

The Prevalence of Smartphone Addiction and its Relationship with Personality Traits, Loneliness and Daily Stress of Students in Jahrom University of Medical Sciences in 2014: A Cross-sectional Analytical Study

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ABSTRACT

Introduction: The world of technology is growing. Smartphones are one of today's most important social media technologies. The purpose of this study is to determine the prevalence of smartphone addiction and its relationship with personality traits, loneliness, and daily stress of students of Jahrom University of Medical Sciences in 2014.

Methodology: This is a random, cross-sectional, analytical study on 233 students of Jahrom University of Medical Sciences. These students were randomly selected. Smartphone Addiction Inventory was used to examine the prevalence of smartphone addiction. Loneliness Scale, Stress Resources Questionnaire and Daily Stress Inventory (DSI) were used to measure the extent of loneliness and stress.

NEO Personality Inventory-Revised was employed to find the relationship between the personality traits and smartphone addiction. Descriptive statistics (mean and standard deviation) and statistical tests (*t*-test and Chi-square) were used to analyze the data in SPSS v.19.

Results: The results indicate that 97.8% of students are addicted to smartphones. According to the *t*-test, loneliness and daily stress have no significant relationship with the smartphone addiction (*p*-value>0.05). However, loneliness and daily stress are higher among the addicted students. According to multivariate regression, conscientiousness, which is a dimension of personality traits, is found to have a significant relationship with the smartphone addiction. It determines 57% of the variance (*p*-value<0.05).

Conclusion: Most of the participants are addicted to smartphones, assigned into the "conscientious" type.

Key words: Addiction, Smartphone, Loneliness, Stress

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INTRODUCTION

The world of technology is progressively growing. Quite recently, we are faced with a growing number of technology users. The extreme use has affected various aspects of human's everyday life in different ways [1]. Unquestionably, education is a key area affected by technology. Rapid spread of e-communication leaves positive and negative effects on the quality and usefulness of the world's basic education through many ways. Students' responsibilities for finding information and

acting mutually as a result of using technology are important aspects of technology in education [2]. Today, cell phones have become digital tools equipped with computer-like facilities, providing the users with the accessibility through text and voice messages [3]. According to the statistics, users allocate most of their time (24 minutes and 41 seconds on average) to Internet and (29 minutes and 17 seconds) social media [4].

Individuals tend to forget their surroundings while using their smartphones. This neglect of the environment and people nearby may lead to new online acquaintances. We are faced with adverse psychological effects such as addiction, depression, negative effects on sleep, learning disorders, violence, etc. among users due to the excessive

use [5]. Strong dependence on smartphones is the most significant and complex problem that smartphone users are explicitly and implicitly engaged with. Many psychologists and sociologists pay considerable attention to this phenomenon. Some researchers believe that it is the "21st century addiction". Some experts also believe that dependence of smartphones is a modern addiction [6]. Some researchers argue the pathological use of technology is as a way to escape underlying rational and social problems; however, others claim that technology and its obsessive use are related to the specialized services such as playing games and win-lose approach [7].

According to the previous studies on many young smartphone users, less compatible individuals were found to spend most of their time conversing. Less confident individuals are likely to text messages and display stronger addictive tendency to text messaging [8]. Many studies have determined the demographic characteristics of smartphone users. Men (53%) are more likely to own cell phones than women (47%). 25 years -44 years-old individual tend to use smartphones more than other age groups. The stress caused by the IT use (here is smartphones) is displayed in different forms as follows. One of the common causes of stress is the ability to converse with multiple possibilities such as chat, text message, voice, etc. The diversity of the methods depends on the individual's need and demand. This can result in stress due to distraction and dual tasking, which determine the human's occupational memory. Loneliness is another element among the smartphone users. The rapid growth of technology and the excessive number of smartphone users are the indicatives of smartphone addiction and loneliness. The researchers' interest on developing information of the relationship between the loneliness and smartphone addiction indicates the importance of the subject [9]. Previous studies show that loneliness has a significant relationship with social interaction shortcomings especially talking [10].

Using smartphone is constant communication among humans at two different locations, which eliminated the initial excitement of humanity regarding loneliness [9]. Therefore, it is rational to believe that lonely people tend to use cell phones in order to escape this excitement. The aforementioned issues indicate the positive relationship between loneliness and smartphone addiction and its growing use [11].

There is much evidence on the effect of excessive use of messaging, calling, surfing, playing and social networks on the psychological health. However, few studies have focused on the effect of a portable smart device on the psychological health and the susceptibility from psychological aspects such as stress and personality traits. Since youths account for a large part of smartphone users, few studies have focused on determining the prevalence of smartphones. Therefore, the purpose of this study is to determine the prevalence of smartphone addiction and its relationship with

personality traits, loneliness and daily stress of students of Jahrom University of Medical Sciences in 2014.

MATERIALS AND METHODS

This is an analytical, cross-sectional study on 233 students of Jahrom University of Medical Sciences. After acquiring official letter of introduction by research deputy of Jahrom Medical University and obtaining the moral code (Ethical code: JUMS.REC.1393.133), stratified, random sampling was used. The data were collected by five questionnaires. Russell et al. [12] Loneliness Scale has 20 items. The items are scored on a 5-rating scale (1- Always true, 2- Often true, 3-Sometimes true, 4-Rarely true, and 5-Never true) (10 negative and 10 positive sentences). Items 1, 5, 6, 9, 10, 15, 16, 19, 20 are all reverse scored. The reliability is reported 78%. The reliability was reported 89% using the Russell et al. [12] retest method. The Scale was translated by Zahedifar et al. [13] and applied after the initial modification [14]. This questionnaire has been standardized by Bahirayi et al. in Iran [15]. NEO Personality Inventory-Revised is a personality trait tests based on the analysis of known factors. It is a modern tool in terms of personality, introduced by Costa et al., known as Revised NEO Personality Inventory [16]. NEO-FFI (NEO Five-Factor Inventory) has 60 items (12 per domain). Each item reflects individual's first reaction against the question. The items are rated by Strongly Agree, Somewhat Agree, Agree, Disagree, Somewhat Disagree, and Strongly Disagree. It assesses Openness, Conscientiousness, Extroversion, Agreeableness, and Neuroticism. The questionnaire has been standardized in the Iranian studies [17].

Stress Inventory consists of two. One of them has 24 items with stress resources [18]. The second, Daily Stress Inventory (DSI), covers 58 stressors, which is administered daily. The stressors are collected by 85 individuals in two weeks, reflecting the most important stressors for them [19]. Initially, Smartphone Addiction Questionnaire was applied in terms of demographic variables (age, gender, family status (number of parents), economic status (high, medium, low), alcohol consumption and smoking (is the individual a permanent alcohol consumer and smoker?)), time and purpose of using the smartphone, and self-evaluation regarding smartphone addiction. Smartphone Addiction Questionnaire has 33 items. The items are related to the extent of smartphone use and the effects on the life. The questionnaire has been translated by Kwon et al. [20].

A pilot study on 20 students was conducted. The final analysis indicates the validity of 0.967 using Cronbach's alpha. The scoring system is as follows: 1-Strongly Disagree, 2-Somewhat Disagree, 3-Disagree, 4-Agree, 5-Somewhat Agree, and 6-Strongly Agree [20]. The questionnaire has not been standardized in Iran. 40 out 80 cut-off point were considered to determine the addicted and healthy smartphone users.

The inclusion criteria were having smartphones, using them, and having physical and mental health. The

psychological health was, to some extent, examined by questions on smoking and alcohol consumption. In terms of the physical health, the criterion was observing students while distributing and asking regarding their physical health.

The exclusion criterion was incomplete questionnaire. Descriptive statistics (mean and standard deviation) and statistical tests (t-test and Chi-square) were used to analyze the data in SPSS v.19.

RESULTS

This is an analytical, cross-sectional study on 224 students of Jahrom University of Medical Sciences. The composition of students was as follows: Medicine, 30.4%; nursing, 18.3%; surgical technology, 11.6%; anaesthesiology, 13.8%; emergency, 4.9%; laboratory science, 9.4%; and health, 11.6%. Out of 224 participants, 82.14% were female and 17.86% were male. 13.4% use alcohol. 97.3% of the participants used their smartphones more than once a week. The purpose of 35.71% was social media and 32.14% entertainment. Table 1 shows the frequency of purpose and the time of using smartphones.

Table 1: Purpose and time of using smartphones

	Variables	Frequency	Percentage (%)
Time of Smartphone Use	During week	218	97.3
	Weekends only	6	2.7
	Total	224	100
Purpose of Smartphone Use	Entertainment	72	32.14
	Surf the Web	28	12.51
	Social Media and Text Messaging	80	35.71
	Others	44	19.64
	Total	224	100

The majority of the students (79%) believed that they were not addicted to smartphones. 42.9% believed that they are addicted to smartphones. The mean score of smartphone addiction was 101.18 ± 30.27. The prevalence of smartphone addiction was 97.8%. Only 2.2% of students were not addicted to smartphones.

The prevalence of smartphone addiction among females (82.2%) was greater than that of male participants (17.8%). Two-parent students have the greatest prevalence of smartphone addiction (85.8%). Students with medium economic conditions displayed the greatest prevalence of smartphone addiction (84.9%). Out of students with smartphone addiction, 13.7% had the history of alcohol consumption and 6.8% were smokers.

The results of Chi-square test show that smartphone addiction has no significant relationship with the demographic variables (p-value>0.05). The results of correlation show that daily stress has direct, significant

relationship with the smartphone addiction (p-value<0.05).

However, personality traits and loneliness had no direct, significant relationship with smartphone addiction (p-value>0.05) (Table 2).

Table 2: The relationship of personality traits, loneliness, and daily stress with smartphone addiction

Dependent Variable	Personality Traits (NEOPI)	Loneliness	Daily Stress (DI)	
Smartphone Addiction	Correlation	0.081	0.053	0.269
	p-value	0.358	0.6	>0.001

Mean scores of loneliness and daily stress were higher among the addicted students than normal ones. However, the results of t-test show that no significant difference is found between the addicted and normal students in terms of loneliness and daily stress (p-value>0.05). Table 3 shows the personality traits, loneliness, and daily stress of addicted and normal students.

Table 3: Mean scores of personality traits, loneliness, and daily stress of normal and addicted students

Variable	Smartphone Addiction Prevalence				T	p-value
	No		Yes			
	Mean	SD	Mean	SD		
Personality traits	Missing	Missing	109.03	23.55	Missing	Missing
Daily stress	63.4	52.13	134.6	81.76	-1.936	0.054
Loneliness	72	4.42	73.71	5.23	-0.714	0.477

Determination factor (R²=0.974) indicates that 97.4% of smartphone addiction variance is influenced by independent variables. The rest is influenced by other variables. Therefore, independent variables can determine the smartphone addiction.

The results of multivariate regression show that only personality traits can predict smartphone addiction (p-value<0.05). Loneliness and daily stress have no significant effect on smartphone addiction (p-value>0.05). Beta factor shows that the extent of effect of personality traits on smartphone addiction is -0.918. R²=0.113 using multivariate regression shows that 11.3% of smartphone addiction variance is influenced by the components of personality traits. Others are affected by other variables. The results of multivariate regression show that awareness can only predict the smartphone addiction (p-value<0.05).

The effects of other elements are not significant (p-value>0.05). Beta coefficients show that conscientiousness is effective in smartphone addiction by 0.316. Table 4 shows the regression analysis coefficients

of the effect of smartphone addiction prediction according to the personality traits.

Table 4: Smartphone addiction prediction according to personality traits using multivariate regression

Independent Variable	R	R ²	B	S.E	Beta	T	P-value
Constant			87.631	15.218		5.758	0
Agreeableness			-1.136	0.603	-0.203	-1.884	0.062
Conscientiousness	0.336	0.113	1.981	0.755	0.316	2.625	0.01
Extroversion			1.287	0.76	0.201	1.693	0.093
Neuroticism			-0.541	0.538	-0.097	-1.006	0.316
Openness to experience			-0.56	0.637	-0.097	-0.879	0.381

DISCUSSION

Smartphones have been one of the successful stories of the past decade, which have created a growing demand for this modern technology worldwide [21]. Compared to the past, smartphone use has been on the rise so that smartphones have become human's integral part of everyday life. Most of smartphone users are young especially students because they spend long hours for this device on a daily basis. As a result, they are late for their daily tasks. Excessive use of smartphones has gone up to a degree, classified as addictive behaviors. The topic has won the attention of many researchers. This study was conducted on 233 students of different majors in Jahrom University of Medical Sciences aged 19 years-35 years old from 2014 to 2016. Smartphone Addiction Questionnaire was initially forwarded to the students in order to state their opinions. According to the responses, 42.9% of students believed that they were addicted to smartphones. According to the results of the Smartphone Addiction Questionnaire, 97.8% of students were found to be addicted to their smartphones. The study by Park et al. [22] on 339 Korean students of different universities aged 19-25 years showed that 84% of students have approved the signs of smartphone addiction including tolerance, quitting, etc. The results are consistent with our study [22]. Another study by Choi on 53 nursing students of Japanese University aged 20 years-28 years showed that 99.2% of students are addicted to their smartphones, which is consistent with our study [23]. A similar study was conducted in India by MACRO on 175 students of different majors aged 19 years-30 years studying in different universities from 2003 to 2004. 50% of students were addicted to their smartphones so that they claimed not to be able to manage their daily lives without smartphones [24]. Excessive use of this modern technology has left numerous adverse effects. The purpose of this study was to examine the relationship of smartphone addiction with stress and loneliness. As it is known, the main goal of smartphone manufacturers is connecting people to remote areas in order to have a permanent communication and stay away from loneliness. Since lonely individuals are less likely to

have face-to-face communication, they tend to social media. Therefore, smartphone addiction has a positive relationship with loneliness. Such relationship has been proved in many studies [25]. The mean loneliness of addicted students is greater than that of normal students; however, the results of t-test show that no significant relationship is found between the addicted and normal students in terms of loneliness. Concerning the loneliness, the study by Park et al. [22] on the evaluation of loneliness of 330 Korean students and its relationship with smartphone addiction showed that smartphone addicts display higher levels of loneliness. In this study, UCLA Loneliness Scale was employed. Among loneliness, shyness, depression and self-confidence, loneliness was the most highlighted with the mean value of 5.18, which is consistent with our study [22]. A similar study was conducted by Iqbal et al. on 100 students of Jakarta University, Indonesia. UCLA Loneliness Scale was used to evaluate the loneliness. It was modified by Zahrani. According to the results, loneliness has no clear relationship with the smartphone addiction, which was not consistent with the results of our study [9]. Another study by Casey et al. was conducted on 414 students in China. Similar to previous studies, UCLA Loneliness Scale was employed. The results show that smartphone addiction has a significant relationship with loneliness. In fact, smartphone addicts are qualified for a high level of loneliness. Lonely individuals tend to use their smartphones when they are alone, which is consistent with the results of our study [25]. The second psychological adverse effect of smartphone addiction is daily stress. One purpose of this study is to examine the relationship between the smartphone addiction and daily stress using two questionnaires. According to the results, the mean daily stress of addicted students was higher than that of normal ones. However, the results of independent t-test show that no significant relationship is found between the addicted and normal students in terms of daily stress. The study by Sarwar et al. [26] on the effect of smartphone addiction and excessive use on users' social function in Saudi Arabia showed that in addition to constant communication with friends and acquaintances, smartphones reduce daily stress, which is inconsistent with the results of our study [26]. Another study by Jeong et al. in Korea on 598 nursing students indicates a positive relationship between the smartphone addiction and stress especially among female users. Due to the stress, these users are more likely to use smartphones, which is consistent with our study [27]. Another study by Lee et al. in Taiwan controversially discussed the topic. The study by Lee et al. showed that smartphones are considered a stressor due to constant check of messages and communication with others; however, communication with others provides accessibility to various resources to meet the problems, leading to reduced stress. The results of the first section were consistent with ours [28]. The last part of our study was to examine the relationship between five dimensions of personality traits and smartphone addiction. These traits are Openness, Conscientiousness, Extroversion, Agreeableness, and Neuroticism. The data are collected

by 60-items Neo Questionnaire. The results indicate that conscientiousness is only able to forecast the smartphone addiction. A study was conducted by Lane et al. on 314 American students in US universities in this regard. The data were collected by John's Big Five Personality Inventory. The results show that extroverts are more likely to be addicted to smartphones, which is inconsistent with our study [29]. A similar study by Beydokhti et al. in Sari University, Iran was conducted on 364 students. The data were collected by Neo Questionnaire. The results showed that smartphone addiction has the greatest relationship with the well-informed characters, which is consistent with the results of our study [30]. The study by Chittaranjan et al. on 117 students of California University used Neo Questionnaire to collect the data. The results showed that a strong relationship is found between compatible characters and smartphone addiction, which is inconsistent with the results of our study [31]. According to aforementioned issued, we found out that smartphone addiction is a growing phenomenon. The number of the modern technology users is on the rise on a daily basis. Among different age groups, university students are mostly affected.

CONCLUSION

The results show that most students are addicted to smartphones. Since the excessive use of smartphones have left a wide range of effects of human life such as education, quality of life, physical and psychological health, loneliness, and stress, it is essential to develop preventive measures.

RECOMMENDATIONS

1. It is essential to turn off cell phones one hour before the bed. In addition to being protected against cell phone light in the dark, the brain can rest.
2. It is a good idea to use alarm clock instead of cell phone alarm clock for two reasons. First of all, you are not stressed out while waking up in the morning and do not search for the messages. Instead, you plan for the day.
3. It is a good idea to set a specific time for checking smartphone so that you do not check in other times.
4. It is essential to have face-to-face communication instead of using smartphones.
5. Teachers should train students on the advantages and disadvantages of smartphones at early age. It prevents the smartphone addiction in adulthood and leads to purposive use of cell phones in the future.

LIMITATIONS

Fewer numbers of male participants than females led to inability to compare the smartphone addiction among both genders. Some students were uncooperative in filling up questionnaires.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this article.

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