

Prevalence and Related Factors of Cyber Addiction among Moroccan University Students

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Abstract

Original Research Article

Background: Internet addiction may be a major health problem among students. Indeed, its prevalence is higher than that found in the general population. **Aim:** to assess the prevalence of cyberaddiction as well as the factors associated with cyberaddiction in a sample of Moroccan university students. **Methods:** We used an online questionnaire including sociodemographic and clinical data, the Internet Addiction Test (IAT), the Rosenberg Self-Esteem Scale and the Hospital Anxiety and Depression Scale (HADS). **Statistical analysis:** IBM's Statistical Package for Social Sciences (SPSS) for Windows, version 26. **Results:** The current prevalence of cyberaddiction among students was 30.9%, with no significant difference according to gender. A younger age, long duration of internet use ($p < 0.001$), activities of social media ($p < 0.01$) and the video game ($p < 0.03$) were the correlated with cyberaddiction. On the other hand, a significant association was found between internet addiction and high levels of depression and anxiety ($p < 0.001$), as well as with low self-esteem ($p < 0.001$). Furthermore, a statistically significant association was found between internet addiction and high levels of depression and anxiety ($p < 0.001$), as well as with low self-esteem ($p < 0.001$). **Conclusion:** The study suggests an association between young age, long duration of Internet use and the risk for developing cyberaddiction. Depressive and anxiety levels, low self-esteem, are also associated with cyberaddiction. The study suggests that considering the high prevalence of this kind of addiction, an awareness and prevention programme for cyberaddiction is needed among this student population.

Keywords: Cyberaddiction, internet use, students, prevalence, depression.

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INTRODUCTION

The Internet become a basic tool for commerce, leisure, communication, as well as education in the contemporary world. Nevertheless, several of its characteristics, including the speed of the information traffic, its content, the availability of a free, varied and unlimited number of social networks without geographical barriers, contribute to its addictive potential [1]. The concept of non-substance addictions began in the 1970s, but was not introduced into the Diagnostic and Statistical Manual until the 5th version, when pathological gambling was officially included in the category of addictive behaviors [2, 3]. Internet Addiction was defined by Kimberly Young in 1996 at the American Psychological Association's annual conference as a new new disorder characterized by the difficulty to control one's impulses, the inability to disconnect from the Internet, and whose clinical picture is similar to compulsive gambling [4]. Indeed, Internet addiction is characterized by excessive or poorly

controlled preoccupations, impulses or behaviors concerning computer use and Internet access leading to significant distress [5]. The consequences are physical, psychological and social, and as with other addictions, it causes functional and structural brain changes [6]. Young populations, particularly students, are the most affected by excessive internet use, and are at the highest risk of developing an internet addiction [7-9]. Prevalence differs widely across studies, but the largest numbers are in younger populations [10-15]. The objective of our study was to assess the prevalence of Internet addiction among students at Hassan II University in Casablanca, to define the profile of students with Internet addiction, and to determine the different factors associated with Internet addiction.

MATERIAL AND METHODS

Our study was conducted among students of Hassan II University of Casablanca. The survey was conducted using an online questionnaire on social

networks, during a period of four months, from February to May 2021. The sample included students from the different faculties and institutes of Hassan II University. The overall number of students at the university was 127026. We used the convenience sampling method. All Moroccan students from Hassan II University who agreed to participate in the study were included. Graduate students from other faculties or schools outside of Hassan II University and foreign students were excluded. Data were collected using a self-administered questionnaire developed with Google Forms, for its easy and free access, and for its common use in creating online surveys and questionnaires. After being tested by a few students, it was finally published on the social network Facebook in the various private student groups reserved for each institution of Hassan II University. At the beginning, a section explained the objectives of the study and the confidentiality guarantee. A total of 1026 responses were collected, 220 were excluded because they did not meet the inclusion criteria. Thus 806 questionnaires were analysed.

The questionnaire included:

- Sociodemographic features: age, gender, nationality, marital status, city of study, institution of higher education, level of study, and place of residence.
- Clinical data included medical and psychiatric history, including history of psychotropic medication use by the participant.
- Internet use: including the average amount of time spent online per day, the most frequent internet use, the most used activity on the net, the student's sense of addiction, and the availability of the internet in the student's room.
- Internet Addiction Test (IAT): The Young's IAT is a 12-item questionnaire used to measure dependence on Internet use. These items examine the degree of dependence on Internet use on a Likert scale ranging from 1 (rarely) to 5 (always). Scores on this scale range from 0 to 60, and a cut-off score of 36 is used to classify Internet addiction [9].
- The Rosenberg Self-Esteem Scale: A 10-item scale that measures global self-worth by measuring both positive and negative feelings about the self. The scale is believed to be uni-dimensional. All items are answered using a 4-point Likert scale format ranging from strongly agree to strongly disagree. [18]. Adding up the total score with a maximum of 40 points, we obtain the following results:
 - Very low self-esteem (<25 points);
 - Low self-esteem (25-31 points);
 - Average self-esteem (31-34 points);
 - Strong self-esteem (34-39 points);

- Very high self-esteem (>39 points).
- Hospital Anxiety and Depression Scale (HADS): the HAD scale is an instrument for screening for anxiety and depressive disorders. It includes 14 items rated from 0 to 3.

Seven questions relate to anxiety (total A) and seven others to the depressive dimension (total D), thus making it possible to obtain two scores (maximum score for each score = 21) [19].

In order to detect anxiety and depressive symptoms, the following interpretation can be proposed for each of the scores (A and D):

- 7 or less: no symptomatology
- 8 to 10: doubtful symptomatology
- 11 and more: definite symptomatology.

Statistical Analysis

Statistical analysis was performed using IBM's Statistical Package for Social Sciences (SPSS) for Windows, version 26. Results are considered significant when the p-value is less than 0.05 with a 95% confidence interval.

RESULTS

The final number of our sample was 806. The characteristics of the participants are shown in Table 1.

The prevalence of Internet addiction according to the IAT was 30.9%, of which 72% were female and 28% were male, however there was no statistically significant difference between the two sexes. Internet addiction was correlated with age, with 95% of the students who met the criteria for Internet addiction being under the age of 25. Time on the net exceeding eight hours was correlated with cyberaddiction ($p < 0.001$). Social networking ($p = 0.011$) and online gaming ($p = 0.032$) were the activities most correlated with cyberaddiction. In addition, our study did not find any significant association between housing and type and level of education. 83.5% of the students meeting the criteria for addiction perceived themselves as such even before the test. While somatic history was not correlated with cyberaddiction ($p = 0.949$), psychiatric history was statistically associated with internet addiction ($p < 0.001$). Cyberaddiction was associated with an anxious symptomatology in 55% of the students, 22% had a depressive symptomatology, the statistical analysis allowed to objectify a significant association between cyberaddiction and anxiety and depression ($p < 0.001$). As for self-esteem, 69% of the cyberaddicts had low self-esteem according to the Rosenberg scale, the correlation was statistically significant between the two ($p < 0.001$) (Table 2).

Table 1: Socio-demographic characteristics of respondents (N = 806)

Age (years), mean	21,8 (SD:4.47)
Gender n (%)	
Female	580 (72)
Male	226 (28)
Level of education (%)	
First year	30.5
2 nd year	14.6
3th year	15.9
4th year	10.7
5th year	10.8
6th year	7.1
7th year	10.4
Marital status (%)	
Single	93.9
Married	5.5
Divorced	0,6
Widow	0
Living (%)	
With parents	73.7
Flat sharing	13.6
With family	7.1
Alone	5.6

Table 2: Related factors of cyberaddiction

		No cyberaddiction	Cyberaddiction	P value	
Medical history	Somatic disease	68.8%	31.2%	0.949	
	Psychiatric disorder	55.4% (17.6%=rate of cyberaddicts without a psychiatric history)	44.6%(31.7=rate of cyberaddicts with a psychiatric history)	p<0.001	
Internet use	Daily time spent connected	<4h	85.9%	14.1%	p<0.001
		4-8h	67.7%	32.3%	0.394
		>8h	55.1%	44.9%	p<0.001
	Preferred activity on the net	Social media	66.2%	33.8%	0.011
		Studying	77.2%	22.8%	0.059
		TB shows	78.1%	21.9%	0.082
		Online gaming	50%	50%	0.032
		Movies	66.7%	33.3%	0.836
Music	76.5%	23.5%	0.507		
	Anxiety	48.9%	51.1%	p<0.001	
	Depression	54.6%	45.4%	p<0.001	
	High self esteem	58.8	41.2	p<0.001	
	Low self esteem	83.2	16.8	p<0.001	

Table 3: Prevalence of internet addiction according to some studies

Name of the author	Country	Diagnostic test	Prevalence (%)
Reda <i>et al.</i> , (2006) [22]	Egypt	IAT	0,8
Lu Li <i>et al.</i> , (2018) [17]	China	IAT/YQ-8/YQ-10/CIAS	11,3
Leung (2004) [23]	Hong Kong	YQ-8	37,9
Mellouli <i>et al.</i> , (2018) [24]	Tunisia	IAS	54

DISCUSSION

The aim of our study was to assess the prevalence of cyberaddiction in a sample of Moroccan students, as well as to assess the factors associated with internet addiction. 30.9% of the students in our survey met the criteria for Internet addiction according to the

Internet Addiction Test (IAT). Our results were identical to those found in a recent meta-analysis on the prevalence of Internet addiction among medical students, with a pooled prevalence of 30.1% [20]. This meta-analysis reported heterogeneous results, with significantly lower prevalence rates using the Chen

Internet Addiction Scale (CIAS) than the IAT. Indeed, at the national level, a study conducted on 553 students from 12 universities in 5 Moroccan cities, used the CIAS, found a lower prevalence of 18.6% [21]. The prevalence of cyberaddiction is very disparate across the literature, with varying considerably from one country to another, according to the student sampling and the age of the students evaluated, ranging from 0.8% in a population of adolescents (11-18 years) to 54% in a sample of students whose mean age was 21.8 (Table 3) [17, 22-24]. Internet addiction was correlated with age below 25 years in our study, however gender was not a significant factor. The results are controversial in studies concerning these two parameters [25-30], however the meta-analysis of Zhang *et al.*, had concluded that gender and mean age of students were not significant factors of cyberaddiction. More than eight hours of online time was correlated with a risk of cyberaddiction in our sample. Other studies had confirmed the significant association between high internet connection time and the risk of internet addiction [31, 32]. The activities most correlated with cyberaddiction were social networking and video games. Social networking was significantly associated with internet addiction in the literature [26, 33, 34]. As for online games, their addictive potential seems to be due to the frequency of reward signals [36, 37]. A psychiatric history was significantly associated with cyberaddiction in our study. There is growing evidence that Internet-related addictions have adverse effects on the physical and mental well-being of individuals. A large survey in Norway of individuals aged 16 to 88 years found that attention-deficit/hyperactivity disorder (ADHD), obsessive-compulsive disorder (OCD), anxiety, and depression were associated with addictive social media and video game use [38]. The cyberaddict students in our sample had high levels of anxiety and depression. The association between cyberaddiction and depression and anxiety has been widely reported, in fact whatever the scale used, HADS, DASS and Beck Depression Inventory, depressive rates have been found to be high in populations with cyberaddiction [39-44]. As for the association of cyberaddiction with anxiety, authors have tried to explain cyberaddiction as an avoidance behavior in patients suffering from anxiety [45]. 69% of the students with cyberaddiction had low self-esteem, and it confirms a significant association between low self-esteem and cyberaddiction. Several studies have investigated this topic, and authors have identified low self-esteem as a predictor of Internet addiction. Within hypotheses for explanations for this correlation, the possibility of expressing oneself more easily in the virtual world, in people who have difficulties in this sense in real life, the Internet would also offer these young people a kind of social support allowing them to escape from emotional difficulties [39, 46-48].

CONCLUSION

One third of students had an internet addiction. This risk was associated, in our study, with younger age, longer time on the internet, type of internet activities, especially social networking and video games. Psychiatric comorbidities, particularly high levels of depression and anxiety, were correlated with cyberaddiction. Low self-esteem was also found to be a predictor of cyberaddiction, however the nature of the relationship between these factors and cyberaddiction remains debatable. Our study has limits, including the size of the sample, as well as the inclusion of students from different institutions and fields. In addition to studying prevalence, our work examined factors associated with Internet addiction. However, our work lacked the assessment of other variables associated with the risk of Internet addiction, including sleep disorders, addictive comorbidities both behavioral and substance use disorders, as well as the impact of Internet addiction on students' studies and family life. The choice of the empirical sampling method of convenience and the use of the online self-questionnaire confronts us on the other hand with selection bias. Indeed, this sampling method does not necessarily represent the entire population. In addition, the online survey is intended for people who are connected to the Internet. Students who do not connect or who connect infrequently may be underrepresented. The generalization of the results to the population is therefore to be taken with caution.

What is known about this topic

- Students are a group considered to be at high risk for Internet addiction
- Despite the methodological difficulties in approaching the prevalence of cyberaddiction, the majority of authors agree that there is a significant increase in the current incidence of cyberaddiction among adolescents and young adults
- Cyberaddiction is part of behavioral addictions, which, like substance addictions, are considered chronic pathologies involving the brain circuits of reward, motivation, memory and related circuits.

What this study adds:

- The data from our study are consistent with previous findings in the literature regarding the prevalence of Internet addiction in the student population.
- As with most studies of Internet addiction, long duration of Internet connection, use of social networks and video games were correlated with Internet addiction in our sample.
- Our study confirmed the findings in the literature regarding the correlation between Internet addiction, depression and anxiety, and low self-esteem.
- The literature on cyberaddiction is rich throughout the world, however, at the Maghreb level and particularly in Morocco, few studies have focused on this topic. Thus, our study allows us to remedy

this lack and to encourage other more methodologically advanced studies on more varied populations.

Competing interests: All authors report no conflicts of interest relevant to this paper.

Authors' contributions:

The concept and design of the study were carried out under the supervision of Mohamed Agoub. The bibliographic research and the writing of the article were mainly done by Nisrine Elkabbaj with the contribution of all the authors.

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