

Relationship between smartphone use and stress, approach from the PubMed publications perspective

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Abstract

Today, more and more people use smartphones, daily, in various moments, locations, and contexts. There are platforms for health education that provide information about depression, anxiety and stress. Smartphone and stress studies have been conducted with populations of several continents: North America, Europe, Middle East and Far East. Smartphones play an essential role in everyday life, being useful in simplifying communication, entertainment, education and many daily activities. There is an association between depression, anxiety, stress and smartphone addiction. But the use of smartphones can not be limited to the category of young adults or students, rather it can be applicable to general adult.

Keywords: smartphone, stress, PubMed publications

1 Introduction

It was found in 2012 that 91% of the population owned a mobile phone (Pearson et al., 2017). 3.2 billion people can easily access the Internet (1), and over 8 billion devices are connected simultaneously, via mobile phones, to the WWW, (2).

The present material is a continuation of the authors' interest in the field of stress, especially regarding the evaluation (Jurcău et al., 2018b) and stress moderation (Jurcău et al., 2016; Jurcău et al., 2017; Jurcău et al., 2018a).

2 Stress

Stress occurs when there is an imbalance between the stresses to which a subject is subjected and the possibilities of its rectification (3). Two types of stress are described: acute stress, which occurs in short-term situations and may be accompanied by physical and psychological reactions; chronic stress in long-term stressful situations, traumatic experiences (4), leading to overexposure of the body stress hormones and the appearance of various disorders eg. cardiovascular (Chockalingam et al., 2003), gastrointestinal (Mönnikes et al., 2001), depression (Plieger et al., 2015).

3 Smartphone - Definition, Monitoring

A smartphone is a mobile phone equipped with functions found on a computer (5). Today, more and more people use smartphones, daily, in various moments, locations, and contexts (Raento et al., 2009). 3.4 billion smartphone subscriptions were in 2015 (6) and a third of the world's population used a smartphone by 2017 (7). There are multiple smartphone applications, some of which are designed to monitor calorie intake, physical activity, sleep, menstruation, health and well-being (8). Smartphone monitoring can be performed by recording data or automatically, through built-in sensors (Kailas et al., 2010).

4 Smartphon - Healthy Use

Public health interests are also strengthened and supported by mobile devices (Rehalia, Prasad, 2016). There are platforms for health education (Nelson, Staggers, 2017), for improving patient-centered care (CCP) (Tang et al., 2016) and for the promotion and continuity of self-care of patients (Finkelstein et al., 2012). It was found that over 56% of health care settings include using mHealth to help with clinical practice (Franko, Tirrell, 2012), 31% of mobile phone owners use these health apps, and 19% have installed a mobile app. to manage their health and well-being (9). There are also services that provide information about depression, anxiety and stress (Kelders et al., 2013).

5 Interventions Through Mobile Applications - Examples

5.1 Weight management applications

It increases participants self-monitoring of calorie intake (Hertzberg et al., 2013). The use of SMS messages, led to small to moderate, weight and body mass index (Partridge et al., 2015).

5.2 Applications for physical activity management

Physical activity management in pregnant women had a reduced effect on increasing the number of steps performed per day, while reducing the prevalence of depressive symptoms (Choi et al., 2016). The use of the SMART MOVE application for 2 months provided a significant effect to moderate to high, in increasing the number of steps (Glynn et al., 2014).

5.3 Applications for depression

The Moodful Moods application was an effective tool for assessing the symptoms of depression, with the Patient Health Questionnaire-9 (Torous et al., 2015). The use of the application called my Compass led to the reduction of depression to moderate, after a follow-up period of one month, as evidenced by the Depression Anxiety Stress Scale (Proudfoot et al., 2013).

5.4 Applications for anxiety and stress

The use of the my Compass application had a significant small effect, on anxiety and a significant moderate effect on stress and after one month of extensive use of the application, the effects became greater (Proudfoot et al., 2013). Following the use of an anonymous application, moderate effects on stress were obtained (Ly et al., 2014).

6 Smartphon - Stress Self-Assessment

Smartphone is used in programs for depression (Richards and Richardson, 2012), bipolar disorder (Faurholt-Jepsen et al., 2016), and anxiety (Mayo-Wilson and Montgomery, 2013). Some studies used a yes or no question to measure self-assessed stress (Ottaviani et al., 2015), and other studies used questionnaires (Adams et al., 2014). In most studies, participants were asked to report stress levels several times: weekly (Pipingas et al., 2013), once daily (Pärkkä et al., 2009), every half hour (Adams et al., 2014).

7 Smartphone - Stress and Addiction

Excessive use of mobile phone dialing and texting features is linked to depression, anxiety and stress (Strassberg et al., 2013). One of the psychological tests used to assess smartphone addiction, is the Smartphone Addiction Inventory (SPAI) contains 26 items and four subscales, for: compulsive behavior (CB; 9 items), functional impairment FI, 8 items), withdrawal (W; 6 items) and tolerance (T, 3 items) (Lin et al., 2014).

8 Smartphone and Stress - Continental Studies

8.1 Studies in North America

Out of 82 managers enrolled in the MBA at a Midwestern university, it was found that nocturnal use of a smartphone for professional purposes led to sleep disruption, exhaustion of self-control and negative consequences on daytime activity (Lanaj et al., 2014). In another study, conducted with 276 African-American students, it was found that 11.2% had anxiety and social phobia, the consequence of smartphone addiction (Bun Lee, 2015).

8.2 Studies in Europe

A study of 362 Swiss high school students found that teens with smartphones delayed sleep hours and reported significant sleep difficulties and decreased sleep duration during the week compared to those with conventional cell phones (Lemola et al., 2015).

8.3 Studies in the Middle East

Lebanon. In a single study conducted at a private university in Lebanon, 44.6% of 249 students (average age = 20.96 years) were found to be at high risk of dependence on smartphones (Hawi and Samaha, 2016).

Turkey. Another study, conducted on 367 Turkish university students, social interaction anxiety and social phobia emerged as positive independent predictors of smartphone addiction, there was a significant positive correlation with smartphone addiction score (Darcin et al., 2016).

8.4 Studies in the Far East

China. A study of 414 Chinese students (aged 19 to 26), using a composite smartphone addiction index, identified five symptoms of smartphone addiction: ignoring the harmful consequences, concern, inability to control appetite, loss of productivity; loneliness, which is extremely positively associated with depression, has emerged as the strongest independent predictor of smartphone addiction score (Bian et al., 2015).

Taiwan. The findings of a study of 325 Taiwanese adults (age range = 17-97 years), comparable in terms of age and sex, with a nationally representative sample, showed a statistically positive effect - social interaction anxiety on use compulsive use of smartphones (Lee et al., 2014).

Japan. In a study of 126 Japanese medical students, depression emerged as an independent predictor of immersion score in Internet communication (Toda et al., 2015).

South Korea. Similar findings were reported in another nationally representative study of 795 high school elementary school students using a Smartphone Addiction Proneness Scale (SAPS) for youth. Symptoms of smartphone addiction: disruption of adaptive functions, orientation to virtual life, withdrawal and tolerance (Kim et al., 2014). Another study conducted in 2013 by the Korean Ministry of Gender and Family Equality on 448 students reported that 17.9% of Korean teenagers showed addiction to smartphones; a significant positive association between neurotic personality character and the severity level of smartphone dependence has been demonstrated (Mok et al., 2014). In a study of 353 Korean students, both aggression and impulsivity scores emerged as significant independent predictors of smartphone addiction, with impulsivity being stronger; depression was a significant independent predictor independent of smartphone dependence (Kim et al., 2015). One study, which involved 210 Korean female students (mean age = 22 years), found that 30.5% had a high risk for smartphone addiction (Lee et al., 2015).

Instead of Conclusions

Smartphones play an essential role in everyday life, being useful in simplifying communication, entertainment, education and many daily activities. However, the interaction with smartphones can lead, in some cases, to dangerous addiction patterns and stress, with its various forms of manifestation, among the most notable in studies being those of depression and anxiety. So far, it has been found that there is an association between depression, anxiety, stress and smartphone addiction. It seems that smartphone addiction is influenced by the high level of perceived stress. The link between depression, anxiety, stress and smartphone addiction cannot be limited to the category of young adults or students, rather it can be applicable to the general adult population.

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