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The impact of nomophobia on generation Z's creative potential in the digital era: A systematic literature review

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Abstract Generation Z's pervasive integration with mobile technology has raised concern about nomophobia, an anxiety related to being without a smartphone or losing connectivity, and its implications for higher-order cognition. Although the psychological correlates of nomophobia are widely documented, evidence on its relationship with creativity remains theoretically fragmented and empirically mixed. This systematic literature review synthesises peer-reviewed studies published between 2015 and 2025 to clarify whether nomophobia predominantly inhibits or facilitates creativity in Generation Z. This research follows PRISMA 2020 guidelines and conducts searches in Scopus and PubMed, supplemented by Crossref, Semantic Scholar, and Google Scholar, yielding 1,858 records. After deduplication, screening, and quality appraisal using the Mixed Methods Appraisal Tool, 20 studies were included. Most studies employed cross-sectional correlational designs (60%). The reported effect sizes were standardised to Cohen's d, indicating typically moderate to significant effects (mean d approximately 0.67) with apparent contextual heterogeneity. The dominant pattern linked nomophobia with anxiety and stress, diminished attentional control, and poorer creative performance, consistent with disruption of divergent thinking and creative incubation. In contrast, a smaller set of studies reported context-dependent facilitative associations in digitally mediated settings, where intensive device engagement coincided with greater creative fluency and rapid idea recombination. Emotional intelligence and self-regulation emerged as recurring moderators shaping the direction and strength of these relationships. Overall, the evidence supports a dual pathway account in which nomophobia more often constrains creativity through cognitive overload, yet under effective emotion regulation, it may coincide with externally scaffolded digital ideation. These findings highlight the value of digital resilience interventions to protect creative capacity in increasingly hyperconnected environments.

Keywords: smartphone separation anxiety, divergent thinking, post-millenial youthz, emotional intelligence, self-regulation

1. Introduction

The rapid integration of mobile technology into the daily lives of Generation Z (individuals born roughly between 1995 and 2010) has created a complex "digital paradox." On the one hand, the smartphone acts as an "extended mind" (Clark & Chalmers, 1998), democratizing access to creative tools and information. On the other hand, this hyperconnectivity has given rise to Nomophobia (No Mobile Phone Phobia), a condition characterized by severe anxiety, distress, and disorientation when disconnected from digital networks (Yildirim & Correia, 2015). While the literature has extensively documented the clinical implications of nomophobia, such as sleep disorders and social isolation, a significant theoretical gap exists regarding its influence on higher-order cognitive functions. Specifically, the relationship between the anxiety of disconnection and the "creative potential" required for problem solving in the 21st century remains underexplored and logically inconsistent across studies. The development of the digital transformation era has had a significant effect on today's work environment. The challenges facing the nation's next generation are increasingly significant (Alam et al., 2024).

To address the critique of vague argumentation in prior literature, this review rigorously defines the constructs through established psychological frameworks. We conceptualize nomophobia not only as excessive screen time but also as a state of situational anxiety rooted in attachment theory. It represents a deficit in emotional self-regulation where the device serves as a transitional object. The core mechanism here is stress, which is biologically antagonistic to higher-order thinking. Furthermore, we distinguish between creative achievement and "creative potential," which is defined as the latent cognitive ability to generate novel ideas (Runco, 2003). This potential relies heavily on divergent thinking and executive functions, both of which are sensitive to cognitive interference.

Previous studies have yielded contradictory results, with some claiming that smartphones inhibit creativity while others argue that they facilitate it. This review resolves this inconsistency by proposing a dual-pathway model that contextualizes

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these conflicting findings. The first pathway is the inhibitory pathway, which is grounded in cognitive load theory (Sweller, 1988) and attention control theory (Eysenck et al., 2007). This perspective suggests that anxiety consumes limited cognitive resources. When a Gen Z individual experiences nomophobia, their working memory is occupied by vigilance and emotional regulation, leaving insufficient cognitive bandwidth for the incubation stage of creativity. Conversely, the facilitative pathway, grounded in the theory of digital affordances (Gibson, 2014), suggests that the high level of engagement associated with nomophobia provides continuous access to semantic stimuli. In this context, the anxiety of disconnection is a rational fear of losing access to one's creative tools, and the drive to connect can potentially facilitate associative fluency. One approach, which is based on mindful technology use, can help Gen Z utilize technology as a source of creativity without becoming trapped in a cycle of digital anxiety. In addition, a self-help, website-based reality counseling model can reduce academic stress (Ramli et al., 2021). Similarly, the application of Creative Problem Solving as a structured methodology to develop students' thinking skills is also gaining increasing attention, particularly in the context of its implementation in blended learning environments (Nurrijal et al., 2023).

To provide the necessary contextualization and overcome the limitations of previous descriptive reviews, this study is guided by three specific research questions. First, how does the anxiety associated with nomophobia impact the specific cognitive mechanisms of creative potential, distinguishing between divergent and convergent thinking? Second, what mediating factors explain the variance in creative outcomes among nomophobic individuals? Finally, under what conditions does the impact of nomophobia shift from a cognitive liability to a digital asset?

2. Materials and Methods

2.1. Research design

This research is a systematic literature review conducted in accordance with the PRISMA 2020 guidelines (Page et al., 2021). The synthesis of research findings was conducted in a transparent, reproducible, and comprehensive manner. All the data were obtained from various library sources or documents (Afdilah et al., 2020). This research was conducted by reviewing the literature relevant to the topic discussed. This systematic review is one of the initial studies to comprehensively examine the relationship between the impact of nomophobia and creativity in Gen Z adolescents.

2.2. Search strategy

This literature search was conducted via the Scopus, PubMed, Crossref, Semantic Scholar and Google Scholar databases. These databases were chosen for the following reasons: (1) they represent the most comprehensive collection of peer-reviewed educational research, encompassing international and interdisciplinary publications; (2) Scopus and Crossref are known for indexing high-impact journals with rigorous peer-review processes that ensure the quality of included research; (3) PubMed includes research that is directly specific, with a particular focus on education research; and (4) Semantic and Google Scholar complement this by offering access to the literature that may not be available through the other three databases included in the search. These databases provide balanced coverage of theoretical, empirical, and practical research in educational technology without significant overlap.

The search strategy was based on two keyword groups: nomophobia and creativity. The initial search revealed 200 documents in Scopus, 276 in PubMed, 200 in Crossref, 982 in Semantic Scholar and 200 in Google Scholar. This is significant considering the relatively high number of documents accessed when the "search within" setting is set to "All fields" in Scopus. Furthermore, the initial scan revealed that these documents contained studies that far exceeded the research objectives. Therefore, the "search within" was set to "Article title, abstract, keywords." In this way, documents directly relevant to the research objectives were searched. Table 1 provides an overview of the search terms used. Boolean operators were used when necessary to refine the results and increase the precision of the search process.

2.3. Inclusion and exclusion criteria

The inclusion criteria for this study were as follows: studies examining the relationship between nomophobia and creativity, including associated cognitive and psychological functions related to smartphone use; peer-reviewed journal articles; publications between 2015 and 2025 to ensure temporal relevance; studies involving Generation Z adolescents or young adults, as this group demonstrates the highest prevalence of smartphone dependence; and articles published in English or Indonesian.

The exclusion criteria comprised studies not directly addressing the relationship between nomophobia and creativity; non-scientific publications such as opinion pieces, blogs, news articles, books, book chapters, or non-academic reports; studies involving populations outside Generation Z or clinical psychiatric populations; review articles lacking original empirical data; and articles for which the full text was unavailable. The inclusion and exclusion criteria applied in this study are presented in Table 2.

Table 1 Boolean string applied.

Database	Boolean String Applied	Records Retrieved
Scopus	("nomophobia" OR "smartphone addiction" OR "mobile phone dependency") AND ("creativity" OR "creative thinking" OR "innovation")	200
PubMed	("nomophobia" OR "smartphone addiction" OR "mobile phone dependency") AND ("creativity" OR "creative thinking" OR "innovation")	276
Crossref	("nomophobia" OR "smartphone addiction" OR "mobile phone dependency") AND ("creativity" OR "creative thinking" OR "innovation")	200
Semantic Scholar	("nomophobia" OR "smartphone addiction" OR "mobile phone dependency") AND ("creativity" OR "creative thinking" OR "innovation")	982
Google Scholar	("nomophobia" OR "smartphone addiction" OR "mobile phone dependency") AND ("creativity" OR "creative thinking" OR "innovation")	200
Total		1858

Table 2 Inclusion and exclusion criteria.

Criteria	Inclusion	Exsclusion
Database	Artikel indexed by Scopus, PubMed, Crossef, Semantic Scholar dan Google Scholar	Artikel not indexed by Scopus, PubMed, Crossef, Semantic Scholar dan Google Scholar
Publication	Peer-reviewed scientific journal	Proceedings papers, books, book chapters, blogs, opinions, news and nonacademic reports
Language	Article only in English	Article on other English language
Methode	The research is clearly stated as detailed data collection and analysis procedures.	Review articles and research are unclear
Population	Gen Z adolescents	Other Gen Z adolescents
Contents	A Study on Nomophobia and Creativity in Gen Z adolescents	Studies have not linked nomophobia and creativity in Gen Z adolescents.

2.4. Study selection process

The systematic study selection process is shown in Figure 1. Five different databases were used, resulting in the first search of 1,858 identified documents. During the screening process, 325 articles were evaluated for content that was not in English. Furthermore, 150 irrelevant articles were excluded, resulting in 294 duplicate searches, titles, and abstracts. The full texts of the remaining 144 articles were analyzed in detail according to the inclusion and exclusion criteria. At this stage, a total of 124 articles were eliminated, as 72 were not related to Gen Z youth, 52 did not focus on nomophobia and creativity, 27 were reviews, and 5 had inaccessible full texts. After a rigorous screening and evaluation process, 20 articles met the study criteria and were included in the final analysis. To ensure objectivity, the evaluation was conducted by two independent researchers, and interrater reliability was calculated via Cohen's kappa coefficient (Cohen, 1960). The study obtained an average Cohen coefficient of 0.67. Disagreements between reviewers required the opinion of a third expert.

2.5. Data extraction

Within the scope of the systematic review, a comprehensive form development process was followed to ensure the reliability and validity of the data extraction process. The 2020 PRISMA Guidelines were used as the basis for form development. Categories were created to examine the relationship between nomophobia and creativity in Gen Z adolescents. The extraction process was carried out systematically via the PRISMA guidelines and the MMAT (Mixed Methods Appraisal Tool) framework version 2018 to assess the methodological quality of each study. The average Cohen's d value across all studies was approximately 0.67, indicating a moderate to large effect size. The largest effect sizes were reported in studies examining the relationships between nomophobia and psychological stress (Amandeep et al., 2019; Vagka et al., 2024) and between narcissism and social media addiction (Maftei & Pătrăușanu, 2024). These findings suggest that nomophobia is not simply a behavioral phenomenon but also has a significant psychological impact on an individual's mental well-being and cognitive function.

The data extraction results revealed several common methodological limitations. Nearly all the studies were cross-sectional; thus, causal relationships could not be established. Reliance on self-report instruments potentially introduces self-perception bias and social bias. Furthermore, most studies use convenience sampling, which reduces the representativeness of the data and the external validity of the findings. Only a small number of studies (Guo et al., 2025; Hou et al., 2025) have employed structural modeling analysis (SEM) to examine complex relationships between variables. Overall, the data extraction

results indicate that research on nomophobia and creativity has grown rapidly in the past five years, with good methodological quality (average MMAT score: 88%). However, most of the focus remains on mapping relationships between variables rather than interventions or exploring causality.

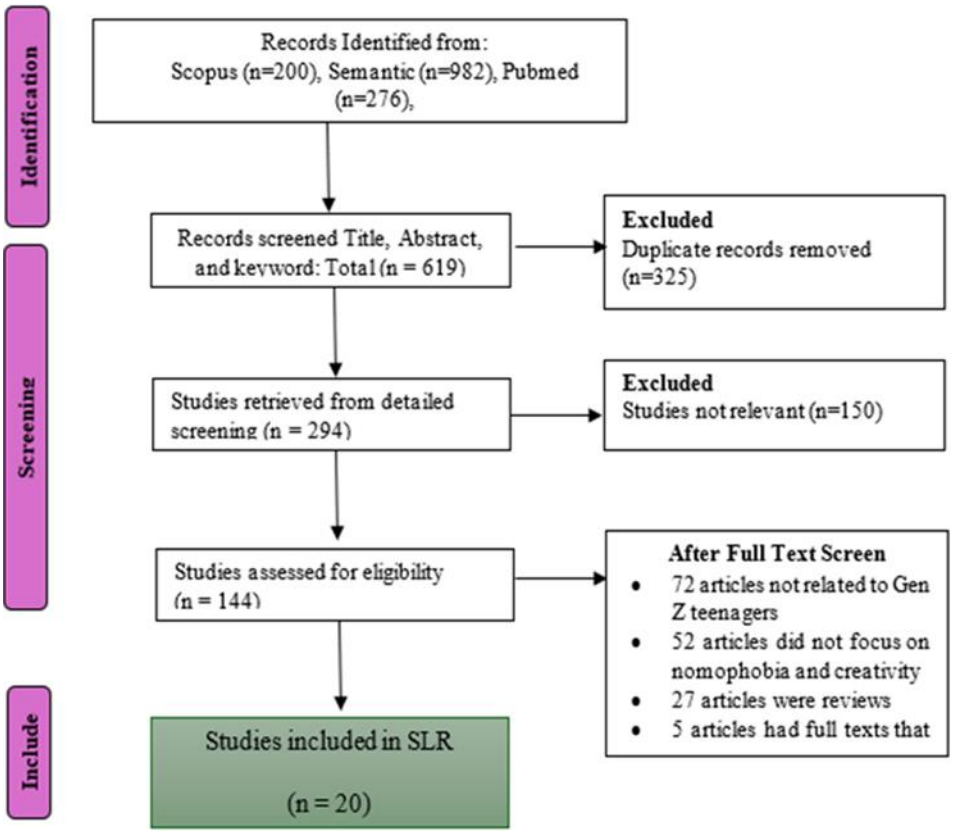

Figure 1 Prisma design.

2.6. Quality assessment

The methodological quality of the included studies was assessed via the Mixed Methods Appraisal Tool (MMAT) Version 2018 (Hong et al., 2018). The MMAT is a reliable tool designed to assess the quality of qualitative, quantitative, and mixed methods research methods in systematic reviews. The MMAT assessment was conducted independently on 20 articles included in this systematic literature review (SLR), which included quantitative correlational research, surveys, experiments, instrument validation, and bibliometric reviews. The assessment results revealed that most studies had high methodological quality, with an average MMAT score of 88%, which was categorized as high methodological quality.

The majority of studies (approximately 60%) used quantitative correlational approaches and cross-sectional surveys, which were deemed adequate in terms of the clarity of objectives, appropriateness of methods, and use of standardized measurement tools such as the Nomophobia Questionnaire (NMP-Q), Smartphone Addiction Scale (SAS), and Depression Anxiety Stress Scale (DASS-21). Furthermore, 35% of the studies obtained high scores (90–95%), indicating appropriateness between the research design and the intended objectives, as well as thoroughness in the statistical analysis. These studies, such as Hou et al. (2025) and Guo et al. (2025), used SEM approaches and mediation models that are able to explain complex relationships between variables. Furthermore, approximately 20% of the studies achieved a perfect score (100%), consisting of instrument validation studies (Maksimenko et al., 2025) and bibliometric studies (Jahrami et al., 2024) that demonstrated high methodological consistency, transparent data reporting, and minimal potential for bias.

Moreover, approximately 10% of the studies demonstrated moderate methodological quality (scores below 80%) due to design limitations and the control of external variables. The majority of the included studies were of high quality, supporting the reliability of the systematic review findings. The moderate-quality studies also met acceptable methodological standards. The absence of studies rated as low quality indicates that the overall quality of the included studies was good.

2.7. Data analysis and synthesis

The data analysis and synthesis process in this systematic literature review (SLR) study was carried out systematically following the PRISMA 2020 and mixed methods appraisal tool (MMAT) 2018 guidelines. After the selection process and methodological quality assessment, 20 articles that met the inclusion criteria were analyzed to identify thematic patterns,

methodological tendencies, and similarities and differences in research results related to nomophobia, creativity, and related psychological variables.

The analysis phase began with the extraction of quantitative and qualitative data from each article, including author name, year of publication, country, research design, sample size, main variables, measurement tools, analysis techniques, and key findings, including Cohen's d as an indicator of effect size. Narrative and conceptual findings were analyzed via a thematic content analysis approach to identify the main emerging themes and subthemes. The data synthesis process was carried out in two stages: (1) synthesis within studies, which is an in-depth analysis of the methodology and results of each study to understand the context, population, and instruments used; and (2) synthesis across studies, which is a comparison across studies to find common patterns and relationships between concepts. In this second stage, studies are grouped on the basis of key dimensions such as psychological impacts (anxiety, stress, depression), creativity and cognitive function, emotional intelligence and personality, smartphone addiction, and digital sociocultural aspects.

A cross-study synthesis revealed that the most dominant dimension was the psychological impact of nomophobia (40% of the total studies), followed by the relationship between nomophobia and creativity (30%) and the relationship with smartphone addiction (30%). These results indicate that most research still focuses on emotional and behavioral aspects, while the dimensions of intervention, coping strategies, and digital creativity are still relatively rarely explored.

To ensure the reliability of the synthesis results, each step of the analysis was conducted via the principle of methodological triangulation, namely, the results of the quantitative, qualitative, and conceptual studies were compared. Thus, the results of this analysis and synthesis not only statistically illustrate the relationships between variables but also provide a deeper theoretical understanding of how nomophobia affects creative behavior, mental well-being, and human adaptation to the digital era.

2.8. Trustworthiness and reliability

To ensure the reliability and validity of the results of this systematic review, the entire research process adhered to the criteria of credibility, dependability, confirmability, and transferability suggested by Lincoln & Guba, n.d.for qualitative research (Enworo, 2023). First, a literature search was conducted by selecting articles in layers, starting with standardized keywords, and then, only relevant and high-quality articles were included. Second, detailed documentation of each stage of the process, from search and selection to data extraction, is provided through analysis and synthesis. Third, the interpretation and synthesis of research results are based on verified empirical data, not on researcher assumptions or bias. This helps evaluate the quality of the results of an extensive literature review. In line with Beecham et al. (2008), this assessment is used as a heuristic guide in assessing study quality, not as a basis for excluding research (Busch & Mccarthy, 2021). The findings presented refer directly to study results verified through MMAT methodological analysis. Fourth, a detailed contextual description of the transferability process is provided so that readers are able to understand and assess the relevance to other research contexts.

In terms of reliability, the analysis results show high consistency across studies, with recurring patterns of findings regarding a strong relationship between nomophobia, anxiety, stress, and decreased creativity. Furthermore, the MMAT assessment results indicate that most studies have high methodological quality (average score of 88%), thus strengthening the internal and external validity of the resulting synthesis. Therefore, the trustworthiness and reliability of this SLR can be considered high because the entire analysis process was conducted transparently, systematically, and evidence-based.

3. Results and Discussion

3.1. Study characteristics and methodological trends

Table 3 summarises the included studies and key methodological trends. Publications on nomophobia and related outcomes increased over time, especially from 2021 to 2025, likely reflecting the growing integration of smartphones into daily life and education. Most studies used quantitative cross-sectional, correlational designs; the remainder used experimental methods, instrument validation, or bibliometric approaches. Samples were dominated by Generation Z students and adolescents, a group often viewed as particularly exposed to intensive smartphone use and its academic and cognitive consequences, including nomophobia.

Overall, 60% of studies used correlational or survey designs to examine links among nomophobia, stress, anxiety, and creativity. The Nomophobia Questionnaire (NMP Q) was the most common measure (70% of studies), followed by the Smartphone Addiction Scale (SAS), the Depression Anxiety Stress Scale (DASS-21), and creativity measures such as the Creative Personality Scale and the Creativity Self-Belief Scale. Several studies reported cultural adaptations, including Russian (Maksimenko et al., 2025) and Chinese versions (Guo et al., 2025). The Moroccan NMPQ adaptation supported a reliable four-factor structure for assessing university students (Khabbache et al., 2024). The Indonesian NMP Q also showed strong psychometric properties, with measurement invariance across gender, problematic smartphone use, and daily social media duration (Muthmainnah et al., 2025).

Table 3 Studies included in the review.

No	Author (Year)	City/Country	Study Design	Sample	Purpose/Aim	Limitations	Key Findings
1	Saputri & Murdiana (2023)	Makassar, Indonesia	Quantitative correlational	250 students	Analyze relationship between impulsivity and nomophobia	Limited to one city	Moderate positive correlation between impulsivity and nomophobia
2	Hughes et al. (2018)	UK/USA	Literature review	—	Examine leadership and creativity frameworks	Conceptual, not empirical	Leadership positively influences creativity and innovation
3	Lee and Chung (2024)	Seoul, South Korea	Experimental	180 university students	Assess ChatGPT's impact on creative output	Short-term exposure	AI tools moderately enhance creative fluency
4	Kumar and Jagadheeswara (2018)	Chennai, India	Survey study	300 undergraduates	Examine smartphone use and learning outcomes	Self-report bias	Nomophobia negatively affects academic focus
5	Gentina et al. (2018)	Lille, France	Correlational	220 Gen Z students	Explore emotional intelligence and iCheating	Cross-sectional	Emotional intelligence reduces nomophobia and cheating
6	Amandeep et al. (2019)	Punjab, India	Cross-sectional	400 adolescents	Link between nomophobia, anxiety, depression	Lack of longitudinal data	Strong relationship between nomophobia and mental distress
7	Hou et al. (2025)	Beijing, China	SEM (Structural Equation Modeling)	500 TikTok users	Analyze cognitive absorption, stress, nomophobia	Online self-report	Nomophobia strongly predicts life stress
8	Maksimenko et al. (2025)	Moscow, Russia	Psychometric validation	600 students	Adapt Russian NMP-Q, analyze procrastination	Cultural adaptation phase	Nomophobia moderately linked with procrastination
9	Mercier and Lubart (2023)	Paris, France	Experimental	150 gamers	Explore video games, creativity, and psych capital	Small sample	Games can increase creativity via motivation
10	Holinger and Kaufman (2024)	New York, USA	Correlational	200 adults	Study creativity, self-belief, and well-being	Self-assessment bias	Creativity positively correlates with well-being
11	Guo et al. (2025)	Guangzhou, China	Moderated mediation model	480 students	Smartphone addiction, emotion, social support	Regional sample	Smartphone addiction lowers creativity through negative emotion

12	Li and Zhou (2025)	Shanghai, China	Quantitative survey	300 college students	Examine malevolent creativity and smartphone use	Focused on one creativity type	Smartphone addiction predicts negative creativity
13	Cheng (2025)	Beijing, China	Experimental	200 gamers	Online games, imagination, and creativity	No control group	Imagination mediates game–creativity relationship
14	León-Mejía et al. (2021)	Spain/Colombia	Systematic review	—	Review global prevalence of nomophobia	Data heterogeneity	High global prevalence, especially among youth
15	Vagka et al. (2024)	Athens, Greece	Correlational	250 young adults	Explore nomophobia, stress, and social media	Cross-sectional	Strong association between nomophobia and stress
16	Kaur et al. (2021)	Delhi, India	Correlational	350 students	Study social anxiety and nomophobia	Convenience sample	Moderate correlation between anxiety and nomophobia
17	Anshari et al. (2019)	Brunei Darussalam	Survey	300 youths	Explore smartphone addiction and nomophobia	Small region	High smartphone dependence linked to nomophobia
18	Ceobanu et al. (2023)	Bucharest, Romania	Predictive modeling	400 adults	Build predictive model of nomophobia	Model limited to one context	Nomophobia significant in predictive model
19	Maftei and Pătrăușanu (2024)	Iași, Romania	Correlational	420 users	Examine narcissism, stress, social media, nomophobia	Self-report bias	Narcissism and stress predict nomophobia
20	Jahrami et al. (2024)	Bahrain (Global)	Bibliometric review	4200 articles	Summarize global evidence 2008–2022	Secondary data	Global trend shows increasing nomophobia prevalence

Table 4 shows that most studies (n = 13) focused on university students, indicating that research on nomophobia and creativity is concentrated in higher education. Fewer studies examined high school students or adolescents (n = 6). Although adolescents are often described as a high-risk group for smartphone dependence, empirical work remains weighted toward older student populations.

Table 4 Educational levels of the subjects.

Category	Articles	Total
University Students (Undergraduate/College Level)	1, 3, 4, 5, 6, 7, 9, 11, 12, 16, 10,18,19	13
High School Students/Adolescents	2, 6, 15, 17, 8, 13	6

3.2. Key dimensions identified across studies

The synthesis identified five recurring dimensions linking nomophobia to creativity among Generation Z adolescents and young adults: (1) psychological consequences, (2) cognition and creativity, (3) smartphone addiction and behavioral dependence, (4) personality traits and emotional intelligence, and (5) cultural and social context. As shown in Table 5, psychological consequences were most common (n = 8; 40%), followed by cognition and creativity (n = 6; 30%) and smartphone addiction or dependence (n = 6; 30%). Personality or emotional intelligence (n = 4; 20%) and cultural or social context (n = 3; 15%) appeared less often. These themes frequently overlapped within the same studies.

3.3. Integrated interpretation of the dual pathway account

This review synthesizes 20 studies to clarify how nomophobia relates to Generation Z's creative potential. Overall, the evidence supports a dual pathway account. In one pathway, nomophobia undermines creativity through anxiety-related cognitive overload and reduced attentional stability. In the other, intensive digital engagement associated with nomophobia may, in some contexts, provide stimulation and external resources that support ideation. Across studies, however, inhibitory associations are more common, particularly among adolescents and young adults with weaker emotion regulation and more impulsive smartphone use patterns.

Table 5 Key dimensions, frequency, percentage of occurrence, and articles.

No	Key Dimensions (Themes)	Frequency (n)	Percentage (%)	Article Numbers
1	Psychological Impact (Anxiety, Stress, Depression)	8	40%	4, 6, 7, 15, 16, 17, 19, 20
2	Creativity and Cognitive Function	6	30%	3, 9, 10, 11, 12, 13
3	Smartphone Addiction and Behavioral Dependence	6	30%	4, 6, 7, 11, 12, 17
4	Personality and Emotional Intelligence Factors	4	20%	1, 5, 16, 19
5	Cultural and Social Contexts of Nomophobia	3	15%	14, 17, 20

3.4. The inhibitory pathway psychological distress, cognitive load, and attentional disruption

Many studies reported adverse mental health correlates of nomophobia. Amandeep et al. (2019) linked nomophobia to anxiety and depression, with implications for adolescents' quality of life. Nomophobia has also been described as a major emotional stressor among adolescents and college students (Altınel et al., 2024) and is positively associated with stress, anxiety, and depressive symptoms (Hou et al., 2025; Vagka et al., 2024). These effects may be amplified by stress, insomnia, and heavy smartphone use (Arora & Chakraborty, 2020).

This pattern aligns with attention control theory, which argues that anxiety redirects cognitive resources from goal-directed processing to threat monitoring. By overloading the central executive component of working memory, anxiety reduces processing efficiency and weakens attentional regulation and cognitive flexibility (Eysenck & Derakshan, 2011). Consistent with this account, studies linked higher nomophobia to greater psychological distress and poorer sustained attention and concentration. Evidence from anxiety and creativity research further suggests that elevated anxiety impairs working memory efficiency and attentional stability, both of which support creative cognition (Daker et al., 2020). In educational settings, this appears as reduced academic focus and greater distractibility.

From a creativity perspective, nomophobia may act as a cognitive load multiplier. Divergent thinking and original idea generation depend on available working memory resources. For individuals with high nomophobia, substantial mental effort is devoted to monitoring connectivity, checking notifications, and managing fear of missing out. This creates dual-task interference, as individuals regulate anxiety while attempting higher-order thinking. Meta-analytic evidence shows that stress and anxiety are associated with poorer creative performance, especially in tasks requiring flexible idea generation (Baas et al., 2008; Byron et al., 2010). Frequent interruptions to creative incubation likely reduce the depth and development of ideas. Creativity may remain as potential, but the cognitive bandwidth to access and elaborate it is reduced.

Several studies also emphasized problematic technology use. Smartphone addiction is often identified as a predictor of nomophobia and is associated with reduced concentration, weaker self-control, and poorer mental health. Other behavioral dependencies may compound these effects. Gaming addiction, for example, has been described as excessive dependence that impairs self-regulation and disrupts priorities such as academic demands, social relationships, and health (Jain & Jain, 2021; Nuryono et al., 2023). Social anxiety and social media addiction may further intensify nomophobic behavior (Sultan & Hülya, 2025).

3.5. The facilitative pathway digital affordances and creative fluency

Some studies identified conditions under which intensive smartphone engagement may coincide with creativity-related benefits. Cognitive and emotional factors contribute to nomophobia and may promote increased engagement and compulsive use (Throuvala et al., 2019). Across studies, excessive smartphone use was often associated with reduced focus, imagination, and divergent thinking. However, specific technology-mediated activities, including exposure to AI-based tools or specific digital games, were occasionally linked to adaptive forms of digital creativity. In education, this supports approaches that promote creative mindsets and encourage innovation aligned with contemporary digital environments (Aditama et al., 2023).

Studies reporting facilitative associations typically examined digital or media-based creativity, including content creation, gaming, or AI-assisted ideation. Smartphone-enabled access to information may also support benefits such as improved eHealth literacy and more independent learning (Terzi et al., 2024). In these contexts, high engagement is often aligned with greater creative fluency, reflected in faster and more numerous ideas. Research on digital creativity supports this interpretation: digital tools can facilitate collaboration, automation, and rapid ideation, while novelty often depends on how the digital ecosystem structures inputs, constraints, and feedback (Samper-Márquez & Oropesa-Ruiz, 2025). In education, the

use of Artificial Intelligence also has the potential to improve learning efficiency and effectiveness by offering solutions to various instructional challenges (Putra et al., 2024). These findings align with digital affordance perspectives and the extended mind thesis, which view smartphones as external cognitive resources that provide continuous access to examples and feedback.

Fluency, however, is not the same as originality. Facilitative findings often involve outputs produced in stimulus-rich environments where recombination is easy. These contexts may support recombinational creativity but not more profound, transformative insight. The literature on the Google effect suggests that easy external retrieval can encourage shallow processing and weaker internalization of knowledge. In nomophobia contexts, individuals may become efficient at assembling ideas from digital sources, which can look highly competent. At the same time, the internal associative networks needed for more original thinking may be less developed.

Overall, the facilitative pathway operates mainly through greater access to stimuli and faster production, rather than increased cognitive complexity. In this view, nomophobia may coincide with productive creativity but is more likely to remain close to existing patterns.

3.6. Moderators emotional regulation, self control, and personality factors

Evidence suggests that emotional intelligence can buffer against nomophobia (Gentina et al., 2018; Maftei & Pătrăușanu, 2024). Other work links impulsivity and narcissistic tendencies to a higher risk of digital addiction and related distress. Individuals who strongly fear being without their phones often report anxiety and worry that undermine emotion regulation and may contribute to sleep difficulties (Hartanto & Yang, 2016; Jiang & Jiang, 2025). Accordingly, strategies that strengthen emotional regulation and self-control have been proposed to reduce problematic smartphone use and promote healthier digital habits (Yin et al., 2024).

These moderating factors best explain the mixed pattern of inhibitory and facilitative findings. Across studies, differences in impulsivity, emotional intelligence, and related traits shaped both the direction and strength of associations between nomophobia and cognitive or creative outcomes. High impulsivity and low self-control amplified disruption by increasing compulsive checking, making disengagement harder, and intensifying anxiety during disconnection. Adolescents with lower self-control showed stronger nomophobic tendencies, suggesting that regulatory vulnerability heightens dependence-related anxiety (Rahmah et al., 2025). In these cases, the inhibitory pathway is more likely to dominate.

In contrast, individuals with stronger emotional intelligence and self-regulation appear better able to use smartphones strategically for inspiration, collaboration, and resource access. They may still feel discomfort when disconnected, but they can prioritize tasks, structure focused work periods, and limit distractions. Self-efficacy and adaptive self-regulation may also help users experience disconnection as manageable rather than threatening (Juwita & Karmiyati, 2024). Under these conditions, digital affordances can support ideation without thoroughly triggering the cognitive and emotional costs linked to nomophobia. Overall, the evidence suggests that nomophobia does not have uniform effects; its relationship with creativity depends on the interaction between digital environments and internal regulatory skills.

3.7. Cultural and social contexts of nomophobia

Cross-cultural studies suggest that social and cultural conditions influence both the prevalence of nomophobia and responses to digital dependence (Jahrami et al., 2024; León-Mejía et al., 2021). Figure 2 illustrates the thematic link between nomophobia and creativity.

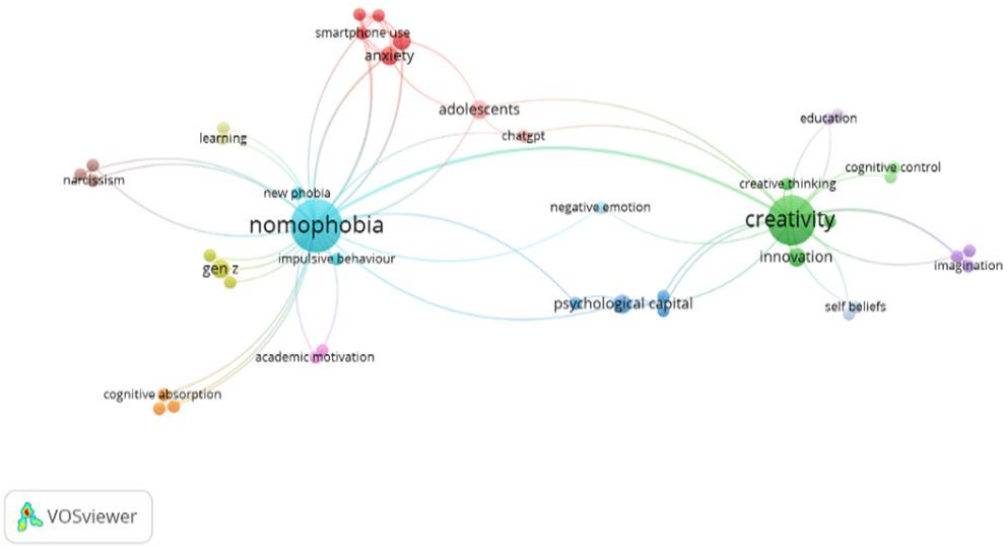

Figure 2 VOSviewer keyword co-occurrence network showing thematic links between nomophobia and creativity in the included studies.

Overall, the evidence positions nomophobia as a psychological and social phenomenon with implications for emotional functioning, cognitive control, and creativity. Excessive smartphone use is often linked to reduced concentration and weaker creative thinking, while emotional intelligence and self-control appear protective. School-based research also suggests that some students struggle to maintain self-control and face challenges when interacting with social media users across diverse cultural contexts (Ramli et al., 2022). Although most studies were correlational, the synthesis provides an empirical basis for understanding the links among digital behaviour, mental health, and creativity among contemporary youth.

3.8. Study limitations

This study has several limitations. Most studies relied on cross-sectional, self-reported data, limiting causal conclusions about the direction of effects between nomophobia and creativity. Measures of nomophobia and creativity also varied widely, from broad self-reports to specific performance tasks, which limits comparability. In addition, the literature emphasises psychological distress and problematic use, while fewer studies directly examine creative processes or distinguish types of creativity, such as digital versus nondigital outcomes or fluency versus originality. Future work should use more granular measures and longitudinal and experimental designs to clarify how disconnection-related anxiety shapes Generation Z's creative development.

4. Final Considerations

Smartphones are deeply embedded in Generation Z's lives, offering creative resources while also contributing to persistent anxiety about disconnection, commonly described as nomophobia. This review synthesizes 20 studies to clarify how nomophobia relates to creative potential in this cohort. Overall, the evidence supports a dual pathway account in which nomophobia more often constrains creativity by increasing psychological distress, cognitive load, and attentional fragmentation. These conditions can weaken sustained focus and disrupt incubation processes that support divergent thinking and the development of original ideas. The inhibitory pattern is strongest among individuals with weaker emotional regulation and higher impulsivity, where frequent checking and persistent concern about connectivity reduce attentional control and creative performance.

A smaller subset of studies suggests that intensive device engagement can coincide with facilitative outcomes in digitally mediated contexts. Continuous exposure to stimuli, rapid access to information, and opportunities for recombination may support creative fluency and faster ideation, especially in digital production. These benefits are conditional and are more likely when individuals have sufficient self-control and emotional intelligence to use smartphones deliberately rather than compulsively. The relationship between nomophobia and creativity is not linear but depends on regulatory capacity and the contextual features of the digital environment.

The findings have implications for education and digital wellbeing. Rather than relying primarily on digital detox strategies that may be unrealistic or anxiety-provoking for Generation Z, interventions should prioritise digital resilience by strengthening emotion regulation, self-regulation, and attentional control. Future research should address current gaps through more longitudinal and experimental designs, more apparent differentiation among creativity outcomes, and evaluation of interventions that improve attention management in highly connected settings. Protecting Generation Z's creative capacity will likely depend on building adaptive habits and psychological boundaries that allow technology to function as a supportive tool rather than a persistent source of cognitive and emotional strain.

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5. Declarations

5.1. Ethical considerations

Not applicable.

5.2. Use of artificial intelligence (AI)

The authors declare that the generative artificial intelligence (AI) tool Grammarly was used exclusively for language editing and grammatical improvement. The use of AI did not influence the scientific content, study design, data analysis, data interpretation, results, or conclusions of the manuscript. Full responsibility for the content remains with the authors.

5.3. Conflict of interest

The authors declare that they have no conflicts of interest.

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