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## E-sports versus physical activity among adolescents

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## E-sports versus physical activity among adolescents

### Abstract

Background: While physical activity is believed to be essential for a healthy lifestyle, younger generations seem to spend less time playing sports. On the other hand, in the past couple of years a new type of sports, e-sports has emerged. Though one cannot question that e-sports requires intense concentration and a lot of practice, whether it needs appropriate physical fitness is still debated. Material and methods: A survey was conducted in Debrecen, in the teacher-training high school of the University of Debrecen with the help of interviewers. Beyond socio-demographic data individual sporting and e-sporting habits were assessed in a gender specific context. Results: 563 respondents were included in the survey, with an average age of  $15.9 \pm 1.4$  years (mean $\pm$ SD). The respondents reported an average free-time of  $3.2 \pm 1.6$  and  $6.5 \pm 1.7$  hours on weekdays and weekends, respectively, with boys having a half an hour more free-time. While only 22.7% of the girls play video-games, this is 85.5% in the case of boys. The percentage of youth engaged in daily out-of school physical activities was 22.9%, but those who do out-of-school sports 2-3 times a week the ratio was 89.5%. Conclusions: While most of the students participate in regular physical activities, they spend a significant amount of their free-time playing video-games. Not only is this time less for girls than for boys, girls report less free-time and less time spent doing physical activity than boys.

### Keywords

adolescents, free-time, physical activity, e-sports, video-games

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# E-sports versus physical activity among adolescents

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**A** Study Design

**B** Data Collection

**C** Statistical Analysis

**D** Data Interpretation

**E** Manuscript Preparation

**F** Literature Search

**G** Funds Collection

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## abstract

**Background:** While physical activity is believed to be essential for a healthy lifestyle, younger generations seem to spend less time playing sports. On the other hand, in the past couple of years a new type of sports, e-sports has emerged. Though one cannot question that e-sports requires intense concentration and a lot of practice, whether it needs appropriate physical fitness is still debated.

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**Results:** 563 respondents were included in the survey, with an average age of 15.9 ±1.4 years (mean±SD). The respondents reported an average free-time of 3.2 ±1.6 and 6.5 ±1.7 hours on weekdays and weekends, respectively, with boys having a half an hour more free-time. While only 22.7% of the girls play video-games, this is 85.5% in the case of boys. The percentage of youth engaged in daily out-of-school physical activities was 22.9%, but those who do out-of-school sports 2-3 times a week the ratio was 89.5%.

**Conclusions:** While most of the students participate in regular physical activities, they spend a significant amount of their free-time playing video-games. Not only is this time less for girls than for boys, girls report less free-time and less time spent doing physical activity than boys.

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## INTRODUCTION

Nowadays it is cliché to say that the physical activity of young people is lower than it should be, which can be observed among the population of Hungary and more specifically the population of the North Great Plain region as well [1, 2]. This is partly due to the recent increase in the curriculum and time spent with learning and other related activities, although some studies suggest that the usage of IT-tools is at least as relevant. One of the key components of the latter is the spreading and the increase of time spent playing computer games [3]. Today, the term e-sports is increasingly spreading, by which we mean that so called gamer groups playing video games on a regular and competitive basis have emerged [4, 5]. By now e-sports has become a thoroughly researched topic, slowly becoming a part of recreational activities commonly referred to as sports [6, 7]. At the same time however, many people tend to see activities typically considered sports as a virtue, while e-sports are considered to be rather useless when it comes to spending free-time [8, 9].

Those supporting that e-sports should indeed be considered as a sport point out – as their most important argument – that e-sports requires regular exercise, is accompanied by the development of certain motor skills, and in no event should be considered as a lower level intellectual performance than some games that are accepted as sports such as billiards. However, several studies show that while stress associated with intense physical activity improves cognitive functions and memory capacity, such effects of video games cannot be justified [10, 11].

With the spread of the internet, video games, e-sports, and online gaming have become one of the most important factors in spending free time, involving millions of players and substantial amounts of money every day [12]. In recent decades, several studies have dealt with these potential positive – including improved communication capability [e.g.13, 14] – and negative effects – such as deterioration in learning outcomes, health and behavioral problems [15, 16]. The latter has led to the inclusion of “internet gaming disorder” as a potential psychiatric disorder on the one hand, and to a number of studies published in this matter on the other hand [17, 18].

Based on the above, we were interested in how today’s young people distribute their free time between playing video games and physical activities, and whether there are any differences between the various age groups.

## MATERIAL AND METHOD

The survey was carried out in Debrecen in the spring of 2018, among the students of a six-grade high school. The questionnaires were filled in with the help of interviewers and based on self-declaration. The completed questionnaires were processed using the EvaSys software (<http://www.vsl.hu>). Our questions covered socio-demographic data beyond the individuals’ sporting habits. During the survey, practicing a sport was defined as a physical activity exercised for a minimum of half an hour outside school physical education. The rest of the questionnaire covered questions concerning e-sporting habits, including the time spent with and the platform of the game, whether it was intended to play in a competitive way and also the age the respondent started playing the game. In the course of analyzing the data, we also examined the proportion of time spent on e-sports and physical activity, extending the scope to the differences between genders and various age groups. Student’s t-test was used to determine statistical differences. A difference was considered significant if  $p < 0.05$ .

## RESULTS

The questionnaire was filled in by 563 people, mean age was  $15.9 \pm 1.4$  years (mean  $\pm$  SD), age distribution of respondents is shown in Fig. 1.

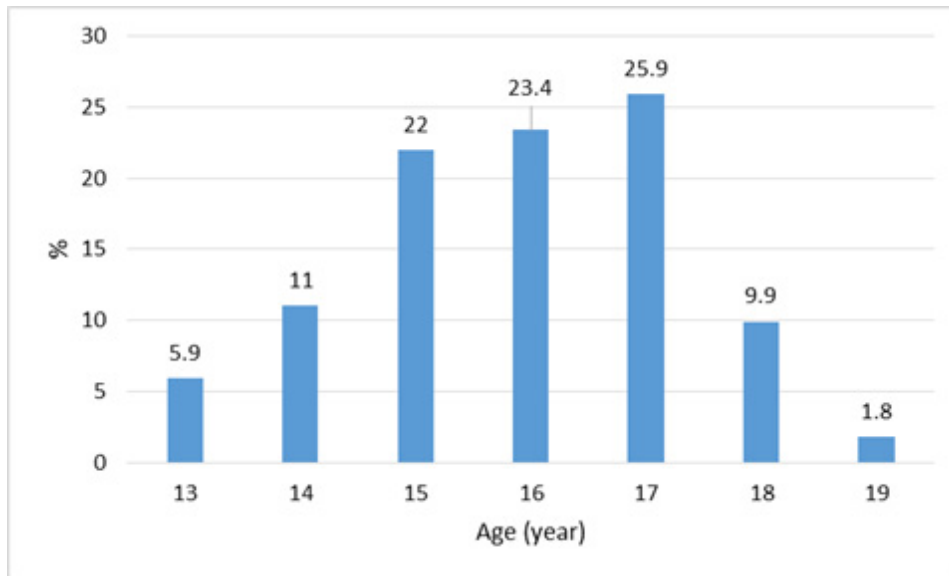


Fig. 1. Distribution of the respondents' age

59.6% of the respondents are girls, 40.4% of them are boys, their mean age corresponds with the mean value.

The overwhelming majority (83.6%) of the young people are residents of Debrecen (Fig. 2) or residents of the surrounding small towns (11.2%).

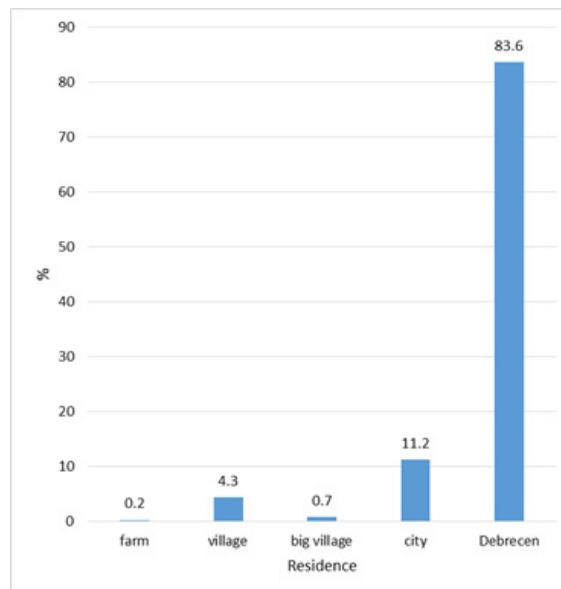


Fig. 2. Residence

Considering the available free time, it can be stated (Fig. 3) that respondents have an average of  $3.2 \pm 1.6$  hours of free time on weekdays while on weekends this value equals  $6.5 \pm 1.7$  hours. When it comes to the difference between the genders, it can be observed that girls have significantly less free time than

boys both on weekdays ( $3.0 \pm 1.4$  h versus  $3.5 \pm 1.8$  h) and weekends ( $6.3 \pm 1.8$  h versus  $6.8 \pm 1.5$  hours) (weekdays:  $p < 0.001$ , weekends:  $p < 0.005$ ).

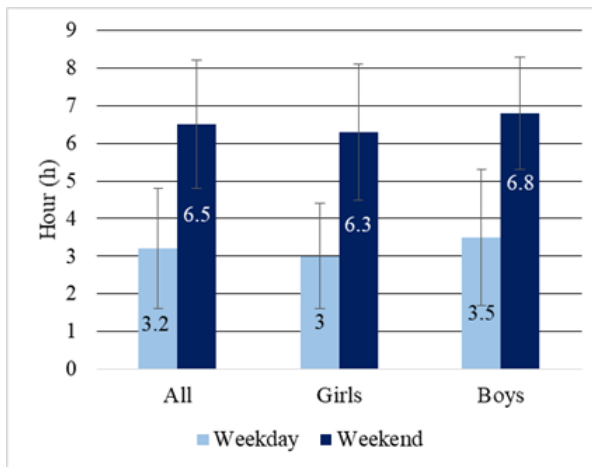


Fig. 3. Amount of free time / self-estimate

When asked if they play computer games, 85.7% of the boys replied “yes”, unlike girls, among whom only 22.1% responded similarly (Fig. 4). The difference is noticeably ( $p < 0.0001$ ) significant.

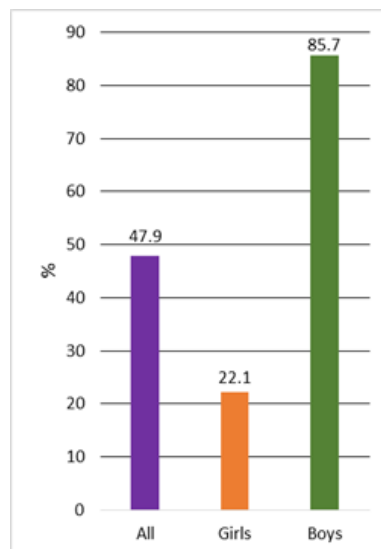


Fig. 3. Proportion of those playing computer games

When asked about the time spent playing computer games, it can be concluded that on weekdays  $1.6 \pm 1.1$  hours are spent with this activity, while on weekends the average is  $3.2 \pm 1.9$  hours. Considering gender differences, it can be stated that boys spend more time on computer games than girls both on weekdays and weekends (Fig. 5), and the difference is significant in both cases ( $p < 0.01$ ,  $p < 0.001$ ).

59.8% of the players use computers and/or phones, 22% game consoles, 15.4% laptops, and 5.4% tablets (Fig. 6).

The most frequently mentioned games are FIFA (15.2%), PUBG, League of Legends (12.7 and 13.2%) and CS: GO (10.7%) (Fig. 7).

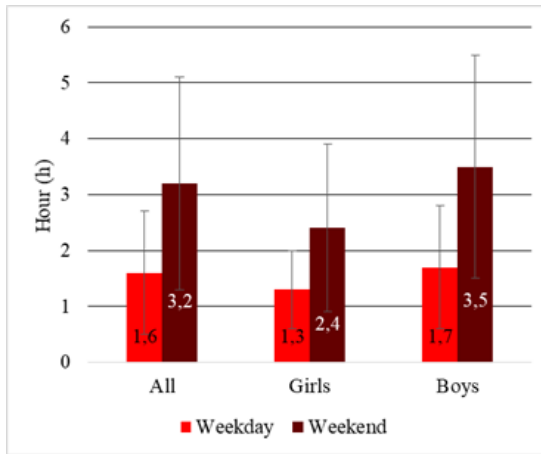


Fig. 5. Time spent playing computer games

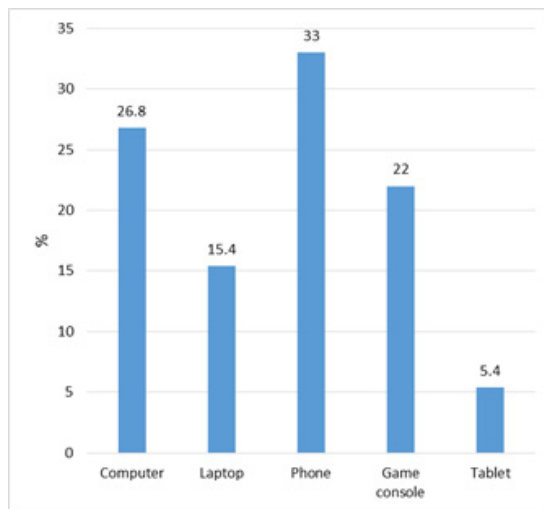


Fig. 6. The platform used

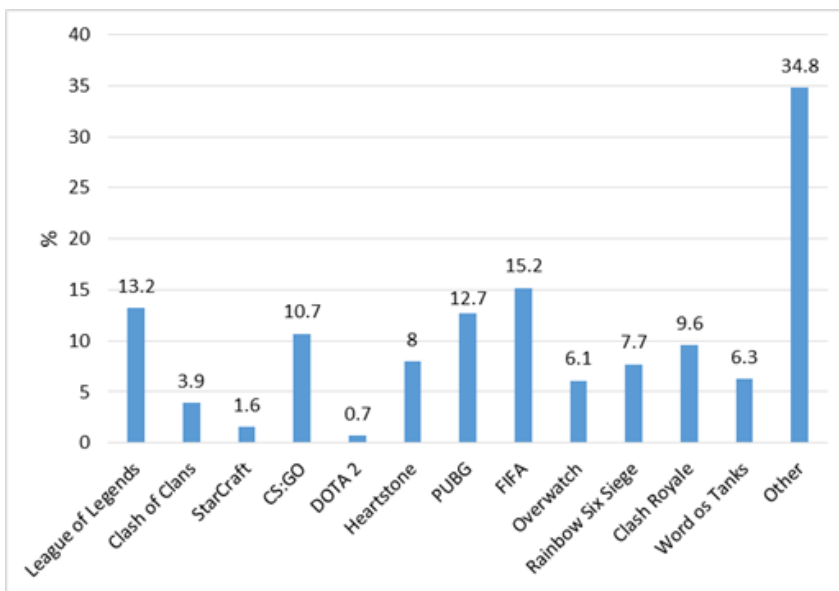


Fig. 7. Games played

The proportion of gamers, that is young people playing e-sports in a competitive way is 9.5% among computer users (i.e. 4.8% of all respondents); slightly more people – 10.8% and 5.7% respectively – are members of e-sports associations (Fig. 8A, B).

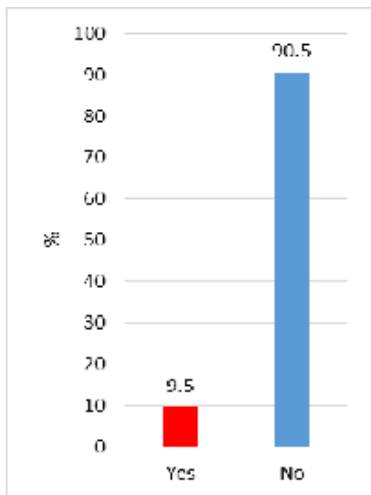


Fig. 8A. Participation in e-sports events

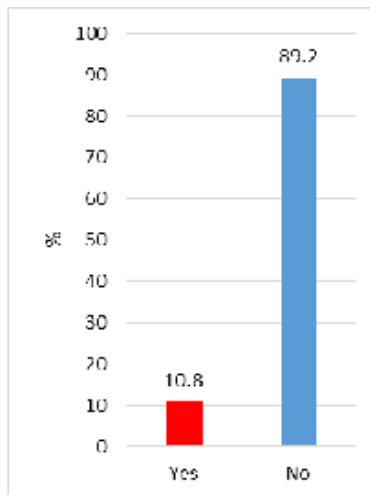


Fig. 8B. Member of an e-sports associations

Looking at the topic of sporting habits, it can be said that the overwhelming majority of respondents (91.6% on average) plays sports regularly. In this respect, there was no evident difference ( $p > 0.9$ ) between the genders. Practicing a sport was defined as an uninterrupted physical activity exercised for a minimum of half an hour outside school physical education. 22.9% of respondents answered “I play sports every day”, 28% responded “4–5 times a week”, 47% “2-3 times a week”, and 2.1% “1-2 times a month” (Fig. 9). Significant difference ( $p < 0.001$ ) between the genders could only be observed in terms of those playing sports every day (in favor of boys).

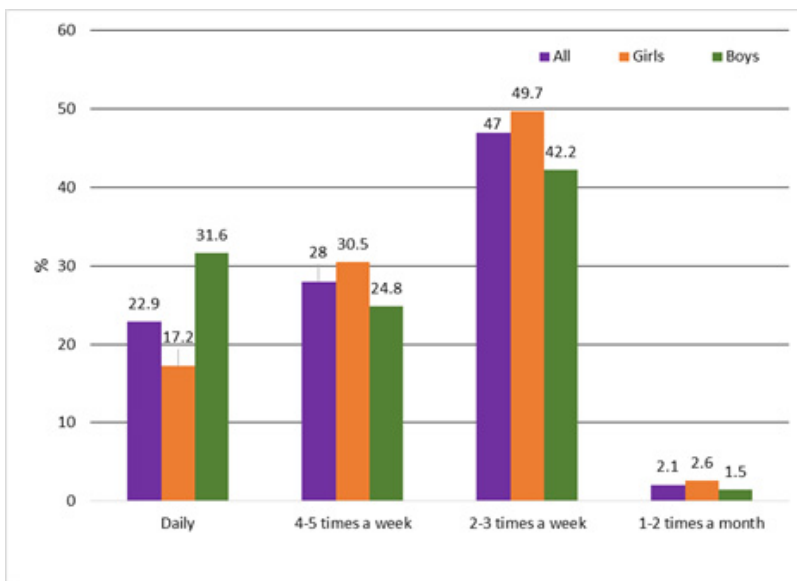


Fig. 9. Distribution of the frequency of playing sports

In terms of the different types of sports they play most of the respondents marked running/athletics (21.5%), workout in a gym (25.4%), cycling (19.5%), dancing (14.6%) and soccer (13.3%) (Fig. 10).



As for the reasons for not playing sports, respondents have identified 3 main areas, namely “lot of studying”, “too tired” and “no time” (Fig. 11).

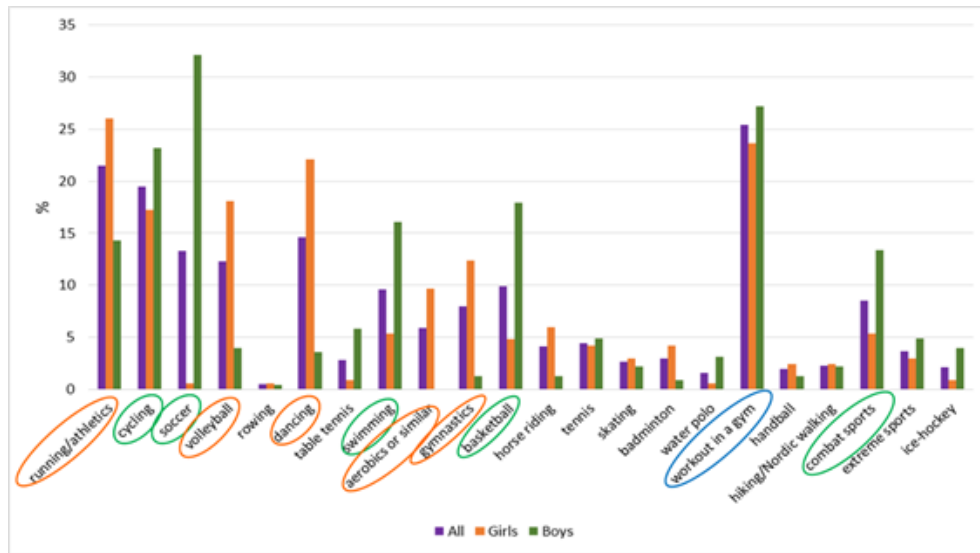


Fig. 10. Types of sports played. Those answers are circled which were selected by girls (orange) or boys (green) in a significantly higher proportion. Blue circle depicts the answer which was the most frequent considering all respondents

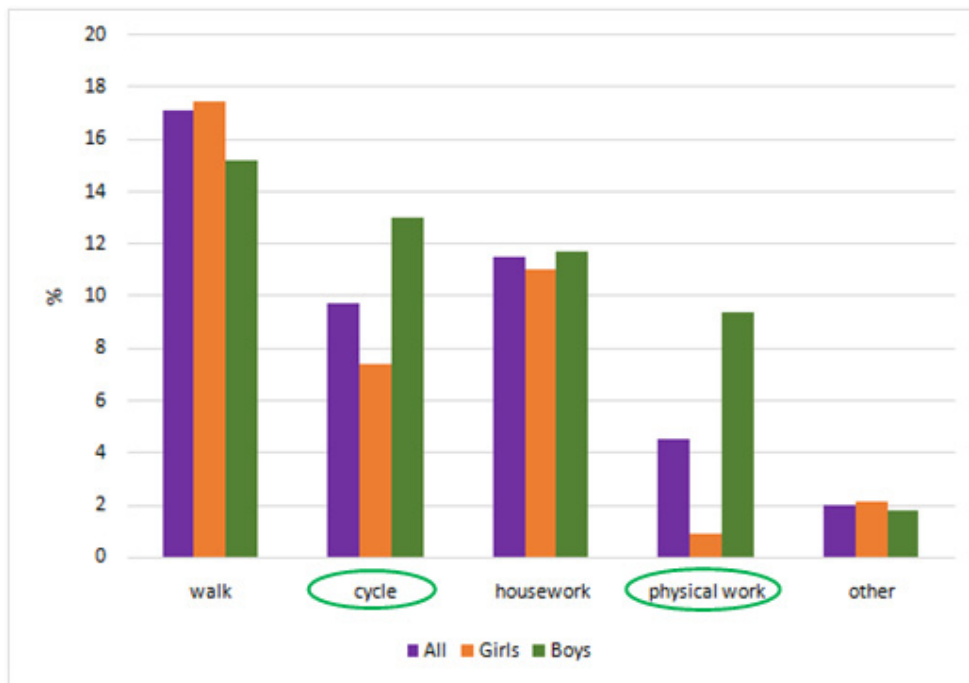


Fig. 11. Reasons for not playing sports. Those answers are circled (orange) which were selected in a significantly higher proportion by girls

We were also interested in whether other types of physical activities had been pursued besides sports. Based on the responses we can say, that walking plays a prominent part in this respect among respondents (Fig. 12). It is also noteworthy that boys report remarkably more cycling and physical work than girls.

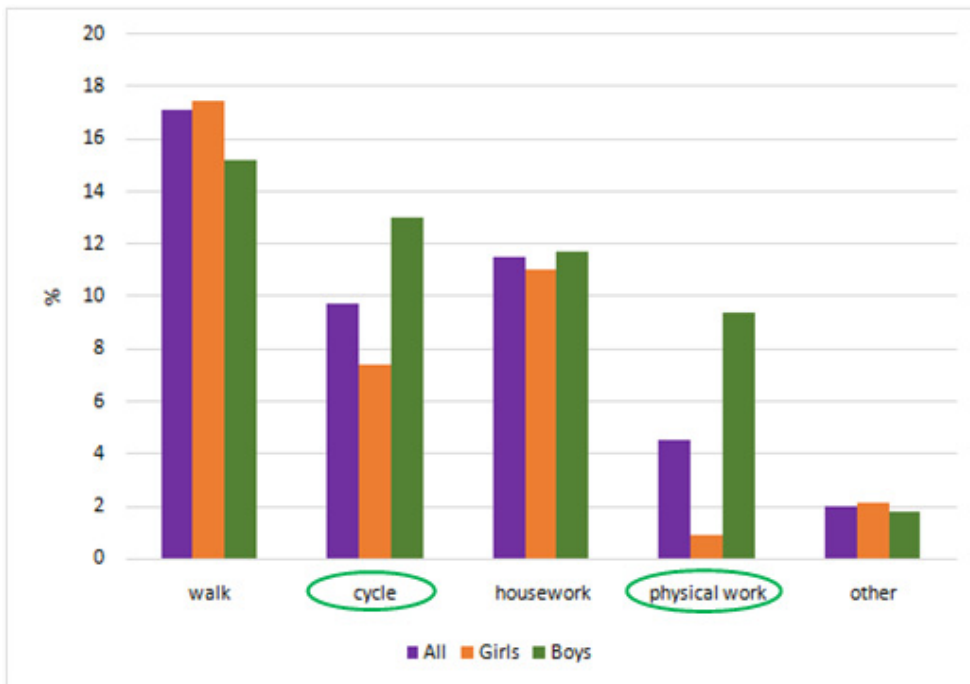


Fig. 12. Other types of physical activities. Those answers are circled (green) which were selected in a significantly higher proportion by boys

## DISCUSSION

Nowadays television and computers are the most common ways of spending free time in Hungary and in Europe [e.g. 19]. According to Eurostat 2018 [20] the daily internet users in the EU are 95% and 92% in Hungary. Based on the 2016 results of the representative Hungarian Youth Research involving 12,000 young people, IT-technology usage has further increased in Hungary; with home internet access and smartphones becoming ever more common [21]. In parallel, almost one quarter (24%) of the 15-24-year-old age group in the EU does not engage in physical activity at all and, furthermore, this ratio increases with age [22].

A study looking at 70,000 schoolchildren from 34 countries reported that they spend more than 3 hours daily with sedentary, not related to school or to homework, activities [23]. This is reflected both in a decrease in physical endurance and in the appearance of psychological problems [24]. Noteworthy is also that children's screen time has increased dramatically in the past decade. As screen time (TV, video games, computers, etc.) is usually linked to the consumption of foods with large amounts of fat, sugar, and/or salt, as well as to sugary beverages, this leads to childhood obesity and further decrease in physical activity [25-28].

As a result of our survey, it can be stated that the vast majority of pupils studying in school in Debrecen, Hungary, play sports on a regular basis. They have nearly 3 hours of free time on average on weekdays, and 6.5 hours of free time on weekends. Boys typically report half an hour more free time than girls. Slightly over 10% of boys do not play computer games regularly, unlike girls, three quarters of whom do not choose this form of entertainment. Although it can be observed that boys spend more time playing on a computer than girls, both in absolute terms and in relative percentages of free time, this difference

is not as dramatic as the difference observed in the proportion of computer game players. All in all, students who play computer games spend nearly half of their free time both on weekdays and weekends with this activity.

## CONCLUSIONS

In Hungary, due to the compulsory everyday PE classes at school, a large – even in an international context – proportion of high school students are engaged in regular physical activity. On the other hand, data show that, with advancing age, the percentage of those who regularly exercise is becoming lesser and lesser. We must, therefore, find those factors that can positively influence towards or maintain the interest of adolescents in continuing their physical activity and move them away from the computer screen. This not only requires a change in the attitude of the society, but local communities, school teachers, and the families should all act in the same direction. Since from the perspective of our future society children are the most important assets, we need to be aware of their needs and interests in order to influence their lifestyles.

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