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Relationships among smartphone addiction, stress, academic performance, and satisfaction with life



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ABSTRACT

Results of several studies have suggested that smartphone addiction has negative effects on mental health and well-being. To contribute to knowledge on this topic, our study had two aims. One was to investigate the relationship between risk of smartphone addiction and satisfaction with life mediated by stress and academic performance. The other aim was to explore whether satisfaction with life mediated by stress and academic performance facilitates smartphone addiction. To identify test subjects, systematic random sampling was implemented. A total of 300 university students completed an online survey questionnaire that was posted to the student information system. The survey questionnaire collected demographic information and responses to scales including the Smartphone Addiction Scale - Short Version, the Perceived Stress Scale, and the Satisfaction with Life Scale. Data analyses included Pearson correlations between the main variables and multivariate analysis of variances. The results showed that smartphone addiction risk was positively related to perceived stress, but the latter was negatively related to satisfaction with life. Additionally, a smartphone addiction risk was negatively related to academic performance, but the latter was positively related to satisfaction with life.

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1. Introduction

Smartphones have not only replaced cellphones, but to a certain extent they have also replaced personal computers and a multitude of other devices. Their large screen size and inherent mobility allow for a plethora of functions to be accessed anytime and anywhere. With a smartphone, a person can make calls, send e-mails, watch and share photos and videos, play video games and music, keep track of appointments and contacts, surf the Internet, use voice search, check news and weather, use chat applications for voice calls and texting (e.g., Whatsapp) and interact on social networks (e.g., Facebook).

Smartphones are becoming an integral part of the lives of all ages worldwide. People feel inseparable from their smartphones (Lepp, Li, Barkley, & Salehi-Esfahani, 2015). For instance, in the USA, the latest data from the Pew Research Center shows that of smartphone owners, 46% said that their smartphone is something “they could not live without” (Smith, 2015). Meanwhile, smartphone ownership among American adults increased from 35% in

2011 to 64% in 2014 (Smith, 2015). In addition, 15% of American young adults between 18 and 29 years of age are classified as heavily dependent on smartphones for online access (Smith, 2015). The data from the EDUCAUSE Center for Analysis and Research shows that 86% of undergraduate students owned smartphones in 2014, which represents an increase from 76% in 2013 (Dahlstrom & Bichsel, 2014).

Smartphone use has been changing daily routines, habits, social behaviors, emancipative values, family relations and social interactions. The constant checking and/or use of smartphone applications 24 h a day has been linked to sleep disturbances, stress, anxiety, withdrawal and deterioration in well-being, decreased academic performance, and decreased physical activity (Thomé, Härenstam, & Hagberg, 2011). Fortunately, the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) addressed this behavior when it introduced a non-substance addiction (Internet gaming disorder) as a psychiatric diagnosis (*American Psychiatric Association: Diagnostic and statistical manual of mental disorders (5th ed.)*, 2013; Pontes & Griffiths, 2015). This addition to the DSM-5 gives hope to researchers who have been conducting studies on non-substance addiction, an area that is expanding to encompass not only Internet gaming disorder, but all types of digital addictions. For instance, some studies have addressed Internet addiction

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and video game dependency and their implications (Griffiths, 2015; Hawi, 2012; N. S. Hawi, Blachnio, & Przepiorka, 2015; Tsitsika et al., 2014). However, research investigating smartphone use and how it is affecting people's lives is still at a very early stage. Nevertheless, studies so far have shown that compulsive use of smartphones may lead to psychological disorders (Beranuy, Oberst, Carbonell, & Chamarro, 2009; Hawi & Rupert, 2015; Lee, Chang, Lin, & Cheng, 2014; Thomée et al., 2011). Belief in the severity of non-substance digital addiction has led some governmental and non-governmental organizations to open rehabilitation centers to treat or cure those suffering with digital dependency such as Hôtel-Dieu Grace Healthcare¹ and reStart.²

1.1. Smartphone use and academic performance

Several studies have found a negative association between cellphone use and academic performance (Judd, 2014; Karpinski, Kirschner, Ozer, Mellott, & Ochwo, 2013; Rosen, Carrier, & Cheever, 2013). In particular, a link has been identified between smartphone multitasking and a decline in academic performance (Rosen et al., 2013). In a sample of 451 US college students, a study identified a negative relationship between the use of social networking sites and GPA, and this relationship was moderated by multitasking (Karpinski et al., 2013). Similar results were obtained from studies on US university students, which revealed that use of Facebook and text messaging while doing schoolwork or attending class were negatively related to college GPAs (Junco & Cotten, 2012; Wood, et al., 2012).

1.2. Smartphone, stress and satisfaction with life

Smartphones have been linked to leisure (Lepp et al., 2015) and satisfaction with life (Lepp, Barkley, & Karpinski, 2014). Factors including social self-efficacy, family pressure and emotional stress have positive predictive power for smartphone addiction (Chiu, 2014). Compulsive smartphone usage is positively associated with technostress, which is stress caused by information and communication overload (Ragu-Nathan, Tarafdar, Ragu-Nathan, & Tu, 2008). To the best of our knowledge no study has investigated the relationship between smartphone addiction and perceived stress. However, several studies have shown that perceived stress can be a predictor of satisfaction with life (Hamarat et al., 2001; Matheny, Roque-Tovar, & Curlette, 2008). In particular, students who report low levels of perceived stress also report higher levels of satisfaction with life (Coffman & Gilligan, 2002; Extremera, Durán, & Rey, 2009) and perceived positive stress is positively related to life satisfaction in the students regardless of academic success or failure (Abolghasemi & Varaniyab, 2010).

The aforementioned research contributions triggered our interest in investigating two relationships. First, we sought to explore the relationship between smartphone addiction risk and perceived stress, which influences satisfaction with life. Then, we also sought to explore the relationship between academic performance, which is influenced by smartphone addiction, and satisfaction with life. Looking at both of these relationships, a model was created (see Fig. 1) with elements including risk of smartphone addiction, perceived stress, academic performance, satisfaction with life, and their additional associations. Accordingly, our research hypotheses were as follows:

Hypothesis 1: Perceived stress mediates the relationship between risk of smartphone addiction and satisfaction with life.

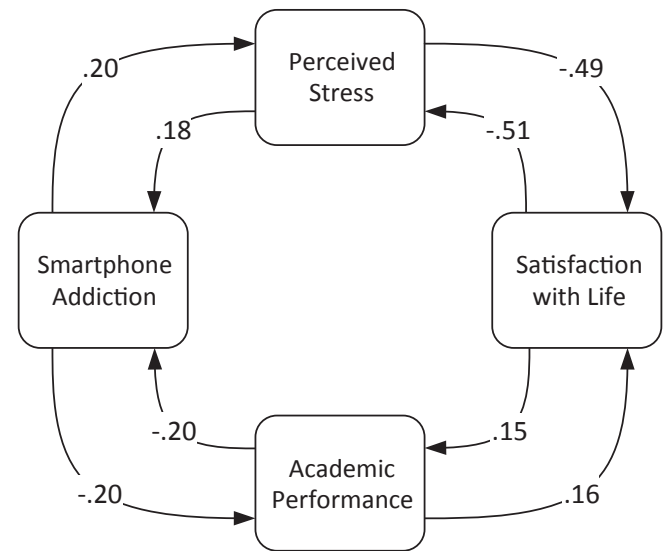


Fig. 1. Conceptual Framework using path analysis.

Hypothesis 2: Academic performance mediates the relationship between risk of smartphone addiction and satisfaction with life.

Hypothesis 3: There was a zero order correlation between smartphone addiction and satisfaction with life.

2. Method

2.1. Sample

The university research committee approved the research instruments. This cross-sectional study was based on stratified random sampling. An email was sent out to all students through the university email system. Before completing the survey, a form explained the purpose of the study and assured volunteers that data collection, storage, and reporting techniques would protect confidentiality and anonymity. A total of 293 respondents filled out the online survey through the university's student portal. The ages of students ranged between 18 and 25 years. Cases with invalid responses to trap question were removed from the dataset, which reduced the sample size to 249.

2.2. Data collection instruments

The survey was composed of four separate sections, including one for demographic information and three separate research instruments. The demographic information section included gender, age, education level, and academic major. The remaining sections encompassed the Smartphone Addiction Scale - Short Version (SAS-SV), the Perceived Stress Scale (PSS) and the Satisfaction with Life Scale (SwLS). The amount of time required to complete the survey was approximately 15–20 min.

The SAS-SV, developed by (Kwon, Kim, Cho, & Yang, 2013a), looks at smartphone usage to identify the level of risk for smartphone addiction, but does not diagnose addiction. This scale is a shortened version of the original Smartphone Addiction Scale (SAS), which consists of 33 questions and 6 points developed by (Kwon, Lee, et al., 2013b). The SAS-SV consists of 10 items rated on a six-point Likert-type scale, ranging from "Strongly Disagree", coded 1, to "Strongly Agree", coded 6. In the present study, the scores for this scale ranged from 10 to 54. A cutoff value of 31 is suggested for boys and a cutoff value of 33 is suggested for girls. High scores

¹ <http://www.hdgh.org>.

² <http://www.netaddictionrecovery.com>.

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