RESEARCH ARTICLE (ORIGINAL) 🔓

Addiction to the use of smartphones among nursing students

Adicción al uso del teléfono móvil inteligente en estudiantes de enfermería
Dependência do uso de smartphones em alunos de enfermagem

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Abstract

Background: Smartphones provide immediate access to information, and nursing students consider them essential tools. However, the addiction to these devices is increasing.

Objective: To identify smartphone addiction among nursing students.

Methodology: A descriptive correlational study was conducted using the stratified random sampling method. The sample size was calculated based on a confidence level of 0.05, with 90% power, and a median effect size of 0.09. The study included 149 nursing students.

Results: The component "Smartphone use, abuse, and addiction" correlated negatively with the component "Personality traits" (r_s = -0.228; p = 0.005); the component "Smartphone use, abuse, and addiction" correlated positively with the component "Financial spending" (r_s = 0.376; p = 0.001).

Conclusion: Smartphone use is high. Understanding the extent of this phenomenon can aid in developing effective strategies to prevent smartphone addiction.

Keywords: technology addiction; smartphone; students, nursing

Resumo

Enquadramento: Os telemóveis inteligentes estão permitem acesso imediato à informação. O vício no uso desses dispositivos é cada vez maior, os celulares inteligentes tornaram-se um elemento importante para os estudantes de enfermagem.

Objetivo: Identificar a dependência do uso do smartphone em estudantes de enfermagem.

Metodologia: Estudo correlacional descritivo, a amostragem foi aleatória, a amostra foi calculada considerando nível de confiança de 0,05, poder de 90%, tamanho de efeito médio de 0,09, a amostra foi composta por 149 estudantes de enfermagem.

Resultados: O componente de uso, abuso e dependência de smartphone foi negativamente relacionado ao componente de traço de personalidade (r_s = -0,228; p = 0,005), o uso, abuso e dependência de smartphone foi relacionado positivamente com gastos monetários (r_s = 0,376; p = 0,001).

Conclusão: Identificou-se que existe um alto uso de telefones móveis inteligentes, compreender a abrangência desse fenômeno pode ajudar a propor estratégias eficazes para prevenir o vício em celulares.

Palavras-chave: dependência de tecnologia; telefone celular; estudantes de enfermagem

Resumen

Marco contextual: Los teléfonos móviles inteligentes permiten acceder a información de manera inmediata. La adicción al uso de estos dispositivos es cada vez mayor, los teléfonos móviles inteligentes se han convertido en un elemento importante para los estudiantes de enfermería.

Objetivo: Identificar la adicción al uso del teléfono móvil inteligente en estudiantes de enfermería.

Metodología: Estudio descriptivo correlacional, el muestreo fue aleatorio, la muestra se calculó considerando un nivel de confianza de 0,05, una potencia de 90%, un tamaño de efecto mediano de 0,09, la muestra se conformó por 149 estudiantes de enfermería.

Resultados: El componente de uso, abuso y adicción al teléfono móvil inteligente se relacionó negativamente con el componente rasgo de personalidad (r_s = -0,228; p = 0,005), el uso, abuso y adicción al teléfono móvil inteligente se relacionó positivamente con el gasto monetario (r_s = 0,376; p = 0,001).

Conclusión: Se identificó que existe un alto uso de los teléfonos móviles inteligentes, comprender el alcance de dicho fenómeno puede ayudar a plantear estrategias eficaces para prevenir la adicción al teléfono móvil inteligente.

Palabras clave: adicción a la tecnología; teléfono inteligente; estudiantes de enfermería

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Introduction

Communication technologies have a significant impact on society. This impact is evident in the exponential growth of mobile phone use worldwide, with around 60% of the world's population owning a smartphone. This percentage represents a 40% increase from 2016 to 2020. In Mexico, for instance, Rodríguez et al. (2019) point out that 49.5% of the population are smartphone users.

Smartphones are constantly evolving as technological tools and are accessible and appealing to young people. They have become an indispensable element for communication in today's world. However, in the short term, excessive and uncontrolled smartphone use can lead to addictive behavior (Cholán, 2020; Pascuas et al., 2020). Particularly among university students, smartphones have become essential for staying connected with society. For some, they serve as an extension of interpersonal connection, while for others, they can be a distraction from other activities (Mendoza et al., 2018; Pascuas et al., 2020). Smartphones also allow young people to create a unique and exclusive language of communication within their peer groups (García & Escalera, 2020; Hernandez et al., 2017).

Globally, research has shown that mobile phone addiction among young university students is heterogeneous. In Japan, for instance, mobile phones are primarily used for email, and university students tend to use them for formal communication rather than recreational purposes (Cha & Seo, 2018).

Cha and Seo (2018) report that in South Korea, people use smartphones to access social media, keep in touch with others, and play online games to reduce tension and stress. In Australia, high smartphone use among young women aged 18-25 years is predominantly motivated by the need to maintain interpersonal relationships (De-Sola et al., 2016; Oviedo-Trespalacios et al., 2017), and in Mexico, smartphone use is associated with personality-related determinants (García & Escalera, 2020).

Smartphones contribute to the excessive use of certain applications as a way to combat boredom by accessing them at any time. Dependence and lack of control lead to smartphone addiction, which is characterized by feelings of desire, euphoria, and relief while using these devices, and irritability and hostility when not using (García & Escalera, 2020; Hernandez et al., 2017).

In recent years, there has been a growing interest in studying smartphone addiction, as it may be a contributing factor in distraction from academic, work, and recreational activities. Young nursing students are a population of interest due to the activities they engage in during their training, which include theoretical and practical activities that form the basis of their performance in the workplace. However, several studies (Haro et al., 2020; Pacheco et al., 2016; Peña et al., 2018) have reported that smartphones can be a distraction in school and hospital settings. This is a concerning realization as nursing students need to be focused and responsible when learning and performing procedures during their training.

Therefore, this study aims to identify smartphone addiction among nursing students. The results are expected to form a basis for providing the necessary attention to young nursing students, thus allowing them to not divert their attention from learning activities and academic and professional development in nursing.

Background

Smartphones are widely used in society as a tool for interpersonal communication and leisure activities, such as playing games, listening to music, watching television, and accessing information through search engines and specialized blogs. They are also used for research, calculations, sharing educational information, work, and organizing activities (Cholán 2020).

Smartphone use is not a continuous activity, and individuals can easily stop using the devices when they want to or when they need to focus on other activities without negative consequences or discomfort. On the other hand, mobile phone addiction is described as a maladaptive behavior where individuals spend a large amount of time on their phones, often at the expense of other activities they previously enjoyed (Aranda et al., 2017).

Addiction occurs when people have adapted their needs to the use of smartphones, using them to satisfy their need for excitement, companionship, challenge, self-improvement, and distraction. Smartphone addiction is defined as the inability to control or interrupt smartphone use, avoiding turning it off or silencing notifications or calls. Using a smartphone becomes an irresistible, repetitive, exaggerated, and persistent behavior that produces pleasure and leads to loss of control (Aranda et al., 2017). Personality traits relate to the patterns of thinking about oneself and the surrounding environment, as well as how one relates to that environment. They help to identify a person's introversion or extroversion and their preferences for social interaction (Aranda et al., 2017). Excessive smartphone use can have negative effects on an individual's personal finances and health. Health consequences include sleep disturbances, poor posture, and tendonitis. It can also cause social, work, and academic problems. Smartphone addiction is currently recognized as a behavioral disorder and is one of the most common addictions among young people (García & Escalera, 2020).

Research questions

What is the extent of smartphone addiction among nursing students and how does it differ by gender and occupation?
What is the relationship between smartphone addiction and sociodemographic variables?

Methodology

The study design was both descriptive and correlational, according to Burns and Grove (2012). The study population consisted of undergraduate nursing students from

a public university in Monterrey, Nuevo León, Mexico. The sample size was calculated using a confidence level of 0.05, with 90% power, and a median effect size of 0.09. The stratified random sampling method was used, subdividing the sample into strata representing the semesters. A total of 149 nursing students were included in the sample.

Inclusion criterion
Nursing students over 18 years of age.

Exclusion criterion
Nursing students who did not complete the personal data questionnaire and the instrument.

A personal data questionnaire consisting of five questions asking participants about age, gender, current semester, and occupation was used to measure the study's variables. Smartphone addiction was measured using the "Not without my Smartphone" instrument, developed and validated in the Spanish population by Aranda et al. (2017). The instrument is used to assess the level of addiction to mobile phones and consists of 40 items divided into three components. The first component "Smartphone use, abuse, and addiction" consists of 30 items (1, 2, 3, 4, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 inverted, 18, 20, 21, 22, 23, 24, 25, 26, 29, 30, 31, 35, 38, 39, 40), and assesses the use, abuse, and addiction to smartphones and their applications. The second component "Personality traits" evaluates the participants' personality characteristics and consists of six items (5, 7, 19, 27, 33, 36 inverted). The third component "Financial spending" assesses the money spent and consists of four items (28, 32, 34, 37). This instrument has been used with young people and has shown an acceptable Cronbach's alpha of 0.81. Participants use a Likert-type scale ranging from 1 (*I disagree*) to 5 (*I strongly agree*) to respond to the instrument. The scores are interpreted according to the components. Higher scores on the first component indicate a greater addiction to the use of smartphones and their applications. Higher scores on the second component show higher image-related self-esteem and higher extroversion. Higher scores on the third component point to larger amounts of money spent on smartphones and their applications. Authorization was requested from the Research and Ethics Committee of the Autonomous University of Nuevo León and the educational institution where the study was conducted. Nursing students were identified using an Excel spreadsheet to randomly select them by semester (from the third to the eighth), considering the inclusion criterion of being over 18 years of age. Finally, the selected students were invited to participate and, if they accepted, a date for data collection was scheduled. During the research process, consideration was given to the ethical aspects that guarantee the protection of individuals, as established in the regulations of the *Reglamento de la ley general de salud en materia de investigación para la salud* (General Health Law on Health Research), updated in 2014 (Secretaria de Salud, 1987).

The criterion of anonymity was followed, and the protection of the dignity, rights, and welfare of research participants was ensured, following articles 13 and 14, sections v, vi, vii, viii, and ix, and article 16.

The study participants gave their informed consent to take part in the study following article 20, article 21, sections i, ii, iii, iv, vi, vii, and viii, and article 22, section ii. The informed consent proves that students over 18 years of age authorized their participation in the study, knowing the purpose and procedures of the research, and were free to choose to participate without coercion.

The provisions of articles 57 and 58, sections i and ii, were also respected, as the population studied consisted of young students from a university institution, a subordinate group in which the informed consent was not influenced by any authority. Furthermore, participants were ensured that their participation or non-participation would not affect their academic situation.

The IBM SPSS Statistics software was used to respond to the study objectives. Descriptive statistics were determined, and frequencies and percentages were calculated for categorical variables. The Kolmogorov-Smirnov normality test was applied for continuous variables. Non-parametric tests, such as Spearman's rank correlation coefficient and Mann-Whitney U tests, were also carried out.

Results

The "Not without my Smartphone" instrument exhibits an overall Cronbach's alpha of 0.86, its first component "Smartphone use, abuse, and addiction" has an alpha of 0.90, its second component "Personality traits" has an alpha of 0.72, and its third component "Financial spending" has an alpha of 0.73.

Table 1 describes the socio-demographic characteristics of the participants. According to it, 83.9% of the study participants were female, 26.1% were in their sixth semester of study, and 28.2% reported having an informal occupation, such as shop worker or waiter. The mean age of the participants was 20.8 years, with a standard deviation of 1.7.

Table 1

Socio-demographic description of the study participants

	f	%
Gender		
Female	*125*	*83.9*
Male	*24*	*16.1*
Semester		
Third	*25*	*16.8*
Fourth	*15*	*10.1*
Fifth	*15*	*10.1*
Sixth	*39*	*26.1*
Seventh	*29*	*19.5*
Eighth	*26*	*17.4*
Occupation		
Yes	*42*	*28.2*
No	*107*	*71.8*
Age		

M	*SD*	**Minimum value**	**Maximum value**
20.8	*1.7*	*18*	*25*

Note. M = Mean*; SD* = Standard deviation; *n* = 149; % = Percentage.

Table 2 shows the Spearman correlation between age, semester, and smartphone addiction. The results indicate a negative and significant correlation (r_s = -0.241; *p* = 0.003) between the component "Financial spending" and the variable "semester," indicating that nursing students who are more advanced in their studies spend less money on smartphone use.

The component "Smartphone use, abuse, and addiction" shows a negative and significant correlation with the component "Personality traits" (r_s = -0.228; *p* = 0.005). On the other hand, a positive and significant correlation is observed between the component "Smartphone use, abuse, and addiction" and the component "Financial spending" (r_s = 0.376; *p* = 0.001), indicating that the greater the use, abuse, and addiction to smartphones, the more students spend on smartphone applications and games.

Table 2

Spearman correlation of addiction to smartphones

Variable	1	2	3	4
1. Age	1			
2. Semester	0.624** (0.001)	1		
3. Smartphone use, abuse, and addiction	-0.130 (0.114)	-0.121 (0.141)	1	
4. Personality traits	0.080 (0.330)	0.091 (0.267)	-0.228** (0.005)	1
5. Financial spending	-0.130 (0.115)	-0.241** (0.003)	0.376** (0.001)	-0.025 (0.764)

Note: ** = Statistical Significance*;* Value between parentheses = *p-value; n* = 149.

Table 3 shows gender differences in smartphone addiction, with statistically significant differences in "Financial spending" (*U* = 1017.00; *p* = 0.012), with male participants having higher mean values (*M* = 9.70; *SD* = 4.16) than female participants (*M* = 7.59; *SD* = 3.36).

Table 3

Mann-Whitney U test for smartphone addiction by gender

Variable	Gender	*M*	*Mdn*	*SD*	Min. value	Max. value	*U*	*p*
3. Smartphone use, abuse, and addiction	Female	84.66	84.00	20.44	40.00	139.00	1391.50	0.575
	Male	82.29	80.50	17.97	51.00	120.00		
4. Personality traits	Female	19.32	20.00	5.54	8.00	30.00	1243.50	0.185
	Male	20.83	22.50	6.93	8.00	30.00		
5. Financial spending	Female	7.59	7.00	3.36	4.00	19.00	1017.00	0.012*
	Male	9.70	9.50	4.16	4.00	20.00		

Note: M = Mean; Mdn = Median; SD = Standard deviation; U = Mann-Whitney U; p = Significance; n = 149.

Table 4 shows the results of the smartphone addiction study according to the occupation of the nursing students. The results show statistically significant higher means (*U* = 1812.50; *p* < 0.047) in those who do not work (*M* = 85.71; *SD* = 19.47) compared to those who work (*M* = 80.61; *SD* = 21.18). Additionally, the study found statistically significant higher means (*U* = 1557.50, *p* < 0.004) in students who work (*M* = 21.73, *SD* = 5.11) in the component "Personality traits" compared to those who do not work (*M* = 18.71, *SD* = 5.83).

Table 4

Mann-Whitney U test for smartphone addiction taking into account participant occupation

Variable	Work	*M*	*Mdn*	*SD*	Min. value	Max. value	*U*	*p*
3. Smartphone use, abuse, and addiction	*Yes*	80.61	77.00	21.18	46.00	127.00	1812.50	0.047*
	No	85.71	85.00	19.47	40.00	139.00		
4. Personality traits	*Yes*	21.73	22.00	5.11	8.00	30.00	1557.50	0.004*
	No	18.71	19.00	5.83	8.00	30.00		
5. Financial spending	*Yes*	8.02	8.00	3.07	4.00	16.00	2052.00	0.407
	No	7.89	7.00	3.76	4.00	20.00		

Note: M = Mean; Mdn = median; SD = Standard deviation; U = Mann-Whitney U; p = Significance; n = 149.

Discussion

Our study focused on determining whether nursing students were addicted to smartphone use, by administering the "Not without my Smartphone" instrument developed by Aranda et al. (2017).

Results show a negative and significant correlation between the component "Smartphone use, abuse, and addiction" and the component "Personality traits". This suggests that the more students use, abuse, and are addicted to smartphones, the lower their self-esteem and degree of extroversion. Cerro et al. (2020) and Rodríguez et al. (2019) report similar findings, noting that individuals with low image-related self-esteem are at a higher risk for smartphone addiction. Furthermore, inappropriate smartphone use can cause negative consequences that directly affect self-image and lead to anxiety, as undervalued young people often turn to smartphones in search

of recognition and validation.

The component "Smartphone use, abuse, and addiction" correlates positively with the component "Financial spending," which is consistent with the findings of Cerro et al. (2020) and Jiménez-Albiar et al. (2012) who report high spending levels among young people who predominantly use smartphones. A possible explanation is the fact that young people use smartphones to reduce stress and as a means for online interactions through applications. Some of these applications can be costly, requiring regular, monthly, or annual subscriptions and payments, which can impact students' finances.

A negative correlation was found between the component "Financial spending" and semester progression, which is consistent with the findings of Tapha et al. (2020), who report a decrease in the money spent on smartphone applications as students progress through their university experience. This can result from the fact that students

gain academic experience and become more aware of the importance of managing their finances more effectively, thus reevaluating the purchase of smartphone applications. Additionally, university students become more involved in their studies, which reduces the amount of time they have available to use smartphone applications, which often require in-app purchases.

Considering the correlation between the component "Smartphone use, abuse, and addiction" and gender, male participants spent more money than female participants. This is consistent with Cha and Seo's (2018) findings that men use their smartphones more frequently to access online games as a way to reduce stress, which in turn increases money spending. On the other hand, women tend to seek recognition and appreciation from their social media, rather than spending large amounts of money (Rodríguez et al., 2019).

Our study also observed that non-working nursing students show higher rates of smartphone use, abuse, and addiction, which is consistent with the literature (Pedrero et al., 2012; Rodríguez et al., 2019). Working students are less likely to develop addictive behaviors related to smartphones due to their work responsibilities, which limit their exposure. This realization emphasizes the significance of considering available time as a factor in non-working students' susceptibility to addiction.

Similarly, individuals who work tend to exhibit higher scores in the component "Personality traits," as noted by Gamero et al. in 2016. This is because they maintain regular contact with their social environment, rather than being consumed by excessive smartphone use. Working students also experience greater development of traits such as personality, time management, and adaptability. Moreover, work engagement can help students practice and refine skills, strengthen specific aspects of their personality, and develop autonomy and the ability to understand challenges through interaction with their work environment and associated responsibilities.

Although the results suggest that students use smartphones frequently, it does not necessarily mean they are addicted as smartphones serve multiple functions and applications for everyday life. Cholán (2020) considers that smartphone addiction should not be viewed negatively. In fact, excessive smartphone use may reduce the likelihood of developing harmful habits such as alcoholism, smoking, or drug abuse. Our study considers that, in the academic environment, the use of smartphones may be seen more as a distraction rather than an addiction. We noted that when nursing students become restless during classes or find them uninteresting, they choose to check their smartphones to combat boredom. However, it should be noted that this attitude may result in poor academic performance. While the reliability of the instrument and the stratified random sampling method used to select participants are points that strengthen external validity, the results of our study should be viewed with caution. Due to the small sample size, the results may not be representative of the general population. In other words, the sample may not adequately reflect the variability of the population as a whole.

Conclusion

Smartphones have become an essential tool in the daily lives of nursing students, who rely on these devices to stay up-to-date with academic, social, and personal activities. Nursing education programs also use smartphones to enhance the teaching-learning process. Therefore, ensuring the correct use of these devices for academic purposes is crucial, as there is a fine line between "use of" and "addiction to" smartphones among nursing students. Behaviors similar to traditional addictions, such as alcohol and tobacco, are associated with smartphone use, which is viewed as a non-substance addiction. Holistic nursing interventions that address physical, emotional, and cognitive aspects and provide holistic care by identifying, preventing, and treating addictive behaviors can be a solution to address smartphone addiction.

Within this context, nursing interventions should educate individuals about the risks associated with smartphone addiction, and how to promote healthy habits and develop self-regulation skills. The design of psychological and social support programs for students with addictive behaviors can help them manage and reduce their addiction. Furthermore, the collaboration between mental health professionals, educators, and other experts can improve interventions and address the phenomenon comprehensively.

Author contributions

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