ORIGINAL ARTICLE

Exploring the role of Gender and Education on Nomophobia, Anxiety and Insomnia in Gen Z

Prabhudarsan Sahoo[1], Sai Chandan Das[2], Deep Shikha[3], Ruchi Juyal[4]

[1] Assistant Professor, Department of Psychology, Ravenshaw University, Cuttack, Odisha

[2]Associate Professor, Department of Community Medicine, KIMS, KIIT University, Bhubaneswar, Odisha

[3,4] Professor, Department of Community Medicine, Himalayan Institute of Medical Sciences, Swami Rama Himalayan University, Dehradun. Uttarakhand

CORRESPONDING AUTHOR

Dr Deep Shikha, Professor, Department of Community Medicine, Himalayan Institute of Medical Sciences, Swami Rama Himalayan University, Dehradun. Uttarakhand

Email: deepshikha@srhu.edu.in

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ABSTRACT

Aims: The present study aims to explore the role of gender and educational qualification on nomophobia, anxiety and insomnia among Gen Z in Odisha. **Methods:** The sample consisted of 513 participants (42.7% males and 57.3% female). Three scales were used to measure the variables: the Nomophobia questionnaire, the Insomnia Severity Index and the Generalised Anxiety Disorder scale. **Results** demonstrated that female participants exhibited higher levels of nomophobia and greater levels of anxiety, while males reported higher levels of insomnia. UG students exhibited higher levels of nomophobia, while PG students reported higher levels of both insomnia and anxiety. **Conclusion**: The findings from the study contribute to the evolving research on the psychological repercussions of excessive mobile phone use, sleep disturbances, and anxiety, while also emphasising the importance of designing support strategies suited to specific populations.

KEYWORDS

Nomophobia; Insomnia; Anxiety; Young Adult

INTRODUCTION

The rapid advancement of technology has significantly influenced modern life, particularly among the younger generation known as Generation Z (Gen Z). Gen Z generally includes individuals born between 1995 and 2010 and is widely recognised as the first truly "digital native" generation, having grown up with continuous exposure to smartphones, social media, and digital communication platforms.(1) This generation is also referred to as "Gen Zers," "post-Millennials," or "iGen."(2) Nomophobia, or "no mobile phone phobia," is a behavioural condition associated with excessive smartphone use. Individuals with high levels of nomophobia experience persistent anxiety related to loss of connectivity, leading to compulsive checking and impaired daily functioning.(3,4) Gen Z reportedly spends nearly 16 hours daily engaging with digital devices, reflecting a high degree of technological dependence.(5) Such dependence has been linked to adverse psychological outcomes, particularly anxiety and insomnia. Excessive screen exposure and irregular sleep patterns contribute to emotional distress and sleep disturbances.(6–15) However, limited empirical data exist from eastern India, especially Odisha, highlighting the need for region-specific evidence.

Aims & Objective:

- Assess levels of nomophobia, anxiety, and insomnia among Gen Z students in Odisha.
- Investigate gender differences in these psychological factors.
- Compare these outcomes between undergraduate and postgraduate students.

MATERIAL & METHODS

Study type & design: This descriptive cross-sectional study was conducted among students enrolled in various educational institutions across the Cuttack district of Odisha.

Study duration: Data was collected between March 2024 and June 2024.

Sample Size: The estimated prevalence of nomophobia among students, according to previous literature, is 18.5%.(3) Sample size was calculated using the formula N = Z2PQ/E2, taking Z=1.96 (for 95% confidence interval), considering a power of 90% and a precision level of 0.05, a design effect of 2.0 and an expected response rate of 90%. We arrived at a sample size of 511.11, which was rounded off to 513.

Sampling method: The probability proportionate to size sampling method was adapted to select students from different colleges across Cuttack city in Odisha. The following inclusion was considered like students belonging to Generation Z (i.e. born between the 1990s and 2010) not using any psychotropic drugs or not suffering from any chronic diseases. Students who refused to participate and provide written consent were excluded from the study. Students could discontinue the survey at any point and their responses would not be taken into consideration.

Study Tool: The study used a semi-structured questionnaire to collect sociodemographic details; the other three measurement tools were the Nomophobia Questionnaire (NMP-Q) (4), the Insomnia Severity Index to assess insomnia, and the Generalised Anxiety Disorder Scale to assess participants' anxiety. (20,21)

Inclusion & Exclusion criteria: Data were gathered on an individual basis, with strict confidentiality upheld throughout the study. Students who did not provide informed consent or missed at least three scheduled visits were excluded from the study.

Statistical analysis: Data analysis was performed using SPSS version 21.0 (Armonk, NY, IBM Corp). Mean and Standard deviation (SD) were used to describe the normally distributed data. The study adopted a 2 (gender) x 2 (educational qualification) factorial design. The independent variables of the study were gender (male and female) and educational qualification (undergraduate and post graduate). The dependent variables of the study were Nomophobia, Anxiety and Insomnia of the Gen Z. Two-way analysis of variance (ANOVA) was employed to assess the possible interactions between these variables.

RESULTS

Five hundred and thirteen students were approached, of whom 219 were male and 294 were female. Of these, 341 were undergraduate (UG) students, while 172 were pursuing postgraduate (PG) studies.

Table 1 summarises the participants' socio-demographic variables. The educational qualification data show a majority of 66.5% undergraduates, with the remaining 33.5% in postgraduate programs. Gender distribution was 42.7% male and 57.3% female. About 52.63% of participants live in rural areas, and 47.36% reside in urban settings. Additionally, 57.9% of participants reported satisfaction with their academic performance, 19.9% were dissatisfied, and 22.2% were uncertain about their performance.

Table 1: Socio-demographic profile of the participants (N=513)

Demographic characteristics	Frequency	Percentage
Educational qualification		
Undergraduate	341	66.5
Postgraduate	172	33.5
Gender		
Male	219	42.7
Female	294	57.3
Place of stay		
Rural	270	52.63
Urban	243	47.36
Satisfied with academic performance	297	57.9
Yes	102	19.9
No	114	22.2
May be		

Table 2 revealed a significant main effect of Gender, F (1,511) = 8.38, p<.01 and educational qualification, F (1,511) =4.10, p<.01. However, the Gender x educational qualification interaction effect was found to be not significant, F<1.

Tabel 2 ANOVA on Nomophobia scores of the participants

Source	SS	df	MS	F
Gender	4805.72	1	4805.72	8.38**
Educational qualification	2354.24	1	2354.24	4.10*
Gender x educational qualification	11.10	1	11.10	.01 NS
Error	292771.76	511	572.83	

**p<0.01, NS=Not Significant

Table 3 showed that the mean Nomophobia score among female college students (M=81.86, SD=24.05) was higher than that among male college

students (M=75.03, SD=23.90). Likewise, the mean for UG college students (M=80.60, SD=23.69) was higher than that for their PG counterparts (M=75.66 SD=24.92).

Table 3: Mean and SD of Nomophobia scores of participants

Gender	UG		PG		Combined	
	M	SD	M	SD	M	SD
Male	76.59	23.78	72.35	24.01	75.03	23.90
Female	83.40	23.27	78.54	25.46	81.86	24.05
Combined	80.60	23.69	75.66	24.92	78.93	24.20

As shown in Table 4, both gender, F (1,511) = 3.82, p<0.05 and educational qualification, F (1,511) = 5.52, p<0.01 had significant main effects on insomnia. Additionally, gender x educational qualification interaction effect was also significant F (1,511) = 4.46, p<0.05.

Table 4: ANOVA on Insomnia scores of the participants

Source	SS	df	MS	F
Gender	126.97	1	126.97	3.82*
Educational qualification	183.23	1	183.23	5.52**
Gender x educational qualification	147.98	1	147.98	4.46*
Error	16944.81	511	33.16	

***p<.01, *p<0.05*

Table 5 shows that mean insomnia scores were higher among male (M=11.26, SD=5.88) participants than female participants (M=10.50, SD=5.73). The insomnia scores of PG students (M=11.61, SD=5.60) was higher than their UG counterparts (M=10.43, SD=5.87). Gender x educational qualification interact and significantly influenced the insomnia scores of the participants. Mean scores revealed that males in PG (M=12.79 SD=5.26) had the highest insomnia compared to all other groups of participants.

Table 5: Mean and SD of Insomnia scores of participants

Gender	UG		PG		Combined	
	M	SD	M	SD	M	SD
Male	10.38	6.05	12.79	5.26	11.26	5.88
Female	10.46	5.75	10.59	5.72	10.50	5.73
Combined	10.43	5.87	11.61	5.60	10.83	5.80

Table 6 showed that there was a significant main effect of gender F (1,511) = 9.27, p<0.01 and educational qualification F (1,511) = 3.94, p<0.05 on anxiety. But the gender x educational qualification interaction effect was found to be not significant F<1

Table 6: ANOVA on Anxiety scores of the participants

Source	SS	df	MS	F
Gender	259.52	1	259.52	9.27**
Educational qualification	110.27	1	110.27	3.94*
Gender x educational qualification	1.36	1	1.36	.04 NS
Error	14292.14	511	27.96	

**P<0.01, *P<.05, NS=Not Significant

Table 7 revealed that mean of anxiety scores of female participants (M=8.39, SD=5.16) was higher than the male (M=6.96, SD=5.47) participants. Comparison of means indicated that participants in PG (M=8.39, SD=5.51) had more anxiety than UG (M=7.47, SD=5.23) participants.

Table 7*:* Mean and SD of Anxiety scores of the participants

Gender	UG		PG		Combined	
	M	SD	M	SD	M	SD
Male	6.64	5.32	7.52	5.70	6.96	5.47
Female	8.04	5.09	9.14	5.26	8.39	5.16
Combined	7.47	5.23	8.39	5.51	7.78	5.34

Table 8 shows that there were significant positive relationships between nomophobia and insomnia (r=.302, p<0.01); nomophobia and anxiety (r=.234, p<0.01). In addition to this, a significant positive relationship is found between insomnia and anxiety (r=.386, p<0.01)

Table 8: Inter-correlations among Nomophobia, Insomnia and Anxiety of participants

Variables	n	M	SD	1	2	3
Nomophobia	513	78.93	24.20	-	-	-
Insomnia	513	10.83	5.80	.302**	-	-
Anxiety	513	7.78	5.34	.234**	.386**	-

**P<0.01

DISCUSSION

The present research intended to examine nomophobia, insomnia and anxiety in males and females, and to investigate any possible variations between both groups. This study revealed a significant gender difference in nomophobia with females tend to experience higher levels than their male counterparts. This finding aligns with prior studies demonstrating that females are more likely to experience nomophobia. (3,22,23) This may be attributed to differences in mobile phone usage and attachment patterns. Females use their phones

more intensely, interact in social media platforms more frequently and rely largely on their smartphones for communicating and maintaining interpersonal relationships. Smartphones provide an avenue for social connection and acknowledgment and females may have a greater urge to remain constantly connected, contributing to higher degrees of nomophobia.

Findings of the present study revealed a significant gender difference in anxiety among participants and with female participants reporting higher levels of anxiety compared to males. The result corroborates with prior researches, and females had higher levels of anxiety across various age groups and populations.(24-26) Expectations from parents and society, traditional gender-related roles, and cultural norms may contribute to the experiences and pressures faced by female students. Increased anxiety among female participants may be attributed to factors like, perceived social scrutiny, perfectionism, body image issues, social validation and gender-related adversities. Additionally, females have a heightened level of self-awareness and reflection in comparison to males. This greater level of self-awareness and self-reflection may contribute to increased worry and excessive overthinking, both of which are the primary symptoms of anxiety.

The results of this study showed a significant difference between male and female students in insomnia, with male students reporting higher levels of insomnia than female students. This finding of the present study contradicts with the findings of other researches. (27-30) Young males often deal with various problems, such as academics, societal expectations, and career aspirations. The competitive characteristics of these important areas, as well as extensive hours of preparation and irregular sleep patterns can all have adverse impact on the overall sleep quality of a person. Males may experience higher amounts of stress and worry as a result of the pressures of their academic performance. These pressures might cause greater level of psychological distress and increased level of anxiety, impairing their capability to both initiate and maintain good quality of sleep. Furthermore, social stereotypes also hinder men from seeking support from others or expressing their feelings freely may lead to insomnia.

Results indicated a significant variation in nomophobia among Undergraduate and postgraduate students, with UG students having higher levels of nomophobia than PG students. Research suggested that nomophobia is prevalent and widespread among the college going students across the globe.(31) According to a survey among undergraduate students in India, 98% of students reported having nomophobia, with the majority of the students reporting moderate nomophobia.(32) UG students are usually in their late teens or early twenties, a period which is characterized by increased peer influence and the need for social validation. Mobile phones serve as a means of social connection and identity formation during this phase of their life. PG students, on the other hand, are often older, more matured and may have acquired greater coping skills and a stronger sense of self-identity, which may reduce their dependency on mobile phones and consequent nomophobia. Generally, UG students are in early phases of their academic journey, adjusting to new situations and settings, academic requirements, and social media platforms. Because of the pressure and concern associated with these important transitions, UG students may become more reliant on their mobile phones for comfort, relief, distraction, social interaction and immediate support, which may contribute to increased levels of nomophobia.

The findings of the present study revealed a significant disparity in anxiety scores among Post graduate and Undergraduate students, with PG students reporting higher levels of anxiety and greater levels of insomnia compared to the UG students. The greater academic burden, uncertainties about career and pressure associated with study might explain why PG students have higher levels of sleep deprivation when compared to UG students. PG students frequently confront with higher expectations about their study and career, they go through more rigorous curriculum, and academic responsibilities. Academic pressure, combined with assignment and project deadlines, thesis preparation, and other academic related work, may contribute to increased levels of anxiety and sleep disturbances among PG students, which may result in higher levels of insomnia. Moreover, the transition from UG to PG studies can be a significant life event for the PG students. They often face new environments, increased independence, and higher expectations from their parents and society compared to the UG students. The transition period, along with additional academic, career and personal responsibilities, may lead to higher levels of anxiety and sleep issues among the PG students.

The results showed positive and significant relationship between nomophobia, insomnia and anxiety. The positive and significant association between nomophobia and insomnia supports the notion that excessive mobile phone use and dependency may significantly affect patterns of sleep. These findings are consistent with several past researches showing how usage of technology

disrupts sleep habits. (33,34) Those exhibiting higher nomophobia are more likely to experience greater difficulties falling asleep, staying asleep, and achieving quality sleep, resulting in the development or escalating of insomnia symptoms. Similarly, the significant and positive association between nomophobia and anxiety is consistent with previous studies that has highlighted the role of excessive mobile phone use in resulting heightened level of anxiety symptoms. (35,36) Nomophobia can cause feelings of apprehension fear of missing out, or a persistent desire for social approval through online connections, all of which can lead to increased anxiety. Those with higher levels of nomophobia often experience increased concern, restlessness, and anxiousness, all of which are signs of anxiety disorders. Likewise, lack of sleep can affect the body's normal stress-response systems, resulting in heightened physiological arousal and cognitive reflection, which may adversely affect anxiety symptoms.

The results of the present study carry significant implications for various stakeholders, including parents, educators, counsellors, mental health professionals, and policymakers. By recognizing the associations between nomophobia, insomnia and anxiety, appropriate interventions and support strategies aimed at mitigating the adverse effects and promoting the overall well-being and success of Gen Z students. Interventions and awareness programs promoting digital well-being, dealing with academic and other related pressures, and proper quality of sleep may benefit students in minimizing the harmful impacts of nomophobia on sleep and overall psychological well-being. Additionally, educational institutions may play an important role in raising awareness of nomophobia and its detrimental effects on student well-being. The study did not control for confounding factors such as hours of phone use, socioeconomic status, or living situations, which may have influenced the outcomes.

Conclusion

The present study highlights a considerable burden of nomophobia, insomnia, and anxiety among Gen Z students in Odisha, with significant variations across gender and educational qualification. Female students exhibited higher levels of nomophobia and anxiety, whereas male students reported greater insomnia. Undergraduate students were more prone to nomophobia, while postgraduate students experienced higher anxiety and sleep disturbances. These findings are consistent with recent literature from the last decade, which indicates increasing psychological dependence on smartphones and its strong association with poor sleep quality and emotional distress among young adults (33-36).The positive correlations observed between nomophobia, insomnia, and anxiety further suggest that excessive smartphone use is closely linked with impaired mental well-being and sleep health, supporting the view that nomophobia represents a multidimensional psychosocial concern rather than a simple behavioural habit.

Recommendation

This study underscores nomophobia as an emerging behavioural risk factor among Gen Z, affecting mental health and academic achievement. Schools should adopt structured programs promoting digital well-being, responsible smartphone use, and screen-time limits. Incorporating routine mental health assessments for issues like anxiety, insomnia, and nomophobia into student health services can help with early intervention. Gender-sensitive counselling is recommended to specifically address anxiety in females and sleep issues in males and postgraduates. Encouraging healthy lifestyles and providing psychosocial support can lower the long-term mental health risks and enhance youth well-being on a broader scale.

Limitation of the Study

This cross-sectional study limits the ability to infer causality from the observed associations. Since the data were self-reported, they could be affected by recall bias and social desirability bias. Additionally, the research did not control for confounders such as daily screen time, academic workload, socioeconomic status, or living conditions, all of which might affect both smartphone use and psychological outcomes. Consequently, future longitudinal research with objective smartphone use measures is advised to clarify causal relationships and develop effective intervention strategies

Relevance of the Study

This study adds to existing knowledge by providing region-specific data from Odisha on the relationships among nomophobia, anxiety, and insomnia among Gen Z. It highlights important gender and educational disparities that can inform targeted public health initiatives and mental health promotion strategies within educational settings.

Authors Contribution

All authors have contributed equally.

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Nil

Conflict of Interest

There is no conflict of interest.

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Declaration of Generative AI and AI Assisted Technologies in the Writing Process

The authors haven't used any generative AI/AI assisted technologies in the writing process.

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