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How Mindfulness Training Reduces Nomophobia in Gen Z Remote Workers: A Big Five Personality Approach

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ABSTRACT

This study aims to examine the effectiveness of mindfulness training in reducing nomophobia in Generation Z Remote Workers, as well as evaluating differences in nomophobia based on the Big Five Personality Traits personality dimensions. The research sample consisted of 10 employees of Company X engaged in the creative media industry aged 20-27 years. After screening using the Nomophobia Questionnaire (NMP-Q) scale and the BFI-2 scale, 10 people were determined who met the criteria for research subjects and were willing to take part in the intervention program. This study used a quasi-experimental method with a one group pretest-posttest design. The research instruments included the NMP-Q and BFI-2 scales, while data analysis used the Wilcoxon and Kruskal-Wallis tests. The results of the Wilcoxon test showed an Asymp. Sig (2-tailed) value of 0.007 (<0.05), which indicates a significant difference between the pretest and posttest results after the mindfulness training intervention, this means that mindfulness training effectively reduces nomophobia in Generation Z remote workers. Furthermore, the Kruskal-Wallis test showed an Asymp. Sig (2-tailed) value of 0.578 (>0.05), which means that there is no significant difference in reducing nomophobia based on the personality types of Openness, Extraversion, and Neuroticism

INTRODUCTION

The rapid advancement of technology in the digital era has transformed smartphones into indispensable tools of daily life. As sophisticated devices, smartphones offer a wide array of features and functions that streamline communication and other activities (Cummiskey, 2011). These devices, evolving from traditional mobile phones, have become symbols of effective and efficient communication, allowing users to stay connected anytime and anywhere (Yasser, 2016). Global smartphone usage has seen a significant surge over recent years, with projections indicating that the number of users will reach 7.7 billion by 2028 (Woodlief, 2017). Indonesia, as one of the most populous nations, ranks as the fourth most active user of smartphones worldwide, trailing only China, India, and the United States. Data from Kompas.com reveals that in 2023, Indonesians spent an average of more than six hours per day on their smartphones (APJII, 2024). This growing dependency on smartphones, while beneficial in many ways, also raises concerns about overuse and its psychological consequences.

The increasing ubiquity of smartphones has brought about both positive and negative consequences. On one hand, these devices enhance productivity, provide entertainment, and facilitate access to information. On the other hand, their excessive use has led to psychological dependence, manifesting in conditions such as nomophobia. Nomophobia, an abbreviation for "no mobile phone phobia," describes the anxiety experienced when individuals are unable to use or access their smartphones (Yildirim & Correia, 2015). This phenomenon, first identified in a study conducted by the UK Post Office in 2008, has since evolved into a significant global issue. Initial research revealed that 66% of participants experienced heightened anxiety when separated from their smartphones, with young adults aged 18–24 showing the highest vulnerability (SecurEnvoy, 2012). For many, the inability to communicate, losing connectivity, and being unable to access information triggers significant stress, making nomophobia a modern psychological phenomenon.

Globally, studies have highlighted the widespread prevalence of nomophobia among young adults. Research in Turkey revealed that 42.6% of young adults experience moderate to severe

nomophobia, while in India, university students reported significant levels of anxiety related to smartphone dependency (Bartwal & Nath, 2019; Yildirim et al., 2014). Similar patterns were observed in Canada, where young professionals identified nomophobia as a key contributor to workplace stress (Tams et al., 2018). These findings underscore the global nature of this issue, particularly in the context of the digital economy.

In Indonesia, Generation Z (Gen Z), born between 1997 and 2012, represents 27.94% of the population, making them the largest demographic group in the country (BPS, 2024). Gen Z is known for its adaptability to digital advancements and proficiency in utilizing various technological applications. Their upbringing in a technology-saturated environment has heightened their dependence on smartphones for communication, entertainment, and work-related tasks (Sari, 2020). Studies conducted in Indonesia have shown that more than half of Gen Z individuals exhibit moderate to severe levels of nomophobia, with significant anxiety stemming from concerns over losing connectivity and the inability to access information (Muryana & Widyastuti, 2024). Similar trends are observed in other countries, including Turkey and India, where young adults have demonstrated high levels of smartphone-related anxiety (Bartwal & Nath, 2019; Yildirim et al., 2014).

Within a professional setting, the COVID-19 pandemic accelerated the shift from traditional office-based work to remote working arrangements. Remote work environments necessitate constant connectivity, leading to blurred boundaries between personal and professional life. This transition has intensified the reliance on smartphones for professional communication, leading to increased screen time and greater psychological stress. Studies have shown that this constant connectivity, while enhancing work efficiency, has blurred the boundaries between work and personal life, contributing to heightened levels of nomophobia among employees (Vargo et al., 2021; Molino et al., 2020). The seamless integration of smartphones into everyday routines and work environments has further exacerbated the psychological impact of their excessive use, creating a pressing need for targeted interventions.

Mindfulness training has emerged as a promising solution to address nomophobia. Rooted in the principles of present-focused awareness and non-judgmental acceptance, mindfulness helps individuals regulate their emotions, reduce anxiety, and develop healthier behavioral patterns. Research suggests that mindfulness can mitigate the psychological effects of smartphone dependency by fostering self-awareness and improving stress management (Arpaci et al., 2019). Furthermore, mindfulness has been shown to enhance cognitive and emotional resilience, enabling individuals to navigate the challenges posed by modern digital lifestyles.

This study aims to explore the effectiveness of mindfulness training in reducing nomophobia among Gen Z professionals engaged in remote work. Additionally, it examines the influence of personality traits, particularly those within the Big Five Personality Model, on the susceptibility to nomophobia. Traits such as extraversion and neuroticism have been identified as significant predictors of smartphone dependency, with extraverts exhibiting a stronger desire for connectivity and neurotic individuals demonstrating heightened anxiety over losing access to their devices (Turan & Yilmaz, 2024; Saidon et al., 2023).

Understanding the interplay between mindfulness, personality traits, and nomophobia is critical to developing effective interventions. By addressing the psychological and behavioral dimensions of smartphone dependency, this research seeks to provide practical insights for both individuals and organizations. It highlights the need for strategies that not only reduce nomophobia but also foster a balanced and mindful approach to technology use in professional settings.

METHODS

Sample

The population in this study consisted of employees of a creative media company in Malang, Indonesia. From this population, a purposive sampling technique was employed, aligning with Arifin's (2011) framework. This technique ensures the selection of participants who meet specific, predetermined criteria relevant to the research objectives. Based on Krejcie and Morgan's sample size determination table, 66 employees were

identified as the sample for this study, focusing on Generation Z remote workers aged 20-27 years with moderate to severe nomophobia and dominant personality traits from the Big Five Personality framework.

To refine the sample further, only participants meeting the following criteria were included: both male and female employees born between 1997 and 2004, with at least one year of remote work experience. Participants were required to score in the moderate to severe categories on the Nomophobia Questionnaire (NMP-Q) and exhibit a dominant trait in the Big Five Personality dimensions, particularly extraversion or neuroticism. From the initial 40 qualifying individuals, the final sample comprised 10 participants who provided informed consent and committed to participating in the study.

Instruments

The Nomophobia Questionnaire (NMP-Q) and the Big Five Inventory-2 (BFI-2) were utilized as the two key instruments in the study. The NMP-Q, adapted from Eskawati (2019) into Indonesian, measures nomophobia across four dimensions: inability to communicate, losing connectedness, inability to access information, and giving up convenience. The instrument demonstrated strong reliability (Cronbach's Alpha = 0.945) and validity, with 15 valid items showing corrected item-total correlations ranging from 0.540 to 0.809. Scoring was based on a 7-point Likert scale, categorizing nomophobia into none, mild, moderate, and severe levels.

The BFI-2, adapted into Indonesian by Ahya & Siaputra (2021), assessed personality traits across five dimensions: openness, conscientiousness, extraversion, agreeableness, and neuroticism. Each dimension comprised 12 items scored on a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree." Reliability testing revealed a Cronbach's Alpha of 0.931 for 54 valid items, with item-total correlations between 0.353 and 0.696, confirming the instrument's robustness for this study.

Research Design and Procedure

A quasi-experimental framework was applied in the research, with a focus on the non-randomized one-group pretest-posttest model. This approach involved assessing the participants' levels of nomophobia before and after an intervention. The intervention consisted of mindfulness training sessions adapted from Arpaci et al. (2019), based on Kabat-Zinn's (2013) mindfulness framework. This framework emphasizes paying attention intentionally, maintaining awareness, experiencing the present moment with acceptance, and avoiding judgment.

The mindfulness training was delivered over four sessions within two weeks, with each session lasting 90 minutes. A licensed clinical psychologist facilitated the sessions, focusing on equipping participants with mindfulness techniques to manage their nomophobia. The training content was tailored to address the unique challenges faced by Generation Z remote workers, emphasizing practical applications in their daily routines.

Data collection was conducted before the intervention using the NMP-Q to establish baseline nomophobia levels. Following the completion of the mindfulness training, participants were reassessed using the same instrument to measure changes in their nomophobia levels. This design allowed for a comparative analysis of pretest and posttest results, providing insights into the effectiveness of the mindfulness intervention in reducing nomophobia among Generation Z remote workers.

RESULTS AND DISCUSSION

This study included ten participants who met the specified inclusion criteria and demonstrated a commitment to completing the mindfulness training

intervention from start to finish. These participants were all members of Generation Z, falling within the age range of 20 to 27 years, with an equal distribution of five males and five females. Their professional backgrounds were diverse, encompassing roles such as graphic design, administration, animation, and customer service, all within a creative media company known for its adoption of remote and hybrid work models. This employment setting reflected the growing trend of flexible work environments, particularly among younger generations. Of the ten participants, 60% (n=6) exhibited severe nomophobia, characterized by heightened anxiety related to smartphone unavailability, while the remaining 40% (n=4) were identified with moderate levels of the condition. This prevalence underscores the significant impact of nomophobia on Generation Z, particularly those engaged in remote work, where smartphones often serve as critical tools for professional and personal connectivity.

A closer examination of the participants' dominant personality traits revealed a distribution primarily across three dimensions of the Big Five Personality framework: Openness, Extraversion, and Negative Emotionality. Individuals with Openness were likely driven by curiosity and adaptability, often embracing new experiences and technologies. Those with Extraversion exhibited sociable and outgoing tendencies, emphasizing interpersonal engagement, while participants with Negative Emotionality were more prone to emotional instability and stress. This varied personality composition provided a comprehensive context for analyzing how mindfulness training might interact with individual differences to address nomophobia effectively.

A Wilcoxon test was conducted to determine differences in nomophobia scores before and after the mindfulness intervention. Descriptive analysis revealed the following:

Table 1. Descriptive Analysis Results

Aspect	Mean	Median
Pretest Nomophobia	82.9	93.5
Posttest Nomophobia	62.5	66.5

The mean nomophobia score decreased from 82.9 in the pretest to 62.5 in the posttest, with a median reduction from 93.5 to 66.5. This significant reduction in nomophobia levels after the intervention

highlights the effectiveness of the mindfulness training. The Wilcoxon test results are presented below:

Table 2. Wilcoxon Test Results

Aspect	Significance	Conclusion
Nomophobia	< 0.007 (p)	Significant

The Wilcoxon test showed a p-value of 0.007 ($p < 0.05$), indicating a statistically significant reduction in nomophobia levels after the mindfulness training. This supports the hypothesis that the intervention effectively reduces nomophobia among Generation Z remote workers.

A Kruskal-Wallis test was also performed to compare nomophobia levels across participants with different personality traits—Openness, Extraversion, and Negative Emotionality. The results are shown below:

Table 3. Kruskal-Wallis Test Results

Personality Trait	N	Mean Rank (Pretest)	Mean Rank (Posttest)
Openness	2	7.50	8.00
Extraversion	3	5.00	3.83
Negative Emotionality	5	5.00	5.50

Table 4. Kruskal-Wallis Significance Values

Aspect	Sample Size	Significance
Pretest Nomophobia	10	0.578
Posttest Nomophobia	10	0.319

The results indicate no significant differences in pretest or posttest nomophobia scores among participants with different personality traits ($p > 0.05$). This suggests that nomophobia levels before and after the intervention were relatively consistent across personality types.

Interestingly, the findings revealed that participants with Extraversion experienced the most significant reduction in nomophobia, as reflected by the lowest posttest mean rank of 3.83. Extraverts are typically characterized by their sociable, energetic, and outgoing nature, which enables them to seek and maintain broader social networks in real life, reducing their dependence on digital communication for interpersonal interactions. This trait naturally

positions them to adapt more quickly to interventions like mindfulness training, which emphasize present-moment awareness and real-world engagement. These results align with Turan and Yilmaz (2024), who highlighted the pivotal role of extraversion in fostering face-to-face interactions, thereby mitigating smartphone dependency.

Further supporting this perspective, Li et al. (2023) identified a positive correlation between extraversion and the size of social networks, both online and offline. Extraverts' ability to cultivate extensive social connections may act as a protective factor against the anxiety associated with smartphone unavailability. For these individuals, mindfulness training likely amplified their inherent

strengths by encouraging deeper, more meaningful real-world interactions, which in turn diminished their reliance on virtual connectivity and reduced their levels of nomophobia.

This finding also underscores the adaptability of extraverts to mindfulness practices, which resonate with their predisposition toward active and engaged social behaviors. The intervention may have provided extraverts with practical strategies to balance their digital and real-world interactions more effectively, empowering them to manage their emotional responses to smartphone dependence. By enhancing their focus on present-moment experiences and fostering greater self-regulation, mindfulness training enabled extraverts to shift their reliance from digital distractions to more fulfilling and tangible social engagements.

Moreover, the significant reduction in nomophobia among extraverts has broader implications for designing targeted interventions. It suggests that personality traits, such as extraversion, can play a critical role in determining the responsiveness of individuals to mindfulness-based therapies. Tailoring mindfulness interventions to leverage the natural strengths of extraverts—such as their sociability and proactive engagement—could further optimize outcomes, not only for reducing nomophobia but also for enhancing overall mental well-being in populations with similar traits. This approach highlights the importance of integrating personality considerations into therapeutic strategies for addressing technology-related anxieties in the digital age.

In contrast, individuals with Negative Emotionality exhibited a slower reduction in nomophobia, with a posttest mean rank of 5.50. Negative Emotionality, or neuroticism, is often associated with emotional instability, anxiety, and a tendency to focus on negative outcomes (Sakiroglu et al., 2017). This trait makes such individuals more susceptible to over-reliance on smartphones as a coping mechanism for managing their emotional distress. Smartphones may serve as a form of digital escape, offering immediate relief through virtual interactions or social media. While mindfulness training can aid in emotional regulation, individuals with high levels of Negative Emotionality may require additional time and more intensive practice to internalize these techniques effectively. According to Li et al. (2020), the biological

underpinnings of neuroticism, including heightened sensitivity to stress, can make it challenging for these individuals to disengage from their dependence on smartphones.

Participants with Openness to Experience showed the slowest reduction in nomophobia, as reflected by the highest posttest mean rank of 8.00. This personality trait, characterized by curiosity, creativity, and a desire for novelty, often drives individuals to explore and engage with new technologies. Turan and Yilmaz (2024) suggest that individuals with high levels of Openness may rely on smartphones to fulfill their intellectual curiosity and stay updated on the latest developments. In this study, the slower reduction in nomophobia among these participants might stem from their intrinsic motivation to use smartphones as tools for learning and exploration. Even after the mindfulness training, their dependency on smartphones for these purposes may persist, highlighting the need for tailored interventions that address their specific needs and behaviors.

It is worth noting that while mindfulness training demonstrated overall effectiveness across all personality traits, the differences in response rates underscore the nuanced interplay between personality and behavioral change. Extraverts, who are naturally predisposed to seek social engagement, adapted quickly to the training's emphasis on present-moment awareness. Conversely, participants with Negative Emotionality, who often struggle with emotional regulation, and those with Openness, who view smartphones as a gateway to knowledge, required more effort and time to achieve similar outcomes. These findings suggest that personalized mindfulness interventions, designed to cater to individual personality profiles, may further enhance their efficacy.

The results also shed light on the broader implications of mindfulness training for Generation Z remote workers. This demographic, often labeled as digital natives, faces unique challenges in managing their relationship with technology. As remote work continues to blur the boundaries between professional and personal life, the ability to regulate smartphone use becomes increasingly critical. The findings of this study reinforce the potential of mindfulness training as a practical and scalable solution to address these challenges. By cultivating self-awareness and promoting intentional

technology use, mindfulness practices enable individuals to recognize and manage their smartphone reliance. Mindfulness practices can not only alleviate nomophobia but also promote healthier work-life integration among Generation Z professionals.

CONCLUSION

These findings highlight the potential of mindfulness-based therapy as an effective treatment for nomophobia. The study demonstrates that mindfulness training plays a significant role in reducing nomophobia among Generation Z remote workers. This conclusion is supported by quantitative analysis, which revealed notable differences in nomophobia scores before and after the intervention within the experimental group. Although variations in post-intervention scores were observed. Subjects with Openness exhibited the highest scores, followed by those with Negative Emotionality, and the lowest scores were found in individuals with Extraversion. these differences were not statistically significant. This suggests that the examined personality dimensions did not affect the overall effectiveness of mindfulness training in alleviating nomophobia for this population.

Based on the implementation and evaluation of the study's limitations, several recommendations for future researchers conducting similar studies are proposed. First, future studies should involve larger research groups and implement control groups to generalize the findings more representatively. Second, follow-ups on research subjects after the intervention are recommended to assess how long the effectiveness of mindfulness training persists. Finally, future researchers can apply and compare different therapeutic interventions beyond mindfulness to provide a broader understanding of effective treatments for nomophobia.

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