

## Research Article

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## Phubbing and Feelings of Loneliness: A Study with Future Health Professionals

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**Abstract**

**Background/purpose.** The increasing use of technology in people's daily lives has given rise to novel social phenomena such as "phubbing," the act of ignoring someone in a physical environment to attend to a mobile phone. This behavior has sparked interest in the academic field, where social interaction is fundamental for the emotional and psychological well-being of students. The main objective of this study is to examine the relationship between phubbing and feelings of loneliness.

**Materials/methods.** The study adopts a quantitative approach with a cross-sectional, correlational, and descriptive-comparative design. A total of 318 voluntary students from a public health sciences university in Peru participated, responding to the Phubbing Scale and the Loneliness Scale.

**Results.** According to the results, phubbing is directly and significantly related to feelings of loneliness ( $r = 0.318$ ,  $p < 0.05$ ). The majority of students reported high levels of phubbing (55.66%) and feelings of loneliness (69.81%). Men exhibited greater mobile phone dependence ( $p = 0.007$ ) and social loneliness ( $p = 0.001$ ) than women. Furthermore, those under 24 years of age reported feeling lonelier ( $p = 0.047$ ) than those older than this age.

**Conclusion.** Health sciences students who exhibit phubbing behaviors are likely to feel lonely in society, at school, or at home. Therefore, it is important for universities to address these cases, particularly for male students and those under 24 years old.

## 1. Introduction

In the digital age, mobile devices have become an almost indispensable tool that facilitates continuous and automatic access to information and communication. The majority of university students with a mobile device (82 %) use a mobile phone on a daily basis (Orosco et al., 2020). However, despite the fact that technology opens doors to globalization and automation of productivity, excessive time spent using mobile phones or other technological resources can lead to significant changes in individuals' behavior. Young people aged between 16 and 20 typically focus almost all their attention on selfies, video games, or social media (Balakrishnan & Griffiths, 2018). Increasingly, they do not pay attention to the people with whom they have physical interactions because they are engaged with their smartphones (Xie et al., 2018). This complex social phenomenon is termed “phubbing.”

Although numerous studies have attempted to address the link between phubbing and feelings of loneliness, these have been conducted in European or Asian contexts (Maftai & Măirean, 2023; Ergün et al., 2020; Bakir & Dilmaç, 2023) while a significant gap remains in the Latin American reality. Considering that the demographic population in Peru has grown by 1.1% in recent years, while the number of connected mobile phones has increased by nearly 4% (Branch, 2025), the constant growth of internet users may contribute to an increase in the number of people dependent on the use of mobile devices. Smartphone addiction has inevitably become a relevant health issue among university students who exhibit imbalanced mental health (Aldana-Zavala et al., 2021). Excessive use of mobile smartphones can lead to significant distractions that compromise the effectiveness of communication, a fundamental human skill that must be performed efficiently.

Considering the literature review and the findings presented by various studies, this research primarily focuses on examining the relationship between phubbing and feelings of loneliness among health sciences students in Peru. Additionally, it sets out specific objectives such as a) describing the prevalence of both variables in this study group, b) identifying differences between men and women, and c) comparing the phenomena based on age range.

The findings of this study will contribute to understanding how phubbing behaviors may predict feelings of loneliness among university students and inform strategies for mental health support in educational settings.

## 2. Literature Review

The term phubbing refers to the situation in which an individual, despite being surrounded by others, is drawn to the constant access to social media (Nazir & Bulut, 2019). These platforms have become highly addictive sources of social interaction and virtual entertainment; however, excessive use can lead to the neglect of real-life social relationships. The measurement of phubbing is commonly defined through three dimensions: (a) dependence, referring to the inability to abstain from pleasurable behaviors in daily life; (b) anxiety-insomnia, which evaluates feelings of restlessness or fear in the face of perceived threats, and difficulties maintaining restorative sleep; and (c) interpersonal relationships, reflecting the quality of connections with partners, family, or friends (Cumpa, 2017). Some causes of phubbing include fear of missing out (FoMO), addiction to virtual content, and, most importantly, loneliness (Correa-Rojas et al., 2022; Tacca et al., 2021). In the academic context, phubbing may manifest as psychosocial challenges among students, such as shyness, impulsivity, social isolation, low self-esteem, and disinterest in other activities (Marin et al., 2024).

Loneliness is a universal, subjective experience shaped by one's social environment and personal perception (de Jong-Gierveld, 1987). Social loneliness stems from limited social connections and feelings of exclusion, whereas emotional loneliness results from the absence of close, meaningful

relationships (de Jong Gierveld et al., 2006). The World Health Organization (2013) has reported a growing prevalence of loneliness globally, which may have serious consequences for both physical and mental health (Wang et al., 2024). In Latin America and the Caribbean, approximately 18.1 % of students report feeling lonely most of the time (Sauter et al., 2019). In the Peruvian reality, it is explained that this feeling of loneliness may increase with the negative experiences of adolescents while online (Magis-Weinberg et al., 2021). In this sense, loneliness becomes a psychological and social issue that may be associated with the excessive use of mobile phones (Correa-Rojas et al., 2022).

Although the literature exploring the link between phubbing and loneliness is still emerging, studies suggest a correlation between the two in Romanian (Maftei & Măirean, 2023) and Turkish populations (Ergün et al., 2020). The presence of mobile communication technology can become a barrier to meaningful interaction (Wang et al., 2024; Przybylski et al., 2012). As a result, individuals engaged in phubbing may harm not only their interpersonal relationships but also their own emotional well-being, leading to increased loneliness and lower self-esteem (Al-Saggaf & Hogg, 2024). The repeated reliance on digital devices may cause symptoms of addiction, further reinforcing isolation (Oral & Karakurt, 2025). Interestingly, some studies argue that people who already feel lonely are more prone to phubbing as a way to find virtual connection (Zhan et al., 2022). Thus, smartphone addiction and phubbing may form a reciprocal cycle that worsens emotional dependence on technology (Safdar et al., 2023). Family context also plays a critical role; for instance, parental phubbing may foster loneliness in children, which manifests as difficulties in social settings such as university (Wang et al., 2022).

According to the theoretical framework of de Jong-Gierveld's model (1987), loneliness emerges from an unmet need for genuine relationships. This experience may deepen when excessive mobile phone use promotes distant, less meaningful interactions and erodes trust in one's social circle (Cumpa, 2017). The university setting, where students are typically adolescents or young adults, may increase challenges in socializing compared to earlier stages of education (Jaud et al., 2023). Feelings of exclusion, disconnection, and social inadequacy may foster boredom and isolation and, ultimately, impact students' academic performance—especially among future health professionals whose careers require constant social interaction (Weiss, 1973).

### **3. Methodology**

#### **3.1. Research Model**

This study adopts a quantitative approach, employing data collection and statistical analysis to measure psychological attributes and verify hypotheses. It is a basic research study, aiming to expand theoretical knowledge about the investigated variables and describe the relationship between them. The research design is non-experimental, cross-sectional, and descriptive-correlational (Creswell, 2012), as the study was conducted at a single point in time without manipulating the variables. The phenomena were observed and recorded as they occurred naturally.

#### **3.2. Participants**

The study was conducted with the participation of students from the Faculty of Health Sciences at a university located in southern Peru. A non-probabilistic, purposive sampling method was used. The exclusion criteria considered for the research were as follows: (a) students enrolled in the 2024-I semester, voluntary participation, acceptance of informed consent, and being of legal age. In addition, questionnaires completed by students who failed to select any response options or who reported being 17 years of age or younger were excluded. As a result, the final sample consisted of 318 health sciences students. Of these, 50.63% were male (161), and 49.37% were female (157).

Participants' ages ranged from 18 to 56 years, with a mean age of 22.88 and a standard deviation of 5.12.

### **3.3. Data Collection Instrument**

The Phubbing-G Scale developed by Cumpa Prada (2017) was used to assess phubbing. This instrument identifies issues related to mobile phone use and is designed for both male and female participants with a sufficient cultural level to understand the test instructions and items. The estimated completion time ranges from 8 to 15 minutes. The statements follow a Likert-type scale format and are suitable for clinical, educational, and research contexts. The scale has demonstrated strong validity, supported by the judgment of 10 experts, and a reliability coefficient of 96% was obtained for the 23-item version. It comprises three dimensions: Dependence (items 2, 4, 12, 13, 15, 19, and 22), Anxiety–Insomnia (items 1, 6, 8, 10, 14, 16, 17, 18, 20, 21, and 23), and Interpersonal Relationships (items 3, 5, 7, 9, and 11). For scoring, responses are rated from 1 to 4. The total score is calculated by summing the individual scores assigned to each item, using established benchmarks to classify levels as low, medium, or high.

The second instrument used was the Loneliness Scale (de Jong-Gierveld, 1987). Regarding its psychometric properties, the scale was validated in Peru by Ventura-León & Caycho (2017) among young people and adults in Metropolitan Lima. The instrument demonstrated reliability through exploratory and confirmatory factor analysis, and its internal consistency was confirmed using omega and hierarchical omega coefficients ( $\Omega = .83$ ). Test validity was supported by goodness-of-fit indicators (GFI, CFI, and TLI = 0.95). The scale consists of 11 items with Likert-type response options: 1 = no, 2 = more or less, 3 = yes. It includes reverse-scored items: 1, 4, 7, 8, and 11. Scoring is dichotomous, with each item scored as 0 or 1. One point is assigned for direct items answered with “more or less” or “yes”, and for reverse-scored items, one point is given for responses of “no” or “more or less”. After summing the item scores, the total score is used to determine the corresponding category according to the established benchmark. Total scores range from 0 (“No loneliness”) to 11 (“Maximum loneliness”).

### **3.4. Data Collection Process**

Firstly, prior arrangements were made with the Director of the Faculty of Health Sciences at the university, who granted permission for the instruments to be administered to the students. Subsequently, coordination took place with faculty lecturers to carry out the application during class hours. All participants were then informed about the objectives of the research and the handling of the data, after which they provided their informed consent and agreed to participate voluntarily. The data collection process was conducted in May 2024. The estimated time required for each participant to complete the instruments ranged from approximately 11 to 18 minutes.

### **3.5. Data Analysis**

Once the information had been collected, the data were transcribed into Excel 2021 and SPSS version 26. The variables and dimensions were analysed categorically by identifying low, medium, and high levels using frequency tables. Tests for skewness, kurtosis, and the Kolmogorov–Smirnov test were applied to assess the normality of the data distribution, as the sample size exceeded 50 participants. Accordingly, hypothesis testing was carried out using Spearman's Rho non-parametric test, with a two-tailed significance level below 0.05 considered indicative of statistical significance. Subsequently, the Mann–Whitney U test was used to compare variables and dimensions by sex, in order to identify potential differences between male and female participants. In addition, the Kruskal–Wallis test was applied to compare the variables across different age groups.

### 3.6. Research Ethics

The study was developed following the ethical principles of scientific research. Participation was completely voluntary and anonymous, and all students were previously informed about the objectives and scope of the study. In addition, their informed consent was requested before proceeding with the application of the instruments. Throughout the entire process, the confidentiality and privacy of the data collected was guaranteed.

## 4. Results

According to the results presented in Table 1, the majority of respondents report a high level of phubbing (56.66%) and feelings of loneliness (69.81%). Regarding the dimensions, it has been found that interpersonal relationships (51.57%), anxiety-insomnia (60.40%), and social loneliness (53.15%) showed a greater tendency towards high levels. In terms of dependence (53.77%) and emotional loneliness (44.65%), most participants fall into the medium level. The detected levels are confirmed by the mean scores for each of the variables.

**Table 1.** Levels of Phubbing and its Dimensions

Variables	Low		Medium		High		M	SD
	n	%	n	%	n	%		
Phubbing	20	6.29	121	38.05	177	55.66	55.85	11.29
Interpersonal Relationships	17	5.35	137	43.08	164	51.57	11.84	3.09
Anxiety-Insomnia	22	6.92	104	32.70	192	60.40	26.06	5.90
Dependence	50	15.72	171	53.77	96	30.50	17.94	3.78
Loneliness	11	3.46	85	26.73	222	69.81	7.70	2.75
Social Loneliness	34	10.69	80	25.16	204	64.15	3.73	1.46
Emotional Loneliness	38	11.95	142	44.65	138	43.40	3.98	1.72

The results presented in Table 2 indicate that some cases, such as phubbing and anxiety-insomnia, show a relatively symmetrical distribution, with values close to zero. Other variables, such as loneliness, social loneliness, and emotional loneliness, display negative skewness, with values concentrated towards the higher end of the scale. Regarding kurtosis, the values fall within the expected range of  $-1$  to  $+1$ , suggesting the absence of extremely heavy or light tails. All variables show  $p$ -values well below  $0.05$ , indicating that they do not follow a normal distribution. Consequently, a non-parametric test statistic is applied to examine the study's hypotheses.

**Table 2.** Normality of Study Variables

Variables	Skewness	Kurtosis	Statistic	$p$
Phubbing	0.041	0.715	0.051	0.047
Interpersonal Relationships	0.180	-0.289	0.090	0.000
Anxiety-Insomnia	0.011	0.127	0.060	0.009
Dependence	0.078	0.487	0.093	0.000
Loneliness	-0.697	-0.181	0.124	0.000
Social Loneliness	-1.017	0.109	0.230	0.000
Emotional Loneliness	-0.582	-0.539	0.158	0.000

In the results presented in Table 3, the correlations between the study variables are shown using Spearman's Rho test statistic. It is identified that there is a positive, low, and significant relationship between phubbing and loneliness ( $r = 0.318$ ,  $p < 0.05$ ). This same level of relationship was found with the dimensions of social loneliness ( $r = 0.134$ ,  $p < 0.05$ ) and emotional loneliness ( $r = 0.376$ ,  $p < 0.05$ ). Similarly, loneliness also positively and significantly correlated with interpersonal relationships ( $r = 0.266$ ,  $p < 0.05$ ), anxiety-insomnia ( $r = 0.319$ ,  $p < 0.05$ ), and dependence ( $r = 0.224$ ,  $p < 0.05$ ). Among the relationships between the dimensions, significant positive correlations were noted between emotional loneliness and interpersonal relationships, anxiety-insomnia, and dependence, in all cases. Meanwhile, social loneliness correlated more strongly with anxiety-insomnia and dependence. A significant correlation was not identified between social loneliness and interpersonal relationships.

**Table 3.** Correlations Between Study Variables

Variables	Loneliness	Social Loneliness	Emotional Loneliness
Phubbing	0.318**	0.134*	0.376**
Interpersonal Relationships	0.266**	0.089	0.324**
Anxiety-Insomnia	0.319**	0.131*	0.378**
Dependence	0.224**	0.134*	0.243**

Note. \*\* correlations less than 0.01, \* correlations less than 0.05

According to Table 4, there are significant differences in dependence ( $Z = -2.71$ ,  $p = 0.007$ ) and social loneliness ( $Z = -3.42$ ,  $p = 0.001$ ). Men exhibited greater dependence on their mobile phones (Mean = 18.28, SD = 4.064) and higher social loneliness (Mean = 3.98, SD = 1.371) than women. No significant differences were detected in the study variables such as phubbing ( $Z = 0.71$ ,  $p = 0.468$ ) and loneliness ( $Z = -1.59$ ,  $p = 0.113$ ), nor in the dimensions of interpersonal relationships ( $Z = -0.57$ ,  $p = 0.569$ ), anxiety-insomnia ( $Z = -0.56$ ,  $p = 0.576$ ), and emotional loneliness ( $Z = -0.53$ ,  $p = 0.595$ ).

**Table 4.** Differences in Variables by Sex

Variable	Male		Female		U	Z	p
	(n = 161)		(n = 157)				
	M	SD	M	SD			
Phubbing	55.89	12.045	55.80	10.493	12044.50	-0.73	0.468
Interpersonal Relationships	11.76	3.220	11.92	2.966	12174.50	-0.57	0.569
Anxiety-Insomnia	25.79	6.236	26.33	5.543	12104.50	-0.56	0.576
Dependence	18.28	4.064	17.60	3.432	10358.00	-2.71	0.007
Loneliness	7.88	2.838	7.52	2.650	11350.00	-1.59	0.113
Social Loneliness	3.98	1.371	3.46	1.504	9967.00	-3.42	0.001
Emotional Loneliness	3.90	1.814	4.06	1.622	12211.00	-0.53	0.595

In Table 5, it is identified that there are differences in the feelings of loneliness among students ( $H = 8.866$ ,  $p = 0.031$ ), highlighting that those who experience more loneliness are students aged 21 to 23 years ( $M = 8.33$ ,  $SD = 2.322$ ). Additionally, differences in social loneliness are presented ( $H = 8.866$ ,  $p = 0.031$ ), where those aged 21 to 23 also had higher scores ( $M = 3.99$ ,  $p = 0.031$ ). Significant

differences were found in mobile dependence ( $H = 15.464$ ,  $p = 0.001$ ), particularly among those aged 18 to 20 years ( $M = 18.72$ ,  $SD = 3.552$ ). No significant differences were found in phubbing, interpersonal relationships, anxiety-insomnia, or emotional loneliness among health sciences students.

**Table 5.** Differences in Variables and Dimensions by Age Range

Variable	18 to 20		21 to 23		24 to 26		27 to above		H	p
	(n = 128)		(n = 83)		(n = 44)		(n = 63)			
	M	DE	M	DE	M	DE	M	DE		
Phubbing	57.39	10.277	56.87	11.501	55.70	11.230	51.46	12.119	6.293	0.098
Interpersonal Relationships	12.05	3.082	12.01	2.957	11.34	2.828	11.52	3.454	1.814	0.612
Anxiety-Insomnia	26.56	5.243	26.61	6.082	26.86	6.407	23.76	6.114	7.649	0.054
Dependence	18.72	3.552	18.33	3.758	17.50	3.567	16.17	3.846	15.464	0.001
Loneliness	7.79	2.774	8.33	2.322	7.50	2.426	6.86	3.217	7.944	0.047
Social Loneliness	3.80	1.480	3.99	1.283	3.45	1.284	3.41	1.681	8.866	0.031
Emotional Loneliness	3.98	1.702	4.34	1.476	4.05	1.698	3.44	1.966	7.677	0.053

## 5. Discussion

Considering the results obtained, it has been confirmed that there is a significant and positive relationship between phubbing and feelings of loneliness among future health professionals. Our findings are consistent with and align with the line of research presented by other scholars (Bakir & Dilmaç, 2023; Ergün et al., 2020; Maftai & Măirean, 2023). Excessive use of mobile phones and a reduction in social interactions with people in one's environment could increase feelings of loneliness. Similarly, the use of these devices may lead to greater social isolation, creating a cycle that is difficult to break (Zhan et al., 2022). The social skills of health sciences students may deteriorate if their interaction with mobile phones increases (Cumpa Prada, 2017; Y.-L. Wang et al., 2024). Real-world communication is affected when there are communicative barriers, such as smartphone addiction, which prevent the natural development of the communicative process (Oral & Karakurt, 2025), making it less effective and more distant.

This association between both phenomena may result in health sciences students frequently experiencing high levels of stress, as ignoring others would lead them to miss relevant opportunities to establish meaningful connections. This is reflected in the decrease of social support among peers, an aspect that typically affects emotional well-being, which is constantly challenged by the academic pressure associated with professional training. The problematic use of smartphones caused by phubbing can even impact students' life satisfaction (Sun & Wong, 2024). When they choose to look at their phones instead of engaging in conversations with their peers, they create barriers that hinder the development of deep connections in the socialization process. This phenomenon may intensify feelings of loneliness, as students feel that they are not being heard by their peers (Safdar Bajwa et al., 2023).

Although the purpose of using technology, such as mobile devices, is to enable connection with others, it appears to generate sudden isolation. People who experience phubbing undergo a sense of social exclusion that leads to a greater attachment to networks in the hope of feeling more included virtually (David & Roberts, 2017). Phubbing and persistent feelings of loneliness can trigger

related psychological phenomena, such as social isolation, with consequences ranging from reduced cognitive abilities and impaired concentration to difficulties in decision-making and challenges in recognizing and altering negative thought patterns (Guzmán-Brand & Gelvez-García, 2023). One of the relevant aspects in professional training is empathy, an essential skill in the health field, which is adversely affected by phubbing. Students who frequently distract themselves with their phones may miss opportunities to practice active listening and emotional understanding, skills that are indispensable in their professional development. The inability to connect with others can lead to increased isolation, intensifying feelings of loneliness among future professionals.

Another significant finding in the study is the high level of loneliness and phubbing identified among university students. These results are consistent with other studies that have reported that 35.6% of German students exhibit moderate to severe levels of loneliness (Diehl et al., 2018), and they also align with findings from another study showing that this phenomenon increased by 7% between 2014 and 2018 (Hysing et al., 2020). The way students relate during their university years can lead to an increase in emotional and social loneliness compared to their school years (Jaud et al., 2023). The demands of studies often leave less time for recreational or social activities, reflected in the few opportunities for socialization, and the competitive environment typically leads students to avoid sharing their feelings, perpetuating their isolation and disconnect from their surroundings. The adaptation to students' study conditions can influence the loneliness experienced by students.

On the other hand, regarding phubbing, it has been found that the majority of students exhibit high levels of phubbing behavior. This aligns with the reviewed literature, which indicates the prevalence of this phenomenon among most university students (Ahmed et al., 2023). Davey et al. (2018) identified the prevalence of phubbing at 39.4% of the adolescent population in India and concluded that they require special guidance from clinics or governmental universities to control this habit. Purwar et al. (2023) report that this phenomenon affects almost 42.7% of the university population, and the majority of them, 72.5%, state that they are always using their mobile phones. Other research indicates that current university students present high levels of digital addiction, considerably affecting their social interactions and daily routines (Jouty et al., 2024). Another study identified that the majority of university students (74.5%) always or almost always have their phone within reach, and a significant group (9.4%) indicate that they are busy with their mobile phones when they are with friends or family (Barbed-Castrejón et al., 2024). These behaviours are more pronounced with close individuals, such as parents, peers, or children, than with strangers due to social norms (Al-Saggaf & MacCulloch, 2019).

Another important finding of the study indicates that, although there are no significant differences in the overall scores of loneliness or phubbing between male and female university students, relevant differences were identified in two dimensions: mobile dependence and social loneliness. Regarding feelings of loneliness, some findings also reported no difference in loneliness experienced by male and female university students (Bagaskara et al., 2022), as well as in older populations (Pollet et al., 2022). Meanwhile, other research suggests that women are more prone than men to feel lonely, and this increases if they are single, of low income, or living alone in university residences (Hysing et al., 2020; Nicolaisen & Thorsen, 2024; Zahedi et al., 2022). At least one in three women feels lonely compared to men of the same age (Deslauriers et al., 2023; Wickens et al., 2021), which may be due to women being more willing to acknowledge their feelings of loneliness than men. Other studies argue that men are more likely to experience loneliness, which increases when they are alone and decreases when they are married or in a relationship. Thus, it seems that marriage among young men may condition a reduction in this feeling (Barreto et al., 2021; Kim & Lee, 2022; Salkic, 2023).

Regarding phubbing, the study aligns with reports by Teixeira & Freire (Teixeira & Freire, 2020) and Ilic & Tanyeri (İliç & Tanyeri, 2020), demonstrating that phubbing is present in both male and



female couples without distinction. Other research indicates that women in informal relationships are more likely to exhibit phubbing behaviours than men (Cebollero-Salinas et al., 2022; Chmielik & Błachnio, 2022), especially in certain dimensions such as communication and phone obsession, particularly concerning social media platforms like Facebook (Błachnio & Przepiorka, 2019). Conversely, other studies suggest that men are more sensitive to phubbing (Kryukova & Ekimchik, 2019). In line with this, our research found that men show greater dependence on their mobile devices than women; however, the reasons may hinge on the utility they derive from them, whether for academic purposes or communication with others.

There are age differences in feelings of loneliness, loneliness, and mobile dependence, with younger individuals showing better scores than students older than 24 years. Regarding levels of loneliness, research agrees that younger people typically report higher levels of loneliness than older individuals (Barreto et al., 2021; Child & Lawton, 2019; Deslauriers et al., 2023). Generally, those under 20 often present high levels of loneliness compared to those aged 40 or over 60 (Nguyen et al., 2020; Solon'ko & Kolesnichenko, 2021). Mund et al. (2020) argue that loneliness follows an inverted U-shaped trajectory, being low in childhood but remaining stable during adolescence until advanced old age.

Regarding phubbing, although no significant differences were identified in the overall scores, differences were noted in mobile dependence. Other research also found no differences between students aged 13 to 17 and those aged 18 to 22, as social media usage habits are similar (Tuncay & Toker, 2021). Paradoxically, more studies suggest that this difference becomes apparent as age increases, as younger individuals are more prone to problematic internet use (Barbed-Castrejón et al., 2024; Chmielik & Błachnio, 2022; İliç & Tanyeri, 2020). As individuals age, they assume new commitments and behaviors distinct from their adolescent or young adult years, as they become parents and colleagues, valuing face-to-face connections more because they need them.

## **6. Conclusion, Suggestions and Implications**

### **6.1. Conclusion**

The study concluded that phubbing and feelings of loneliness are associated among university students in health sciences. Additionally, in most cases, it was found that the majority of students habitually ignore the people around them to focus on their mobile devices and generally feel lonely. Another important point is that male and female students did not show any differences regarding phubbing attitudes and feelings of loneliness; however, in terms of mobile dependence and social loneliness, male students scored higher. Finally, it was identified that younger students under the age of 24 feel lonelier than those over this age; the same situation applies to social loneliness and mobile dependence. Younger individuals tend to use their phones more, which seems to distance them from interpersonal socialization.

### **6.2. Limitations and Suggestion**

This study expresses several limitations that must be taken into account when interpreting the results regarding the correlation between phubbing and feelings of loneliness. Firstly, being a cross-sectional study, the data collection was subject to the socio-emotional conditions of the students at that moment, making it difficult to establish causal relationships. Secondly, reliance on self-reported questionnaires may introduce biases, as participants could be influenced by social desirability, thus compromising the validity of the results. Thirdly, the representativeness of the sample is another limiting aspect, as non-probabilistic sampling challenges the generalizability of the findings. Finally, external variables that could influence the observed relationship, such as the quality of personal relationships or underlying psychological factors, were not controlled.

Future research addressing these variables could perform longitudinal studies or include qualitative interviews and observations to provide a better explanation of the phenomenon, which would mitigate biases associated with self-reported questionnaires. Additionally, it is essential to control for external variables that could confound the results or to conduct an analysis of possible mediating or moderating variables.

### 6.3. Implications

Our study presents theoretical implications. According to De Jong-Gierveld's (1987) model, loneliness is a situation that manifests when there is an unpleasant or unacceptable lack concerning the quality of social interactions; that is, when the number of social relationships is lower than what a person considers desirable. Therefore, excessive time spent online can lead to superficial relationships and negatively affect emotional well-being, hindering participation in social and community activities that are essential for healthy social development. Additionally, it complements the theory of loneliness by Sadler and Weiss (1973), which posits that loneliness is not limited to the person not wanting to be sought after but rather that the social group attempting to do so but fails, making it important to distinguish between objective and subjective loneliness. An inclination towards mobile phones can result in individuals opting out of interpersonal interaction in environments that warrant it, such as university settings (Safdar Bajwa et al., 2023). This study provides empirical evidence supporting both theories in the context of higher education in health sciences.

Furthermore, it has practical implications, as loneliness among university students is a growing issue. Therefore, our findings may help higher education institutions organize socialization activities that address loneliness, as well as effective methods to mitigate its impact on young people (Ousman & Nazir, 2023). Promoting social connection through interventions at universities is more successful in reducing loneliness (Ellard et al., 2021). Controlling phubbing can lessen its impact on psychological health and improve students' moods (Correa-Rojas et al., 2022), thereby not affecting their academic performance. The field of psychology represents a strategic ally in proposing psychological projects that enable continuous improvement for students. Workshops aimed at managing technological addiction through social activities create a deep communication environment, reducing the need to stay connected and promoting participation in social activities through face-to-face contact rather than solely online communication (Wilson et al., 2022).

### Declarations

**Author Contributions.** Conceptualization: GCQ, YSNRB, EGEA; Data curation: YSNRB; Formal analysis: GCQ, EGEA; Investigation: GCQ, YSNRB; Methodology: GCQ, YSNRB, EGEA, JRPE; Project administration: GCQ, YSNRB; Resources: YSNRB; Software: GCQ; Supervision: GCQ; Validation: YSNRB, EGEA, JRPE, DEMV; Writing – original draft: GCQ, YSNRB, EGEA, JRPE, DEMV; Writing – review and editing: GCQ, YSNRB, EGEA, JRPE, DEMV. All authors have read and approved the final version of the manuscript.

**Conflicts of Interest.** The authors declare no conflicts of interest.

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**Ethical Approval.** This study was approved by the Ethics Committee of the Newman Graduate School (Approval Letter No. 003-2024-DIN-EPN). The research adhered to the National Code of Scientific Integrity of the Peruvian National Council of Science, Technology, and Technological Innovation (CONCYTEC) under Presidential Resolution No. 028-2024-CONCYTEC and complied with the principles of the Declaration of Helsinki.

**Data Availability.** The data supporting the findings of this study are confidential due to ethical restrictions but are available from the corresponding author upon reasonable request.

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