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Emotion regulation strategies as predictors of internet addiction and smartphone addiction in adolescents

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Abstract

The current study aims to examine the strategies of adolescents' emotion regulation to predict the Internet addiction and the smartphone addiction. The study participants included totally 262 high school students with 132 females (50.4%) and 130 (49.6%) males. Students' ages ranged between 14 and 19 with average age being 16.57, SD=1.13. Emotion Regulation Scale for Adolescents, Young Internet Addiction Test-Brief Form, Smartphone Addiction Scale-Brief Form, and Personal Information Form were used as instruments to collect data in the current research. Based on the research findings, it was seen that external-dysfunctional emotion regulation, internal-dysfunctional emotion regulation, and internal-functional emotion regulation significantly predicted both the Internet addiction and the smartphone addiction; however, external-functional emotion regulation predict neither of the variables on significant levels. Emotion regulation strategies overall explained the 38% of variance in the Internet addiction and 19% of that in the smartphone addiction. The current research findings were discussed and interpreted, and suggestions were included for relevant researchers.

Keywords: emotion regulation; internet addiction; smartphone addiction; adolescents

1. Introduction

1.1. Internet addiction

Today, the possibilities, provided by the Internet technologies to individuals, have increased and Internet has begun to play an intermediary role in organizing many activities in daily life. As in all societies, in Turkey too, the number of Internet users, diversity of the users' purposes in using the Internet and their duration of use are gradually increasing. Internet use, particularly among children and youth, increases fast (Ceyhan, 2011). This technology, beside its educational aspect for children and youth, is worrying with inappropriate content and purpose of use (Yüksel and Baytemir, 2010) and it can cause some problems associated with its use and lead to addiction (Şimşek, Akça, and Şimşek, 2015). The phenomenon that initially used to be termed Internet addiction disorder is now mostly called problematic Internet use or compulsive Internet use. These overlapping terms refer to problematic or pathologic computer use. Internet addiction is associated with dealing with Internet excessively and uncontrollably (Juneja and Sethi, 2015). Young (1999) evaluated the Internet addiction with eight criteria and emphasized that Internet addiction may be mentioned when five of these criteria are found in an individual. These criteria are listed as follows: 1 – excessive thinking and mental activity about the Internet, 2- needing to use the Internet increasingly in order to get satisfaction, 3- continuous failure to leave or decrease Internet use, 4- feeling unrest, being moody, and feeling irritable and depressed when the Internet is not used, 5- being online longer than planned, 6- experiencing the loss of an important relationship, job, education or career opportunity because of the Internet addiction, 7- lying to family members and others

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about the time online, and 8- using the Internet as a way of running away from problems or decreasing negative feeling (emotions such as helplessness, guilt, anxiety, and depression).

In addition to advantages making life easier, increasing time on the Internet brings along risks such as being addicted to the Internet particularly for adolescents (Ceyhan, 2011; Juneja and Sethi, 2015). Studies in the relevant literature found a direct relationship between longer time online and Internet addiction (Ceyhan, 2011; Derin, 2013; Üneri and Tanıdır, 2011). As of November 2015, the number of people using the Internet in Turkey was found to be 46.282.850. This is 59.6% of the population in the country (http://www.internetworldstats.com/stats4.htm). Based on other data, Internet use in Turkey was mostly prevalent among people ages 16 – 24 with a rate of 77% in 2015 (http://www.tuik.gov.tr/PreTablo.do?alt_id=1028). Thus, adolescents appear to use the Internet and computer more than adults do. In a study, 7% of high school adolescents were found to be problematic Internet users (Çam and Nur, 2015). In another study, the rate of problematic Internet users was found to be 3.7 (Babacan Gümüş, Şıpkın, Tuna, and Keskin, 2015). Örsal, Örsal, Ünsal, and Özalp (2013), on the other hand, discovered as 8.3% rate for Internet addiction. Taylan and Işık (2015) found the rate of Internet-addicted adolescents as 4.1% and the rate of those on the border of Internet addiction as 28.5%. Durak, Batıgün and Kılıç (2011) stated that 18.89% of children could be described as Internet addicts. Büyükşahin Çevik, and Çelikkaleli (2010), on the other hand, found that male adolescents had higher levels of Internet addiction than female adolescents did.

Particularly in adolescence, problems associated with pathologic Internet use can be experienced (Şimşek et al., 2015). Excessive use of the Internet may, at the same time, lead to distress in individuals (Juneja and Sethi, 2015). Hence, Internet addiction and problematic Internet use were found to be associated with various mental health indicators, in studies within relevant literature. In Ata, Akpınar, and Kelleci's (2011) study, it was found that as students' problematic Internet use increased, their anger statements became more negative. In some studies, a positive relationship between Internet use and hopelessness (Şimşek et al., 2015), depression (Çam and Nur, 2015; Örsal et al., 2013; Üneri and Tanıdır, 2011), anxiety (Çam and Nur, 2015), tendency towards violence (Babacan Gümüş et al., 2015), and loneliness and shyness (Eroğlu, Pamuk, and Pamuk, 2013) was discovered. In Durak et al.'s (2011) study, on the other hand, Internet addiction was found to be associated with neuroticism, anxiety, and somatization. In a another study conducted by Derin (2013), students with high levels of Internet addiction were found to have negative expectation of future and low level of subjective well-being. In Özdemir, Kuzucu, and Ak's (2014) study, significant relationships were found between depression, loneliness, low self-control, and Internet addiction.

1.2. Smartphone addiction

Use of smartphones has become very widespread in recent years. Smartphones are considered useful technology devices as they provide efficiency and convenience in our daily lives (Zhang, Chen, and Lee, 2014). In a study conducted by Yazıcı (2015), 85% of students were found to use smartphones. Students stated that they use the social networks very often and the smartphones for purposes such as easy communication, free texting, photo-sharing, talk, entertainment, and obtaining and sharing information. Mobile phones, initially used for talk and text functions, have today become essential devices, with the addition of Internet access and many other features. Therefore, the use of smartphones among youth is fast gaining prevalence. This fast increase brings along smartphone addiction and problematic use as well (Demirci, Orhan, Demirdaş, Akpınar, and Sert, 2014; Şata, Çelik, Ertürk, and Taş, 2016; Yazıcı, 2015). In a research, Gökçearslan, Kuşkaya Mumcu, Haşlaman, and Demiraslan Çevik (2016) determined that increase in the use of smartphones increased addiction. Excessive use of smartphones has indicators similar to those of alcohol and drug addiction. Smartphones are devices that enable people to be continuously online and interactive (Park and Lee, 2014). In such case, overusing

smartphones may harm people's functionality and lead to a psychological and behavioral addiction (Zhang et al., 2014). Leung's (2008) study showed that the possibility of becoming a smartphone addict for adolescents seeking sensation due to boredom was higher. In the said research, addicts had low levels of self-esteem at the same time. In a study conducted, Desouky (2016) determined the smartphone addiction rates in Saudi adolescents as 11.6% and in Egyptian adolescents as 6.1%. Park and Lee (2014), on the other hand, found the smartphone addiction rate in Korea as 8.7%. They determined that smartphone addicts used social network websites and chats extensively. In addition, persons with high levels of addiction were found to have high levels of addiction in social relationships. Individuals with high levels of smartphone addiction were found to have high levels of shyness, loneliness, and depression. In another study, Thomée, Härenstam, and Hagberg (2011) stated that individuals using smartphones excessively had more stress, sleep disorders, and depression than those using smartphones less.

In Kaya and Argan's (2015) study investigating the meaning of smartphones for youth in leisure time, the themes prevalent were boredom, preoccupation, avoidance, socializing and entertainment. Tan, Pamuk, and Dönder (2013) found positive relationships between smartphone addiction and loneliness. They stated that addicts suffered more from loneliness. Desouky (2016) found a positive relationship between smartphone addiction and Internet addiction. Kutlu, Savcı, Demir, and Aysan (2016) found a positive relationship between Internet addiction and smartphone addiction and loneliness; and a negative relationship between Internet addiction and life satisfaction and happiness. Enez Darçın, Köse, Noyan, Murmedov, Yılmaz, and Dilbaz (2016), on the other hand, stated that increased levels of social anxiety and loneliness in individuals lead to increased smartphone addiction. In Samaha and Hawi's (2016) study, a positive relationship between smartphone addiction and perceived stress and a negative relationship between smartphone addiction and life satisfaction were found.

1.3. Emotion regulation

According to Macklem (2008), our emotion regulation activity included reducing, increasing, or maintaining a certain emotion (p.3). Emotion regulation is about an individual's sustaining, intensifying, or inhibiting the emotion, based on the individual's purposes (Gross, 1998, 2002; Gross and Thompson, 2007). Emotion regulation refers to the processes influencing the emotions that individuals have, when they had these emotions, how they experience these emotions, and how they express these emotions (Gross, 1998, 2008; Rottenberg and Gross, 2003). Emotion regulation consists of active attempts that people have in order to manage their emotional situations. In the broadest sense, emotion regulation includes the regulation of all emotionally-charged situations pertaining to moods, stress, and positive and negative affect as well (Koole, 2009). The basic function of emotion regulation is to naturally modify the emotional reaction on adequate levels (Gross, 2002). Emotion regulation works on people's emotions. Effects of emotion regulation can be observed on all emotional reactions including behaviors, physiology, thoughts, and feelings. Emotion regulation may influence various aspects of emotional process as well as the output direction of the emotional reactions such as their harmony, intensity, awareness, and target orientation (Koole, 2009).

According to Howe (2005), emotion regulation is the basic component of a well mental health. Hence, a review of studies in the relevant literature indicates that individuals' strategies of emotion regulation are associated with various indicators of mental health. Emotion regulation and self-esteem (Freire and Tavares, 2011; Min, 2013) among these were found to be associated with, other than the indicators of psychological well-being such as psycho-social well-being, emotional well-being, subjective well-being (Schraub, Turgut, Clavairoly, and Sonntag, 2013; Verzeletti, Zammuner, Galli, and Agnoli, 2016; Yıldız, 2014), and positivity (Duy and Yıldız, 2015) as well as psycho-pathologic problems such as rumination, depressive and psycho-somatic symptoms (Aldao, Nolen-Hoeksema, and Schweizer, 2010; Beblo,

Fernando, Klocke, Griepenstroh, Aschenbrenner, and Driessen, 2012; Duy and Yıldız, 2013; Min, 2013). On the other hand, emotion regulation difficulties were found to have significant relationships with loneliness and substance abuse (Nikmanesh, Kazemi, and Khosravi, 2015; Verzeletti et al, 2016). According to Mineka and Sutton (1992), problems, associated with emotions or emotion regulation, define more than 75% of psycho-pathology diagnosis criteria on DSM-IV. Such situations as mood and anxiety disorders are mainly associated with inability to regulate emotions. According to Howe (2005), inability to regulate emotions is often a precursor of mental health problems. Children, unable to regulate emotions, become aggressive, unfriendly, helpless, introverted, lonely with social anxiety, and over-cautious in interpersonal relationships.

1.4. Addictions and emotion regulation

Relationships between addictions and emotion regulation are found. Macklem (2008) emphasizes that addictions are associated with inability to regulate emotions. According to Gross (2007), suppression, among emotion regulation strategies, is not only limited to emotions; at the same time, suppressing thoughts is a way of coping used against addictions. Addicts attempt to control their desires by suppressing their own thoughts. In a study, Hormes, Kearns, and Timko (2014) determined that individuals with high levels of Internet addiction have difficulties in regulating emotions. Caplan's (2010) research showed that there was a negative relationship between Internet addiction and functional emotion regulation. Yu, Kim, and Hay (2013) determined that people using Internet problematically had difficulties regulating their emotions. Oktan's (2011) study showed a relationship between Internet addiction and skills of emotion management. Mood regulation was indicated to have a significant effect on smartphone addiction in relevant literature (Zhang et al., 2014; Zhang, Chen, Zhao, and Lee, 2014). In another study, Lee, Cho, Kim, and Noh (2015) stated that people with high levels of smartphone addiction had lower levels of self-regulation and flow. Elhai, Levine, Dvorak, and Hall (2016) found significant-level relationships between problematic smartphone use and anxiety and depression. Suppression, as a dysfunctional strategy of emotion regulation, mediated between problematic smartphone use and anxiety. On the other hand, no significant relationship was found between re-appraisal and problematic smartphone use. Hoffner and Lee (2015) found that people using smartphones effectively regulated negative emotions by using these technological devices. As can be seen in the relevant literature, there are significant relationships between emotion regulation and Internet addiction and smartphone addiction.

1.5. Purpose and significance

Today, Internet and smartphone uses become indispensable aspects of life. Considering particularly adolescents, born into today's period called information age, it may be said that Internet and smartphone use by this age group is more frequent. It is most probable that this frequency of use may bring along addiction. On the other hand, for adolescents, it is greatly important to have emotion regulation skills that may be considered among the criteria for being mentally healthy or unhealthy. According to Gross (2002), successful emotion regulation is among great difficulties of life. Macklem (2008), on the other hand, stated that developmental tasks of childhood and adolescence required successful emotion regulation and the emotion regulation skill became physical and mental health. In adolescence, considering the adolescents' emotional ups and downs, it is possible that the emotion regulation strategies used may be influential on adolescents' Internet addiction and smartphone addiction. In addition, determining the causal relationships between emotion regulation strategies and adolescents' Internet addiction and smartphone addiction may shed light on the preventive and intervention studies by experts such as psychological counselors, psychologists, and psychiatrists within the mental health sphere. Also, no study investigating the relationships between emotion regulation

strategies and smartphone addiction and Internet addiction, within the relevant national and international literature, was found. Based on this, the current study aimed to investigate the predictive relationships between emotion regulation strategies used by adolescents and their smartphone addiction and Internet addiction.

2. Method

2.1. Study design

A relational design was used in the current study. According to Heppner, Wampold, and Kivlighan (2013), relational designs are used for investigating the relationships between two or more variables. In the current study, the predictive effect of emotion regulation strategies (predicting variables) over Internet addiction (predicted variable) and smartphone addiction (predicted variable) was investigated through regression analysis.

2.2. Participants

The study participants included a total of 262 high school students with 132 females (50.4%) and 130 (49.6%) males, attending three high schools in the city of Adıyaman. Students' ages ranged between 14 and 19 with average age being 16.57, SD=1.13. Research participants were selected through convenience sampling.

2.3. Instruments

Emotion Regulation Scale for Adolescents (ERSA): Adaptation study into Turkish for ERSA, developed by Phillips and Power (2007), was conducted by Duy and Yıldız (2014). The instrument consists of 17 items scored on a 5-point scale (1=Never; 5=Always). Factor load values of ERSA were found as .53 and .77 through explanatory factor analysis. The scale with four dimensions explained 51.48% of the total variance. Fit indices obtained by the confirmatory factor analysis were found as follows: χ^2= 517.94, df= 129, χ^2/df= 4.01, RMSEA= .06, RMR= .09, SRMR= .06, GFI= .94, AGFI= .92, CFI= .93, NFI= .91 and NNFI= .92. The scale to measure adolescents' strategies of emotion regulation has four sub-dimensions described as internal-functional emotion regulation (α= .75), external-functional emotion regulation (α= .57), internal-dysfunctional emotion regulation (α= .71), and external-dysfunctional emotion regulation (α= .74). Total score obtained on a sub-dimension indicates the frequency of using the relevant strategy of emotion regulation: higher scores mean more frequent and lower scores mean less frequent uses. The results of test-retest for reliability were on satisfactory levels.

Young Internet Addiction Test-Brief Form (YIAT-BF): The YIAT-BF, developed by Young (1998) and converted to brief form by Pawlikowski, Altstötter-Gleich and Brand (2013), is a 5-point Likert type (1=Never; 5=Very Often) scale with 12 items. Adaptation studies into Turkish for the scale were conducted by Kutlu et al. (2016). Explanatory factor analysis indicated that the scale explained 39.52% of the total variance in university students and 48.9% of that in adolescents. For the confirmatory factor analysis (CFA) with university students, data collected on 350 students were used. Fit indices values associated with EFA were found as follows: χ^2=144.93, df=52, RMSEA=.07, RMR=.70, GFI=.93, AGFI=.90, CFI=.95 and IFI=.91. The YIAT-BF factor loadings were listed between .33 and -.67. For CFA in adolescents, data collected on 220 adolescents were used. Through CFA, fit indices values of the YIAT-BF model were found as follows: χ^2=141.93, df=51, RMSEA=.08, GFI=.90, CFI=.90 and IFI=.90. Factor loads of the YIAT-BF in adolescents ranged between .49 and -.71. Cronbach's alpha coefficient for the scale was found as .91 in university students and .86 in adolescents. Correlation coefficient for test-retest reliability was found as .93 in university students and .86 in adolescents.

Smartphone Addiction Scale – Brief Form (SAS-BF): SAS-BF, developed by Kwon, Kim, Cho, and Yang (2013) to measure smartphone addiction risk in

adolescents, consists of 10 items, with a 6-point (1=Strongly Disagree; 6=Strongly Agree) Likert type scale. The adaptation study into Turkish for the scale was conducted by Noyan, Darçın, Nurmedov, Yılmaz, and Dilbaz (2015). Through explanatory factor analysis, scale factor load values were found to be between .49 and .83. Significant-level relationships were found between the scores obtained in order to examine the concurrent validity of SAS-BF and the Internet addiction. Cronbach's alpha coefficient to indicate the SAS-BF reliability was found to be .87. Test-retest reliability coefficient was .93.

Personal Information Form: socio-demographic characteristics such as gender, age, and attendance years were obtained through the personal information form.

2.4. Procedure

In the data analysis, first of all, the hypotheses based on the regression analysis were examined. Kurtosis and skewness values were found to be between +1 and -1 as accepted values. For the four independent variables, the Mahalanobis critical value is 18.47 (Pallant, 2011). As the values obtained in the research did not exceed the critical value, the data did not include outliers. Correlation values, found to be not very high, between the research variables indicated no multi-collinearity problems. In addition, tolerance and VIF values were found within normal limits. Also, the Cook's distances were determined below 1, the critical value (Tabachnick and Fidell, 2013). Based on this, it was seen that research data were normally distributed and hypotheses in the regression analysis, as a parametric analysis, were met and its use was considered possible.

The predictive effect of grade levels, gender, and age variables on Internet addiction and smartphone addiction was examined through multiple linear regression analysis. As the predictive effect of grade levels, gender, and age variables on Internet addiction and smartphone addiction were not on significant levels, these variables were included in later analyses. Predictive effects of emotion regulation strategies on Internet addiction and smartphone addiction were examined separately through multiple linear regression analyses. Descriptive statistics, Pearson correlation coefficient, and multiple linear regression analyses were used in the current research to analyze the data. Significance level in the current research was set as .05. IBM SPSS 22.0 software was used in the current research for data analysis.

3. Results

Table 1 includes Pearson correlation analysis results, among the research variables, and descriptive statistics.

Table 1. Bivariate correlations and descriptive statistics of study variables

Variables	1	2	3	4	5	6
1. IFER	---					
2. EDER	-.23**	---				
3. IDER	.01	.42**	---			
4. EFER	.09	.33**	.30**	---		
5. Internet addiction	-.26**	.53**	.47**	.21**	---	
6. Smartphone addiction	-.20**	.37**	.32**	.15*	.61**	---
Mean	14.92	12.05	14.87	12.75	31.55	31.37
SD	3.15	4.83	3.99	3.03	10.33	13.47
Skewness	-.34	.38	.19	.13	-.01	.09
Kurtosis	-.12	-.70	-.08	.03	-.58	-1.03

*$p<.05$, **$p<.01$

IFER: Internal-Functional Emotion Regulation, EDER: External-Dysfunctional Emotion Regulation, IDER: Internal-Dysfunctional Emotion Regulation, EFER: External-Functional Emotion Regulation

Based on the results obtained through correlation analysis, there was a significant low-level negative relationship between internal functional emotion regulation and Internet addiction and smartphone addiction. A significant moderate-level positive relationship was found between external dysfunctional emotion regulation and Internet addiction and smartphone addiction. There was a significant moderate-level positive relationship between internal dysfunctional emotion regulation and Internet addiction and smartphone addiction. A significant low-level positive relationship was found between external functional emotion regulation and Internet addiction and smartphone addiction. In addition, there was a significant moderate-level positive relationship between Internet addiction and smartphone addiction.

Standard multiple regression analysis was conducted in order to determine whether there was any predictive effect of grade level, gender, and age variables on Internet addiction before testing the predictive effect of emotion regulation strategies on Internet addiction. The results are included in Table 2.

Table 2. Multiple linear regression analysis results of demographic variables on Internet addiction

Variables	B	β	t	p
Grade level	-1.97	.21	-.1.37	.11
Age	-.51	-.06	-3.3	.67
Gender	.39	.02	-6.62	.76

*p<.05, **p<.01, R^2=.03, *Adj.* R^2=.02

Based on the multiple regression analysis, it was seen that the model including the demographic variables predicting the Internet addiction was not on significant levels [$F_{(3\text{-}258)}$= 2.41, p>.05] and demographic variables explained 3% of the variance on Internet addiction (R=.16, R^2=.03).

Standard multiple regression analysis was conducted in order to determine the predictive effect of emotion regulation strategies on Internet addiction. The results are included in Table 3.

Table 3. Predictive role of emotion regulation strategies on Internet addiction

Variables	B	β	t	R	R^2	F
IFER	-.59	-.18	-3.50***	.62	.38	39.65***
EDER	.73	.34	5.90***			
IDER	.83	.32	5.79***			
EFER	.06	.02	.33			

*p<.05, **p<.01, ***p<.001

IFER: Internal-Functional Emotion Regulation, EDER: External-Dysfunctional Emotion Regulation, IDER: Internal-Dysfunctional Emotion Regulation, EFER: External-Functional Emotion Regulation

According to the results of standard multiple regression analysis, there was a moderate-level relationship between overall emotion regulation strategies and Internet addiction (R= .62, R^2= .38, p<.05). Emotion regulation strategies overall explained 38% of variance on Internet addiction. Also, the model was seen to be on significant levels [$F_{(4,\ 257)}$= 39.65, p<.001]. Based on the standardized regression coefficient (β), relative order of importance for predicting variables on Internet addiction was as follows: EDER (β= .34), IDER (β= .32), and IFER (β= -.18). Upon examining the t-test results associated with significance of regression coefficients, IFER (t= -3.50, p<.001), EDER (t= 5.90, p<.001), and IDER (t= 5.79, p<.001) were found to be significantly predictive on Internet addiction. However, EFER (t= .33, p>.05) did not have a significant effect on Internet addiction.

Standard multiple regression analysis was conducted in order to determine whether there was any predictive effect of grade level, gender, and age variables on smartphone addiction before testing the predictive effect of emotion regulation strategies on smartphone addiction. The results are included in Table 4.

Table 4. Multiple linear regression analysis results of demographic variables on smartphone addiction

Variables	B	β	t	p
Grade level	2.95	.24	1.82	.07
Age	-1.28	-.11	-.81	.42
Gender	-1.54	-.06	-.93	.36

*p<.05, **p<.01, R^2=.03, *Adj.* R^2=.02

Based on the regression analysis, the model including the demographic variables predicting smartphone addiction was not found to be on significant levels [$F_{(3\text{-}258)}$= 2.28, p>.05] and the demographic variables explained 3% of variance on smartphone addiction (R=.16, R^2=.03).

Standard multiple regression analysis was conducted in order to determine the predictive effect of emotion regulation strategies on smartphone addiction. The results are included in Table 5.

Table 5. Predictive role of emotion regulation strategies on smartphone addiction

Variables	B	β	t	R	R^2	F
IFER	-.63	-.15	-2.52**	.43	.19	14.85***
EDER	.66	.24	3.55***			
IDER	.73	.22	3.38***			
EFER	.08	.02	.28			

*p<.05, **p<.01, ***p<.001

IFER: Internal-Functional Emotion Regulation, EDER: External-Dysfunctional Emotion Regulation, IDER: Internal-Dysfunctional Emotion Regulation, EFER: External-Functional Emotion Regulation

Based on the standard multiple regression analysis, there was a moderate-level relationship between overall emotion regulation strategies and smartphone addiction (R= .43, R^2= .19, p<.05). Emotion regulation strategies overall explained 19% of variance on smartphone addiction. Also, the model was seen to be on significant levels [$F_{(4,\ 257)}$= 14.85, p<.001]. Based on the standardized regression coefficient (β), relative order of importance for predicting variables on smartphone addiction was as follows: EDER (β= .24), IDER (β= .22), and IFER (β= -.15). Upon examining the t-test results associated with significance of regression coefficients, IFER (t= -2.52, p<.01), EDER (t= 3.55, p<.001), and IDER (t= 3.38, p<.001) were found to be significantly predictive on smartphone addiction. However, EFER (t= .28, p>.05) did not have a significant effect on smartphone addiction.

4. Discussion

Based on the results obtained in the current study investigating the predictive effects of emotion regulation strategies on Internet addiction and smartphone addiction, the following were found: external dysfunctional emotion regulation, internal dysfunctional emotion regulation, and internal functional emotion regulation significantly predicted both Internet addiction and smartphone addiction, however, external functional emotion regulation did not significantly predict neither independent variable. Overall emotion regulation strategies explained 38% of variance on Internet addiction and 19% of that on smartphone addiction.

Based on the current study results, emotion regulation strategies were found to be more effective on Internet addiction than they were on smartphone addiction.

According to Koole (2009), people's efforts to regulate emotions serve hedonic needs to increase pleasure and decrease suffering. Thus, adolescents may be regulating their emotions by using smartphones and Internet in order to inhibit the suffering and boredom based on their own negative emotions. On the other hand, due to experiencing positive emotions based on the pleasure stemming from the addiction, they may be intensively using smartphone and Internet to sustain the pleasure from emotions. Griffiths (1999) emphasized that an Internet user develops tolerance increasing the time online, to obtain the mood that initially short-lived. Hence, adolescents with high levels of Internet and smartphone addiction may be putting in efforts to regulate their emotions by using the Internet and smartphone excessively upon developing tolerance.

Adolescents' addiction may be increasing because they are not able to regulate their emotions against the daily stress. Adolescents with smartphone and Internet addiction may be using smartphones and Internet more often to develop more addiction as a way to avoid their negative emotions. According to Elhai et al. (2016), individuals with problematic smartphone use are probably using the smartphones excessively due to inadequacy of emotion regulations experienced. In addition, they emphasize that problematic smartphone use may be, although ineffective, a technique for coping with and regulating negative emotions. Based on such explanation, individuals with high levels of smartphone and Internet addiction may be developing addiction towards smartphones and Internet particularly due to being unable to regulate negative emotions. Also, as in the explanation by Gross (1998) about "attentional deployment" as an emotion regulation strategy, through smartphone and Internet use, adolescents may be relaxing by focusing on smartphones and Internet instead of their negative emotions and, thusly, increasing the use of smartphone and Internet. In this respect, Young (1999) describes the behaviors associated with Internet use as ways of preventing problems, emotional relaxation, and mental escape involved in alcohol, substance, gambling, and eating disorders.

Griffiths (1999) pointed out to mood changes in addicts when explaining the Internet addictions. For instance, s/he emphasizes that individuals with high levels of Internet addiction experience liveliness when online or such individuals feel the soothing effect of escape or being indifferent when online for hours. Thus, individuals with high levels of Internet and smartphone addiction may be using smartphones and the Internet to regulate emotions without noticing time.

In response modulation as an emotion regulation strategy, for instance, individuals may try to reduce physiologic and experiential elements of negative emotions through exercising or rest. In addition, they may alter the mood experiences through use of alcohol, smoking, and drugs (Gross, 2008; Gross and Thompson, 2007). Probably, adolescents with smartphone and Internet addiction also may not be able to regulate their emotions and may be intensively using smartphone and Internet in order to reduce the negative physiological and experiential elements when negative emotions are experienced. In this respect, Young (1999) emphasized, as an indicator of addiction, that addicts use the Internet in order to get away from their problems or to reduce negative emotions such as helplessness, guilt, anxiety, or depression. On the other hand, according to Griffiths (1999), an Internet addict may suffer from shaking and feel depressed and irritable when prevented from being online. Hence, it is possible that adolescents' moods may be changed based on smartphone and Internet use and this may affect their emotion regulation. According to Juneja and Sethi (2015), most adolescents log on social networks and Internet in order to manage non-pleasant emotions such as loneliness, stress, depression, and anxiety. Individuals would like to seek a way of freeing from their problems and stress and to obtain fast relaxation through Internet on a bad day because the researchers emphasize that individuals may temporarily eradicate/evaporate their emotions such as stress, loneliness, depression, and boredom, in the virtual-reality environment. On the other hand, LaRose, Lin, and Eastin (2004) stated that individuals with high levels of Internet addiction can manage low levels of self-regulation. It may generally be said that findings of studies and theoretical explanations in the relevant literature seem to support the findings of the current research.

4.1. Limitations

One limitation in the current research is about the participating adolescents that never been clinically diagnosed for mental health. Thus, study findings may be generalized to adolescents in similar situations. Another limitation is about the sampling conducted only in one city and region. Hence, caution must be practiced when generalizing the study findings to other adolescents living in different regions. Therefore, findings from the current research must be supported with new studies on different adolescents. Not preferring the probability sampling methods in selecting the participants can also be stated as another limitation.

5. Conclusion and suggestions

In conclusion, it was found that variables of grade levels, age, and gender significantly predicted neither the smartphone nor the Internet addiction. Another result indicated that external dysfunctional emotion regulation, internal dysfunctional emotion regulation, and internal functional emotion regulation in adolescents significantly predicted both the Internet and the smartphone addiction. Based on these results in the current study, it may be useful to create psycho-educational programs based on cognitive-behavioral therapy particularly for adolescents with high levels of addiction, in order to let them gain functional emotion regulation skills. In addition, cognitive-behavioral therapy based individual and group psychological counseling sessions may be held to reduce addiction. Psychological help services by experts to show how to regulate emotional emptiness and negative emotions for adolescents with high levels of smartphone and Internet addiction may be suggested when they exhibit withdrawal symptoms

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