Original Article

The relationship between personality factors and smart phone use among university students

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Abstract

Introduction: Smart phone use is one of the phenomena of this age and has had a profound effect on the various aspects of human life today, therefore, different aspects of smart phone use should be identified to make use of this device more targeted and to reduce its ineffective use with knowledge. In this study, the basic role of personality factors in using smart phone was investigated.

Materials and Methods: In this study 64 peoples were selected by systematic random and random cluster sampling method from the students of Ferdowsi University of Mashhad, Iran in 2018-2019. Then the questionnaire of smart phone and computer use and Neo personality questionnaire were completed. Spearman rank correlation test and SPSS version 24 were used for data analysis.

Results: The findings of the study indicated that there is a relationship between gender and age with the amount of smart phone use ($P=0.007$, $P=0.03$) and on the other hand, the weaker responsibility and agreeableness personality are associated to the greater use of smart phone ($P=0.01$, $P=0.03$).

Conclusion: The results of this study showed the role of gender as well as personality factors such as agreeableness and responsibility in smart phone use.

Keywords: Personality, Smartphone, University students

Introduction

The use of mobile phones began with the expansion of wireless communications, and with the advancement of electronics and the advent of small-scale electronic parts has undergone fundamental changes so that the use of mobile phones only for communication is very rare now. Over the past 20 years, with the expansion of peripheral facilities of Cell phones Finally, "smart phones" were created, which in addition to establishing telephone communication, also provide many peripheral facilities for users,

including but not limited to the use of location and routing equipment, Internet and browser access, camera and recording images and the possibility of using various social networks (1,2).

Smart phones have a significant part of the smart devices use due to their practical features and portability, and easy use for the majority of people in the community (3,4). In the last few years, it has also covered many of the capabilities of computers and reduced the need to use other electronic products to a minimum, considering the above and the study of the use of smart phones in Iran, which is based on statistics of 1392, it reaches 85% of use in the population (2,5), it can be seen that the use of mobile phones is a pervasive issue in the community, which is increasing every year. However, in addition to these many benefits and advantages of smart phones, there may be problems and disadvantages, such as mobile media addiction, negative impact on marital status, wasting time, check phone anxiety, depression to use in Long-term and also in case of use in inappropriate situations can lead to accidents (6-10). Therefore, it can be seen that with the increasing development of smart phones, the issues and problems related to them are expanding, and it seems that studies in this field are limited and more attention should be paid to this field. However, factors that affect how and to what extent previous studies have identified smart phone use include anxiety, varying levels of depression, personality disorders and issues, and marital status and employment status (11-15). although The above has been investigated in previous studies, it has always been shown that environmental, context and social factors effectively engage in certain behaviors, which in the present study is cell phone use, and should not be viewed unilaterally. People's personalities are formed from a combination of biological and environmental factors. Personality is a set of stable behavioral traits that have minor changes over time, and a person can be described by these traits (16,17). Personality affects most human behavior and is also expected to have a fundamental role in smart phone use. On the other hand, certain behaviors are always influenced by society and the environment or the whole external conditions that govern life, affecting these behaviors. In this study, to show the fundamental

role of personality and eliminate the intervening factors and variables related to external conditions, an attempt was made to select the study population with the same maximum external conditions, in which students were finally selected. However, some previous study investigates Characters that affect smart phones or the Internet and the relationship between this issue and mental health. However, no study specifically addressed the fundamental role of personality by eliminating other factors in smart phone usage; therefore, the present study was conducted to investigate the basic role of personality in the use of smart phones in the population with the same external conditions (students).

Materials and Methods

The present study was performed as a cross-sectional correlation among students of the Ferdowsi University of Mashhad in 2018-2019. The sampling method was systematic in two stages of random and clusters. In the first stage, the list of university departments was prepared as a cluster, and five groups were randomly selected from 68 departments of this university, then the list of students studying in these five departments was prepared, and the required number of samples was selected systematically from among them. Considering that the study is a cross-sectional correlation, the sample size calculated using G*Power 3.1 software for correlation studies with the first type of error equals 0.05. Therefore, the power is 0.80 and considering the average correlation between personality factors and smart phones use. The final sample size was estimated to be 58 people, considering a 5% drop in completing questionnaires.

A total of 64 people were selected, and after considering the codes of informed consent and non-disclosure of personal information, the questionnaire was completed. Inclusion criteria included studying in the permitted years of study, age between 18 and 48 years, not having diagnosed mental illness. The exclusion criteria included not having willingness to participate and informed consent.

Research instruments
A) Demographic Questionnaire: The researcher-made demographic questionnaire in

the present study includes age, gender, and level of education.

B) Questionnaire for the Use of Smart Phones and Computers: The questionnaire for smart phones and computers consists of 5 items with six sub-items. The section related to smart phones includes three items. The validity and reliability of this questionnaire are acceptable.

C) Neo Personality Questionnaire: It was developed by McCrae and Costa to examine the five personality factors, including neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. In the present study, a short form of 60 items was used. Each factor has its own 12 items. It is scored in the range between 0 and 4. The validity of the original version of the questionnaire has been confirmed. In several studies, the validity of its structure has been investigated by factor analysis, which has obtained the desired results and confirms the appropriate validity of the questionnaire (8,13,18). In other studies such as Kiamehr, the retest method was used to evaluate the reliability of the short form of the questionnaire. The correlation coefficient between the two test scores for the questionnaire factors was between 0.65 and 0.86 (19). The coefficient of internal consistency of this questionnaire with Cronbach's alpha was obtained between 0.54 and 0.79. In Ghasemi and Mehdad's research, the reliability of the questionnaire using Cronbach's alpha coefficient for neuroticism was 0.8, extroversion 0.76, empiricism 0.61, adaptability 65, and conscientiousness 0.86 (20,21). Bayrami also used this questionnaire with acceptable psychometric properties (22). In Mehdad and Molavi's researches, the reliability of the questionnaire using Cronbach's alpha method for neuroticism components was 0.752 extraversion 0.703 openness to experience 0.828 flexibility 0.788 and finally conscientiousness 0.715 (21). Also, McCrae and Costa reported the correlation coefficients of this test with the 240-item Neo test for the five personality traits of neuroticism (0.75), extraversion (0.91), openness to experience (0.71), agreeableness (0.78), and conscientiousness (0.75) (23). In the present study, Cronbach's alpha, which indicates the internal correlation and part of the reliability of the questionnaire, was estimated to be 0.724 by

removing two heterogeneous items 41 and 51 that were in the psychoactive factor. This shows that the questionnaire is well-matched with the study population and data have the necessary conditions for analysis. To analyze the data, first, the central indices of mean, variance, and frequency were used to describe the data, and then Kolmogrov-Smirnov and Shapiro-Wilk tests were used to evaluate the normality of data distribution. Then Mann–Whitney U and Kruskal-Wallis and Spearman rank correlation tests were performed. The present analysis was performed using IBM SPSS v24 software.

Results

The demographic findings indicate that the mean age of the participants in the study is 25.03 years, and its standard deviation is 7.68 years. In terms of gender, 36.70% of them are men. Also, the highest frequency at the level of education is related to undergraduate students. According to the information provided in Table 1, which is related to the Neo Personality Questionnaire and the use of phones and computers, it can be seen that the conscientiousness factor with an average of 44.97 and a standard deviation of 7.29 is the highest personality factor among the existing factors. Furthermore, the average usage of a smart phone is 5.82 hours per day with a standard deviation of 3.85, which shows that the participants in the study use a smart phone for an average of about 6 hours per day.

Table 1. Descriptive statistics of the variables

Variable	M	SD
Neuroticism	33.98	8.25
Extraversion	33.49	5.82
Openness to experience	39.67	4.55
Agreeableness	41.45	5.51
Conscientiousness	44.97	7.29
Smart phone usage	5.82	3.85

To examine the relationship between gender and the rate of smart phone use, first, the normality of the distribution of smart phone usage for men and women was investigated using the Shapiro-Wilk. Moreover, Kolmogrov-Smirnov tests, the results are seen in Table 2.

Table 2. The normality test of the data distribution

Variable	Kolmogrov-Smirnov		Shapiro-Wilk	
	Statistic	P	Statistic	P
Smart phone usage	0.164	0.000	0.910	0.000*
Female	0.120	0.199	0.790	0.000*
Male	0.328	0.000	0.944	0.060
Neuroticism	0.113	0.057	0.902	0.000*
Extraversion	0.099	0.200	0.974	0.235
Openness to experience	0.088	0.200	0.982	0.519
Agreeableness	0.111	0.072	0.969	0.146
Conscientiousness	0.092	0.200	0.972	0.418

According to the normality test results of the data distribution, the variable of the use of a phone did not have a normal distribution, which was predictable according to the concept of the variable. Therefore, the Mann-Whitney U test was used to examine the difference between the use of phones in men and women, the results of which are shown in Table 3.

Table 3. Mann-Whitney U test to examine smart phone use among male and female

Gender	Variable	Gender	M rank	Statistic	P
Male	Smart phone usage	Male	23.45	261.500	0.038*
Female		Female	32.93		

According to the results of Table 4, it can be seen that there is a significant difference between men and women in the amount of smart phone use, and women use smart phones more than men. Then, to investigate the effect of education on smart phone usage, due to the non-normal distribution of data in the smart phone usage variable, the Kruskal-Wallis test was used for this purpose.

Table 4. Kruskal-Wallis test results for smart phone usage

Variable	Education	M rank	Statistic	P
Smart phone usage	Undergraduate	34.23	5.762	0.056
	Masters	23.02		
	Ph.D	25.13		

The results of the Kruskal-Wallis test, as shown in Table 5, show that although there is a difference in the present sample between the use of the smart phone at the undergraduate and doctoral levels, at the population level, this difference is not significant. Spearman rank correlation test was used to continue the analysis and examine the relationship between personality factors and cell phone usage. The results can be seen in Table 6, which shows the inverse and significant correlation between smart phone usage and responsibility and flexibility of personality factors. In addition, there are significant decreases in the amount of smart phone use with the increasing age of people.

Table 5. Spearman rank correlation test examines the relationship between personality factors and smart phone usage

Spearman rank correlation		Neuroticism	Extraversion	Openness to experience	Agreeableness	Conscientiousness	Age
Smart phone usage	The correlation coefficient	0.215	-0.190	0.182	-0.280	-0.335	-0.345
	P	0.105	0.153	0.171	0.033	0.010*	0.007*

Discussion

The main findings of the study show that there is a relationship between gender and age with the rate of smart phone use, and on the other hand, the weaker the factors of, Agreeableness and Conscientiousness in people, the more they use smart phones.

Regarding the relationship between gender and the use of smart phones, women spend more time using mobile phones, in a study by Akbari et al., which was conducted in 2014 on 230 students of Neishabour University of Medical Sciences by the Harmful Use Questionnaire From the mobile phone, it was found that female students have a higher rate (10.9%) of excessive use of mobile phones than male students (5.4%). Unfortunately, few studies investigate these findings, but according to the present study and the study of Akbari et al., it can be said that more phone use time in women is due to differences in the sociality of men and women in Iran and leisure styles in Iran. Also, no mention has been made of this issue in studies conducted abroad (24). Regarding the relationship between age and the use of smart phones, the data showed that with increasing age, the use of smart phones decreases in studies conducted abroad; Hussain, Griffiths, and Sheffield studied with a sample of 640 people between the ages of 13 and 69, conducted an online survey by modified DSM-5 criteria for harmful use of smart phones. They examined the rate of smart phone use, which is consistent with the present study (as one of the results of this study). The Bianchi and Phillips study was also conducted on 324 people. In this study, 132 women, 62 men through the questionnaire of harmful cell phone use. As one of the goals, the relationship between age and the use of mobile phones has been investigated, and findings are consistent with the results of the present study. The study of Lip et al., which was conducted on 454 people, through a researcher-made questionnaire to examine the relationship between age and the use of mobile phones, the result is consistent with the present study. Therefore, Ezoe, Hussain, Bianchi's studies have shown the inverse relationship between age and phone usage and are consistent with the present study (11,14,25,26). There is no study in this field in domestic studies. However, by reviewing these studies and the present study, it can be said that

this inverse relationship is probably due to people's high leisure at a young age and also more busyness and purposefulness at higher ages. However, the effect of technological progress on this negative correlation should not be ignored because older people are less familiar with using smart phones. In comparison, younger people who have been familiar with smart phones since childhood can easily use most of the phone's capabilities, which can also be the cause of the inverse relationship between age and the amount of smart phone use.

In the relationship between personality factors with the use of smart phones, higher responsibility was associated with less use of smart phones. A study by Bazrafshan et al. in 2017 on high school students in Shiraz District 4 analyzed personality dimensions and used social networks. The tools used were the Neo Personality Traits Questionnaire (short form) and the researcher-made questionnaire about social networks. This study shows that high responsibility leads to less use of social networks. These findings are also consistent with the present study (27). Furthermore, Rashidi et al. conducted a study on 380 male and female high school students in the first and second grades in Qorveh city using random cluster sampling and Neo McCrae and Costa questionnaire, mobile phone dependence, and feeling lonely. The results of this study are consistent with the fact that high responsibility leads to less use of mobile phones (28). Therefore, by reviewing the present study, the study of Bazrafshan et al., and the study of Rashidi et al., It can be concluded that the characteristic of high responsibility and less use of mobile phones can be due to time constraints. These people are known responsible for education, work and so on thus spend more time on these activities and therefore useless smart phones.

In addition to conscientiousness, agreeableness is also inversely related to smart phone usage, the 2017 Zaher, Girdes, and Sheffield study of a sample of 640 people between the ages of 13 and 69 and an online survey. Including the modified DSM-5 criteria for harmful use of the smart phone, the same results were obtained in the factors affecting the use of the phone and its dependence, which higher compatibility is associated with less usage (14). Furthermore,

Rashidi et al. conducted a study on 380 first and second-grade high school students in Qorveh city using random cluster sampling and Neo McCray and Costa questionnaire, mobile phone dependence, style Brozonsky, and feelings of loneliness. The results of this study are consistent with the view that compatibility results in less cell phone use (28). Based on the present study and Rashidi et al. study, it can be explained that adaptation is a factor that calls a person to be with others and be with them and also to help them. Therefore, the low use of the phone in people with high compatibility can be due to more attention paid to people and close friends and therefore avoids prolonged use of the phone. Regarding other personality factors and the insignificance of their relationship using a smart phone, we can only say that no average relationship was found between them at the level of correlation (according to the estimated sample size). Finally, it should be noted that although the present study had good sampling and remarkable findings, like all other studies, it is not without problems and limitations. For example, this study did not address other disturbing variables such as marital status and socioeconomic status. In addition, the questionnaire used in the field of smart phone use is one-dimensional and does not cover the various dimensions of smart phone use. On the other hand, studies with a larger sample size should be conducted to examine the relationship between other personality factors using smart phones.

Practical suggestions for the present study 1. Conduct a study on a larger community for greater generalizability of results, 2. Design training and awareness protocols on effective personality traits and evaluate the effectiveness of the extent of effective and beneficial use of mobile phones. The other limitations of this study can be called the lack of study resources in the present study field.

Conclusion

The present study showed the role of gender and personality factors of agreeableness and conscientiousness in the use of smart phones.

Acknowledgments

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