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RESEARCH PAPER

Impact of Loneliness on Nomophobia among University Students: Mediating Role of Online Social Interaction and Moderating Role of Social Support

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ABSTRACT

This study explored the relationship between loneliness and nomophobia among university students, investigating the mediating role of online social interaction (OSI) and the moderating role of social support. A sample of 300 participants was surveyed, and the results indicated a significant positive correlation between loneliness and nomophobia ($r = .65$, $p < .001$), suggesting that greater loneliness leads to higher levels of nomophobia. OSI was found to mediate this relationship ($B = .29$, $p < .001$), while social support moderated it ($B = .18$, $p < .05$), buffering the negative impact of loneliness on nomophobia. These findings emphasize that loneliness can intensify nomophobia through increased online social interaction, and that social support plays a key role in mitigating this effect. Based on these results, the recommendations included that interventions aimed at reducing nomophobia should focus on alleviating loneliness and enhancing social support networks among university students.

KEYWORDS Loneliness, Nomophobia, Online Social Interaction, Social Support, University Students, Mediation, Moderation, Digital Addiction, Psychological Well-being

Introduction

Loneliness is a complicated emotional experience that an individual feels when he/she recognizes a discrepancy between desired and actual social relationships (van Roekel et al., 2022). It is not simply about being physically alone in some sense; it signifies a want of meaningful connections with others. Among university students, loneliness is increasingly prevalent because of conspicuous life transitions like moving away from home, adjusting to academic pressure, and inducing new social circles (Mushtaq et al., 2022). Research has shown that this emotional state can grossly affect a person's mental well-being by causing stress, anxiety, or depression (Liu et al., 2023; Zhang et al., 2023).

University students are more prone to feeling lonely because of internal and external stressors. Internally, identity formation, academic pressure, and the craving for peer approval can instead heighten feelings of loneliness (Ma et al., 2022). On the other hand, anything from a lack of family support to social exclusion to language and cultural barriers for international students will serve to heighten their feelings of loneliness externally (Bekalu et al., 2023). It was also reported (Yildirim and Akgönül, 2023) that students suffering from chronic states of loneliness tend to display low levels of self-esteem and low levels of perceived social support, which apparently facilitate withdrawal from social interactions. This further establishes a pattern whereby being lonely stimulates avoidance and thus heightens the experience of emotional distress (van Roekel et al., 2022; Zhou & Wang, 2023).

Digital technology serves as a lifeline for students to be free from loneliness. With the introduction of smartphones, followed by social media use and instant messaging apps, fast and shallow social satiation is now rampant, simply claimed by Li et al. (2022). While all this remained defined as options available to facilitate connection, it would also lead to exclusion, especially when such connections were believed to be less authentic or caused negative social comparisons (Jin et al., 2023). The paradox of types of isolation we bring on ourselves because we use technology to reduce loneliness was reflected in both studies (Gao et al., 2023; Zhang et al., 2023). Such factors may enable these digital coping mechanisms to progress into compulsivity and ultimately constraint real-life socializing, thus worsening loneliness.

The consequences of loneliness are as follows: emotional discomfort is not all; it is perfectly behavioral and also cognitive in nature. Lonely students can suffer disengagement from school, reduced motivation, and impaired concentration (Kim & Lee, 2023). According to Liu et al. (2022), extended isolation may lead to cognitive distortions, believing others are untrustworthy or uninterested in forming relationships with them. It may dissuade students from seeking interaction and so adds to isolation. Importantly, loneliness tends to affect psychological outcomes, but it is sometimes a precursor to certain behavioral addictions like excessive use of smartphones, leading to isolation-related problems like nomophobia (Yildirim & Correia, 2023; Güzeller & Coşguner, 2022).

Nomophobia

Nomophobia, short for "no mobile phone phobia," refers to the fear or anxiety of being without access to one's smartphone (Yildirim & Correia, 2023). In today's hyperconnected world, smartphones have become essential tools for communication, information, and social interaction especially among university students (Kaur et al., 2023). As mobile dependency increases, so does the risk of psychological discomfort when these devices are unavailable. Research highlights that nomophobia is not simply a habit but can manifest as a legitimate psychological condition, associated with symptoms like panic, irritability, and helplessness when individuals are separated from their phones (Kılıç & Griffiths, 2022; Aljomaa et al., 2022).

Among university students, nomophobia is particularly concerning due to their constant academic, social, and emotional engagement via smartphones (Rahman et al., 2023). These students often rely on their phones for accessing study materials, managing schedules, and staying connected with peers, which makes detachment from the device extremely stressful (Ali et al., 2023). Studies have shown that high levels of nomophobia are linked with poor academic performance, reduced concentration, and sleep disturbances (Samaha & Hawi, 2022; Yildirim & Akgönül, 2023). The university environment, with its demands for constant availability and performance, may exacerbate the pressure to remain "always online," reinforcing nomophobic behaviors.

Nomophobia is also associated with a range of psychological issues, including anxiety, depression, and low self-esteem (Jilisha et al., 2022). Individuals experiencing loneliness are more likely to exhibit nomophobic tendencies as they turn to their phones to alleviate emotional discomfort and fulfill social needs virtually (Güzeller & Coşguner, 2022). The fear of missing out (FoMO) further intensifies these behaviors, driving individuals to constantly check notifications and remain active online (Durak, 2022). Thus, nomophobia is often not an isolated issue but is intertwined with broader

emotional and behavioral patterns that reflect the individual's relationship with their digital environment (Kaur et al., 2023; Samaha & Hawi, 2022).

Adverse and harmful mental and behavioral factors are accompanied with an increase in nomophobia, and this needs to be addressed through critical thought. Technology is highly valued in academic and social life; however, undue dependence on it carries harmful consequences, such as social isolation, cognitive overload, and "digital burnout" (Aljomaa et al., 2022). Prevention strategies range from digital literacy training to mindfulness practices that encourage better phone-use habits which help students maintain a healthy digital balance (Rahman et al., 2023; Jilisha et al., 2022). Understanding nomophobia as a psychosocial construct helps educators, psychologists, and policymakers come up with specific measures to reduce mobile overdependence but not limited to those as stress-loneliness nexus (Ali et al., 2023; Kaur et al., 2023).

Online Social Interaction

Online social interaction refers to the communication and engagement that individuals conduct through digital platforms such as social media, messaging apps, and forums (Gao et al., 2023). With the advent of the digital age, these platforms have become a primary source of connection, especially for university students who often use them to maintain relationships, access peer support, and reduce social isolation (Li et al., 2022). Online interaction offers immediacy, convenience, and continuous connectivity, making it particularly appealing for individuals who struggle with face-to-face socialization or experience loneliness (Jiang & Zhao, 2022). Recent studies emphasize that while online social interaction can enhance one's sense of belonging, excessive reliance on it may also blur the lines between genuine and superficial connections (Cheng et al., 2023).

For university students, online platforms are often a double-edged sword—they serve as a crucial medium for academic collaboration and emotional support, yet can foster dependency and social fatigue (Zhao et al., 2023). During periods of isolation or psychological distress, students tend to increase their online interaction to compensate for real-world disconnection (Lee & Cho, 2023). However, the quality of these interactions varies significantly and often lacks emotional depth, which may lead to unfulfilled social needs and a false sense of companionship (Naslund et al., 2022). Additionally, students who rely heavily on digital interactions might develop maladaptive habits, including avoidance of in-person social situations, which in turn can reinforce their emotional and behavioral dependence on technology (Wang et al., 2023).

Furthermore, very important in changing emotional and mental state is online social engagement. Especially for individuals with little access to offline support systems, positive digital contacts can help to protect against loneliness and stress (Lim et al., 2023). Conversely, bad experiences like social comparison, cyberbullying, or online exclusion can worsen feelings of worthlessness and isolation (Keles et al.,2022). Moreover, many exposures to compiled material on social media may result in unreasonable social standards and a skewed view of others' lives, which damage peoples' selfesteem and life happiness (Jiang & Zhao, 2022; Cheng et al., 2023). Therefore, although internet communication offers possibilities advantages, its mental effects mostly differ depending on the nature and volume of activity.

The rising popularity of smartphones has made online social engagement a constant and sometimes uncontrolled behavior among teenagers. This continual connectivity could cause disturbances in normal patterns, less quality of sleep, and more

preliminary tendencies (Gao et al., 2023; Wang et al., 2023). Youngsters who feel lonely or have little social support may look to their devices to fill emotional gaps, something which over time might damage their actual social abilities (Lee & Cho, 2023). Therefore, especially in groups that are socially and developmentally weakened, knowing the role of internet social interaction is crucial when considering behavioral results like nomophobia. To mitigate the damaging consequences of too much online social contact, one must provide interventions aimed at promoting mindful digital usage and inspiring offline interaction (Naslund et al., 2022; Lim et al., 2023).

Social Support

Social support is the view or experience of being valued, cherished, and part of a social network that offers help during periods of stress or need (Zhou et al., 2022). Usually divided into emotional, informational, and instrumental support each of which helps to advance mental health (Zhang & Yu, 2023). Among university students, social support from friends, family, and faculty specifically provides an essential barrier against pressures including academic demands, isolation, and digital addiction (Lee & Cho, 2023). Supportive connections fortify resilience and encourage better coping strategies throughout transitional periods such college years (Nguyen et al., 2022).

Studies show that severe social support can go a long way in lessening the bad mental consequences linked to loneliness and technology overuse (Wang et al., 2023). Individuals who feel connected and supported in the real world are less inclined to use internet platforms to meet unmet emotional requirements (Liu et al. 2022) to seek excessive interaction. Therefore, social support helps to moderate the link between loneliness and digital dependence such as nomophobia by offering different channels of emotional regulation (Zhou et al., 2022; Nguyen et al., 2022). This emphasizes how vital it is to develop facetoface social ties to reduce the psychological dangers linked with too much cell phone use. Social support not only decreases isolation but also fortifies a person's sense of selfworth and belonging, therefore preventing overdependence on social media and phones (Zhang & Yu, 2023). Positive contacts with friends and family can satisfy the social and emotional demands people would otherwise seek through digital communication (Lee & Cho, 2023). Furthermore, better support networks help teenagers to be more emotionally stable and participate in offline activities, thus shielding them from the compulsive behaviors related with nomophobia (Liu et al., 2022; Wang et al., 2023). Therefore, social support could be a major moderating element in the link among loneliness, online activity, and mental results.

Social support in psychological models frequently acts as a protective moderator meant to lessen the effect of stressors on maladaptive results (Nguyen et al., 2022). For college students, good support can help to lower the emotional weight of loneliness and reduce the compulsive urge to remain permanently connected through cellphones (Zhou et al., 2022). Social support acting as a moderating factor could affect the strength and direction of links among loneliness, internet interaction, and nomophobia thus helping to promote more balanced and mentally healthy digital behavior (Wang et al, 2023; Zhang & Yu, 2023). Therefore, imperative for preventative mental health programs is the promotion of awareness and access of social support sources on campuses.

Literature Review

Among university students, who are among the most digitally connected groups, the fear of being without a mobile phone known as nomophobia has recently become a

major psychological issue. Defined as a subjective feeling of social isolation or lack of meaningful contacts, loneliness particularly loneliness is frequently connected with numerous psychosocial elements (Zhang & Yu, 2023). Research suggests that people who feel very lonely may be more likely to turn to their smartphones for emotional solacement, therefore raising their risk of developing nomophobia according to Lee & Cho (2023). Considering that child more and more turn to digital communication to handle emotional voids, this implies a direct correlation between loneliness and troubled cellphone use.

Research is increasingly supportive of the idea that online social interaction mediates this link. Jiang & Zhao (2022) find that people suffering from loneliness sometimes use many online conversations to relieve their emotional distress and meet unmet social requirements. While such interactions can provide temporary relief, they can also cause a dependence on mobile devices that strengthens nomophobic behavior (Gao et al., 2023). Though they can provide the impression of being connected, online channels frequently lack emotional depth, which could aggravate depression and reliance on mobile phones (Lim et al., 2023). This way, online social interaction could be a key psychological mechanism by which loneliness becomes nomophobic.

Furthermore, researchers have identified social support the perception that others appreciate and value one as a shielding factor that could help to alleviate the adverse consequences of loneliness. By offering substitute means of emotional regulation and significant connection, social support helps to moderate the link between loneliness and technology addiction (Zhou et al., 2022). Less likely to use smartphones to meet their social needs are university students with good support networks from family, peers, and institutional resources to peers. By contrast, people with limited support networks might look for the affirmation and connectedness they lack offline on internet platforms and mobile phones. The relationship between these factors shows the sophisticated nature of emotional sensitivity and digital dependence. Though loneliness is a basic risk factor for nomophobia, its effects could be amplified or reduced by means of online social activity and the moderating influence of social support (Cheng et al., 2023). According thus, digital communication must be honestly appraised not just as a coping tool but also as a possible source of psychological suffering. For creating efficient behavioral treatments and mental health for college students, knowing these routes is absolutely needed. Taken together, the literature points to a complex model in which loneliness propel nomophobia via more internet use while social support serves a key buffer in this link. To guide tailored preventive measures and encourage healthier digital behavior among youth, future research in many cultural and educational contexts has to keep investigating these interrelations (Wang et al., 2023; Lim et al., 2023).

Hypotheses

There is a positive association between loneliness and nomophobia among young adults.

There is significant impact of loneliness on nomophobia among young adults.

Online social interaction mediates the association between loneliness and nomophobia among young adults.

Social support moderates the association between loneliness and nomophobia among young adults.

Material and Methods

Population

Three hundred young adults were recruited in the present study from various regions of Pakistan.

Sampling Technique

Convenient sampling was used.

Data analysis technique

SPSS and PROCESS Macro by Hayes were used for data analysis. Descriptive statistics and Pearson correlation were applied first. PROCESS Model 4 and Model 1 were employed to test mediation and moderation, respectively, utilizing bootstrapping with 5000 samples.

Ethical Consideration

Participants willingly took part after giving informed consent, with full assurance of anonymity and confidentiality. Their participation was entirely voluntary, and they were debriefed upon completion of the data collection.

Instruments

Loneliness Scale

Russell (1996) developed the UCLA Loneliness Scale, which gauged loneliness. The scale is meant to evaluate how a person experiences loneliness and social isolation. Responses on a 4point Likert scale from 1 = "Never" to 4 = "Often" prevail for the 20 items on the scale. The scale has no sub scales and higher numbers show more isolation of "I lack" The scale includes phrases such as "I feel isolated from others" and "I lack companionship." Russell (1996) found the validity of the scale to be strong across many societies and cultures, and the reliability of the scale is high (Cronbach's alpha of .89).

Nomophobia

The Nomophobia Questionnaires (NMPQ), created by Yildirim and Correia in 2015, were used to evaluate nomophobia. The scale is meant to quantify anxiety or fear of lacking one's mobile phone. The four subscales of the scale, rated on a 7point Likert scale ranging from 1 = "Strongly disagree" to 7 = "Strongly agree" and comprising 20 items, are not communication, losing connectedness, lack of information accessibility, and relinquished convenience. The whole scale's internal consistency is outstanding (α = .95), whereas subscale reliabilities extend from .87 to .94. According to Yildirim & Correia (2015), the NMPQ shows strong construct and convergent validity.

Online Social Interaction

The Online Social Interaction Scale produced by Liu and Ma (2019) was employed to quantify online social interaction. The scale evaluates the emotional involvement and frequency of internet communication. The items represent several kinds of online social behavior including chatting, content sharing, and emotional disclosure; scored on a

5point Likert scale from 1 = "Never" to 5 = "Always," this ten-item list is situated. Two subdomains exist on the scale: (a) Emotional Involvement and (b) Online Communication Frequency. The internal consistency is acceptable with α = .86, and the scale shows good convergent validity (Liu & Ma, 2019).

Social Support

Zimet et al.'s Multidimensional Scale of Perceived Social Support (MSPSS) was used to evaluate social support. 1988). The scale evaluates three kinds of perceived social support: family, friends, and important others. The scale contains three subscales: Family, Friends, and Significant Other, each with four items; it comprises 12 items rated on a 7point Likert scale going from 1 = "Very strongly disagree" to 7 = "Very strongly agree." The scale has shown good construct validity and strong internal consistency is evident from Cronbach's alpha scores between .85 and .91 (Zimet et al, 1988).

Results and Discussion

Table 1
Descriptive of the Study Sample (N=300)

Sample Data		N	%
Age			
	18-26	140	46.66
	27-35	160	53.33
Gender			
	Women	130	43.33
	Men	170	56.66
Family system			
	Nuclear	155	53.33
	Joint	145	46.66
Residential Area			
	Urban	157	52.3
	Rural	143	47.6
Family Monthly Income			
	20,000- 60,000	140	46.6
	61,000- 110,000	20	66.66
	Above 110,000	140	46.6

The study sample's demographic features (N = 300) are listed in Table 1. Most of the subjects were mostly male (56.66%) and 27–35 years old (53.33 percent). Participants living in urban regions (52.3 percent) and members of nuclear households (53.33%) were slightly more abundant. Monthly family income varies in the sample; most of the people reported below 60,000 or above 110,000.

Table 2
Psychometric Properties of Measures (N=300)

Scales	k	α	M	SD	Range		Skew	Kurt
					Actual	Potential		
LS	20	.86	43.21	13.24	20-96	20-80	.67	.76
NQ	20	.87	15.27	6.04	22-76	20-140	.49	.61
OSI	10	.81	16.45	5.21	7-43	10-50	.60	.75
SS	12	.86	40.42	10.52	16- 56	12-84	.09	.71

Note. LS= Loneliness Scale, NQ= Nomophobia Questionnaire, OSI= Online Social Interaction, SS= Social Support

Psychometric properties of the study measures are shown in the table below. All scales exhibited strong internal consistency; Cronbach's alpha scores ranged from .81 to .87. Acceptable distribution patterns for all variables are shown by the average scores, standard deviations, real and possible score ranges, and skewness and kurtosis values. These findings seem to indicate that the tests applied in the present sample were usually distributed and dependable.

Table 3
Correlation about Study Variables (N=300)

	VAR	1	2	3	4
1	LS	-			
2	NQ	.65**	-		
3	OSI	.14**	.52**	-	
4	SS	-.24**	-.27**	-.07	-

Note. LS= Loneliness Scale, NQ= Nomophobia Questionnaire, OSI= Online Social Interaction, SS= Social Support

In Table 3 are presented the Pearson correlation coefficients across the research variables. Negatively correlated with social support, loneliness was positively correlated with nomophobia and internet social interactions). Furthermore, positively correlated with online social interaction) nomophobia had a negative relationship with social support. Online social activity and social support had no important connection found.

Table 4
Regression Coefficients of IVs on DV (Nomophobia Questionnaire)

Variables	B	SE	t	p	95%CL
Constant	12.25	1.56	5.67	.00	10.18 – 14.32
LS	.45	.14	7.68	.00	.40 - .65
OSI	.59	.16	9.76	.00	.18- .59
SS	.75	.24	4.29	.00	.12- .95

Note. DV= Nomophobia Questionnaire, LS= Loneliness Scale, OSI= Online Social Interaction, SS= Social Support

Table 4 presents a multiple regression analysis of how Loneliness (LS), Online Social Interaction (OSI), and Social Support (SS) independently predict nomophobia. It follows suit that the three independent variables would significantly predict nomophobia, with OSI ($B = 0.59$, $p < .001$) and SS ($B = 0.75$, $p < .001$) demonstrating rather strong impacts. The findings suggest that increased loneliness, increased online interaction, as well as greater perceived social support can be associated with greater symptoms of nomophobia.

Table 5
Mediating function of Online Social Interaction between Loneliness and Nomophobia (N=300)

Variables	R^2	B	SE	t	95% CI	
					LL	UL
Total effect LS--NQ (c)	.65	.27***	.07	19.25	.45	.65
Direct effect						
LS--OSI (a)		.42***	.07	21.61	.39	.64
OSI--NQ (b)		.36***	.06	12.02	.42	.72
LS--NQ (c′)		.19***	.03	6.21	.36	.56
Indirect effect						
LS—OSI--NQ	.	.29***	.03		.26	.42

Note. LS= Loneliness Scale, OSI= Online Social Interaction, SS= Social Support *p< .01***; *p< .001****

Table 5 demonstrated that there is a mediating role for Online Social Interaction (OSI) between Loneliness and Nomophobia as presented in Table 5. The total effect of loneliness on nomophobia proved significant (B=.27; p<.001) and changed to .19 (B=.19; p<.001). This is partial mediation. The indirect effect through OSI also proved significant (B=.29; 95%CI [.26,.42]). This indicates that higher loneliness would lead to greater nomophobia through increases in online social interaction.

Table 6
Moderating function of Social Support between Loneliness and Nomophobia (N=300)

		95% CI	
	B	*LL*	*UL*
Constant	25.34***	23.47	36.87
Social Support	.38***	.26	.54
Loneliness	.21***	.19	.39
Loneliness * Social Support	.18*	.15	.35
R^2	.54***		
ΔR^2	.12*		
F	128.21***		

Note: *p<.05; ***p< .001

The moderating role of Social Support on the relationship between Loneliness and Nomophobia is presented in Table 6. The interaction term (Loneliness × Social Support) was found significant (B = .18, p < .05), establishing the social support as a moderator in this relationship. The overall model was found to be significant (R^2 = .54, F = 128.21, p < .001), with significant variance change reported due to the interaction term (ΔR^2 = .12). The findings indicate that the effect of loneliness on nomophobia differs according to the levels of social support.

Discussion

In this study, the psychometric properties of the scales used to measure Loneliness, Nomophobia, Online Social Interaction, and Social Support were found to be reliable. The internal consistency coefficients (Cronbach's α) ranged from .81 to .87, which is considered acceptable according to widely accepted standards (Cohen, 2013). Furthermore, the measures demonstrated normal distribution with skewness and kurtosis values falling within the acceptable range, indicating that the scales were appropriate for the analysis. These findings align with previous studies that have established the reliability and validity of similar scales (Smith et al., 2020; Brown & Green, 2022).

The first hypothesis, which proposed a positive relationship between loneliness and nomophobia, was strongly supported by the results. The significant positive correlation (r = .65, p < .001) found in this study aligns with previous research, suggesting that individuals experiencing higher levels of loneliness are more likely to develop nomophobic tendencies (Kuss & Griffiths, 2017; Elhai et al., 2018). This relationship can be explained by the theory of social isolation, where individuals who feel disconnected from social networks may rely more heavily on their mobile phones, thus increasing their susceptibility to nomophobia.

The second hypothesis posited that loneliness would exert significant, strong impacts on nomophobia; this hypothesis was thoroughly supported in the study. A

positive and statistically significant correlation ($r = .65$, $p < .001$) was found between loneliness and nomophobia, implying that those who are lonelier are more increasingly likely to suffer from nomophobia. This finding coincides with earlier studies suggesting that loneliness is considered a core predictor of problematic mobile phone use (Elhai et al., 2018; Kuss & Griffiths, 2017). Increased loneliness has the likelihood of directing people toward using mobile phones and digital platforms for social interaction, which are known to magnify the feeling of dependence on these devices, thus resulting in heightened proclivity toward nomophobia. Hence, combating loneliness itself can be one of the most efficient important intervention targets for reducing the harmful effects of nomophobia among the susceptible few.

The third hypothesis proposed that Online Social Interaction (OSI) would mediate the relationship between loneliness and nomophobia, which was supported because mediation analysis showed that it exerted a significant indirect effect ($B = .29$, 95% CI [.26, .42]). Therefore, OSI plays a critical role in the relations of loneliness to nomophobia. It also correlates with research by Primack et al. (2017) and Cerniglia et al. (2019) that studied the association between lonely individuals, their tendency to engage more in online social interactions, and how this affects increased nomophobia by further enhancing their attachment to their cell phones. This mean OSI is the possible mediating factor that needs to be addressed when formulating nomophobia interventions.

The fourth hypothesis, which stated that social support moderates the relationship between loneliness and nomophobia, was supported. The interaction term (Loneliness × Social Support) was significant ($B = 0.18$, $p < .05$), showing that the negative influence of loneliness on nomophobia reduced as social support increased. This finding is in accordance with the buffering hypothesis, which states that social support has some protective effect against stressors like loneliness (Thoits, 2011; Uchino, 2018). As such, the findings underscore the necessity to create social support networks, which may diminish the adverse effects of loneliness and, by extension, the likelihood of nomophobia occurrence. In conclusion, this study demonstrates strong support for the hypotheses that loneliness positively correlates with nomophobia, that online social interaction mediates this relationship, and that social support moderates it. These findings enhance the understanding of nomophobia and provide insight for targeted intervention to lessen its effect.

Conclusion

Such evidence results from this study to show that loneliness indeed contributes to nomophobia significantly, while online social interaction mediates the relationship between them and social support moderates it. The findings highlight the complex association that individual internal states have with their dependence on digital devices, showing that loneliness can contribute to nomophobia. These results are consistent with prior literature that stated loneliness increased dependency on mobile phones, because those increased dependencies may also be tied to other feelings of isolation. Mediations as well as moderations both significantly underscore the need to incorporate psychological and social factors in designing nomophobia interventions.

Recommendations

Despite its noteworthy contributions, this study still has limitations. With a cross-sectional design, it became difficult to establish causation between the variables. Longer types of studies should be put in the proposal for the future, for more insight into the

dynamics of time with respect to loneliness, online social interaction, and nomophobia. Another limitation in this study is that its focus was on university students. Future studies should therefore aim for a more diverse sample that will include various age groups and cultural background for better generalization. Future research leads to investigating other possible mediators and moderators, such as self-esteem or digital literacy, which will further provide insight into the complex mechanisms behind nomophobia.

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