Epidemiology of Internet Use by an Adolescent Population and its Relation with Sleep Habits

Epidemiologia do Uso de Internet numa População Adolescente e Sua Relação com Hábitos de Sono

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ABSTRACT

Introduction: In the last decades, the great technological development increased Internet popularity, emerging the concern about its overuse. The objectives of this study were to assess and characterize Internet use in adolescence, determine Internet addiction and clarify its association with sleep disorders and excessive daytime sleepiness.

Material and Methods: It was performed an observational, cross sectional and community-based study. The target were students attending 7th and 8th grades, to whom was applied an online self-report questionnaire to assess sociodemographic features, Internet use, Internet dependence, sleep characteristics and excessive daytime sleepiness.

Results: A total of 727 adolescents were included with a mean age 13 ± 0.9 years. Three-quarters of teenagers use Internet daily and 41% do it for three or more hours/day, mainly at home. The phone and laptop were the main devices used. Online games and social networks use were the main activities performed. Internet dependence was observed in 19% of adolescents, and it was associated with male gender, social networks use, mainly Twitter and Instagram use, self-perceived sleep problems, initial and middle insomnia and excessive daytime sleepiness ($p < 0.05$).

Discussion: The results confirm the highlight that Internet has in adolescents routine, who prioritize in their use access to social networks and online games, using single devices, less subject to parental control.

Conclusion: The Internet addiction rate observed and its association with sleep alterations and daytime sleepiness emphasizes the importance of this issue.

Keywords: Adolescent; Behavior, Addictive; Disorders of Excessive Somnolence; Internet; Sleep; Social Media

RESUMO

Introdução: A grande evolução tecnológica das últimas décadas tornou a Internet cada vez mais popular, sendo crescente a preocupação com a sua utilização excessiva. Foram objetivos do presente trabalho aferir e caracterizar o uso de Internet na adolescência, determinar a dependência de Internet e estabelecer a sua associação com alterações do sono e sonolência diurna excessiva.

Material e Métodos: Foi realizado um estudo de base comunitária, observacional e transversal dirigido a adolescentes a frequentar o sétimo e oitavo ano de escolaridade. Recorreu-se a um questionário de autopreenchimento *online*, para aferir características sociodemográficas, uso e dependência de Internet, características do sono e sonolência diurna excessiva.

Resultados: Foram incluídos 727 adolescentes com idade média de 13 ± 0,9 anos. Três quartos dos adolescentes usa a Internet diariamente e 41% fá-lo durante três ou mais horas/dia, maioritariamente em casa. O telemóvel e o computador portátil são os principais dispositivos utilizados. Os jogos *online* e o uso das redes sociais são das principais atividades realizadas. A dependência de Internet foi observada em 19% dos adolescentes, associando-se ao género masculino, à utilização de redes sociais, o Twitter e Instagram, à autopercepção de problemas de sono, insónia inicial e intermédia e sonolência diurna excessiva ($p < 0,05$).

Discussão: Os resultados reiteram o destaque que a Internet tem na rotina dos adolescentes, que priorizam o seu uso no acesso a redes sociais e jogos *online*, fazendo-o com dispositivos de uso individual, menos passíveis de controlo parental.

Conclusão: A dependência de Internet verificada e associação com alterações do sono e sonolência diurna excessiva enfatiza a relevância desta problemática.

Palavras-chave: Adolescente; Comportamento Aditivo; Distúrbios do Sono por Sonolência Excessiva; Internet; Social Media; Sono

INTRODUCTION

The great technological evolution of the past few decades made Internet increasingly popular and with an important role in modern society's daily life as a means of information, entertainment and socialisation. Adolescents and young adults are the main Internet users and 2-4 hours are spent daily in online activities by an estimated 70% of the European adolescents.[1-3] Internet usage has been increasingly higher and becoming a subject for discussion in which the acceptable level has been questioned, as well as any potential consequences of excessive Internet use in youngster's development and health.[4] 'Internet addiction disorder' has been for the first time used in 1996 by Kimberly Young[5] and different terminologies have been used since then to describe an excessive and compulsive Internet use with personal, professional or social negative consequences. Different definitions have been established, according with different scales, including Internet addiction disorder or problematic Internet use.[6] The Internet Addiction Test (IAT) is currently one of the most widely used.[7-11] This is a 20-item questionnaire allowing for the identification of the presence of Internet addiction disorder, ranging from moderate to severe. The application of the IAT to a group of 475 Finnish adolescents allowed for the conclusion that 25% of the participants showed criteria for moderate to

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severe Internet addiction.[12] According with Milani *et al.*, a problematic use of the Internet was found in 36.7% of Italian adolescents and was associated with dysfunctional coping strategies and poor interpersonal relationships.[13] In fact, different studies showed the negative impact of Internet addiction in psychosocial development of adolescents,[14-16] as well as its association with suicidal behaviours (suicidal ideation and suicide attempt), depression and anxiety.[17-19] As regards sleep disorders, different positive associations have been described even though, to the authors' knowledge, no other Portuguese study has ever been carried out on the prevalence of Internet dependency in the adolescence or its effect on sleep quality and daytime sleepiness.[20-24] Therefore, our study mainly aimed at (i) the assessment and characterisation of the Internet use in adolescents; (ii) the assessment of Internet addiction in the adolescence and (iii) the association between Internet addiction and sleep disorders / excessive daytime sleepiness.

MATERIAL AND METHODS

Study design

This was an observational, cross-sectional, analytical, community-based study aimed at adolescents attending the 7th and 8th grades. All the school clusters from a high population density municipality located in the North of Portugal were selected and six school clusters confirmed their participation and were included in the study. These were predominantly urban school clusters from small cities or towns. Information was collected through the application of a self-completed, anonymous and confidential electronic questionnaire, with mandatory response to all the questions. This questionnaire was self-completed at the class of *Tecnologia de Informação e Comunicação (TIC)* (Information and Communication Technology) throughout April 2016. The study was approved by the Ethics Committee and an informed consent has been obtained from each participant's legal representative.

Information collection

The 67 closed-item questionnaire has been organized into three different sections (Table 1).

Data analysis

Categorical variables were described by frequency and percentage and continuous variables by mean and standard deviation. Chi-square or Fisher's exact test (whenever appropriate) have been used for the comparison between categorical variables and Student's t-test between continuous variables. The Statistical Package for the Social Sciences® (SPSS), version 22.0 software has been used and statistical significance was considered for p-value < 0.05.

RESULTS

Sample characteristics

In total, 727 adolescent participants were included in the

Table 1 - Issues addressed by the questionnaire

1. Personal, social and demographic characteristics of the adolescent participants
1.1. Personal characteristics
Age; gender; grade repetition rate; extracurricular regular sport activities; extracurricular group activities.
1.2. Family characteristics
Family type; parental age; parental education level.
2. Characteristics of Internet use and Internet addiction
2.1. Characteristics of Internet use
Previous Internet use; age of onset for Internet use; frequency of Internet use; daily time spent online; devices used for Internet use; setting for Internet use; reasons for Internet use; online activities; frequency of online gaming; daily time spent in online gaming; daily time spent in ISN; type of ISN; privacy profile configuration; attitude regarding friendship requests from strangers; personal images sharing through ISN; location disclosure in ISN; personal contacts and address disclosure in ISN; meetings with acquaintances exclusively through ISN; parental/guardian awareness of online activities; compliance with parental recommendations regarding Internet use.
2.2. Internet addiction
The IAT questionnaire has been used for the definition of Internet addiction, validated for the Portuguese population, scored by the sum of responses to 20 items and allowing for the classification into moderate (50-79 points) or severe Internet addiction (over 80 points).[25]
3. Characterisation of sleeping habit and excessive daytime sleepiness
3.1. Characterisation of sleeping habit
Self-awareness of sleep disorders; initial, middle and terminal insomnia; nightmares; naps; number of sleeping hours.
3.2. Excessive daytime sleepiness
The Paediatric Daytime Sleepiness Scale (PDSS), an eight-item instrument validated for the Portuguese population, has been used; the presence of a score >20 defined the presence of excessive daytime sleepiness.[26]

study, from a total of 2,345 enrolled in all the municipality's school clusters, with a mean age of 13 ± 0.9 years and a slight male predominance (53%). Participation in extracurricular activities, namely regular physical activity, was described by 60% of the participants and group activities by 41% (Table 2). As regards the participant's family, mean age of mothers and fathers was 42 ± 5 and 46 ± 6 years, respectively. Most participants (76%) were part of a nuclear family (Table 2).

Internet use characteristics

All the participants reported as having previously gone online and 28% as having for the first time gone online under the age of six. Participants mainly went online at home and in free public hotspots, using the smartphone, laptop or tablet. Around 75% of our participants went online daily and at least three hours a day were spent online by 41% of the participants. Entertainment, communication and socialisation were the main reasons for using the Internet and online gaming and Internet social networking (ISN) were the participant's main activities. At least three hours a day were spent by 24 and 31% of the participants with online gaming and ISN, respectively (Table 3).

Facebook and Instagram were mostly used and 57% of the participants went online using a private profile configuration. Most participants used ISN to communicate with real friends and 17% have described meetings with online friends in the Internet (Table 3). The publication of personal pictures was mainly the way for sharing any personal information through ISN and participant's location, address and personal contacts were almost never disclosed (Fig. 1). Parental awareness of their children's Internet use was ranked as very good by 52% of the participants and slightly more than half of the participants have described as having complied with parental recommendations regarding the Internet use (Table 3).

Sleep habit characteristics

One out of 10 participants has described the presence of sleep disorders and middle insomnia (41%) was the most frequently described. Around half of the participants described as having usually slept less than nine hours a day. The presence of criteria for excessive daytime sleepiness was found in 11% of the participants (Table 4).

Internet addiction

The presence of criteria for Internet addiction was found in 19% of the participants and severe addiction was found in 2% (Table 3) while dependency was only associated with male participants ($p < 0.05$) (Table 5). No family characteristic from those assessed in the study was

Tabla 2 - Social and demographic characteristics of the adolescents and their families (n = 727)

Characteristics		% (n)
Characteristics of the adolescent		
Gender	Male	53 (386)
	Female	47 (341)
Previous grade repetition	No	80 (584)
	Yes	20 (143)
Regular extracurricular sport activities	No	40 (294)
	Yes	60 (433)
Extracurricular group activities	No	59 (430)
	Yes	41 (297)
Family characteristics		
Family type	Nuclear	76 (553)
	Extended	11 (78)
	Monoparental	11 (78)
	Other	2 (18)
Mother's education level	≤ 4th grade	18 (131)
	6th grade	28 (204)
	9th grade	23 (167)
	12th grade	19 (138)
	Graduation	12 (87)
Father's education level	≤ 4th grade	22 (160)
	6th grade	29 (211)
	9th grade	22 (160)
	12th grade	20 (145)
	Graduation	7 (51)

Table 3 - Characterisation of Internet use and addiction (Section 1)

Characteristics		% (n)
Internet use (n = 727)		
Previous Internet use	No	0 (0)
	Yes	100 (727)
Age of onset for Internet use	≤ 6 years	28 (203)
	7 years	16 (120)
	8 years	11 (77)
	9 years	11 (76)
	10 years	11 (77)
	11 years	2 (17)
	12 years	1 (13)
	Undetermined	20 (144)
Frequency of Internet use	< once a week	5 (36)
	1 - 3 times a week	10 (76)
	4 - 6 times a week	10 (71)
	Daily	75 (544)
Daily time spent online	< 1 hour	20 (147)
	1 - 2 hours	39 (285)
	3 - 6 hours	31 (227)
	> 6 hours	10 (68)
Device used for going online	Smartphone	94 (684)
	Computer	30 (218)
	Laptop	73 (531)
	*T*ablet	59 (429)
	Television	21 (153)
	Game console	18 (131)
Setting for Internet use	Personal Wi-Fi	34 (247)
	Free Wi-Fi	26 (189)
	At home	94 (684)
	School	51 (370)
	Free public hotspots	64 (465)
	Paid hotspots	3 (22)
	Other's home	60 (436)
Reason for going online	Entertainment	82 (596)
	Communication	80 (582)
	Socialisation	77 (560)
	Schoolwork	52 (378)
	Information research	51 (371)
Online activities	Movies/serials/videos	74 (538)
	Watching TV	21 (153)
	Downloads	48 (349)
	Reading magazines/books	7 (51)
	Listening to music	66 (480)
	Online gaming	65 (474)
	Communication with friends	80 (582)
	Using e-mail	38 (276)
	ISN	94 (680)
	Making phone calls	45 (327)
Parental / guardian awareness on adolescent Internet use	None / poor	15 (109)
	Reasonable	33 (240)
	Good / very good	52 (378)
Compliance with parental / guardian recommendations on the use of Internet	Never / rarely	5 (36)
	Occasionally	40 (291)
	Frequently / always	55 (400)

Tabela 3 - Characterisation of Internet use and addiction (Section 2)

Characteristics		% (n)
Online gaming (n = 474)		
Frequency of online gaming	< < once a week	24 (114)
	1 - 3 times a week	26 (123)
	4 - 6 times a week	16 (76)
	Daily	34 (161)
Daily time spent in online gaming	< 1 hour	38 (180)
	1 - 2 hours	38 (180)
	3 - 6 hours	18 (85)
	> 6 hours	6 (28)
Internet social networks (ISN) (n = 680)		
Frequency of use of ISN	< once a week	8 (54)
	1 - 3 times a week	15 (102)
	4 - 6 times a week	10 (68)
	Daily	67 (456)
Daily time spent online in ISN	< 1 hour	34 (231)
	1 - 2 hours	35 (238)
	3 - 6 hours	21 (143)
	> 6 hours	10 (68)
Used ISN	Facebook	74 (503)
	Twitter	22 (150)
	Snapchat	69 (469)
	Instagram	77 (524)
	Other	10 (68)
ISN privacy profile configuration	Public	34 (231)
	Private	57 (388)
	Semi-public	9 (61)
Type of friends with whom the adolescent communicates through ISN	Real friends	80 (544)
	Virtual friends	2 (14)
	Both	18 (122)
Meeting with known friends exclusively through ISN	No	83 (564)
	Yes	17 (116)
Internet addiction (n = 727)		
AIT	No addiction	81 (589)
	Moderate addiction	17 (124)
	Severe addiction	2 (14)

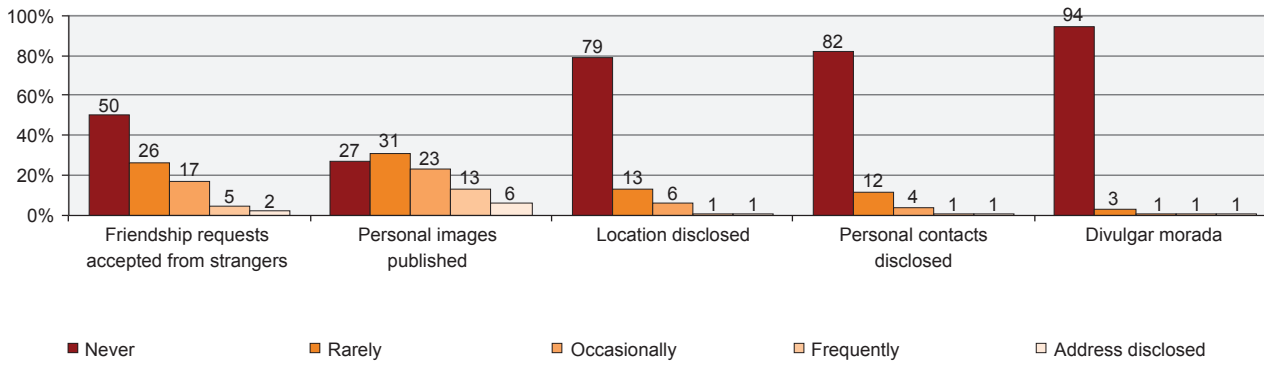

Figure 1 – Safety of the activities carried out by the adolescents in ISN

Safety of the activities carried out by the adolescents when using Internet social networks, namely how often friendship requests from strangers are accepted, as well as regarding the publication of personal images and address and personal data disclosure.

Table 4 - Characterisation of sleeping habits and the presence of daytime sleepiness in the group of participants and according with the presence of Internet addiction

Characteristics		All	No Internet addiction	Internet addiction	χ^2 (df)	*p*
		%	% (n)	% (n)		
Sleeping habits						
Self-awareness of sleep disorders	No	90	83 (519)	17 (105)	25.478 (1)	0.000
	Yes	10	58 (42)	42 (30)		
Initial insomnia	No	82	84 (483)	16 (90)	28.234 (1)	0.000
	Yes	18	63 (78)	37 (45)		
Middle insomnia	No	59	83 (346)	17 (69)	5.045 (1)	0.025
	Yes	41	76 (215)	24 (66)		
Terminal insomnia	No	69	82 (394)	18 (89)	0.950 (1)	0.330
	Yes	31	78 (167)	22 (46)		
Nightmares	No	88	81 (502)	19 (114)	2.716 (1)	0.099
	Yes	12	74 (59)	26 (21)		
Naps	No	88	82 (500)	18 (113)	3.047 (1)	0.081
	Yes	12	74 (61)	26 (22)		
Sleeping time < 9 hours per night	No	45	87 (272)	13 (42)	13.265 (1)	0.000
	Yes	55	77 (289)	24 (93)		
Excessive daytime sleepiness						
No		89	84 (519)	16 (99)	42.449 (1)	0.000
Yes		11	53 (40)	47 (36)		

Table 5 - Characteristics of the family and the adolescent and its association with Internet addiction (comparative analysis)

Characteristics		No Internet addiction	Internet addiction	χ^2 (df) / *t-Student*	*p*
		% (n) / x ± SD	% (n) / x ± SD		
Family					
Nuclear family	Não	79 (131)	21 (35)	0.378 (1)	0.539
	Sim	81 (463)	19 (101)		
Mother with 9th grade education	Não	81 (261)	19 (62)	0.05 (1)	0.941
	Sim	80 (303)	20 (73)		
Mother's age		42.1 +/- 5.4	42.4 +/- 5.5	-0.593 (693)	0.553
Father with 9th grade education	Não	81 (281)	19 (66)	0.094 (1)	0.759
	Sim	80 (277)	20 (69)		
Father's age		44.5 +/- 5.6	45.6 +/- 5.6	-0.059 (687)	0.953
Adolescent					
Gender	Male	84 (279)	16 (54)	3.901 (1)	0.048
	Female	77 (289)	23 (82)		
Extracurricular regular sport activities	No	79 (226)	21 (58)	0.372 (1)	0.542
	Yes	83 (342)	17 (78)		
Extracurricular group activities	No	80 (328)	20 (87)	1.757 (1)	0.185
	Yes	81 (240)	19 (49)		
Previous grade repetition	No	81 (458)	19 (106)	0.499 (1)	0.480
	Yes	79 (110)	21 (30)		

associated with the presence of Internet addiction (Table 5).

The use of personal Internet in free public locations or in school, namely on Twitter and Instagram was associated with Internet addiction ($p < 0.05$) (Table 6).

Self-awareness regarding the presence of sleep disorders, the presence of initial insomnia, or middle insomnia and sleeping less than nine hours a day were associated with Internet addiction ($p < 0.05$) (Table 4), as well as the presence of criteria for excessive daytime sleepiness ($p < 0.05$) (Table 4).

DISCUSSION

The results obtained in our study support the relevance of Internet adolescent's routine, which is daily used by 75% of the participants and 41% usually spend no less than three hours a day online. In addition, 60% from a total of 25,142 children and adolescents aged 9 to 16 went online on a daily basis, according with the 2010 report of the EU Kids Online project, in which Portugal took part,[27] suggesting an increasing trend and showing its relevance in adolescent daily life.

Apart from a more frequent use, the results have also confirmed the trend of an early-onset Internet use; around half of the participants in this project went online for the first time up to the age of eight and 28% up to the admission to primary school. According with 2014 data, mean age of onset for Internet use by Portuguese adolescents was 8.6 years, in line with other European countries, in which it has varied from 7.9 in the United Kingdom and 9.5 years in Italy.[28] The trend was also reinforced when 2010 data were taken into consideration, showing a mean age of onset of 10 years.[29]

The adolescents in our group mostly went online at home, using the smartphone and the laptop, in line with what has been shown in the Portuguese report of the Net Children Go Mobile project, in which, like other European countries, an increasing Internet home use has been found from 2010 to 2014, with the use of personal devices.[27-29] Unlike what has been described in the report, in which the school has been described as the second most frequent point of access to the Internet, our results showed that the use of free mobile internet Wi-Fi (61%) was the second most commonly described and the school was the fourth option (51%).[29] The technological evolution providing better and wider range of free Wi-Fi hotspots can be considered as a possible explanation for this result. In addition, our results also contrasted the perception that accessing the internet on the move, anywhere, which until then seemed negligible

Table 6 - Characterisation of the activity carried out online, according with the presence of Internet addiction (comparative analysis)

Characteristics		No Internet addiction % (n)	Internet addiction % (n)	χ^2 (df)	*p*
Internet point-of-access					
At home	No	79 (34)	21 (9)	0.076 (1)	0.782
	Yes	81 (534)	19 (127)		
Personal Wi-Fi	No	85 (394)	15 (72)	13.228 (1)	0.000
	Yes	73 (174)	27 (64)		
Free Wi-Fi	No	83 (433)	17 (86)	9.568 (1)	0.002
	Yes	73 (135)	27 (50)		
At school	No	85 (210)	15 (37)	4.595 (1)	0.032
	Yes	78 (358)	22 (99)		
Type of online activity					
Online gaming	No	84 (241)	16 (47)	2.812 (1)	0.095
	Yes	79 (327)	21 (89)		
ISN	No	87 (138)	13 (21)	4.920 (1)	0.027
	Yes	79 (430)	21 (11)		
ISN type					
Facebook	No	82 (198)	18 (44)	0.306 (1)	0.580
	Yes	80 (370)	20 (92)		
Instagram	No	86 (231)	14 (38)	7.529 (1)	0.006
	Yes	77 (337)	23 (98)		
Snapchat	No	83 (271)	17 (59)	2.829 (1)	0.093
	Yes	78 (297)	22 (22)		
Twitter	No	84 (488)	16 (95)	19.890 (1)	0.000
	Yes	66 (80)	34 (41)		

among the Portuguese adolescents, seemed widespread, as free or paid mobile internet was described by 61 and 34% of the adolescents in our group, respectively.[29] In addition, all the devices used for going online, including smartphones, laptops or tablets, reinforced the preference for the access on the move, subject to lower parental control. Nevertheless, half of the participants described as being compliant with parental recommendations regarding the Internet use and the same percentage of participants described a good parental awareness regarding online activities. These results reinforced the relevance of raising awareness of the condition among parents, due to their crucial role in adolescent education, through parent-implemented interventions aimed at the management of daily time used in online activities, as well as regarding the type of activities and its safety. Knowing adolescent's online behaviour is therefore crucial.

Higher daily use of online gaming (34%) and ISN (67%) was found in our group of participants when compared to what was found in the Health Behaviour in School – Aged Children study, in which 17.4% of the adolescents daily went online to communicate with friends and 13% used ISN.[31] However, considering the results of the Net Children Go Mobile project, daily use of online gaming (21%) and ISN (50%), even though showing a lower percentage, was closer to the percentage found in our study.[29] As regards the use of social networks, we found that Instagram was used by 77% of the participants, Facebook by 74%, Snapchat by 69% and Twitter by 22%. These results showed a simultaneous use of multiple ISN and an increasing popularity of Instagram, by contrast with previous studies showing that Facebook was used by 97% of the adolescents and the remaining ISN were rarely used (19% - Instagram and 2% - Twitter).[29]

As regards the prevalence of Internet addiction, mixed values have been found, such as 1% in Greece, 7.9% in Iceland, 18% in the UK and 22.8% in Spain, which makes the 19% percentage obtained in our study harder to explain.[32,33] In Europe, at least two different behaviours associated with Internet addiction were found in one out of five adolescents, according with the Net Children Go Mobile project and a 16% percentage of excessive Internet use was found in Portugal by the same project, lower when compared to the European average (21%) of the seven countries involved in the study. The percentage found in Portugal was similar with what has been found in Denmark (25%), Romania (24) and in Ireland (23%), the lowest percentage having been found in Italy (11%) and the highest in the United Kingdom (29%).[28,29] It should be mentioned that the comparison of the prevalence of Internet addiction is not an easy task as no universal definition, as well as no clear diagnostic criteria have been defined. Therefore, any study comparison, involving different methodologies, must be carefully considered. To the best of the authors' knowledge, no previous study has been carried out on Internet addiction in Portugal based on the application of the IAT questionnaire. European or global studies based on uniform standards would be very important in allowing for an adequate characterisation of this reality and for monitoring its evolution.

Male gender has been associated with Internet addiction, according with our study results, in line with some authors, even though no gender differences were found in other studies.[33-37] Some authors have associated the use of social networks and online gaming with Internet addiction,[38] even though our results only showed a positive association between Internet addiction and the use of ISN, contradicting the initially established idea that Internet addiction only concerned online gaming.

Internet addiction and behaviours associated with problematic Internet use can have a significant impact on the circadian rhythm.[21,39] Previous studies have shown that Internet addiction is associated with insomnia,[22,24] as found in our study. The use of devices (laptop/smartphone/tablet) before going to sleep leading to overexcitement and therefore disrupting normal circadian rhythm, can explain for the negative impact of excessive Internet use in the sleeping habit.[39,40] To the authors' best knowledge, no other study was ever carried out in Portugal on the identification of a positive association between Internet addiction and sleep habits / excessive daytime sleepiness.

The use of a convenience sample was the main limitation of this study, preventing from any result extrapolation to the population of Portuguese adolescents. The study is expected to become a starting point for further research aimed at the identification of the pattern of Internet use of Portuguese adolescents. Further prospective studies will allow for the identification of the development pattern, as well as any potential impact in young user's daily life.

In short, the results have shown the relevance of Internet in adolescent's routine in which its use is crucial for allowing the access to social networks and online gaming, using personal devices, less subject to parental control. Internet addiction disorder and its association with sleep disorders and excessive daytime sleepiness reinforced the relevance of this subject and the need for raising awareness of the condition among parents, educators and healthcare professionals aimed at diagnosis and prevention. A more frequent access to the Internet, in different settings, using mobile devices and performing different online activities simultaneously has been found as the main characteristics of the Internet use by adolescents.

CONCLUSION

- Internet is a relevant part of adolescents' daily routine and has a crucial role for providing access to social networks and online gaming.

- The presence of Internet dependency/addiction has been found in 19% of the participants in this study and the presence of criteria for severe addiction was found in 2%.

- Internet dependency/addiction is associated with sleep disorders and excessive daytime sleepiness, supporting the relevance of this subject.

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HUMAN AND ANIMAL PROTECTION

The authors declare that the followed procedures were according to regulations established by the Ethics and Clinical Research Committee and according to the Helsinki Declaration of the World Medical Association.

DATA CONFIDENTIALITY

The authors declare that they have followed the protocols of their work centre on the publication of patient data.

CONFLICTS OF INTEREST

The authors declare that there were no conflicts of interest in writing this manuscript.

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