 pandemic on pro-health attitudes, psychophysical condition, and quality of life of students.

Methods: The study included 150 students aged 22 attending Polish Universities. The study utilized the original questionnaire. The questionnaire included questions about mental state, quality, and frequency of meals, hours of sleep, need for physical activity, and the impact of these factors on the quality of life during the pandemic.

Results: The pandemic and the closure of sports venues didn't significantly decrease the quality of life in the study group. Many students used their free time spent at home to sleep, eat healthily, and became interested in various forms of physical activity, which positively influenced their quality of life.

Conclusions: The pandemic and associated restrictions haven't had an impact on the psychophysical condition of the students and weren't the cause of the abandonment of physical activity. Positive changes in the students' quality of life were observed.

Background

The new virus, called SARS-CoV-2, responsible for the development of COVID-19 disease has spread quickly all over the world raising serious concerns and changing the lives of many people. The effects of actions in public health, such as business closures, prolonged isolation, and social distance have had a significant impact on working patterns, finance, social life, and relationships, as well as on the health of people worldwide. Due to the dramatic increase in the incidence of SARS-CoV-2, the WHO declared a coronavirus pandemic on 11 March 2020. It could therefore be concluded that COVID-19 has become a global plague of the 21st century as it is associated with high mortality rates and it raises concerns and fears of getting the disease and its consequences. The first case of coronavirus infection in Poland was confirmed on 4 March 2020. The number of infected people increased rapidly and it became difficult to control.

Limiting the number of contacts, quarantine, observing hygiene practices, and closing venues where groups of people congregate were aimed at restricting the spread of the virus and reducing the risk of infection. Under the pressure of growing anxiety, panic, and information chaos, experienced with various catastrophes from the past, the society employed old strategies of making stocks for the time of crisis. Further restrictions in the areas of education, work, health care, transport, and leisure have created new conditions, in which everybody had to learn how to live. An unprecedented situation of loss of social security has emerged, in which everyday, professional and social life has changed. It has become an opportunity to take a closer look at the social consequences of this situation.

The COVID-19 pandemic has changed academic reality by unexpectedly imposing restrictions that prevented universities from their previous functioning. The exceptional commitment of the entire academic community has made it possible to launch online learning. Academic youth is an interesting group of people for researchers as they have never experienced social disasters. This is the generation of people who did not experience limitations of martial law or the Chernobyl disaster. The current situation may bring different generations closer together, which manifests in staying together with their families and involving in help for the elderly. Some scientists believe that a “new generation” is being formed - the “coronavirus generation”, whose experience and attitudes will be shaped by the pandemic.

Most students are satisfied with their lives and cope very well with the pandemic. They try to live normally treating this time as an opportunity to rest at home and relax and they concentrate on good aspects of their lives. They spend a lot of time online, not only because of online education but also to maintain a social life, listen to music and watch movies. Despite the presented positive phenomena, students had some difficulties adjusting to the new epidemiological situation. The accompanying fear for health, and even life, made many students wonder about the quality of their lives. In the context of physical activity, most students considered the issue of health one of the major aspects. Taking care of body shape, practicing a selected form of physical activity and following a balanced diet constitute the healthy lifestyle preferred nowadays.

The positive impact of physical activity on human health is defined as physical, mental, and social well-being. Arousing from an early age the need for physical activity, getting used to a healthy, hygienic lifestyle, and forming the habit of physical exercise combined with the appropriate motivation and supported by knowledge shape in young people the healthy model of spending leisure time in the future. The implementation of health-promoting behaviors plays an important role in promoting health and creating a healthier future. Academic youth should be aware of the impact of specific behaviors on health, understand the role of an appropriate lifestyle for maintaining good health, especially that in the future it will be the generation responsible for promoting healthy behaviors. Students' lifestyle depends on many factors: the classes schedule, fatigue, the distance between the university and the place of residence, and habits acquired at home. Students choose their lifestyle by themselves, being aware that slowing down the aging process and maintaining physical activity at old age is one of the factors predicting higher life expectancy, whereas abandonment of physical activity will have a negative impact on the body in the future.

The concept of the quality of life refers to the condition of human life in the economic, social, philosophical, medical, and psychological context. The WHO defines the quality of life as “an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns. It is a broad-ranging concept affected in a complex way by the person's physical health, social relationships, and their relationship to salient features of their environment” [1,2]. Definitions of the quality of life presented in the literature are multidimensional and include physical, economic, social, and emotional well-being. They also show that the subjective perception of human life is associated with social interactions, financial security, and job

satisfaction. The quality of life has a great impact on the emotional aspects of human life in the context of satisfying their existential needs, social interactions, and sense of security [3]. It is also important to maintain a healthy lifestyle, that is get enough sleep and rest. Studies conducted in the group of Polish people showed that most of them sleep too short, which results in problems with concentration, daytime sleepiness, problems with decision making, and making mistakes. Too little sleep and changes in the pattern of sleep are the causes of many diseases, e.g. hypertension and obesity. These people usually do not undertake any physical activity and choose an unhealthy diet [4-6].

Physical activity is an important part of a healthy lifestyle contributing to well-being, quality of life, and longevity. Regular exercise reduces the risk of the development of many age-related diseases, such as diabetes mellitus, obesity, cardiovascular diseases, osteoporosis, some types of cancer, and depression. Performing regularly selected forms of physical activity has an impact on the functioning of many systems of the body. It also reduces stress and lowers psychological tension [7]. Physical fitness is an important part of life for young people. Availability of fitness clubs and spas and the diversity of equipment used to exercise have in recent years significantly increased the interest of young people and adults in active leisure. Most of them choose such a form of spending free time that brings them happiness and improves their quality of life [8-11].

The objective of the study was the assessment of the impact of the SARS-COV-2 pandemic on pro-health attitudes, psychophysical condition, and the quality of life of students

Methods

The study was performed in May and June of 2020. The study group included students aged 22 attending Polish universities in the academic year 2019/20. The total number of subjects was 150 (109 females and 41 males). Participation in the study was voluntary and anonymous. The study utilized the original questionnaire conducted with the use of Google web form. It included 18 questions about sex, age, place of residence, and year of studies. Additional questions concerned types, duration and frequency of physical activity (every day, a few times a week) and its impact on the quality of life. The survey questions concerned also students' emotional state, duration of sleep per day and number of meals before and during the coronavirus pandemic. IPAQ was also used in the study. IPAQ allows to assess the level of physical activity, and express it in MET, the unit of energy expenditure (Metabolic Equivalent of Work [min/week])

Seven questions concerned physical activity in various domains of everyday life: work, travel, housework, leisure, sports, and sedentary time on weekdays and weekends. The obtained results allowed for the evaluation of the respondents' level of physical activity before and during the pandemic. The key part of the study was the assessment of frequency, duration, and intensity of any effort that lasted continuously for over 10 minutes. All types of physical activity may be expressed in MET.

MET values expressed in min/week for various types of physical activity (physical effort) are as follows: walking 3.3, moderate 4.0, vigorous 8.0. By multiplying the MET value assigned to the activity by the

number of days a week when the activity was undertaken and the duration of the activity in minutes per day, it was possible to classify the level of the student's physical activity as high (intense physical activity), that is over 1500 MET min/week, or sufficient, that is over 600 MET min/week. For those who practiced vigorous exercise 3 times a week for about 30 minutes, the total value of MET was $8.0 \times 3 \times 30 = 720$ MET min/week. By doing so, the respondents were classified into one of the three categories. The sufficient level of physical activity was defined as the activity associated with the energetic expenditure of 600 to 1500 MET minutes/week, assuming that the energy expenditure was the result of three or more days of vigorous physical exercise for at least twenty minutes a day and five or more days of moderate physical activity or walking for not less than 30 minutes, or the combination of vigorous and moderate physical activity resulting in the energy expenditure of 600 or more MET min/week.

Obtained results were analyzed by the comparison of percentage and numerical values, presented in the form of bar graphs.

Results

Data about the number of physically active and inactive students was the important information obtained in the study. Figure 1 shows the percentage of people undertaking and not undertaking physical activity during the pandemic and it suggests high involvement of students.

IPAQ questionnaire has helped to confirm that the level of activity has changed as the result of the pandemic. The number of students whose level of activity was sufficient dropped from 91 to 72 (from 60.66% to 48%) and the number of students whose level of activity was high dropped from 46 to 39 (from 30.66% to 26 %). The group of students whose level of activity was insufficient increased from 13 to 39 (increase from 8.66% to 26% of respondents **Fig. 2**).

There were also changes in the frequency of undertaking physical activity observed. The groups of people exercising every day, once a month, and not exercising at all increased. In other groups the number of people exercising regularly decreased (**Fig. 3**).

Forms of physical activity have changed. There was a large decrease in the number of students who did fitness exercise, visited the gym, jogged, played team games, and practiced martial arts. The number of people who used swimming pools and ski slopes dramatically decreased. The number of people who practiced other forms of physical activity and those who did not undertake any form of physical activity increased (**Fig. 4**).

The impact of the pandemic on the quality of life of students with psychological problems is presented in Figure 5. The results show that the number of people abusing alcohol, as well as those with depression and anxiety, increased. However, it was a slight increase. It was also observed that the number of people who reported no problems slightly decreased (by 4 students).

The quality of life is associated with physical activity and human health. Satisfactory level of the society's life quality depends not only on active leisure but also on the sufficient length of sleep and regular meals. Figure 6 presents the differences in the number of hours of sleep before and during the pandemic.

Research shows that during the pandemic, the number of students who slept less than 6 hours significantly decreased (from 75 to 9). However, there was a significant increase in the number of students who slept between 7 and 8 hours and more than 8 hours (from 7 to 54).

Another element that positively affects the quality of life is having regular meals. Irregular meals have a negative influence on health. Figure 7 shows changes in the frequency of meals during the pandemic. The results show that there was a significant increase in the number of students having 4 to 5 meals a day and that students started eating more regularly.

Another element that was analyzed in the study was the impact of the pandemic on the quality of life determined by the length of sleep, number of meals, and the presence of psychological dysfunctions before and during the pandemic. Figure 8 shows the impact of the pandemic on the students' quality of life and Table 1 shows factors that influence the quality of life.

Table 1. Factors that influence the quality of life.

Meals	Points	Hours of sleep	Points	Number of problems	Points
1	1	Below than 5 hours	0	4	0
irregularly	2	5 - 6 hours	1	3	1
2 - 3	3	7 - 8 hours	2	2	2
4 - 5	4	over 8 hours	3	1	3
				0	4

The quality of life was defined as the sum of three answers to the questions included in the questionnaire according to the adopted scale (**Tabl. 1**). The questions concerned psychophysical state, time spent sleeping, and the frequency of having meals before and during the pandemic. The scale for psychophysical problems was inverted due to their negative impact on the quality of life. After summing up the scores, it was assumed that the lowest possible value for the quality of life was 1, the maximum was 10 and the medium was 5-7 points.

It has been found that the students' quality of life, determined by the pattern of sleep, number of meals, and psychophysical problems, changed during the pandemic. Before the pandemic, high quality of life was reported in 73 students (they scored between 8 and 10 points). During the pandemic, none of the

students scored 9 or 10 points. 38 students scored 8 points. The quality of life decreased in 35 (23.33%) students. There was a bigger group of 77 students who scored between 3 and 7 points before the pandemic and whose quality of life increased during the pandemic. The number of people who scored 5, 6, and 7 points increased to 103 (68.66%) (**Fig. 8**).

Discussion

Since the SARS-Cov-2 pandemic is a new phenomenon of quite short duration, there are no well-established reports of all changes that occurred in our social and personal life. We do not know the long-term consequences of this situation. The study results show that the pandemic did not significantly change the pro-health attitudes of students and it did not dramatically decrease their quality of life. Only a small group of students with high quality of life experienced a decrease in this matter and it resulted mostly from a change in the forms of physical activity, which was still willingly undertaken. With the closure of all sports venues and universities, the pandemic changed the rhythm of life. Before the pandemic, 93% of students undertook physical activity in various forms: jogging, swimming, exercising in the gym, etc. When the pandemic started, students performed physical activity at home. Physical activity was not abandoned, but its type, frequency, and the standard has changed.

The frequency of undertaking physical activity has changed. Students who had exercised every day or once a month before the pandemic intensified their physical activity. However, the group of students who had exercised 1-2 or 3-4 a week before the pandemic decreased. Supposedly, these students stopped exercising (4 people) or started exercising every day. Students who had undertaken physical activity 3-4 a week or 1-2 a week before the pandemic decreased their physical activity when the pandemic started (Figure 2, 3, 4). Different results were obtained in the study performed on students of the University of Pécs, where the decrease in physical activity was observed [12]. Studies on children and young people also showed a dramatic decrease in physical activity [13].

The pandemic caused a slight increase in the number of people abusing alcohol and those with anxiety-depressive disorder which was the result of isolation and fear of the disease contraction. Globally there was no significant increase in this matter, but there were single cases reported. (Figure 5). The pandemic and COVID-19 lockdown may have a negative impact on mental health but there is still no data on the long-term results of the crisis. A study conducted during the epidemic in January on 17 000 users of Weibo – one of the most popular social networks in China – showed significant differences in the expression of emotions, on the basis of which conclusions about the mental states of its users may be drawn. During the two-week period of social distancing there was an increase in the number of reports of depression, anxiety, and outrage, while the expression of positive emotions decreased [14]. Wang et al. observed an increase in the number of people with anxiety-depressive disorder and sleep problems [15]. Nonetheless, fear is highly needed in face of the pandemic. Before it becomes destructive, it motivates to fight, mobilizes necessary resources, sensitizes to threats, and provokes to use protective measures. The pandemic will certainly result in psychological and psychiatric problems, such as post-traumatic

symptoms. Specialist help and support from other people will be necessary. Most people will cope on their own by using their own resources to deal with difficult situations [16].

The well-being of the studied population was highly affected by the frequency of meals and length of sleep. The obtained results showed that students who spend more time at home eat better and get enough sleep. These findings are positive, contrary to problems identified in other studies: insomnia-coronasomnia, nightmares. Many papers suggest the epidemic leads to the development of health problems, such as stress, anxiety, depression, insomnia, denial, anger, and fear. These problems affect people's everyday life and the economy and, consequently, may lead to higher morbidity and increased mental healthcare needs [17].

The pandemic and associated restrictions cause serious concerns because restrictions in physical activity may have detrimental effects on the natural history of many diseases, cardiovascular risk factors, physical capacity, and mental health [18]. The studies of Fei Quin et al. showed a decrease in physical activity level and an increase in psychological dysfunctions associated with the emergence of the pandemic. At the same time, a positive correlation was found – people who were actively involved in vigorous physical exercise reported a better emotional state, while the group of people who undertook only light physical activity showed a decline in psychophysical condition [19]. Such observations may be helpful in planning preventive measures that would minimize the multidimensional effects of the pandemic.

To sum up, the pandemic and the closure of sports venues did not significantly decrease the quality of life in the study group. Most young people felt the need to exercise and undertook various forms of physical activity at home. Contrary to appearances, people who did not spend much of their leisure time actively before the pandemic became interested in various forms of physical activity when the pandemic started. Many students used their free time spent at home to sleep and eat healthy, which positively influenced their psychological comfort and, consequently, their quality of life.

Conclusions

1. The closure of sports venues due to the pandemic was not the cause of the abandonment of physical activity. An increase in the interest in other forms of physical activity was observed.
2. The pandemic and associated restrictions have not had an impact on the psychophysical condition of students.
3. Positive changes in the students' quality of life were observed. Students started sleeping longer and eat meals regularly.

Abbreviations

WHO – World Health Organization

IPAQ - International Physical Activity Questionnaire

MET - the unit of energy expenditure (Metabolic Equivalent of Work [min/week])

Declarations

Author contributions: BB and JKL contributed equally to this article, made substantial contributions to conception and design, acquisition of data, analysis and interpretation of data; BB, JKL and MK have been involved in drafting the manuscript and they have been involved in the data acquisition; JKL and MK have revised it critically for important intellectual content and given final approval of the version. All authors read and approved the final manuscript.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the Bożena Bogut (project manager). The data are not publicly available due to polish law and law at the Medical University of Wrocław.

Conflicts of Interest: The authors declare no conflict of interest.

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Figures

Figure 1

Number of students undertaking and not undertaking various forms of physical activity during the pandemic.

Figure 2

The level of physical activity before and during the pandemic.

Figure 3

The frequency of undertaking physical activity before and after the declaration of the pandemic.

Figure 4

Forms of physical activity undertaken by students before and during the pandemic.

Figure 5

The impact of the pandemic on the psychophysical problems

Figure 6

Differences in the number of hours of sleep before and during the pandemic.

Figure 7

Changes in the number of meals before and during the pandemic.

Figure 8

The impact of the pandemic on the quality of life.

Supplementary Files

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