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Excessive use of the Internet on the mental health of nursing university students

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Abstract

Internet use has grown by 4% by 2023 and has become a fundamental tool in our everyday lives, however, its excessive use can contribute to mental health problems such as anxiety, depression and burnout, especially in university health students. This study aimed to determine the risk of anxiety and burnout due to excessive internet use in university nursing students. The research had a non-experimental quantitative approach, with an explanatory design. The study had the participation of 337 nursing students from the Universidad Privada San Carlos SAC de Puno, with an average age of 30.35 ± 9.274 years; 15.70% (n=53) were men and 84.30% (n=284) were women. Students who used the internet excessively for more than four hours a day had a 3.160 times greater risk of developing anxiety (95% CI: 1.519-6.577); 1.704 times more likely to develop emotional exhaustion (95% CI: 0.925-3.215); 1.786 times more likely to develop depersonalization disorders (95% CI: 0.931-3.413) and 2.101 times more likely to develop a lack of personal fulfillment compared to students who use the internet for less than three hours a day. Anxiety levels are positively associated with emotional exhaustion (rho=0.765; p<0.001); depersonalization (rho=0.744; p<0.001); lack of personal fulfillment (rho=0.631; p<0.001), which indicates that excessive internet use by university students had harmful negative effects on mental health.

Keywords: Professional Burnout. Anxiety. Nursing. University Students. Excessive Internet Use.

INTRODUCTION

Internet use has become a fundamental tool in our daily lives and is growing by 19.5%, an impressive figure, due to the COVID-19 pandemic, reaching more than 5 billion users worldwide, which represents 63% of the global population[1]. The internet has become increasingly ubiquitous in almost all of our daily activities, providing global communication[2], a variety of entertainment[2,3], educational development at all levels[4], and professional advancement[5]. The Internet has changed the way we carry out our daily activities, such as commerce, education, access to healthcare and is related to different forms of relationships and communication, especially affecting the young population compared to older populations[6]. However, it is important to note that certain population groups, such as university students in the healthcare field, are more vulnerable to excessive internet use due to their habits, academic demands and lifestyle, which increase potential risk factors for addiction. of the internet, the consequences of which affect mental health[7].

Recent studies indicate that excessive Internet use affects 6.2% of the general population

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and 41.6% of university students worldwide, resulting in a decline in mental health due to increased levels of stress, anxiety and emotional exhaustion[8]. Excessive Internet use in university students can have several negative consequences, affecting family relationships, academic interactions and friendships, as students tend to be less present in the real world and more focused on their devices[9]. Furthermore, spending too much time online threatens personal interactions, which can lead to social isolation and feelings of loneliness that affect the Internet user's mental health[10]. Recent research also warns that excessive internet use puts the nervous system at risk, impairing the concentration necessary for university studies, among other factors harmful to mental health[11,12]. Therefore, university institutions need to develop strategies to deal with the problem of excessive internet use, which represents a significant challenge to mental health[13].

Numerous studies carried out with university students from various specialties and from different parts of the world show that anxiety and burnout are associated with excessive internet use[14,15], especially in university students in the healthcare field, who experienced an increase during COVID-19 pandemic[16]. Furthermore, excessive internet use is related to a poor health-related quality of life[6,7], affecting various aspects of personal life and leading to emotional stress and mental breakdown[17], with a greater impact on academic activities.

In Peru, more than 44% of university students combine work and study due to several factors, such as helping the family financially, covering personal expenses, acquiring early professional experience and/or supporting the family[18]. However, many experts warn that this situation could pose a risk to the mental health of university students, as academic performance is negatively affected by the burnout and stress that students face balancing their two main responsibilities, compounded by excessive Internet use. Several studies indicate that reconciling study and work reduces the capacity for attention and concentration, increasing levels of exhaustion, anxiety and stress[19,20], especially in young people studying health-related careers, which require additional effort[21,22]. Carrying out these two activities, work and study, increases Internet use and, consequently, the risk to mental health[23]. However, balancing study with work can bring significant benefits, such as learning to manage time, gaining greater autonomy and developing perseverance[18].

Recently, Peru's Ministry of Health reported that young students at public and private universities face mental health problems, with anxiety (82%), stress (79%), and violence (52%) being the most common. To address this worrying situation, the Ministry of Education and the Ministry of Health propose that public and private universities implement internal regulations to take care of the mental health of the university community[24]. For this reason, universities in Peru have implemented strategies to reduce these high rates of anxiety, stress, violence and emotional exhaustion.

Furthermore, mandatory social isolation in Peru during the COVID-19 pandemic had a major impact on the Peruvian educational system, especially in the Puno region, revealing that only 7.5% of households had home access to the internet[25], and more than 80% of young university students accessed the internet through smartphones and not through a home connection, worsening burnout and anxiety. Additionally, the lack of digital literacy in vulnerable groups, such as women, young people in rural areas or urban peripheries, limits academic success[26]. This situation is aggravated as university students balance their studies with work[27,28], further increasing their exposure to excessive internet use[29], with direct consequences in increasing the risk to mental health. Therefore, this study aimed to determine the risk of anxiety and burnout due to excessive Internet use by university students who combine study with work.

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MATERIALS AND METHODS

This study was quantitative, cross-sectional and non-experimental in nature, carried out in the undergraduate nursing program at the Private University San Carlos SAC, in the city of Puno, Peru, located at the following geographic coordinates: 15°50'22.4"S 70°01' 46.6"W. The research was conducted from May to November 2022, with the participation of 337 nursing students, of which 15.70% (n = 53) were male and 84.30% (n = 284) were female. Of the students, 79.50% (n = 268) combined work with studies, while only 20.50% (n = 69) dedicated themselves exclusively to studies. The average age of nursing students was 30.35 ± 9.274 years. Among the students, 42.10% (n = 142) were single, 22.60% (n = 76) were married and 35.30% (n = 119) were cohabiting. More than 70% of students used the internet for more than 3 hours a day (Table 1). The inclusion criteria applied to this study were: students enrolled in the undergraduate Nursing program at the Private University San Carlos SAC, and the exclusion criteria included: enrolled students who did not attend the academic semester, students who chose not to participate in the study and students who did not fully complete the surveys.

Table 1 - Descriptive characteristics of study participants..

Variables	% (n)
Use of Internet	3.82 ± 0.734 horas
<3 hours/day	29.10 % (n = 98)
3-4 hours/day	44.50 % (n = 150)
>4 hours/day	26.40 % (n = 89)
Works	
Yes	79.50 % (n = 268)
No	20.50 % (n = 69)
Age	30.35 ± 9.274 anos
<25 years old	35.00 % (n = 118)
From 25 to 30 years old	23.10 % (n = 78)
>30 years old	41.80 % (n = 141)
Gender	
Male	15.70 % (n = 53)
Female	84.30 % (n = 284)
Marital status	
Single	42.10 % (n = 142)
Married	22.60 % (n = 76)
Cohabiting	35.30 % (n = 119)

During the research carried out, participants received appropriate instructions for correctly filling out the instruments, as well as the purpose of the study was explained. Informed consent was obtained from each of the students who participated in this study. To assess anxiety, the Hamilton test - HARS (Hamilton, 1959) was applied in this study.

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This instrument was chosen due to its wide use in diverse populations[30]. The HARS test was applied for 15 minutes and consists of 14 items, where each item is evaluated as: 0 (absent); 1 (light); 2 (moderate); 3 (severe) and 4 (very serious). The instrument's overall score is interpreted as follows: no anxiety (0-5 points); mild anxiety (6-14 points); moderate anxiety (15-25 points) and severe anxiety (more than 25 points). To evaluate the internal consistency of the HARS, it was applied to a pilot sample of 20 participants who had similar conditions to the research sample. In this test, a Cronbach's Alpha coefficient $\alpha = 0.914$ was obtained, which indicates high reliability.

There are several instruments to assess burnout at work, however, in this study, the Maslach Burnout Inventory - MBI was used, as it is widely used in the field of education[31]. This inventory assesses the dimensions of emotional exhaustion, depersonalization and personal fulfillment. To apply this inventory, students in the pilot sample spent a maximum of 25 minutes. The Burnout Inventory consists of 22 items that measure the characteristics of burnout, including emotional exhaustion, depersonalization and personal accomplishment. Each item has a 6-point *Likert* scale to indicate how often educators agree with the statements: 0 (never); 1 (sometimes); 2 (once a month or less); 3 (a few times a month); 4 (once a week); 5 (a few times a week) and 6 (every day). The inventory score is provided in three dimensions as follows: emotional exhaustion, which varies from 0 to 24 points (low) and from 25 to 54 points (high), with 9 items that assess the experience of emotional exhaustion due to demands in the workplace. work; depersonalization, which varies from 0 to 14 points (low) and from 15 to 30 points (high), with 5 items that assess the degree to which the individual presents attitudes of coldness and detachment; and, finally, the personal fulfillment dimension, which varies from 0 to 22 points (low) and from 23 to 48 points (high), with 8 items that assess feelings of self-efficacy and personal fulfillment at work. The Maslach Burnout Inventory for Educators was subjected to reliability testing in a pilot sample of 20 students who had similar conditions to the study sample, and the Cronbach's Alpha coefficient values were $\alpha = 0.90$ for emotional exhaustion, $\alpha = 0.82$ for depersonalization and $\alpha = 0.78$ for personal fulfillment.

Participants were asked how many hours per day, on average, they had used the internet in the last 30 days, with three response options: <3 h/day, 3–4 h/day and >4 h/day, according to the literature previously used in this study[32].

Descriptive statistics were performed, including mean and standard deviation (SD) for continuous variables, frequency and percentage for categorical variables. Spearman's correlation was used to evaluate the correlations between anxiety, emotional exhaustion, depersonalization and personal accomplishment, with a significance level of $p<0.05$. Pearson's Chi-square tests were used to establish associations, considering a significance level of $p<0.05$. To examine the risk of anxiety, emotional exhaustion, depersonalization and personal fulfillment, odds ratios were calculated with a 95% confidence interval, adjusted for the independent variables that showed greater significance. All statistical analyzes were performed with a value of $p\leq0.05$, considered statistically significant. Statistical analyzes were performed using IBM SPSS software, version 25.0.

RESULTS

18.10% of nursing students had a moderate level of anxiety; 23.10% of nursing

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students showed a high level of emotional exhaustion; 21.70% of nursing students showed a high level of depersonalization; and 22.60% of nursing students showed a high level of abandonment of personal fulfillment (Table 2), while 70.90% of nursing students use the internet for more than 3 hours a day (Table 1).

The highest and most significant correlation was observed between anxiety and emotional exhaustion (rho=0.765; p<0.001), and the highest and most significant correlation between emotional exhaustion and depersonalization (rho=0.958; p<0.001).

Chi-square analyzes (χ^2) show significant relationships in anxiety scores (χ^2=17.127; p<<0.05); emotional exhaustion (χ^2=9.987; p<<0.05); depersonalization (χ^2=9.550; p<<0.05) and abandonment of personal fulfillment (χ^2=8.995; p<<0.05), with the use of the internet. This relationship indicates that excessive internet use for more than 4 hours a day is negatively associated with anxiety in the mental health of young students. We also found a significant association between excessive internet use for more than 4 hours/day and anxiety (χ^2=17.127); more than 4 hours/day of internet and emotional exhaustion (χ^2=9.987); more than 4 hours/day of internet and depersonalization (χ^2=9.550); more than 4 hours/day of internet and abandonment of personal fulfillment (χ^2=8.995) (Table 3).

Nursing students who used the internet for more than 4 hours per day had a 3.160-fold increased risk of experiencing anxiety (95% CI: 1.519-6.577); 1.704 times of feeling emotional exhaustion (95% CI: 0.925-3.215); 1.786 times of experiencing depersonalization (95% CI: 0.931-3.413) and 2.101 times of experiencing abandonment of personal fulfillment (95% CI: 1.142-3.876), compared to students who used the internet for less than 3 hours per day.

Likewise, it can be observed that students aged between 25 and 30 are at risk of suffering: anxiety (2.725 times, with 95% CI: 1.168-6.329); emotional exhaustion (2.272 times, with 95% CI: 1.005-5.154); depersonalization (2.353 times, with 95% CI: 1.001-5.525) and abandonment of personal fulfillment (2.475 times, with 95% CI: 1.056-5.780), all compared to students under 25 years of age. Nursing students working at the same time had a: 4.025 times risk of experiencing anxiety (95% CI: 2.203-7.355); 2.305 times of feeling emotional exhaustion (95% CI: 1.296-4.099); 2.108 times of experiencing depersonalization (95% CI: 1.212-3.922) and 1.545 times of experiencing abandonment of personal fulfillment (95% CI: 0.850-2.809), compared to students under 25 years of age. Additionally, female students had a: 1.404 times risk of experiencing anxiety (95% CI: 0.688-2.865); 1.548 times of feeling emotional exhaustion (95% CI: 0.808-2.967); 1.721 times of experiencing depersonalization (95% CI: 0.895-3.311) and 1.443 times of experiencing abandonment of personal fulfillment (95% CI: 0.745-1.230) compared to male students. Finally, married students had a: 2.519 times risk of experiencing anxiety (95% CI: 1.199-5.291); 3.476 times of feeling emotional exhaustion (95% CI: 1.885-6.408); 3.995 times of experiencing depersonalization (95% CI: 2.140-7.460) and 3.523 times of experiencing abandonment of personal fulfillment (95% CI: 1.942-7.143) compared to single students (Table 4).

We can observe that there is a significant association between internet use and university students who do not work (chi-square = 109.29; p < 0.01). More than 75% of university students who dedicate themselves only to studying use the internet for more than 4 hours a day, while more than 85% of students who combine work with studies use the Internet for less than 4 hours a day (Table 5).

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Table 2 - Correlations between anxiety, emotional exhaustion, depersonalization and abandonment of personal fulfillment.

Variables	Percentage	Anxiety	Emotional exhaustion	Depersonalization	Abandonment of personal fulfillment
Anxiety		1.000	0.765**	0.744**	0.631*
Mild	81.90 % (n = 276)				
Moderate	18.10 % (n = 61)				
Emotional exhaustion		--	1.000	0.958**	0.798**
Low	76.90 % (n = 259)				
High	23.10 % (n = 78)				
Despersonalization		--	--	1.000	0.819**
Low	78.30 % (n = 264)				
High	21.70 % (n = 73)				
Abandonment of personal fulfillment		--	--	--	1.000
Low	77.40 % (n = 261)				
High	22.60 % (n = 76)				

** significant correlation (p<0.001)

* non-significant correlation (p>0.05)

Table 3 - Distribution of symptoms of anxiety, emotional exhaustion, depersonalization and abandonment of personal fulfillment with different levels of internet use (n=337).

Variables	Use of Internet				
	Group I <3 hours/day	Group II 3-4 hours/day	Group III >4 hours/day	X^2	p-value
Anxiety					
Low	86.70 % (n = 85)	87.30 % (n = 131)	67.40 % (n = 60)	17.127	P<0.05
High	13.30 % (n = 13)	12.70 % (n = 19)	32.60 % (n = 29)		
Emotional exhaustion					
Low	75.50 % (n = 74)	84.00 % (n = 126)	63.30 % (n = 59)	9.987	P<0.05
High	24.50 % (n = 24)	16.00 % (n = 24)	33.70 % (n = 30)		
Depersonalization					
Low	76.50 % (n = 75)	85.30 % (n = 128)	68.50 % (n = 61)	9.550	P<0.05
High	23.50 % (n = 23)	14.70 % (n = 22)	31.50 % (n = 28)		
Abandonment of personal fulfillment					
Low	70.40 % (n = 69)	83.30 % (n = 125)	75.30 % (n = 67)	8.995	P<0.05
High	29.60 % (n = 29)	16.70 % (n = 25)	24.70 % (n = 22)		

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Table 4 - Risk of experiencing symptoms of anxiety, emotional exhaustion, depersonalization and abandonment of personal fulfillment depending on different levels of Internet use.

Variables	Anxiety OR (95% IC)	Emotional exhaustion OR (95% IC)	Depersonalization OR (95% IC)	Abandonment of personal fulfillment OR (95% IC)
Use of internet				
<3 hours/day	1.000	1.000	1.000	1.000
3-4 hours/day	1.055 (0.495- 2.020)	1.568 (0.830-2.963)	1.407 (0.784-2.858)	1.105 (0.525- 2.070)
>4 hours/day	3.160 (1.519-6.577)	1.704 (0.925-3.215)	1.786 (0.931- 3.413)	2.101 (1.142-3.876)
Age				
< 25 years old	1.000	1.000	1.000	1.000
25 to 30 years old	2.725 [1.168-6.329]	2.272 [1.005-5.154]	2.353 [1.001-5.525]	2.475 [1.056-5.780]
>30 years old	1.443 [0.051-2.646]	1.430 [0.816-2.506]	1.473 [0.830-2.615]	1.501 [0.853-2.642]
Works and studies				
No	1.000	1.000	1.000	1.000
Yes	4.025 [2.203-7.355]	2.305 [1.296-4.099]	2.108 [1.212-3.922]	1.545 [0.850-2.809]
Gender				
Male	1.000	1.000	1.000	1.000
Female	1.404 [0.688-2.865]	1.548 [0.808-2.967]	1.721 [0.895-3.311]	1.443 [0.745-1.230]
Marital status				
Single	1.000	1.000	1.000	1.000
Married	2.519 [1.199-5.291]	3.476 [1.885-6.408]	3.995 [2.140-7.460]	3.523 [1.942-7.143]
Cohabiting	1.488 [0.779-2.843]	1.703 [0.862-3.367]	1.742 [0.848-3.584]	1.125 [0.585-2.159]

OR: Odd ratio; CI: confidence interval.

*p < .05

**p < .001

Table 5 - University students working in relation to internet usage levels.

		Works and studies		
		Yes	**No**	**Total**
Use of internet	< 3 hrs	96	2	98
		35.8%	2.9%	29.1%
	3 - 4 hrs	135	15	150
		50.4%	21.7%	44.5%
	> 4 hrs	37	52	89
		13.8%	75.4%	26.4%
Total		268	69	337
		100.0%	100.0%	100.0%

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DISCUSSION

This study shows that university students who use the Internet excessively for more than four hours a day have a 3.169 times greater risk of developing anxiety, 1.704 times more likely to suffer emotional fatigue, 1.786 times more likely to have depersonalization disorders and 2.101 times more likely to experience a lack of personal fulfillment, compared to students who use the Internet for less than three hours a day. This finding is supported by the fact that more than 75% of university students who dedicate themselves exclusively to studying use the internet for more than 4 hours a day, while more than 85% of students who work at the same time use the internet for less than 4 hours a day (chi-square = 109.29; $p < 0.01$).

Various studies have shown that students who balance their studies with work are unable to perform adequately in both their work and studies and, on the contrary, feel stressed, anxious and experience severe student burnout[7,12]. Consequently, excessive internet use can affect quality of life in many aspects, such as emotional well-being, mood, interpersonal relationships, among others[33]. This not only affects psychological and emotional quality of life, but also social and physical quality of life, which can be negatively influenced by pathological Internet use[34].

However, the United Nations states that Internet use is a priority for the year 2030, and stresses that "connecting everyone, everywhere" to level society in various services that are currently provided through the Internet, also recognizes the dangers of information technology[35], which indicates that excessive use of this service is and will be a permanent problem in our society, consequently, Internet use must be taken into account with great caution as it is a problem that can drag economic losses on the part of the state, in the psychological solution of these addictions[36].

Students aged between 25 and 30 had a higher risk of anxiety and burnout compared to students under 25. This evidence is associated with the dual role (work and study) that students play, in addition to taking on a family burden (Table 5). Similar research has shown that it is difficult for university students with a family burden to achieve their full professional competencies, since they need to work to support their household financially[7,12]. On the other hand, this study also states that anxiety is related to gender and marital status, and our study showed that female university students were at greater risk than male students and that married students were at greater risk than single students. University students who balance their time with a job, in addition to taking care of household chores, are at high risk of anxiety and professional burnout[37]. Furthermore, our results add to the many studies confirming that anxiety disorders affect women more than men[38-40].

CONCLUSION

University nursing students who use the Internet for more than four hours a day have a higher risk of developing anxiety, emotional fatigue, depersonalization disorders and lack of personal fulfillment, compared to those who use the Internet for less than three hours a day. Students' age, work-study balance, gender and marital status were risk factors for anxiety and burnout in these university students.

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