



PREVALENCE OF INTERNET DEPENDENCY AND ASSOCIATED FACTORS IN UNIVERSITY STUDENTS IN THE CITY OF PELOTAS, RS, BRAZIL

Medicine

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ABSTRACT

Introduction: There are evidences that the internet dependency may affect the physical and mental health of adolescents and young adults.

Objectives: Check the prevalence of internet dependency in university students in the city of Pelotas and investigate associated factors.

Methods: Cross-sectional study carried out with a sample of 1,029 freshman university students from the Federal University of Pelotas, Sul-riograndense Federal Institute - Campus CaVG and Catholic University of Pelotas. We used the International Addiction Test, Beck Depression Inventory and the Game Addiction Scale (GAS). Proportions were compared by using the chi-square test and stratified analyses.

Results: The prevalence of internet dependency was of 41.7%, those who presented changes in the screen test for depression had 83% more than internet dependency than those who did not present it.

Conclusions: Younger university students presented higher prevalences of internet dependency. There is a significant association with depression.

KEYWORDS

Internet addiction disorder; Internet dependency; Compulsive internet use; Problematic internet use.

Introduction

Internet dependency is characterized by an impulse-control disorder which involves the connected and/or disconnected computer use and presents four basic components: excessive use, negligence of hygiene care, food and family life; abstinence, when the user is not able to go online he/she presents unrest, aggressiveness, anxiety and/or depression; tolerance, where the individual increasingly needs a faster internet to keep the same satisfaction¹⁻³.

There is no consensus concerning the disorder diagnosis and the use of the terms which define internet dependency: problematic internet use, internet dependency and internet dependency disorder are the most used ones⁷. Most of the national studies use convenience samples, making it more difficult to establish the causal relationships⁸⁻¹⁰.

In Europe the prevalence of internet dependency between adolescents ranges between 1% to 18.3%¹¹⁻¹⁴. In the United States, the prevalence of internet dependency ranges from 9.8% to 26.3%¹⁵⁻¹⁷. In Asia it ranges from 13.7% to 26.7%¹⁸⁻²⁰.

The main factors associated to internet dependency investigated were poor academic performance, sleep disorders, musculoskeletal disorders, loneliness, depression^{21,23} and anxiety^{1,3,5,23}. Regarding depression, there is still no consensus which establishes its role in the etiology of internet dependency, that is, it is not known whether they have become dependent due to previous depression which led to isolation, or if these dependent individuals would feel more comfortable due to the anonymity of the net, then later developing depression^{3,21}.

Adolescents and young adults, specially university students, are the most vulnerable to the disorder^{22,24,25}, due to their easier access to the internet. Internet dependency is already considered a public health problem in Asian countries^{26,27} such as China, Korea and Singapore and in Europe there is some concern from the governments with the prevention of internet dependency through counseling at schools and clinics for virtual dependent individuals³.

The purpose of this study was to check the prevalence of internet dependency and associated factors between university students from two educational institutions, a public and a private one, and from a Federal Institute in the city of Pelotas, RS, Brazil.

Methods

Cross-sectional study carried out at three higher education institutions, two public (Federal University of Pelotas and Sul-riograndense Federal Institute - Campi CaVG) and a private one (Catholic University of Pelotas). The identification of the courses of each university/institute which would take part in the sample was carried out as well as the random drawing of those for the inclusion in the study. Students from the first and second term of the courses selected were included, with the exclusion of students under 18 and those who were not in class at the moment of picking up. At the Federal University of Pelotas the courses of Medicine, Law, Agronomy, Computer Science, Nursing, Gastronomy, Nutrition, Industrial Chemistry, Occupational Therapy, Psychology and Geography were included. At the Catholic University of Pelotas the courses of Medicine, Law, Physiotherapy, Computer Science, Dentistry, Journalism, Architecture, Accounting, Psychology and Administration were included and at the Sul-rio-grandense Federal Institute, the students from the Physics, Biological Sciences, Chemistry Degrees and Technology in Fashion Design participated.

According to the number of freshman students at each public institution estimated through the High School National Exam, a proportional calculation was made to the number of students per institution to be included in the study. At the private institution, the number of freshman students was estimated through the selective process from the institution carried out in the year of 2015. In order to investigate the associations with a power of 80% and level of significance of 5%, adding 10% for denials and 15% for confounding factors, 1,023 students would be necessary.

Data collection was carried out by two researchers through anonymous self-applicable surveys with open and closed questions between August 2016 and March 2017.

In order to rank individuals with internet dependency we used the Internet Addiction Test (IAT)²⁸. It has a likert scale of self-filling with 20 items ranging from one (rarely) to five (always), making up a total of 100 points. The higher the score, the more serious the dependency. If the individual scored up to 30 points, he/she will be considered as normal, from 31 to 49, he/she will be mildly dependent, from 50 to 79 he/she will be moderately dependent and above 80, he/she will be

seriously dependent. This instrument was validated in Brazil ($\alpha=0.85$) and recent validation for the Portuguese language was also carried out by Pontes et al, with excellent internal consistency ($\alpha=0.90$)²⁹. The students who scored above 30 were considered as dependent.

In order to rank the students as electronic game dependent or at risk of dependency, we used the Game Addiction Scale (GAS)³⁰. In its validation, the instrument presented high reliability ($\alpha > 0.92$). It involves 10 items and five dimensions (salience, mood swings, tolerance, conflict and time restrictions). Each dimension has two questions, assessed through a likert scale of four points, ranging from one (never) to four (very often). To be considered as game dependent the individual should respond often or very often to at least one question of any dimension and if he/she is dependent in three dimensions besides the one which assesses conflict, the individual will be at risk due to the dependency behavior. It is worth mentioning here that the concept of risk is inherent to the instrument and not to the study design.

To assess physical activity we used the International Physical Activity Questionnaire (IPAQ)³¹ – short version, validated in Brazil ($\alpha=0.74$), to verify the practice of physical activity in adolescents, of both genders and above 14 years old. It has eight questions concerning the time spent weekly in different activities such as: walking, moderate physical activity and vigorous physical activity. It is considered active the individual with more than 150 minutes a week of physical activities in the free time and/or commuting and sedentary the one who did not perform any physical activity for at least 10 continuous minutes a week.

Body Mass Index (BMI) was calculated by dividing the weight in kg by the height, in meters, squared (kg/m^2). Such measures were reported by the interviewees. We used the cut-off points from the World Health Organization³², considering as undernourished the students with BMI lower than 18.5 eutrophic from 18.5 to 24.99 overweight from 25 to 29.9 and obese those with BMI above 30.

For sleepiness assessment we used the Epworth Sleepiness Scale³³, a likert scale of four points, ranging from zero (no chance of sleep) to three (high chance of sleep), which comprises eight everyday situations where the user has the possibility of sleeping or falling asleep, making up a total of 24 points. It was validated for use in Brazil with adequate internal consistency ($\alpha=0.76$). The individuals who presented a score higher than 10 were considered with daytime sleepiness.

For socioeconomic classification we used the criteria from the Brazilian Association of Research Companies (ABEP)³⁴, in which the participants were ranked in classes A, B₁, B₂, C₁, C₂, D-E. In this study, the classes were grouped in A, B₁, B₂ and C/D/E.

Depression was assessed using the Beck Depression Inventory (BDI)³⁵, a self-assessment instrument with 21 items, with score from zero to three, with total maximum score of 63 points, already validated in different countries and in Brazil ($\alpha=0.81$). A cut-off point of 12 points was used to classify the students with depressive symptoms.

The intake of high calorie foods such as sweets and fried food and the use of alcoholic beverages was investigated through the “Ten steps for healthy eating”³⁶. We collected information regarding the intake of sweets and fried food during the week (ranging from rarely or never / less than twice a week / two to three times a week / four to five times a week and everyday). Concerning the intake of alcohol the instrument categorized the frequency in: daily / once to six times a week / casually or rarely (less than four times a month) and no intake. In terms of smoking, we investigated the presence of the habit of currently smoking.

The data were double-entered in the Epi-info program and analyzed through the SPSS 21.0 (Statistical Package for Social Sciences) program. The sample characteristics sample were described and bivariate analyses were carried out to test the hypothesis of the study, considering an alpha error of 0.05 and a beta error of 0.20. The chi-square test was used for heterogeneity for nominal varieties and of linear tendency for ordinal variables.

All the students who accepted to participate signed an Informed Consent Form. The students with the changed screen tests were taken to the ambulatories of the researched institutions for assessment. The study was approved by the Ethics Committee of the Catholic University of Pelotas under number 56053616.2.0000.5339.

Results

1,029 university students were interviewed. 60% were female and 81% were white. The average age was 23 years old and four in ten interviewees were below 20 years old. Concerning the socioeconomic classification, 38% belonged to class A and 18% belonged to classes C, D and E. About 40% of the students had a monthly family income of up to US\$ 434 and 65.66% studied at a public university (Table 1).

About one third of the interviewees were overweight (32%) and 12% were sedentary. The use of alcoholic beverages once to six times a week was referred to by 22% of the students and 10% were smokers. Regarding eating habits, it has been noticed that 30% of the sample reported daily intake of sweets and 42% mentioned using fried food twice to five times a week. According to the Beck scale, 19% of the university students presented some form of depression (Table 2). The great majority used the cell phone to get connected (80%) and 65% used to be connected up to five hours a day. Concerning the sites used while surfing on the internet, 78% of the students mentioned the use of social networks for entertainment, such as facebook, twitter and chat rooms. Almost one third of the students presented daily sleepiness and 3% presented a risk of game dependency (Table 3).

According to the cut-off point used, the prevalence of internet dependency was of 41.7% (IC95% 38.6%-44.8%): 337 students scored between 30 to 49 (mild dependency – 34.2%) and 74 scored between 50 and 79 (moderate dependency – 7.5%).

There was no difference in internet dependency concerning gender ($p=0.372$), skin color ($p=0.173$), socioeconomic classification ($p=0.407$), family income ($p=0.670$) and belonging to either a public or private institution ($p=0.735$) (Table 1). In the same way, no differences were observed concerning BMI ($p=0.052$) and smoking ($p=0.601$) (Table 2), as well as the devices used for connection ($p=0.545$) (Table 3).

The older the students, there was a significantly lower prevalence of internet dependency ($p=0.000$), in which the university students aged under 20 were almost twice more dependent than the ones above 25 years old (RP=1.96; IC95% 1.47-2.60) (Table 1).

The students ranked as sedentary had higher prevalences of internet dependency than the active ones (RP=1.44; IC95% 1.15-1.81) (Table 2). The higher the frequency of alcohol use, the higher the prevalence of internet dependency ($p=0.000$). Concerning the intake of highly caloric food, a linear association between the intake of sweets ($p=0.000$) and fried foods ($p=0.001$) and internet dependency was noticed (Table 2). According to the BDI scale, the students who presented depression had 83% more internet dependency than those who did not (RP=1.83; IC95% 1.58-2.12) (Table 2).

Concerning the purpose for using the net (sites), it was noticed that 46% of those who used the network as entertainment were internet dependent, in which this dependency was of only 26% among those who used it for researching or studying ($p=0.000$) (Table 3). The higher the number of daily hours online, the higher the internet dependency, in which the students who used the internet for more than twelve hours a day were 2,6 times more dependent than those who used it for up to five hours ($p=0.000$). A statistically significant relationship between internet dependency and the presence of daily sleepiness and game dependency was found, both with $p=0.000$ (Table 3).

Because of the potential confounding effect of age on the relationship between internet dependency and sedentarism, the intake of alcohol, sweets, fried foods and depression, a stratified analysis was carried out for these variables. For none of them this effect was confirmed, therefore a reason for which it was not necessary to carry out adjusted analyses.

Table 1. Sample description, prevalence of internet dependency (ID) and prevalence ratios according to sociodemographic variables and the type of university. Pelotas, RS, 2016.

	n (%)	ID (%)	PrevalenceRatio (IC95%)	p-value
Gender (n=1,025)				0.372#
Female	614 (59.9)	40.6	1.00	
Male	411 (40.1)	43.7	1.08 (0.93-1.25)	
Age (years) (n=1,020)				0.000##
18 to 19	421 (41.3)	46.7	1.96 (1.47-2.60)	
20 to 25	415 (40.7)	45.0	1.89 (1.42-2.51)	
26 and more	184 (18.0)	23.9	1.00	
Skin color (n=1,020)				0.173#
White	826 (81.0)	40.6	1.00	
Other	194 (19.0)	46.3	1.14 (0.96-1.36)	
Economic class – ABEP* -(n=921)				0.407##
A	350 (38.0)	46.8	1.11 (0.89-1.37)	
B1	167 (18.1)	31.3	0.74 (0.55-0.99)	
B2	238 (25.8)	42.6	1.01 (0.80-1.28)	
C / D/ E	166 (18.0)	42.2	1.00	
Per capita family income (USD) (n=1,003)				0.670##
2.610.45 to 6.086.12	47 (4.7)	43.5	1.21 (0.81-1.81)	
1.329.10 to 2.610.44	160 (16.0)	46.3	1.29 (0.96-1.72)	
723.25 to 1.329.09	179 (17.8)	35.6	0.99 (0.73-1.35)	
434.42 to 723.24	223 (22.2)	42.5	1.18 (0.89 -1.56)	
192.15 to 434.14	265 (26.4)	45.7	1.27 (0.97-1.66)	
Until 191.85	129 (12.9)	36.0	1.00	
University (n=1025)				0.735#
Private	353 (34.4)	40.9	1.00	
Public	672 (65.6)	42.3	1.03 (0.88-1.21)	
* Brazilian Association of Studies and Research				
# p-value of heterogeneity				
## p-value of linear tendency				

Table 2. Sample description, prevalence of internet dependency (ID) and prevalence ratios according to behavioral and health situation variables. Pelotas, RS, Brazil, 2016.

	n (%)	ID (%)	PrevalenceRatio (IC95%)	p-value
Anthropometric situation – BMI* (n=981)				0.052##
Undernourishment	27 (2.8)	55.6	1.44 (0.94-2.21)	
Eutrophia	638 (65.0)	43.1	1.12 (0.84-1.47)	
Overweight	224 (22.8)	35.9	0.93 (0.68-1.28)	
Obesity	92 (9.4)	38.6	1.00	
Physical activity – IPAQ** (n=977)				0.002##
Active	357 (36.5)	36.2	1.00	
Irregularly active	502 (51.4)	43.2	1.19 (1.00-1.42)	
Sedentary	118 (12.1)	52.2	1.44 (1.15-1.81)	
Frequency of alcohol use (n=1.009)				0.000##
Daily	27 (2.7)	51.7	1.83 (1.21-2.78)	
1 to 6 times a week	225 (22.3)	46.6	1.49 (1.18-1.89)	
Less than 4 times a month	514 (50.9)	44.2	1.42 (1.14-1.75)	
Never	243 (24.1)	31.2	1.00	
Currently smoking (n=1.026)				0.601#
Yes	102 (9.9)	44.8	1.08 (0.85-1.37)	
No	924 (90.1)	41.4	1.00	
Sweets intake				0.000##
Never / rarely	427 (42.1)	34.9	1.00	
2 to 5 times/week	279 (27.5)	44.9	1.29 (1.07-1.55)	
Daily	308 (30.4)	48.6	1.39 (1.17-1.66)	
Fried food intake				0.001##
Never / rarely	510 (50.4)	35.7	1.00	
2 to 5 times/week	421 (41.6)	48.1	1.35 (1.15-1.58)	
Daily	80 (7.9)	46.7	1.31 (1.00-1.71)	
Depression – BDI*** (n=923)				0.000#
No	750 (81.3)	35.6	1.00	
Yes	173 (18.7)	65.1	1.83 (1.58-2.12)	
* Body Mass Index				
**International Physical Activity Questionnaire				
***Beck Depression Inventory				
#p-value of heterogeneity				
##p-value of linear tendency				

Table 3. Sample description, prevalence of internet dependency (ID) and prevalence ratios according to daily connection time, devices and sites used, risk of game dependency and daily sleepiness. Pelotas, RS, Brazil, 2016.

	n (%)	ID (%)	Prevalence Ratio (IC95%)	p-value
Daily connection time (n=1,025)				0.000##
Up to 5 h	670 (65.4)	28.9	1.00	
6 to 12 h	288 (28.1)	63.2	2.19 (1.88-2.54)	
More than 12 h	67 (6.5)	75.8	2,63 (2.18-3.16)	
Devices (n=1,016)				0.545#
Cell phone	815 (80.2)	41.2	1.54 (0.67-3.59)	
Notebook	122 (12.0)	42.9	1.61 (0.68-3.82)	
Desktop	63 (6.2)	46.7	1.75 (0.72-4.23)	
Tablet / other	16 (1.6)	26.7	1.00	
Sites(n= 1,026)				0.000#
Entertainment*	797 (77.7)	46.0	1.76 (1.39-2.23)	
Research	229 (22.3)	26.1	1.00	
Risk of game dependency** (n=974)				0.000#
No	944 (96.9)	40.5	1.00	
Yes	30 (3.1)	88.5	2.18 (1.86-2.56)	
Daily sleepiness – ESS***(n= 919)				0.000##
No	642 (69.9)	37.6	1.00	
Mild	209 (22.7)	54.2	1.44 (1.23-1.70)	
Moderate	54 (5.9)	56.9	1.51 (1.17-1.96)	
Severe	14 (1.5)	38.5	1.02 (0.51-2.05)	
*Facebook, twitter and chat rooms				
**Game Addiction Scale				
***Epworth Sleepness Scale				
#p-value of heterogeneity				
##p-value of linear tendency				

Discussion

Internet dependency presents very broad prevalences, depending on the types of instruments used in the researches and on the methodology applied. In the present study we found a prevalence of internet dependency of 41.7%, considered high in relation to national studies most likely due to the cut-off point used. Brazil has 107,9 million internet users, corresponding to 61% of the population aged 10 years-old or more. However, there are still inequalities in the access to the internet. 59% of residences in urban areas have access to the internet while in rural areas the percentage is only 26%³⁷. Regarding socioeconomic classification, 23% of the classes D/E residences are connected to the internet, contrasting to 98% in class A and 91% in class B³⁷. Due to these inequalities, it was believed that the prevalence of internet dependency would be higher in populations of higher socioeconomic classes, a fact which was not confirmed in this sample.

Studies refer that the male gender presents higher prevalences of internet dependency^{46,47}. However, in this study there was no difference between the genders. A similar result occurred in a cross-sectional study carried out with 3,557 freshman students at a university in northwest China, with the same instrument (IAT) and in which a prevalence of 6.6% in males 6.1% in females was found³⁰.

In terms of age, it was noticed that the younger the students, the higher the prevalence of internet dependency. Some studies reveal that the brain of an adolescent presents difficulties to control the time of internet use due to the immaturity of the pre frontal lobe, making it more difficult to control the impulses^{40,51}.

The higher the prevalence of internet dependency, the higher the frequency of intake of highly caloric foods with inadequate nutritional value. In this sample we identified a high intake of sweets and fried foods among students who are internet dependent (Table 2). The internet dependent individuals end up eating in front of the screens⁵³, eating more fast food, sweets, fried foods and snacks. This intake of high-calorie and industrialized food, with high salt content, may cause serious damages to their health, propitiating the emergence of overweight individuals⁴⁷.

It is worth mentioning the high prevalence of weight excess and obesity in this sample, 22.8% and 9.4% respectively. A similar study involving 15,746 university students in 22 emerging countries⁵² found a prevalence of weight excess of 22%, where the countries with higher income presented higher prevalences, which was not confirmed in the present study.

A cross-sectional study in Japan⁵⁴ with 100,050 students found a linear association between the use of alcohol and problematic internet use. Those who presented higher frequency of drink intake had higher prevalences, which was also noticed in the present study.

Public policies are necessary to guide students to adopt healthy eating habits through the availability of nutritious food at campi cafeterias and also guide them concerning the practice of physical activity and the hazards caused by the intake of alcohol and smoking.

Depression is considered, according to some authors, as a predisposing factor to enter into the virtual world in an uncontrolled way, leading to some isolation of the individual in the internet. However, there is some controversy in literature if depression is the cause or the consequence of internet dependency^{3,21,25-27,38,41,43,44}. In the present study this association was also registered, with the controversy remaining due to the design.

Connection time is not considered an essential factor for the diagnosis of internet dependency as, in order to classify the individual as dependent, it is necessary to occur some losses in his/her social, academic life and/or at work^{22,39,40}. A study carried out at 12 universities from Taiwan revealed that internet addicted students spend three times as much time online than non-addicted ones and this time online is spent in entertainment in sites as dating sites, games and e-mail sending⁴².

Studies mention the problematic internet use is higher in individuals who use it for playing, send instant messages and social networks^{3,25,45,50}. In the present study 80% of the students used the social networks for entertainment, a result similar to the one found in the Research of Technology of Information and Communication (TIC residences 2016)³⁷, where almost half of the students who used the internet as entertainment were internet dependent.

An association between the risk of games dependency and internet dependency was noticed. A similar result was found in a cross-sectional study in Hong Kong, where online game users presented an increased risk of developing internet addiction³⁶.

In the present sample we observed an association between daily sleepiness and higher prevalences of internet dependency. Some studies mention that the internet dependent presents changes in sleep standards, with a decrease in the quality of sleep and the presence of daily sleepiness, which ends up causing academic losses and/or at work for these young adults^{48,49}.

The study presents some limitations related to cross-sectional studies such as: memory bias of the interviewees, which could harm the accuracy of their answers, and the self-filling of the questionnaires, which may lead to a misdiagnosis of internet dependency. The lack of national studies on the theme, the use of different cut-off points for diagnosis and the non-standardization of instruments used may increase the difficulty to compare the findings.

It is concluded that internet dependency is a reality amongst freshman university students in Pelotas, RS, Brazil, and other studies which approach this problem are of key importance so that a disorder diagnosis can be established as well as an adequate treatment for these youngsters. The strong association with depression, coupled with its high prevalence, should be a reason for concern for health and education professionals and should be present in the public policies agenda to prevent this grievance.

References

- Ko CH, Yen JY, Chen CS, Yeh YC, Yen CF. Predictive values of psychiatric symptoms for internet addiction in adolescents: a 2- year prospective study. *Arch Pediatr Adolesc Med* 2009; 163:937-943.
- Beard KW, Wolf EM. Modification in the proposed diagnostic criteria for internet addiction. *Cyberpsychol Behav* 2001; 4:377-383.
- Young KS, Abreu CN. (2011). Dependência de internet: manual e guia de avaliação e tratamento. Porto Alegre: Artmed.
- Goldberg I. (1996). Internet addiction disorder.
- Young KS. Internet addiction: The emergence of a new clinical disorder. *Cyberpsychol Behav* 1998; 1:237-244.
- Griffiths MD. Does internet and computer "addiction" exist? Some case study evidence. *Cyberpsychol Behav* 2000; 3:211-218.
- Shapira NA, Lessig MC, Goldsmith TD, Szabo ST, Lazoritz M, Gold MS, Stein DJ. Problematic internet use: Proposed classification and diagnostic criteria. *Depress Anxiety* 2003; 17:207-216.
- CIN ICTPD. Dependência de internet: um estudo com estudantes e profissionais da área de TI em Belo Horizonte [dissertação]. Belo Horizonte: Faculdade Novos Horizonte; 2013.
- Abreu, C. N. D., Karam, R. G., Góes, D. S., & Spritzer, D. T. Internet and videogame addiction: a review. *Rev Bras Psiquiatr* 2008; 30: 156-167.
- Suzuki, F. T. I., Matias, M. V., Silva, M. T. A., & Oliveira, M. P. M. T. D. The use of video, computer and internet games by a sample of college students from the University of São Paulo. *J Bras Psiquiatr* 2009; 58:162-168.
- Polli R, Agrimi E. Internet addiction disorder: Prevalence in an Italian student population. *Nord J Psychiatry* 2012; 66:55-59.
- Tsitsika Artemis, et al. "Internet use and misuse: a multivariate regression analysis of the predictive factors of internet use among Greek adolescents." *Eur J Pediatr* 2009; 168: 655-665.
- Ferraro G, Casi B, D'Amico A, Blasi M. Internet addiction disorder: an Italian study. *Cyberpsychol Behav* 2007; 10:170-175.
- Bakken I. J., Wenzel H. G., Gøtestam, K.G., Johansson A., & ØREN, A. Internet addiction among Norwegian adults: a stratified probability sample study. *Scandinavian journal of psychology* 2009; 50: 121-127.
- Anderson KJ. Internet use among college students: An exploratory study. *J Am Coll Health* 2001; 50:21-26.
- Moreno Megan A., et al. "Problematic internet use among US youth: a systematic review." *Archives of pediatrics & adolescent medicine* 2011; 165:797-805.
- Fortson BL, Scotti JR, Chen YC, Malone J, Del Ben KS. Internet use, abuse, and dependence among students at a southeastern regional university. *J Am Coll Health* 2007; 56(2):137-44.
- Cao F, Su L. Internet addiction among Chinese adolescents: prevalence and psychological features. *Child Care Health Dev* 2007; 33:275-281.
- Yang SC, Chieh-Ju T. Comparison of Internet addicts and non-addicts in Taiwanese high school. *Computers in Human Behavior* 2007; 23:79-96.
- Ni X, Yan H, Chen S, Liu Z. Factors influencing internet addiction in a sample of freshmen university students in China. *Cyberpsychol Behav* 2009; 12:327-330.
- Orsal O., Unsal, A., Ozalp, SS. Evaluation of internet addiction and depression among university students. *Procedia-Social and Behavioral Sciences* 2013; 82:445-454.
- Kubey Robert W., Michael J. Lavin, and John R. Barrows. Internet use and collegiate academic performance decrements: Early findings *Journal of communication* 2001; 51: 366-382
- Caplan SE. Preference for online social interaction: A theory of problematic Internet use and psychosocial well-being. *Communication Research* 2006; 30:625-648.
- Caplan SE. Relations among loneliness, social anxiety, and problematic Internet use. *Cyberpsychol Behav* 2006; 10:234-242.
- Kuss Daria J., Griffiths MD, Jens F. Binder. Internet addiction in students: Prevalence and risk factors. *Computers in Human Behavior* 2013; 29: 959-966.
- Shek DTL, You L. Internet addiction phenomenon in early in adolescents in Hong Kong. *Scientific World Journal* 2012. [Internet]. 2012 [cited 2014 Dez 10]. Available from: <https://www.hindawi.com/journals/tsvj/2012/104304>.
- Kim K, Ryu E, Chon MY, Yeun EJ, Choi SY, Seo JS, Nam BW. Internet addiction in Korean adolescents and its relation to depression and suicidal ideation: a questionnaire survey. *Int J Nurs Stud* 2006; 43:185-192
- Conti, M. A., Jardim, A. P., Hearst, N., Cordás, T. A., Tavares, H., & Abreu, C. N. D. Evaluation of semantic equivalence and internal consistency of a Portuguese version of the Internet Addiction Test (IAT). *Archives of Clinical Psychiatry (São Paulo)* 2012; 39: 106-110.
- Pontes, H. M., Patrão, I. M., & Griffiths, M. D. Portuguese validation of the Internet Addiction Test: An empirical study. *Journal of Behavioral Addictions* 2014; 3(2):107-114.
- Lemos IL, Conti MA, Sougey EB. Avaliação da equivalência semântica e consistência interna da Game Addiction Scale (GAS): versão em português. *J. bras. Psiquiatr* 2015; 64:8-16.
- Matsudo S, Araújo T, Matsudo V, Andrade D, Andrade E, Oliveira L, Braggion G. Questionário Internacional de Atividade Física (IPAQ): estudo de validade e reprodutibilidade no Brasil. *Revista Atividade Física & Saúde* 2001; 6:5-18.
- World Health Organization. Obesity: preventing and managing the global epidemic. Report of a World Health Organization Consultation. Geneva: World Health Organization, 2000. p. 256. WHO Obesity Technical Report Series, n. 284.
- Bertolazi, A. N., Fagundes, S. C., Hoff, L. S., Pedro, V. D., Barreto, M., Saldanha, S., & Johns, M. W. (2009). Portuguese-language version of the Epworth sleepiness scale: validation for use in Brazil. *J Bras Pneumol* 2009; 35: 877-83.
- ABEP. Associação Brasileira de Empresas de Pesquisa; 2014. [acesso em 11 fev 2015]. Disponível em: <http://www.abep.org>.
- Gorenstein C, Andrade LHS. Inventário de depressão de Beck: propriedades psicométricas da versão em português. *RevPsiqClin* 1998; 25:245-50.
- Ministério da Saúde (Brasil). Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Guia alimentar para a população brasileira. 2. ed. Brasília: Ministério da Saúde, 2014. [acesso em 7 set 2015]. Disponível em: <http://dab.saude.gov.br/portaldab/>.
- CETIC. Pesquisa sobre o uso das tecnologias de informação e comunicação nos domicílios brasileiros [livro eletrônico]: TIC domicílios 2016. São Paulo: Comitê Gestor da Internet no Brasil, 2017. [cited 2017 Mai 8]. Available from: http://data.cetic.br/cetic/explore?idPesquisa=TIC_DOM.
- Young K. Diagnosis and treatment considerations. *J Contemp Psychother* 2009; 39:241-246.
- Kuss DJ., et al. "Internet addiction in adolescents: Prevalence and risk factors." *Computers in Human Behavior* 2013; 29:1987-1996.
- Widyanto L. Griffiths MD. Internet addiction: a critical review. *Int J of Ment Health Addict* 2006; 4:31-51.
- Kuss DJ., Griffiths MD., Karila L., Billieux J. Internet addiction: a systematic review of epidemiological research for the last decade. *Current pharmaceutical design* 2014; 20:4026-4052.
- Chou C, Ming-Chun H. Internet addiction, usage, gratification, and pleasure experience: the Taiwan college students' case. *Computers & Education* 2000; 35:65-80.
- Morrison, C. M., & Gore, H. The relationship between excessive Internet use and depression: a questionnaire-based study of 1,319 young people and adults *Psychopathology* 2010; 43:121-126.
- Young K. S., Rogers R. C. The relationship between depression and Internet addiction. *CyberPsychology & Behavior* 1998; 1:25-28.
- Caplan SE, Williams D., Yee, N. Problematic internet use and psychosocial well-being among MMO players. *Computers in Human Behavior* 2009; 25:1312-1319.
- Tsai, Hsing Fang, et al. "The risk factors of Internet addiction: a survey of university freshmen." *Psychiatry research* 2009; 167:294-299.
- Tsitsika, Artemis K., et al. "Association between problematic internet use, socio-demographic variables and obesity among European adolescents. The European Journal of Public Health 2016:617-622.
- Cheng, Shu Hui, et al. A study on the sleep quality of incoming university students. *Psychiatry research* 2012; 197: 270-274.
- Choi, Kwisook, et al. "Internet overuse and excessive daytime sleepiness in adolescents. *Psychiatry Clin Neurosci* 2009; 63.4: 455-462.
- Griffiths, Mark D., Mark NO Davies, and Darren Chappell. "Online computer gaming: a comparison of adolescent and adult gamers." *J Adolesc* 2004; 24: 87-96.
- Yuan, Kai, et al. Microstructure abnormalities in adolescents with internet addiction disorder. *PLoS one* 6.6 2011: e20708.
- Peltzer K, Pengpid S, Samuels TA, Ozcan NK, Mantilla C, Rahamefy OH, et al. Prevalence of overweight/obesity and its associated factors among university students from 22 countries. *Int. J. Environ. Res Public Health* 2014; 11:7425-7441.
- Oliveira, Juliana Souza, et al. ERICA: uso de telas e consumo de refeições e petiscos por adolescentes brasileiros. *Rev Saude Publica* 2016; 50: 7s.
- Morioka H, Itani O, Osaki Y, et al. The association between alcohol use and problematic internet use: A large-scale nationwide cross-sectional study of adolescents in Japan. *Journal of Epidemiology* 2017; 27:107-111.