

**ORIGINAL STUDIES**  
**ARTICOLE ORIGINALE**

**The use of internet and its relationship with the involvement in physical activity among Romanian school children from urban and rural areas**

**Utilizarea internetului și relația sa cu implicarea în activități fizice în rândul elevilor români din mediul urban și rural**

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**Abstract**

*Background.* Adolescents use internet to get confidential and convenient access to an unprecedented level of information regarding a diverse range of subjects, to play games, to perform homework, to send messages and to network with other peers.

*Aims.* This article seeks to explore internet use related behaviours among Romanian adolescents, giving special attention to the possible differences between urban and rural areas. Moreover, the relationship between the time dedicated to internet use daily and the time dedicated to physical activity among adolescents will also be investigated.

*Methods.* A cross-sectional study was conducted in May 2014 in two schools in Cluj-Napoca and one school in Cuzdrioara among 187 adolescents aged 11-15. Information was collected by means of anonymous questionnaires.

*Results.* A percentage of 92% of subjects declared that they used internet for several purposes (information searching, email, social media, playing games). It was observed that statistically significantly more adolescents from rural areas declared that they did not use internet compared to adolescents from urban areas (15.9% vs 4%). Around half of the subjects used internet less than 1 hour/day and around one quarter declared the use of internet between 1-2 hours per day. More than 80% of the subjects had used internet in the last month for getting information for a school activity or homework, half were interested in searching information about socio-cultural events, while one third were interested in information regarding a healthy lifestyle (nutrition, physical activity, body weight, smoking prevention). Only one quarter of the participants followed the recommendations of performing at least one hour of moderate to intense physical activity daily. The results of the bivariate correlation show that there was no statistical association between the time spent using internet/day and the time spent for physical activity daily.

*Conclusions.* School instruction and health promotion programmes in Romania might take advantage of the spread of internet for developing sustainable, attractive and effective educational activities for adolescents.

**Keywords:** internet use, physical activity, Romanian adolescents.

**Rezumat**

*Premize.* Adolescenții utilizează internetul pentru a avea acces în mod rapid și confidențial la un nivel fără precedent de informații din diferite domenii, pentru a juca jocuri, pentru a-și face temele, pentru a comunica cu alte persoane.

*Obiective.* Acest articol încercă să exploreze comportamentele adolescenților din România cu privire la utilizarea internetului, acordând atenție diferențelor care ar putea să existe între mediul urban și rural. De asemenea, investighează relația dintre timpul dedicat activităților pe internet și timpul dedicat activităților fizice.

*Metode.* S-a realizat un studiu transversal în mai 2014 în 2 școli din Cluj-Napoca și o școală din Cuzdrioara, în rândul a 187 de elevi, cu vârsta cuprinsă între 11-15 ani. Datele au fost colectate prin intermediul unor chestionare anonime.

*Rezultate.* Un procent de 92% dintre subiecți utilizează internetul cu diferite scopuri (căutare de informații, e-mail, rețele de socializare, jocuri), observându-se că în mod semnificativ statistic mai mulți elevi din mediul rural declară că nu folosesc internetul în comparație cu cei din mediul urban (15.9% vs 4%). Aproximativ jumătate dintre adolescenți folosesc internetul mai puțin de o oră pe zi și aproximativ un sfert au declarat folosirea internetului 1-2 ore pe zi. Mai mult de 80% dintre subiecți au folosit internetul în ultima lună pentru a obține informații pentru activitățile școlare sau temele pentru acasă, jumătate au fost interesați să caute informații privind diferite evenimente socio-culturale, în timp ce o treime au fost interesați de informații

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privind un stil de viață sănătos (nutriție, activitate fizică, managementul greutății corporale, prevenirea fumatului). Doar un sfert dintre participanți respectă recomandările de a realiza zilnic cel puțin o oră de activități fizice intense sau moderate. Rezultatele analizei de corelație bivariată arată faptul nu au fost asociații semnificative statistic între timpul petrecut pe internet și timpul dedicat activităților fizice.

*Concluzii.* Programele de instruire școlară și de promovare a sănătății din România ar putea beneficia de răspândirea utilizării internetului pentru a realiza activități educaționale sustenabile, atractive și eficiente pentru adolescenți.

**Cuvinte cheie:** utilizarea internetului, activitate fizică, adolescenți români.

## Introduction

Adolescents use internet to get confidential and convenient access to an unprecedented level of information about a diverse range of subjects, to play games, to perform homework, to send messages and to network with other peers (Graya et al., 2005; Tahiroglu et al., 2008). The use of internet on computers, tablets, mobile phones is increasing very much in several countries of Europe; this approach is very popular especially among young groups (\*\*\*, 2014).

The use of internet has several advantages related to healthy lifestyle promotion, such as providing specific content related to healthy nutrition and physical activity, offering interactive possibilities for information and education, rapid feedback and even personalised counselling by use of computer tailored educational programs, facilitation of recruitment and follow-up of participants in several educational programs, providing supportive social influences for the adoption of healthy lifestyle behaviours, high potential of reaching large groups of people who have internet access (Chou et al., 2013; Li et al., 2013; Lotrean et al., 2009; Lotrean et al., 2015; Lustria et al., 2013).

Nevertheless, several potential threats are also present, such as the quality of information which might be accessed, exposure to advertisement for alcohol and tobacco products, exposure to online violent behaviour and pornography, risk of exposure to cyberbullying (Tahiroglu et al., 2008; Dowel et al., 2009). Moreover, there are concerns that internet abuse might lead to addictive behaviour and can also have detrimental effects on the involvement in physical activity and well-being of adolescents (Li et al., 2013; Brindova et al., 2015).

The World Health Organization emphasises the importance of performing at least 60 minutes of moderate to vigorous physical activity by adolescents daily, because of its positive physical and psychological effects (Currie et al., 2012). Despite this, studies from different countries underline that many adolescents do not follow this recommendation, using means of transport and organizing their free time in a sedentary manner (Currie et al., 2012; Li et al., 2013; Lotrean et al., 2008). Several studies show that excessive TV watching as well as screen based activities (working on computers or playing on computers) decrease the involvement of adolescents in physical activity and interfere with sleep duration (\*\*\*, 2001; Brindova et al., 2015). Recently, different studies have assessed the effects of new information and communication technologies (internet, social media, use of mobile applications, mobile phone texting) on physical activity, but the results are mixed. Some studies show that they decrease the number of hours of physical activity, while others did not find this

or even presented results which showed that the use of these technologies increased the involvement in physical activity (Spengler et al., 2015; Takács, 2013; Lepp et al., 2013; Zhang et al., 2015).

## Hypothesis

This article seeks to explore internet use related behaviours among Romanian adolescents, giving special attention to the possible differences between urban and rural areas. Moreover, the relationship between the time dedicated to internet use daily and the time dedicated to physical activity among adolescents will also be investigated.

## Material and methods

Research protocol

### a) *Period and place of the research*

A cross-sectional study was conducted in May 2014 in two schools in Cluj-Napoca and one school in Cuzdriroara - a rural area of Cluj county. Ethical approval for the study was obtained from the directorate of each school; in Romania, school principals are entitled to decide whether or not their students may participate in health related surveys and educational programs.

### b) *Subjects and groups*

The study involved school children from the fifth to eighth grade aged 11-15 years. In each school, one class per grade level was randomly selected and all pupils who were present in the selected classes on the day of the survey were included in the study.

### c) *Tests applied*

The study used an anonymous questionnaire, which was filled in by the adolescents. The questionnaire was based on literature data (Lotrean et al., 2010; Lotrean et al., 2014; Bauman et al., 2009) and included 100 items related to demographics, as well as a wide range of health related behaviours: alimentary habits, involvement in physical activity, weight management, smoking and alcohol use, internet use related behaviour (name of the questionnaire: Assessment of the lifestyle of school children, author: Lotrean LM).

All study subjects were asked to fill in an anonymous questionnaire, which took approximately 50 minutes. All participants read an introductory letter, which assured them that the study procedures were designed to protect student anonymity and allow for voluntary participation.

The questionnaire was administered and collected in the classroom by members of the research team. Teachers were present in the classroom during data collection, but they stood in front of the class and did not take part in the collection of questionnaires. No refusals were recorded; non-response was exclusively due to absence during the

day of assessment.

The information included in this study focused on the use of internet and involvement in physical activity. The use of internet was assessed by asking the adolescents how many days they used it during one week, how many hours a day they used it, if they had an email address and social media account, as well as if they had used internet in the last month for searching information for school, about different socio-cultural events or a healthy lifestyle (nutrition, physical activity, weight management, smoking prevention).

The study also assessed the involvement of adolescents in intense physical activity (number of days/week, number of minutes/day), as well as in moderate physical activity (number of days/week, number of minutes/day) and walking (number of days/week, number of minutes/day).

*d) Statistical processing*

The prevalence of the investigated behaviour was assessed and chi<sup>2</sup> tests were used in order to assess the differences between participants from urban and rural areas with respect to several items.

The daily time spent on internet was calculated by multiplying the number of days/week dedicated to this activity by the number of hours/day, divided by 7.

The time spent for physical activity was the sum of time allocated to intensive and moderate physical activity (including walking) declared by students; the time dedicated to physical activity of each level of intensity was calculated by multiplying the number of days per week spent for physical activity of that level of intensity by the number of minutes per day, divided by 7.

Bivariate correlation was used in order to estimate the association of the daily time spent on internet with the time dedicated to physical activity per day.

Data analysis was performed with the SPSS-20.0 statistics program. Significant results were reported at p < 0.05.

**Results**

The study sample included 187 adolescents - 124 from Cluj-Napoca (48.4% boys and 51.6% girls) and 63 from Cuzdrioara (60.3% girls and 39.7% boys).

Table I shows that almost all of the subjects declared that they used internet for several purposes (information searching, email, social media, playing games). It was observed that statistically significantly more adolescents from the rural area declared that they did not use internet compared to adolescents from the urban area (15.9% vs 4%). Around half of the study sample used internet less than 1 hour/day and around one quarter declared the use of internet between 1-2 hours per day, the last situation being more frequent among adolescents from the urban area; one out of five adolescents used internet more than two hours per day. Moreover, 87% of the adolescents had an email address, with adolescents from the urban area declaring this more frequently than those from the rural area, while 83% of the subjects had a social media account, with no differences between urban-rural areas.

With respect to the interest of adolescents in searching information on the internet, the study showed that more than 80% had used internet in the last month for getting

information for a school activity or homework, half were interested in searching information about socio-cultural events, while one third were interested in information regarding a healthy lifestyle (nutrition, physical activity, body weight, smoking prevention). Adolescents from the urban area were more interested in getting information about socio-cultural events than those from the rural area.

On the other hand, only one quarter of the participants followed the recommendation to perform at least one hour of moderate to intense physical activity daily, without urban-rural differences being observed. Moreover, around half of the students from the urban area and 61% of those from the rural area performed less than half an hour of physical activity daily.

**Table I**  
Internet use and involvement in physical activity

| Items  | Subjects       |               |                |
|--|----------------|---------------|----------------|
|  | Urban<br>N=124 | Rural<br>N=63 | Total<br>N=187 |
|  | %              | %             | %              |
| <b>Internet use</b>  |                |               |                |
| Never  | 4*             | 15.9          | 8              |
| Less than 1 hour/day   | 44.3           | 44.4          | 44.3           |
| 1-1.9 hours/day  | 32.3*          | 15.9          | 26.7           |
| 2-3 hours/day  | 7.3            | 14.3          | 9.6            |
| More than 3 hours/day  | 12.1           | 9.5           | 11.4           |
| <b>Searching internet for lifestyle related information in the last month</b>    |                |               |                |
|  | 35.8           | 31.7          | 34.2           |
| <b>Searching internet for school related information in the last month</b>       |                |               |                |
|  | 81.4           | 82.5          | 81.8           |
| <b>Searching for socio-cultural events related information in the last month</b> |                |               |                |
|  | 54.8*          | 39.7          | 49.7           |
| <b>Having an email account</b>   |                |               |                |
|  | 92.7*          | 76.2          | 87.1           |
| <b>Having a social media account</b>   |                |               |                |
|  | 83.8           | 82.5          | 83.4           |
| <b>Physical activity</b>   |                |               |                |
| Less than 30 minutes/day   | 50*            | 61.9          | 54             |
| 30-59 minutes/day  | 23.5           | 14.3          | 20.3           |
| 1-2 hours/day  | 21.7           | 15.9          | 19.8           |
| More than two hours/day  | 4.8            | 7.9           | 5.9            |

\* - statistically significant differences in the chi<sup>2</sup> test between subjects from urban and rural areas

The results of bivariate correlations show no statistical association between the time spent using internet/day and the time spent for physical activity daily.

**Discussion**

The use of different forms of information and communication technologies is a reality faced by youth all over the world (\*\*\*, 2014; Graya et al., 2005).

Our study reveals a high internet access and use among adolescents in Cluj-Napoca, a large Romanian city, as well as among those in Cuzdrioara - a rural area of Cluj county situated at 60 km from Cluj-Napoca. Several studies have shown that access to the internet in Romanian rural areas is far behind its use in urban areas (1). Our study also found significant differences with regard to internet access and use between adolescents from a big city and adolescents from a rural area, but, nevertheless, more than 80% of students from the rural area where the study was performed used internet for several purposes. Future studies should investigate the use of internet, as well as stimulating and

detering factors in several regions of Romania, both in large and small urban and rural areas.

More than 80% of the study subjects searched information on the internet for their school activity and homework, showing the potential of including internet based activities as instruments for stimulating active learning, problem-based teaching methods, group and individual projects, skills development, distance learning. Further investigation is needed in order to find opportunities and ways to increasingly incorporate this approach into the Romanian school system, based on feedback from teachers, pupils and parents.

Half of the adolescents relied on the internet for finding information about socio-cultural events, while one third of them declared having searched information related to lifestyle (nutrition, physical activity, weight management, smoking prevention) in the last month. This underlines the importance of incorporating the information and communication technologies into the development of health promotion programs. Studies from other countries show examples of several programs which used the internet and computer tailored programs for educating and motivating adolescents and young people to adopt a healthy nutrition, an active lifestyle and obesity prevention (Chou et al., 2013; Li et al., 2013; Lustria et al., 2013; Bennet & Glasgow, 2009; Kreps & Neuhauser, 2010; Kroeze et al., 2006). Future research should focus on the development, implementation and evaluation of health promotion programs for Romanian adolescents using innovative approaches, including the use of internet, to create communication networks and personalised educational programs which are attractive, sustainable and effective in motivating and supporting adolescents to adopt a healthy lifestyle.

On the other hand, the study shows that only one quarter of adolescents complied with the recommendation to perform at least one hour of moderate to intense physical activity. Other Romanian and European studies also underline the low involvement of adolescents in physical activity, which calls for long-term strategies to combat this public health problem (Lotrean et al., 2008; Currie et al., 2012). Our study data show that the time spent on internet did not influence the daily time dedicated to physical activity.

Actually, the time spent using internet every day was less than 2 hours for around 80% of the participants. The data of our study show that many adolescents had an email account and a social media account. The use of social media could pose several threats, which might be reduced by a good communication between parents and children with regard to what teens are doing with social media. On the other hand, there are also recent studies that have started to focus on the potential of social media to motivate, provide social support and guidance for stimulating involvement in physical activity, but the results are mixed, with some studies finding evidence for this, and others not (Lefebvre & Bornkessel, 2013; Laranjo et al., 2015; Korda et al., 2013; Maher et al., 2014).

The limitations of the study include its limited sample and cross-sectional design, as well as the fact that the study did not assess internet safety issues.

## Conclusions

1. Around 92% of adolescents used internet, for purposes such as searching information for school, about socio-cultural events, and lifestyle related information.
2. Only one quarter of the adolescents complied with the recommendation to perform at least one hour of moderate to intense physical activity daily.
3. The time spent on internet daily did not decrease the involvement in physical activity among our study sample.
4. School instruction and health promotion programmes in Romania might take advantage of the spread of internet in both urban and rural areas for developing sustainable, attractive and effective educational activities for adolescents.

## Conflicts of interests

The authors have no conflict of interest.

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