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BAHCESEHIR UNIVERSITY

RELATIONSHIP OF PROBLEMATIC INTERNET USE WITH ALEXITHYMIA, EMOTION REGULATION, AND IMPULSIVITY

Master's Thesis

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CLINICAL PSYCHOLOGY

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ABSTRACT

RELATIONSHIP OF PROBLEMATIC INTERNET USE WITH ALEXITHYMIA, EMOTION REGULATION, AND IMPULSIVITY

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Internet is taking up a major importance in everyday life. The rapid growth of internet technologies and increasing prevalence rates are causing some concerns about excessive use of the internet. Therefore, there is an increased attention to internet use from academic and non-academic audiences across different countries in order to find out internet's role in our lives and understand its excessive use.

"Problematic internet use" or "internet addiction" is studying as a behavioral addiction in the literature. From this perspective, it can be defined as excessive use of the internet which gives some benefits to the individual, such as escaping from problems or regulating the mood and cause some negative consequences on the individual's life, such as withdrawal from social interactions in real life or worsening performance in work/school.

This study aims to study the role of some psychological factors, which are found related to the alcohol-substance and behavioral addiction, on internet addiction. Literature showed that individuals high in alexithymia, who have difficulty identifying subjective emotional states and a limited ability to communicate these feelings to others, result in the struggle and inability to effectively regulate emotions. Additionally, limited ability to deal adequately with affective states may lead individuals to engage in impulsive acts or compulsive behaviors, rather than rationally planned activities, in order to regulate distressing emotional states.

Based on these views, it was hypothesized that alexithymia, difficulties in emotion regulation, and impulsivity predicts the internet addiction; alexithymia is related to internet addiction through emotion regulation; impulsivity strengths the relationship between emotion regulation and internet addiction.
In order to test these hypotheses, Internet Addiction Test, Toronto Alexithymia Scale, Difficulties in Emotion Regulation Scale, and UPPS Impulsive Behavior Scale were used. Data gathered from 100 high school students (aged between 14 and 18) and 105 college students (aged between 19 and 30).
Results showed that alexithymia, difficulties in emotion regulation, and impulsivity predicted the internet addiction and emotion regulation mediated the relationship between alexithymia and internet addiction.

Keywords: Internet Addiction, Problematic Internet Use, Alexithymia, Emotion Regulation, Impulsivity

ÖZET

PROBLEMLİ İNTERNET KULLANIMININ DUYGU DÜZENLEME. ALEKSİTİMİ VE DÜRTÜSELLİK İLE İLİŞKİSİ

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İnternetin gittikçe hayatımızın merkezine yerleşmesi ve kullanım yaygınlığının artması, bu konuyla ilgili merak uyandırmaktadır ve aynı zamanda onun aşırı kullanımını gündeme getirmektedir. Bu yüzden internetin hayatımızdaki rolünü araştırmak ve problemli kullanımın mekanizmalarını anlamak için yapılan bilimsel çalışmalar gün geçtikçe artmaktadır.

"Problemli internet kullanımı" ya da "İnternet bağımlılığı" literatürde bir tür "davranışsal bağımlılık" olarak görülmektedir. Bu pencereden bakıldığında internet bağımlılığı; kısa vadede kişiyi yatıştırma, duygu-durumunu düzenleme gibi kazançlar sağlayan ve uzun vadede kişinin hayatında olumsuz sonuçlara yol açan, aşırı internet kullanımı olarak tanımlanmaktadır.

Bu çalışma, literatüre göre davranışsal bağımlılıklar, alkol-madde bağımlılıklarında sıkça görülen bazı psikolojik olguların, internet bağımlılığında ne kadar rolü olduğu araştırmayı amaçlamaktadır. Yapılan araştırmalarda, aleksitimi özelliği yüksek olan, kendi ruhsal durumlarını tanımakta ve ifade etmekte problem yaşayan kişilerin, aynı zamanda duygularını etkin bir biçimde regüle etmekte de zorlandıkları, duygu düzenlemede güçlükler yaşadıkları görülmektedir. Ek olarak, kişi yoğun bir duygu yaşadığında, bunu tam olarak tespit edemiyor ve etkin biçimde düzenleyemiyorsa, bu duyguları hafifletebilmek için dürtüsel bazı davranışlara yönelebilmektedir.

Bu görüşlere dayanarak, bu çalışma için, yüksek aleksitiminin, duygu düzenleme güçlüğünün ve dürtüselliğin internet bağımlılığını yordayacağı; aleksitiminin internet bağımlılığıyla duygu düzenleme üzerinden ilişkili olacağı; dürtüselliğin duygu düzenleme güçlüğü ile internet bağımlılığı arasındaki ilişkiyi güçlendireceği hipotezleri kurulmuştur.

Kurulan hipotezleri test etmek için İnternet Bağımlılığı Ölçeği, Toronto Aleksitimi Ölçeği, Duygu Düzenleme Güçlüğü Ölçeği ve UPPS Dürtüsel Davranış Ölçeği kullanılmıştır. Araştırmanın örneklemini İstanbul'da okuyan, 14-18 yaşları arasında 100 lise öğrencisi ve 19-30 yaşları arasında 105 üniversite öğrencisi oluşturmaktadır.

Sonuçlar aleksitiminin, duygu düzenleme güçlüğünün ve dürtüselliğin internet bağımlılığını yordayıcılığını ve duygu düzenlemenin aleksitimi-internet bağımlılığı ilişkisindeki aracı rolünü doğrulamıştır.

Anahtar Kelimeler: İnternet Bağımlılığı, Problemli İnternet Kullanımı, Aleksitimi, Duygu Düzenleme, Dürtüsellik

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1. INTRODUCTION

1.1. STATEMENT OF THE PROBLEM

Internet is taking up a major importance in everyday life. As it is becoming easier to access, the prevalence of internet use has dramatically increased, especially among youth. An internet usage research in US showing that 95% of the teens aged between 14 and 17, 95% of young aged between 18 and 29, and 89% of the adults aged 30 and 49 are regularly using internet. Ratios are 77% for ages between 50 and 64, and 52% for people aged 65 and above. Same study showing that 29% of the teens ages between 14-17 (24% of the boys, 34% of the girls) access internet mostly on cell phones, whereas this ratio is 15% for adults. (Madden, Lenhart, Duggan, Cortesi, & Gasser, 2013). A research in Turkey discloses prevalence of internet use as 69% for ages 16 to 24, 59% for ages 25 to 34, 46% for ages 35 to 44, 25% for ages 45 to 54, 11% for ages 55 to 64, and 4% for ages 65 and above (Doğan, 2013).

This rapid growing of internet technologies and increasing prevalence rates are causing some concerns about excessive use of the internet and its consequences. According to results of a global survey on internet usage, Turkey is the third country in Europe who has the most engaged internet users, after United Kingdom and the Netherlands, because it had 23.1 million internet visitors who spent an average of 32.7 hours per month online (Mohamud, 2011). People use internet for many different purposes like working, obtaining information, entertainment, stress relief, communicating with relatives, or establishing social relationships with unfamiliar

people (Ceyhan A. , 2011). In spite of many benefits of the internet, spending so many hours on the internet and using the internet as the primary mean of entertaining, alleviating stress, or socializing creates problems. Excessive internet use was found related with some physical health, mental health, and social issues like sleep problems (Nalwa & Anand, 2003), depression (Ceyhan, Ceyhan, & Gürcan, 2007), problems in interpersonal relationships (Lin & Kuo, 2007) and worsening work/school performance (Lin, Ko, & Wu, 2011).

Excessive internet use and its negative consequences firstly defined by Dr. Kimberly S. Young (1996) by using the term "Internet Addiction". She claimed that some users are becoming addicted to the Internet in a similar way that others became addicted to alcohol or drugs, and that this situation cause them to experience problems in their life. There is also another popular term "Problematic Internet Use", refers to the excessive preoccupation with Internet use that results in psychosocial maladjustment, academic difficulties, and physical health problems for the individuals involved (Yu, Kim, & Hay, 2013). From a behavioral addictions perspective, internet addiction can be defined as internet use behaviors that produce short-term rewards, such as self soothe or mood regulation and that persist despite their negative consequences or attempts to control them.

Today, there is an increased attention to internet use from the academic and non-academic audiences across different countries in order to find out internet's role in our lives and understand its problematic use. The increasing number of studies in the literature which investigates different psychological factors associated with internet addiction show that it is related with aggressiveness (Mehroof & Griffiths, 2010), lack of perseverance (Mottram & Flemong, 2009), low self-esteem

(Fioravanti, Dèttore, & Casale, 2012), and sensation seeking (High novelty seeking and high harm avoidance) (Shi, Chen, & Tian, 2011). Internet addiction has also found correlated with some interpersonal factors such as conflicted family relationships (Wang, Zhou, Lu, Wu, Deng, & Hong, 2011), perceived discontentment with peer interactions (Lin & Kuo, 2007) and insecure attachment style by (Lin, Ko, & Wu, 2011).

1.2. RESEARCH QUESTION

This study aims to focus on some psychological factors which may be related to the problematic internet use. Literature showed that alexithymia, poor emotion regulation abilities, and impulsiveness are important factors for the development, increase, and maintenance of addiction-related problems. This study aims to explain the role of these mechanisms in internet addiction.

Although internet mentioned as one of the behavioral addictions and these psychological phenomenons are important in the behavioral addiction literature, there are not enough studies investigating the relationship between internet addiction and these concepts. There are only a few studies which focusing separately on alexithymia, emotion regulation, and impulse control. This study aims to bring these psychological factors together and expand the view of excessive internet use as a behavioral addiction.

2. LITERATURE REVIEW

2.1. INTERNET ADDICTION

2.1.1. Definition

In the literature, there are many different terms have been used to describe excessive internet use, including internet addiction (Young K. S., 1996), pathological internet use (Davis, 2001), problematic internet use (Ceyhan, Ceyhan, & Gürcan, 2007), internet dependency and compulsive computer use. Although there are terminological differences, most scales which were developed to measure this concept are focusing on the following symptoms: (1) excessive use of the internet, (2) negative consequences of the usage on the individual's life, and (3) some benefits gained from the internet.

Excessive use can be determined by hours spent online, often with a loss of sense of the time. Spend time online is an indicator of excessive internet use but it is not sufficient to explain internet addiction by itself. Problematic use also requires some negative consequences and positive gains related to internet use.

Negative consequences are problems in individual's life caused by the internet use, such as withdrawal from social interactions in real life or worsening performance in work or school. Research shows that people who are more problematic internet users are experiencing some physical and mental health issues and some social problems more than the others. Several studies showed that individuals who use internet problematically tend to have sleep problems (Nalwa &

Anand, 2003). Internet addicts experience more insomnia, witnessed snoring, apnea, teeth grinding, nightmares compared to possible addicts, and they experience these more than non-addicts. Internet addicts are also considered their own health condition as poor (Choi, Son, Park, Han, Kim, & Lee, 2009). Excessive internet users also experiencing some negative consequences in social life. They tend to have experience problems in their interpersonal relationships (Lin & Kuo, 2007), delay other work to spend time on the internet problems and find life boring without the internet (Nalwa & Anand, 2003).

Definition of the problematic use also includes some benefits gained from the internet, such as escaping from problems or regulating the mood. These benefits from the internet become a problem when people gain those only from the internet rather than gaining in real life relationships. It is shown that most of the internet addicts use the Internet as their primary means of escaping from problems, alleviating stress, feeling social support, and having a sense of belonging (Chou, 2011).

2.1.2. Measurement

First tool for assessing internet addiction was developed by Kimberly S. Young in 1996, with the name "Internet Addiction Scale". She introduced an 8-item questionnaire to screen addictive Internet use by adapting diagnostic criteria of pathological gambling from Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition (American Psychiatric Association, 1994). In the questionnaire, presence of the preoccupation with the internet, increasing amounts of use, unsuccessful efforts to control usage, negative consequences of the situation in user's

life, and some gains from the internet such as relieving a dysphoric mood were aimed to be examined. The items are listed below:

1. Do you feel preoccupied with the Internet (think about previous on-line activity or anticipate next on-line session)?
2. Do you feel the need to use the Internet with increasing amounts of time in order to achieve satisfaction?
3. Have you repeatedly made unsuccessful efforts to control, cut back, or stop Internet use?
4. Do you feel restless, moody, depressed, or irritable when attempting to cut down or stop Internet use?
5. Do you stay on-line longer than originally intended?
6. Have you jeopardized or risked the loss of significant relationship, job, educational or career opportunity because of the Internet?
7. Have you lied to family members, therapist, or others to conceal the extent of involvement with the Internet?
8. Do you use the Internet as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)? (Young K. S., 1996).

First scales designed to measure excessive internet use were mainly categorical, which were trying to find out the presence of an addiction through a specific number of symptoms, decide whether this person addicted or not, and give the person a diagnosis. Today, newly developed measures and revised scales, including Young's Internet Addiction Scale (Young K. S., 1996), brought a more dimensional view, by reporting frequency of addiction symptoms and measuring

severity of addiction. This dimensional view seems more functional in studying behavioral addictions, especially internet addiction because behavioral addictions for example exercise or shopping, are harder to define than substance or alcohol addictions. In the case of internet, most of the people are spending many hours daily on the internet. It is difficult to categorize some people as "addicts" and it is not good to ignore other people's internet use behaviors.

On the other hand, majority of the people using internet but some of them use it more addictively, like other behavioral addictions. In a way they spent more time than they intended, gain a psychological relief with the use of internet, and experience some negative consequences of this behavior. By assessing these situations and their frequency, internet addiction can be measured.

2.2. BEHAVIORAL ADDICTIONS

Studies are showing that development of behavioral addictions often shows similarities with substance related addictions and that there are significant comorbidities between different behavioral addictions. Therefore, it can be concluded that there are some similar underlying shared mechanisms driving addictive behaviors and some other factors determining expressed addiction. (Sussman, Lisha, & Griffiths, 2011) Although the type of the addictive behavior people engage in is determined by various factors and the way people use the internet changes according to different motivations, there are also some shared psychological dimensions of addictions, which increase the person's engagement to an addictive

behavior, in this case internet use, and the negative consequences of the behavior in individual's life.

Merlatt, Baer, Donovan, and Kivlahan (1988) defined addictive behavior as *a repetitive habit pattern that increases the risk of disease and/or associated personal and social problems. Addictive behaviors are often experienced subjectively as "loss of control" the behavior continues to occur despite volitional attempts to abstain or moderate use. These habit patterns are typically characterized by immediate gratification (short-term reward), often coupled with delayed, deleterious effects (long term costs). Attempts to change an addictive behavior (via treatment or by self-initiation) are typically marked by high relapse rates* (Merlatt, Baer, Donovan, & Kivlahan, 1988).

Griffiths (2000), referred to six features of behavioral addiction: salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse. *Salience* means particular activity becomes the most important activity in the person's life and tends to dominate thinking, feelings, and behavior. *Mood modification*; refers to the emotional effect the behavior has on the individual which often serves as a coping strategy and is reported as an arousing "buzz" or a "high" or tranquilizing feel of "escape" as a consequence of engaging in the particular activity. *Tolerance* is the process of increasing amounts of the particular activity is required to achieve the former effects. *Withdrawal symptoms* are unpleasant feeling states and/or physical effects that occur when the particular activity is discontinued. *Conflict* refers to the conflict between the addict and those around them, with other activities, or from within the individual themselves. *Relapse* is the tendency for repeated reversions to earlier patterns of the particular activity to recur (Griffiths, 2000).

Behavioral addiction can be defined as excessive behaviors that produce short-term rewards, such as self soothe or mood regulation and that persist despite their negative consequences or attempts to control them. Engaging in the addicted behavior produces pleasure, provides escape from emotional or physical discomfort, but it also causes negative consequences and inability to control the behavior (Goodman, 1990). Examples of behavior addictions include gambling (Griffiths, 1995), shopping, exercise, sex, work, video gaming (Griffiths, 2002), binge eating, and internet use (Young K. S., 1996).

Internet addiction has symptoms similar to other behavioral addictions, including cognitive preoccupation with the internet, difficulty resisting the urge to be online (Young K. S., 1996), guilt about internet use and using internet to escape from problems (Caplan, 2002), produces short-term rewards; such as self soothe or mood regulation and that persist despite their negative consequences in individual's life (Young K. S., 1996), (Ceyhan, Ceyhan, & Gürcan, 2007).This study mostly related to the third concept which claims that people use the internet in order to regulate their moods.

2.3. EMOTION REGULATION

Emotion regulation can be described as the mechanism through which individuals modify (either intentionally or unintentionally) their emotions to achieve a desired outcome (Aldao, Nole-Hoeksema, & Schweizer, 2010). Literature shows that maladaptive emotion regulation abilities play a role in the development and maintenance of psychopathology, including addictive behaviors (Taylor, Bagby, &

Parker, 1997). Individuals who are experiencing difficulties in emotion regulation are more likely to engage in addictive behaviors in an attempt to escape from negative moods and to try to relief from their emotional distress (Schreiber, Grant, & Odlaug, 2012). People's difficulties to contain and modulate negative affect cause them to seeking engagement in an addictive behavior to help them emotionally self-regulate. They use the addicted behavior to help decrease the intensity of their emotions (McDougall, 2001). Although there are few studies with adolescents, there are studies supporting that onset of addictive behaviors are associated with poor emotional regulation (Wills, Pokhrel, Morehouse, & Fenster, 2001).

People's internet use purposes and patterns are determined by some personal and psychosocial characteristics of them (Ceyhan A. A., 2011). Their emotional regulation inabilities and need for regulating their affect may also determine the way they use internet. Young (1998) suggests that people engage in the internet use to increase positive sensations and/or reduce unpleasant emotions (Young & Rodgers, 1998). The "compensatory internet use" model supports this view by claiming that negative life situations can give rise to a motivation to go online to alleviate negative feelings and individuals use the internet according to facilitate their negative life situations (Kardefelt-Winther, 2013).

There is a recent study by Yu, Kim, & Hay (2013) with 525 high school students in Seoul, Korea examined the relationship between emotion regulation and internet addiction by using Difficulties in Emotion Regulation Scale (DERS) and Internet Addiction Scale (IAT). Emotion regulation difficulty was found significantly correlated with problematic internet use. Results also showed that adolescents'

difficulty with emotion regulation is functioning as a mediator between parenting behavior and problematic Internet use (Yu, Kim, & Hay, 2013).

2.4. ALEXITHYMIA

Alexithymia is "a multifaceted personality construct that is characterized by difficulty identifying subjective emotional states and a limited ability to communicate these feelings to others" (Taylor J. G., 2000). Previous research shows that alexithymia is associated with the development of addictive behaviors (Taylor, Bagby, & Parker, 1997). This relation is happening through the emotion dysregulation. Individuals high in alexithymia, who have difficulty identifying subjective emotional states and a limited ability to communicate these feelings to others, result in the struggle and inability to effectively regulate emotions (Parker, Taylor, & Bagby, 1998). Individuals with poor abilities on identifying their emotions may experience difficulties in thinking about their feelings and coping with stressful feelings (Taylor J. G., 2000). Lumley and Roby (1995) suggested that individuals who experiencing difficulties in regulating their emotions have limited ability in identifying subjective emotional states and communicating their feelings to others. They also claimed that individuals with high alexithymia, who also experience difficulties in emotion regulation, use some addictive behaviors to regulate their emotions (Lumney & Roby, 1995). Similarly, individuals who can understand, differentiate, and regulate their emotions are found to be more likely to inhibit addictive behaviors (Kun & Demetrovics, 2010).

The research of Craparo (2011), with 335 a sample of college students investigated the relationship of alexithymia and internet addiction, by using Toronto Alexithymia Scale-20 and Internet Use, Abuse, Dependence scales. Results showed that there were significant correlations between internet addiction, alexithymia, and dissociation scores. It was suggested that internet addiction could represent a psychic retreat necessary to modulate the painful emotions (Craparo, 2011). A similar study by De Berardis et al (2009) with 312 undergraduate students by using Toronto Alexithymia Scale (TAS-20) and Young's Internet Addiction Test (IAT) showed that difficulty in identifying feelings, higher dissociative experiences, lower self-esteem, and higher impulse dysregulation were associated with higher internet addiction (De Berardis, D'Albenzio, Gambi, Sepede, Valchera, & Conti, 2009).

2.5. IMPULSIVITY

Impulsivity is "a tendency to act quickly without weighing the consequences of the actions" (Carver, 2005). Impulsivity is an important personality trait in the development and maintenance of behavioral addictions. Previous research suggests that addictive behaviors are associated with impulsivity (Castellanos-Ryan, O'Leary-Barrett, Sully, & Conrod, 2013) and individuals with addictive behaviors have higher levels of impulsiveness than the other individuals (MacKillop, Amlung, Few, Ray, Sweer, & Munafo, 2011). Individuals with high impulsivity experience difficulties resisting an impulse to act and controlling their addictive behaviors. As mentioned earlier, limited ability to deal adequately with affective states may lead individuals to engage in impulsive acts or compulsive behaviors, rather than rationally planned activities, in order to regulate distressing emotional states. They attempt to get rid of

emotional distress by seeking out immediate pleasure and relief, such as smoking a cigarette or acting impulsively (Tice, Bratslavsky, & Baumeister, 2001). It can be claimed that impulsiveness increases the addictive behaviors which have been engaged to regulate emotions. Research on alcohol addiction supports this claim by showing that impulsivity moderates the relationship between alexithymia and alcohol-related problems by increasing the strength of this association (Shishido, Gaher, & Simons, 2013).

The study Park, Park, Lee, Jung, Lee, & Choi (2013) have done in Korea with 211 high school students examined the relationship between impulsivity and internet addiction. They used Barratt Impulsiveness Scale 11 to measure impulsivity and Internet Addiction Test for internet addiction. The internet addiction scores of students were found strongly correlated with their impulsiveness scores. Results also showed that fun seeking subcategory of Behavioral Activation System (BAS) predicted the internet addiction with the mediation of impulsivity (Park, Park, Lee, Jung, Lee, & Choi, 2013).

2.6. AIMS OF THE STUDY

2.6.1. Aims

This study aims to focus on the relationship between internet addiction, alexithymia, emotion regulation difficulties, and impulsiveness. Although alexithymia, emotion regulation difficulties, and impulsiveness are strong relationships with addiction, there are not enough studies investigating their relationship with internet addiction. There are only a few studies which focusing

separately on these concepts. This study aims to bring these psychological factors together in order to see how all of these mechanisms predict the level of internet addiction and what the relationship is between these factors in the prediction of internet addiction.

Based on the addiction literature claims that individuals with high alexithymia experience difficulties in regulating their emotions and they engage to impulsive acts in order to regulate their emotional states, it is hypothesized that alexithymia will be related to internet addiction through emotion regulation and impulsivity strengths the relationship between emotion regulation and internet addiction. The overall model was illustrated in the conceptual framework diagram (Figure 1).

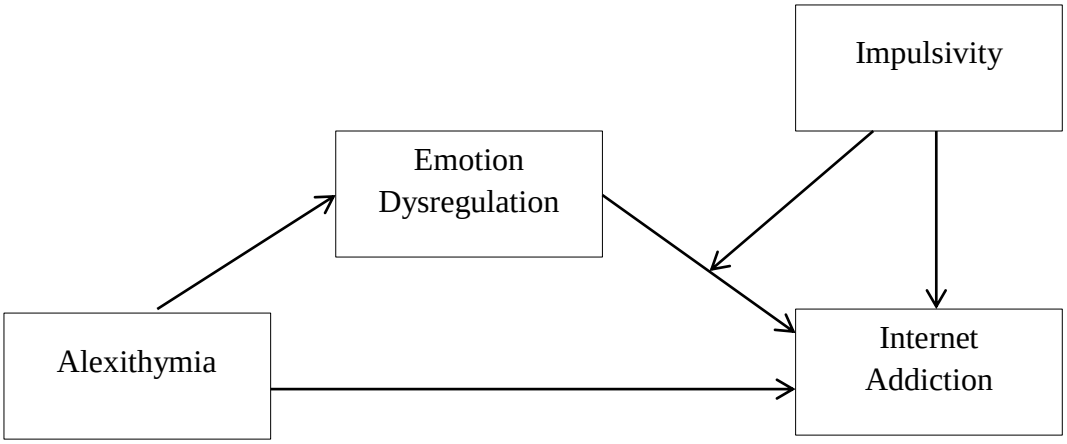

Figure 1: Conceptual Framework

2.6.2. Hypotheses

Main hypothesis of this research is that alexithymia, emotion regulation, and impulsivity are significant predictors of internet addiction.

H1: There will be statistically significant correlations between alexithymia, difficulties in emotion regulation, and impulsivity scores of individuals measured by TAS-20, DERS, and UPPS.

H2: Alexithymia measured by TAS-20 is a significant predictor of internet addiction measured by IAT.

H3: Difficulty in emotion regulation measured by DERS is a significant predictor of internet addiction measured by IAT.

H4: Impulsivity measured by UPPS is a significant predictor of internet addiction measured by IAT.

H5: Difficulty in emotion regulation measured by DERS is a mediator in the relationship between Alexithymia measured by TAS-20 and internet addiction measured by IAT.

H6: Impulsivity measured by UPPS moderates the relationship between alexithymia measured by TAS-20 and internet addiction measured by IAT.

H7: There will be a statistically significant difference between the high school and college students regarding the levels of alexithymia measured by the TAS-20.

H8: There will be a statistically significant difference between the high school and college students regarding the levels of emotion regulation scores as measured by the DERS.

H9: There will be a statistically significant difference between the high school and college students regarding the levels of impulsivity scores as measured by the UPPS.

2.6.3. Other research questions

Information about the gender, average time per week spending online, purposes to use internet, and how the individual sees her/his internet use have been collected from the subjects. Descriptive analysis will also be conducted using these data.

3. METHOD

3.1. POPULATION AND SAMPLE

The participants included a convenient sample of high school and college students from Istanbul. The sample recruited through advertisement on the internet. Participants were asked to join the survey on Surveymonkey. Data collected from all internet users with different levels of internet usage.

Survey was given to 236 people and 205 participants completed the whole survey. Eventually, data gathered from 100 high school students (66 female, 34 male) and 105 college students (76 female, 28 male). The sample's demographic characteristics were summarized in the Table 1.

Table 1: Social-Demographic Characteristics of Participants

	N	Age Range	Age Mean
High school	100	14-18	16.06
Female	66	14-18	16.03
Male	34	14-18	16.12
College	105	19-30	24.67
Female	76	19-30	24.28
Male	28	20-30	25.71
Total	205	14-30	20.45

3.2. Measurement Tools

Each participant completed a survey that included the information form, Internet Addiction Test (IAT; Young, 1996), Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994), Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) and UPPS Impulsive Behavior Scale (Whiteside & Lynam, 2001).

3.2.1. Information Form

The participants will be asked to fill a demographic form (see Appendix B). The first part of the questionnaire consists of information about gender, age, and education. Second part aims to obtain information about internet usage of the participant and asks the average time per week spending online on computer and mobile devices. Third part of the survey asks the purposes to use internet and consists of 15 items chosen according to Internet Usage Habits Report from Turkey (Ipsos KMG, 2009). Internet use purposes can be collected into 4 categories: obtaining information, entertainment, establishing communication with relatives, and establishing social relationships with unfamiliar people (Ceyhan A. , 2011). Finally, questionnaires are ending with the questions about how the individual sees her/his internet use. These questions aim to gain information about the level of insight on excessive use of the internet, social gains from the internet, and the negative consequences of the internet.

3.2.2. Internet Addiction Test (IAT)

Internet Addiction Test (IAT), developed by Young (1996), is a 20-item self-report measure of problematic internet use in adults. Questions evaluate the presence of preoccupation with the internet, increasing amounts of use, losing track of time, unsuccessful efforts to control usage, withdrawal symptoms, negative consequences of the situation in user's life, and some gains from the internet such as relieving a dysphoric mood. Respondents are asked to choose the answer that best corresponds to their use of the internet on a 6-point Likert scale ranging from "0" ("never") to "5" ("always"). At the end, participants have a score between 0 and 100. Higher scores mean greater level of addiction. People who have scores lower than 49 are accepted as average internet users. Scores between 50 and 79 show that person is experiencing occasional or frequent problems because of the Internet. Scores above 80 indicate that internet usage is causing significant problems in that person's life. Turkish form of the IAT can be found in Appendix C.

Turkish adaptation of the scale was made by Balta and Horzum (2008) with 250 undergraduate students. In their study, internal consistency score of the scale founded .89 for the total internet addiction score (Balta & Horzum, 2008).

3.2.3. Toronto Alexithymia Scale-20 (TAS-20)

The Toronto Alexithymia Scale (TAS-20), developed by Bagby et al. (1994), is a 20-item measure designed to measure alexithymia in adult samples. Questions evaluate the presence of difficulty in identifying feelings, difficulty in describing feelings, and externally-oriented thinking. Participants are asked to rate their agreement with each item on a 5- point Likert scale ranging from 1="strongly disagree" to 5="strongly agree". Each participant has a score between 20 and 100.

Higher scores on the TAS-20 indicate higher levels of alexithymia. Turkish form of the TAS-20 can be found in Appendix D.

Research has shown that the TAS-20 is a reliable and valid measure of alexithymia in samples of community. Internal constancy of the scale was found to be .86 for the total TAS-20 score (Taylor, Bagby, & Parker, 2003). Turkish adaptation of the scale was made by Güleç, et al. (2008) with 390 undergraduate students. The internal consistency was found to be 0.78 for the total alexithymia score (Güleç, et al., 2009).

3.2.4. Difficulties in Emotion Regulation Scale (DERS)

Difficulties in Emotion Regulation Scale (DERS), developed by Gratz & Roemer, (2004), is a 36 item scale which designed to measure how much participants are experiencing difficulty in regulating their emotions. Questions evaluate the presence of lack of emotional awareness, lack of emotional clarity, non-acceptance of emotional responses, limited access to emotion regulation strategies, difficulties engaging in goal directed behavior, and impulse control difficulties. Respondents are asked to rate their agreement with each item on a 5-point Likert scale ranging from 1 = “almost never” to 5 = “almost always”. At the end each participant has a score between 36 and 180. Higher scores correspond to more difficulties in emotion regulation. Turkish form of the DERS can be found in Appendix E.

In the original study, internal reliability score of the scale found to be 0.93 for the total difficulties in emotion regulation score (Gratz & Roemer, 2004). The scale was adapted to Turkish by Rugancı (2008) and in the Turkish version, the internal reliability was found to be .94 for the total score (Rugancı & Gençöz, 2010).

3.2.5. Impulsive Behavior Scale (UPPS)

Impulsive Behavior Scale (UPPS), developed by Lynam et al. (2001), is a 44 item scale designed to measure impulsivity. Questions evaluate the presence of urgency, lack of premeditation, lack of perseverance, and sensation seeking. Respondents are asked to choose the answer that best corresponds to them on a 4-point scale ranging from 1 = "agree strongly" to 4 = "disagree strongly". Each participant gained a score between 44 and 176. Higher scores correspond to higher impulsivity. Turkish form of the UPPS can be found in Appendix F.

The scale was adapted to Turkish by Yargıç et al. (2001) and the internal consistency of the Turkish form was found to be .85 for the total impulsivity score (Yargıç, Ersoy, & Oflaz, 2011).

3.3. Procedure

Data collected by asking participants to answer the online survey on Surveymonkey. Firstly, participants were asked to read a consent form that informed participants of the anonymity of their responses, the purpose of the study, and their rights to not to participate in the study. A copy of the Informed Consent Form can be found in Appendix A. Then, they filled out the survey which consists of the information form, Internet Addiction Test (IAT), Toronto Alexithymia Scale (TAS), Difficulties in Emotion Regulation Scale (DERS) and Impulsive Behavior Scale (UPPS). There were total 160 questions in the survey and it took approximately 10-15 minutes to complete. Data collection was conducted from March to May, 2014.

3.4. Data Analysis

SPSS was used for the purposes of statistical analyses. Before analyses, the data screened for the outliers. In the univariate outlier analysis, it was seen that skewness and kurtosis scores for IAT, TAS, DERS, and UPPS total scores were between -1 and 1. In multivariate outlier analysis, 1 outlier was found according to Mahalanobis distance at $\alpha = .001$. This 1 subject removed and further analysis continued with 204 subjects.

The first step was presenting the descriptive statistics of the independent and dependent variables. In the second step, correlations between the key variables were run to see whether there is a relationship between them. Then, linear regression models were run to investigate whether alexithymia, emotion dysregulation, and impulsivity predicts the internet addiction. In the third step, mediation hypothesis was tested by putting alexithymia as a predictor of internet addiction and emotion regulation as a mediator in this relationship. Finally, moderation hypothesis for impulsivity on the relationship of emotion dysregulation and internet addiction was tested.

4. RESULTS

4.1. Descriptive Analyses

Information gathered from the information form was investigated in order to see the characteristics of the subjects. Firstly, one-way analyses of variance were conducted to see whether there were differences in internet use between genders and the two school groups (Table 2). According to ANOVA results, hours college students spend on the internet in a week were significantly higher than the time high school students spend; $F(1,202) = 2.36$, $p < .001$. Comparisons between high school and college students showed that high school students spend more time online via their mobile phones; $F(1,202) = 8.43$, $p = .024$, while college students spending more time online on their computers; $F(1,202) = 66.47$, $p < .001$. In gender comparisons, it is found that females spent time online via mobile phones significantly more than males $F(1,202) = 6.18$, $p < .01$.

Table 2: The hours participants spent online in a week

	College		High school	
	Female	**Male**	**Female**	**Male**
Time spend online (hour/week)				
computer	21.37	26.60	4.77	8.74
mobile phone	13.18	6.50	18.97	12.85
total	34.55	33.10	23.74	21.59

An examination of internet addiction, alexithymia, difficulties in emotion regulation, and impulsive behavior scores was performed in terms of means, standard deviation and minimum-maximum values. These descriptive statistics are presented in Table 3. These values are compared between the genders and two school groups. There were no significant differences in terms of key variable scores between the females and males. Some significant differences between high school and college students have been found and explained in the following section.

Table 3: Descriptive statistics of key variables

	N	Mini	Max	Mean	STD	α
College						
IAT	104	1,00	64,00	24,18	12,38	,73
TAS	104	20,00	77,00	45,02	10,47	,54
DERS	104	43,00	127,00	81,01	19,92	,51
UPPS	104	59,00	130,00	90,17	15,54	,57
High school						
IAT	100	1,00	82,00	25,40	16,47	,73
TAS	100	28,00	74,00	50,28	11,20	,67
DERS	100	49,00	160,00	92,94	22,82	,58
UPPS	100	63,00	132,00	96,40	14,84	,69

Note. IAT = Internet Addiction Test, TAS = Toronto Alexithymia Scale, DERS = Difficulties in Emotion Regulation Scale, UPPS = UPPS Impulsive Behavior Scale.

4.1.1. Internet Addiction

The dependent problematic internet use was measured by the Internet Addiction Test (IAT) scored within the possible range of 0-100. In this study, the lowest score was 1, the highest score was 82, the mean was 24.78 and the standard deviation was 14.51. Distribution was skewed to the left side (skewness=0.81, SD=0.17), implying that a small proportion of the total participants (N=204) reported high internet addiction (Figure 2). People who have scores lower than 49 are accepted as average internet user, between 50-79 as experiencing occasional or frequent problems because of the Internet, and above 80 indicate that internet usage

is causing significant problems in that person's life. In our data, 94% of the participants have scores between 1 and 50. There are 10 participants who have scores between 50 and 79, and there is only one subject whose score is above 80.

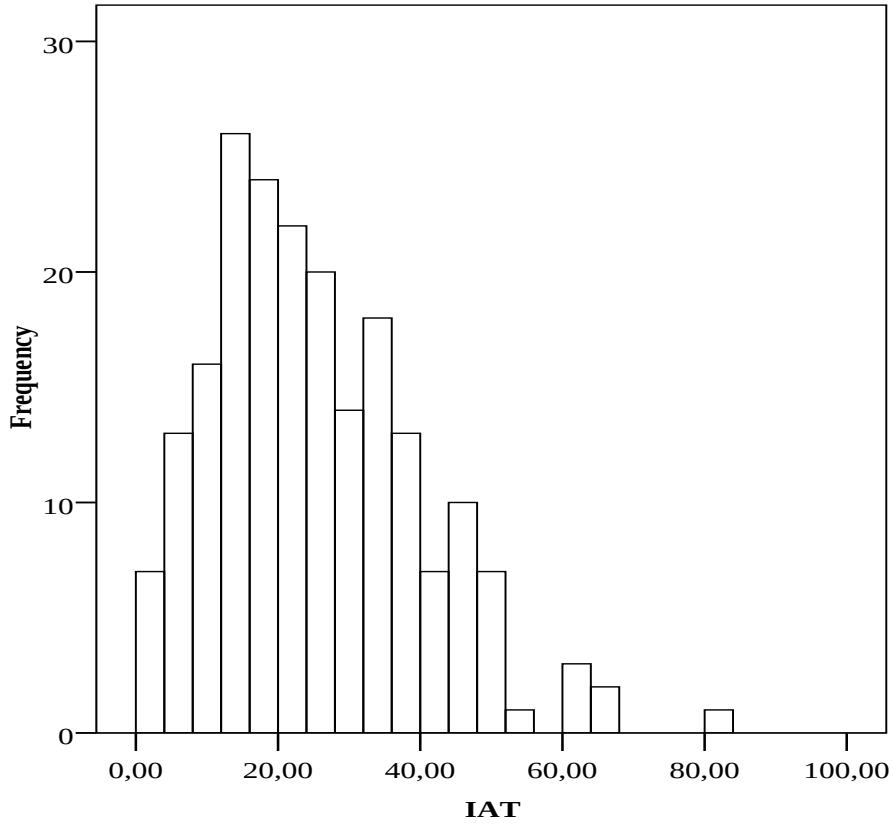

Figure 2: Histogram of Internet Addiction Test scores

4.1.2. Alexithymia

Impulsivity was measured by the Toronto Alexithymia Scale (TAS-20) which gives each participant a score between 20 and 100. In this data, minimum score was 20, the highest score was 77, the mean was 47.60 and the standard deviation was 11.12. Alexithymia scores of high school students are found significantly higher than those of college students, $F(1, 204) = .583$, $p < .001$.

4.1.3. Emotion Regulation

Emotion regulation was measured with the Difficulties in Emotion Regulation Scale (DERS), which has a minimum score of 36 and maximum score of 180. In the current study, minimum score was 43, the maximum score was 163, the mean was 87.40 and the standard deviation was 22.93. Difficulties in emotion regulation scores of high school students are found significantly higher than those of college students, $F(1, 204) = .452$, $p < .001$.

4.1.4. Impulsive Behavior

Impulsivity levels of participants evaluated with the Impulsive Behavior Scale (UPPS) from which each participant gained a score between 44 and 176. In this study, lowest score was 59, the highest score was 132, the mean was 93.50 and the standard deviation was 15.80. Impulsivity scores of high school students are found significantly higher than those of college students, $F (1, 204) = .146$, $p < .01$.

4.2. Correlation Analysis

Correlations between the internet addiction, alexithymia, emotion regulation, and impulsivity were run to see whether there is a relationship between them. There was a significant relationship between internet addiction scores and alexithymia scores of the participants, $r (204) = .27$, $p < .01$. Participants had higher alexithymia were more likely to use internet problematically. There was a significant relationship between internet addictions scores and emotion regulation difficulty scores of the participants, $r (204) = .32$, $p < .01$. Participants had more difficulties in regulating emotion were more likely to use internet problematically. The relationship between internet addiction scores

and impulsivity scores of the participants was a significant, r (204) = .23, p < .01. Participants had higher impulsiveness were more likely to use internet problematically. Correlations between alexithymia, emotion regulation, and impulsivity scores of participants were also positively correlated. The findings are presented in Table 4.

Table 4:Correlations

	1	2	3
1 IAT			
2 TAS	.27**		
3 DERS	.32**	.68**	
4 UPPS	.23**	.46**	.53**

Notes: IAT = Internet Addiction Test, TAS = Toronto Alexithymia Scale, DERS = Difficulties in Emotion Regulation Scale, UPPS = UPPS Impulsive Behavior Scale.

**p<.01.

Then correlation analyses were run for college and high school students separately. For high school students, internet addiction scores were significantly correlated with alexithymia, emotion regulation, and impulsivity scores; r (204) = .35, p < .01; r (204) = .42, p < .01; r (204) = .27, p < .01 respectively. On the other hand, internet addiction scores of college students were not correlated with any of the key variables. Correlations between alexithymia, emotion regulation, and impulsivity scores of participants were positively correlated for both groups. The findings are presented in Table 5.

Table 5: Correlations separately for college and high school students

	College			High school		
	1	2	3	1	2	3
1 IAT						
2 TAS	.15			.35**		
3 DERS	.19	.66**		.42**	.65**	
4 UPPS	.19	.48**	.46**	.27**	.39**	.55**

Notes: IAT = Internet Addiction Test, TAS = Toronto Alexithymia Scale, DERS = Difficulties in Emotion Regulation Scale, UPPS = UPPS Impulsive Behavior Scale.

**p<.01.

4.3. Regression Analysis

In order to test whether the variables are predicting the problematic internet use, regression analyses were conducted. Firstly, Multiple Linear Regression applied to TAS-20, DERS, and UPPS scores. Results indicated that the three predictors explained approximately 9% of the variance, R=.335, R2=.112, adjusted R2=.099, F (3, 203) =8.43, p<.001. Then, separate linear regressions for alexithymia, emotion dysregulation, and impulsivity were run.

Result showed that alexithymia score measured by TAS is significant predictor of internet addiction: R=.27, F (1, 202) =15.23, p < .001. When regression analysis were run separately for high school and college students, it has been found that TAS is significant predictor of IAT only in high school sample R=.35, F(1, 98)=13.61, p < .001.

Results of the regression showed that difficulty in emotion regulation measured by DERS is a significant predictor of internet addiction R=.32, F (1, 202) =23.38, p < .001. When regression analysis were run separately for high school and college students, it has been found that DERS is significant predictor of IAT only in high school sample, R=.41, F(1, 98)=20.59, p < .001.

Another linear regression was run to see whether alexithymia predicts the problematic internet use, and results were significant; R=.23, F (1, 202) =11.69, p < .001. Further analysis showed that impulsivity predicted internet addiction only in high school sample; R=.27, F (1, 98) =7.73, p < .01. More detailed values for these significant predictors were presented in Table 6.

Table 6: Results of regression analysis for each predictor variable

	(All participants)					**(High school only)**				
	B	*β*	*t*	*p*	partial *r*	*B*	*β*	*t*	*p*	partial *r*
TAS	.35	.27	1.93	.000	.27**	.51	,35	3.69	.000	.35**
DERS	.21	.32	4.84	.000	.32**	.30	.42	4.54	.000	.42**
UPPS	.22	.23	3.42	.001	.23**	.30	.27	2.79	.007	.27**

Note: IAT = Internet Addiction Test, TAS = Toronto Alexithymia Scale, DERS = Difficulties in Emotion Regulation Scale, UPPS = UPPS Impulsive Behavior Scale.

4.4. Mediation Analysis

The mediation hypothesis was supported. Alexithymia was significantly related to both the emotion regulation difficulties; R=.68, F (1, 202) =169.32, p <

.001, and the problematic internet use; R=.27, F (1, 202) =15.23, p < .001. Additionally, the emotion regulation difficulties was significantly related to problematic internet use; R=.32, F (1, 202) =23.38, p < .001. In order to test for mediation, a regression analysis was conducted by entering alexithymia and emotion regulation difficulties as predictor variables, and internet addiction as the outcome variable. The overall equation was significant; R=.33, F (2, 201) = 12.15, p < .001. The relationship between alexithymia and internet addiction was weaker in this analysis (β = .09; t = .96, p = .34) compared to the direct relationship (β = .27; t = 3.90, p < .001). Satisfying these conditions provided evidence for a complete mediation (see Figure 3).

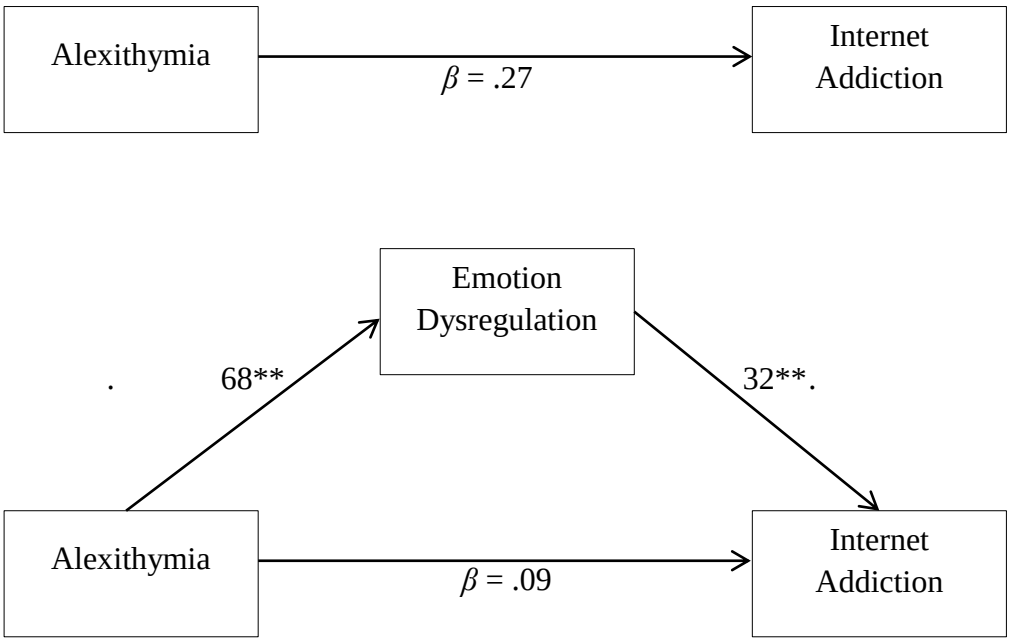

Figure 3: Results of the Mediation Analysis

Notes: Model testing hypothesis that emotion dysregulation mediates the relationship between alexithymia and internet addiction.

** p<.01.

4.5. Moderation Analysis

Hypothesis for impulsivity as a moderator of the relation between emotion dysregulation and internet addiction was examined. Emotion dysregulation and impulsivity were entered in the first step of the regression analysis. In the second step, the interaction term between emotion dysregulation and impulsivity was entered to the regression analysis. Result did not show a significant increase in variance in internet addiction, $\Delta R2 = .00$, $F (3, 200) = 8.23$, $p < .001$.

5. DISCUSSION

Basic aim of this study was to investigate the relationship between alexithymia, emotion dysregulation, impulsivity and internet addiction. Firstly, some descriptive analyses have been done. The differences in internet use between gender and two school groups were investigated. It was found that college students spend more time in a week compared to high school students. On the other hand, there is not a significant difference between the internet addiction scores of college and high school students. Results showed that devices that high school and college students are using to connect to the internet are different. High school students spend more time online via their mobile phones, while college students spending more time online on their computers. In addition, it is found that females spent time online via mobile phones significantly more than males for both groups. These results are consistent with the report from the US that showing that teens aged between 14-17 access internet on cell phones more than the others and girls in this age group access internet on cell phones more than boys (Madden, Lenhart, Duggan, Cortesi, & Gasser, 2013).

Secondly, consistently with the literature, internet addiction was found related to alexithymia (Craparo, 2011), difficulties in emotion regulation (Yu, Kim, & Hay, 2013), and impulsivity (Park, Park, Lee, Jung, Lee, & Choi, 2013). It is also found that alexithymia, difficulties in emotion regulation, and impulsivity are significant predictors of problematic internet use.

Literature was saying that individuals high in alexithymia, who have difficulty identifying subjective emotional states and a limited ability to

communicate these feelings to others, result in the struggle and inability to effectively regulate emotions. That limited ability to deal adequately with affective states may lead individuals to engage some addictive behaviors in order to regulate distressing emotional states. Based on these views, it was hypothesized that alexithymia is related to internet addiction through emotion regulation. Mediation analysis in regression showed a complete mediation. In other words, the hypothesis that emotion regulation mediated the relationship between internet addiction and emotion regulation was verified.

In previous research, it has been found that impulsivity moderated the relationship between alexithymia and alcohol-related problems by increasing the strength of this association (Shishido, Gaher, & Simons, 2013). In this study, impulsivity was not a significant moderator on the relationship between emotion regulation and internet addiction.

In this study, alexithymia, emotion regulation, and impulsivity were found as significant predictors of internet addiction. On the other hand, when high school and college student group were analyzed separately, it was seen that these variables are not significantly predict the internet addiction in college students. It brought mind that college group may be not enough homogenous because of the age range. High school students were ages between 14 and 18, and college were ages between 19 and 30. This may be a limitation while generalizing the results of college students.

Finally, possible range of scores gained from Internet Addiction Test was 0-100 and test owners were interpreting scores lower than 49 as average internet user, scores between 50-79 as experiencing occasional or frequent problems, and scores above 80 as significant problems with the internet usage. In this study, the internet

addiction score range was 1-82 but 94% of the participants had scores between 1 and 50. It means that there were not much problematic internet users in the sample. This may be a limitation that comparing internet addiction results within this range.

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