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Associations between Basic Psychological Need Satisfaction and Nomophobia: Mediated By Self-Control and Smartphone Addiction among University Students

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ABSTRACT

The current study explored the association among the satisfaction of basic psychological needs, nomophobia (fear of being without a smartphone), smartphone addiction, and self-control among students at AJK University. It also examined how these factors vary across sociodemographic factors like cohort and gender identity. A sample of 300 students from various departments participated in the research. They completed questionnaires that included the Basic Psychological Need Satisfaction Scale (BPNSS), the Brief Self-Control Scale (BSCS), the Smartphone Addiction Scale - Short Version (SAS-SV), and the Nomophobia Questionnaire (NQ), comprising a total of 37 items. Data analysis was conducted using SPSS (Statistical Package for Social Sciences). The analysis demonstrated a meaningful negative correlation between the fulfillment of fundamental psychological needs (autonomy, competence, and relatedness) and nomophobia. Moreover, a substantial positive association was proved between smartphone addiction and nomophobia, while self-control was positively linked to the fulfillment of fundamental psychological needs and negatively related to nomophobia. Gender and age differences were also observed. Female students reported a higher need for relatedness compared to male students, while nomophobia and smartphone addiction were more prevalent among students aged 18–22 than those aged 23 and older. The results suggest that when basic psychological needs are fulfilled, individuals demonstrate better self-control, which in turn helps reduce nomophobic tendencies. This highlights the importance of fostering psychological well-being as a strategy to address smartphone addiction and its related anxieties in today's digital age.

Introduction

Basic Psychological Need Satisfaction

Basic Psychological Needs Satisfaction (BPNs) is a fundamental human requirement which has a prime function in guiding behavior toward achieving psychological well-being (Ryan & Deci, 2000). The fulfillment of these fundamental needs is considered vital for human development and thriving. On the flip side, when these needs are not fulfilled, it can exacerbate maladjustment or even psychological health issues (Ryan et al., in press; Vansteenkiste & Ryan, 2013). BPNs are centered on three core domains: competence, autonomy, and relatedness.

Competence

Competence signifies a person's confidence in their capability to accomplish tasks and attain objectives. For example, people feel competent when they master a skill or complete a challenging task. Studies by Can (2018) and Partala (2011) found that online networks helped fulfill the need for competence for example, when users leveled up in online games or managed virtual networks effectively.

Autonomy

Autonomy signifies the perception of control an individual has over their actions and choices. It involves the liberty to decide and act in alignment with personal preferences. For young adults, autonomy can be fulfilled by being able to choose their own paths in life, like deciding what to study, where to work, or how to live independently (Deci & Ryan, 1985a). Can (2018) and Partala (2011) noted that the use of online networks supports autonomy when individuals access content freely without restrictions.

Relatedness

Relatedness is defined as the need to feel connected and maintain healthy interactions with others. It's the feeling of belonging to a social group or community. Cajas-Tibanta (2019) highlighted that excessive use of online networks could fulfill the need for relatedness, as people often perceive they are building social connections and reducing feelings of isolation in the virtual world. Similarly, maintaining close relationships with family and friends also satisfies this need (Ryan & Deci, 2001).

Basic Psychological Needs Theory (BPNT), which forms the foundation of Self-Determination Theory (SDT), emphasizes that meeting these needs provides the psychological nourishment essential for growth and well-being (Ryan & Deci, 2000). Autonomy is fulfilled when individuals possess a sense of control over their lives and make their own decisions. For example, young adults feel autonomous when they can freely choose their career path or lifestyle. Competence is achieved when individuals feel effective and capable in managing life's challenges. This could include mastering practical skills like cooking or organizing, as well as developing mental health skills such as self-awareness, communication, and critical thinking (Ryan & Deci, 2001). Relatedness is satisfied by fostering close, supportive relationships with family, friends, or social groups, which provide a sense of security and connection (Ryan & Deci, 2001).

As per SDT, satisfying these psychosocial needs leads to more autonomous motivation, which enhances overall well-being. Conversely, when these needs are unmet, people are more prone to controlled motivation, diminishing well-being and potentially resulting in maladaptive behaviors,

such as smartphone dependency. Research by Minmin et al. (2019) suggests that people often turn to mobile devices as a way to fulfill unmet psychological needs, which can perpetuate a cycle of dependence. In today's digital world, understanding and addressing these needs is essential to fostering psychological well-being and mitigating the potential negative effects of technology use.

Smartphone Addiction

Smartphones have become essential personal devices, serving not only as communication tools but also as symbols of social identity and status. Unlike traditional mobile phones, smartphones offer constant internet connectivity and a range of features such as entertainment, social interaction, time management, information access, and coping strategies (Bian & Leung, 2015). However, excessive smartphone use has emerged as a global concern, as it can lead to addictive behaviors with adverse effects on daily life. Smartphone addiction is marked by repetitive or excessive usage of smartphones that disbalances an individual's daily routine and leads to negative outcomes, although it is not yet officially recognized as a disorder (Demirci et al., 2015; Lee et al., 2014).

Previous research demonstrates that individuals addicted to smartphones are often reliant on the functionality and features their devices provide, rather than the devices themselves (Kuss & Griffiths, 2017). Symptoms of smartphone addiction include ignoring the harmful effects of excessive use, an inability to control usage, constant preoccupation with the device, reduced productivity, and feelings of anxiety or discomfort when separated from the phone (Bian & Leung, 2015). Additionally, individuals may exhibit obsessive-compulsive tendencies, such as prioritizing phone use over essential tasks, being unable to voluntarily reduce usage, and experiencing withdrawal symptoms when access to the phone is restricted (Charlton & Danforth, 2007; Turel et al., 2011).

Studies have also linked smartphone addiction to mental health issues such as anxiety and depression (Thomée et al., 2011; Beranuy et al., 2009). Griffiths (1996) identified six fundamental factors of behavioral addiction centrality, mood adjustment, desensitization, abstinence effects, disharmony, and resumption which are often observed in cases of smartphone addiction (De-Sola et al., 2016; Jenaro et al., 2007). One notable factor contributing to smartphone addiction is the Fear of Missing Out (FoMO), which reflects anxious condition about being disconnected or uninformed, a phenomenon closely associated with nomophobia. Individuals struggling to manage their concerns about being without their smartphones tend to use them problematically, reinforcing addictive behaviors (Cheever et al., 2014; Lepp et al., 2014).

Smartphone addiction and nomophobia share significant overlaps, as both involve excessive reliance on smartphones and difficulties in managing their usage. Nomophobia amplifies addiction by fostering a heightened need for connection and access, turning it hard for individuals to detach themselves from their devices. Addressing these interrelated issues requires understanding the underlying psychological drivers of excessive smartphone use and promoting healthier, more balanced digital habits (Yildiz-Durak, 2018).

Nomophobia

Nomophobia refers to the anxiety or fear of smartphone disconnection, whether for social, work, or educational purposes (Potter et al., 2014). Al-Balham et al. (2018) define it as the perceived threat of feeling cut off from the virtual world. Researchers, including Ali et al. (2017) and Yildirim et al. (2015), describe nomophobia as having four key dimensions: (1) fear or discomfort about being unable to connect with others; (2) anxiety over losing connection to the internet or networks; (3) stress related to losing instant availability of knowledge; and (4) unease about not having

convenience given by mobile devices. Nomophobia often stems from excessive smartphone use, where reliance on the device's many features create a sense of comfort and dependency, leading to anxiety when the device is inaccessible (Potter et al., 2014).

Bragazzi and Del (2014) identified seven common characteristics of nomophobia, including spending long hours on smartphones, always carrying a charger, worrying excessively about losing the device or network coverage, frequently checking messages or calls, being unable to turn off the phone for extended periods, preferring communication through technology over face-to-face interactions, and facing increased financial costs due to excessive use. Similarly, Kanmani et al. (2017) highlighted behaviors such as constantly checking for missed calls or texts, taking the phone everywhere, using it in inappropriate situations, and prioritizing phone communication over in-person interaction.

Nomophobia can negatively impact mental health, contributing to personality disorders, low self-worth, loneliness, and decreased happiness, specifically among young people (Lee et al., 2018; Ozdemir et al., 2018; Gutiérrez et al., 2016). It also affects physical health, disrupting sleep and increasing stress, depression, anxiety, anger, and emotional instability (Yildirim et al., 2016; Darvishi et al., 2019; González-Cabrera et al., 2017). Moreover, it influences daily life by creating a dependency on mobile devices that affects academic and professional performance through constant distractions. It also harms interpersonal relationships by encouraging isolation from the physical world (Dasgupta et al., 2017; Gutiérrez-Puertas et al., 2019).

Nomophobia further exacerbates the fear of losing immediate access to information or communication, which can trigger to heightened conditions of stress and emotional instability. Young adults vulnerable by mobile phone addiction often lose their personal control over their daily conducts, contributing to nomophobic tendencies. Studies emphasize that enhancing control on self is a key tactic for addressing both smartphone addiction and nomophobia (Jeong et al., 2020).

Self-control

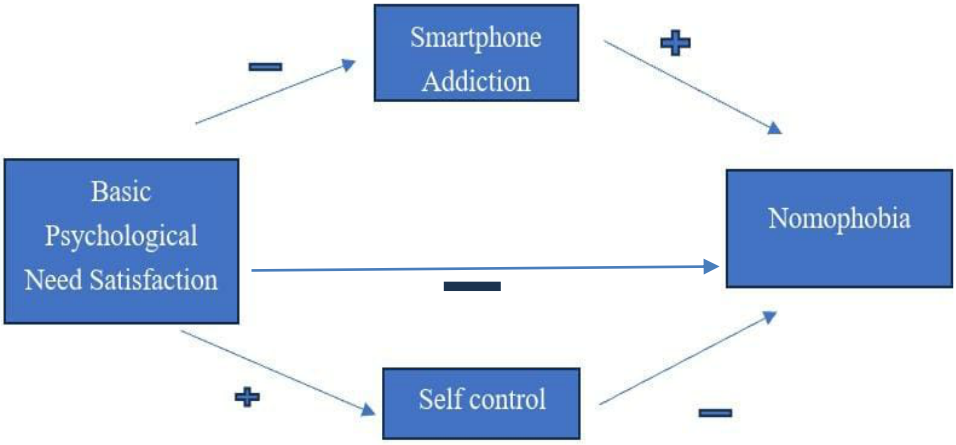
Self-control refers to the mental ability to resist temptations, manage competing demands, and maintain focus on desired goals (Inzlicht et al., 2014). It is a vital skill that helps individuals regulate their behavior and adapt to their environment. A strong sense of self-control is particularly important in curbing excessive smartphone use, as poor self-regulation often leads to dependency, anxiety when separated from the device, withdrawal from social interactions, and diminished productivity (Setiawan et al., 2023).

Karuniawan and Cahyanti (2013) identify three primary components of self-control. The first is behavioral control, which involves managing one's responses to mitigate or improve challenging situations. The second is cognitive control, which refers to processing and interpreting information effectively to make sound judgments. Lastly, decision control pertains to the capacity of a person to evaluate options and make thoughtful, well-considered choices (Setiawan et al., 2023).

Individuals with greater control of self are better at regulating their cognitions, emotions, and impulses than those with lower control on self (Baumeister et al., 1998). This capacity is linked with positive consequences like academic success, healthier behaviors, strong interpersonal relationships, and greater life satisfaction (Duckworth & Seligman, 2005; Ronen et al., 2016; Şimşir & Dilmaç, 2021). On the other hand, low self-control is linked to harmful behaviors, including criminal activity, substance abuse, behavioral addictions like smartphone overuse, binge eating, bullying, and procrastination. These behaviors stem from an inability to resist immediate

impulses or distractions, often leading to long-term negative consequences (de Ridder et al., 2012; Geng et al., 2018; Grasmick et al., 1993; Vainik et al., 2019). Strengthening self-control is a fundamental aspect of personal development. It not only helps individuals manage their behaviors effectively but also reduces the likelihood of engaging in maladaptive patterns, thereby improving overall well-being and life satisfaction.

Conceptual model



Objectives

1. To investigate the association among fulfilment of fundamental needs, self-control, smartphone addiction and nomophobia among university pupils.
2. To find out the impact of fulfilment of fundamental needs on nomophobia among university pupils.
3. To investigate the mediating role of self-control between fulfilment of fundamental needs and nomophobia among university pupils.
4. To analyze the mediating role of smartphone addiction fulfilment of fundamental needs and nomophobia among university pupils.
5. To find out the role of demographic variables in study variables.

Hypotheses

1. There is substantial negative association between fulfilment of fundamental needs and nomophobia among university students.
2. Fulfilment of fundamental needs (autonomy, competence, relatedness) will have a negative impact on nomophobia among university students.
3. Smartphone addiction mediates the association between fulfilment of fundamental needs and nomophobia among university pupils.
4. Self-control will meditate the association between fulfilment of fundamental needs and nomophobia among university pupils.
5. Men will score higher on basic psychological need satisfaction as compared to women.
6. Women will score higher on nomophobia, smart-phone and self-control addiction as compared to men.
7. As the age increases, the smartphone addiction and nomophobia also increase.

Instruments

Informed Consent

Informed consent was an essential component of the study, allowing participants to grant permission for their involvement while maintaining the freedom to withdraw at any time.

Nomophobia Questionnaire (NMP-Q)

The Nomophobia Questionnaire (NMP-Q) was developed by Yildirim and Correia (2015) to measure nomophobia across four dimensions: (1) difficulty in retrieving information (items 1–4), (2) disruption of convenience (items 5–9), (3) deprivation of ease to communicate (items 10–15), and (4) disconnection (items 16–20). It comprises 20 items scored on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). However, for this study, responses were condensed into a 4-point scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, and 4 = Strongly Agree. The total score is calculated by summing all items, with similar scoring applied to each subscale. Reliability coefficients for the four dimensions were .94, .87, .83, and .81, respectively, while the overall scale demonstrated excellent reliability with a coefficient of .94 (Yildirim & Correia, 2015; González-Cabrera et al., 2020).

Smartphone Addiction Scale–Short Version (SAS-SV)

The Smartphone Addiction Scale–Short Version (SAS-SV) by Kwon et al. (2013b) is a self-report tool designed to assess problematic smartphone use. The scale consists of 10 items rated on a 6-point Likert scale, ranging from 1 (strongly disagree) to 6 (strongly agree), with higher scores indicating greater smartphone addiction. The scale has demonstrated excellent reliability, with an internal consistency of .911 (Kwon et al., 2013b). Further research among Japanese adults confirmed its reliability, reporting an internal consistency of .88 (Hamamura et al., 2023).

Basic Psychological Need Satisfaction Scale (BPNSS)

The Basic Psychological Need Satisfaction Scale (BPNSS), developed by Deci and Ryan (2000), is a 21-item measure assessing the fulfillment of three fundamental psychological needs: autonomy (7 items, 14–20), competence (6 items, 1–6), and relatedness (8 items, 7–13, 21). Participants rate their agreement on a 5-point Likert scale, from 1 (not true at all) to 5 (completely true). The scale has shown strong psychometric properties, with internal consistency ranging from .64 to .89 and factor loadings between .62 and .80 (Deci & Ryan, 2000; Mitchell et al., 2017).

Brief Self-Control Scale (BSCS)

The Brief Self-Control Scale (BSCS), developed by Tangney et al. (2004), measures self-control across various domains, including impulse control, emotional regulation, and decision-making. This 13-item scale uses a 5-point Likert scale, from 1 (not at all) to 5 (very much), with consistent scoring for all subscales. The BSCS has demonstrated strong reliability, showing internal consistency scores from .89 to .93 and a test-retest reliability of .85 (Tangney et al., 2004; Zhou et al., 2022).

Procedure

The study began by obtaining permission from the authors of the respective scales via email, followed by the development of a questionnaire booklet. Participants were approached, notified about the study's objectives and reassured of the confidentiality of their responses.

Consent was acquired, and verbal and written instructions were provided to ensure clarity in answering the questionnaires. Participants were encouraged to identify any difficult words or phrases, which were subsequently rephrased for better comprehension. They were instructed to answer all questions to the best of their knowledge and were informed regarding their right to leave study anytime. After completing the demographic sheet and scales, participants were thanked for their cooperation. The collected data was then analyzed using the Statistical Package for Social Sciences (SPSS).

Results

Table 1: Socio-demographic Characteristics of Participants

Demographic variable		n	%
Gender	Men	162	53.8
	Women	139	46.2
Marital Status	Married	7	2.3
	Unmarried	293	97.7
Degree	Graduation	293	97.3
	Post-Graduation	7	2.3
Age	18-22	161	53.6
	Above 23	139	46.3
Family System	Nuclear	136	45.5
	Joint	164	54.5
Psychological Treatment	Yes	41	13.6
	No	259	86.3
Family income	<40,000	26	8.6
	41000-60000	88	29.2
	61000-80000	80	26.6
	81000-100000	30	10.0
	>100000	76	25.3

Note: The demographic statistics provided in this table reflect the attributes of the study participants.

Table 1 highlights the demographic details of the 300 students in the study. Among them, 162 were male and 139 females, with all participants being over 18 years of age. Most students (161) were between 18 and 22 years old, while 139 were older. Regarding their educational background, nearly all (97.7%) were graduates, with a small portion (2.3%) being postgraduates. The sample included students from both joint (164) and nuclear (136) families. In terms of marital status, the majority (293) were unmarried, and only 7 were married. Additionally, 259 students had not received psychological treatment, while 41 had, and participants represented a range of family income levels.

Table 2 presents the reliability analysis for a sample of 300 participants, focusing on variables such as fulfillment of fundamental psychological needs, Smartphone Addiction, Self-Control, and Nomophobia. The Cronbach's alpha values for the three subscales of the fulfillment of fundamental psychological needs are as follows: autonomy (.634), competence (.601), and relatedness (.609), all of which suggest satisfactory reliability for these subscales. The value of Cronbach alpha for the Nomophobia scale, Smartphone Addiction scale, and Self-Control scale are

.935, .887, and .693, respectively, indicating strong reliability across all scales. Additionally, the skewness and kurtosis values indicate that the data set follows a normal distribution.

Table 2: Measurement Properties for Scales

Scale	M	SD	Range	Cronbach's a	Skewness	Kurtosis
Basic Psychological Need Satisfaction						
Autonomy	26.40	5.57	12.03-42.77	.634	.070	-.074
Competence	22.27	5.19	8.19-35.64	.601	.013	-.248
Relatedness	31.73	7.72	9.18-36.46	.609	-.009	-.240
Nomophobia	81.41	24.78	14.18-148.64	.935	.047	-.124
Smartphone Addiction	11.03	11.03	4.22-148.64	.887	.011	-.229
Self-control	7.98	7.98	16.61-56.30	.693	-.011	-.242

Note: Cronbach's alpha coefficients are reported for each scale.

Table 3: Correlation matrix between BPNS, SAS, SCS and NQ

Variables	N	M	SD	BPNS(A)	BPNS(C)	BPNS(R)	NQ	SAS	SCS
BPNS(A)	300	26.45	5.54	-					
BPNS(C)	300	22.27	5.05	.426**	-				
BPNS (R)	300	27.57	7564.1	.493**	.421**	-			
NQ	300	81.64	24.64	-.1O8	-.227**	-.131*	-		
SAS	300	34.23	10.90	-.014	.202**	.101	.787**	-	
SCS	300	37.17	7.78	0.154**	0.379**	.048**	-.495**	.529**	-

*Note: BPNS = Basic Psychological Need Satisfaction Scale, SAS = Smartphone Addiction Scale, SCS = Self-Control Scale NQ=Nomophobia Questionnaire. **p < 0.01*

Table 3 reveals a substantial positive association between the Smartphone Addiction Scale (SAS) and the Nomophobia Questionnaire (NQ), indicating that individuals with higher smartphone addiction are more likely to encounter nomophobia. A small positive correlation is observed between self-control and basic psychological need satisfaction, specifically in autonomy (0.154*), competence (0.379*), and relatedness (0.048**). Additionally, a small negative correlation is found between self-control and nomophobia, suggesting that individuals with better self-control are less prone to nomophobia. The fundamental psychological needs autonomy, competence, and relatedness also show negative correlations with nomophobia, implying that when these needs are

met, the likelihood of experiencing nomophobia decreases. Nonetheless, it is crucial to highlight that the correlations between these variables are weak, indicating that other components may influence the association between basic psychological needs and nomophobia.

Table 4: Regression Coefficients of Basic Psychological Need Satisfaction (Autonomy, Competence, Relatedness), Smartphone Addiction and Self-control on Nomophobia

Variable	B	SE	t	p	95%CI
Constant	68.919	6.925	9.952	.000	55.29-82.54
BPNS(A)	.481	.256	1.877	.062	-.023-.985
BPNS(C)	1.110	.276	4.024	.000	.567-1.653
BPNS(R)	.000	.000	2.286	0.023	.000-.001
SAS	1.777	0.081	21.994	.000	1.618-1.936
SCS	1.569	.160	9.808	.000	1.254-1.883

*Note: N=300, ***p<.001BPNS=Basic Psychological Need Satisfaction, A=Autonomy, C=Competence, R=Relatedness, SAS=Smartphone Addiction Scale, SCS=Self Control Scale*

The table shows significant impact of all independent variables on the outcome that is nomophobia.

Table 5: Regression Analysis for Mediation of Smartphone Addiction between Autonomy and Nomophobia

Variable	B	95%CI	SE	β	R^2	ΔR^2
Step 1					0.012	.008***
Constant	68.919	(55.29-82.54)	6.92			
Autonomy	.481	(-.023-.985)	0.256	0.108		
Step 2					0.633	.630***
Constant	6.682	(-3.27-16.63)	5.058			
Autonomy	.529	(.221-.837)	.156	.119		
SAS	1.78	(1.62-1.93)	0.079	0.788		

*Note: CI=Confidence Interval, ***p<.001 SAS=Smartphone Addiction Scale*

In Step 1, the R^2 value of 0.012 indicated that autonomy satisfaction explained only 1.2% of the variance in nomophobia, with no significant prediction (beta = 0.108, $p > 0.05$). In Step 2, the R^2 value of 0.633 showed that autonomy and smartphone addiction together explained 63.3% of the variance in nomophobia, with both autonomy (beta = 0.119, $p < 0.05$) and smartphone addiction (beta = 0.788, $p < 0.001$) significantly predicting nomophobia. The delta R^2 value of 0.630 indicated that the addition of smartphone addiction improved the model significantly (delta F = 502.66, $p < 0.01$). The regression weight for autonomy increased slightly but remained significant, suggesting that smartphone addiction does not mediate the association between autonomy and nomophobia.

Table 6: Regression Analysis for Mediation of Smartphone Addiction between Competence and Nomophobia

Variable	B	95%CI	SE	β	R^2	ΔR^2
Step 1					0.052	.049***
Constant	56.90	(44.50-69.30)	6.30			
Competence	1.110	(.567-1.553)	0.276	0.227		

Step 2					0.625	.622***
Constant	14.09	(5.33-22.85)	4.452			
Competence	.347	(-.002-.697)	.177	.071		
SAS	1.749	(1.59-1.911)	0.082	0.773		

*Note: CI=Confidence Interval, ***p<.001 SAS=Smartphone Addiction Scale*

In Step 1, the R^2 value of 0.049 showed that competence satisfaction explained 4.9% of the variance in nomophobia, with competence significantly predicting nomophobia (beta = 0.227, $p < 0.05$). In Step 2, the R^2 value of 0.625 indicated that both competence and smartphone addiction together explained 62.5% of the variance in nomophobia, with both factors significantly predicting nomophobia (competence: beta = 0.071, $p < 0.05$; smartphone addiction: beta = 0.773, $p < 0.001$). The delta R^2 value of 0.622 showed a significant improvement in the model (delta F = 452.104, $p < 0.01$). While the regression weight for competence decreased, it remained significant, indicating that smartphone addiction significantly mediates the relationship between competence and nomophobia.

Table 7: Regression Analysis for Mediation of Smartphone Addiction between Relatedness and Nomophobia

Variable	**B**	**95%CI**	**SE**	**β**	**R^2**	**ΔR^2**
Step 1					0.017	.014***
Constant	81.516	(78.73-84.29)	1.413			
Relatedness	0.000	(.000-0.001)	0.000	0.131		
Step 2					0.619	.617***
Constant	21.14	(15.38-26.90)	2.927			
Relatedness	.000	(.000-.001)	.000	.052		
SAS	1.768	(1.60-1.92)	0.082	0.780		

*Note: CI=Confidence Interval, ***p<.001 SAS=Smartphone Addiction Scale*

In Step 1, the R^2 value of 0.014 showed that relatedness satisfaction explained 1.4% of the variance in nomophobia, with relatedness significantly predicting nomophobia (beta = 0.131, $p < 0.05$). In Step 2, the R^2 value of 0.617 revealed that both relatedness and smartphone addiction together explained 61.7% of the variance in nomophobia, with both factors significantly predicting nomophobia (relatedness: beta = 0.052, $p < 0.05$; smartphone addiction: beta = 0.780, $p < 0.001$). The delta R^2 value of 0.617 indicated a substantial improvement in the model (delta F = 467.749, $p < 0.01$). While the regression weight for relatedness decreased, it remained significant, showing that smartphone addiction mediates the association between relatedness and nomophobia.

Table 8

Regression Analysis for Mediation of Self-control between Autonomy and Nomophobia

Variable	**B**	**95%CI**	**SE**	**B**	**R^2**	**ΔR^2**
Step 1					0.011	.008***
Constant	69.06	(55.36-82.76)	6.96			
Autonomy	0.475	(-.033-0.982)	0.258	0.106		
Step 2					0.246	.240***
Constant	20.23	(4.609-35.86)	7.94			

Autonomy	.137	(-.312-.586)	.228	.031
SCS	1.554	(1.235-1.872)	0.162	0.490

*Note: CI=Confidence Interval, ***p<.001 SCS=Self Control Scale*

In Step 1, the R^2 value of 0.011 indicated that autonomy satisfaction explained only 1.1% of the variance in nomophobia, with autonomy not significantly predicting nomophobia (beta = 0.106, $p > 0.05$). In Step 2, the R^2 value of 0.246 showed that autonomy and self-control together explained 24.6% of the variance in nomophobia, with both significantly predicting nomophobia (autonomy: beta = 0.031, $p < 0.05$; self-control: beta = 0.490, $p < 0.001$). The delta R^2 value of 0.240 suggested a substantial increase in the model's explanatory power (delta F = 91.91, $p < 0.01$). While autonomy's direct effect was small, self-control significantly mediated the association between autonomy and nomophobia, indicating an indirect effect.

Table 9: Regression Analysis for Mediation of Self-control between Competence and Nomophobia

Variable	**B**	**95%CI**	**SE**	**B**	**R^2**	**ΔR^2**
Step 1					0.051	.048***
Constant	56.85	(44.35-69.35)	6.35			
Competence	1.113	(.564-1.661)	0.279	0.226		
Step 2					0.248	.243***
Constant	20.02	(6.157-33.88)	7.045			
Competence	.218	(-.310-.746)	.268	.044		
SCS	1.528	(1.186-1.870)	0.174	0.480		

*Note: CI=Confidence Interval, ***p<.001 SCS=Self Control Scale*

In Step 1, the R^2 value of 0.051 indicated that competence satisfaction explained 5.1% of the variance in nomophobia, with competence significantly predicting nomophobia (beta = 0.226, $p > 0.05$). In Step 2, the R^2 value of 0.248 showed that competence and self-control together explained 24.8% of the variance in nomophobia, with both factors significantly predicting nomophobia (competence: beta = 0.044, $p < 0.05$; self-control: beta = 0.480, $p < 0.001$). The delta R^2 value of 0.243 highlighted a significant increase in explanatory power (delta F = 77.246, $p < 0.01$). While competence's effect became smaller in Step 2, it remained significant, suggesting that self-control mediates the relationship between competence satisfaction and nomophobia.

Table 10: Regression Analysis for Mediation of Self-control between Relatedness and Nomophobia

Variable	**B**	**95%CI**	**SE**	**β**	**R^2**	**ΔR^2**
Step 1					0.017	.014***
Constant	81.48	(78.69-84.27)	1.418			
Relatedness	.000	(.000-.001)	0.000	0.131		
Step 2					0.251	.246***
Constant	24.058	(12.045-36.07)	6.104			
Relatedness	.000	(.000-.001)	.000	.108		
SCS	1.548	(1.231-1.865)	0.161	0.485		

*Note: CI=Confidence Interval, ***p<.001 SCS=Self Control Scale*

In Step 1, the R^2 value of 0.017 indicated that relatedness satisfaction explained 1.7% of the variance in nomophobia, with relatedness significantly predicting nomophobia (beta = 0.131, $p > 0.05$). In Step 2, the R^2 value of 0.251 showed that relatedness and self-control together explained 25.1% of the variance in nomophobia, with both factors significantly predicting nomophobia (relatedness: beta = 0.108, $p < 0.05$; self-control: beta = 0.485, $p < 0.001$). The delta R^2 value of 0.246 reflected a notable increase in explanatory power (delta F = 92.312, $p < 0.05$). While relatedness's effect became smaller in Step 2, it remained significant, suggesting that self-control mediates the association between relatedness satisfaction and nomophobia.

Table 11: Mean Comparison of Men and Women in Basic Psychological Need Satisfaction, Nomophobia, Smartphone Addiction and Self-control

	Men		Women				
Variable	**M**	**SD**	**M**	**SD**	***t* (297)**	**P**	**Cohen's d**
BPNS-A	26.67	5.64	26.20	5.42	.724	.469	0.08
BPNS-C	21.81	5.12	22.81	4.94	-1.712	.088	0.19
BPNS-R	-1008.42	7040.63	1236.23	7989.31	-2.557	0.011	0.29
Smartphone Addiction	34.63	11.25	33.76	10.50	.695	.488	0.07
Nomophobia	80.38	23.96	83.09	25.42	-.946	.345	0.10
Self-Control	36.72	7.90	37.68	7.63	-1.069	.286	0.12

Table 11 presents the mean differences for three basic psychological needs across genders. For autonomy, there was no substantial difference ($t(297) = 0.724$, $p > 0.05$), suggesting that gender does not impact autonomy, with a little effect size (Cohen's d = 0.08). Similarly, competence showed no significant difference $t(297) = -1.712$, $p > 0.05$), indicating that gender does not influence competence, with a small effect size (Cohen's d = 0.19). However, relatedness showed a substantial difference $t(297) = -2.557$, $p < 0.05$), with women reporting higher levels of relatedness (M = 1236.23, SD = 7989.31) compared to men (M = 1008.42, SD = 7040.63), with a small effect size (Cohen's d = 0.29). As smartphone addiction, nomophobia, and self-control are concerned, no significant gender differences were found ($t(297) = 0.695$, $p > 0.05$ for smartphone addiction; $t(297) = -0.946$, $p > 0.05$ for nomophobia; $t(297) = -1.069$, $p > 0.05$ for self-control, with Cohen's d values indicating poor or negligible effects.

Table 12: **Mean Comparison of Age differences in Nomophobia and Smartphone Addiction**

	18-22		Above 23				
Variable	**M**	**SD**	**M**	**SD**	**t (297)**	**P**	**Cohen's d**
Nomophobia	87.90	25.37	76.26	22.22	3.456	.001	0.48
Smartphone Addiction	35.88	11.02	31.63	10.53	2.782	.006	1.08

Table 12 reveals that self-control did not show significant gender differences ($t(297) = 3.456$, $p < 0.05$), while nomophobia exhibited statistically significant gender differences with a little effect size (Cohen's d = 0.42). Additionally, smartphone addiction showed significant differences based on age $t(297) = -2.782$, $p < 0.05$), with a good effect size (Cohen's d = 1.08).

Discussion

The current investigated the function of fulfillment of fundamental psychological needs on nomophobia, mediated by smartphone addiction and self-control. The first hypothesis, proposing a substantial negative association between fulfillment of fundamental psychological needs (autonomy, competence, relatedness) and nomophobia, was supported. The findings showed that when these needs are met, nomophobia decreases, aligning with studies by Sezer & Yıldırım (2020) and Kircaburun et al. (2019), who found that fulfillment of fundamental psychological needs reduces nomophobia due to less reliance on mobile phones for emotional fulfillment. This suggests that fulfilling psychological needs can help mitigate the anxiety of being without a phone.

The third hypothesis posited that smartphone addiction mediates the association between fulfillment of fundamental psychological needs and nomophobia. This was partially supported. While smartphone addiction did not mediate the association between autonomy and nomophobia (Lee et al., 2020), it did mediate the association between competence and relatedness with nomophobia. For example, Kahn et al. (2021) found that individuals with higher competence needs engage more with smartphones, leading to addiction and, consequently, increased nomophobia. Similarly, Przybylski & Weinstein (2019) supported the mediatory function of smartphone addiction in the relationship between relatedness and nomophobia. These findings underscore the complex association between smartphone use, psychological needs, and nomophobia.

The fourth hypothesis, asserting that self-control mediates the association between fulfillment of fundamental psychological needs and nomophobia, was fully supported. The study found that self-control mediated the relationships between autonomy, competence, and relatedness with nomophobia. Baumeister (2007) emphasized that higher control on self helps individuals manage their mobile phone usage, reducing nomophobia even when basic needs like autonomy or competence are satisfied. Additionally, Błachnio et al. (2016) found that self-control can balance social needs with technology use, mitigating nomophobia. These results suggest that self-control is crucial in managing the impact of psychological needs satisfaction on smartphone addiction and nomophobia.

Conclusion

This study concluded that basic psychological needs satisfaction significantly influences nomophobia, with smartphone addiction mediating the association between competence and relatedness needs. Control on self also acts as a mediator between basic needs and nomophobia. While autonomy was not a predictor of nomophobia, competence and relatedness were significant factors. Gender do not show a substantial association with smartphone addiction, nomophobia, or self-control, though women scored higher in relatedness needs. Age, however, had a negative association with both smartphone addiction and nomophobia, suggesting that these decrease as age increases.

Suggestions and Limitations

The current study had limitations, including a little sample and focus on university students. Future research should explore nomophobia in a broader population and consider other factors like personality traits. Additionally, incorporating basic psychological need frustration for comparison would offer a more comprehensive understanding. Future research should expand to a larger, nationwide sample across colleges and schools to better understand the impact of fulfillment of fundamental psychological needs on nomophobia. Professionals and educators should raise

awareness about nomophobia and its link to unmet needs. Increasing sample size would improve the generalizability of the findings.

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