

IDENTIFYING INTERNET ADDICTION AMONG NURSING STUDENTS AT THE UNIVERSITY OF PALERMO: A STUDY UTILIZING THE INTERNET ADDICTION TEST

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Abstract. Introduction. The implementation of technology and the internet has brought many benefits, but excessive and uncontrolled use of the internet has raised concerns about the emergence of addictive behaviors. **The aim** of the study was to identify internet addiction among nursing students at the University of Palermo through the use of the Internet Addiction Test (IAT). **Materials and methods.** The study was carried out in April 2024. Its design is cross-sectional. The study population is made up of first, second and third year nursing students at the University of Palermo (Italy) and Supplementary year students. The IAT was administered. An ordered logistic regression was performed, with dependent variable "internet addiction", in order to evaluate the role of the variables of the questionnaire. **Results.** 801 individuals filled out the questionnaire. 9.74% of the sample are "Above average users/Internet use is very intense". The ordered logistic regression shows the statistically significant covariates associated with the IAT: increasing age (aOR = 0.92), male gender (aOR = 2.59), not living with one's family (aOR = 2.86), being single (aOR = 1.96), perceived health status medium (aOR = 2.19) and low (aOR = 13.35), having had sleep disturbances in the last two weeks (aOR = 2.77). **Conclusions.** Due to the increase in information technology availability, more and more individuals have a risky use of the internet which could lead to addiction. Information and training campaigns on the use of the internet and information technologies should be implemented among the general population to increase knowledge of the phenomenon.

Key words: University students, nursing students, Italy, Sicily, internet addiction, internet

ИДЕНТИФИЦИРАНЕ НА ЗАВИСИМОСТ КЪМ ИНТЕРНЕТ СРЕД СТУДЕНТИ ПО ЗДРАВНИ ГРИЖИ ОТ УНИВЕРСИТЕТА В ПАЛЕРМО: ПРОУЧВАНЕ С INTERNET ADDICTION TEST

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Резюме. Въведение. Внедряването на технологиите и интернет донесе много ползи, но прекомерното му и неконтролирано използване поражда опасения относно появата на зависимо поведение. **Целта** на проучването беше да се идентифицира зависимостта към интернет сред студентите по здравни грижи в Университета в Палермо чрез използването на Internet Addiction Test (IAT). **Материал и методи.** Проучването е проведено през април 2024 г. Дизайнът на изследването е срезов. Извадката се състои от студенти по здравни грижи в първи, втори и трети

курс и незавършили студенти в Университета в Палермо (Италия). Приложен е тест за зависимост към интернет (IAT). Проведена е логистична регресия със зависима променлива „зависимост към интернет“, за да се оцени ролята на променливите от въпросника. **Резултати.** 801 души попълниха въпросника. 9,74% от тях са „Потребители над средното/Интернет употребата е много интензивна“. Логистичната регресия показва статистически значимите коварианти, свързани с IAT: по-висока възраст (aOR = 0,92), мъжки пол (aOR = 2,59), неживеене със семейството (aOR = 2,86), живеещ без партньор (aOR = 1,96), възприятие за собственото здравословно състояние като средно (aOR = 2,19) и ниско (aOR = 13,35), нарушения на съня през последните две седмици (aOR = 2,77). **Заключение.** Поради увеличаването на достъпността на информационните технологии все повече и повече хора използват интернет рисковно, което може да доведе до зависимост. Необходимо е провеждането на информационни и обучителни кампании за използването на интернет и информационните технологии сред общата популация, за да се повиши познаването на явлениято.

Ключови думи: студенти, студенти по здравни грижи, Италия, Сицилия, зависимост към интернет, интернет

INTRODUCTION

In modern society, the pervasive integration of internet has revolutionized communication, access to information and various aspects of daily life. The implementation of this technology has brought many benefits but the excessive and uncontrolled use of the internet has raised concerns about the emergence of addictive behaviors, particularly among vulnerable populations such as University students [1]. Among these, nursing students represent a group that may be particularly susceptible to internet addiction due to high levels of stress, academic demands, and reliance on digital resources for learning and communication [2].

Internet addiction, characterized by compulsive and excessive use of the internet that leads to impairment or distress, has become a topic of growing interest among researchers and mental health professionals [3]. Numerous studies have linked internet addiction to a variety of negative outcomes, including poor academic achievement, social isolation, and mental health disorders such as depression and anxiety [2]. Recognizing the potential impact of internet addiction on nursing students' well-being and academic performance is critical to implementing effective interventions and support mechanisms [4]. Universities offer rich environment to explore the prevalence and correlates of internet addiction in specific academic groups [5].

Additionally, this research attempts to explore potential demographic and academic factors associated with internet addiction among nursing students. Understanding the socio-demographic and educational correlates of internet addiction can direct targeted interventions tailored to address

the specific needs of at-risk individuals within this population. Through this investigation, we aim to contribute to the existing body of knowledge on internet addiction among college students, with implications for both research and practice. Shedding light on the prevalence and determinants of internet addiction among nursing students at the University of Palermo, this study seeks to inform evidence-based interventions aimed at promoting healthy internet use and supporting the well-being of this student population.

OBJECTIVE

The aim of the study was to identify internet addiction among nursing students at the University of Palermo through the use of the Internet Addiction Test (IAT).

MATERIAL AND METHODS

The study was carried out in April 2024. The study design is cross-sectional. The sample is made up of first, second and third year nursing students at the University of Palermo (Italy) and supplementary year students, i.e. students who do not fall into the first, second or third years but have not yet finished their studies and do not belong to one of the three years of the degree course. Informed consent was requested from each participant. The survey was done in person, using an anonymous self-administered questionnaire and the responses were then uploaded to a password protected Excel spreadsheet for statistical analysis.

The questionnaire was divided into two sections. The first one contained questions about basic demographics, studies, work, perception of one's economic and health status and voluptuary

habits. The second section was the questionnaire IAT, a test consisting of twenty questions that assess internet addiction, each one with five possible answers, with a score from 1 to 5. A total score is obtained from the sum of each scores, according to which the subjects are categorized as “Average internet user” (score = 20-49) or “The person already has several problems due to the internet” (score = 50-79) (Above average user) or “The use of the internet is causing considerable problems to the person” (score = 80-100) (Internet use is very intense) [6]. The “age” variable was subsequently dichotomized into < 23 years and ≥ 23 years as the average age of the sample was 22.71 years. The Body Mass Index (BMI) was calculated with the weight and height variables and then based on the value obtained the subjects were categorized into 4 categories: i) BMI between 18.50 and 24.99, or normal weight, ii) BMI between 25.00 and 29.99, overweight, iii) BMI equal to or above 30, obese, and iv) BMI below 18.50, underweight [7].

In order to take the exams, students must attend lessons, so the test was administered at the end of the lessons during the lesson days. Absolute and relative frequencies were calculated for all qualitative variables, and categorical variables were analyzed by Pearson’s chi-squared test. An ordered logistic regression was performed, assuming IAT as the dependent variable, in order to evaluate the role of the variables of the first section of the questionnaire. In the final model, all the variables present in the first part were inserted as independent variables. Each independent variable is adjusted for all the other independent variables. The statistical significance level chosen for all analyzes was 0.05. Results were analyzed using STATA statistical software version 14 [8]. Results are expressed as adjusted odds ratio (aOR) with 95% confidence intervals (95% CI). The study was approved by the Ethics Committee of the “P. Giaccone” University Hospital of Palermo, Minutes no. 14/2024 (1. Study BMSI) of June 6th, 2024.

RESULTS

The questionnaire was administered to all students present at the obligatory lectures, 806 persons. 801 from them agreed to complete the questionnaire. 72% of the interviewees are women, around 50% of them are in the first year of study, 98% report being born in Italy, 32% have regular physical activity, and for the majority of the participants the perceive health status and perceived economic status was medium-high. Regarding the IAT, 90.26% of the interviewees are average internet users,

7.99% above average users, and in 1.75% internet use is very intense (Table 1). In the bivariate analysis (Table 2) all the variables considered are statistically significant except the country of birth and the question whether the subject currently works or not. The ordered logistic regression shows the statistically significant covariates associated with the IAT: increasing age (aOR = 0.92), male gender (aOR = 2.59), not living with one’s family (aOR = 2.86), being single (aOR = 1.96), perceived health status medium (aOR = 2.19) and low (aOR = 13.35), and having had sleep disturbances in the last two weeks (aOR = 2.77) (Table 3).

Table 1. Description of the sample

Variables		N	Percent
Age class	< 23 years old	558	69.66
	≥ 23 years old	243	30.34
Gender	Male	226	28.21
	Female	575	71.79
BMI	Normal weight	554	69.16
	Overweight	144	17.98
	Obese	66	8.24
	Underweight	37	4.62
Country of birth	Italy	788	98.38
	Other	13	1.62
Year of study	First	402	50.19
	Second	200	24.97
	Third	177	22.1
	Supplementary year student	22	2.74
Do you have a job right now?	Yes	82	10.24
	No	719	89.76
Do you live with your family?	Yes	705	88.01
	No	96	11.99
Are you a student off-site or in-site?	In-site	478	59.68
	Off-site	323	40.32
Do you currently smoke?	I have never smoked	164	20.47
	No	379	47.32
	Yes	258	32.21
Are you engaged or single?	Engaged	494	61.67
	Single	307	38.33
Perceived health status	High	291	36.33
	Medium	463	57.8
	Low	47	5.87
Perceived economic status	High	103	12.86
	Medium	559	69.79
	Low	139	17.35
Do you perform regular physical activity?	Yes	259	32.33
	No	542	67.67
Have you had any sleep disturbances in the last 2 weeks?	No	486	60.67
	Yes	315	39.33
IAT	Average internet user	723	90.26
	Above average user	64	7.99
	Internet use is very intense	14	1.75
Age	22.71 (SD ± 5.12*)		
BMI score	23.27 (SD ± 4.05*)		

Table 2. Correlation between IAT and the variables of the first section of questionnaire (Pearson's chi-square test)

Variables		IAT			
		Average internet user (%)	Above average internet user (%)	Internet use is very intense (%)	p-value
Age	< 23 years old	506 (90.68)	49 (8.78)	3 (0.54)	< 0.001
	≥ 23 years old	217 (89.30)	15 (6.17)	11 (4.53)	
Gender	Male	189 (83.63)	24 (10.62)	13 (5.75)	< 0.001
	Female	534 (92.87)	40 (6.96)	1 (0.17)	
BMI	Normal weight	510 (92.06)	43 (7.76)	1 (0.18)	< 0.001
	Overweight	133 (92.36)	10 (6.94)	1 (0.69)	
	Obese	49 (74.24)	5 (7.58)	12 (18.18)	
	Underweight	31 (83.78)	6 (16.22)	0 (0.00)	
Country of birth	Italy	711 (90.23)	63 (7.99)	14 (1.78)	0.888
	Other	12 (92.31)	1 (7.69)	0 (0.00)	
Year of study	First	373 (92.79)	28 (6.97)	1 (0.25)	< 0.001
	Second	181 (90.50)	18 (9.00)	1 (0.50)	
	Third	149 (84.18)	16 (9.04)	12 (6.78)	
	Supplementary year student	20 (90.91)	2 (9.09)	0 (0.00)	
Do you have a job right now?	Yes	71 (86.59)	11 (13.41)	0 (0.00)	0.078
	No	652 (90.68)	53 (7.37)	14 (1.95)	
Do you live with your family?	Yes	648 (91.91)	57 (8.09)	0 (0.00)	< 0.001
	No	75 (78.13)	7 (7.29)	14 (14.58)	
Are you a student off-site or in-site?	In-site	433 (90.59)	43 (9.00)	2 (0.42)	0.001
	Off-site	290 (89.78)	21 (6.50)	12 (3.72)	
Do you currently smoke?	I have never smoked	155 (94.51)	9 (5.49)	0 (0.00)	< 0.001
	No	352 (92.88)	27 (7.12)	0 (0.00)	
	Yes	216 (83.72)	28 (10.85)	14 (5.43)	
Are you engaged or single?	Engaged	459 (92.91)	34 (6.88)	1 (0.20)	< 0.001
	Single	264 (85.99)	30 (9.77)	13 (4.23)	
Perceived health status	High	281 (96.56)	10 (3.44)	0 (0.00)	< 0.001
	Medium	418 (90.28)	45 (9.72)	0 (0.00)	
	Low	24 (51.06)	9 (19.15)	14 (29.79)	
Perceived economic status	High	97 (94.17)	6 (5.83)	0 (0.00)	< 0.001
	Medium	515 (92.13)	43 (7.69)	1 (0.18)	
	Low	111 (79.86)	15 (10.79)	13 (9.35)	
Do you perform regular physical activity?	Yes	239 (92.28)	20 (7.72)	0 (0.00)	0.032
	No	484 (89.30)	44 (8.12)	14 (2.58)	
Have you had any sleep disturbances in the last 2 weeks?	No	463 (95.27)	22 (4.53)	1 (0.21)	< 0.001
	Yes	260 (82.54)	42 (13.33)	13 (4.13)	

Table 3. Ordered logistic regression with presented adjusted odds ratios, and each independent variable being adjusted for all other independent variables

Independent variables		IAT		
		aOR	95% C.I.	p-value
Age	as continuous variable	0.92	0.86-0.99	0.034
Gender	Female	1		
	Male	2.59	1.45-4.63	0.001
BMI	Normal weight	1		
	Overweight	0.72	0.33-1.57	0.408
	Obese	1.51	0.67-3.43	0.323
	Underweight	2.13	0.73-6.19	0.164
Country of birth	Italy	1		
	Other	0.89	0.10-7.91	0.916
Year of study	First	1		
	Second	0.84	0.42-1.70	0.63
	Third	1.24	0.61-2.50	0.55
	Supplementary year student	1.67	0.32-8.78	0.546
Do you have a job right now?	Yes	1		
	No	0.91	0.39-2.12	0.833
Do you live with your family?	Yes	1		
	No	2.86	1.29-6.34	0.010
Are you a student off-site or in-site?	In-site	1		
	Off-site	0.6	0.33-1.09	0.092
Do you currently smoke?	I have never smoked	1		
	No	1.43	0.62-3.30	0.396
	Yes	2.14	0.94-4.91	0.071
Are you engaged or single?	Engaged	1		
	Single	1.96	1.13-3.40	0.016
Perceived health status	High	1		
	Medium	2.19	1.03-4.66	0.041
	Low	13.35	4.70-37.94	<0.001
Perceived economic status	High	1		
	Medium	1.21	0.43-3.35	0.719
	Low	1.76	0.58-5.34	0.316
Do you perform regular physical activity?	Yes	1		
	No	1.31	0.71-2.41	0.389
Have you had any sleep disturbances in the last 2 weeks?	No	1		
	Yes	2.77	1.54-4.97	0.001

DISCUSSION

Internet use has advantages but also negative effects if excessive. The latter may include physical and psychological health problems and negative influence on interpersonal relationships and daily activities [5]. In our study the prevalence of subjects with very intensive use of the internet is 1.75%, however if added to the users who appear to have an above average use of the internet the percentage is 9.74%, a result similar to others studies present in the literature [9-10].

Males appear to be more at risk for intensive and risky use of the internet than females, as highlighted also in other studies [11-13]. Males generally are more likely to browse entertainment, daily news, games and music websites, while women would be more attracted to social networking sites. Our study also shows that with increase of age the risk decreases – probably, with rise of job or study commitments one generally has less time for video games, interacting on social media and the internet in general [5, 14]. Other important factors that

increase risk are “not living with one’s parents”, suggesting that reduced family relationships can also lead to reduced parental control over internet use [15], and being single. Previous studies have found a significant relationship between internet addiction and loneliness, boredom, and absence of control by family relationships [16, 17].

Adequate sleep is essential for correct cognitive functioning, while using smartphones and internet them before going to sleep can negatively affect the quality of sleep [18, 19]. In our study the rise of internet addiction is parallel to the probability of having had sleep disorders in the last two weeks (aOR 2.77). The study also shows that as the perceived state of health decreases, the risk of internet addiction increases. It is likely that it is due to the fact that generally those who perceive a low level of health spend more time at home or in any case isolated, and have more time to spend on internet. In isolation social interactions through social networks generally increase (as happened with the COVID-19 pandemic) [20, 21].

Furthermore, comparing the results of our study with a similar study carried out in Tunisia [22], it emerges that in both studies not living with one’s family increases the risk of intense use of internet, and both studies show that not doing physical activity increases the risk of an excessive use of internet (even if in our study statistical significance was not reached).

The study has some limitations. It is a cross-sectional study and therefore does not provide information on the casual effect of the elements that were detected. It is also monocentric and it is unknown whether the results are generalizable to other contexts. The interviewees may not have answered sincerely due to social desirability, as those who respond to a questionnaire could give answers that can be considered more socially acceptable, even if the instruments is anonymous. And, lived context of the COVID-19 pandemic may have changed internet use habits.

CONCLUSIONS

Due to the increase in information technology availability, more and more individuals have a risky use of internet which could lead to addiction. This can cause decrease in cognitive performance and, subsequently, in job performance. In healthcare workers such decrease may put not only the worker but also the patient at risk. Information and training campaigns on the use of internet and information technology should be implemented

in the general population to increase knowledge of the phenomenon. Furthermore, ad hoc courses could be held in medical degree courses to better understand the risk and danger of a possible internet addiction. Further studies will certainly be useful to understand what further risk factors are, how to carry out preventive campaigns, and understand how effective these can be.

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