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NOMOPHOBIA AMONG PRE-SERVICE TEACHERS IN ASSAM: PREVALENCE AND DEMOGRAPHIC ANALYSIS

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Abstract:

This study investigated nomophobia—anxiety triggered by smartphone separation—among pre-service teachers in Assam, India, examining how this modern psychological phenomenon might influence future classroom practices and students' digital behaviours. Using a descriptive survey method, researchers assessed 240 pre-service teachers through a self-developed instrument, 'Nomophobia Assessment Scale for Pre Service Teachers' (NASPT), analyzing five demographic variables: gender, age, educational background, residential area, and family structure. The majority of participants (35.42%) exhibited moderate nomophobia levels (scores 104-121), while 13.33% showed severe symptoms. Gender emerged as the only statistically significant demographic factor, with male pre-service teachers displaying higher vulnerability to nomophobia. The study revealed that nomophobia transcends most demographic boundaries, indicating pervasive smartphone dependency among pre-service teachers regardless of age, educational background, residence, or family structure. These findings highlight the need for targeted awareness and intervention programs for pre-service teachers, particularly males. Such initiatives would benefit teacher preparation programs by addressing digital anxiety that could impact future teaching practices and student interactions.

Keywords: Nomophobia, Pre-service Teachers, Technology Dependence, Demographic Factors

1. INTRODUCTION

In the modern era, the rapid growth of digital technology has significantly impacted people's daily lives. With rapid technological advancements, every sector of society has experienced significant changes, including education. The integration of digitalization and smartphones has significantly improved modern education, making e-learning, online classes, and digital curricula more accessible and enriching for students. In today's learning environment, smartphones and the internet serve as crucial tools for increasing awareness, enriching educational experiences, and enhancing digital classrooms. While these advancements offer numerous benefits, their excessive or improper use has also led to negative consequences. One such concerning psychological issue is nomophobia, where individuals experience anxiety or distress when separated from their phones or disconnected from the internet. This issue is particularly crucial in the educational domain, as it impacts teachers' focus, memory retention, and overall well-being, ultimately influencing the quality of education.

Nomophobia arises from excessive reliance on mobile phones, driven by social media addiction and the constant need to stay connected. As digital education expands, students increasingly use smartphones for online classes, e-books, and study materials, while platforms like Facebook, Instagram, WhatsApp, and Telegram further deepen their dependence. Consequently, when they are unable to access their phones, they experience anxiety, restlessness, and a sense of disconnection, making it difficult to concentrate and

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ultimately affecting their learning. This dependency not only heightens stress and reduces focus during study sessions but also strains social interactions. To address this issue among pre-service teachers, it is essential to adopt digital detox strategies, promote offline learning, and encourage effective time management alongside physical activities. Furthermore, seeking psychological support can be instrumental in overcoming this challenge and fostering a healthier academic environment.

1.1 Background of the Study

Pre-service teachers, as future educators, play a crucial role in shaping students' learning experiences. However, their excessive reliance on mobile phones not only impacts their personal well-being but also affects their teaching methods, classroom management, and interactions with students. Since digital technology is an integral part of modern education, it is essential to differentiate between its productive use and the harmful effects of nomophobia. Given that teachers influence not only academic learning but also the psychological development of their students, their mental well-being becomes a matter of great importance. Understanding the prevalence of nomophobia among pre-service teachers and its potential impact on the teaching process is therefore essential. This study aims to assess a serious psychological issue, nomophobia can hinder academic performance, making it vital for students to cultivate responsible mobile phone usage and maintain a balance between digital and traditional learning. By raising awareness and promoting effective time management, the negative impact of digital dependency can be reduced, ultimately enhancing the overall quality of education. Through an in-depth analysis, this study seeks to highlight the importance of addressing nomophobia to foster a healthier educational environment. When teachers develop a balanced approach to digital engagement, they not only improve their own well-being but also guide students in managing their digital habits effectively. Therefore, recognizing the significance of nomophobia among pre-service teachers and its implications for education is a critical area of research in today's digital era.

1.2 Need and Significance of the Study

This research about nomophobia affects pre-service teachers in Assam tackles an essential gap in understanding the digital anxiety factors that will influence future educational leaders in multicultural areas. Research examining nomophobia effects on teacher education development has been scarce ever since smartphones became widespread, particularly in Northeast India. The digital behaviours and worries of pre-service teachers will strongly determine how their students are taught through education technology in the coming generation. It is crucial to know how severe nomophobia affects this group because they will become the role models for digital conduct while developing technology policies that future students will experience in their classrooms. This investigation creates substantial effects across numerous aspects. This study delivers important findings from Assam, which stands as a sparse area when it comes to nomophobia research, even though India dominates this research field. The study investigates separate characteristics, including gender and age together with educational level and place of origin and household structure to reveal which teachers demonstrate the highest risk for nomophobia and their specific conditions. The obtained understanding enables the creation of targeted interventions that should be implemented within teacher education programs. The research findings will create connections between generic nomophobia research and educational applications so teacher training programs can better address digital wellness and healthy technology relationships. Educational institutions must understand technology dependence psychology because they continue to adopt digital technology in their teaching and learning practices. Teacher educators and educational policymakers, along with mental health professionals, will gain evidence-based data through this research to create suitable solutions for nomophobia treatment in educational

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environments. The research investigation of Assam's cultural patterns may uncover protective elements that educational systems across different regions could utilize. This research enhances the broader objective of developing educators who remain digitally balanced and psychologically stable while mastering technology practices in digital learning environments.

1.3 Research Question of the Study

To what extent does nomophobia (no-mobile-phone phobia) affect pre-service teachers in Assam, and how do demographic factors such as gender(male vs. female), age group (21-29 years), educational background (undergraduate vs. postgraduate), residential area (rural vs. urban), and family structure (nuclear vs. joint/extended) influence the prevalence and severity of this digital anxiety?

1.4 Research Objectives of the Study

Building on the primary research question, this study establishes specific objectives to systematically address these concerns.

i. To assess the prevalence and severity of nomophobia among pre-service teachers in Assam
ii. To examine differences in nomophobia among pre-service teachers in Assam based on demographic factors such as gender, age group, educational background, residential area, and family structure.

2. LITERATURE REVIEW AND RESEARCH GAP

Recent research about nomophobia explores its prevalence and severity among graduate and post-graduate students as well as educational settings. Multiple academic studies between 2012 and 2024 present vital information about nomophobia's frequency and impact as well as its distribution among diverse communities, that demonstrates its importance for teacher education programs. The studies relevant to this research are presented below:

2.1 Prevalence of Nomophobia in Different Populations : Pre-service teacher studies specifically reveal moderate to high nomophobia prevalence (Becit Isciturk, 2020; Moorthi, 2024; Essel et al., 2022; Vagka et al., 2023), particularly concerning information and communication access anxiety. Academic impacts are consistently negative, with nomophobia linked to decreased academic success (Erdem et al., 2016), increased academic stress (Suresh et al., 2019), and poorer academic performance (Ahmed et al., 2019; Vagka et al., 2023; Devi & Dutta, 2022; Kubrusly et al., 2021), no significant impact on academic performance (Alkalash et al., 2023; Aldhahir et al., 2023). Overall prevalence data shows nomophobia is widespread, predominantly at moderate levels (50-70%), with most studies finding 20-35% severe cases. Psychological correlates reveal significant relationships between nomophobia and mental health factors, including personality traits like extraversion (Astriani, 2023; Garcia-Masip et al., 2023; Molu et al., 2023), poor mental health (Singh & Rathore, 2023), anxiety (Molina et al., 2022; Singh & Rathore, 2023; Yilmaz et al., 2023; Devi & Dutta, 2022; Mukherjee; 2022; Kubrusly et al., 2021), depression (Yilmaz et al., 2023; Notara, V. et al., 2023; Singh & Rathore, 2023; Devi & Dutta, 2022; Kubrusly et al., 2021), work stress (Aslan & Aslan, 2022; Notara, V. et al., 2023; Devi & Dutta, 2022; Mukherjee, 2022; Kubrusly et al., 2021), panic attack (Mukherjee, 2022) and loneliness (Lekra, 2021).

2.2 Gender Differences and Nomophobia: Research on nomophobia reveals significant gender differences, with most studies indicating higher prevalence among females (Cirak & Islim, 2020; Gezgin et al., 2017; Moorthi, 2024; Vagka et al., 2023; Aldhahir et al., 2023; Kadan, 2023; Awed & Hammad, 2022; Basu et al., 2022), though some contradictory findings show higher levels in males

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(Oraison & Wilson 2024; Kumar et al., 2021; Ying Lin et al., 2021) or no gender differences (Colak, 2020; Padmavathy, 2024; Echazarreta et. al., 2023; Essel et al., 2021; Than & Shan, 2021).

2.3 Age Differences and Nomophobia : Age-related research consistently demonstrates that younger individuals experience more severe nomophobia (Cirak & Islim, 2020; Gurbuz & Ozkan, 2020; Alkalash et al., 2023; Padmavathy, 2024; Singh & Rathore, 2023; Devi & Dutta, 2022; Aslan & Aslan, 2022; Molu et al., 2023), with nomophobia decreasing as age increases (Setia & Tiwari, 2021). Vaishali (2021) found no significant association between age and nomophobia.

2.4 Educational background Differences and Nomophobia : Educational background findings are mixed but generally suggest higher nomophobia levels during earlier academic stages (Gurbuz & Ozkan, 2020; Padmavathy, 2024) and among students with lower academic performance (Kraishan et al., 2024; Aldhahir et al., 2023). Some studies found that no significant difference in nomophobia score based on the education level (Echazarreta et. al., 2023; Vaishali, 2021). Geography appears influential, with urban residents showing higher nomophobia levels (Moorthi, 2024; Kumar et al., 2021; Padmavathy, 2024).

2.5 Family Structure Differences and Nomophobia: Family structure research indicates socioeconomic factors significantly impact nomophobia, with higher risk among individuals whose fathers lack academic degrees (Vagka et al., 2023) and significant associations with family income (Kaur et al., 2021). Nuclear families report higher levels of nomophobia (Padmavathy, 2024). But Echazarreta et. al. (2023) found that no significant difference in nomophobia score based on the population nucleus.

2.6 Research Gap

Research on nomophobia in India fails to study the territories of Assam and the Northeast region, thus creating a gap in understanding digital anxiety patterns in ethnically diverse areas, particularly among pre-service teachers in Assam addresses gaps in previous study findings. Indian educational research shows no traces of pre-service teachers' nomophobia effects on their teaching methods, but Turkish scholars have thoroughly investigated this subject. The research approach unites gender information with age categories and participant educational attainment and residential location, and family composition data within one unified methodological structure, even though past research focuses on these components individually. The chosen dataset brings value to research since Assam's diverse population allows the study of nomophobia mechanisms through joint family and nuclear family comparisons. Most research initiatives ignore cultural disparities when they analyse the relationship between technology usage and regional connectivity histories within their sample regions. Investigating these factors together will produce advanced knowledge that enables the development of improved teacher education approaches and challenges existing beliefs rooted outside the research areas. A better understanding of nomophobia's manifestations appears within diverse cultural environments and throughout multiple population demographics will be achieved by the research outcome.

3. METHOD AND MATERIALS

The Descriptive Survey research design was adopted by researchers for the current study with the use of Stratified Random Sampling technique to obtain data of 240 pre-service teachers from Assam. For this reason, this approach was used to ensure a representative range across all demographic variables mentioned in the research question, namely, gender, age group, educational background, residential area, and family structure. Stratification consisted of grouping the pre-service teachers into different strata based on the mentioned demographic characteristics and then randomly choosing participants from each of these strata. By using this methodology, the study was able to assess the proportional representation from each

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demographic category, providing validity in its ability to make valid comparisons between groups while preserving the benefits of random sampling. For the reason of data collection, researchers used '**Nomophobia Assessment Scale for Pre-Service Teachers**' (NASPT), a self-structured instrument, contextually developed for the purpose by Mrs. Vashwati Sarma and Dr. R. D. Padmavathy. The final version of the scale consists of 40 items distributed equally across 10 dimensions: Smartphone Communication Dependency, Educational Resource Accessibility Anxiety, Digital Teaching Tools Reliance, Work-Life Balance and Digital Boundaries, Emotional Responses to Smartphone Separation, Professional Development and Networking Concerns, Digital Organization and Time Management, Teaching Performance and Adaptability Anxiety, Separation and Connectedness Anxiety, and Daily Functioning and Convenience Impairment. High reliability and excellent content validity for NASPT have been demonstrated by the NASPT. The tool was consistent in the assessment of nomophobia by the expert review with high agreement (85% for rating agreement, 70% for nominal agreement, 85% for inter-rater agreement; substantial Fleiss' Kappa=0.84). The Content Validity Index (CVI) of 0.95 confirms the strong content validity of the instrument and the moderate mean score (1.31) shows that the scale does measure changing levels of nomophobia-related behaviours. These attributes have made the NASPT a reliable, sound instrument to assess nomophobia in the degree of pre-service teachers' education in Assam.

4. DATA ANALYSIS AND INTERPRETATION OF DATA

Research objectives will be addressed through descriptive statistics to ascertain prevalence and severity levels and through inferential statistical methods, including t-tests and ANOVA to investigate differences between demographic variables.

TABLE 1: RESPONDENTS' DEMOGRAPHIC ANALYSIS

Variable	Category	Frequency	Percentage
Gender	Male	70	29.2%
	Female	170	70.8%
Age	Young (21-23)	73	30.4%
	Middle-aged (24-26)	118	49.2%
	Senior (27-29)	49	20.4%
Educational Background	Undergraduate	78	32.5%
	Postgraduate	162	67.5%
Residential Area	Urban	130	54.2%
	Rural	110	45.8%
Family Structure	Nuclear	47	19.6%
	Joint/Extended	193	80.4%

Note. Total sample size: 240 respondents (100%)

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Out of the 240 participants in the study, 29.2% were male and 70.8% were female. In terms of age distribution, 30.4% participants were in the 21-23 age group, 49.2% were in the 24-26 age group, and 20.4% were in the 27-29 age group. With regard to educational level, 32.5% of respondents completed undergraduate programs, while 67.5% completed postgraduate programs. In terms of residential area, 54.2% of the sample came from urban areas and 45.8% came from rural areas. Regarding family structure, 19.6% came from nuclear families, while the remaining 80.4% came from joint/extended families.

4.1 Statistical Classification of Nomophobia Severity((Standard Deviation Method)

To classify nomophobia severity, researchers employed the standard deviation method, a well-established approach in psychometric testing (Field, 2018). Using data from 240 participants, we calculated a mean score of 111.78 with a standard deviation of 17.80. Following guidelines recommended by Cohen (1988) and implemented in similar psychological scale validations (Yildirim & Correia, 2015; Kwon et al., 2013), we established five distinct categories: Low (scores 61-94, below mean-1SD), Below Average (scores 95-103, between mean-1SD and mean-0.5SD), Average (scores 104-121, within ±0.5SD of mean), Above Average (scores 122-130, between mean+0.5SD and mean+1SD), and Very High (scores 131-172, above mean+1SD). This classification aligns with normal distribution principles (Gravetter & Wallnau, 2017), expecting specific population percentages in each category. Our sample distribution (16.25%, 18.75%, 35.42%, 16.25%, and 13.33%) closely matched theoretical expectations, confirming the approach's statistical validity. As noted by Tabachnick and Fidell (2019), this method provides statistically meaningful categories based on deviation from population means, allowing for standardized interpretation across studies. The resulting bell-shaped distribution supports Lee et al.'s (2018) finding that nomophobia follows a normal distribution in the general population. Category interpretations range from "minimal symptoms" to "severe nomophobia with extreme anxiety when the smartphone is unavailable," consistent with clinical descriptions in the literature (King et al., 2013; Bragazzi & Del Puente, 2014).

4.2 Objective-Wise Analysis

4.2.1 Objective 1: Aassessing the prevalence and severity of nomophobia among pre-service teachers

The analysis of nomophobia scores among pre-service teachers revealed a distribution that closely aligns with theoretical normal distribution expectations. Using the standard deviation method to establish classification criteria, the findings indicate that the majority of participants (35.42%) exhibit moderate levels of nomophobia, falling within the average range (104-121). This distribution pattern suggests that while most pre-service teachers experience a typical degree of smartphone separation anxiety, a concerning subset (13.33%) exhibits severe nomophobia symptoms that could potentially impact their daily functioning. These findings align with research by Yildirim and Correia (2015), who first conceptualized and validated nomophobia as a four-dimensional construct affecting modern smartphone users. The standard deviation approach employed here is consistent with measurement practices in psychological assessments (Groth-Marnat & Wright, 2016), providing a statistically robust framework for interpreting nomophobia severity. As Gezgin et al. (2017) noted in their study of pre-service teachers, nomophobia represents a growing concern in educational contexts, with varying levels of severity that warrant attention in teacher preparation programs. This classification system offers valuable insights that could inform targeted interventions to address problematic smartphone use among future educators (Bragazzi & Del-Puente, 2014). While establishing the overall prevalence of nomophobia provides a foundation for understanding its scope among pre-service teachers, examining demographic variations offers deeper insights into which subgroups may be most vulnerable to this digital dependency.

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4.2.2 Objective 2: To examine differences in nomophobia among pre-service teachers in Assam based on demographic factors such as gender, age group, educational background, residential area (rural/urban), and family structure (nuclear/joint).

The statistical analysis examined the relationship between nomophobia scores and five demographic variables (gender, age, educational background, residential area, and family structure) among pre-service teachers in Assam.

Gender Differences

Table 2: Statistical Tests for Nomophobia Scores by Gender

Demographic Variable	Groups	N	Mean Score	Standard Deviation	t value (df=238)	Sig. (2-tailed) (Significant)
Gender	Male	70	115.97	18.93	t = 2.359	0.019
	Female	170	110.05	17.13		Yes*

Note. *Statistically significant difference at $p < 0.05$

A statistically significant difference ($t(238) = 2.359$, $p = 0.019$) was found between male and female pre-service teachers' nomophobia scores. Male participants ($M = 115.97$, $SD = 18.93$) reported significantly higher levels of nomophobia than female participants ($M = 110.05$, $SD = 17.13$). This suggests that male pre-service teachers in Assam experience greater anxiety and discomfort when separated from their mobile phones compared to their female counterparts. This gender difference could be attributed to varying patterns of smartphone use, different social pressures, or distinct dependency relationships with mobile technology between genders.

Age Group Differences

Beyond the notable gender disparities observed in nomophobia levels, the relationship between age and smartphone separation anxiety presents another intriguing dimension of this phenomenon among pre-service teachers.

Table 3: Statistical Tests for Nomophobia Scores by Age

Demographic Variable	Groups	N	Mean Score	Standard Deviation	t/F value (df=238)	Sig. (2-tailed) (Significant)
Age	Young	73	112.73	17.75	F = 2.415	0.092
	Middle-aged	118	109.48	17.75		No**
	Senior	49	115.90	17.75		

Note. **Statistically, no significant difference at $p < 0.05$

Although the one-way ANOVA showed no statistically significant overall effect for age ($F(2, 237) = 2.415$, $p = 0.092$), there was a significant deviation from linearity ($p = 0.038$), suggesting a non-linear relationship between age and nomophobia. The mean scores indicate that senior participants (27-29 years, $M = 115.90$) and young participants (21-23 years, $M = 112.73$) reported higher nomophobia levels than middle-aged participants (24-26 years, $M = 109.48$). This U-shaped pattern suggests that both the youngest and oldest groups in the study might have different but equally intense relationships with their mobile devices

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compared to the middle-aged group. Tukey's post-hoc test didn't identify statistically significant differences between specific age groups, indicating that while the pattern exists, the differences are subtle. Although age demonstrates a complex non-linear relationship with nomophobia, other demographic factors such as educational background, residential area, and family structure present a different pattern of influence on smartphone dependency.

Educational Background-Related Differences

Table 4: Statistical Tests for Nomophobia Scores by Educational Background

Demographic Variable	Groups	N	Mean Score	Standard Deviation	t value (df=238)	Sig. (2-tailed) (Significant)
Educational Background	Undergraduate	78	111.85	18.72	t = 0.040	0.968
	Postgraduate	162	111.75	17.46		No**
Note. **Statistically, no significant difference at p < 0.05						

No statistically significant difference (t (238) = 0.040, p = 0.968) was found between undergraduate (M = 111.85, SD = 18.72) and postgraduate (M = 111.75, SD = 17.46) pre-service teachers' nomophobia scores. The nearly identical means suggest that educational level has virtually no impact on nomophobia levels among pre-service teachers in Assam. This indicates that smartphone dependency and associated anxiety transcend educational attainment within this professional group.

Residential Area Differences

Table 5: Statistical Tests for Nomophobia Scores by Residential Area

Demographic Variable	Groups	N	Mean Score	Standard Deviation	t/F value (df=238)	Sig. (2-tailed) (Significant)
Residential Area	Urban	130	113.32	19.16	t = 1.454	0.147
	Rural	110	109.96	16.04		No**
Note. **Statistically, no significant difference at p < 0.05						

No statistically significant difference (t (238) = 1.454, p = 0.147) was observed between urban (M = 113.32, SD = 19.16) and rural (M = 109.96, SD = 16.04) residents' nomophobia scores. Although urban participants showed slightly higher nomophobia scores than rural participants, this difference was not statistically significant. This suggests that geographic location may have limited influence on nomophobia among pre-service teachers in Assam, possibly indicating the widespread penetration of mobile technology across both urban and rural areas.

Family Structure Differences

Table 6: Statistical Tests for Nomophobia Scores by Family Structure

Demographic Variable	Groups	N	Mean Score	Standard Deviation	t/F value (df=238)	Sig. (2-tailed) (Significant)
Family Type	Nuclear	47	111.36	18.03	t = -0.179	0.858
	Joint/Extended	193	111.88	17.84		No**
Note. **Statistically, no significant difference at p < 0.05						

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No statistically significant difference (t (238) = -0.179, p = 0.858) was found between pre-service teachers from nuclear families (M = 111.36, SD = 18.03) and those from joint/extended families (M = 111.88, SD = 17.84). The nearly identical means suggest that family structure has virtually no impact on nomophobia levels among pre-service teachers in Assam. This indicates that smartphone dependency and associated anxiety exist regardless of family living arrangements.

4.3 Overall Findings of the study

Among the demographic variables examined, only gender emerged as a statistically significant factor influencing nomophobia levels among pre-service teachers in Assam. This suggests that while nomophobia is prevalent across various demographic segments, gender-specific interventions might be worth considering when addressing digital anxiety in this population. The non-significant results for other variables suggest that nomophobia transcends most demographic boundaries, indicating the pervasive nature of smartphone dependency among pre-service teachers regardless of age, educational background, residential area, or family structure. The findings highlight the need for awareness and intervention programs for pre-service teachers, particularly male pre-service teachers who appear more vulnerable to nomophobia. Such interventions would be beneficial across demographic categories as the overall nomophobia scores were moderately high across all groups.

5. DISCUSSION OF MAJOR FINDINGS AND INTERPRETATION OF RESULTS IN LIGHT OF THE LITERATURE

The present study investigated the prevalence and demographic patterns of nomophobia among pre-service teachers in Assam. This discussion interprets the findings in light of existing literature, highlighting similarities, differences, and potential explanations for the observed patterns.

5.1 Prevalence and Severity of Nomophobia : The findings reveal that the majority of pre-service teachers in Assam (35.42%) experience moderate levels of nomophobia, with a concerning subset (13.33%) exhibiting severe symptoms. This distribution pattern aligns with several previous studies on nomophobia among student populations. Specifically, Kubrusly et al. (2021) reported that nearly all students (99.7%) in their study exhibited some level of nomophobia, with 64.5% experiencing moderate to severe levels. Similarly, Thakur and Bharti (2022) found that most nursing students demonstrated moderate nomophobia levels, with none falling into the "absence of nomophobia" category, parallel to our findings among pre-service teachers. The prevalence rates in our study are also comparable to Basu et al. (2022), who reported that 26.8% of participants had severe nomophobia and 61.3% had moderate nomophobia. Likewise, our findings echo Padmavathy's (2024) observation that 66.7% of participants exhibited moderate levels of nomophobia. These consistencies across different populations suggest that nomophobia is a widespread phenomenon among young adults in academic settings, transcending geographical and professional boundaries.

5.2 Gender Differences in Nomophobia : Our study found statistically significant gender differences (p = 0.019) in nomophobia, with male pre-service teachers reporting higher levels (M = 115.97) compared to their female counterparts (M = 110.05). This finding presents an interesting contrast to some existing literature. For instance, Aldhahir et al. (2023) reported that higher nomophobia was associated with being female among physiotherapy students. Similarly, Oraison and Wilson (2024) found that while males had higher nomophobia scores, females demonstrated higher addiction scores. However, our results align with Kumar et al. (2021), who found that males were more affected by nomophobia than females. This gender disparity could be attributed to differences in smartphone usage patterns, social pressures, or cultural factors specific

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to the Assam region. The contrast with some previous studies highlights the complex and potentially context-dependent nature of gender's influence on nomophobia. Interestingly, Echazarreta et al. (2023) found that while women exhibited more intensive daily smartphone use, no significant differences in nomophobia scores were observed based on gender. This suggests that the relationship between usage patterns and nomophobia may be mediated by other factors that vary across populations and contexts.

5.3 Age-Related Patterns : Our analysis revealed a non-linear relationship between age and nomophobia ($p = 0.038$ for deviation from linearity), with the youngest (21-23 years) and oldest (27-29 years) groups showing higher nomophobia levels than the middle age group (24-26 years). Although this U-shaped pattern does not reach overall statistical significance ($p = 0.092$), it suggests that both younger and older pre-service teachers may have different but equally intense relationships with their mobile devices. This finding partially aligned with Alkalash et al. (2023), who reported higher nomophobia prevalence among younger medical students. Similarly, Setia and Tiwari (2021) noted that nomophobia generally decreases with age but increases with smartphone usage frequency. The higher levels among our youngest participants could be attributed to digital nativity and stronger social media integration, while elevated levels in the oldest group might reflect different usage patterns or adaptation challenges. The absence of a linear age-nomophobia relationship contrasts with Kadan's (2023) finding of significant age-based differences in nomophobia. This discrepancy might reflect the relatively narrow age range in our study (21-29 years) compared to studies with broader age distributions, suggesting that age effects may be more pronounced across wider developmental stages.

5.4 Educational Background, Residential Area, and Family Structure

Our study found no significant differences in nomophobia based on educational background (undergraduate vs. postgraduate), residential area (urban vs. rural), or family structure (nuclear vs. joint/extended). These findings present mixed alignment with existing literature. The lack of educational background differences contradicts Padmavathy (2024), who reported significant variations in nomophobia based on education level. Similarly, our finding of no significant urban-rural differences contrasts with Kumar et al. (2021), who observed higher nomophobia levels among individuals in metropolitan and urban areas, and Moorthi (2024), who found higher nomophobia among urban female pre-service teachers. However, our results regarding family structure align with Echazarreta et. al. (2023), who also reported no significant differences based on family type. This consistency suggests that the influence of family structure on nomophobia may be minimal across different populations and contexts. The absence of significant differences across these demographic variables suggests that nomophobia transcends these traditional social boundaries among pre-service teachers in Assam. This finding is particularly noteworthy given the rapid digital transformation across India, which may be homogenizing smartphone dependency patterns regardless of geographical or social backgrounds.

5.5 Implications for Pre-service Teacher Education

The pervasive nature of nomophobia across different demographic segments, with gender emerging as the only significant differentiating factor, has important implications for teacher education programs. As Essel et al. (2022) noted, most pre-service teachers experience mild to severe nomophobia, with anxiety particularly related to information and communication access. This digital dependency could potentially impact their teaching effectiveness and role modeling for future students.The finding that male pre-service teachers exhibit higher nomophobia levels suggests that gender-specific intervention approaches might be beneficial. This aligns with Devi and Dutta's (2022) observation that nomophobia can negatively impact

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academic performance and psychological well-being, highlighting the importance of addressing this issue in teacher preparation programs Furthermore, the influence of technology on pre-service teachers' psychological well-being deserves attention in educational policy and practice. Notara et al. (2023) found significant positive links between nomophobia and health issues, including psychosomatic symptoms, with depression and stress mediating this association. Similarly, Singh and Rathore (2023) confirmed a positive correlation between nomophobia and poor mental health. The demographic patterns revealed in this study, particularly the significant gender differences and non-linear age relationship, carry important implications for how teacher education programs should address digital wellness among future educators. While these findings suggest several promising directions for interventions within teacher preparation programs, it is important to acknowledge the limitations that contextualize our understanding of nomophobia among pre-service teachers.

5.6 Limitations and Future Research Directions

Although this study offers insightful information about nomophobia trends among pre-service teachers in Assam, it should be noted that it has a number of drawbacks. The cross-sectional design restricts causal inferences, and social desirability bias may affect self-reported measurements. Additionally, the study did not explore the relationship between nomophobia and personality traits, which Garcia-Masip et al. (2023) and Astriani (2023) found to be significant moderators of nomophobia.

Future research should examine the longitudinal progression of nomophobia among pre-service teachers, particularly as they transition into professional teaching roles. Additionally, exploring the relationship between nomophobia and teaching efficacy could provide valuable insights into the potential impact of digital dependency on educational outcomes. As Molina et al. (2022) noted, the relationship between anxiety and nomophobia in educational contexts deserves further investigation, particularly in post-pandemic educational settings.

6. CONCLUSION

This study contributes to the growing body of literature on nomophobia by highlighting its prevalence and demographic patterns among pre-service teachers in Assam. The findings reveal that nomophobia is a pervasive phenomenon that transcends most demographic boundaries, with gender emerging as the only significant differentiating factor. This suggests that digital dependency and associated anxiety are widespread among future educators, potentially impacting their professional development and teaching practices. The results underscore the need for awareness and intervention programs within teacher education curricula, particularly targeting male pre-service teachers who appear more vulnerable to nomophobia. As Guin et al. (2021) demonstrated, planned teaching programs can effectively improve understanding and management of nomophobia, suggesting a potential pathway for addressing this issue in teacher preparation contexts. By acknowledging and addressing nomophobia among pre-service teachers, educational institutions can better prepare future educators to navigate the increasingly digital educational landscape while maintaining balanced relationships with technology.

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