Originales

Prevalence and factors associated with the problematic use of the smartphone in Honduran university students

Prevalencia y factores asociados al uso problemático del smartphone en estudiantes universitarios de Honduras

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Abstract

The use of Information and Communication Technologies (ICT) has increased exponentially, leading to rapid changes in society. It has transformed the way we communicate, socialize, seek information, and even entertain ourselves. However, its uncontrolled use, known as problematic smartphone use (PSU), has been linked to numerous negative consequences. Therefore, the main objective of this study is to determine the prevalence of PSU in a sample of Honduran university students and to examine its possible sociodemographic and personality correlates. The sample consists of 791 students from Francisco Morazán National Pedagogical University in Honduras (77.2% women) with a mean age of 26.29 years. A descriptive, correlational, and comparative analysis was conducted using SPSS 28.0. The results indicate a PSU prevalence of 19.97% and show that both the Big Five personality traits and self-esteem are associated with this behavior. In conclusion, this study is the first to establish the prevalence of PSU among Honduran university students These findings may have significant implications for the development of policies aimed at reducing excessive technology use in this at-risk group.

Keywords

Problematic use of the smartphone, mobile devices, higher education.

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Resumen

El uso de las Tecnologías de la Información y de la Comunicación (TIC) se ha incrementado exponencialmente provocando cambios vertiginosos en la sociedad, ha cambiado nuestra manera de comunicarnos, socializarnos, buscar información o incluso divertirnos, sin embargo, su utilización incontrolada, conocida como uso problemático del smartphone (UPS) se ha asociado a numerosas consecuencias negativas. Por ello, el objetivo general de este trabajo es calcular la prevalencia del UPS en una muestra de estudiantes universitarios hondureños y examinar los potenciales correlatos sociodemográficos y de personalidad. La muestra del presente estudio tiene un total de 791 estudiantes de la Universidad Pedagógica Nacional Francisco Morazán de Honduras (77.2% de mujeres) con una edad media de 26.29 años. Se llevaron a cabo análisis descriptivos, correlacionales y comparativos con el programa SPSS 28.0. Los resultados muestran una prevalencia del UPS del 19.97% y que tanto los factores de personalidad de los Cinco Grandes como la autoestima se asocian con esta conducta. En conclusión, el presente estudio es el primero en establecer la prevalencia del UPS en estudiantes universitarios hondureños. Estos resultados pueden tener implicaciones significativas a la hora de desarrollar políticas para reducir el uso excesivo de nuevas tecnologías en este grupo de riesgo.

Palabras clave

Uso problemático del smartphone, dispositivos móviles, educación superior.

INTRODUCTION

The use of Information and Communication Technologies (ICT) has increased exponentially, bringing about rapid changes in social dynamics since it allows, on the one hand, unlimited access to information and immediate and simultaneous communication and, on the other, more playful and interactive entertainment. This panorama has caused our way of communicating, socializing, searching for information or even having fun to undergo a radical transformation, making new technologies a fundamental aspect of the modern lifestyle. Within ICTs, phones with an internet connection or smartphones have been introduced into our daily lives to the point of becoming devices, in most cases, indispensable. In fact, 99.5% of internet users report connecting through their mobile phones (Ruiz-Palmero, 2021).

Despite the positive effects derived from the use of smartphones, excessive and uncontrolled usage, referred to as problematic smartphone use (PSU), has been linked to numerous negative consequences such as drug abuse (Grant et al., 2019), anxiety (Wang et al., 2022), depression (Augner et al., 2023), lower social support (Herrero et al., 2019) and, in general, reduced quality of life (Buctot et al., 2020). In addition to its various negative consequences, the prevalence of PSU, which reaches 26.99% of the population globally (Meng et al., 2022), has been rising in recent years, due, in part, to social isolation and technological dependence exacerbated by the COVID-19 pandemic (Ruiz-Palmero et al., 2021).

Personality is one of the key variables contributing to behavioral addictions, such as PSU (Grant et al., 2010). The Big Five personality

model, developed by Costa and McCrae in 1992, categorizes personality traits into extraversion, agreeableness, conscientiousness, emotional instability, and openness. It is widely regarded as one of the most comprehensive and relevant models for studying personality (Andreassen et al., 2013). Several studies based on this model have demonstrated how certain personality traits influence the development and persistence of PSU (Arpaci & Unver, 2020; Billieux et al., 2015; Hidalgo-Fuentes, 2021b; Marengo et al., 2020).

In addition to personality research, numerous studies have specifically examined self-esteem and its relationship with PSU. However, findings in this area remain inconsistent. While various studies have identified a link between low self-esteem and PSU (Cheung et al., 2018; Işiklar et al., 2013; Lee et al., 2018; Romero-Rodríguez, et al., 2020; Wang et al., 2017), a meta-analysis conducted by Elhai et al. (2017) concluded that the association between these variables has not been clearly established and that the underlying factors shaping this relationship have yet to be fully identified.

In conclusion, research in this field shows, on the one hand, that young people frequently use smartphones in their daily lives, sometimes in an abusive and uncontrollable manner, which could be influencing their physical and mental health, and, on the other hand, that the prevalence of PSU among university students is particularly high (Alotaibi et al., 2022; Okasha et al., 2022). However, to our knowledge, no study has evaluated the prevalence of PSU in the Honduran population, either at a general level or in the university population. However, one previous study focused on the problematic use of the Internet highlights the need to specifically explore the PSU phenomenon in this context to examine possible similarities and differences between the two phenomena (Martínez-Álvarez et al., 2024). Therefore, the objectives of the present study are to calculate the prevalence of PSU in a sample of Honduran university students and to examine potential sociodemographic and personality correlates. This research is original and particularly relevant since it provides insight into a little-explored context such as Honduras, which can help broaden our understanding of similar cultural environments, and, on the other hand, identifies the factors most strongly associated with PSU among those analyzed in recent years.

METHOD

Participants and procedure

The sample of this study consisted of 791 students from the Francisco Morazán National Pedagogical University of Honduras, with a mean age of 26.29 years, and 77.2% were women.

Once the study was approved by the Research Ethics Committee of the Francisco Morazán National Pedagogical University (code 20203-003), a survey was created using Google Forms and was distributed to students by their professors. Before completing the tests, students gave their consent to participate in the study by answering an item created for this purpose, after reading the objectives and scope of the study, as well as its voluntary and anonymous nature. No incentive was provided to students for their participation in the study.

Instruments

A questionnaire was included to collect the following demographic data: age, sex, alcohol

and tobacco consumption over the past 30 days, current romantic partner, and number of hours of daily smartphone use.

The PSU was evaluated using the Spanish version of the Smartphone Addiction Scale-Short Version (SAS-SV; López-Fernández, 2017), which consists of 10 items (e.g. "I feel impatient and restless when I don't have my smartphone") scored on a Likert scale from 1 (*strongly disagree*) to 6 (*strongly agree*). The total score ranges from 10 to 60, with a higher score indicating a higher level of PSU. The cut-off point established to classify problematic smartphone users in the version used is a score of 32 or higher.

The factors of the Big Five personality model were measured by adapting the short version of the Big Five Inventory (BFI-2-S; Gallardo-Pujol et al., 2022). This scale consists of 30 items (e.g. "Curious about a wide variety of things"), 6 for each of the personality traits (extraversion, agreeableness, conscientiousness, neuroticism and openness to experience), which are answered on a five-point Likert scale, from 1 (*Strongly disagree*) to 5 (*Strongly agree*), with a higher score indicating higher levels in the evaluated trait.

The self-esteem of the participants was examined using the Spanish validation of the Rosenberg Self-Esteem Scale (RSES; Gómez-Lugo et al., 2016), which contains 10 items with both positive and negative self-evaluations. These items are responded to using a four-point Likert scale, from 1 (*Strongly disagree*) to 4 (*Strongly agree*), with higher scores indicating higher levels of self-esteem.

Data analysis

The data were analyzed using the SPSS 28.0 program. First, the normality of the quantitative variables was examined using the skewness and kurtosis indices, with all skewness values falling within the range of ±2 and kurtosis values within the range of ±7, so normality was assumed (Hair et al., 2010). Descriptive statistics, including the mean and standard deviation for quantitative variables and frequency and percentage for categorical variables, were calculated. The association between the different variables was evaluated using Pearson correlations. Finally, differences between the group of participants who exhibited PSU and the group who demonstrated normal use after applying the SAS-SV cut-off point were examined using the Chi-square test and Cramer's *V* statistic for categorical variables, and through Student's t-test and Cohen's *d* test for quantitative variables.

RESULTS

Table 1 shows the descriptive characteristics of the 791 study participants, with continuous variables presented as means and standard deviations, and nominal variables as frequencies and percentages.

Pearson's analysis of bivariate correlations, presented in Table 2, shows that PSU has statistically significant negative correlations with self-esteem ($r = -.331$, $p < .001$), extraversion ($r = -.192$, $p < .001$), agreeableness ($r = -.356$, $p < .001$), conscientiousness ($r = -.442$, $p < .001$) and openness to experience ($r = -.256$, $p < .001$), meaning the higher the score in these variables, the lower the level of PSU. In contrast, neuroticism and PSU show a statistically significant positive correlation ($r = .248$, $p < .001$), indicating that greater emotional instability is associated with higher levels of PSU. Following Cohen's (1988) criteria, all the correlations found can be considered of moderate magnitude.

Table 1. Descriptive characteristics of the sample (n = 791)

Variables	M	DT	n	%
Age	26.29	8.02		
Sex				
Man			180	22.8
Woman			611	77.2
Alcohol consumption				
Yes			112	14.16
No			679	85.84
Tobacco consumption				
Yes			21	2.62
No			770	97.35
Current partner				
Yes			398	50.32
No			393	49.68
Hours of smartphone use	3.25	0.93		

The application of the SAS-SV cut-off point resulted in the classification of 158 participants as users with PSU (19.97%), while the group that did not present PSU was made up of 633 students (80.03%). Differences between the PSU group and the normal-use group were examined with Student's t-test and chi-square tests, and Cohen's d and Cramer's *V* were used as effect sizes to assess the magnitude of the differences (see Table 3). No statistically significant differences were found between the two groups in relation to sociodemographic variables. In contrast, both the scores of all personality factors and self-esteem showed statistically significant differences between the PSU group and the normal use group. Specifically, the PSU group presented significantly higher scores in neuroticism and significantly lower in extraversion, agreeableness, conscientiousness, openness to experience, and self-esteem, in all cases with a significance level below .001. To interpret the magnitude of the effect sizes, Cohen's (1988) criterion was followed, which classifies effect sizes smaller than 0.20 as very small, between 0.20 and 0.49 as small, between 0.50 and 0.79 as moderate, and those equal to or greater than 0.80 as large. According to this criterion, the difference in extraversion can be considered as small, the differences in neuroticism, openness to experience and self-esteem as moderate and, finally, the differences in agreeableness and conscientiousness as large.

Table 2. Pearson correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age	-												
2. Sex	-.027	-											
3. Alcohol consumption	.021	.074*	-										
4. Tobacco consumption	-.040	.098**	.316**	-									
5. Current partner	-.338**	-.064	.063	.054	-								
6. Hours of smartphone use	.000	.006	-.047	.002	-.008	-							
7. Extraversion	-.035	-.014	.020	.042	.096**	.044	-						
8. Agreeableness	-.080*	-.016	.027	.065	.086*	.010	.285***	-					
9. Conscientiousness	-.018	-.034	.040	.026	.079*	.024	.418***	.525***	-				
10. Neuroticism	-.003	.035	-.036	-.006	-.067	-.038	-.390***	-.251***	-.331***	-			
11. Openness	-.034	.011	.025	.066	.093**	.060	.434***	.428***	.420***	-.238***	-		
12. Self-esteem	-.004	-.069	-.006	.009	.066	.072*	.478***	.326***	.437***	-.474***	.277***	-	
13. PSU	-.001	.060	-.037	-.012	-.014	.009	-.192***	-.356***	-.442***	.248***	-.256***	-.331***	-

Notas. * $p<.05$; ** $p<.01$; *** $p<.001$

Table 3. Characteristics of the participants in relation to the UPS

Variables	No UPS (n = 633)	UPS (n = 158)	p	Effect size
Age, M ± DT	26.46 ± 8.12	25.59 ± 7.60	.225[a]	0.108[c]
Women, n(%)	488(77.1)	123(77.8)	.840[b]	0.007[d]
Alcohol consumption, n(%)	88(13.9)	24(15.2)	.678[b]	0.015[d]
Tobacco consumption, n(%)	17(2.7)	4(2.5)	.914[b]	0.004[d]
With a current partner, n(%)	322(50.9)	76(48.1)	.534[b]	0.022[d]
Hours of use of the smartphone, M ± DT	3.25 ± 0.94	3.25 ± 0.90	.973[a]	0.003[c]
Extraversion, M ± DT	20.45 ± 4.17	19.25 ± 4.29	<.001[a]	0.286[c]
Agreeableness, M ± DT	24.64 ± 3.45	21.65 ± 3.90	<.001[a]	0.842[c]
Conscientiousness, M ± DT	24.33 ± 4.07	20.38 ± 4.31	<.001[a]	0.959[c]
Neuroticism, M ± DT	16.60 ± 4.38	18.75 ± 3.67	<.001[a]	-0.504[c]
Openness, M ± DT	22.58 ± 3.66	20.69 ± 3.61	<.001[a]	0.521[c]
Self-esteem, M ± DT	32.79 ± 6.18	28.42 ± 6.02	<.001[a]	0.712[c]

Notes. [a] = Student's t-test; [b] = Spearman's chi-square test; [c] = Cohen's d; [d] = Cramer's V..

DISCUSSION

PSU is associated in the scientific literature with numerous negative consequences, and its prevalence has been increasing in recent years, especially among young people. The work carried out is distinguished by being a pioneer in exploring this problem in a Honduran university context, thereby increasing knowledge about the impact of PSU in Latin American regions that have traditionally been left on the sidelines in more international research. The objectives of this study were to establish the level of prevalence of PSU in a sample of university students in Honduras and to assess the role of sociodemographic and personality variables in relation to this problem.

In relation to the first objective, the prevalence of PSU among Honduran university students was 19.97%, a percentage lower than that found in a recent meta-analysis conducted by Meng et al. (2022), which estimated an overall prevalence of 26.99%, although very similar to the prevalence estimated in this same meta-analysis for studies carried out in the Americas, which was 20.66%. These results are relevant because they allow us to compare what happened in Honduras with the international and regional panorama, thus highlighting the existing differences with the most developed countries due to specific social, cultural and economic conditions, as well as the limitations they face when it comes to accessing smartphones and staying connected. However, other studies that have assessed the prevalence of university students have found higher rates (Alhazmi et al., 2018; Alotaibi et al., 2022; Okasha et al., 2022). These dif-

ferences could be explained by the different tests used to assess prevalence, as well as by a lower income in developing countries such as Honduras, which can make it difficult to acquire smartphones. This perspective allows us to deepen our understanding of the role played by economic development and inequality in access to ICTs, an issue of great interest for the field of research and policy in Ibero-American countries.

Regarding the possible correlates analyzed, neither sex nor age presented statistically significant differences between the groups of university students with and without PSU. In relation to sex, there is no robust evidence in the scientific literature of its influence on PSU since, although several studies have found an increased risk of PSU among women (Aldana-Zavala et al., 2021; Fischer-Grote et al., 2019), other research points to a higher prevalence in males (Kwak et al., 2018). Likewise, studies such as that of Romero-Rodríguez et al. (2021) do not find significant differences in the level of PSU according to sex. What does seem clear is that men and women have different patterns of smartphone use, with women focusing on the social and communication aspects and men on games and the Internet (Cocoradă et al., 2018). There is some consensus that young people have a higher risk of developing PSU (Csibi et al., 2021), so the fact that no differences were found in the present study could be due to all the study participants belong to the same age group and the same population, university students.

In relation to the use of alcohol and tobacco, no significant differences were found between the groups of students with and without PSU. Although several studies have found a relationship between PSU and alcohol and tobacco consumption (Liu et al., 2022; Okasha et al., 2022), the fact that there were few cases of users of both substances in our sample may have influenced the result found.

Although studies such as the one conducted by Koçak et al. (2021) have found a lower risk of problematic use of new technologies among people with a partner due to the fact that they tend to have greater life satisfaction, in the present study there are no differences between participants who had PSU and those who did not in relation to having a partner or being single. Therefore, marital status does not seem to have an influence on the PSU.

Students who have PSU were not found to use their smartphone significantly longer throughout the day. Although it may seem strange, recent research has shown that the PSU is mainly related to the perceived use of the smartphone and not so much to the actual use (Hitcham et al., 2023).

Regarding the relationship between the PSU and the Big Five personality model, statistically significant differences have been found between participants who had PSU and those who did not in all traits. The fact that the group of university students with PSU has a significantly lower conscientiousness score is consistent with recent scientific literature (Arpaci & Unver, 2020; Bağcı & Horzum, 2022; Herrero et al., 2022), since students who have higher levels of conscientiousness are able to efficiently organize their time and make use of new technologies to improve their performance (Erdem & Uzun, 2022), which works as a protective factor against PSU. The fact that students with PSU have higher neuroticism scores is also consistent with previous studies (Hidalgo-Fuentes, 2021b; Peterka-Bonetta et al., 2019), since those people who are more emotionally unstable are more likely to face

stressful situations in their lives and, in turn, have greater emotional sensitivity towards them due to the use of inappropriate coping strategies (Lahey, 2009), which can trigger various mental problems, including addictive behaviors and the problematic use of new technologies. The finding that students with PSU achieve significantly lower agreeableness scores could be explained by the fact that these individuals, due to their low agreeableness, may have trouble initiating and maintaining satisfactory social relationships and try to use their smartphone to more easily satisfy their need for social contact (Chang et al., 2022), while people who have higher levels of agreeableness tend to have adequate social networks and have a higher level of life satisfaction (Agbaria & Mokh, 2022), so they may not find the need to seek social support online through their smartphones. A similar explanation can be given to the fact that college students with PSU show significantly lower extraversion scores, as more introverted people may try to use their smartphone to try to compensate for their lower number of face-to-face relationships (Peterka-Bonetta et al., 2019). University students classified within the group with PSU showed significantly lower scores of openness to experience than those who did not present this condition, which could be explained by the fact that the interest shown by people with high openness to experience in changing activities can cause the use of the Internet through smartphones to be transitory and they do not dedicate themselves exclusively and compulsively to this behavior (Tian et al., 2021).

Concerning self-esteem, the fact that students with problematic smartphone use had lower levels is an expected result, which coincides with the findings of various studies carried out on samples of university students (Hidalgo-Fuentes, 2021a; Mohamed & Mostafa, 2020). People with low self-esteem show a preference for the use of social media as they are more sensitive in face-to-face interactions and often find them unsatisfactory (Luo & Hancock, 2020), which could lead to excessive smartphone use. Additionally, young people with low self-esteem tend to avoid potentially stressful social situations, opting more frequently to communicate through social networks or messaging services through their smartphones (Chu et al., 2020).

A particularly relevant finding of this research is precisely the relationship between the Big Five model and the PSU. This study confirms that certain personality traits, such as low conscientiousness and high emotional instability, are significantly associated with PSU, replicating and extending previous results to a little-studied context, such as the Honduran population (Arpaci & Unver, 2020; Herrero et al., 2022). This type of analysis not only contributes to the field of behavioral addiction psychology but also has practical implications, as it can guide the design of preventive programs based on specific psychological characteristics.

Despite the findings presented, this study is not without limitations. Firstly, the use of non-probability sampling means that caution should be exercised when generalizing the results found, so future studies would benefit from using random sampling. Second, PSU was assessed at a general level without differentiating between specific apps or activities that could be contributing to the problem, such as social media use, video games, or online gambling. We believe that future research should focus on exploring these specific behaviors to obtain a more detailed understanding of the phenom-

enon and its relationship with the negative consequences identified. Finally, the use of a cross-sectional design prevents the evolution of the variables and their relationships over time from being tracked, so longitudinal studies would be recommended.

In conclusion, the present study is the first to establish the prevalence of PSU among Honduran university students. In addition to providing unique data on the Latin American population, the results provide a highly valuable comparative framework for studies both in the Ibero-American context and in Spain, thus promoting a holistic understanding of PSU. These results may have significant implications for the development of policies aimed at reducing the excessive use of new technologies in at-risk groups.

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