

The Relationship of Smartphone Addiction with Self-esteem and Self-consciousness among Girls in the First Year of High School

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Abstract

Background

In recent years, an increasing number of studies have shown self-esteem and self-consciousness can be protective factors against smartphone addiction among adolescents. Our study aims to investigate the relationship between smartphone addiction and self-esteem and self-consciousness among girls in their first year of high school.

Materials and Methods: The samples of this cross-sectional included all the female first year students in Tehran, Iran, from 2019 to 20. The formula suggested by Krejcie and Morgan was used to measure the sample size (n=140), and stratified sampling was used for the collection of samples. The scale of smartphone addiction, the scale of Coopersmith self-esteem, and the self-consciousness scale (revised version) were used. Data were analyzed by SPSS software version 23.0.

Results: The total sample of the study included 140 girls with the mean age of 15.81 (0.63) years. The Mean students' self-esteem was (34.58± 11.81). The correlation analysis indicated that self-esteem and self-consciousness (MR = -0.423, p<0.05) had a significant negative correlation with smartphone addiction among student. The results also showed a significant negative correlation between self-esteem and self-consciousness with smartphone addiction (p<0.05). The correlation coefficient between self-esteem and smartphone addiction was (r = 0.394, p<0.05) and the correlation coefficient between self-consciousness and smartphone addiction was (r = -0.293, p<0.05).

Conclusion

Based on the regression equation with the standard coefficients, self-esteem and self-consciousness had a positive effect on smartphone addiction in students. The findings also show that self-esteem predictors, compared to those of the self-consciousness, are better predictors for smartphone addiction.

Key Words: Adolescents, Self-Esteem, Self-Consciousness, Smartphone Addiction.

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1- INTRODUCTION

In recent years, the global number of mobile users has steadily increased (1). In the past two decades, a growing number of studies have explored the various benefits of cell phone use. Mobile phones have been used for educational purposes, facilitating the access to information, and building and maintaining social ties (2). Despite these advantages, excessive smartphone use can lead to serious mental health problems in adolescents (3). These problems include physical health issues, disturbed sleep and associated mental difficulties, and academic deficiencies (4).

According to Min-Hyuk et al., the excessive use of smartphones had a significant correlation with suicide attempts. In a multiple logistic regression study, they adjusted odds ratio for smartphone usage 5 hours or more a day and the correlation with smartphone use was more prominent for process purposes (5). Using the same study, Sohn et al. included 41871 cases, of which 55% were female, in their analysis research and found a correlation with increased chances of depression and anxiety, higher perceived stress, and lower sleep quality (6). Smartphone use in children aged 11 years and older is common and the incidence of mental health issues peaks in teenagers (7).

So far, studies on risk factors for smartphone use in children and adolescents have reached inconclusive results. However, minors tend to be especially vulnerable (8, 9), which could be attributed to their difficulty in self-regulation (10) and inadequate control forces (4). Among cell phone users, there are many with low self-esteem and bad/poor social ties who believe they should be in constant contact with others. Smartphone addiction can lead to anxiety, irritability, sleep disturbances, trembling, insomnia, and digestive problems (11). According to Thomee et al., misuse of cell

phones is linked to anxiousness, sleeplessness, depressed mood, psychological distress, and an unhealthy lifestyle (12). Excessive cell phone usage is widespread among young people and is negatively correlated with academic performance (13), interpersonal relationships, self-esteem, conscience-regulation, and general happiness (14). Communication technology decreases social connections and the well-being of the individual because of alienation, depression, and isolation (15). According to Li et al., low self-esteem is a result of perceived rejection, alienation, or indifference of a significant other; thus, self-esteem can be linked to problematic use of the Internet (16). Recent studies have shown that self-esteem is associated with smartphone addiction (17).

In regressions, low self-esteem has also significantly predicted smartphone addiction (18). Low self-esteem, therefore, could predict susceptibility to smartphone dependency. Several researchers have studied the relationship between self-esteem and Internet dependency, but few have focused on how self-esteem is connected to Internet dependency (19). Previous studies have indicated that social isolation plays a significant role in smartphone addiction (20-22). Problematic use of technology has resulted in cognitive changes in people of any age at different rates, with children and adolescents being the most vulnerable (23). These effects are cognitive (24), emotional (25), and social (26) and are linked to people's consciousness of the environment around them (27). Consciousness is the inner state of being and the underlying governing mechanism of human consciousness. Chalmers refers to it as self-awareness; attention, voluntary regulation, intelligence, self-reflection, reporting, and consciousness (28). Since Fenigstein et al. created the Self-Consciousness Scale in the 1970s, the public and private

dimensions of self-consciousness have been researched and assessed (29). The orientation of the object of one's own concern differentiates the definition of private and public self-consciousness; i.e. either internal (the inner feelings and beliefs that one has about oneself) or external (the beliefs that one has about what other people might think about them). This distinction has been questioned (30), but several scholars have later accepted the differences between the emphasis on private and public self-characteristics (31). Nordah et al. used the SCS measure and exclusively concentrated on its private dimension (32). On the other hand, McKenzie and Hoyle addressed the existence of negative public and private dimensions of self-consciousness as a continuous and unyielding self-focused attention (33). Consciousness of the extent of mobile addiction has already been demonstrated in clinical research and practice. Specifically, smartphones are devices with psychological effects that broaden our mind's consciousness of how we share/experience emotions, memories, exchange knowledge and ideas, and reinforce our personal relationships (34).

The results of the study found a large increase in consciousness and a healthier mood in the days when students did not use their smartphones. The participants showed an improved consciousness on the second day of no cell phone use compared to the first and third days (35). Ulasvirta et al. reported that the consciousness of problems associated with frequent usage of smartphones has been underestimated (36). The few respondents described a frequent use of a smartphone as irritating, addicting, "a pit", and distracting (37). Cha and Seo demonstrated that social networking and consciousness of game overuse were the predictive factors for smartphone addiction (37). To this date, few studies have examined the awareness of performance among adolescents with smartphone

addiction and its relation to self-esteem and self-consciousness. An example is the study by Farrington et al., who highlighted the importance of task awareness, strategy awareness, and performance awareness to advance in academic performance (38). Otherwise, there is a lack of research focusing on the relationship between cell phone use, self-esteem, and self-consciousness among adolescents. Therefore, our research aimed to explore the complex and broad field of consciousness and self-esteem in the context of smartphone addiction, with the focus on adolescent girls.

2- MATERIALS AND METHODS

2-1. Participants and study method

Samples of this cross-sectional study included all the girl students in their first year of high school in Tehran, Iran, from 2019 to 2020. The sample size was measured by the Krejcie and Morgan method (n=140). Stratified random sampling was conducted with proportional allocation for collecting the samples. First, the list of high school students was extracted with proper coordination and the number of female students of each class and its ratio to the whole school were determined. Afterward, each school was allocated the samples at random. In the next step, the students who satisfied the inclusion criteria participated in the study on the basis of a random sampling procedure and sample size in each class. All the girl students in their first year of high school in Tehran were included. The students were excluded if they were unwilling to participate. The goals and the overall nature of the research, as well as the advantages of its implementation, were clearly explained to the participants and their consent to the implementation of scales and questionnaires was obtained. Informed consent was obtained from all students at the baseline and, subsequently, demographic information, the scale of

smartphone addiction, the Coopersmith self-esteem scale, and the self-consciousness scale (revised version) were used. The descriptive and inferential data were analyzed by SPSS software version 23.0 using mean and standard deviation (SD). A P-value less than 0.05 was considered as statistically significant. Normal distributions were investigated using Kolmogorov–Smirnov test.

2-2. Measuring tools

2-2-1. Smartphone Addiction Scale (SAS): SAS is a smartphone addiction scale consisting of 6 factors and 33 items, rated using the Likert six-point scale (from 1: strongly disagree to 6: strongly agree) and is primarily based on self-reporting. The six factors are: positive expectations, daily life disturbances, Internet-based relationships, overuse, withdrawal, and tolerance. The sum of the six subscale scores gives a total SAS ranking. The minimum and maximum SAS scores range from 48 to 288, with higher scores indicating higher dependency. Cronbach's alpha was 0.967 for the complete size. The calculations showed that all SAS subscales had a positive relationship with Young scales (Y-scales) (39). The sensitivity and specificity of the study were 80 percent and 86 percent, respectively. Cronbach's alpha coefficient was 0.93 for the complete scale. The test-retesting reliability of the SAS was good and had an interclass correlation of 0.996 (40). The calculation demonstrated a strong reliability for this analysis (Cronbach's alpha= .86).

2-2-2. Coopersmith Self-Esteem Scale (CSEC): This scale is composed of 58 objects, of which 8 (numbers 6, 13, 20, 27, 34, 41, 48, and 55) are lie detectors. The remaining 50 elements are divided into four subscales: general self-esteem, social self-esteem (peers), family self-esteem (parents), and educational self-esteem (schools). Objects are either zero

or one, meaning the minimum total score is nil and the average is 50. If a participant scores more than 4 from the 8 "false detector" objects, it shows the validity of the test is poor and the subject has attempted to represent themselves better than they actually are. The reliability of the questionnaire was found to be 0.90 and 0.92 for both male and female students, respectively (41).

2-2-3. The Self-Consciousness Scale – Revised (SCS-R): This scale is an updated edition of the SCS edition (42). It defines self-consciousness as the practice of being the focus of one's own thoughts and claims to quantify three constructs related to self-consciousness. The first is personal self-consciousness and is related to the internal direction of one's thoughts; while public self-consciousness is related to the outward direction of one's thoughts, or one's ideas and opinions about the effect of their existence on other people (30). The third subscale is called social anxiety and is known to be a subscale of public self-consciousness. It originally consisted of 23 objects measured on a five-point Likert scale. It was divided into three dimensions: Internal self-consciousness (9 items), public self-consciousness (7 items), and social anxiety (6 items) (total= 23 items). The Iranian edition used in this analysis includes 22 items and has been adopted by Zemestani et al. (43). It provided a satisfactory reliability score (Cronbach's= 0.73 and .89 for the test-retest) and validated the tri-factor structure in accordance with the original scale.

2-3. Ethical consideration

This study was approved by the Ethics Committee of Payame Noor University (with the IR.PNU.REC.1398.467 Code of Ethics).

2-4. Data Analyses

Descriptive and inferential data were analyzed using SPSS software version

23.0. Pearson correlation coefficient was used to measure multiple regression correlations. $P < 0.05$ was significant for all evaluations. The first step was to build a forecasting model by checking data assumptions. These four assumptions are normality, linearity, heteroscedasticity, and multi-collinearity. All of the variables in this paper had normal distribution.

3- RESULTS

The sample of the study included a total of 140 female students with the mean age = 15.81 years, $SD = 0.63$ (**Table.1**). As shown in **Table.2**, the mean of self-esteem

mean of students is (34.58 ± 11.81) . These results show that the mean of self-esteem of high school girl students is moderate. The subsets of this questionnaire includes the following: the private self-consciousness (21.66 ± 6.83) , public self-consciousness (16.90 ± 5.63) , social anxiety (12.65 ± 6.15) , and total self-consciousness (50.85 ± 11.83) . These results showed that the self-consciousness of students was lower than mean. The mean of the smartphone addiction is (28.55 ± 15.08) . These results show that the rate of student smartphone addiction was moderate.

Table-1: Frequency, Mean, Standard Deviation, Minimum and Maximum age of Participants.

Variable	Frequency	Mean \pm SD	Min	Max
Age	140	15.81 \pm 0.63	14	16

SD: Standard deviation.

Table-2: Frequency, Mean, Standard Deviation, Minimum and Maximum Scores of Students' Variables.

Variables	Mean \pm SD	Min	Max
Self-Esteem	34.58 \pm 11.81	18	60
Private Self-Consciousness	21.66 \pm 6.83	6	33
Public Self-Consciousness	16.90 \pm 5.63	5	33
Social anxiety	12.65 \pm 6.15	0	31
Total self-consciousness	50.85 \pm 11.83	30	60
Smartphone addiction	28.55 \pm 15.08	13	62

SD: Standard deviation.

As shown in **Table.3**, the inter-regression analysis showed that the multiple correlations between the dependent variable (smartphone addiction), and the remaining independent variables in the regression (self-esteem and self-consciousness), $MR = 0.423$ and $p < 0.004$, which is significant at $p < 0.05$, the

coefficient of determination $R^2 = 0.179$ and the adjusted coefficient of determination is $R^2_{\text{adjusted}} = 0.15$. That is to say, 18% of the variance in the criterion of smartphone addiction can be predicted through self-esteem and self-consciousness variables.

According to the regression equation with the above standard coefficients, self-esteem and self-consciousness have a positive effect on students' smartphone addiction. With each unit of self-esteem increase, students' smartphone addiction score decreased by -0.33. In addition, with each unit increase in self-consciousness,

students' smartphone addiction score decreased by -0.16. The results also showed that among the predictors, self-esteem with a beta coefficient of -0.33 is a better predictor for smartphone addiction compared to self-consciousness with a beta of -0.16.

Table-3: Multiple regression analysis with an enter method for the smartphone addiction in terms of Self-Esteem and Self-Consciousness (n= 140).

Predictor variables	β	SE	t	P-value	R	R ²	Adjusted R ²	F	P-value
self-esteem	-0.33	0.016	-2.54	0.014	.423	.179	.15	9.13	.001
Self-Consciousness	-0.16	0.16	-1.27	0.20					

R= correlation between the predicted values and the observed values of smartphone addiction, R²=coefficient of determination, Adjusted R²= adjusted coefficient of determination, SE: standard error.

As seen in **Table.4**, the correlation coefficient between self-esteem and smartphone addiction was $r = 0.394$ and $p = 0.002$, with the significance at $p < 0.05$. These results show that there is a significant negative relationship between self-esteem and smartphone addiction. That is, an increase in self-esteem scores is associated with a decrease in the score of

smartphone addiction among female students. As can be seen in **Table.4**, the correlation coefficient between self-consciousness and smartphone addiction was $r = -0.293$ and $p = 0.02$, respectively, with the significance at $p < 0.05$. These results show that there is a significant negative relationship between self-consciousness and smartphone addiction.

Table-4: Pearson correlation coefficient between self-esteem, self-awareness, and Smartphone addiction of girls' students.

Predictive variable	Smartphone addiction	
	Pearson correlation coefficient	P-value
Self-esteem	-0.394	0.02
Self-Consciousness	-0.293	0.02

4- DISCUSSION

This study aimed to investigate the relationship between smartphone addiction and self-esteem and self-consciousness among girl students. According to the regression equation with the above standard coefficients, self-esteem and self-consciousness had a positive effect on smartphone addiction among students. That is to say, 18% of the variance in the

criterion of smartphone addiction can be predicted through variables of self-esteem and self-consciousness. The results also showed that among the predictors, self-esteem with a beta coefficient of -0.33 is the best predictor for smartphone addiction compared to self-consciousness with a beta coefficient of -0.16. Moreover, these results show a significant negative relationship between self-esteem and self-

consciousness with smartphone addiction. Compared to previous studies (17, 18), we found that self-esteem was positively related to smartphone addiction. A multiple regression analysis showed that the extent of smartphone dependency is significantly correlated with low self-esteem (17). High levels of smartphone addiction have been associated with low self-esteem, isolation, depression, and shyness (44, 45). Another report proposed that people stigmatized for being overweight have lower levels of perceived self-esteem, which may lead to higher rates of Internet addiction (45).

Andreassen et al. have shown that a younger age, female gender, not being in a relationship, being a student, lower education, lower income, lower self-esteem, and narcissism are correlated with higher scores on smartphone addiction, explaining a total of 17.5 percent of the variance. The study suggested that adolescent self-esteem can partly explain the effect of student-to-student relationships on smartphone addiction. That is, the student-to-student relationship may positively predict self-esteem, and self-esteem may be an inverse predictor of smartphone addiction among adolescents (42). Furthermore, this indirect relationship was moderated by the need to be part of the second stage of the mediation process; so, the path of self-esteem was stronger in the context of a higher desire to be part of it.

In other words, a high level of self-esteem is a protective factor against smartphone addiction for students with an increased need to be part of it, while a protective effect has not been identified in students with a low level of need to be part of it (18). In previous studies on teenage smartphone addiction, school psychologists focused on group-relationship factors, while developmental psychologists emphasized individual well-being factors (e.g., self-esteem and

depression). Positive relationships with peers and sustained social contact can mitigate psychosocial issues such as anxiety and depression in adolescents under negative stress in their families (42). In addition, supportive peer relationships can provide social reinforcement and a sense of security and acceptance from others that cannot be received from parents (41). Another finding of our study showed a strong negative relationship between self-consciousness and smartphone addiction. Some studies (37, 40) have reported similar findings. Son has shown that class, academic year, self-awareness, and interpersonal skills have a significant effect on smartphone addiction. In their study (titled "Effects of Individual Differences, Consciousness-Knowledge, and Perception of Internet Addiction as a Health Risk on Willingness to Alter Internet Habits"), Jiang and Leung found that 12.3 percent of students may be at high-risk of potential Internet addiction disorders (IADs).

The high-risk group tended to be rather more temperamentally rigid, more concerned with facial disability, and more mindful of Internet addiction. As expected, users who were more flexible, stigma-resistant, mindful about identity loss, and in a low-risk culture were more likely to self-discipline their problematic use of the Internet (45). The explanation is that self-awareness enables adolescents to identify "time wasters" – online applications that consume more time than expected and notifications that are particularly distracting. More importantly, self-awareness helps teenagers understand why the Internet can be so persuasive and how they can substitute Internet use with positive and safe alternatives (30). They were aware that a repetitive use could lead to addiction; however, they were not aware of the extent of frequent and intensive use of a smartphone. If they are aware of the dangers posed by smartphone addiction,

they would take some action. The awareness of the severity of smartphone addiction can, therefore, play an important role in preventing negative effects of the overuse of smartphones on physical health, including cancer, brain tumors, nervous system disorders, immune system weakness, ear problems, wrist, neck and joint pain, fatigue, and sleep disorders (37). Conclusively, there is a need to raise consciousness in this demographic to prevent smartphone addiction early on. It is necessary that teenagers and their parents become more aware of the ill effects of smartphone overuse in a population of around 50 percent. Teenagers using smartphones should be engaged in activities to help them wash off the negative impacts of smartphone addiction. Also, relaxation methods and posture correction are also recommended (35).

4-1. Study Limitations

Due to its cross-sectional design, this study could not draw conclusions about the causal relationship between variables. It is also questionable whether its findings can be generalized to the clinical population as the study was conducted on a community sample. In addition, the analysis relied entirely on self-reported information. Further studies would benefit from the use of multiple reporting sources for more comprehensive and accurate data. Future research may benefit from testing the model in another sample, such as clinical samples, and use a more sensitive assessment tool to explore the associations established in this study.

5- CONCLUSION

The overall findings of our study may be useful in this field. The current study showed that the level of self-esteem in high school girl students was moderate and their self-consciousness lower than the average. Also, smartphone addiction

among students was moderate. That is to say, 18% of the variance in the criterion of smartphone addiction can be predicted through variables of self-esteem and self-consciousness variables. According to the regression equation, self-esteem and self-consciousness had a positive effect on students' smartphone addiction. The results also showed that, among the predictors, self-esteem with a beta coefficient is the best predictor for smartphone addiction compared to self-consciousness. These results show a significant negative relationship between self-esteem and smartphone addiction. In other words, an increase in self-esteem scores is associated with a decrease in the score of smartphone addiction in female students. Finally, the results showed a significant negative relationship between self-consciousness and smartphone addiction.

6- CONFLICT OF INTEREST: None.

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