Impact of Mobile Phone Usage on Sleep Quality Among Medical Students Across Latin America: A Multicenter Cross-Sectional Study

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Abstract

Background: The ubiquitous use of mobile phones among medical students has been linked to potential health consequences, including poor sleep quality.

Objective: This study investigates the prevalence of mobile phone addiction and its association with sleep quality among medical students across six Latin American countries.

Methods: A descriptive, cross-sectional, multicenter study was conducted from December 2023 to March 2024 using a self-administered online survey. The survey included the Mobile Phone Addiction Scale and the Pittsburgh Sleep Quality Index (PSQI) to assess addiction rates and sleep quality among 1,677 medical students from Bolivia, Colombia, Ecuador, Panama, Paraguay, and Peru.

Results: Approximately 32.5% of participants exhibited mobile phone addiction, with significant variations between countries. The overall mean PSQI score was 7.26, indicating poor sleep quality. Higher addiction rates were associated with worse sleep quality across all PSQI components ($p < 0.05$). Regression analysis highlighted a strong association between mobile phone addiction and poorer sleep, controlled for demographic variables (Beta=1.40; (95%CI: 1.05 - 1.74).This study underscores a significant prevalence of mobile phone addiction among medical students and its detrimental association with sleep quality in Latin America. The findings advocate for the need to address mobile phone usage to mitigate its negative implications on student health and academic performance. Strategies to enhance digital literacy and promote healthier usage habits could benefit medical education and student well-being.

Conclusions: This study underscores a significant prevalence of mobile phone addiction among medical students and its detrimental association with sleep quality in Latin America. The findings advocate for the need to address mobile phone usage to mitigate its negative implications on student health and academic performance. Strategies to enhance digital literacy and promote healthier usage habits could benefit medical education and student well-being.

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Keywords: mobile phone; addiction behavior; sleep quality; medical students; sleep quality; Latin America.

Introduction

According to Statista, by 2024, approximately 17.8 billion mobile phones were in circulation worldwide [1]. Initially designed for voice calls, these devices have evolved to become essential for text messaging and more complex communications [2]. With the introduction of the smartphones featuring advanced computational capabilities, mobile phones have seamlessly integrated into daily life [3]. While the evolution of mobile phones has greatly enhanced access to educational and informational content and demonstrated their potential as versatile tools, their constant use also presents clear negative effects [4]. Some common issues from acute or chronic exaggerated use include headaches, carpal tunnel syndrome, tendinitis, and significant distractions leading to accidents [5]. Other less severe but still impactful effects are loss of motivation, memory and concentration issues, sleep disturbances, and learning difficulties [6].
One of the most explored and recognized negative effects of mobile phone usage is the disruption of sleep patterns and quality. When sleep is interrupted by cellphone use or prolonged screen exposure, both the quantity and quality of human sleep are adversely affected [7,8]. Research has linked inadequate sleep to a variety of health issues, including cardiovascular diseases, mental health disorders, neurodegenerative conditions, musculoskeletal problems, and a general reduction in life

quality [9,10]. University students, particularly those of Generation Z (GenZ), also referred to as iGen or postmillennials, born between 1996 and 2015 and the first generation to have grown up with the Internet and portable digital technology. Such students have been termed “digital natives” who are experts in using mobile phones and interacting on social media while having gained less experience with print media and other forms of communication, may face compounded risks. The combination of academic demands and extensive mobile phone usage can negatively impact students’ mental health, sleep patterns, and academic performance [11].

In recent years, mobile phones have become fundamental to the academic training of medical students [12]. Studies have shown that transitioning from personal communication tools to essential academic devices can lead to dependency and 'extreme use'" [13]. Addiction rates in the general population are reported to be approximately 40% [14]. For medical students in particular, problematic smartphone use (PSU), nomophobia – a fear of not having mobile phone connectivity, and general dependency not only negatively impacts academic performance but also poses significant health risks [15–18].

Recent research conducted in both the United States and Turkey have identified a correlation between increased mobile phone use and poorer sleep quality among university and medical students [19,20]. This trend underscores potential future challenges for both the academic success and health of medical students.

While this issue has been studied in various parts of Asia, Europe, and North America, the specific impacts of mobile phone addiction on sleep quality among medical students in Latin America have been largely unexplored. This study aims to examine the extent of mobile phone addiction and its association with sleep quality among medical students across six Latin American countries, addressing a critical gap in current research.

Methods

Study design

A descriptive, cross-sectional, multicenter study was conducted from December 2023 to March 2024.

Setting and participants

This study employed a self-administered online survey targeting medical students enrolled at universities across six Latin American countries: Bolivia, Colombia, Ecuador, Panama, Paraguay, and Peru. Participants included undergraduate students from the first to the final years (sixth or seventh) of their medical degree. Participants were selected using a non-probability convenience sampling method via the online survey platform Survey Monkey. Participation was voluntary.

Survey development and measures

The research team designed a 49-item anonymous online survey to collect data on demographic characteristics, mobile phone usage, and sleep quality among the Latin American medical student population. An initial version of the questionnaire was reviewed by a public health expert to ensure its relevance, accuracy, and to preempt potential errors. It was then pilot tested with 20 medical students from Ecuador to fine-tune comprehension and design; data from this phase were excluded from the final analysis. Revisions post-pilot test produced the final version of the survey, which was drafted in Spanish.

Questionnaire and Variables

The final version of the questionnaire was structured into three sections to meet the research objectives.

Demographic Data: The first section collected demographic information such as sex, age, country of residence, year of study, and type of university, categorized by funding source (public or private). It also included an additional year category (seventh year) to account for students in countries such as Colombia and Panama, where medical training can extend up to thirteen semesters.

Mobile Phone Addiction: The second section utilized the Mobile Phone Addiction Scale, designed and validated by Basu et al. [21], which adheres to the ICD-10 criteria for substance dependence syndrome. It comprised 20 questions rated on a six-point Likert scale (from 1 - completely disagree to 6 - completely agree). The questionnaire evaluated six addiction components: intense desire, poor control, abstinence, tolerance, diminished interest in alternative pleasures, and harmful use. Addiction presence was defined if half or more of the questions in each component were affirmed; global addiction was noted when three or more components were present.

Sleep Quality: The third section employed the standardized Pittsburgh Sleep Quality Index (PSQI) [22,23], designed to evaluate sleep quality through 19 questions covering seven components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. Scores ranged from 0 (no difficulty) to 3 (very severe difficulty), with a total score from 0 to 21. A score of 5 or less indicated normal rest, while scores greater than 5 indicated poor rest, categorizing the overall sleep quality level.

Data collection and management

The online platform "Survey Monkey" was utilized to facilitate data collection. Participants accessed the survey through a unique link shared across social media channels, including Facebook and WhatsApp. The preamble of the survey outlined the study's aims, assured confidentiality, and sought informed consent. Participants were required to agree to the informed consent and accept the Participation Agreement to proceed, reinforcing the survey's anonymity. To ensure high data integrity, all responses were meticulously reviewed for potential errors or inconsistencies, such as implausible age ranges or respondents selecting all available answers. This scrutiny led to the exclusion of questionnaires from an original sample of 1,798 survey responses prior to filtering to a final total of 1,667 responses which were considered valid and included in the study.

Bias

To mitigate potential bias during data collection and management, several strategies were employed. For example, IP addresses were used to eliminate duplicate submissions by configuring the "Survey Monkey" platform to limit one response per IP address. To ensure anonymity the questionnaire was carefully curated to avoid collecting any identifiable information, including IP addresses, beyond what was necessary for filtering duplicates. In the analysis phase, additional steps were taken to minimize bias. A dedicated member of the research team meticulously reviewed the results, and any discrepancies identified were collaboratively resolved. This rigorous approach ensured that only valid and genuine responses were included the final analysis, substantially enhancing the reliability and credibility of the study’s findings.

Ethics statement

This study was conducted in strict adherence to the ethical standards set forth in the Declaration of Helsinki. It also followed the ethical protocols approved by the Ethics Committee of Universidad de Las Américas (CEISH-UDLA), under code 2023-EXC-004. The research team was trained to ensured that all aspects of the study upheld the principles of participant anonymity and voluntary participation. No personally identifiable or sensitive information was solicited or included in the research data.

Statistical analysis

The current study utilized descriptive statistical tests to analyze the responses for each categorical variable, including the calculation of frequencies and percentages. For quantitative variables, measures of central tendency (mean) and dispersion (standard deviation) were evaluated.
To evaluate the relationships between the variables studied, inferential statistical tests were employed. Chi-square tests were conducted to assess the influence of participant characteristics on the presence of mobile phone addiction. T-tests and one-way ANOVA were used to examin the influence of characteristics on sleep quality as determined by mean PSQI scores.
Additionally, a multiple regression model adjusted for sex, age, and educational level was used to estimate the association between mobile phone addiction and poor sleep quality, expressed by Beta and 95% confidence intervals (CI 95%). In all statistical analyses, a p-value < 0.05 was considered statistically significant. All the analysis were conducted using R Core Team. (2020 version). R: A Language and Environment for Statistical Computing [Computer software]. R Foundation for Statistical Computing (Indianapolis, IN, USA).

Results

Demographic characteristics

A total of 1,677 medical students from six Latin American countries participated in this study. Ecuador and Panama had the highest representations at 20.1% and 18.0%, respectively. The majority of participants were female (64.4%), and over half (58.0%) were in their initial years of undergraduate study (first to third year). The majority (57.7%) were enrolled in private universities (Table 1).

Table 1. Demographic characteristics of medical students from 6 Latin American countries.

		Bolivia (n=251; 15.0%)	Colombia (n=259; 15.4%)	Ecuador (n=337; 20.1%)	Panama (n=302; 18.0%)	Paraguay (n=253; 15.1%)	Peru (n=275; 16.4%)	Overall (n=1677)
Sex	Male	99 (39.4%)	103 (39.8%)	118 (35.0%)	113 (37.4%)	73 (28.9%)	88 (32.0%)	594 (35.4%)
	Female	152 (60.6%)	156 (60.2%)	219 (65.0%)	189 (62.6%)	180 (71.1%)	187 (68.0%)	1083 (64.6%)
Age	Mean (± SD)	20.2 (3.14)	21.6 (3.46)	21.7 (2.18)	22.1 (2.27)	23.0 (4.58)	22.3 (3.76)	21.8 (3.36)
Year of study	First	111 (44.2%)	31 (12.0%)	12 (3.6%)	22 (7.3%)	67 (26.5%)	35 (12.7%)	278 (16.6%)
	Second	104 (41.4%)	51 (19.7%)	43 (12.8%)	52 (17.2%)	33 (13.0%)	64 (23.3%)	347 (20.7%)
	Third	28 (11.2%)	53 (20.5%)	124 (36.8%)	60 (19.9%)	35 (13.8%)	48 (17.5%)	348 (20.8%)
	Fourth	4 (1.6%)	34 (13.1%)	124 (36.8%)	20 (6.6%)	58 (22.9%)	38 (13.8%)	278 (16.6%)
	Fifth	2 (0.8%)	65 (25.1%)	14 (4.2%)	41 (13.6%)	32 (12.6%)	33 (12.0%)	187 (11.2%)
	Sixth	2 (0.8%)	18 (6.9%)	8 (2.4%)	102 (33.8%)	20 (7.9%)	19 (6.9%)	169 (10.1%)
	Seventh	0 (0%)	7 (2.7%)	12 (3.6%)	5 (1.7%)	8 (3.2%)	38 (13.8%)	70 (4.2%)
Level of education	Initial (1st to 3rd year)	243 (96.8%)	135 (52.1%)	179 (53.1%)	134 (44.4%)	135 (53.4%)	147 (53.5%)	973 (58.0%)
	Advanced (4th to 7th year)	8 (3.2%)	124 (47.9%)	158 (46.9%)	168 (55.6%)	118 (46.6%)	128 (46.5%)	704 (42.0%)
Type of university	Private University	248 (98.8%)	89 (34.4%)	256 (76.0%)	41 (13.6%)	229 (90.5%)	104 (37.8%)	967 (57.7%)
	Public University	3 (1.2%)	170 (65.6%)	81 (24.0%)	261 (86.4%)	24 (9.5%)	171 (62.2%)	710 (42.3%)

Smartphone Usage

Smartphones were used by nearly the entire study population (98.4%), with 94.9% reporting using mobile phones for academic purposes. However, computers or laptops were preferred for studies

(47.5%), while mobile phones were the least preferred option for studying (6.4%) (Figure 1).

Mobile Phone Addiction

According to the Mobile Phone Addiction Scale, 32.5% of participants exhibited mobile phone addiction. The domain most affected was tolerance (58.1%), followed by an intense desire to use the phone (42.2%). A decrease in pleasure was the least common symptom, noted in only 9.8% of the sample. (Supplementary Table 1).

According to the distribution among the participating countries, the highest prevalence of mobile phone addiction was observed in medical students from Panama (40.1%), while the lowest was in Peru (25.5%) ($p < 0.001$) (Figure 2). Furthermore, the presence of mobile phone addiction was associated with certain participant characteristics, being significantly higher (44.2%) among medical students who stated they did not use their phones for academic purposes ($p= 0.023$), as well as among those who reported that their undergraduate preparation negatively affected their rest (35.8%, $p < 0.001$). Additionally, medical students who preferred printed texts had the lowest percentage of mobile phone addiction (22.8%) when compared to those participants using screen devices (mobile phone, computer, tablet) ($p= 0.002$) (Table 2).

Table 2. Relationship between the characteristics of the participants with mobile phone addiction and sleep quality.

		Mobile addiction			PSQI	
		Absence n (%)	**Presence n (%)**	**P - value**	**Mean (± SD)**	**P - value**
Sex	Male (n=594)	400 (67.3%)	194 (32.7%)	0.916	7.04 (3.34)	**0.023**
	Female (n=1083)	732 (67.6%)	351 (32.4%)		7.39 (3.50)	
Level of education	Initial (n=973)	655 (67.3%)	318 (32.7%)	0.85	7.37 (3.41)	0.218
	Advanced (n=704)	477 (67.8%)	227 (32.2%)		7.11 (3.50)	
Type of university	Private University (n=967)	658 (68.0%)	309 (32.0%)	0.578	7.57 (3.48)	**0.001**
	Public University (n=710)	474 (66.8%)	236 (33.2%)		6.85 (3.37)	
Academic mobile phone use	No (n=86)	48 (55.8%)	38 (44.2%)	**0.023**	7.40 (3.50)	0.719
	Yes (n=1591)	1084 (68.1%)	507 (31.9%)		7.26 (3.45)	
Preferred way of studying	Mobile phone (n=108)	61 (56.5%)	47 (43.5%)	**0.002**	8.21 (3.71)	**0.022**
	Computer/laptop (n=797)	551 (69.1%)	246 (30.9%)		7.13 (3.41)	
	Tablet/iPad (n=470)	299 (63.6%)	171 (36.4%)		7.22 (3.47)	
	Prefer printed texts (n=302)	221 (73.2%)	81 (22.8%)		7.34 (3.40)	
Negative effects of your academic training on your rest	No (n=426)	329 (77.2%)	97 (22.8%)	**< 0.001**	6.08 (3.63)	**< 0.001**
	Yes (1251)	803 (64.2%)	448 (35.8%)		7.49 (3.37)	

Sleep Quality

As measured by the PSQI, a general mean of poor sleep quality of 7.26 (±3.45) was found among medical students from the six study countries. The components with the highest scores (indicating the worst sleep quality) were Subjective Sleep Quality (1.33 ± 0.77) and Daytime Dysfunction (1.31 ± 0.84), while the lowest scores were found in the Use of Sleep Medication (0.27 ± 0.70) and Habitual Sleep Efficiency (0.89 ± 1.12) (Supplementary Table 2).

Differences in sleep quality by country showed the highest scores for Bolivian (7.69 ± 3.61) and Paraguayan (7.64 ± 3.52) students, while Peru had the lowest score (6.29 ± 3.22) ($p < 0.001$). Complementary post-hoc analyses revealed that Peruvian medical students had significantly lower

PSQI scores (better sleep quality) compared to their counterparts from Bolivia ($p < 0.001$), Ecuador ($p < 0.001$), Panama ($p = 0.001$), and Paraguay ($p < 0.001$) (Figure 1).
Furthermore, characteristics associated with higher PSQI scores (worse sleep quality) were found in female medical students (7.39 ± 3.50) ($p = 0.023$), those from private universities (7.57 ± 3.48) ($p = 0.001$), those who preferentially use mobile phones for studying (8.21 ± 3.71) ($p = 0.022$), and those who consider that academic preparation affects their sleep quality (7.49 ± 3.37) ($p < 0.001$) (Table 2).

Effect of Mobile Phone Addiction on Sleep Quality

The negative influence of mobile phone addiction on sleep quality was statistically significant across all seven components of the PSQI, showing higher mean scores (worse quality) in the group of medical students with mobile phone addiction, including in the dimensions of Habitual Sleep Efficiency and Use of Sleeping Medication (Table 3).

Table 3. Effect of mobile phone addiction on the components of sleep quality of medical students in Latin America.

	Mobile addiction				
	Absence (n=1132)		**Presence (n=545)**		**P value**
	Mean	**± SD**	**Mean**	**± SD**	
Subjective sleep quality	1.27	0.76	1.44	0.76	< 0.001
Sleep latency	1.08	0.90	1.28	0.97	< 0.001
Sleep duration	1.06	1.05	1.29	1.09	< 0.001
Habitual sleep efficiency	0.83	1.09	1.00	1.17	0.003
Sleep disturbance	1.15	0.54	1.29	0.59	< 0.001
Use of sleeping medication	0.23	0.67	0.33	0.77	0.011
Daytime dysfunction	1.19	0.81	1.56	0.84	< 0.001

A multiple regression demonstrated that mobile phone addiction is a factor associated with poor sleep quality as measured by mean PSQI scores even after adjusting for sex, age, and level of studies (Beta: 1.40, CI 95%: 1.05 - 1.74) (Table 4).

Table 4. Regression analysis of mobile addiction impact on sleep disturbance (by PSQI mean scores).

		Beta (95% CI)
Mobile addiction		1.40 (1.05, 1.74)***
Sex	Female	0.40 (0.06, 0.74)*
Age		0.32 (0.13, 0.51)***
Level of education	Advanced	-0.46 (-0.85, -0.06)*
Country	Colombia	-0.62 (-1.23, -0.02)*
	Ecuador	-0.31 (-0.88, -0.26)
	Panama	-0.42 (-1.02, -0.17)
	Paraguay	-0.17 (-0.79, -0.44)
	Peru	-1.41 (-2.00, -0.81) ***
	R^2	0.06

Sleep disturbance predicted by mobile addiction was controlled for sex, age and level of studies. Statistical significance was defined by: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Discussion

By the third decade of the 21st century, access to and use of mobile phones has become practically universal, a reality that certainly includes medical students in Latin America. Although the primary use of smartphones is often associated with barrier-free communication through social networks, these devices possess numerous tools that are increasingly integrated into academic training, particularly among medical students. However, prolonged and uncontrolled use of these devices can have significant health effects on users [24–26]. This research aimed to explore the status of mobile phone addiction among medical students across six Latin American countries, as well as to describe their sleep quality and the potential impact of excessive and unhealthy mobile phone use on sleep.

This multicenter study included 1,677 undergraduate medical students, revealing a notable predominance of female participants. This aligns with recent research indicating that a majority of medical students in Latin America are female [27]. Nearly 100% of participants reported using a smart device, a rate comparable to those reported among medical students in other regions [28]. Furthermore, 94.9% of participants used these devices for academic purposes, a figure that is higher than in other regions but consistent with global trends favoring the academic use of mobile phones among undergraduate medical students [12,29,30].

Despite being regarded as a tool for academic enhancement, approximately one third (32.5%) of the study population exhibited "addiction" to their mobile phones, with rates ranging from 25.5% among Peruvian students to 40.1% among Panamanian students. The challenge of defining addiction status compared to peers globally is complicated by the wide variety of questionnaires used to assess mobile phone use, addiction, or overuse in medical students, such as the Smartphone Addiction Scale (SAS-SV) or the Cell Phone Overuse Scale (COS) [14]. For example, Kamal S. et al. found a 48% addiction rate among Pakistani medical and dental students using a similar instrument [31], while other tools have reported addiction rates ranging from 10.7% among Iranian medical students [32] to 34.4% among first- and second-year medical students in Srinagar, India [33]. The questionnaire used in the present study [21] found the most affected characteristics of addiction related to tolerance—using the phone more than expected and considering the usage excessive—and a strong desire to use the cell phone, particularly the need for immediate interaction with social networks and phone use even when others are nearby, which are typical traits of addictive behaviors [34]. Despite the heterogeneity in the questionnaires utilized, the collective body of research underscores the pervasive nature of cell phone addiction among medical students worldwide, including within Latin America.

Interestingly, our study found no demographic variables related to overuse or addiction to cell phones, such as gender [35,36]. However, it is concerning that there was a significant relationship between students who claimed not to use the mobile phone for academic purposes and a higher rate of addiction, which could be explained by a preference for using the device for leisure activities like social networks, gaming, or streaming platforms [37]. Furthermore, those who believed that their studies negatively affected their rest exhibited higher rates of addiction, suggesting an indirect relationship between cell phone addiction and poor rest. This notion is supported by the finding that the most commonly used device for studying also influences addiction rates, with a lower prevalence of addiction observed among those who prefer studying from printed texts.

Sleep quality studies have become more standardized with the widespread acceptance of the PSQI. The average PSQI score among the students in the present study (7.26 ± 3.45) indicated poor sleep quality, which is considerably higher than that reported in previous studies including military medical students (PSQI = 5.78 ± 2.26) [38], Indian medical students (PSQI = 4.43 ± 2.62) [36], and Iranian medical students (PSQI = 5.38 ± 2.31), as well as systematic reviews identifying a meta-mean PSQI between 5.95 and 6.1 [14,39]. Sleep problems and poor sleep quality are well-known among medical students and have been attributed to various factors including heavy study loads, a preference for studying over sleeping, and irregular schedules not faced by students in other disciplines [40,41]. The current study's findings also indicate that students from private universities and

women had worse sleep quality, a characteristic previously observed in other studies [38].

Furthermore, there was a significant and consistent association between cell phone addiction and poor sleep quality, with higher mean scores in all seven dimensions of the PSQI (subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, daytime dysfunction) among the addicted group compared to those without addiction ($p < 0.05$). Regression analyses revealed a global association between mobile phone addiction and diminished sleep quality, even when controlling for sex, age, and educational level variables (Beta = 1.40; 95% CI: 1.05 - 1.74; $p < 0.001$). This association has been widely evidenced in previous studies of medical students from various nations and years of study [14,32,35,36,38,42]. These findings reinforce previously presented ideas and highlight a significant issue for medical training in the coming years. As mobile phones become increasingly accessible worldwide, their effects on health must be monitored.

The current study found a significant and consistent association between smartphone addiction and poor sleep quality. There are multiple plausible explanations for this finding based on the extant literature. First, modern mobile phones, which provide the ability for gaming, streaming videos and music, and connecting with others via numerous social media applications, compete for users' limited time and attention, thus potentially displacing sleep. Social media platforms in particular have been designed to capture and maintain users' attention and induce what has been termed a "mindless" or "infinite scroll" [43,44]. Notifications, direct messaging (DMs), and comment functionality, together with quantifying likes, follows, and reposts, have transformed social media into attention-driven platforms where captured users become products to be sold and monetized for advertising [43].

Second, numerous studies have associated the blue light emitted from smartphones as disruptive to users' circadian rhythms [45–47]. In particular, artificial light has been found to delay the release of the circadian-monitoring and sleep-inducing hormone melatonin among medical students [48–50]. The attention-capturing characteristics of smartphone applications, which can cause a user to prioritize phone use above sleep needs, and a phone's artificial light delaying the release of melatonin, provide plausible explanations for the current study's findings.

This study addresses a crucial issue, emphasizing the necessity of recognizing that mobile phones have both a potentially positive and negative impact on the present and future of academic medical training [51]. These devices offer various applications, not only providing portable and digital access to textbooks and scientific articles but also practical tools including video content, infographics, and podcasts [52–54]. Such resources can significantly impact knowledge acquisition among students, even in Latin American countries. Hence, decision-makers, including university institutions and educators, must be aware of the potential consequences of mobile phone use in academic settings, which may include cross-device addiction, indirect effects on sleep quality, and other physical and mental health impacts.

Limitations

The current study had certain limitations. First, the study survey was conducted online, potentially biasing our sample towards medical students with easier access to technology or greater familiarity with online platforms. Additionally, study data relied on participants' self-reports, introducing the possibility of social desirability bias, where participants may exaggerate the academic use of their smartphones or provide socially acceptable answers.

Furthermore, due to the cross-sectional design of our study, it is not possible to establish causality between mobile phone addiction and poor sleep quality. It remains unclear whether academic mobile phone use leads to addiction, or if academically successful students simply use smartphones more frequently and sleep less. Additionally, while this study included participants from six Latin American countries, the findings may not be universally applicable across the region.

Conclusions

In conclusion, this study reveals a substantial prevalence of mobile phone addiction among medical students from six Latin American countries, affecting approximately one-third of the sample. Additionally, the overall sleep quality of student participants was found to be poor, as indicated by a mean PSQI score higher than previously reported. Findings suggest that using mobile phones for studying can indirectly contribute to poorer sleep quality by diverting attention to other activities during study sessions. This underscores the dual nature of mobile technology, which can serve both educational and recreational purposes, each with differing impacts on the lives and health of students. Importantly, we identified a significant association between mobile phone addiction and poor sleep quality. Overall, this study confirms the widespread academic integration of mobile phones among medical students in Latin America and highlights the critical need for strategies to address the use of these devices in academia and their potential impact on health and academic success.

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None.

Conflicts of Interest

None declared.

Abbreviations

95% CI: 95% confidence intervals
PSQI: Pittsburgh Sleep Quality Index

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Supplementary Files

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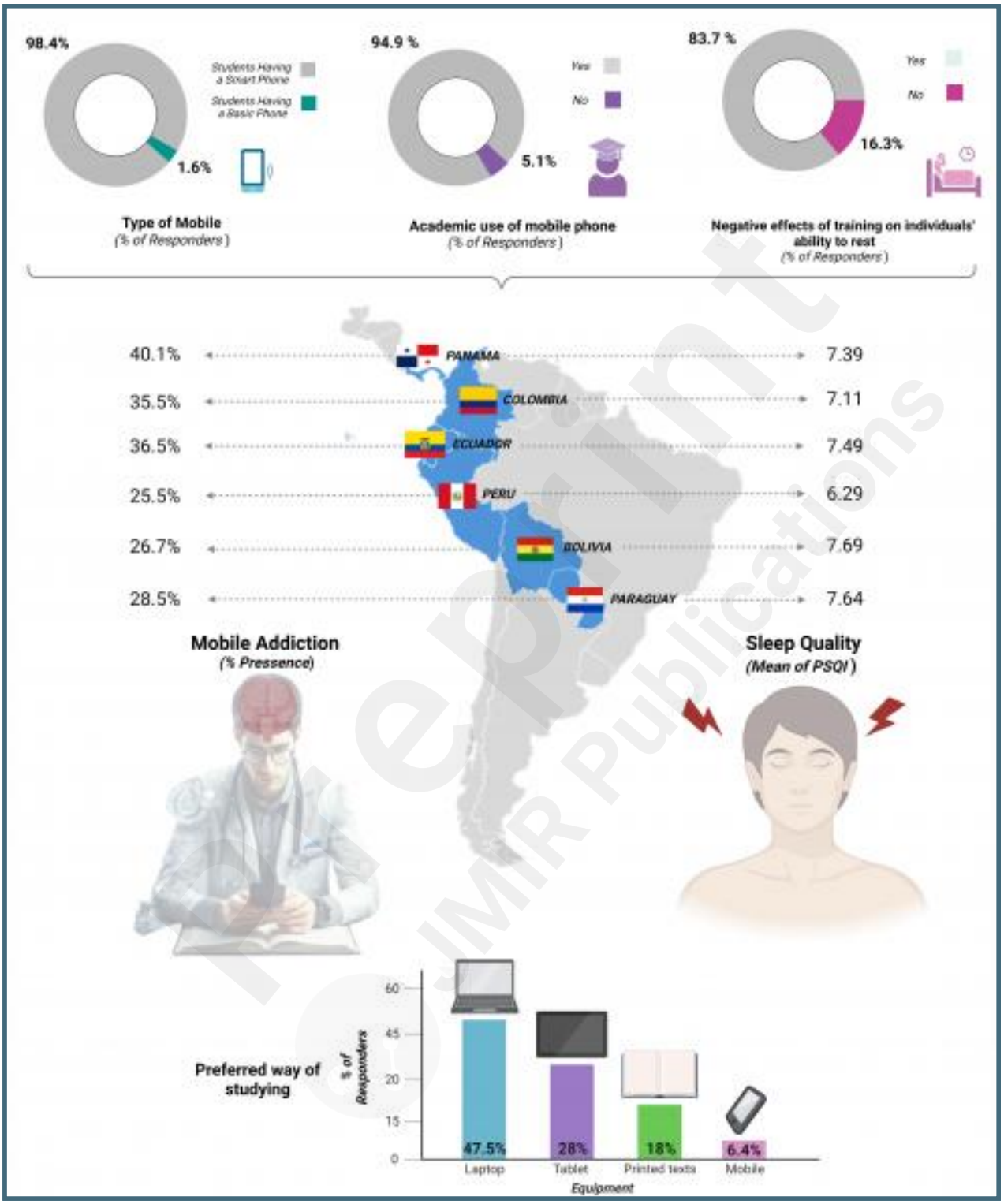
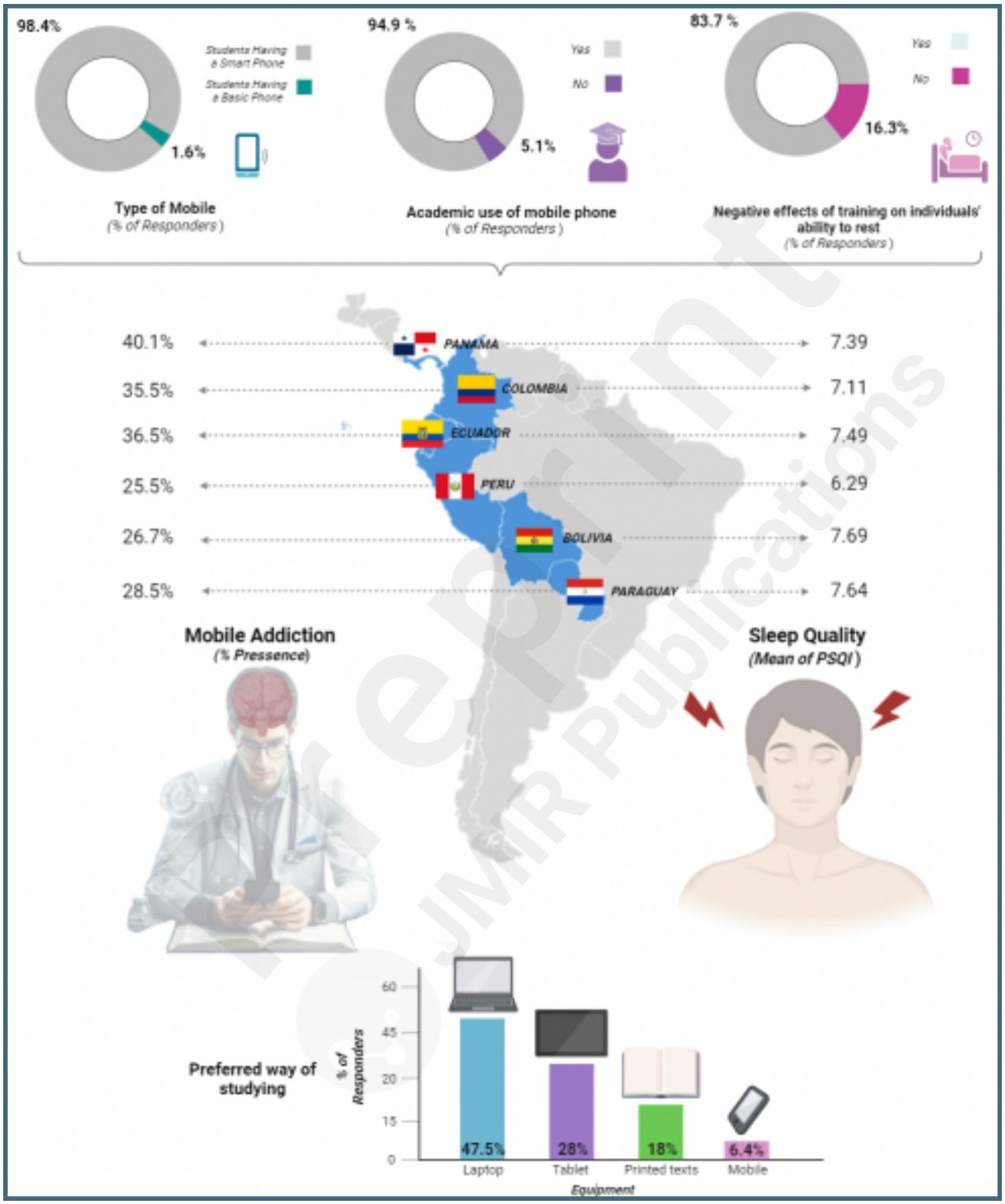

98.4%
Students Having a Smart Phone
Students Having a Basic Phone
1.6%
Type of Mobile
(% of Responders)
94.9 %
Yes
No
5.1%
Academic use of mobile phone
(% of Responders)
83.7 %
Yes
No
16.3%
Negative effects of training on individuals' ability to rest
(% of Responders)
40.1%
PANAMA
7.39
35.5%
COLOMBIA
7.11
36.5%
ECUADOR
7.49
25.5%
PERU
6.29
26.7%
BOLIVIA
7.69
28.5%
PARAGUAY
7.64
Mobile Addiction
(% Presence)
Sleep Quality
(Mean of PSQI)
Preferred way of studying
% of Responders
60
45
20
15
0
47.5%
28%
18%
6.4%
Laptop
Tablet
Printed texts
Mobile
Equipment

Figures

Characteristics of cell phone use, academic preparation, and distribution of cell phone addiction and sleep quality by country of residence among Latin American medical students.



Multimedia Appendixes

Supplementary tables 1 and 2.
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