

The Impact of The Internet Use in Physical Activity, Exercise and Academic Performance of School Students Aged 14-16 Years Old

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Abstract- In most countries, the vast majority of young people use the internet several times a week. The increasing use and the importance of the internet among teens, has gradually lead those who deal with the health in professional level, to address the serious health effects possibly related to this activity. The aim of the study was to examine the relationship between the use of the internet and the relation with exercise, physical activity and academic performance. In was investigated, through questionnaires, the profile of adolescents who use the computer and the internet connection as well as their correlation with social demographic characteristics (gender, age), sports activities and school performance. The survey involved 171 students (79 boys and 92 girls) high school students aged 14-16 years. The selection of the sample students was randomly sampled among high school students. For data processing it was used the principal components of factor analysis and ANOVA analysis of variance. Regarding to gender results showed that there were no statistically significant differences between boys and girls on the frequency of the negative thoughts because of the internet connection absence. Regarding the age there were statistically significant differences with the frequency of the satisfaction feelings because of the online connection, ($F_{2,165} = 10,20, p = 0,00$), frequency of the negative thoughts because of the internet connection absence, ($F_{2,165} = 10,68, p = 0,00$), frequency of abnormal reactions because of the online connection, ($F_{2,165} = 27, 30, p = 0,00$), frequency of decreased performance in courses because of online connection and ($F_{2,168} = 18,79, p = 0,00$). Also, there were statistically significant differences between the students who exercised with the frequency of decreased performance in courses because of online connection ($F_{1,169} = 4,3, p = 0,40$), with those students who have practiced more have better performance at the grade in their lessons. In conclusion the use of the internet was found to have a direct positive relationship to health, such as the existence of abnormal reactions, as well as the existence of negative emotions and a direct negative relationship with school performance of teenagers' students.

Index Terms. Exercise, internet use, physical activity, school performance, student.

I. INTRODUCTION

Since the advent of the use of the Internet as a new technology in the 1990s, it has become a common mode of operation, particularly among young people and adolescents. Young people and teenagers have adopted the use of Internet and have incorporated many aspects of their daily life [1], [2]. In many countries, [2], [3], [4] the vast majority of young people use the Internet several times a week [5]. There are many studies for the role of Internet and information in health promotion [6], but it has not been sufficiently clarified the role that can be played by the Internet in the health sector.

Some studies indicate that appropriate action can have beneficial effects on health [7], [8]. However, it seems possible that the use of the Internet can aggravate the mental and physical condition of the participants in it.

The Internet is not a tool only that provides information. This can be seen more as a telecommunications tool, since it is possible to increase social interactions between people [9]. Moreover, it appears that the basic properties of the Internet, such as the possibility of someone being anonymous, the asynchronous communication, the liberation from the restrictions of time and space, facilitate the formation of close personal relationships [10]. Several studies suggest that the Internet can facilitate social support and solidarity among people [11], [12], [8]. Another study [13] concluded that there is a lack of convincing evidence on the effects of using the Internet for social support. The increasing use and importance of the Internet among teens, has gradually lead those who deal with the health in professional level, to address the serious health effects possibly related to this activity [14]. Recently, it has proven a close link between mental and physical health problems and excessive Internet use by teenagers. Anxiety disorders, depression, suicidal ideation are some of the symptoms experienced by teenagers who use too much the Internet [15], [16], [17], [18], [19].

Teenagers who spend a significant amount of time at internet online, it is known that often experience physical problems such as headaches and musculoskeletal pain [20], [21]. All these are the results of lack of muscle contractions, lack of physical activity, exercise, and training. Another problem reported by internet users is the reduction of sleep time [20], [21], [22] because young people use the internet quite often late and sometimes overnight. Moreover, as it is well known that obesity is a critical risk factor for cardiovascular diseases, longitudinal studies have shown that there is an increased Body Mass Index (BMI) among teenagers who spend many hours online daily online ([23], [24]). Therefore, they do not have time to deal with the physical activity and sport. The studies that have been published, however, tend to focus only on the excessive use of the internet by young people, and some of them have no correlations with negative results in the short or normal use of the Internet [25]. Finally, the resolution between the two sexes on how they use the internet related to health claims, that teenagers' boys and girls have the same behavior on the Internet, but still remains to be confirmed by research.

It is generally recognized that the health problems of the human population is constantly growing despite the development of biological and medical sciences and

associated technology. The specific researchers suggests that many of these problems could have been avoided, or at least to mitigate their consequences. But it should have been different lifestyle or habits and behavior of people from a young age in relation to physical activity and exercise. Cardiovascular diseases are the leading cause of death in the U.S. and this trend is increasing significantly worldwide [26]. It is also known that obesity in childhood is an important risk factor for development of cardiovascular disease in adults [27]. The prevalence of childhood obesity in the US has tripled between 1980 and 2000 [28]. Longitudinal studies in populations, such as the Framingham study, [29], have demonstrated that the body weight is strongly related to cardiovascular disease. Also it is well known that obesity in adulthood, and subsequent cardiovascular diseases, starting during childhood [30].

It is obvious that the prevalence and spread of childhood obesity has increased dramatically. Childhood obesity is one of the most important social problems [31] threatens to eventually reverse the positive trends of cardiovascular morbidity and mortality that have occurred in the last decade. Immediate steps should be taken to prevent excessive weight gain in children [32]. Children and adolescents who are close to the limits of obesity should promptly realize the problems they encounter in the future because of this situation. The most studies, who achieved the reduction of body weight, emphasized the importance of incorporating physical activity and decrease sedentary lifestyle (watching TV, preoccupation with video games and computer) with intervention programs. Regular physical activity is important for the prevention of obesity and modification of the body weight [33].

Additionally, it was investigated the relationship between the level of physical fitness and heart diseases or other problems associated with health. These studies confirmed the earlier observations about the importance of the minimum activity level in order to reduce the high risk groups sedentary. The greatest reduction in risk for causing heart disease comes from being a minimum natural or physical activity. The gradually increasing activity and higher levels of activity and fitness, show the obvious benefits in reducing heart disease challenge probabilities [34], [33]. The purpose of this study was to investigate the profile of teenagers using the computer and the internet as well as their correlation with social demographic characteristics like gender and age, sports and school performance.

II. METHODOLOGY

The overall survey sample consisted of 171 individuals who were high school students aged 14-16 years. The selection of the sample students was randomly sampled among the high school students. From the total number of pupils excluded children who did not have their own computer with Internet access.

Measurements

As it is well known the means of data collection depends from the purpose, the specific objectives and the research hypotheses. For the better serve of the purposes of the study for the data collection was selected the questionnaire. The

questionnaire that was completed by students to report the use made by the computer was named SAAC scale (Scale of Adolescent Addiction to Computers). The SAAC scale emerged from 20 test questions called «Internet Addiction Test». It were remained the questions regarding widespread aspects of computer use in conjunction with the Internet. The SAAC scale created as created and CRABI scale based questions from the IAT scale. But it amended so that it can be applied to teenager students' using computers and not exclusively to adult individuals who use the internet. The SAAC scale measures the technological addiction that occurs when the teen demonstrates excessive use behavior of the computer. It is not limited to the use of the Internet but it is extended to all activities performed by a user who uses the computer. SAAC scale consists from 20 questions, which are rated with 5- Likert scale from 1 (not at all) to 5 (always). Questions of SAAC scale cover the effects of the use of computers in everyday life of the adolescent, his social life, sleep, emotions and productivity [35]. Students also answered questions relating to age, the frequency of exercise per week, the grades in school subjects and their participation or not in sport clubs or sport associations

A. Statistical analysis

Data were analyzed using the SPSS 16 statistical package. For the analysis it were used the Factor Analysis of the questionnaire and One Way Anova.

III. RESULTS

Analysis of results showed that percentage 46.19% of the sample (79 individuals), were boys and 53.81% (92 people) were girls. A percentage of 9.35% (16 students) ranked in their school courses with a rating of 10 to 14, up to 36.84% (63 students) ranked in their school courses with a rating of 14.1 to 18 and a percentage of 53.81% (92 students) ranked with a rating of 16 to 20. Of the students exercised in a sport association or a sport group or a private gym a percentage of 88.87%. Of these percentage 18.13% was exercised by 1-2 times a week, 51.46% of 3-4 times a week, 19.29% of 5-7 times a week, while 11.13% did not exercise at all.

Table 1. Number of participants and percentage of the sample by age and gender

Gender	Number of students (percentage)	Age	Number of students (percentage)
Boys	79 (46,2%)	14	69 (40,3%)
Girls	92 (53,8%)	15	44 (25,8%)
		16	58 (33,9%)

Table 2. Number of participants and percentage of the sample by the times of training per week and school grade

Times of training per week	Number of students (percentage)	School grade	Number of students (percentage)
0	19 (11,1%)	10 - 14	16 (9,3%)
1-2	31(18,1%)	14,1 - 18	63 (36,9%)
3-4	88(51,5%)	18,1 - 20	92 (53,8%)
5-7	33 (19,3%)		

For data processing it were used the factorial analysis of main components. The range of responses was 5 Likert-type Secondary namely 1 = none, 2 = rarely, 3 = occasionally, 4 = often 5 = always. To test the structural validity of the questionnaire was used the method of exploratory factor analysis with the method of analysis in principal components (Principal components analysis). Followed the orthogonal rotation axes (Varimax). The criterion for determining the factors was the eigenvalues should be greater than 1. The internal consistency of the questionnaire factors was examined by calculating the coefficient a of Gronbach. To questionnaire examined five factors a) frequency of the satisfaction feelings because of the online connection, b) the frequency of the negative thoughts because of the internet connection absence, c) the frequency of abnormal reactions because of the online connection, d) frequency of decreased performance in courses because of online connection and e) negative impact on the social environment because of the online connection.

At the first factor were loaded four themes that explained the 17.87% of the total variance. At the second factor loaded four themes that explained the 15.88% of the total variance. At the third factor loaded four topics explain the 14.20% of the total variance. On the fourth factor was loaded one issue that explained the 12.14% of the total variance. In the fifth factor were loaded two issues explaining the 9.28% of the total variance. Regarding to gender results from the One Way Anova analysis of variance showed that there were no statistically significant differences between boys and girls frequency of the satisfaction feelings because of the online connection, frequency of abnormal reactions because of the online connection, frequency of decreased performance in courses because of online connection and negative impact on the social environment because of online connection. Instead this it was found statistically significant effect on the frequency of the negative thoughts because of the internet connection absence, ($F(1,166) = 27,29, p = 0,00$). The average score for boys ($M = 1,92, SD = 0,90$) were significantly higher than girls ($M = 1,35, SD = 0,49$).

Table 3. Results of analysis of variance (One way Anova) for the examined factors of students' by gender

	df	Mean Square	F	Sig.
Frequency of negative thoughts because of the internet connection absence	1 166	13,73 0,50	27,97	,000

Regarding the age analysis of variance (one-way ANOVA) showed that there were statistically significant differences in age with the frequency of the satisfaction feelings because of the online connection, ($F(2,165) = 10,20, p = 0,00$), frequency of the negative thoughts because of the internet connection absence, ($F(2,165) = 10,68, p = 0,00$), frequency of abnormal reactions because of the online connection, ($F(2,165) = 27,30, p = 0,00$), frequency of decreased performance in courses because of online connection and ($F(2,168) = 18,79, p = 0,00$), and the negative impact on the social environment because of online connection. ($F(2,168) = 8,42, p = 0,00$),

After the Post Hoc analysis with Scheffe method of the dependent variable frequency of the satisfaction feelings because of the online connection, in relation to the age, it were demonstrated that there were significant differences of aged 14 and 15 years, as well as for 14 years and 16 years ($p < .05$). For the dependent variable frequency of the negative thoughts because of the internet connection absence, were found differences among persons aged the 14 and 15 years as well as 15 and 16 years ($p < .05$). for the variable negative impact on the social environment because of online connection, there were differences among the 14 year olds and 16 years ($p < .05$).

Also, the analysis of variance with one factor (one-way ANOVA) showed a statistically significant number between the people who exercised in sports groups, private gyms and people who do not exercise at all with frequency of decreased performance in courses because of online connection ($F(1,169) = 4,3, p = 0,40$), with those students who have practiced more have better performance at the grade in their lessons.

Table 4. Results of analysis of variance (One way Anova) for the examined factors of students' by age

	df	Mean Square	F	Sig.
Frequency of the satisfaction feelings because of the online connection	2 165	8,97 0,87	10,20	,000
Frequency of the negative thoughts because of the internet connection absence	2 165	5,57 0,52	10,68	,000
Frequency of abnormal reactions because of the online connection	2 165	11,13 0,40	27,30	,000
Frequency of decreased performance in courses because of online connection	2 168	13,22 0,70	18,79	,000
Negative impact on the social environment because of online connection	2 168	6,94 0,82	8,42	,000

Table 5. Results of analysis of variance (One way Anova) for the examined factors of students' by School grade

	df	Mean Square	F	Sig.
Frequency of the satisfaction feeling because of the online connection	2	8,44	9,53	,000
	165	0,88		
Frequency of the negative thoughts because of the internet connection absence	2	11,62	25,91	,000
	165	0,44		
Frequency of abnormal reactions because of the online connection	2	3,50	7,01	,001
	165	0,50		
Frequency of decreased performance in courses because of online connection	2	20,79	33,89	,000
	168	0,61		

As for the school grade of the students the analysis of variance (one-way ANOVA) showed that there were statistically significant differences in the frequency of the satisfaction feelings because of the online connection, ($F_{2,165} = 9,53$, $p = 0,00$), frequency of the negative thoughts because of the internet connection absence, ($F_{2,165} = 25,91$, $p = 0,00$), frequency of abnormal reactions because of the online connection, ($F_{2,165} = 7,01$, $p = 0,01$) and the frequency of decreased performance in courses because of online connection ($F_{2,168} = 33,89$, $p = 0,00$). After the Post Hoc analysis with Scheffe method as for the above variables found that the higher the score the student as less frequency of the satisfaction feelings because of the online connection ($p < 0,05$), frequency of the negative thoughts because of the internet connection absence, ($p < 0,05$), less frequency of abnormal reactions because of the online connection ($p < 0,05$), less frequency of decreased performance in courses because of online connection ($p < 0,05$).

IV. DISCUSSION

According to the study, Internet use was found to have a direct positive relationship to subjective health, such as the existence of abnormal reactions, nervousness, tension the poor sleep. It also found that there is a positive correlation with the existence of negative emotions, and a direct negative relationship with the school performance of teenagers surveyed. Interesting interpretation side is that there were found a positive correlation between the ages of the students with their online time in connection with internet. This can be seen as something expected because as the students grow their preoccupation with computers, new technologies, and the internet can provide many learning opportunities, education and entertainment and thus the increase of internet use.

The investigation demonstrated that there is a significant percentage that exercised for two or three times per week, while about half of students who were exercised at younger ages have stopped. This finding is confirming other conclusions of many studies which indicate that as the age of the person increases, both reduced the exercise time as well as the training of the people. The use of a computer that is connected to the Internet is regardless of age and gender, the

participation of individuals in exercises and physical activities, and performance in school. Differences also were not found among students with different scores, from moderate to outstanding in relation to their involvement in sports groups, sports clubs or gyms, nor with exercise training frequency per week.

More studies are needed for more extensive investigation of the above factors in adolescence. This is because in today's society, the internet, the mobile phone and any other tablet device that allows online collaboration in adolescence is considered as an epidemic. One of the major technological breakthroughs of all time has been described by many as the drug of the modern era. Especially in the critical period of adolescence the internet has now become necessary, which is probably a good thing, but can do much damage. This is because in all matters exaggeration is negative. Thus, the excessive use of only bad internet, especially in adolescence can make to young people at an age quite critical to the formulation of the future.

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