



# Exploring Digital Dependency: Investigating Nomophobia's Influence on Anxiety and Emotional Reactivity Across Age and Gender

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## Abstract

This study was conducted to understand how the impact of mobile phones influences emotional reactivity and anxiety in middle adolescents, young adults and middle aged adults in the current scenario. The aim of this study focused upon the relationship between nomophobia, emotional reactivity and anxiety. The results of this study indicate that there is a significant relationship between nomophobia, anxiety and emotional reactivity based on gender, it was found that emotional reactivity is higher in females than males. Furthermore, based on age groups it was found that nomophobia between 14-17 years and 18-29 years, also between 14-17 years and 30-65 years is significant. Anxiety is predominantly significant between the age group of 14-17 years and 18-29, as compared to the difference between 18-29 years and 30-65 years. Lastly, it was found that nomophobia has an effect on emotional reactivity.

**Key words:** Nomophobia, Anxiety, Emotional Reactivity, Middle Adolescence, Young Adults, Middle Aged Adults

## Chapter 1

### Introduction

### Overview

Along with the progress to scientific advancements and rapid technological advancements, smartphones have become a necessary tool in people's daily lives in recent years. Worldwide, people are becoming more aware of mobile phones (Bian & Leung, 2015). Information on every topic is available on a smartphone at any time and from any location. With just a "click," one can now communicate and access information, which has made life easier and more convenient. As a result, the smartphone is having a significant impact on the lives of a growing number of people, and its ownership is rising. The majority of Americans (81%) and young adults (18–29 years) own at least one smartphone, according to the Pew Research Center (2019).

Given their functionality, people frequently use their smartphones to interact with applications in public places (Hatuka & Toch, 2014; Rahmani & Lavasani, 2011; Rodríguez-García, Moreno-Guerrero, & López Belmonte, 2020). Young adults, in particular, are frequent users of smartphones because they make up the largest consumer group globally (Head & Ziolkowski, 2012). Since this age group uses smartphones for play, social networking, news, music, and movies, as well as for internal communication, smartphone use has become crucial (Jeong, 2016).

Even though cell phones are popular and have many benefits, when people use them excessively or get reliant on them, it can have detrimental impacts on their lifestyle that can be physical, psychological, behavioural, social, and affective (Gezgin & Çakir, 2016). As a result, using a smartphone excessively can interfere with many elements of everyday life and set off a chain reaction of actions that may not be suitable for the user or others near to them. But the problem lies not in how the technology is used, but rather in how much time individuals spend on it. Problems arise when individuals get reliant on their smartphones and live a portion of their lives online (Gezgin, 2017). Therefore, nomophobia—a term derived from the abbreviation for "no-mobile"—may

result from excessive smartphone use (King, Valença, & Nardi, 2010). The term "nomophobia" describes the unease, tension, and anxiety a person experiences when their smartphone is not in easy reach (King, 2013). Nomophobia is defined as the dread of not being able to utilize a smartphone and/or the services it delivers for the sake of this study. It alludes to the anxiety that comes with losing one's ability to connect and communicate, as well as giving up the convenience that comes with owning a smartphone. According to Park, Kim, Shon, and Shim (2013), people's dependence on their smartphones has grown, which exacerbates the anxiety that comes with not being able to use them.

## Nomophobia

According to Jeong (2016), Lin et al. (2014), Rodríguez-De-Dios, Oosten, & Iguartua (2018), and others, nomophobia is a disruption of the digital, virtual, and contemporary culture that refers to the discomfort, tension, worry, and agony produced by the lack of touch with a smartphone. It is crucial to assess the association between nomophobia and lifestyles because the symptomatology in this case once again highlights the persons' way of life (Mok et al., 2014). Although this is still a developing topic, research has shown a favourable association between nomophobia and health issues (Kriswanto, Tri, Meikahani, & Suharjana, 2018; Nath, 2018; Shen, Prior, Wang, & Kuo, 2020, for example). However, little is known about how nomophobia and people's lifestyles are related. One such study examines the tendency of Portuguese young adults (18–24 years old) towards nomophobia and people's lifestyles in light of this research gap with the launch of new mobile services like social media apps, cloud storage services, and mobile Internet, the acceptance and use of mobile technologies have expanded. Individuals can communicate more effectively and efficiently, access information more quickly and anywhere, and make better decisions thanks to mobile technologies, particularly smartphones (Asongu and Nwachukwu, 2017; Arpacı, 2017; Poong, Yamaguchi and Takada, 2017; Wu, Lu, Gong and Gupta, 2017; Kim, Hwang, Zo and Lee, 2016; Arpacı, 2016; Kim, Chung, Lee and Preis, 2016). According to data from the International Telecommunication Union (2016), at the end of 2016, the percentage of industrialized countries with mobile broadband connections hit 90%, whereas global adoption of the technology was predicted to reach 50% by the first quarter of 2017. According to Park, Kim, Shon, and Shim (2013), there is evidence that people are steadily growing more reliant on their mobile devices, and difficulties related to these devices and their detrimental effects on people have escalated (Hong, Chiu, and Huang, 2012). One particular problem brought on by smartphone use is nomophobia. The phrase refers to "the fear of being unable to use one's mobile phone or being unreachable through one's mobile phone" and is an acronym for "no mobile phone phobia" (Yildirim & Correia, 2015: 1323). According to King, Valença, Silva, Baczyński, Carvalho, and Nardi (2013), nomophobia is defined as "the feelings of discomfort or anxiety experienced by individuals when they are unable to use their mobile phones or utilize the affordances these devices provide." One harmful use of mobile phones is nomophobia. As a result, the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, suggests classifying it as a "situational phobia" under "specific phobia" (American Psychiatric Association, 2013; Bragazzi and Del Puente, 2014).

There are not many studies on nomophobia because it is a relatively new and poorly understood syndrome. The initial investigation of nomophobia was a case report written by King, Valença, and Nardi (2010). According to the report, nomophobia is a condition specific to the modern society. Similar to this, Dixit et al. (2010) state that nomophobia is a "modern era emerging problem". King, Valença, Silva, Baczyński, Carvalho, and Nardi (2013) make an additional case study in which they discuss the detrimental effects of new technologies on human behaviour, such as nomophobia.

As smartphone technology has advanced quickly, more people are beginning to rely on their devices because they are practical and adaptable tools that let them perform instantly fulfilling tasks, instantly access a wide range of information, and communicate through a variety of media. Particularly among college students, smartphone use is growing in popularity (Mannion, 2018; Savci et al., 2020; Yildirim, 2014). Young adulthood is defined as 18 - 24-year old university students. This time frame has been linked to problematic smartphone use, according to empirical studies (Adnan & Gezgin, 2016; Bragazzi & Del Puente, 2014; Yildirim & Correia, 2015). Additionally, students in this age group are more emotionally comfortable using smartphones for social and academic purposes (Gikas & Grant, 2013). It has been proposed, however, that frequent smartphone use may have detrimental effects on psychological wellbeing in a small percentage of people by making them feel more anxious in circumstances in which they are unable to use their smartphone (e.g., when they run out of battery, forget to bring it with them when they leave the house, are in places without Wi-Fi, or experience an unexpected loss of Internet connectivity) (C.-Y. Lin et al., 2018; Przybylski et al., 2013; Savci, 2019; Savci & Griffiths, 2019; Walsh et al., 2011). "Nomophobia" is the term used to describe the intense fear and unease that people experience when they are without their smartphones (King et al., 2010; Yildirim & Correia, 2015). The term nomophobia refers to the modern-day fear of losing access, connectivity, and communication abilities as a result of the introduction of new technologies. It is a contraction of the term "no mobile phone phobia" (Yildirim, 2014). (King et al., 2010; Yildirim & Correia, 2015). In the literature, some researchers believe that nomophobia is related to smartphone addiction (e.g., Sahin et al., 2013), while other researchers (Y. H. Lin et al., 2014; King et al., 2014; Yildirim & Correia, 2015) contend that nomophobia should be considered as a distinct phobia. Nevertheless, based on the available data, it seems more appropriate to classify nomophobia as a phobia even though it has not yet been formally included in any official diagnostic texts, such as the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association.,2013). (Y. H. Lin et al., 2014; King et al., 2014). Nomophobia is

classified as a particular phobia since it is understood to be anxiety or worry brought on by not being able to use a smartphone (Bragazzi & Del Puente, 2014; Yildirim, 2014; Yildirim & Correia, 2015).

Even if technology has made life easier, there are certain negative impacts from using cell phones excessively that have also been noticed. According to King, Valença, and Nardi (2010), nomophobia is the uneasiness, worry, and tension brought on by a reliance on smartphones. Individuals who suffer from nomophobia can be recognized by traits like "never turning off the phone," "repeatedly checking for missed texts and calls," "taking their phone everywhere," "indulging in it at inappropriate times," and "deliberately missing face-to-face interaction." In more extreme situations, nomophobics may also experience physical side effects like "panic attacks," "shortness of breath," "trembling," "sweating," "accelerated heart rate," "pain in the hand joints, neck and back pain," etc. when their phone connection dies or becomes unusable (Kanmani, Bhavani, & Maragatham, 2017). Because they feel safer and more at ease there than in the real world, very socially anxious persons move the majority of their social interactions—including the formation of close friendships—into the virtual realm (Shalom, Israeli, Markovitzky, & Lipsitz, 2015). Numerous research works suggest a noteworthy correlation between nomophobia and social anxiety (Uysal, Ozen, & Madenoglu, 2016), loneliness (Gezgin, Hamutoglu, Sezen-Gultekin, & Ayas, 2018), social appearance anxiety, and social media dependency (Ayar, Özalp Gerçeker, Özdemir, & Bektaş, 2018).

### **Emotional reactivity**

According to Bowen's (1978) family system therapy, differentiation of self is the capacity to preserve autonomy and self-awareness while preserving ties to one's family and other social systems as described in the study differentiation of self and nomophobia. It has both intrapsychic and interpersonal dimensions. In the intrapsychic realm, differentiation pertains to the capacity to control one's emotions and discriminate between ideas and sensations. The ability to establish a self-sufficient identity while preserving intimate bonds with significant others, particularly family, is a distinguishing factor in the interpersonal dimension (Bowen, 1978; Kerr & Bowen, 1988). By depending too much on their smartphones, people with low degrees of self-differentiation may promote intrapsychic and interpersonal fusion (Smith, 2017). Smartphone use affects and exemplifies how people choose to handle relationships, cope with worry, and pursue approval. According to Smith (2017), there is a clear correlation between the subscale of self-differentiation that measures wanting approval from others and the heavy use of mobile phones. It has been proposed that smartphone users' sense of self-identity may be impacted when they regard their devices as an essential (as in nomophobia) and that smartphone use and engagement may be connected to self-expression (Smith, 2017; Walsh et al., 2009). According to Walsh et al. (2010), young adults who use their smartphones frequently believe that doing so helps them feel better about themselves and that they feel validated when they receive positive feedback or compliments from others. Highly differentiated people, on the other hand, are less likely to display nomophobia traits because they are more adaptable and have stronger emotional control to effectively handle stress and worry as well as manage their relationships. As a result, it's probable that people with lower levels of differentiation who struggle with coping and emotion management may develop nomophobia and turn to cell phones as a solace (Smith, 2017). Taking into account the connections between nomophobia and self-differentiation, the following theory was put out. The emotional response to an experience that varies amongst people in terms of intensity, peak speed, and descent from the peak to baseline is known as emotional reactivity (Davidson, 1998; Rothbart & Derryberry, 1981). A new review on emotion regulation by Sheepees, Suri, and Gross (2015) defines emotion regulation as the process of attending to and activating mechanisms that modulate emotional experiences, which may be implicit or effortful. Emotional response and subsequent regulation are thus theoretically distinct but connected phenomena that are inherently interdependent.

Different systems can trigger emotional reactivity, which varies in intensity and duration amongst people. Delineating between these two characteristics of response is crucial since these variations have in fact been documented in previous studies highlighting affective chronometry in measuring of timing of peak response to and recovery from a stressor (Davidson, 1998). More problem behaviours and depressive symptoms are reported by people who report more intense and labile emotions (Silk, Steinberg, & Morris, 2003).

### **The role of anxiety and emotional reactivity**

It was found that clinical anxiety levels (Carthy et al., 2010) and the emergence of anxiety and depressive disorders in adulthood (McLaughlin et al., 2010) have been associated with emotional reactivity. Furthermore, physiological arousal may have an impact on the connection between an individual's sense of stress and internalizing symptoms (Sontag & Graber, 2010).

Another way to think of emotional reactivity is as a part of the well-studied idea of emotion regulation. Both internal and external mechanisms for tracking, evaluating, and modifying emotional responses in order to achieve objectives are included in emotional regulation (Becerra & Campitelli, 2013). These procedures range throughout a spectrum and comprise There are involuntary reactions associated with emotional responses (such as emotional reactivity) and voluntary reactions (such as being aware of and comprehending emotions, controlling one's impulses, and developing techniques to regulate emotions). The

development of emotional control skills in children is significantly influenced by the family environment. Self-regulation techniques develop from an early age through close study of parents' actions and feelings. Certain approaches to parenting and the emotional environment of the family have an impact on the development of emotional control techniques as well (Morris et al., 2007). Even though automatic and volitional emotional control are demonstrated to be separate constructs, it is assumed that hierarchical functioning characterizes them. It is proposed that the creation of voluntary control processes like attention and executive functions, which facilitate self-regulation, is caused by emotional reactivity, which is thought to be involuntary arousal in the form of automatic regulation (Ursache et al., 2013). Therefore, emotional sensitivity may increase the likelihood of having trouble controlling emotions (Nock et al., 2008).

## Need and Significance of the Study

This study helps to understand the relationship between fear of being detached from phone, improving physiological wellbeing, to help the emotional regulation of the current population. In order to understand the impact of nomophobia on emotional reactivity and anxiety of individuals throughout various age groups.

This study will bring awareness in relationships with family and close ones despite phones or excessive technological or digital proximity. By depending too much on their smartphones, people with low degrees of self-differentiation may promote intrapsychic and interpersonal fusion (Smith, 2017). This study, will help to us understand the relationship of how individuals cope with anxiety as they use phones as a source of distraction, how phones have become attached to mobile phones and how anxiety plays a role, as well as how individuals are emotionally reactivity in relation to this factor. Additionally, it helps to identify whether nomophobia, emotional reactivity and anxiety is more prominent among males or females.

## Chapter 2

### Review of literature

Fatma Gizem Karaoglan Yilmaz et al (2023). Smartphones have become an integral part of people's life, especially among adolescents. Problematic smartphone uses lead to several psychological and physical problems. This study explored the relationships of smartphone addiction, nomophobia, depression, and social appearance anxiety among college students. A total of 473 college students voluntarily participated in this study, including 286 male and 187 female. Data were collected to employ four instruments: nomophobia scale, smartphone addiction scale, social appearance anxiety scale and beck depression scale. This correlational study with the structural equation model revealed that nomophobia had a significant direct effect on smartphone addiction, social appearance anxiety had a significant direct effect on smartphone addiction and nomophobia, and depression had a significant direct effect on social appearance anxiety. This empirical study provides a solid foundation to build a deeper understanding of adolescents' wellbeing, as related to mobile technologies. It is also vital to guide systematic efforts on the individual, institutional or national level to assist college students to maintain overall health and wellbeing, while advancing digital learning in higher education.

Mir et al (2020) Investigated the emotional experiences of undergraduate students with mild nomophobia when their mobile phone usage was restricted over a period of time. Additionally, the study aimed to examine whether cognitive and sensory distractions could delay anxious thoughts and the subsequent increase in anxiety. To achieve these objectives, a quasi-experimental design with a non-equivalent control group was utilized, whereby participants were not randomly assigned to groups. A total of 64 undergraduate students from a university in Islamabad took part in the study. The Nomophobia Questionnaire (NMPQ) and the State Trait Anxiety Inventory (STAI) were administered to assess the participants' levels of nomophobia and anxiety, respectively. The collected data was analyzed using a general linear model to determine the significant impact of time and therapy on state anxiety levels at different time intervals. The results of the multivariate analysis revealed that participants with mild nomophobia who were not in contact with their mobile phones, as expected, experienced a significant increase in state anxiety over time. However, distractions from thoughts and sensations only slightly delayed anxiety in threatening situations. It was found that the anxiety levels of students, when separated from their phones in an academic setting with typical cognitive and sensory distractions, were significantly influenced by time and nomophobia.

Liang et al (2024) Nomophobia refers to the condition of feeling anxious or disturbed when experiencing a disconnection from the digital world, which can have a considerable impact on the health and well-being of individuals. The present study aims to explore the influence of attachment anxiety on nomophobia and investigate whether this relationship varies between males and females, drawing upon attachment theory and previous literature on nomophobia. In order to assess attachment anxiety, alexithymia, perceived stress, and nomophobia, the Human Penguin Project (HPP) conducted a study involving participants from 12 countries who were aged 20 years or older total of 1221 participants. The Experiences in Close Relationships Questionnaire-Revised (ECR-R), the Toronto Alexithymia Scale (TAS-20), the Perceived Stress Scale (PSS), and the Nomophobia Questionnaire (NMP-Q) were



employed for this purpose. The findings of this study revealed significant positive correlations between attachment anxiety, nomophobia, alexithymia, and perceived stress. Moreover, the direct impact of attachment anxiety on nomophobia was found to be significant, with alexithymia and perceived stress partially mediating this relationship. Interestingly, the relationship between attachment anxiety and nomophobia was found to be moderated by gender. While the predicted effect was significant for both males and females, the direct effect of attachment anxiety on nomophobia was found to be stronger in males.

Gonçalves et al (2020) The tendency of young adults (18–24 years old) toward nomophobia and lifestyle is examined in this study. There was a positive and moderate connection found in a sample of 495 participants between psychopathological symptoms and nomophobia. Strong predictors of nomophobia included interpersonal sensitivity, obsession-compulsion, and the amount of time spent on smartphones each day. In order to examine the associations between the variables, a descriptive-correlational study was chosen. This kind of study takes into account a number of factors to investigate their links with one another and, ultimately, to characterize the linkages that have been found between the variables. The current study's sample was chosen using a convenience and non-probabilistic approach.

Arzu Bulut et al (2023) conducted this research to investigate the moderating role of gender in the correlation between nomophobia and social interaction anxiety. The data for this investigation were acquired from 331 university students, whose ages ranged from 19 to 42 years. In this study, the moderating effect of gender was examined in relation to the predictive influence of social interaction anxiety on different sub-dimensions of nomophobia. It was found that social interaction anxiety significantly predicted the "inability to access information" and "inability to communicate" among college students, and this effect was consistent regardless of gender. However, the predictive effect of social interaction anxiety on "giving up convenience" and "losing connectedness" did vary depending on gender.

Shaoxiong (2020) To validate the model, a large-scale field survey was conducted at a public university in China to collect representative data. For data analysis, a total of 6,855 valid responses were retained and a structural equation modelling technique was used. The main findings of the study are as follows: firstly, the relationship between smartphone overuse and students' academic performance is partially mediated by health issues such as insomnia, nomophobia, and poor eyesight. Secondly, the relationship between smartphone overuse and health issues including insomnia and poor eyesight can be moderated by health information literacy, while the relationship between smartphone overuse and nomophobia remains unaffected.

Kinga Kaleta et al (2022) In this cross-sectional study, they tested a model in which self-differentiation mediates the link between dispositional forgiveness and trait anxiety. The sample was composed of 216 individuals. Polish adaptations of the Heartland Forgiveness Scale, the Differentiation of Self Inventory-Revised, and the State-Trait Anxiety Inventory were used. Results indicated that the three aspects of DoS (emotional reactivity, I-position, emotional cut-off) partially mediated the negative association between total forgiveness and anxiety. Emotional reactivity and emotional cut-off mediated the association between reduced unforgiveness and anxiety while positive forgiveness-anxiety link was mediated by I-position and emotional cut-off. The findings demonstrate that differentiation of self might be a mechanism through which forgiveness reduces anxiety after one has been hurt.

Lateefa Rashed Daraj et al (2023) The following systematic review and meta-analysis aimed to establish the relationship between nomophobia with anxiety, smartphone addiction, and insomnia. To identify the relevant studies, we searched through several databases. Out of the 1523 studies identified, 16 studies met the inclusion criteria. After conducting the statistical analysis, the results revealed that anxiety, smartphone addiction, and insomnia are positively associated with nomophobia. Mobile phone usage has become inevitable, even for individuals who use it to a lesser degree than others, to perform simple tasks, such as communicating with others or for educational purposes. It is crucial to raise awareness about the consequences of overusing these devices, including the physical and psychological complications in both the short and long terms.

Kara et al (2019) Based on social cognitive theory, this study attempts to explore the various mediation of loneliness and anxiety in the relationship between the amount of time adolescents spend using smartphones on a daily basis and their degree of nomophobia. 274 teenage smartphone users provided the data, which were then analysed using bootstrap techniques, ordinary least-squares regression analysis, descriptive statistics, and Pearson correlation. The main conclusions of the study showed a substantial relationship between nomophobia, loneliness, anxiety, and the amount of time spent using a smartphone each day. Furthermore, there is a substantial correlation between the amount of time spent using a smartphone every day and nomophobia, as well as both the single and multiple mediation effects of loneliness and anxiety. The results also showed that, in contrast to earlier models where loneliness as a single variable and anxiety as a pair both significantly mediated the connection, the single mediation impact of anxiety is more potent. The research led to the conclusion—which is in line with the pertinent literature—that teenagers who use smartphones on a daily basis exhibit greater nomophobic behaviours as a result of feeling more alone and nervous. By modelling the links among the duration of daily smartphone usage, loneliness, anxiety, and nomophobia, the current study added to the pertinent literature.

Kuşçu et al (2020) The objective of this investigation was to determine whether adolescents with internalizing or externalizing illnesses exhibit higher levels of nomophobia in comparison to adolescents in a state of good health. Additionally, an examination of the correlation between nomophobia and symptoms of internalization and externalization was conducted. A total of 139 teenagers, aged between 13 and 18, who underwent the K-SADS (Kiddie Schedule for Affective Disorders and Schizophrenia) were requested to complete the No Mobile Phone Questionnaire and the Revised Child Anxiety and Depression Scale, while their parents were requested to complete the Conners Parent Rating Scale-48. The combined nomophobia scores of the three research groups did not exhibit any significant differences. There was no notable distinction between the group diagnosed with externalizing disorders and the healthy group. However, the group diagnosed with internalizing disorders displayed significantly higher sub scores for losing connectivity and not being able to access information in comparison to the healthy controls. The overall nomophobia score exhibited a strong connection with separation anxiety, social phobia, general anxiety, depression, ADHD, and oppositional difficulties. The ability to manage situations solely related to losing connectivity was a relevant factor. The total nomophobia score was predicted by hyperactivity and overall anxiety.

Lampis et al (2019) Bowen's theory on families spanning multiple generations centres on the impact that the differentiation of self-processes has on the psychological well-being of individuals, as well as on the levels of dyadic and systemic relationships. Furthermore, it underscores the importance of autonomy and interdependence in the development of human beings. With these assumptions in mind, the main objective of this study was to examine the differences in anxiety levels and self-differentiation between a group of adult clients seeking therapy for anxiety that included 47 participants and a control group of 69 participants. To obtain more accurate findings, we also explored which dimensions of self-differentiation were more or less likely to contribute to an individual's affiliation with either the anxiety group or the control group. Our results reveal that individuals with lower I-position and higher levels of emotional cutoff and fusion with others are more prone to experiencing anxiety-related issues. Therefore, it was found that emotional cutoff and fusion with others are predictive of the likelihood of seeking help for anxiety disorders.

Ercengiz et al (2020) There has been a growing amount of research conducted on the adverse effects of excessive smartphone use. Problematic smartphone use can negatively impact mental health and evoke unpleasant emotions such as severe anxiety and distress when the device is unavailable, which is known as nomophobia. This study focused on the variable of nomophobia and examined two distinct mediating and moderating effects. The relationship between nomophobia and self-differentiation was explored, with a specific emphasis on the mediating role of intolerance of uncertainty. Following that, the association between emotion management abilities and nomophobia was investigated, with a focus on the mediating role of intolerance of uncertainty. The connection between nomophobia and self-differentiation was examined, as well as the moderating influence of intolerance of uncertainty. Finally, a test was conducted to investigate the moderating role of intolerance of uncertainty in the association between emotion regulation abilities and nomophobia. The study included 398 university students, consisting of 250 females and 148 males. Various assessments including the Intolerance of Uncertainty Scale, the Emotions Management Skills Scale, the Differentiation of Self Inventory-Revised, and the Nomophobia Questionnaire. The results revealed that while intolerance of uncertainty did not have any moderating effects, it did have a statistically significant mediating influence in the examined relationships.

Al-Mamun et al (2023) The extent of nomophobia in Bangladesh remains largely unexplored, necessitating research to investigate the severity and interrelated factors of nomophobia, as well as the mediating role of smartphone usage in the relationship between Facebook addiction and nomophobia. In this study, a cross-sectional survey employing convenience sampling was conducted among 585 university students. The survey encompassed inquiries pertaining to sociodemographic characteristics, behavioural health, academic performance, nomophobia, smartphone addiction, Facebook addiction, insomnia, and depression. The findings revealed that 39.5% of individuals exhibited severe nomophobia, while 56.1% displayed moderate nomophobia, and 9.4% experienced mild nomophobia. Notably, first-year students exhibited higher levels of nomophobia compared to their counterparts in other academic years. The time spent on smartphones per day, the use of psychoactive substances, and being in a romantic relationship emerged as significant predictors of nomophobia. Moreover, depression, insomnia, Facebook addiction, and smartphone addiction demonstrated substantial correlations with nomophobia. Furthermore, the analysis unveiled a robust moderating effect of smartphone addiction on the association between nomophobia and Facebook addiction. Consequently, adopting strategies such as reducing psychoactive substance use and managing daily smartphone usage may prove instrumental in mitigating the prevalence of nomophobia among college students.

Olivencia-Carrión et al (2018) The relationship between personality, temperament, and the manifestation of nomophobia is of interest. A total of 968 individuals, comprising 182 males and 785 females aged between 23 and 24, were selected from the Andalusian population as the sample. The instruments used were the Temperament and Character Inventory Revised (TCI-R; Cloninger et al., 1993) and the Questionnaire to Assess Nomophobia (QANIP; Olivencia-Carrión et al., 2018). The results suggest that cooperation significantly decreases levels of nomophobia, particularly in relation to negative consequences and mobile phone addiction. Moreover, Reward Dependence appears to have a positive association with Loss of Control and Mobile Phone Addiction, both of which are characteristics associated with nomophobia, thereby indicating a connection between nomophobia and personality traits. In a descriptive correlational study conducted at Chitkara University in Punjab, 209 students participated and were assessed

using a social interaction anxiety scale and a nomophobia questionnaire. The convenience sampling technique was employed to select the participants, and data was collected through a Google Form. The collected data was analysed using SPSS software, employing both descriptive and inferential statistics. All students exhibited symptoms of nomophobia, with only a small proportion experiencing mild symptoms, while the majority of the student population exhibited severe symptoms of nomophobia.

Moreno-Guerrero et al (2020) The purpose of this study was to examine the incidence of nomophobia in youth and determine whether it is more common in boys or girls, as well as in students who report using their phones more frequently than eating a healthy diet. Based on a correlational and predictive design using a quantitative methodology, the research approach was conducted. The Nomophobia Questionnaire (NMP-Q) is the measuring instrument that is employed. 1743 students from the Autonomous City of Ceuta (Spain) who were in different educational stages and aged between 12 and 20 made up the participating sample. The findings indicate that the inability to communicate and get in touch with people right away was associated with the greatest rates of nomophobia. In terms of gender, nomophobia is more common in women than in males. Since there were no discernible age disparities, the issue might impact people of all ages equally. Finally, students who believe that using a smartphone interferes with eating a healthy diet score higher on the given scale.

Kukreti et al (2021) The purpose of the study is to assess the degree of nomophobia in medical students in a tertiary care medical college hospital and its correlation with stress, anxiety, and depression. This study uses cross-sectional analysis. The study involved 307 students by simple random sampling. The google form contained the DASS-21 scale, a pre-validated questionnaire that is the Nomophobia questionnaire, information about mobile phone use, and sociodemographic data. According to the study, the majority of students used their phones for an average of three to six hours per day. Online movie streaming and social networking were the most popular uses. A statistical analysis showed that all students experienced some level of nomophobia. Of the kids, nineteen percentage had severe nomophobia. The amount of money spent on mobile phone recharge, the length of time people utilize their phones every day, and their own impression of their dependence on them were all related to the severity of nomophobia. The degree of stress, anxiety, and sadness was highly correlated with the degree of nomophobia. According to this study, a sizable portion of kids experience nomophobia during the COVID-19 epidemic. Subsequent research endeavours examining the correlations and additional contributing elements for nomophobia might facilitate the development of remedial strategies to mitigate the consequences of this overlooked social health issue.

Nasab et al (2021) Students who have a high level of mobile phone dependency may experience cognitive, emotional, and academic deficits; therefore, appropriate interventions should be carried out to reduce the risk. The current study set out to find out how well the nomophobia therapy package worked for high school students' symptoms of nomophobia and self-esteem. The study used a quasi-experimental design with a control group and a pre-, post-, and follow-up exam. All of the pupils exhibiting symptoms of nomophobia who attended Isfahan high schools during the 2018–2019 academic year were included in the statistical population. They were randomly split the 30 willing students into equals of experimental and control groups after using purposive sampling to choose the participants. The Nomophobia Questionnaire and the Self-Esteem Questionnaire were among the research tools. The experimental group received nomophobia therapy for eight sessions, lasting 75 minutes each week. Two months had passed since the follow-up. Descriptive and inferential statistics, including repeated measures ANOVA, standard deviation, and mean, were used to evaluate the data. Students in the experimental group who had symptoms of nomophobia saw a significant gain in self-esteem after receiving nomophobia therapy. When comparing the experimental groups of high school students to the control group, the training intervention sessions resulted in a significant reduction in the symptoms of nomophobia. The research indicates that nomophobia therapy is a useful intervention for raising students' self-esteem and easing their symptoms of nomophobia.

## Conclusion

In conclusion, nomophobia which is also referred to as "no mobile phone phobia," has emerged as a prevalent condition on a global scale in recent years and has been associated with various behavioural and psychological health concerns. The recent findings have exhibited in a study how anxiety, smartphone addiction, and insomnia are positively associated with nomophobia. The relationship of smartphone addiction, social appearance anxiety its significant direct effect on smartphone addiction and nomophobia. According to Moreno-Guerrero et al (2020) In terms of gender, nomophobia is more common in women than in males.

According to Ercengiz et al (2020) this investigated three aspects of DoS (emotional reactivity, I-position, emotional cut-off) partially mediated the negative association between total forgiveness and anxiety. Daraj et al (2023) Studies showed a substantial relationship between nomophobia, loneliness, anxiety, and the amount of time spent using a smartphone each day by adolescents. Kara et al (2019) It was found that there is a substantial correlation between the amount of time spent using a smartphone every day and nomophobia, as well as both the single and multiple mediation effects of loneliness and anxiety. Lampis et al (2019) study showed higher levels of emotional cutoff and fusion with others are more prone to experiencing anxiety-related issues. Daraj et al (2023) systematic analysis showed that the results of the multivariate analysis revealed that participants with mild nomophobia who were not in contact with their mobile phones, as expected, experienced a significant increase in state anxiety over time. Yılmaz

et al (2023) Correlational studies exhibited association between emotion management abilities and nomophobia was investigated and how attachment anxiety influences nomophobia and whether this relationship differs between males and females.

## Research gap

According to this study Ercengiz et al (2020) to provide a more thorough explanation of the variables underlying nomophobia, the relationships between: emotional reactivity, anxiety and nomophobia. These relationships have not been well studied between these variables therefore this study explores the relationship between nomophobia emotional reactivity, anxiety and nomophobia. There are not many studies on nomophobia because it is a relatively new and poorly understood syndrome. The initial investigation of nomophobia was a case report written by King, Valença, and Nardi (2010). According to the report, nomophobia is a condition specific to the modern society. Dixit et al. (2010) state that nomophobia is a "modern era emerging problem".

## Chapter 3 – Method

The method employed in the current investigation are covered in this chapter. The current investigation attempts to investigate nomophobia, anxiety and emotional reactivity. The study participants, the procedures utilized for data collection, the measurements used to collect data, and statistical method are all included in this chapter.

### Research design

It is a quantitative study in nature, and it implies correlational outcomes along with regression and one way analysis of variants to understand the impact of the variables based on age and gender.

### Objectives

1. To study the relationship between nomophobia, emotional reactivity and anxiety.
2. To study the difference in gender in nomophobia, emotional reactivity and anxiety.
3. To study the correlation between nomophobia, emotional reactivity and anxiety based on age groups.
4. To study the impact of nomophobia on emotional reactivity.

### Hypotheses

H<sub>1</sub>: There is significant relationship between nomophobia, anxiety and emotional reactivity.

H<sub>2</sub>: There will be significant effect on nomophobia by emotional reactivity.

H<sub>3</sub>: There will be significant effect on emotional reactivity by anxiety.

H<sub>4</sub>: There will be significant effect on anxiety by nomophobia.

H<sub>5</sub>: There will be significant difference between age groups on nomophobia.

H<sub>6</sub>: There will be significant difference between age groups on anxiety.

H<sub>7</sub>: There will be significant difference in gender on nomophobia.

H<sub>8</sub>: There will be significant difference in gender on anxiety.

H<sub>9</sub>: There will be significant difference in gender on emotional reactivity.



## Operational definitions

**Anxiety:** Anxiety is an emotion characterized by feelings of tension, worried thoughts, and physical changes like increased blood pressure.

**Nomophobia:** The term NOMOPHOBIA or NO MOBILE PHONE PHOBIA is used to describe a psychological condition when people have a fear of being detached from mobile phone connectivity.

**Emotional reactivity:** Emotional reactivity is defined as degree of emotional responses. Examples include frequency and intensity of emotion, threshold of arousal, negative response to challenge, and autonomic reactivity.

**Middle adolescents:** In this study, middle adolescence from ages 14 to 17, involves ongoing puberty changes. Increased arguments with parents and reduced family time occur as teens strive for independence and prioritize friendships. This stage is characterized by heightened self-involvement, a focus on appearance, and the peak of peer pressure. Cognitive development advances with a growing capacity for abstract thought, but decision-making is often emotionally driven, accompanied by the emergence of long-term goal-setting and moral reasoning.

**Young adulthood:** in this study, young adulthood is a unique developmental period that occurs between the ages of 18 and 25 years, during which there are key developmental tasks that allow the young adult to participate in self-exploration and identity formation.

**Middle adulthood:** According to American Psychiatric association, middle adulthood is about 36 to 64 years.

**Gender:** it refers to two primary sexes: males and females.

### Inclusion criteria

This study involves individuals who possess their own phone, both males females who hail from an Indian origin primarily individuals who are proficient in English.

### Exclusion criteria

Individuals who are intellectually disabled.

### Measures

To obtain the information required about the various study variables, the following instruments were employed. Below is a brief overview of the instruments used to obtain the data.

#### *Nomophobia Questionnaire (NMP-Q).*

The NMP-Q is a 20-item scale developed by Yildirim and Correia (2015) through a thorough procedure including qualitative and quantitative phases. The NMP-Q comprises four factors (Factor 1: not being able to communicate; Factor 2: losing connectedness; Factor 3: not being able to access information; and Factor 4: giving up convenience). These factors emerged from semi-structure interviews during the qualitative phase. Twenty items were then generated based on the qualitative phase and performed satisfactorily in the following quantitative phase. More specifically, the four-factor structure among the 20-item instrument was supported in an exploratory factor analysis. The Cronbach's  $\alpha$  was excellent across the entire NMP-Q ( $\alpha = .945$ ) and in each factor ( $\alpha = .814-.939$ ). Concurrent validity was achieved through its high correlation with Mobile Phone Involvement Questionnaire (MPIQ;  $r = .71$ ; Yildirim & Correia, 2015). A 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) is applied to each NMP-Q item leading to a summated total score. The higher the score, the greater the severity of nomophobia. In addition, the interpretation of the NMP-Q score into the level of nomophobia (out of a total score between 20 and 140) is 20 corresponding to the absence; 21–59 corresponding to a mild level; 60–99 corresponding to a moderate level; and  $\geq 100$  corresponding to severe level (Yildirim & Correia, 2015).

### *Anxiety Questionnaire (STAI).*

The State-Trait Anxiety Inventory (STAI) is a commonly used measure of trait and state anxiety (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). It can be used in clinical settings to diagnose anxiety and to distinguish it from depressive syndromes. It also is often used in research as an indicator of caregiver distress (e.g., Greene et al., 2017, Ugalde et al., 2014). Form Y, its most popular version, has 20 items for assessing trait anxiety and 20 for state anxiety. State anxiety items include: "I am tense; I am worried" and "I feel calm; I feel secure." Trait anxiety items include: "I worry too much over something that really doesn't matter" and "I am content; I am a steady person." All items are rated on a 4-point scale (e.g., from "Almost Never" to "Almost Always"). Higher scores indicate greater anxiety. The STAI is appropriate for those who have at least a sixth-grade reading level. Internal consistency coefficients for the scale have ranged from .86 to .95; test-retest reliability coefficients have ranged from .65 to .75 over a 2-month interval (Spielberger et al., 1983). Test-retest coefficients for this measure in the present study ranged from .69 to .89. Considerable evidence attests to the construct and concurrent validity of the scale (Spielberger, 1989). Studies also have shown that it is a sensitive predictor of caregiver distress over time, and that it can vary with changes in support systems, health, and other individual characteristics (Elliott, Shewchuk, & Richards, 2001; Shewchuk, Richards & Elliott, 1998).

### *Perth Emotional Reactivity Scale-Short Form (PERS-S).*

The Perth Emotional Reactivity Scale-Short Form (PERS-S) is an 18-item short form of the 30-item PERS. The PERS-S is designed to measure trait levels of emotional reactivity. That is, measure the typical ease of activation, intensity, and duration of one's emotional responses, and do so for negative and positive emotions separately. The Perth Emotional Reactivity Scale-Short Form (PERS-S; Preece, Becerra, & Campitelli, 2018) is an 18-item self-report measure of people's trait levels of emotional reactivity. The PERS-S assesses the emotional reactivity construct as it is defined by Davidson (1998) and Becerra and Campitelli (2013); that is, it measures the typical ease of activation, intensity, and duration of one's emotional responses, and does so for positive (e.g., happiness) and negative (e.g., sadness) emotions separately. Two composite scores and six subscale scores can be derived by summing a participant's responses (i.e., the number they select on the 5-point answer scale) for the relevant items. For all composites and subscales, higher scores indicate higher levels of reactivity in that domain; in other words, that emotions are more easily/quickly activated, more intense, and longer in their duration. The PERS-S is an 18-item self-report measure answered on a 5-point Likert scale that generates six subscale scores and two composite scores, with higher scores indicating higher levels of reactivity. Data from 768 individuals showed that the PERS-S had good to excellent goodness-of-fit. The internal consistency was high, with an overall reliability coefficient (Cronbach's  $\alpha$ ) of .87 and .86 for the negative and positive general scales, respectively.

### **Sampling Procedure and Techniques**

The procedure for this study comprised of middle adolescents, young adults and middle aged adults across India. The sampling technique used was convenience sampling. The sample size in the study included 165 participants totally, each category of 55 participants belonging to middle adolescence, young adulthood and middle adulthood were included, there was a total of 82 males and 83 females. The participants were given the google form that comprised of the existing standardised Nomophobia Questionnaire (NMP-Q), State Anxiety Questionnaire (STAI) and the Perth-Emotional Reactivity Scale- Short Form (PERS-S). Informed consent was obtained from each participant prior to their involvement in their study. The tool used for statistical analysis SPSS 25.

### **Ethical considerations**

The following ethics were followed in this research are -

### **Informed Consent**

Consent process ensures that individuals are voluntarily participating in the research with full knowledge of relevant risks and benefits. The consent procedure guarantees that participants are giving their free will and are fully aware of the rewards and risks associated with the research. In addition, experts advise stressing that participation is optional, going over the possibility, extent, and duration of any potential harm or benefit, and, if applicable to the study, outlining treatment options. (As stated in 3.3 in APA code)

### **Confidentiality**

Protecting the confidential communications, such as papers or grants submitted for publication and personnel records of the participants. (As stated as 2.7 in APA ethics code)

## Correlation

To understand the relationship between nomophobia, emotional reactivity and anxiety in middle aged adolescents, young adults and middle aged adults.

## Regression Analysis

Regression analysis is done to understand the influence of nomophobia on emotional reactivity across age groups.

## One way Analysis of Variants (Anova)

One way analysis of variants is done to find the difference of nomophobia in the age group of 14-17 years, 18-29 years and 30-65 years. Also to determine whether there is significant difference for anxiety and emotional reactivity across age groups.

## Chapter 4

### Result and Discussion

Person correlation was done to find out if there is a significant relationship between nomophobia, emotional reactivity and anxiety. Regression analysis was done to find the impact of nomophobia on emotional reactivity and anxiety. One way analysis of variance along with post hoc test was done to find out the differences of nomophobia, anxiety and emotional reactivity based on the difference age groups.

### Results

**Table 1**

*Pearson correlation between nomophobia, emotional reactivity and anxiety*

Variable	n	Mean	SD	1
Nomophobia	165	75.83	23.155	.238**
Anxiety	165	45.50	9.624	.209**
Emotional reactivity	165	63.70	8.384	.341**

\*\*p<.01

Table 1 shows the Pearson correlation coefficient between nomophobia, anxiety and emotional reactivity. The first hypothesis stated that there is significant relationship between nomophobia, anxiety and emotional reactivity. From the results of Pearson correlation, it is found out that there is a significant relationship between nomophobia and anxiety ( $r=.238^{**}$ ,  $p=.002$ ). There is a significant relationship between nomophobia and emotional reactivity ( $r=.341^{**}$ ,  $p=.000$ ). Therefore, there is a significant relation between emotional reactivity and anxiety ( $r=.209$ ,  $p=.007$ ). Hence,  $H_1$  is accepted as there is a significant relationship between nomophobia, anxiety and emotional reactivity. In a similar study conducted, Kara et al (2019) it was found that there is a substantial correlation between the amount of time spent using a smartphone every day and nomophobia, as well as both the single and multiple mediation effects of loneliness and anxiety. According to Ercengiz et al (2020) this investigated three aspects of DoS (emotional reactivity, I-position, emotional cut-off) partially mediated the negative association between total forgiveness and anxiety. From the

results of Pearson correlation, it is found out that there is a significant relationship between nomophobia and anxiety. These studies support the results of the current study.

**Table 2**

*Regression analysis on the effect on nomophobia by emotional reactivity.*

Beta	R	R <sup>2</sup>	F	Sig.
Coefficient				
.341	.314 <sup>a</sup>	.116	21.489	.000 <sup>b</sup>

Table 2 shows the regression analysis and the effect of nomophobia on emotional reactivity. Therefore, H<sub>2</sub> there will be significant effect on nomophobia by emotional reactivity will be accepted. H<sub>3</sub> and H<sub>4</sub> will be rejected since is there no significant effect on emotional reactivity by anxiety and no significant effect on anxiety by nomophobia. There is a significant effect on nomophobia by emotional reactivity was accepted and is there no significant effect on emotional reactivity by anxiety in the current study a similar study but with contradicting results conducted by Lampis et al (2019) study showed higher levels of emotional cutoff and fusion with others are more prone to experiencing anxiety-related issues. It was found that there no significant effect on emotional reactivity by anxiety and no significant effect on anxiety by nomophobia but there are studies that do not support this result, Daraj et al (2023) systematic analysis showed that the results of the multivariate analysis revealed that participants with mild nomophobia who were not in contact with their mobile phones, as expected, experienced a significant increase in state anxiety over time. Mir et al (2020) multivariate analysis revealed that participants with mild nomophobia who were not in contact with their mobile phones, as expected, experienced a significant increase in state anxiety over time.

**Table 3**

*Result of One- way Analysis of Variants (ANOVA)*

Variables	F	df1	df2	p
Nomophobia	5.221*	2	108	.007
Anxiety	8.726***	2	105	<.001
Emotional reactivity	0.551	2	104	.578

\*\*\*p<.001, \*p<.05

There is a significant difference in nomophobia at <.05 level, and in emotional reactivity at <.001 level, whereas there is no significant difference in emotional reactivity. The post hoc test shows that there is a significant difference in nomophobia between 14-17 years and 18-29 years, also between 14-17 years and 30-65 years at p <.05 level. There is a significant difference in anxiety between 14-17 years ,18-29 years at <.001 level. There is also a significant difference between 18-29 years and 30-65 years <.01 level. H<sub>5</sub> will be accepted, there will be significant difference between age groups on nomophobia. H<sub>6</sub> will be accepted, there will be significant difference between age groups on anxiety. It was found that there is a significant difference in nomophobia between 14-17 years and 18-29 years, between 14-17 years and 30-65 years. Results in this study also indicate that there is a significant difference between age groups on nomophobia and there is a significant difference between age groups on anxiety. Studies that contradict this result include Moreno-Guerrero et al (2020) there were no discernible age disparities, the issue might impact people of all ages equally.



Table 4

*t-test between males and females*

Variables	t	df	p
Nomophobia	.888	163	.188
Anxiety	-0.991	163	.838
Emotional reactivity	3.725***	163	< .001

\*\*\*p&lt;.001

Table 4 shows difference in emotional reactivity is significantly higher in females than males.  $H_7$  will be rejected, since there is no significant difference in gender on nomophobia.  $H_8$  will be rejected, since there is no significant difference in gender on anxiety.  $H_9$  will be accepted, since there is significant difference in gender on emotional reactivity. It was found that emotional reactivity is significantly higher in females than males similar to this result, a study done by Anna .M et al (2009) gender was a significant predictor of emotional reactivity; adolescent girls in this study were likely to report higher levels of emotional reactivity than boys which correlates to the finds of this study. It was found in the current study that there is no significant difference in gender on nomophobia, some studies that contradict such as Moreno-Guerrero et al (2020 in terms of gender, nomophobia is more common in women than in males.

## Chapter 5

### Summary and Conclusion

#### Summary

Since nomophobia is on the rise in the modern day, an attempt to understand the current scenario across middle adolescents, young adults and middle-aged adults this research was done. It's a quantitative study, using convenience sampling technique. Ethical consideration such confidentiality of the participants data, voluntary participation and the right to withdraw from the research was implied in this research. The scales used were Nomophobia questionnaire (NMP-Q), Perth emotional reactivity short form scale (PERS-S) and state trait anxiety questionnaire (STAI) was used in this study. The statistical analysis was done using SPSS 25. The statistical tools used were Pearson's correlation, t-test, regression and one way analysis of variants. The research was conducted on a total of 165 individual out of which there were 83 females and 82 males, the level of nomophobia, emotional reactivity and anxiety were measured, the results indicate that there is a significant correlation between nomophobia, anxiety and emotional reactivity. It was found that the age group 18-29 face more anxiety compared to the other two age groups ;(14-17 years and 30-65 years). There is a significant difference in emotional reactivity pertaining to gender (males and females).

#### Conclusion

The results indicated that there is a significant correlation between nomophobia, anxiety and emotional reactivity. There is a significant difference in anxiety on the age group of 18-29 years as compared to other age groups (14-17 years and 30-65 year), it was also found that the impact of nomophobia was significant on emotional reactivity. The difference in gender was significant in emotional reactivity females had higher emotional reactivity than males.

#### Implications

This study helps us to understand the way individual react emotionally and the level of anxiety one possesses pertaining to a mobile phone. Whether this affects their functioning in academic, social, occupational domains of life. It also helps us to see the effect of nomophobia on emotional reactivity and a further insight on how an age group is affected by nomophobia.

#### Limitations of the study

The limitations of this study are other factors that influence the result of this study, this study had a limitation in sample size that limits the ability to generalize the results to broader populations, demographics, or contexts. The data was collected through google

forms and there were 60 items hence the potential for participant fatigue may have arisen due to the inclusion of numerous items within the questionnaire.

### Suggestion for future research

Further research can be done to understand the underlying factors of addiction and anxiety and how it plays a role in building relationships. Nomophobia's influence familial and marital relationships. How it affects the current parenting styles and perception of social relationships.

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