The use of smartphones in the physical activities of adolescent girls in Slovakia and the Czech Republic

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Authors’ Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

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How to site

Abstract

Background
The lack of physical activity is a global public health problem. Physical inactivity is the principal risk for obesity and other serious life-threatening diseases. This study is specialized in discovering the use of smartphones in physical activities of females from Slovak Republic and Czech Republic.

Purpose
The study’s objective was to compare how adolescent girls in Slovakia and the Czech Republic used their smartphones for physical activity.

Methods
The observing group consisted of 1515 females who used smartphones and studied in 3rd and 4th year of high schools, conservatories and grammar schools in Slovak Republic and Czech Republic. The main method of this work was a survey that consisted of 13 questions. The survey which we distributed to Slovak schools from December 2020 to August 2021 was paper based. The survey distributed to Czech schools was an online survey through google forms. The paper-based survey distributed to Slovak schools was evaluated through TAP3 software by a company based in Banská Bystrica, Slovakia. The online survey distributed to Czech schools was evaluated through MS Excel. We analysed the results with the chi-square test at the level of p < 0.01, p < 0.05. For some of our needs we used arithmetic mean.

Results
We discovered that 49.33% of females from Czech Republic spend 1-3 hours daily on their smartphones. Simultaneously, we discovered, that females from Czech Republic (27.19%) and from Slovak Republic (27.78%) do 3 to 5 hours a day of activities connected with smartphones. Most of these females considered this time as adequate. The majority of activities in which they participated by using their smartphones were social media, chat, or e-mail (65.11%). The negative discovery was that not even 3% of females used their smartphones in connection with physical activities. We found that 69.09% of females from Czech Republic and 67.96% females from Slovak Republic monitor the number of steps or distances walked/ran on their smartphones. We recorded a statistically significant difference at the level of significance p < 0.01 in questions no. 3, 4, 5, 8 and at the significance level p < 0.05 in questions no. 1, 6.

Discussion & Conclusion
From the point of view of what time they spend with activities related to smartphones, we discovered that most of the females were using their smartphones 1-3 hours daily, with some indicating 3-5 hours of daily activities. A total of 62.06% of females considered time spent with activities on smartphone to be adequate to this era. 22.3% of females realized that presented time of hours spent on smartphone is high. Even though there are a lot of applications that can be helpful in doing physical activity, only a small percentage of our participants used them. Given that some applications work on a group system in which individuals can be added to groups in that application and the participants can motivate each other with their shared goals and results, encouragement should be given by schools for students to download and use such apps.

Keywords: adolescents, physical activity, smartphone, secondary schools

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Анотація

Габріель Буйдош, Штефан Адамчак, Міхал Марко, Павол Бартік. Використання смартфонів у фізичній активності дівчат-підлітків у Словаччині та Чехії

Обґрунтування

Відсутність фізичної активності є глобальною проблемою охорони здоров'я. Відсутність фізичної активності є основним ризиком розвитку ожиріння та інших серйозних захворювань, що загрожують життю. Це дослідження спеціалізується на виявленні використання смартфонів у фізичній активності жінок зі Словацької Республіки та Чехії.

Мета

Метою дослідження було порівняти, як дівчата-підлітки у Словаччині та Чехії використовують свої смартфони для фізичної активності.

Методи

Групу спостереження складали 1515 дівчат, які користувалися смартфонами та навчалися на 3-му та 4-му курсах середніх школ, консерваторій та гімназій Словаччини та Чехії. Основним методом роботи було анкетування, яке складалося з 13 питань. Опитування, яке ми розповсюдили серед словацьких шкіл з грудня 2020 року по серпень 2021 року, було паперовим. Опитування, розповсюджене серед чеських шкіл, було онлайн-опитуванням через Google-форми. Опитування на паперових носіях, розповсюджене серед словацьких шкіл, було оцінено за допомогою програмного забезпечення TAP3 компанією, розташованою в Банській Бистриці, Словаччина. Онлайн-опитування, розповсюджене серед чеських шкіл, було оцінено за допомогою MS Excel. Результати аналізували за допомогою критерію хі-квадрат на рівні p < 0,01, p < 0,05. Для деяких наших потреб ми використовували середнє арифметичне.

Результати

Ми виявили, що 49,33% жінок з Чехії витрачають 1-3 години на день на свої смартфони. Одночасно ми виявили, що жінки з Чеської Республіки (27,19%) і зі Словацької Республіки (27,78%) займаються від 3 до 5 годин на день діяльністю, пов’язаною зі смартфонами. Більшість із цих самок вважали цей час достатнім. Більшість дій, у яких вони брали участь за допомогою своїх смартфонів, були соціальними мережами, чатом або електронною поштою (65,11%). Негативним відкриттям стало те, що навіть 3% жінок не використовували свої смартфони під час фізичних навантажень. Ми виявили, що 69,09% жінок з Чехії та 67,96% жінок зі Словацької Республіки відстежують кількість кроків або пройдених дистанцій на своїх смартфонах. Ми зафіксували статистично значущу різницю на рівні значущості p < 0,01 у питаннях № 3, 4, 5, 8 та на рівні значущості р < 0,05 у питаннях № 1, 6.

Обговорення та висновок

З точки зору того, який час вони витрачають на діяльність, пов’язану зі смартфонами, ми виявили, що більшість жінок користуються своїми смартфонами 1-3 години на день, а деякі вказують на 3-5 годин щоденної діяльності. Загалом 62,06% жінок вважають час, проведенний за діяльністю на смартфоні, адекватним цій епосі. Незважаючи на те, що існують багато додатків, які можуть бути корисними для фізичної активності, лише невеликий відсоток наших учасників користувався ними. З огляду на те, що деякі програми працюють за групою системою, у якій окремих осіб можна додавати до груп у цій програмі, а учасники можуть мотивувати один одного своїми успіхами та результатами, школи повинні заохочувати учнів завантажувати та використовувати такі програми.

Ключові слова: підлітки, фізична активність, смартфон, загальноосвітні школи
Introduction

Lack of physical activity is a global public health problem. Physical inactivity is one of the major risks of obesity and various diseases resulting in death [1]. According to international measurements, high school youth is insufficiently active in relation to health. Michal [2] states that rather than engaging in physical activities, adolescents prefer playing computer games in their free. The greatest decrease in physical activity occurs during the transition from childhood to adolescence [3]. Smartphones that offer various applications could help solve this problem [4]. Glynn et al. [4] state that the great advantage of using smartphones is that no additional device is needed, and people always carry a mobile phone with them. Measurement feedback is important, e.g., measuring time, speed, energy consumption and, last but not least, receiving rewards and positive feedback for achieving and exceeding goals. Xiao et al. [5] also state that mobile phones are important in changing lifestyle risk factors such as physical inactivity. Sheikh et al. [6] argue that the rate at which communication technologies are developing makes it possible to potentially reach more individuals interested in information about their health. We agree with Chen & Wang [7] who argue that the Internet is increasingly being used as a medium for providing information on health changes. Recent years have shown that use of mobile phones is an integral part of daily lives of almost the entire population. Young people not only use their mobile phones to make phone calls, but they also use various applications they can download. There are more and more ways to use a mobile phone and they are becoming more and more attractive for young people [8]. According to Domin et al. [9] and their study, which offers an overview of the use of applications focused on physical activity over the last 10 years, state, that there have been positive changes in the field of physical activity. They also mention that the COVID-19 pandemic and the related curfew in several countries, as well as domestic quarantine, have a negative impact on positive physical activity changes, but at the same time there has been an increase in the use of communication technologies, e.g., in the field of the mHealth mobile application. Smartphones are an everyday part of today's population and therefore may be helpful in performing and monitoring physical activity [10, 11]. One of the greatest advantages of smartphones is the possibility of planning physical activity and its evaluation afterwards [12]. Thanks to the functions they have, applications in smartphones are more advantageous for monitoring physical activity compared to various pedometers etc., they can monitor/track more things at the same time e.g., heart rate, time, distance which they can as well evaluate at the end of the workout [13]. As reported by Domin et al. [9] despite the availability of smartphones and the associated improvement in physical activity associated with a reduction in sedentary lifestyle, there is not enough literature available to understand developments in this topic. Although several applications are available for smartphones, it is not certain how these applications affect health behaviour and related physical activity [10]. We think that it would only be for good, if young people would use these widely available smartphone applications for promoting physical activity and healthy lifestyle. We share the view of Tong et al. [14], who argue that the determination to exercise regularly can reduce the risk of chronic diseases in young people. According to WHO [15], to maintain good health and prevent chronic diseases, it is recommended to engage in physical activity at a medium to severe intensity for 150 minutes per week. Several studies point to the fact that in countries where people earn more, they are less active than in lower earning countries, for example, only 15% of Canadians and 10% of Americans follow the recommended amount of physical activity [16].

Methods

Our research group consisted of adolescents - girls of the 3rd and 4th years of secondary vocational schools, conservatories, and grammar schools in selected cities in the Slovak Republic (SVK) and the Czech Republic (CZE). Their total number was 1515. The individual numbers of pupils from the aspect of the type of school attended are given in Table 1.

Considering the aim of the work, after the second question in our survey, we analysed only the results of those adolescents who own a smartphone (n = 1472). Their basic characteristics are listed in Table 2.

The main method of our work was a survey in printed form consisting of 13 questions. The survey in printed form was distributed in Slovakia (Bratislava and Košice) in the months from December 2020 to August 2021. Due to the ongoing Covid-19 pandemic, the survey was conducted online in the Czech Republic (Prague and Brno) via google forms. Survey forms were processed and evaluated via the TAP3 program of the company Gamo Banská Bystrica. The response forms obtained via google forms were evaluated using Microsoft Excel. In our work we use the arithmetic mean, %. We analyse the results from the perspective of individual countries using the chi-square test (χ²), at the level of significance p <0.05 and p <0.01.
Table 1

Characteristics of the survey group of adolescent girls

<table>
<thead>
<tr>
<th>State</th>
<th>Type of school</th>
<th>Grammar schools</th>
<th>Conservatories</th>
<th>Secondary vocational schools</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Republic</td>
<td></td>
<td>87</td>
<td>63</td>
<td>534</td>
<td>684</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td></td>
<td>285</td>
<td></td>
<td>546</td>
<td>831</td>
</tr>
<tr>
<td>Summary</td>
<td></td>
<td>372</td>
<td>63</td>
<td>1080</td>
<td>1515</td>
</tr>
</tbody>
</table>

Table 2

Characteristics of the survey group of adolescent girls, who own a smartphone

<table>
<thead>
<tr>
<th>State</th>
<th>Type of school</th>
<th>Grammar schools</th>
<th>Conservatories</th>
<th>Secondary vocational schools</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Republic</td>
<td></td>
<td>85</td>
<td>63</td>
<td>525</td>
<td>673</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td></td>
<td>283</td>
<td></td>
<td>516</td>
<td>799</td>
</tr>
<tr>
<td>Summary</td>
<td></td>
<td>368</td>
<td>63</td>
<td>1041</td>
<td>1472</td>
</tr>
</tbody>
</table>

Results

The introductory question of our survey focused on the selection of girls who own or do not own a smartphone (Fig. 1). By evaluating it, we found out that more than 96% of the girls in both groups own a "smartphone", although we recorded a higher frequency of responses in the group of girls from the Czech Republic, where the response rate was up to 98.39%. Our findings subsequently point to the fact that in the Slovak Republic there is a higher % of girls who do not own a phone of any kind- 0.84% or own a classic hardware phone – 1.68%. Even the answer "I do not know" what type of phone the girls own was higher in the answers from girls from Slovakia. From the point of view of statistical evaluation, we recorded statistically significant differences in the responses from girls in Slovakia and the Czech Republic (p < 0.05; p = 0.0347).

Fig. 1. Type of phone owned by adolescents
Only girls who had smartphones filled out the following survey questions. We were interested in finding out how many hours each day they spent using their smartphones. We present the results in Figure 2, which shows that smartphones are used to a greater extent by girls from the Czech Republic. 49.33% of the girls in the Czech Republic use a smartphone every day for 1-3 hours in on the other hand girls from Slovakia only at the level of 44.81% and in the range of 3 to 5 hours a day, the differences in the answers from girls from the Czech Republic and Slovakia were less than 1% (on average at 27%). Significant differences in the answers from the girls in the groups we monitored were recorded in the answer "less than 1 hour a day", where the frequency of answers from girls from the Czech Republic was 5.79% and in the group of girls from Slovakia at 9.26%. From the results we can see that 16.34% of girls from the Czech Republic and 16.02% of girls from the Slovak Republic use a smartphone for more than 5 hours a day, which we evaluate as inadequately high time (Fig. 2). From the point of view of statistical evaluation, we did not record any significant differences at the level of p > 0.05 (p = 0.0696).

<table>
<thead>
<tr>
<th></th>
<th>Slovak Republic</th>
<th>Czech Republic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 3 hours a day</td>
<td>44.81%</td>
<td>49.33%</td>
</tr>
<tr>
<td>3 to 5 hours a day</td>
<td>27.78%</td>
<td>27.19%</td>
</tr>
<tr>
<td>I use it daily</td>
<td>1.34%</td>
<td>1.34%</td>
</tr>
<tr>
<td>Less than 1 hour a day</td>
<td>9.26%</td>
<td>5.76%</td>
</tr>
<tr>
<td>More than 5 hours a day</td>
<td>16.02%</td>
<td>16.34%</td>
</tr>
</tbody>
</table>

Fig. 2. Time spent on smartphone-related activities

Subsequently, we were interested in the girls opinion on how they evaluate their time spent with activities on a smartphone - whether they consider it appropriate, disproportionate to the present, and so on. (Fig. 3). We found that more than 55% of both groups monitored by us consider it appropriate at present, with a higher frequency of responses in the group of girls from the Czech Republic – 68.80% (Slovak girls 55.32%), 19.32% of Czech girls considered their time spent with activities on smartphone high, 4.31% for disproportionately high. From the point of view of girls in the Slovak Republic, 25.28% consider their time spent with activities on smartphone high, 3.00% disproportionately high, but up to 16.40% consider it low. This fact may be related to the previous answer, where 9.26% of Slovak girls said that they use a smartphone for less than 1 hour a day. Even in the evaluation of this question, we noticed significant differences in the answers of girls from the Czech Republic and the Slovak Republic at the level of significance p <0.01 (p = 5.772 E-09).

In figure 4 we present what activities with a smartphone do the girls of the Czech and Slovak Republics prefer in addition to calling and sending text messages. Figure 4 clearly shows that in both groups we monitored, activities on social networks, chatting and emailing have a dominant position as this possibility was indicated in their answer forms by up to 69.39% of girls from the Czech Republic and 60.83% from the Slovak Republic. The second most frequent activity in both monitored groups was taking photos, shooting videos, and listening to music with a response rate of 24.07% for girls in the Czech Republic and 31.66% for girls in the Slovak Republic. Less than 4% of girls from Czech Republic use the smartphone predominantly for playing games and monitoring physical and sports activities (Fig. 4). In evaluating this question, we have found statistically significant differences in the girls’ answers, chi statistically significant, p = 0.0034). Authors Lepp et al. [17] found in their research that there is a partially negative relationship between the use of applications on smartphones and the physical activity performed. At the same time, they state that in their free time, the use of a smartphone prevents them from performing the planned physical activity, e.g., so that high school students are more concerned with various websites, games, etc.
Fig. 3. Evaluation of time spent on smartphone-related activities

Fig. 4. Preferred activities performed on the smartphone
Through our research, we also wanted to find out to what extent the girls of our monitored groups use a smartphone in the implementation of their physical activities (Fig. 5). Our results show that 22.90% of girls in the Slovak Republic and only 18.13% of girls from the Czech Republic regularly use a smartphone, while up to 48.89% of girls in the Czech Republic and 39.92% of girls in the Slovak Republic use it irregularly. At the same time, the figure shows that almost 1/3 of the girls from both groups we monitored does not use smartphone in its physical and sports activities, and on average 5% of girls stated that they did not carry out physical-sports activities. The difference in the responses of girls from the Czech Republic and the Slovak Republic was statistically significant at the level of p <0.01 (p = 0.0011). Study by Smith et al. [18] recorded a significant increase in the use of smartphones to monitor physical activity, which also had a positive effect on improving fitness in connection with the use of applications. Garde et al. [19] report an increase in physical activity within the observed group of adolescents, when using smartphone applications. In contrast, the study by Nollen et al. [20] and Direito et al. [10] did not record significant changes in physical activity, which should be related to the use of applications on smartphones. According to the research of Schoeppe et al. [21] compared to adults, children and adolescents do not use smartphones as a tool to improve their physical activity. Research by Gowin et al. [22] and Middelweerd et al. [23] show that some students perceive the monitoring of their physical activity through applications negatively, mainly due to the feeling of shame, but some people like applications and are happy to compete with classmates.

When using a smartphone, the girls from both groups (Fig. 6) usually monitor the number of steps or the distance travelled/ran. The frequency of responses with this option was higher than 67% with a slightly higher frequency of responses in the group of girls from the Czech Republic (69.09%). When evaluating this question, we also found that up to 7.51% of Slovak girls monitor their pulse rate most via a smartphone, while the frequency of Czech girls’ responses in this question was only 3.86%. Other activity - for example, the number of strokes in badminton, tennis, etc. monitors less than 5% of the girls in both our researched groups. More than 20% of girls chose the alternative as “none of the options”. Even in the evaluation of this question, we recorded statistically significant differences in the answers of girls from the Czech and Slovak Republics at the level of p <0.05 (p = 0.025). Authors Glynn et al. [4] in their study monitored the effectiveness of applications offered by smartphones to increase physical activity on a sample of people over 16 years of age for 8 weeks. The main goal of this study was the change in physical activity measured by the number of steps. They found that using the smartphone application helps to increase physical activity by more than 1000 steps per day, compared to the number of steps in the control group, which has a positive effect on health and reduce the risk of cardiovascular disease and diabetes.

Our next question was focused on finding what kind of applications the girls use to monitor their physical and sports activities. By evaluating it, we found that girls from both countries only slightly prefer the applications installed by the phone manufacturer (Fig. 7), that was indicated in their answer forms 28.68% of girls from the Czech Republic and 32.92% of girls from the Slovak Republic. Applications downloaded by themselves prefer almost the same % of girls from the Czech Republic and Slovakia, respectively, and we recorded similar values even with the possibility of a combination of own and pre-installed applications by the manufacturer. The answers from the aspect of percentage evaluation are relatively balanced, which is also reflected in the statistical evaluation, where we did not notice statistically significant differences in the answers from the Czech Republic and the Slovak Republic. From foreign research by Gowin et al. [22] and Middelweerd et al. [23] it is clear that students prefer simple applications that they can download to their mobile phones for free and can adapt to their own needs. Research also show that students are afraid to share their achieved physical activities goals amongst their peers.

In our last question in our questionnaire, we focused on finding out what interest the girls would have in trying new physical activities in their physical education classes (fig. 8). We recorded more positive answers in the group of girls from the Slovak Republic, where the answers “yes” and “definitely yes” was marked by a total of 49.44% of girls and from the point of view of girls in the Czech Republic it was a total value of 36.7%. As many as 36.26% of girls from the Czech Republic and 26.91% of girls from the Slovak Republic could not express themselves unequivocally on this issue. Figure 8 then shows the fact that the negative answers “no” and “definitely not” in both groups monitored by us did not exceed 30%, while the answer “definitely not” showed a higher frequency of answers in girls from Slovakia. From the point of view of statistical evaluation, when evaluating the answers of girls from the Czech and Slovak Republics, we found significant differences at the level of significance p <0.01 (p = 2.767 E-06). Authors argue that improving health is driven by behavioural change and not by technological and scientific innovation [24]. In contrast, a recent study by Glynn et al. [4] points to the importance and use of new technologies and adds that new technologies (mobile phones, smartphones) can have a major impact on changes in behavioural activity.
### Fig. 5. Use of smartphones for physical activities

<table>
<thead>
<tr>
<th></th>
<th>Slovak Republic</th>
<th>Czech Republic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, irregularly</td>
<td>39.92%</td>
<td>48.89%</td>
</tr>
<tr>
<td>Yes, regularly</td>
<td>22.90%</td>
<td>18.13%</td>
</tr>
<tr>
<td>No, I don’t use smartphone in connection with physical activities</td>
<td>30.41%</td>
<td>28.97%</td>
</tr>
<tr>
<td>I don’t engage in any physical activities</td>
<td>6.76%</td>
<td>4.01%</td>
</tr>
</tbody>
</table>

### Fig. 6. The most frequent activity monitored via a smartphone

<table>
<thead>
<tr>
<th></th>
<th>Slovak Republic</th>
<th>Czech Republic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other activity - for example, the number of strokes in badminton, tennis etc.</td>
<td>3.63%</td>
<td>4.16%</td>
</tr>
<tr>
<td>Number of steps or the distance travelled/ran</td>
<td>20.90%</td>
<td>67.96%</td>
</tr>
<tr>
<td>Pulse rate</td>
<td>7.51%</td>
<td>22.88%</td>
</tr>
<tr>
<td>None of the options</td>
<td>22.88%</td>
<td>4.16%</td>
</tr>
</tbody>
</table>
### Fig. 7. Preferred type of applications used for monitoring physical activity

<table>
<thead>
<tr>
<th></th>
<th>Czech Republic</th>
<th>Slovak Republic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both of the option above</td>
<td>24.67%</td>
<td>22.40%</td>
</tr>
<tr>
<td>Manufacturer preinstalled applications</td>
<td>28.68%</td>
<td>32.92%</td>
</tr>
<tr>
<td>I prefer applications I download myself</td>
<td>28.38%</td>
<td>26.78%</td>
</tr>
<tr>
<td>None of the options</td>
<td>18.28%</td>
<td>17.90%</td>
</tr>
</tbody>
</table>

### Fig. 8. Respondents' interest in trying physical activities with a smartphone in physical and sports education classes

<table>
<thead>
<tr>
<th></th>
<th>Czech Republic</th>
<th>Slovak Republic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>21.10%</td>
<td>29.54%</td>
</tr>
<tr>
<td>I don't know</td>
<td>36.26%</td>
<td>26.91%</td>
</tr>
<tr>
<td>No</td>
<td>18.87%</td>
<td>13.77%</td>
</tr>
<tr>
<td>Definitely yes</td>
<td>15.60%</td>
<td>19.90%</td>
</tr>
<tr>
<td>Definitely not</td>
<td>8.17%</td>
<td>9.89%</td>
</tr>
</tbody>
</table>
Discussion

Presented study aimed to investigate levels of physical activity of female students from Slovakia and the Czech Republic. Physical activity levels are experiencing a downward trend, which has been supported by multiple research [24, 25]. At the time of collecting the answers from our participants, there was an ongoing pandemic of Covid-19, which has affected lives of every member of society. Numerous researches suggested that increased PA might help Covid-19 patients with their respiratory symptoms [26, 27]. According to a comprehensive evaluation of 23 research, PA improves COVID-19 patients' physical and psychological results [28].

Two thirds of time spent by our participants using smartphones was for interaction with peers on social media. Dixon [29] reports increased amount of time spent on social media, for instance, in 2012 people aged 16-64 spent 90 minutes daily on social media, in 2023 this time raised to staggering 151 minutes of social media activity daily. Even while the negative impacts of screen time on sleep have been documented in the past, smartphones are portable, hand-held devices with a far higher likelihood of interfering with sleep patterns. Previous research has repeatedly shown a relationship between problematic smartphone usage and poor sleep, as well as between smartphone misuse and daytime fatigue, greater sleep latency, and shorter sleep length. In example, it has been demonstrated that using a smartphone right before bedtime delays the circadian rhythm and is linked to total sleep time, with longer usage being linked to worse sleep.

The number of steps taken in a day, or a distance ran has been the most frequent activity monitored by our participants. Findings by Mañas et al. [30] and Paluch et al. [31] showed that more steps taken per day is substantially related with a lower risk of death from all causes.

Answers to a question about application preferred to monitor physical activities by our participants were relatively equal. Most of the apps preinstalled by phone manufacturer are to monitor number of steps taken, walking + running distance, flights climbed, pulse rate on amount of burnt calories. All these apps can work without any consumer interference therefore, the user doesn’t have to do anything, and the apps are running on the background while using GPS.

Conclusion

Based on our results, we can state that out of the total number (n = 1515) of adolescents addressed, 43 of them do not own a smartphone. In terms of how much time they spend on smartphone-related activities, we have found that most adolescents spend 1 to 3 hours a day, or even 3 to 5 hours a day on their smartphone. As many as 62.06% of adolescents consider the time spent on smartphone related activities to be appropriate to present. 22.29% of adolescents are aware that the reported number of hours spent on a smartphone is high. They mostly use social sites, chat, or email on their smartphones, as well as taking photos, shooting videos and listening to music. Only 2.7% of adolescent women use their smartphone to monitor physical / sport activity. The most common activity they monitor with their smartphone is the number of steps or travelled distance. Out of the applications that adolescents use, they prefer those that are preinstalled by the smartphone manufacturer. When asked if they would be interested in trying applications related to physical activities in their physical education classes, they couldn’t answer whether they’d be interested or not. Among adolescents from the Czech and Slovak Republic, we recorded statistically significant differences at the level of significance p <0.01 in the questions concerning the time spent on activities with a smartphone, the most frequently monitored activity using a smartphone and the interest in trying physical activities with a smartphone during physical education classes. We recorded a statistically significant difference on the level of significance p < 0.01 between adolescents from the Czech and Slovak Republic when evaluating the time spent with smartphone-related activities.

In recent years, there has been a significant increase in applications that are complementary to other applications such as eHealth. In addition to social networks, there are number of applications that can be helpful in performing physical activity. Some applications run on a group system, meaning that an individual can join a group in one of the available applications and people can motivate each other to perform better.

In similar surveys, there is still little evidence of how smartphones can affect physical activity. For this reason, it is important to carry out more such surveys in order to make the relationship between smartphone use and the level of physical activity clearer. We recommend that smartphones and the applications they offer be used more in physical education classes, which can help increase adolescents’ physical activity outside the teaching process.

Conflict of interest

The authors declare that there is no conflict of interest.
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