



IMPACT OF COVID-19 ON PHYSICAL ACTIVITY OF HIGH SCHOOL STUDENTS (BULGARIAN EXPERIENCE)

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ABSTRACT

The neglect of physical activity in the education of high-school students (14 – 19 years old) during the COVID-19 pandemic could lead to serious consequences for their physical development and put their health at risk. In order to mitigate the problem with inactivity many countries all over the world use different approaches to sports classes. In cases where attendance is not possible, it is necessary to provide distance learning with maximum efficiency. The aim of the study was to examine the opinion of high-school students on the influence of COVID-19 on their physical activity and to optimize the learning process in physical education and sports under the conditions of distance learning in an electronic environment (DLEE). The study was carried out with 43 respondents who met the criteria of the target group. The survey was administered in two phases. Two questionnaires were completed by the participating students. The analysis of the results shows that in Bulgaria the pandemic does not have a negative influence on the physical activity of high-school students. We assume that the main reasons for this observation are the more liberal measures and the availability of options to use different sports facilities. In perspective, it would be useful to identify contemporary and innovative methods for improvement and monitoring of the activity of high-school students under the conditions of DLEE.

Key words: pandemic, sport, e-learning.

INTRODUCTION

Due to the COVID-19 outbreak, many countries around the world have imposed various restrictions on social life and education to low the spread of COVID-19. These include introducing varying degrees of social isolation and restrictions on things such as social gatherings, travel, sports, leisure activities, going to work and school. In this context, schools in 194 countries were closed (1). These social distancing measures mean that people have far fewer opportunities to be physically active, especially if activities such as walking or cycling as transportation, or taking

part in a leisurely activity (e.g. jogging, walking the dog, going to the gym) are being restricted. Furthermore, these drastic measures also make it so much easier to be sedentary at home for long periods of time (2).

In the beginning of March 2020, in Bulgaria, all schools and sports centers were also closed, and the only way for physical activity for students was related to exercises at home, and only online physical education and sports classes remained as mandatory physical activity. Until the end of the 2019/2020 academic year, students continued to study online. During COVID-19 in some European countries, the school year ended with online teaching and homeschooling, as a physical education practices (1).

The new school year 2020/2021 started in Bulgaria right away, but with the worsening of the

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pandemic situation at the end of October, schools were closed again. For the convenience of teachers and students, a unified platform of MS teams was created to conduct classes in real time. As a result, children no longer had access to school based physical activities such as physical education, recess, and walking to/from school (3). The cancellation of youth sports and activity classes have inspired programs, coaches, independent fitness professionals, and other entities to offer online streaming services with live or recorded sports/activity classes for youth using platforms such as Zoom, YouTube, Instagram, and proprietary mobile applications. Furthermore, without the structure of school or demands of after-school lessons and classes, some children may have more time for physically active free play at home. However, there may be enormous disparities in access to these opportunities based on household financial considerations, digital technology access, house and yard size, and neighborhood safety and traffic volume (4-8).

It has been argued COVID-19 school closures will lead to increased rates of obesity in children (9, 10) in part because schools provide opportunities and facilities for physical activity through physical education and recess (11-13).

For the purpose of improving the physical activity of high school students (age 14-19) during the COVID-19 pandemic, a number of countries around the world have implemented different approaches: face-to-face learning, alternating face-to-face and online-hybrid learning, or fully online learning. If it is impossible to organize the lessons in person, it is necessary to look for the most effective distance learning.

Neglecting the process of motor activity would lead to serious consequences, which would put students' health at risk. Given the potential for increased risk of obesity, diabetes, and other chronic diseases in children due to prolonged physical inactivity, information about the impact of the COVID-19 pandemic on children's physical activity can inform immediate programmatic and policy efforts during the next few months of the pandemic (3).

During the COVID-19 pandemic, when so many of us are very restricted in our movements, it is

even more important for people of all ages and abilities to be as active as possible. Even a short break from sitting, by doing 3-5 minutes of physical movement, such as walking or stretching, will help ease muscle strain, relieve mental tension and improve blood circulation and muscle activity. Regular physical activity can also help to give the day a routine and be a way of staying in contact with family and friends.

Regular physical activity benefits both the body and mind. It can reduce high blood pressure, help manage weight and reduce the risk of heart disease, stroke, type 2 diabetes, and various cancers. It also improves bone and muscle strength and increases balance, flexibility and fitness. or children, regular physical activity helps support healthy growth and development and reduce the risk of disease in later life, and through regular activity, children can develop fundamental movement skills and build social relationships.

All children and adolescents aged 5-17 years should do at least 60 minutes a day of moderate to vigorous-intensity physical activity, including activities that strengthen muscle and bone, at least 3 days per week (14).

After passing of the COVID-19 pandemic, students returned back in full attendance form. However, a number of open questions remain, such as: What will the level of physical activity be in the coming years and is it affected by COVID-19?, How can students be stimulated to spend more time doing some physical activity? Will the COVID-19 pandemic affect students' health and social skills indirectly? How to optimize physical education and sport training in future online learning.

The purpose of the study was to investigate the opinion of high school students regarding the impact of COVID-19 on their physical activity and optimization of the physical education and sports training process in the conditions of a pandemic and after the transition.

The subject of the study was the impact of COVID-19 on physical activity of high school students.

The object of research were 43 students (24 boys and 19 girls) from 21 "Hristo Botev" Secondary

School, Sofia, Bulgaria. The average age of the subjects was 15 ± 1.1 years.

METHODS

The following scientific methods were used for conducting the research - survey, included observation, mathematical and statistical methods: analysis and synthesis of the results, theoretical analysis of specialized scientific and documentary sources.

The overall study proceeded in two stages. Two (2) in number questionnaires were prepared, which were filled in by the studied students. The first survey with them was done in June 2020. The reason for the choice was that from March until the end of the 2019/2020 school year, the training took place online and it was possible to track the attitudes of high school students towards learning in an electronic environment. The second survey of students was conducted in February 2021 due to the fact that in the 2020/2021 school year, the training started in person and from the end of October, the students switched to online training again. This required the study to be carried out in two stages of questioning, in which the same

individuals participated. The survey cards were electronic, and the questions to them were 15 in number, and we focus on 4 questions in detail in our study. Each question had 5 closed answers - a standardized questionnaire.

RESULTS

The questions in the inquiry survey were focused on the physical activity of students under pandemic conditions, including outside the learning process. In Bulgaria, some of the restrictive measures were dropped already in June 2020, when the sports centers began to function. At the end of October, they were closed again and in the beginning of 2021, they gradually began to open again.

One of the questions that was asked to high school students was: "Do you practice physical exercises and sports outside of physical education classes at school?". An important clarification that has been explained to the students is whether they practice any sport outside the compulsory physical education and sports curriculum before the pandemic. The results are presented in **Figure 1** for 2020 and in **Figure 2** for 2021.

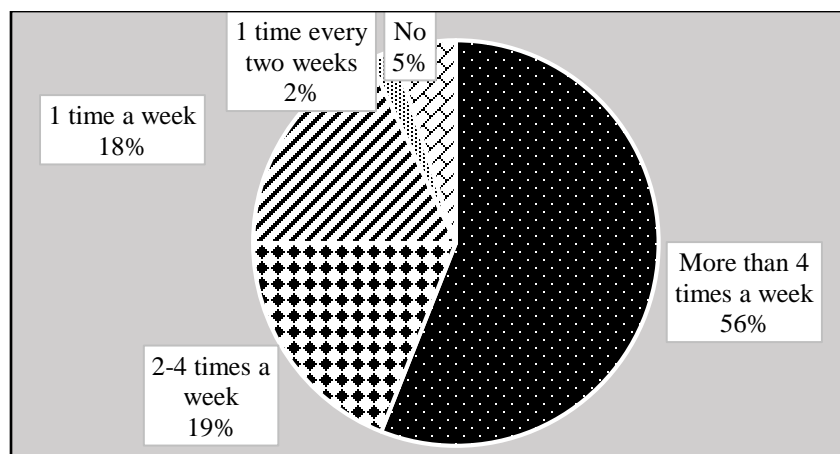


Figure 1. Results of the inquiry survey on additional physical activity in 2020.

Comparing the results of the survey in 2020 and 2021, it is clear that a large percentage of the students questioned confirm that they exercise more than 4 times a week. In 2020, this was 56%, while in 2021 – 45%. This indicated a high motor activity in free time. It is noteworthy that for 1 year, in which online learning alternates with face-to-face learning, we had more than a 10% drop, which also showed a trend towards less motor activity among the studied students.

From 2 to 4 times a week, we had in 2020 – 19% out of those surveyed, in 2021 – 22%. The results were close, which showed that about 20% of all studied students exercised relatively often. A reason for the high percentage of those actively involved in sports activities may be due to the fact that a large number of students also practice various types of sports outside of school.

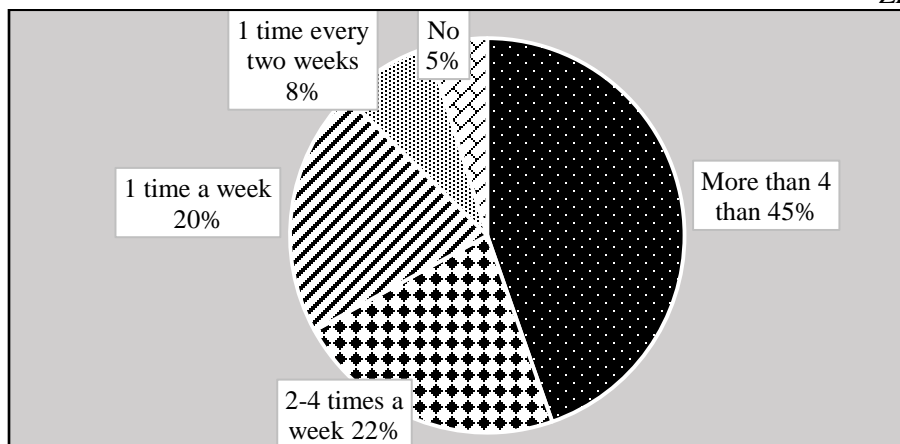


Figure 2. Results of the inquiry survey on additional physical activity in 2021.

More than ¼ of students engaged in 1 time or less of some physical activity, with a decline in the second year of the pandemic. This shows a tendency towards a decrease in physical activity among some of the students. The main reason, in our opinion, is the COVID-19 pandemic and the extremely large amount of time spent in front of the computer by high school students.

Another question from the inquiry card was: "Did you practice physical exercise during the online training as a result of the COVID-19 pandemic?", and the results are presented in **Figure 3** and **Figure 4**.

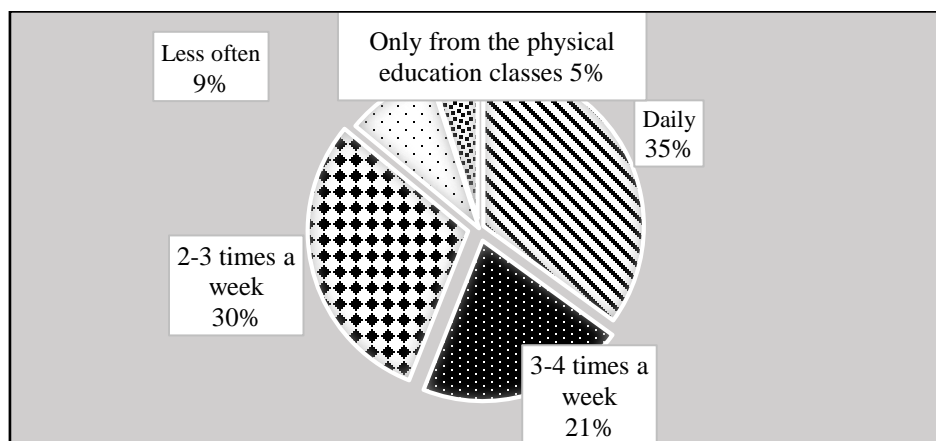


Figure 3. Pupils' activity during online learning in 2020.

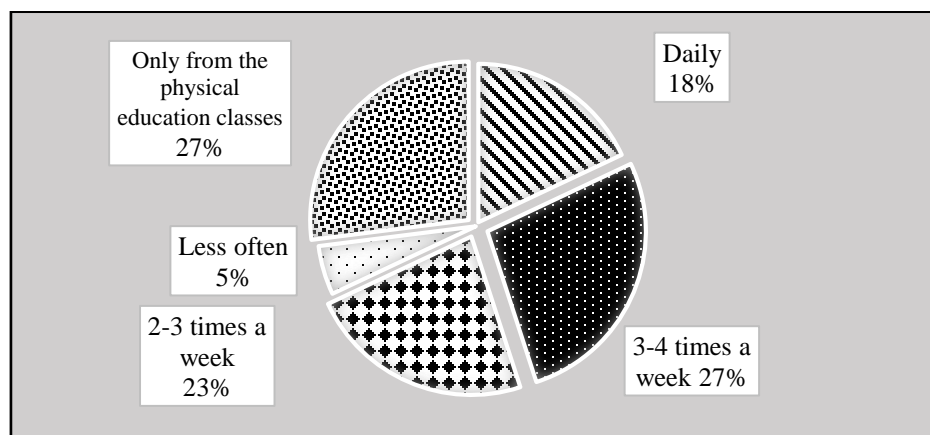


Figure 4. Pupils' activity during online learning in 2021.

In 2020, 35% of the surveyed students played sports daily, while the responses to the same survey question in March 2021 dropped to 18% playing sports daily. This showed a decrease of as much as 17%, which was a half. It could be seen that in 2021 - 27% only played sports in PE and sports classes, which was worrying, compared to 2020 where only 5%. The downward trend in student physical activity, which continued even after the COVID-19 pandemic, was confirmed. In a study by Petkova et al, 2022 as an overall trend

for boys and girls, we could observe that the average sitting time increases, but all of the other parameters decrease. That means that with aging Bulgarian children have less activity as a total (15).

"Does online learning affect students' physical activity?" The answers to this question are presented in **Figure 5** – 2020 and **Figure 6** – 2021.

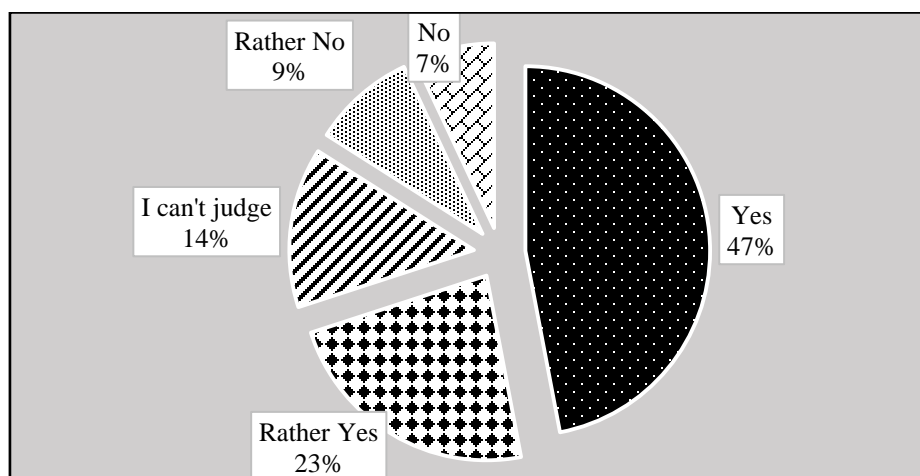


Figure 5. Impact of online learning on students' motor activity in 2020.

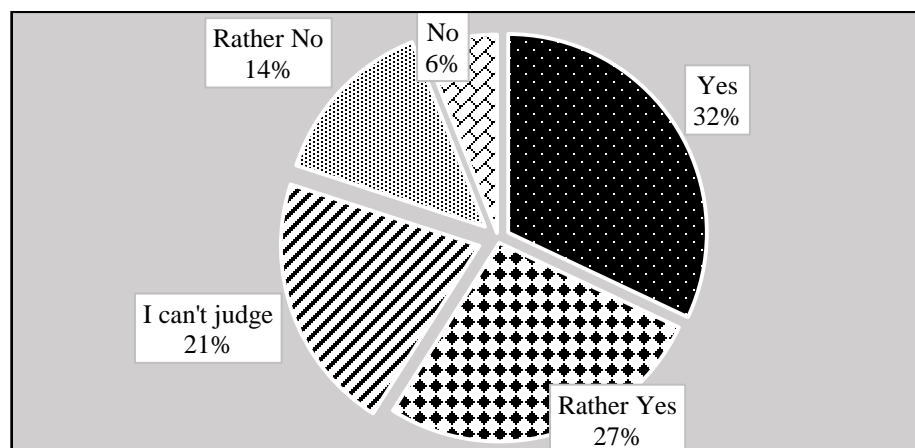


Figure 6. Impact of online learning on students' motor activity in 2021.

It is obvious from the results presented, that 47% in 2020 and 32% in 2021 of the students surveyed believe that online learning has had an impact on their physical activity. In 2020, we have 15% more students compared to 2021. The reason for this is probably due to the longer period of online training in 2020 and the closure of training places (gyms, pools, gyms, etc.). Not insignificant is the stress associated with the transition to online

learning, as well as the lack of a single learning platform for students, which further tires and burdens them when working with different learning platforms during the 2019-2020 school year.

The percentage of students whose physical activity was unaffected by online learning was small. This showed the need for more motor activities both in physical education classes and in

extracurricular sports activities. It is necessary to explain and promote students' need for systematic sports and motor exercises.

A great number of students want to play sports, the main reasons for them being related to looking good and to a lesser extent leading a healthy lifestyle. The main reason for the lack of sports activities is the lack of places for training, financial opportunities, desire and motivation. All this shows the need to create additional extracurricular sports and socialization activities

among adolescents. If quick and adequate measures are not taken, there is a real danger of lack of movement, and this would respectively lead to a number of health problems, which in the future can very hardly become a chronic problem. The studied students found it difficult to assess how effective physical education and sports training was, which necessitated a systematic approach to increasing physical activity from the side of physical education and sports teachers (**Figure 7**).

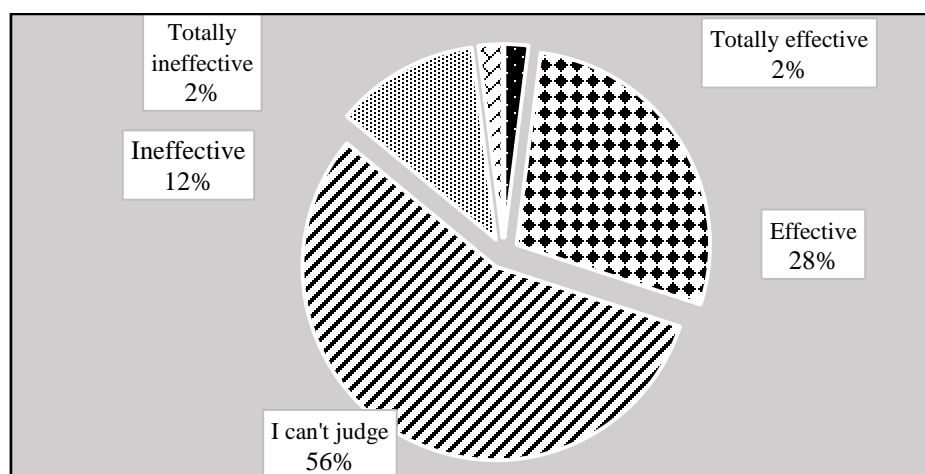


Figure 7. Pupils' opinion of the conducted physical education and sports training in 2020.

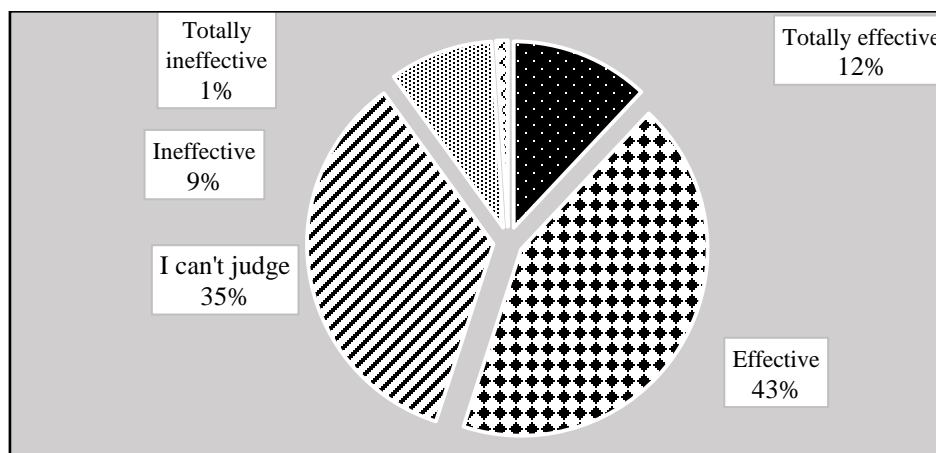


Figure 8. Pupils' opinion of the conducted physical education and sports training in 2021.

In 2020, learning physical education (PE) online was difficult and required selecting and creating videos that were age and gender appropriate (**Figure 8**). While at the beginning of March the training was mostly asynchronous, it was switched to distance learning with the inclusion of the video cameras and monitoring of the performance of the exercises by the teachers and imitation by the students. This was probably one

of the reasons why most of the students could not judge how effective the exercise was. It could be seen that in 2020, the students who could not judge were 56%, while in 2021 they were significantly less - 35%.

By continued online learning, new approaches are constantly being sought for effective student work during physical education classes. Assignments

are made by the teachers to engage and interest the students, they are more independent work, to be interesting and new for them. Looking for an innovative approach in classes. As a result of all these attempts to improve learning in 2021, 43% of students believe that this type (learning in MS teams) online PE learning is effective.

Online programs prepared by physical education teachers should reflect a value-oriented approach that includes behaviors such as socialization, interaction/ communication, teaming, problem solving and cooperation. Also, not all students in a class are at the same level of ability. Teachers should develop online programs that will enable students to develop their basic skills at their own level. In addition, they can prepare a health and wellness-based model that incorporates World Health Organization (WHO) guidelines (1).

Given the fact that it is possible that online learning will be used in the future as a result of other pandemics, there is a need to search for effective and innovative mechanisms to be implemented in distance learning.

A good example in physical education lessons can be given by tracking the current state of the student. For this purpose, it is necessary for each student to have a smart bracelet or a multi-sport watch that measures the heart rate in real time. In this way, during the lesson, the teacher will be able to track the activity of each student through the so-called "Live Track". Of course, at this stage, this would be difficult to implement, given the large financial parameters that the Ministry of Education and Science will have to provide for these devices for the whole of Bulgaria.

In summary, a positive role-model that facilitates learning healthy life skills can be developed in a physical education setting. The link between student and teacher is important to ensure that learning takes place. The lack of direct interaction in the COVID-19 era has significantly highlighted how valuable this link is. This is a new challenge in teaching physical education, and physical education teachers will be a resource teacher/personal trainer and coach to all students during the COVID-19 pandemic, although there is a debate about how much these values and behaviors can be obtained via distance physical education classes (1).

CONCLUSION

In conclusion, in Bulgaria, the COVID-19 pandemic did not have a sufficiently large impact on the physical activity of high school students due to the more liberal measures and the possibility of visiting sports facilities - fitness centers, swimming pools, football fields, etc., which were closed for about 4 months. The lessons of physical education and sports remained one of the few systematic activities related to motor activity of the students, which are held according to a schedule and regularly 2 times plus 1 time a week an additional hour of "sports activities". However, the trend was towards a decrease in the motor activity of the student as a result of the stagnant lifestyle.

There is a need to search for modern and innovative methods to improve and monitor the activity of students in high school, for example using smart or multi-sport watches with real-time tracking of workload.

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