



Interdisciplinary Research Team
on Internet and Society

Czech Adolescents and mHealth Applications

Authors:

Bc. Adela Lokajova

Prof. PhDr. David Smahel, Ph.D.

Reference:

Lokajova, A., & Smahel, D. (2022). *Czech Adolescents and mHealth Applications*. [Research Report]. Masaryk University.

KEY FINDINGS

- Over half of adolescents aged 11-16 use some health-oriented application (58%). Between the ages of 13 and 16, about two-thirds of adolescents use such an application. Girls use the app a little more often than boys.
- Adolescents most often use step counting applications (25% of boys and 32% of girls daily); the least frequently they monitor their weight and calories burned.
- Adolescents use applications most often to monitor activities (25% of boys and 30% of girls); girls use them just as often as a source of instructions. On the other hand, boys use applications to compete slightly more often than girls.

INTRODUCTION

The lack of physical activity in children and adolescents is a global problem. The World Health Organization recommends that children and adolescents perform moderate to heavy exercise at least an hour a day, on average (WHO, 2020). According to this recommendation, only 22% of Czech adolescents were sufficiently active in the period before the Covid-19 pandemic (WHO, 2021). However, this does not mean that Czech adolescents are explicitly inactive; the WHO recommendation is relatively strict. Half of the boys and 40% of the girls exercise enough at least five times a week, two-thirds of the adolescents also play sports in organized clubs and organizations (HBSC Czech Republic, 2022). However, activities that motivate adolescents to move, such as sports clubs or physical education classes, were severely limited during the pandemic. Therefore, it is useful to focus on other factors that may support adolescent physical activity. One of them can be modern technologies, a natural tool for adolescents. This research report aims to map how often and in which ways Czech adolescents use technologies to support their health.

The most widespread technologies of this type are the so-called mHealth applications, which can be installed on smartphones or smartwatches. These applications generally focus on maintaining a healthy lifestyle, both in prevention (e.g., monitoring steps or physical activity) and intervention (e.g., applications aimed at patients with a specific diagnosis). They monitor the user's sports performance (e.g., the application Strava) or weight. They also monitor heart rate, sleep, quality sleep, the regularity of physical activities, and the fulfillment of set goals. These values can be entered

manually or measured directly using GPS or a smartwatch. The smartwatch is typically linked to a mobile phone application. mHealth applications can also serve as a source for instructions (e.g., video tutorials with specific exercises), reminders to the user of their goals, and provide positive or negative feedback in terms of their fulfillment. Moreover, they can make recommendations about exercise or calorie intake, or provide comparisons with peers (Smahel et al., 2018).

The effect of mHealth applications on users' physical condition is evident from many studies. In particular, studies show that mHealth app use is associated with increased physical activity (Lee et al., 2019), which has a secondary impact on factors, such as weight and health. Their potential lies mainly in maintaining the habits of people who have already started a physical activity, rather than in the ability of applications to initiate this change (Ng et al., 2020). In other words, mHealth apps can serve as an excellent tool, but they are seldom the primary motors of change. However, it is the long-term routine that is crucial for physical activities and, at the same time, difficult to follow (Shin et al., 2019).

In the case of adolescents, mHealth applications can have great potential for several reasons. Giovanelli and colleagues (2020) point out that such applications can build on adolescents' interest in modern technology and their need to compare and share with peers. At the same time, adolescents can accept application-mediated recommendations and guidelines more easily than direct advice from adults (Giovanelli et al., 2020). In this report, we explore the use of mHealth applications by Czech adolescents aged 11-16. We asked whether and how often they use the applications, for what purpose, and what specific features they use in these apps.

METHOD

This report is based on data obtained within the FUTURE project (see <https://irtis.muni.cz/research/projects/future>).¹ The data were collected in June 2021 in Czech households with an online questionnaire that was filled out by adolescents and their parents or legal guardians. The survey was carried out by the media research agency STEM / MARK, who recruited participants from their research panel. A total of 2,484 adolescents, aged 11-16, participated in the study. A quota sampling of respondents was chosen for data collection. Quotas were set for parents' education, municipality size, and region (NUTS 3). Gender and individual age categories are evenly represented in the sample.

We asked respondents the following question: *Do you use applications that are used to monitor health and exercise (i.e., counting steps, tracking calories, weight, sports activities, eating/drinking, stress, or sleep)?* We also asked those who answered in the affirmative **how often and for what purpose** they use the apps (i.e., *Such applications can be used to monitor or record data in various areas of health. How often have you used them in the last six months in the following areas?*) and **what features** they use (i.e., *How often have you used the following functions in these applications in the last six months?*).

We adapted the classification of areas and functions from Smahel et al. (2017). We monitored the use of the applications in the following areas: calorie intake or expenditure, step count, weight monitoring, sport, and health status (e.g., heart rate or sleep quality). Features include activity guides (such as videos with specific exercises), supporting and competing with others (such as sharing and comparing results or communicating through the app), feedback, goal planning, goal setting, and activity monitoring (or tracking).

¹ This report was funded by the Czech Science Foundation as part of the project no. GX19-27828X.

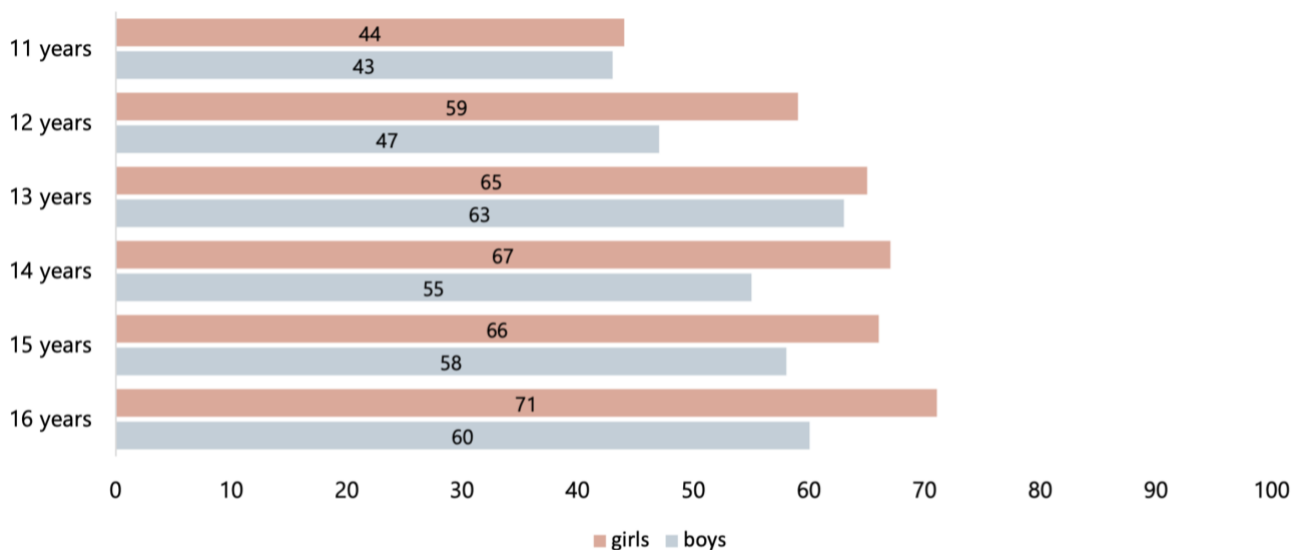
Our respondents indicated how often they used each of their applications or their features on a six-point scale: (1) never, (2) a few times at most, (3) several times a month, (4) several times a week, (5) every day, and (6) several times a day. For this report, we merged the categories "never" and "a few times at most" (both meaning that the respondent is not an active user of the application or function), and we merged the answers "every day" and "several times a day" (both meaning the respondent is an active user).

RESULTS

The data show that more than half of our respondents (58%) use one or more mHealth applications at least occasionally. These applications are used by 62% of girls and 55% of boys.

Graph 1 shows their use across age categories for both girls and boys. In the category of 11-year-olds, less than half of the respondents use one or more applications. The use of applications is increasing in 12-year-olds, especially in girls. From the age of 13, about two-thirds of adolescents use mHealth apps. The number of users within the age categories fluctuates slightly for both genders, but, overall, it shows an increasing trend. In all age categories, girls are more frequent users of mHealth apps than boys; the difference in 11- and 13-year-olds is marginal (1-2%) and in other age groups it is 8-12% in favor of girls.

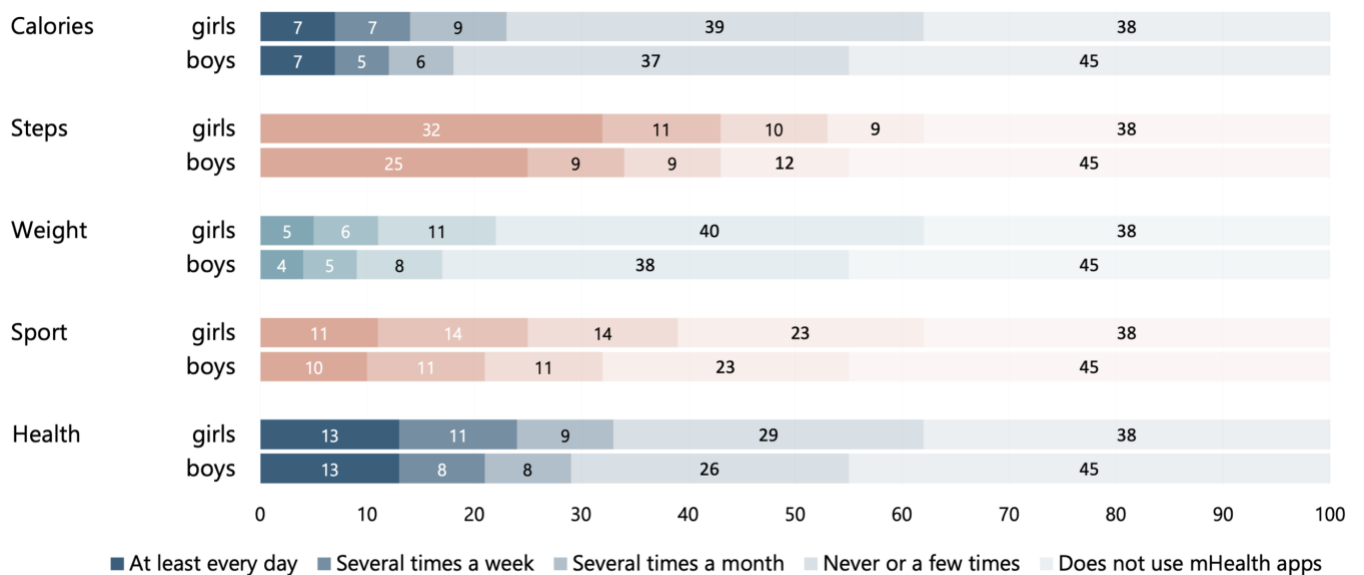
Graph 1: Percentage of girls and boys of a given age who use an app to monitor health or physical activity



Graph 2 shows that adolescents’ favorite area of usage is **step counting**; almost half of them have use such an application. A total of 32% girls and 25% boys used one every day, while only 10% of the respondents used an mHealth application and did not measure the number of steps. About a third of the adolescents monitored their **sports activities** (39% girls, 32% boys) or their **health** (33% girls, 29% boys). On the other hand, monitoring **calories** (23% girls, 18% boys) and **weight** (22% girls, 17%

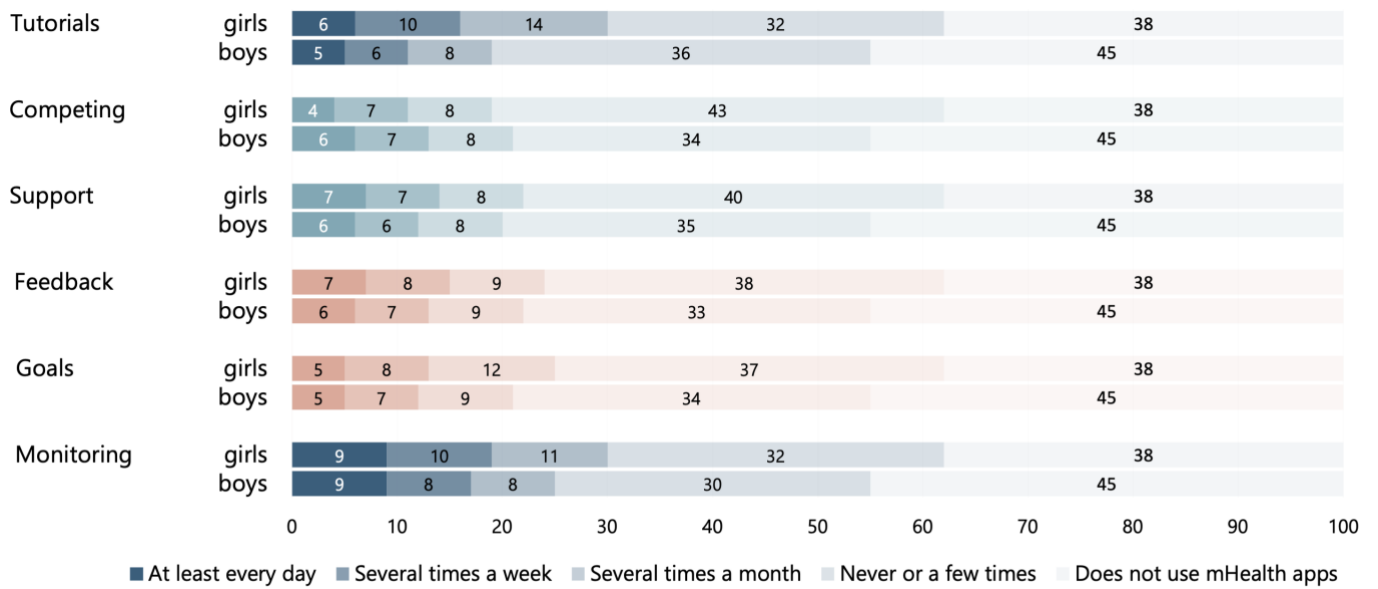
boys) is the least popular. Boys and girls use the application for similar purposes. Girls, however, generally use apps in all of these areas a little more often than boys.

Graph 2: Frequency of use of mHealth apps according to their purpose/areas (%)



Graph 3 shows how often adolescents use the different features of mHealth applications. The most common function is **monitoring or tracking** (e.g., performance or health status), which is used by 30% of girls and 25% of boys. Girls similarly often use activity **guides and tutorials** (30% girls and 19% boys). There are no significant differences in other functions; 25% girls and 21% boys use the application to **plan goals**; 24% girls and 22% boys use **feedback**; 22% girls and 20% boys **support** each other; and 19% girls and 21% boys **compete**. Similar to the previous chart, it is evident that a higher percentage of girls than boys use applications and their functions; otherwise, the use of individual functions does not differ significantly between the genders. The goals and tutorials present an exception, as they are one of the most common functions for girls and, at the same time, the least common for boys. On the contrary, boys use the competition element more often, but the difference is slight (13% boys versus 11% girls, either daily or several times a week).

Graph 3: Frequency of use of individual features within mHealth apps



CONCLUSION

The aim of this report was to show how popular mHealth applications are among adolescents and for what they are most often used. The results show that these applications are widespread among adolescents, and the frequency of their use increases with age. Among 13-year-olds and older, approximately two-thirds of the respondents use an application. They are most likely to use an mHealth app to measure steps and sports activities. In the context of research studies, this is a positive finding. The monitoring of physical activity can lead to the effective development of physical condition. Physical activity is also relatively easy to control compared to, for example, weight or heart rate — and the use of mHealth applications can help through reminders, habit building, and goal-setting (Shin et al., 2019). The most common feature adolescents use in the apps is monitoring or tracking. This corresponds to the areas of use, such as the measurement of physical activity (i.e., sports applications) or step count, which build on monitoring. Interestingly, girls use the apps for tutorials (e.g., for exercise), while that is the least used function for boys. This may be due to the type of activities preferred by the genders: while boys tend to engage in team sports, girls seek more individual activities, such as exercise (HBSC Czech Republic, 2022).

Still, the presented results must be interpreted with caution. In this report, we do not primarily address how mHealth applications affect adolescents, whether this effect is predominantly positive or negative in some cases. We know from previous research that mHealth applications can be used positively, but they can also have adverse effects on health, such as eating disorders (Smahel et al., 2018).

Furthermore, the data may be slightly skewed for some of the functions. It is possible that some respondents did not understand the wording and did not associate it with the function they actually use. For example, given how many respondents said they were monitoring their actions or sports activities, the “monitoring” function could be expected to be used more often than the data suggest.

This short report showed that most Czech teenagers use mHealth apps, with girls being slightly more frequent users. We intend to show the impact of using mHealth applications on the well-being of adolescents in subsequent studies.

REFERENCES

- HBSC Czech Republic (2022). *Děti se hýbou a sportují. Ale nestačí to. Zdravá generace?!*
<https://zdravagenerace.cz/reporty/pohyb/>
- Giovanelli, A., Ozer, E. M., & Dahl, R. E. (2020). Leveraging technology to improve health in adolescence: A developmental science perspective. *Journal of Adolescent Health, 67*(2, Suppl), S7–S13. <https://doi-org.ezproxy.muni.cz/10.1016/j.jadohealth.2020.02.020>
- Lee, A. M., Chavez, S., Bian, J., Thompson, L. A., Gurka, M. J., Williamson, V. G., & Modave, F. (2019). Efficacy and Effectiveness of Mobile Health Technologies for Facilitating Physical Activity in Adolescents: Scoping Review. *JMIR MHealth and UHealth, 7*(2), e11847. <https://doi-org.ezproxy.muni.cz/10.2196/11847>
- Ng, K., Kokko, S., Tammelin, T., Kallio, J., Belton, S., O'Brien, W., Murphy, M., Powell, C., & Woods, C. (2020). Clusters of Adolescent Physical Activity Tracker Patterns and Their Associations With Physical Activity Behaviors in Finland and Ireland: Cross-Sectional Study. *Journal of medical Internet research, 22*(9), e18509. <https://doi.org/10.2196/18509>
- Shin, Y., Kim, S. K., & Lee, M. (2019). Mobile phone interventions to improve adolescents' physical health: A systematic review and meta-analysis. *Public Health Nursing*.doi:10.1111/phn.12655
- Smahel, D., Elavsky, S., Machackova, H. (2017). Functions of mHealth applications: A user's perspective. *Health Informatics Journal*. Advanced online publication. <https://doi.org/10.1177/1460458217740725>.
- Smahel, D., Machackova, H., Smahelova, M., Cevelicsek, M., Almenara, C. A., & Holubčíková, J. (2018). *Digital technology, eating behaviors, and eating disorders*. Cham, Switzerland: Springer. <https://doi.org/10.1007/978-3-319-93221-7>
- WHO. (2020, November 26). *Physical Activity. How much physical activity is recommended?* Retrieved from <https://www.who.int/news-room/fact-sheets/detail/physical-activity>
- WHO. (2021). *2021 Physical Activity Factsheets for the European Region*. Copenhagen: WHO Regional Office for Europe.

M U N I

**Interdisciplinary Research Team
on Internet and Society**

Contact

Prof. PhDr. David Šmahel, Ph.D.
Institut výzkumu dětí, mládeže a rodiny
Faculty of Social Studies
Masaryk University, Brno
E-mail: smahel@fss.muni.cz

Interdisciplinary Research Team on the Internet

<http://www.irtis.muni.cz>