



Exploring the dimensions of nomophobia: Development and validation of a self-reported questionnaire



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ABSTRACT

Nomophobia is considered a modern age phobia introduced to our lives as a byproduct of the interaction between people and mobile information and communication technologies, especially smartphones. This study sought to contribute to the nomophobia research literature by identifying and describing the dimensions of nomophobia and developing a questionnaire to measure nomophobia. Consequently, this study adopted a two-phase, exploratory sequential mixed methods design. The first phase was a qualitative exploration of nomophobia through semi-structured interviews conducted with nine undergraduate students at a large Midwestern university in the U.S. As a result of the first phase, four dimensions of nomophobia were identified: not being able to communicate, losing connectedness, not being able to access information and giving up convenience. The qualitative findings from this initial exploration were then developed into a 20-item nomophobia questionnaire (NMP-Q). In the second phase, the NMP-Q was validated with a sample of 301 undergraduate students. Exploratory factor analysis revealed a four-factor structure for the NMP-Q, corresponding to the dimensions of nomophobia. The NMP-Q was shown to produce valid and reliable scores; and thus, can be used to assess the severity of nomophobia.

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1. Introduction

Information and communication technologies (ICT) have become an indispensable part of our lives (Lee, Tam, & Chie, 2013; Salehan & Negahban, 2013). With the proliferation of inexpensive mobile devices, we are now living in a mobile age in which mobile ICTs are vigorously and quickly adopted (Oulasvirta, Rattenbury, Ma, & Raita, 2012). In this mobile age, smartphones are considered the latest evolution of mobile ICTs (Oulasvirta et al., 2012).

The advances in mobile ICTs have paved the way for the worldwide adoption of mobile phones. Mobile phones have become so pervasive that the number of mobile-cellular subscriptions is expected to reach almost 7 billion by the end of 2014, approaching the world population with a penetration rate of 96% (International Telecommunications Union, 2014).

According to Pew Research Center's Mobile Technology Fact Sheet (2014), as of January 2014, 90% of the American adult population have some kind of a cell phone and 58% of American adults own a smartphone. Among adults who own a smartphone, 83% are

aged 18–29, 74% are aged 30–49, 49% are aged 50–64, and 19% are aged 65 or older. Thus, smartphones are particularly popular among young adults. In fact, college students are regarded as the early adopters of smartphones (Lee, 2014).

The popularity of smartphones among college students is ascribable to the affordances they provide. Smartphones make it possible to perform a variety of daily tasks in one device, including, but not limited to, calling and texting people, checking and sending email messages, scheduling appointments, surfing the Internet, shopping, social networking, searching for information on the Internet, gaming, entertainment, etc. (Park, Kim, Shon, & Shim, 2013). Because smartphones are ubiquitous and provide numerous capabilities, Kang and Jung (2014) propose that smartphones go beyond serving communication, information and entertainment purposes. They state that smartphones enable people to “fulfill needs such as learning, individual capability, safety, and human relationships” (Kang & Jung, 2014, p. 377), which is attributed to the mobility of smartphones.

While the mobility of smartphones provides apparent benefits and enable individuals to satisfy their basic needs (Kang & Jung, 2014), it may also induce some problems associated with smartphone use. Previous studies have shown that smartphones may cause compulsive checking habits (Oulasvirta et al., 2012), that smartphones may lead to compulsive usage and increased distress

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(Lee, Chang, Lin, & Cheng, 2014; Matusik & Mickel, 2011), and that smartphones can be addictive (Chiu, 2014; Lee et al., 2014; Salehan & Negahban, 2013).

Another problem exacerbated by smartphones is nomophobia. Nomophobia, or no mobile phone phobia, is “the fear of being out of mobile phone contact” (SecurEnvoy, 2012, para. 1). The term, nomophobia, is an abbreviation for no-mobile-phone phobia, and it was first coined during a study conducted in 2008 by the UK Post Office to investigate anxieties mobile phone users suffer (SecurEnvoy, 2012). The 2008 study in the UK, conducted with over 2100 people, demonstrated that some 53% of mobile phone users suffered from nomophobia (Mail Online, 2008). The study also revealed that men were more prone to nomophobia than were women, with 58% of male participants and 48% of female participants indicating feelings of anxiety when unable to use their phone.

Another study conducted in the UK (SecurEnvoy, 2012) surveyed 1000 employees and showed that the number of people suffering from nomophobia increased from 53% to 66%. Unlike the 2008 study, the 2012 study found out that women were more susceptible to nomophobia, with 70% of the women compared to 61% of the men expressing feelings of anxiety about losing their phone or not being able to use their phone (SecurEnvoy, 2012). In terms of the relationship between age and nomophobia, the study found that young adults, aged 18–24 were most prone to nomophobia with 77% of them identified as nomophobic, followed by users aged 25–34 at 68%. Moreover, mobile phone users in the 55 and over group were found to be the third most nomophobic users.

In one of the very first research studies into nomophobia (King, Valença, & Nardi, 2010), nomophobia is considered a 21st century disorder resulting from new technologies. In this definition, nomophobia “denotes discomfort or anxiety when out of mobile phone (MP) or computer contact. It is the fear of becoming technologically incommunicable, distant from the MP or not connected to the Web” (King et al., 2010, p. 52). Thus, this definition seems to encompass not only mobile phones but computers, as well. In another study (King et al., 2013), nomophobia is defined as “a disorder of the modern world [that] has only recently been used to describe the discomfort or anxiety caused by the non-availability of an MP, PC or any other virtual communication device in individuals who use them habitually” (p. 141). Although their definition includes the unavailability of computers, they argue that computers are replaced by mobile phones, which presumably have smartphone capabilities, and tablets. Therefore, they state that their research focus is less on computers and more on virtual communication environments, including mobile phones (King et al., 2013, p. 142). Their definition implies a dependency on virtual environments for communication. In a recent study (King et al., 2014), nomophobia is defined as follows:

Nomophobia is the modern fear of being unable to communicate through a mobile phone (MP) or the Internet. ... Nomophobia is a term that refers to a collection of behaviors or symptoms related to MP use. Nomophobia is a situational phobia related to agoraphobia and includes the fear of becoming ill and not receiving immediate assistance (p. 28).

In this definition, King et al. (2014) seem to emphasize the inability to communicate through a mobile phone. Another point that is worth mentioning is the description of nomophobia as a situational phobia related to agoraphobia. While the previous definitions appear to embrace the feelings of anxiety resulting from the unavailability of such devices as computers or virtual communication devices, this recent definition is more related to mobile phones and denotes nomophobia as a situational phobia.

The present study discusses nomophobia in relation to smartphones. As King et al. (2010) propose, nomophobia is considered a modern age phobia and a byproduct of the interaction between individuals and new technologies. Over the last five years,

smartphones have taken over the mobile phone market and have almost replaced the phrase “mobile/cell phone” With their numerous capabilities, smartphones facilitate instant communication, help people stay connected anywhere anytime, and provide people with constant access to information. Thus, people have become dependent on their mobile phones more than ever (Park et al., 2013), which, in turn, supposedly exacerbates the feelings of anxiety caused by being out of mobile phone contact. That connection is why nomophobia should be considered in relation to smartphones, which have the standard capabilities of a cell phone, (e.g., phone calls, texting, etc.) and have more advanced capabilities like internet access, applications, or sensors (Park et al., 2013).

Although there has been an increasing academic interest in investigating the problems emanating from smartphone use, research into nomophobia has been scarce (King et al., 2013, 2014). Thus, the purpose of this two-phase, exploratory mixed methods study was to explore the dimensions of nomophobia with the intent of using these findings to develop and validate a self-reported questionnaire to measure nomophobia among U.S. college students. To our best knowledge, this study is the first to devise a self-reported measure to assess the severity of nomophobia among college students.

2. Methods

This study adopted a mixed methods research design because it encompassed the collection, analysis and combination of both qualitative and quantitative data (Creswell & Plano Clark, 2011). Of all the various mixed methods research designs, this study utilized the two-phase, exploratory sequential design. The basic premise of this design is that the findings of the first, qualitative phase inform the development of the second, quantitative phase (Creswell & Plano Clark, 2011). This design is especially useful when developing and testing an instrument that helps explore a phenomenon about which little is known or there is no instrument available (Creswell & Plano Clark, 2011).

In this study, the first phase began with the qualitative exploration of nomophobia through focused interviews. Then the findings from this qualitative phase guided the development of the items to be used in the Nomophobia Questionnaire, hereinafter referred to as the NMP-Q. The NMP-Q was psychometrically validated in the second, quantitative phase. All the steps taken in each phase are explained in detail in the next sections.

2.1. Phase I: Qualitative exploration

The first, qualitative phase of the study was aimed at exploring the dimensions of nomophobia as described by college students. To this end, a phenomenological approach to qualitative exploration was undertaken. Phenomenology, as a qualitative inquiry approach, involves the exploration of a phenomenon through individuals' narrative descriptions of their own lived experience pertaining to that specific phenomenon (Moustakas, 1994; Sokolowski, 2000). Hence, semi-structured interviews were conducted with a sample from the population to gain a thorough understanding of the dimensions of nomophobia based on the lived experiences of the interviewees.

2.1.1. Participants

Participants for the interviews were purposively selected with the aim of identifying the students who had heavily depended on their smartphone. For this purpose, using snowballing strategies, a screening questionnaire was distributed through email messages. The screening questionnaire included questions about smartphone ownership, duration of ownership, and smartphone use. Moreover,

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