

The Mediating Role of Problematic Mobile Phone Use Between Nomophobia and Psychological Wellbeing of College Students

S. Antonyamy and J. Parameswari
Periyar University, Salem

The usage of the mobile phone into communication has become indispensable. Excessive exposure to this device among college students significantly impacts their psychological wellbeing. The objective of the study is to explore the mediating role of Problematic Mobile Phone Use (PMPU) between nomophobia and psychological wellbeing. Data were collected from 420 undergraduate students aged between 17 and 19 years using problematic mobile phone use, nomophobia, and psychological wellbeing pattern questionnaires. The Amos software was utilized for employing Structural Equation Modeling (SEM) to examine the mediating role of problematic mobile phone use. The findings revealed that there is a full mediation of PMPU between nomophobia and psychological wellbeing. Moreover, significant positive correlation was identified between nomophobia and PMPU and negative correlation between psychological wellbeing, nomophobia and problematic mobile phone use. The research discusses its findings and suggestion ideas for future studies.

Keywords: problematic mobile phone use, nomophobia, and psychological wellbeing

The utilization of the mobile device into communication has become indispensable. However, excessive exposure and the detachment from this device create anxiety which contribute to behavioural addiction known as “nomophobia” (no mobile phone phobia) (Yildirim & Correia, 2015) which means the apprehension of being unable to utilize a mobile device or access its services (King et al., 2013). Individuals affected by nomophobia feel discomfort and nervous or anxious when they are apart from their mobile devices, due to lack of signal, or low battery (Yildirim & Correia, 2015).

King et al. (2010) explored the first investigation into nomophobia (Arpaci, 2019) and it is considered as a malady of the 21st century (King et al., 2014). This phenomenon captivated the attention of the researchers. Humood et al. (2021) reviewed 20 research papers from ten different countries through

meta-analysis, and found that 70% of people experience moderate to severe nomophobia. Further, Tuco et al. (2023) had a comprehensive review encompassing 28 studies on nomophobia from nine different countries. The prevalence rates indicated that 24% of the individuals were experiencing mild nomophobia, 56% encountering moderate nomophobia, and 17% grappled with severe nomophobia. Eventually, Jahrami et al. (2023) conducted a meta-analysis of nomophobia, analysing 20 articles involving a combined total of 12,462 participants spanning ten different countries from 2008 to 2022. Their meta-analysis revealed 70.76% experiencing moderate to severe nomophobia, with 20.81% having severe nomophobia. According to the report by Tuco et al. (2023) there were 15 studies conducted in India revealing insights into nomophobia's prevalence. Within these, Bartwal and Nath

(2020) found that among students aged 20 to 23, 15.5% experienced mild nomophobia, 67.2% faced moderate nomophobia, and 17.3% dealt with severe nomophobia. Additionally, an investigation that included individuals from 15 to 35 years of age showed 74.8% of participants at moderate levels and 18.9% at a high manifestation of nomophobia (Kumar et al., 2021).

Studies have shown that individuals aged 18 to 24 exhibit higher vulnerability to nomophobia than older adults (Durak, 2019; Bragazzi & Del Puente, 2014). It was college students, remarkably, had the highest severe nomophobia prevalence at 25.46% (Jahrami et al., 2023). These findings highlight the growing concern of nomophobia among students pursuing higher education. and it is important to probe the impact of nomophobia on the psychological wellbeing of college students and its mediating role of problematic mobile phone use (PMPU) between nomophobia and psychological wellbeing.

Theoretical Frame Work

Cognitive Behaviour Therapy (CBT) involves cognitive, emotional, and behavioural responses that are interconnected and influence one another (Tolin, 2016). This model emphasizes that maladaptive thoughts can contribute to distressing emotions and problematic behaviours. The maladaptive thought in this research could be nomophobia; the obsessive thoughts or preoccupation with the phone get worse the feelings of anxiety, fear, or distress when separated from one's phone or unable to use it. This thought mixed with feelings fuel the individual to the behavioural element that refers to PMPU, which means excessively giving attention to one's use of the mobile phone without any control (Ratan et al., 2021). These two elements interact, contributing to a deterioration in an individual's mental wellbeing (Figure 1) which

is frequently articulated as a blend of positive emotional states, such as happiness and the attainment of optimal functionality in both individual and social aspects of life (Deci & Ryan, 2008).

Since CBT seeks to alter both cognitive thinking patterns and behavioural responses, this conceptual model has been chosen for the current research, potentially serving as an intervention framework for future studies. While there have been studies exploring the correlation between PMPU and psychological wellbeing (Tabassum & Parveen, 2018; Schivinski et al., 2020), between nomophobia and psychological wellbeing Bulbuloglu et al. (2020) as well as between PMPU and nomophobia (Marquez-Hernandez et al., 2020), no study was specifically found focusing on nomophobia, problematic mobile phone use, and psychological wellbeing. Therefore, the current study aims to explore these relationships and analyse the mediating pathway of PMPU in the association between nomophobia and the psychological wellbeing of college students.

To assess the above model the subsequent hypotheses have been formulated;

- H1. There would be a negative correlation between nomophobia and psychological wellbeing of college students
- H2. There would be a positive correlation between nomophobia and PMPU of college students
- H3. There would be a negative correlation between PMPU and psychological wellbeing of college students
- H4. PMPU would mediate the relationship between nomophobia and psychological wellbeing.

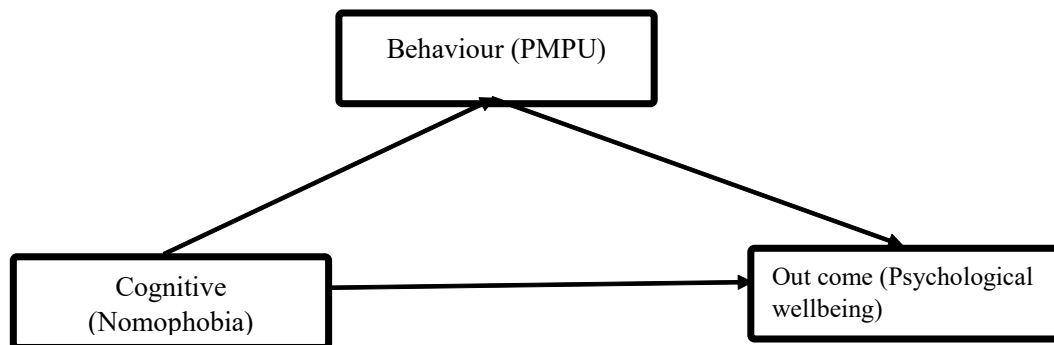


Figure 1: Conceptual Model

Method

Participants

With prior permission from the college principles, the study was described and the questionnaires were distributed to the total sample of 455 undergraduate students from Salem, 420 data were considered and the rest were excluded due to the missing values. During one session, participants completed assessments related to their nomophobia, PMPU and psychological well-being. This sample included 214 male and 206 female students, ranging in age from 17 to 19.

Measurement

Nomophobia was assessed using a 20-item scale Nomophobia Questionnaire (NMP-Q) devised by Yildirim and Correia (2015). It was rated on a seven-point Likert-type scale, where one corresponds to “strongly disagree” and seven corresponds to “strongly agree”. The scores are sorted into categories; scores below 20 suggest an “absence” of nomophobia, starting at 21 and ending at 59 indicate a “mild” level, starting at 60 and ending at 99 signify a “moderate” level, and starting at 100 and ending at 140 correspond to a “severe” level of nomophobia. The Cronbach’s α of NMP-Q was 0.90 in the present study.

Mobile Phone Problem Use Scale (MPPUS) is a 10-item scale established by

Foerster et al. (2015) to measure problematic mobile phone use. On the 10-point Likert scale, participants marked their responses to the scale items, ranging from “1 = not true at all” to “10 = extremely true.” Greater scores signify a higher degree of severity in PMPU classifications. Cronbach’s Alpha, in the present study was calculated to be 0.84.

The Flourishing Scale (FS) by Diener et al. (2010) consisting of 8 items was used to measure psychological wellbeing. Participants used a 7-point scale for rating items, where 1 represented strongly disagree, 2 was for disagree, 3 denoted slightly disagree, 4 indicated mixed or neither agree nor disagree, 5 stood for slightly agree, 6 represented agree, and 7 indicated strongly agree. An elevated overall score suggests greater psychological wellbeing. The Cronbach’s α of FS in our samples was 0.84.

Statistical Analyses

Before the analysis, the data underwent evaluations to ensure normality, identify outliers, and address any missing values. The analysis was performed utilizing SPSS version 23.0. Calculation of Pearson correlation coefficients was performed to investigate the correlation among nomophobia, PMPU, and psychological wellbeing. To determine mediating role of PMPU in the relationship between nomophobia and

psychological wellbeing Structural Equation Modelling (SEM) was performed using Amos version 23.0.

Results

Table 1: Mean and standard deviation and correlation values of the research variables

Variables	M	SD	NMP	PMPU	PWB
1. NMP	75.01	23.403	-		
2. PMPU	47.94	18.942	.614***	-	
3. PWB	40.68	8.098	-.184***	-.214***	-

Note: N=420 *** p<.001

NMP - Nomophobia; PMPU – problematic mobile phone use; PWB- psychological wellbeing

Table 1 presents the outcomes of a Pearson correlation coefficients which indicated that there is a significant negative association between nomophobia and psychological wellbeing ($r = -.184, p = .001$) as well as PMPU and psychological wellbeing ($r = -.214, p = .001$). Furthermore, there was

a positive relationship between nomophobia and PMPU ($r = .614, p = .001$).

Structural Equation Modeling

Figure 2 and Table 2 summarize the SEM of nomophobia, PMPU and psychological wellbeing. The model's adequacy is supported (RMSEA = .048; PCLOSE = .361; CFI = .996). The path coefficients corresponding to the pathway from nomophobia to psychological wellbeing, from nomophobia to problematic mobile phone use, from PMPU to psychological wellbeing, are all significant. The findings suggested a significant negative association between nomophobia and psychological well-being ($\hat{\alpha} = -.184, p < .001$). Thus, H1 was verified and a significant positive correlation was observed between nomophobia and PMPU ($\hat{\alpha} = .614, p < .001$) and consequently, H2 was verified. Moreover, the results pointed to a significant negative correlation between PMPU and psychological well-being. ($\hat{\alpha} = -.162, p < .017$). Therefore, H3 was substantiated.

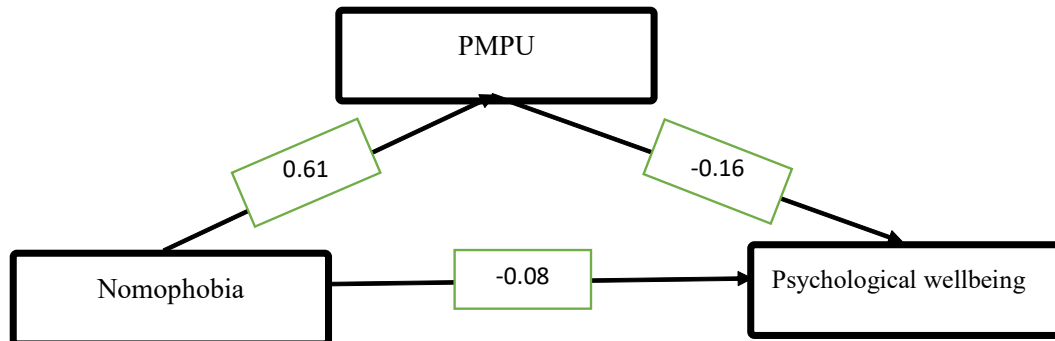


Figure 2: The structural model presenting standardized estimates

Table 2: Summary of model fitting for Structural Equation Modeling

Indices	Obtained Values	Suggested values
Chi-Square	2.0	<5
GFI	0.99	>0.90
AGFI	0.98	>0.90
TLI	0.99	>0.90
CFI	0.99	>0.90

SRMR	0.02	<0.08
RMSEA	0.04	<0.08

Mediation Analysis

The study assessed the mediating role of PMPU on the association between nomophobia and psychological wellbeing. Bootstrapping technique involving 5000 bootstrap samples at 95% confidence interval, (Hayes, 2017) was employed to assess the indirect, direct, and total effects. The findings indicated a significant negative indirect effect of nomophobia on

psychological wellbeing ($\hat{a} = -0.099, p = .014$), supporting H4. Furthermore, it was observed that the direct influence of nomophobia on psychological wellbeing, in the presence of the mediator, was not statistically significant ($\hat{a} = -0.085, p = 0.163$). Hence, nomophobia's impact on psychological wellbeing was completely mediated by PMPU. A summary of the mediation analysis is outlined in Table 3.

Table 3: Path and effect values of the mediating model

Direct, Indirect, and Total Effect	β	SE	LCL	UCL	p	Result
Standardised Direct Effects						
Nomophobia → Problematic mobile phone use	.614	.037	.535	.681	.001	Significant
Problematic mobile phone use → Psychological wellbeing	-.162	.063	-.277	-.027	.017	Significant
Nomophobia → Psychological wellbeing	-.085	.062	-.211	.029	.163	Not Significant
Standardised Indirect Effects						
Problematic mobile phone use → Nomophobia → Psychological wellbeing	-.099	.038	-.174	-.020	.014	Full Mediation
Standardised Total Effects						
Nomophobia → Problematic mobile phone use	.614	.037	.535	.681	.001	Significant
Problematic mobile phone use → Psychological wellbeing	-.162	.063	-.277	-.027	.017	Significant
Nomophobia → Psychological wellbeing	-.085	.049	-.280	-.088	.001	Significant

LCL = Lower Confidence Limit, UCL = Upper Confidence Limit, SE = Standard Error

Discussion

This study investigated the correlation between nomophobia, problematic mobile phone use, and psychological well-being and further, investigated the intermediary function of PMPU in the association between nomophobia and psychological wellbeing. According to the recent research, nomophobia is becoming a more prevalent issue for the higher education students (Dixit et al., 2010). Tuco et al. (2023) reported that one-fourth had mild nomophobia, over half showed moderate nomophobia, and about one-fifth reported severe nomophobia. Regarding the level of nomophobia, in this current study, 0.7% indicated no nomophobia, 23.8% students suffer from mild, 61.0% from moderate and 14.5% from severe nomophobia. Other research studies have documented the prevalence of severe nomophobia in various regions of India. For

instance, in Kanpur, Uttar Pradesh, 21.5% of the population reported severe nomophobia (Guin et al., 2020), while in Bhopal, the rate was 6.1% (Sethia, et al., 2018). Similarly, research carried out in Puducherry revealed a nomophobia prevalence of 23.5% (Jilisha et al., 2019), while the Nagar district of Uttar Pradesh reported a rate of 18.9% (Kumar et al., 2021). Pune documented a nomophobia prevalence of 22.1% (Faroouqi et al., 2018), and across India, Kanmani et al. (2017) found a prevalence of 15.2%, with Northern India showing a rate of 17.3% (Bartwal & Nath, 2020). Nomophobia is notably prevalent among college students aged 18 to 25 (Alwafi et al., 2022; Notara et al., 2021).

In addition to prevalence of nomophobia, the data analysis in this research revealed that a significant positive relationship was

found between nomophobia and PMPU and additionally, negative relationship between nomophobia and psychological wellbeing, and between PMPU and psychological wellbeing. It can be deduced that an increase in the levels of nomophobia and PMPU is linked to a decline in psychological wellbeing. Besides, a rise in the level of nomophobia is expected to increase PMPU (Kaviani et al., 2020).

The key revelation in this study is the role played by PMPU as a mediator in shaping the relationship between nomophobia and the psychological wellbeing of college students. The current research finding demonstrates the full mediating effect of PMPU on the association between nomophobia and psychological wellbeing implying that the effects of nomophobia on psychological wellbeing are primarily channelled through problematic mobile phone use. The full mediation suggests that PMPU acts as a behavioural mechanism through which the emotional and psychological consequences of nomophobia manifest. Individuals may resort to excessive phone use as a maladaptive coping strategy (Horwitz et al., 2011). Understanding the mediation effect emphasizes the importance of examining not just the presence of nomophobia but also the patterns of mobile phone use. Problematic usage patterns emerge as a critical factor in determining psychological outcomes. The meta-analysis affirmed that among the college population, students with mobile phone addiction exhibit a higher likelihood of experiencing negative emotions, including anxiety, depression, and impulsivity (Li et al., 2020).

In the context of Cognitive Behavioural Therapy, the mediation process can be explicated by considering how maladaptive cognitions and behaviours, such as excessive reliance on mobile phones and the associated anxiety from nomophobia, may contribute to a decline in psychological well-

being. CBT's conceptual formulation, which emphasizes identifying and restructuring distorted thoughts and behaviours, aligns with the mediation observed in this study.

Nomophobia, marked by fear or anxiety linked to the absence of a mobile phone, could potentially contribute to PMPU as individuals strive to alleviate their distress. (Yildirim & Correia, 2015; Tams et al., 2018; Kaviani et al., 2020). This maladaptive coping mechanism, in turn, appears to mediate the impact of nomophobia on psychological well-being. CBT interventions could, therefore, be suggested to target and modify these cognitive distortions and problematic behaviours associated with mobile phone use.

Limitation and Suggestions

The results rely on self-reported measures to assess nomophobia, PMPU and psychological wellbeing and further, participants were recruited from two colleges from the region of Salem. However, it is noteworthy to emphasize that our study exclusively focused on the undergraduate student population, potentially limiting the generalizability of the findings.

The results pave the way for future research to probe deeper into the intricate connection between nomophobia, PMPU, and psychological wellbeing. The full mediation highlights the importance of adopting a holistic approach to mental health. Simply addressing nomophobia without considering the mediating role of PMPU may result in incomplete interventions. Exploring specific aspects of mobile phone use and developing targeted interventions can be areas of focus. From a clinical perspective, the findings suggest that interventions addressing nomophobia's impact on psychological wellbeing should consider incorporating strategies to modify problematic mobile phone use. Practically, interventions such as cognitive-behavioural therapy (CBT),

Mindfulness based interventions and mobile phone usage management programs may be recommended for individuals experiencing nomophobia.

Conclusion

The research findings strongly support the concept of full mediation of PMPU in the relationship between nomophobia and psychological wellbeing of college students. This means that the PMPU acts as a complete intervening factor, providing a pathway through which the influence of the nomophobia is transmitted to the psychological wellbeing. The insights gained from this discussion can notify both theoretical frameworks and practical interventions aimed at promoting psychological wellbeing in the context of PMPU and nomophobia. These results suggest the importance of early intervention such as CBT and mindfulness-based interventions could enhance psychological wellbeing and prevent PMPU and nomophobia of college students.

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S. Antonysamy, Research Scholar, the Department of Psychology, Periyar University, Salem -636011santo_cap@yahoo.com

J. Parameswari, Assistant Professor, the Department of Psychology, Periyar University, Salem -636011 paramj25@gmail.com