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ORIGINAL ARTICLE

Prevalence of the problematic use of cell phone by adolescents in a city of State of Paraná

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Abstract

Objectives: To evaluate the prevalence of problematic mobile phone use by adolescents from public schools in a city in the state of Paraná. **Method:** The Mobile Phone Problematic Use Scale short version (MPPUS-10) was applied in adolescents of two public schools, which classifies the subject as a problematic user of a cellular device or not. For this study scores above 51 was considered problematic use; between 29 and 50 points, users at risk of becoming problematic; from 18 to 28 points were regular users and below 18, occasional users. The following variables were evaluated: age, school grade, gender, cell phone ownership, having access to other cellular devices, and their relation to MPPUS-10 score. **Results:** Age ranged from 12 to 19 years (average: 15.5; median: 16; standard-deviation: 1.8) 420 questionnaires were given, of which only those that were correctly filled were selected, totaling 168, of which 100 (59.5%) were female. In the evaluated group, 68 (40.5%) presented a risk of becoming problematic users and 65 (38.69%) were classified as problematic users of the device. There was a positive relationship between female gender and MPPUS-10 scores. **Conclusion:** It was observed a high percentage of subjects with a tendency to become problematic users and adolescents classified as problematic users, with statistical significance between scores on MPPUS-10 and female.

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INTRODUCTION

With advances in technology, the cell phone has gone from being a device restricted to calls to becoming something multifunctional, with capabilities similar to those of a computer connected to the internet[1]. The extent and use of these devices are so pronounced that some researchers have considered the cell phone to be one of the greatest vices of the current century[2]. This fact is supported by the inclusion of the Internet Gambling Disorder chapter in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (*DSM-V*) as a suggestion for further studies[3].

Data from the National Telecommunications Agency (ANATEL) showed that in October 2018 Brazil had a density of 111.9% registered cell phones, that is, there were 111.9 devices for every 100 Brazilians. The state of Paraná recorded, in the same ANATEL report, a density of 115.1%[4].

Historically, the first studies on the excessive use of cell phones were developed in 2004, with the publication of the Cell Phone Dependency Questionnaire (*CPDQ*)[5]. Other scales have been developed since then, such as *The Mobile Phone Addiction Index (MPAI), Excessive Cellular Phone Use Survey (ECPUS), Questionnaire of Experiences Related with the Mobile Phone (CERM), Problem Cellular Phone Use Questionnaire (PCPU-Q), Mobile Phone Addiction Test (MAT)* and *Mobile Phone Use Scale for Adolescents (MPPUSA)*[6]. In 2005, Bianchi and Philips created the *Mobile Phone Problem Use Scale (MPPUS)*[7], which is still used today. It was originally a scale for the population aged 18 to 85 years, but it has been adapted for different ages and populations in different countries[2,7].

In 2015, Swiss researchers developed the *MPPUS short scale* for adolescents, called *MPPUS* -10, because it is a version with only 10 items[8]. It was derived from the original questionnaire (*MPPUS*) with 27 questions where participants assigned a score from 1 to 10 for each item[7]. In this new version, participants should assign points to the sentences using scores from 1 to 10 for each item, where a higher score corresponds to "extremely true" and lower scores correspond to "totally false"[7,8]. The *MPPUS-10* showed good internal consistency and was highly correlated with the *MPPUS-27*, with more than 90% of participants having the same risk rating measured by both scores[8].

Through the marked scores it is possible to know the groups of individuals affected by the cell phone. Users at risk of becoming problematic are those who have undesirable consequences in their daily lives due to cell phone use; while the problematic user behaves incorrectly, with personal and academic losses[9].

This research aimed to evaluate the prevalence of problematic use of cell phones among adolescents from public schools in a city in the west of the state of Paraná.

MATERIAL AND METHOD

Research was carried out by applying the *MPPUS-10 questionnaire* to adolescents regularly enrolled in two public schools in Cascavel, Paraná.

Initially, the institutions potentially participating in the study were consulted about the school's interest and consent to participate in the research. After approval by the Regional Education Nucleus (NRE) and the directions of the schools, the research was carried out in two public institutions of primary and secondary education. The parents or guardians were informed about the study by one of the researchers, and the free and informed consent form (ICF) and the free and informed consent form (TALE) were presented. Upon signature of the documents by the parents or guardians and by the participant, the *MPPUS* -10 questionnaire was delivered. Adolescents from the seventh to the ninth grade of elementary school and from the first to the third year of high school took part in the research, who agreed to participate in the research voluntarily, with a deadline set for the questionnaires to be collected by the researchers. If the participant was 18 years of age or older, the subject signed the informed consent and was included in the research. Data collection took place from October to December 2018.

For this study, the criteria described by Lopez-Fernandez[10] and Chow[9] were used to categorize the groups into occasional user, regular user, user at risk of becoming problematic and problematic cell phone user. The interviewee was classified in these groups based on their score, being divided, respectively, into less than 17 points; between 18 and 28 points; from 29 to 50 points and greater than 51 points (Annex 1). This score was based on the study by Roser[11], where cell phone use was also evaluated using the MPPUS-10. The distinction of users is related to the damage that technology causes in their daily lives. The risk user would have some undesirable consequences and would be becoming addicted; the problematic user would have an incorrect behavior, with personal or academic losses[9].

In another questionnaire, the following variables were analyzed: gender, age, school grade, owning a cell phone, having access to other cell phones and having other media devices at home (*tablet* , television, computer). In addition to these variables, the *MPPUS questionnaire was applied* , a short version with ten statements (*MPPUS*- 10) addressing issues related to the use of cell phones/ *smartphones, translated into Portuguese by the authors and assisted by an English language teacher.*

The data obtained were transcribed into the *Microsoft Office Excel* 2013 program. For the description of the quantitative variables, the statistics of mean, median, minimum value, maximum value and standard deviation were considered. For the description of qualitative variables, frequencies expressed in percentages were considered. To compare the groups defined by the *MPPUS-10 score* in relation to age, the Analysis of Variance model was considered with a source of variation. To compare the groups defined by the *MPPUS-10 score* in relation to the number of devices available, the Kruskal-Wallis non-parametric test was considered. To assess the association between sex, grade and being a cell phone owner, the Chi-Square test was used with the *MPPUS score.* Values of $p<0.05$

indicated statistical significance. The program used for data analysis was *IBM SPSS Statistics®, version 20.*

This work was approved by the Research Ethics Committee of the Universidade Estadual do Oeste do Paraná on July 27, 2018 under number 2,787,791.

RESULTS

420 questionnaires were delivered to adolescents from the seventh grade of elementary school to the third year of high school. Of the total delivered, 177 (42.1%) questionnaires were returned, of which nine questionnaires (5.1%) were excluded because they did not correctly fill out the *MPPUS* - 10 questionnaire . Participants' age ranged from 12 to 19 years (Table 1).

Among the 168 participants, 100 (59.52%) were female and 68 (40.47%) were male. In the evaluated group, 68 adolescents (40.47%) scored between 29 and 50 points (teens at risk of becoming problematic cell phone users). Of these 68 subjects, 39 (57.4%) were female and 29 (42.6%) were male.

Sixty-five adolescents (38.69%) were considered problematic users, 46 (70.8%) were female and 19 (29.2%) were male.

Eighty-nine (52.97%) participants were high school students. For this group, 38 (42.7%) were considered users at risk of becoming problematic and 35 (39.3%) were categorized as problematic users. Thirty-three (19.6%) were seventh or eighth graders, 12 (36.4%) were at risk of becoming problem users and nine (27.3%) were problem cell phone users. Forty-six respondents were in the ninth grade of elementary school, where 18 (39.1%) scored between 29 and 50 points and 21 (45.7%) scored more than 50 points (Table 2).

Eight participants (4.76%) reported not having a cell phone. Of these, two respondents were categorized as problem cell phone users and two other adolescents were at risk of becoming problem cell phone users (Table 3). In this group, it was not asked who the telephone was that the teenager had access to, only asked if he had access to any device.

Data related to age, median, mean and standard deviation are presented in table 4.

The number of devices that the adolescent has access to at home did not show statistical significance with the *MPPUS*- 10 score. All of them answered that they had at least one other media device at home, and in the group up to 17 points the maximum number of other devices was three and in the other groups there were four or more devices.

Table 1. Variation in age and average score obtained in the *MPPUS-10*, broken down by question.

Variable	n	Average	median	Minimum	Maximum	dev pad
AGE	**177**	**15.5**	**16**	**12**	**19**	**1.8**
Question	**n**	**Average**	**median**	**Minimum**	**Maximum**	**dev pad**
1	175	6.0	6	1	10	3.1
2	174	3.3	2	1	10	2.8
3	176	6.7	8	1	10	3.2
4	177	5.2	5	1	10	3.4
5	177	5.0	5	1	10	3.3
6	177	6.2	6	1	10	3.1
7	176	3.2	2	1	10	2.8
8	174	4.1	3	1	10	3.3
9	176	5.3	5	1	10	3.1
10	172	1.5	1	1	10	1.5
Total of spots	177	46.1	44	10	91	19.2

Table 2. Relationship between *MPPUS-10* scores and gender and between *MPPUS-10* and grade school.

Punctuation	Sex				Series					
	Male		Feminine		7th or 8th		9th		1st, 2nd or 3rd year	
	n	%	n	%	n	%	n	%	n	%
Up until 17	7	10.3%	3	3.0%	4	12.1%	2	4.3%	4	4.5%
18 to 28	13	19.1%	12	12.0%	8	24.2%	5	10.9%	12	13.5%
29 to 50	29	42.6%	39	39.0%		36.4%	18	39.1%	38	42.7%
Most in 50	19	27.9%	46	46.0%		27.3%	21	45.7%	35	39.3%
Total	68	100	100	100		100	46	100	89	100
Value in *P*		0.036						0.307		

Table 3. Relationship in between punctuation obtained at the *MPPUS-10* and be owner of telephone cell.

Punctuation	Owner in telephone cell				Value in *P*
	Yea		No		
	n	%	n	%	
Up until 28	31	19.4%	4	50.0%	
29 to 50	66	41.3%	2	25.0%	0.155
Most in 50	63	39.4%	2	25.0%	
Total	160	100.0%	8	100.0%	

Table 4. Relationship between scores obtained in MPPUS-10 based on age and number of appliances that O evaluated has access.

Variable	Punctuation	n	Average	1st quartile	median	3rd quartile	Minimum	Maximum	Detour Pattern	Value in *P*
Age	Up until 17	10	14.8	13.3	14	16.8	12	18	2.0	0.373*
	18 to 28	25	15.2	13	16	17	12	18	1.9	
	29 to 50	68	15.7	14	17	17	12	19	1.9	
	Most in 50	65	15.6	14	16	17	12	19	1.7	
Number of appliances that has access	Up until 17	10	2.0	1.3	2	2.8	1	3	0.8	0.190**
	18 to 28	25	2.8	2	3	4	1	4	1.2	
	29 to 50	68	2.6	2	3	3	1	4	0.9	
	Most in 50	65	2.5	2	2	3	1	4	1.0	

(*) Model in Analysis in variance with one source in variation, significance for $p<0.05$ (**) non-parametric test from Kruskal-Wallis, $p<0.05$.

DISCUSSION

The percentage of cell phone users/owners in adolescence has increased in recent years in the world, and in this research, most subjects were cell phone owners, which corroborates other studies[12-15].

There was a high percentage of risk users and problematic use in this study when compared to the literature, which shows a percentage ranging from 10% to 20%[2,6,10]. According to a study published in 2010**,** children ages 8 to 10 living in the United States spent approximately 8 hours a day with a variety of different media, while older children and teenagers spent more than 11 hours a day. Also in the Kaiser Foundation study, few teenagers reported that their parents had any rules about the time spent on cell phone use for texting and calling, with an average of 95 minutes of use for messages and 33 minutes for calls; in addition, the average use of cell phone time with media alone was 49 minutes[12], contrary to the recommendation of the American Academy of Pediatrics (AAP) which suggests a limit of up to two hours a day with the use of entertainment screens[16].

The literature demonstrates that problematic cell phone use is associated with external factors, such as worse school and home environments, increased sedentary lifestyle, low academic performance, tobacco and alcohol use, in addition to worsening sleep quality when using the cell phone at night. night and to internal factors such as impaired mental health and behavioral problems in those surveyed[11,17-20]. In an Iranian study carried out with university students and published in 2014, it was found that an improvement in mental health was related to a lower rate of addiction to cell phones[17]. Similar results were demonstrated by Roser in a survey conducted with Swiss adolescents in 2015[11].

Problematic cell phone use was correlated with the female gender, corroborating the results of previous research. In these studies, it was evaluated that the time of cell phone use by women tends to be longer than that of men, and that its use, in general, is associated with social activities[7,10,11,19].

When used correctly, the mobile device can facilitate the user's everyday tasks. One of the benefits it can bring to people is through applications that generate reminders to practice physical activities[21]. Other interesting functions are to allow instant messaging, use of banking applications, bill payments, news updates and internet searches[1,18].

Pediatricians in the routine consultation should guide the teenager to healthy habits of life, including the orientation to limit the time of screen use, regardless of whether they are cell phones, *tablets* or televisions, since the excessive use of electronic media can cause so much problem. in the physical and mental health of a developing organism.

CONCLUSION

The cell phone has spread worldwide as a multifunctional device and used by most people. This research showed that its use was identified as problematic in a large part of the adolescents studied, being significantly higher in females.

When used properly, the cell phone can assist in an individual's daily tasks. However, efforts for recognition and guidance on its use need to be carried out with the public to

prevent the incorrect use of this technology from causing negative symptoms in adolescents, leading them to other addictions, and the emergence of personal, school and social losses.

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Annex 1

Scale of Use Problematic of Telephone Cellular-10 (MPPUS-10).

For each item mark O what most if suit The you, being 1 for “totally false” up until 10 “extremely true”.

1)I use my cell phone for to do feel better when I am felling crestfallen.

1□ 2□ 3□ 4□ 5□ 6□ 7□ 8□ 9□ 10□

2)when out of reach, I I’m worried about O thought of losing one Link.

1□ 2□ 3□ 4□ 5□ 6□ 7□ 8□ 9□ 10□

3)if I no have a cell phone, my friends would find difficult to enter in contact with me.

1□ 2□ 3□ 4□ 5□ 6□ 7□ 8□ 9□ 10□

4)I I am anxious if you haven’t checked the messages or stirred on my cell phone per a time.

1□ 2□ 3□ 4□ 5□ 6□ 7□ 8□ 9□ 10□

5)My friends and relatives complain about my use of cell phone.

1□ 2□ 3□ 4□ 5□ 6□ 7□ 8□ 9□ 10□

6) I myself date occupied with my phone cell per bigger periods in time of what I intended.

1□ 2□ 3□ 4□ 5□ 6□ 7□ 8□ 9□ 10□

7)I am often late for appointments Because I am occupied with O cell When no it should be.

1□ 2□ 3□ 4□ 5□ 6□ 7□ 8□ 9□ 10□

8)I think difficult to switch off mine cell phone.

1□ 2□ 3□ 4□ 5□ 6□ 7□ 8□ 9□ 10□

9)They tell me that I spend a lot of time in the my phone cell.

1□ 2□ 3□ 4□ 5□ 6□ 7□ 8□ 9□ 10□

10) I have been receiving cell phone bills that I no could pay.

1□ 2□ 3□ 4□ 5□ 6□ 7□ 8□ 9□ 10□