(ISSN: 2602-4047)

Eşkisu, M. (2021). Childhood Trauma and Internet Addiction: Do Dissociation or Online Dissociation Have a Mediating Role?, *International Journal of Eurasian Education and Culture , 6(12), 501-516.*

DOI: http://dx.doi.org/10.35826/ijoecc.340

Article Type: Research Article

CHILDHOOD TRAUMA AND INTERNET ADDICTION: DO DISSOCIATION OR ONLINE DISSOCIATION HAVE A MEDIATING ROLE?

Mustafa EŞKİSU

Ph.D., Erzincan Binali Yıldırım University, Erzincan, Turkey, mustafa.eskisu@erzincan.edu.tr

ORCID: 0000-0002-7992-653X

Received: 26.12.2020 *Accepted: 25.02.2021* *Published: 10.03.2021*

ABSTRACT

Childhood traumas may have detrimental psychological consequences and lead to use of maladaptive coping strategies. Internet addiction, related to childhood trauma and various psychological disorders, is a growing research area, which attracted the attention of clinicians, researchers and educators. This study using a cross-sectional correlational research design aimed to investigate the relationship between childhood trauma, Internet addiction, dissociative experiences and online dissociation. A total of 286 university students completed measures of childhood trauma, Internet addiction, dissociative experiences and online dissociation, which we analyzed performing path analysis, examining structural equation models of how childhood trauma might predict Internet addiction through dissociative experiences and online dissociation. We found that childhood trauma positively associated with dissociative experiences, online dissociation and Internet addiction. Path analysis indicated an indirect relationship between childhood trauma and Internet addiction through dissociative experiences and online dissociation in serial. Moreover, we found that a tendency to general dissociation was not a mediator between childhood trauma and Internet addiction but it predicted online dissociation, which in turn increase addictive use of Internet. Logistic regression analysis, in which pathological Internet use regressed on childhood trauma, dissociative experiences, online dissociation and other demographic variable, demonstrated that time spent on the net and online dissociation predicted addicted Internet use. The findings of the present study supported the role of Internet addiction as a maladaptive coping mechanism and might offer that clinicians and educators should consider the unique dissociated-construct of Internet and the importance of adaptive coping skills for dealing with psychological stress result from childhood trauma.

Keywords: Childhood trauma, Internet addiction, dissociation, online dissociation, university students, mediation analysis.

INTRODUCTION

In parallel with the high-speed development of Internet technology, the penetration of Internet has increased dramatically. The penetration rate of Internet users in Turkey arrived 83.3%, overlapping the world average (63.2%). Moreover, Turkey with the more than 69 million users is among the top three country in Europe (Internet Live Stats, 2019). This prevalence has brought along the problem of addictive Internet use. Young (1998), as a pioneer, characterized Internet addiction (IA) by excessive preoccupation with Internet, inducing negative consequences in psychological, social and psychical life. However, debates about the theoretical and empirical structure of IA are still ongoing. Therefore, authors proposed various terms to define IA such as problematic Internet use, pathological Internet use and Internet addiction. On the other hand, addictive Internet users differ in terms of some key components as follows: excessive and uncontrollable use of Internet, withdrawal symptoms when Internet is not accessible, developing tolerance for Internet usage and negative consequences (Beard & Wolf, 2001; Block, 2008).

In a meta-analytic study with over than 81000 participants, Cheng and Li (2014) revealed that the overall prevalence of IA in 31 countries was 6% and the prevalence rate was relatively high in Middle East and Asia. The prevalence of IA in Turkish college students was reported as 12.4% in a recent study (Evren et al., 2019). In addition to the remarkable prevalence of IA, numerous studies reported the co-occurrence of IA with other psychological disorders. A meta-analytic study revealed that IA had a comorbidity with substance use disorder, attention deficit and hyperactivity disorder, depression and anxiety disorders (Ho et al., 2014). The high prevalence of IA and the high co-occurrence of IA with other psychological disorders have led researchers to investigate the factors predisposing individuals to addictive Internet use.

Psychological trauma has been investigated as a predisposing factor to addictive disorders and several studies hypothesized that psychological trauma aggrandized the vulnerability to addictive use of Internet (Dalbudak et al., 2014; Schimmenti et al., 2017; Yates et al., 2012). Although previous theoretical models conceptualized Internet addiction as a function of some individual factors and psychological problems such as depression, psychological trauma (Brand et al., 2016; Caplan, 2010; Kardefelt-Winther, 2014), further research is necessary to better understand the underlying mechanisms of the developmental pathways from psychological risk factors (e.g. childhood trauma) to addictive use of online activities (Kardefelt-Winther, 2014). Consequently, present study aimed to examine the role of dissociative experiences and online dissociation on the relationship between childhood traumas and IA, performing a structural model in which childhood trauma was independent variable, Internet addiction was dependent variable, dissociative experiences and online dissociation were mediating variable.

Childhood Trauma and Internet Addiction

Childhood trauma is generally conceptualized under the five distinct dimensions, namely (i) psychical abuse, (ii) emotional abuse, (iii) sexual abuse, (iv) psychical neglect and (v) emotional neglect (Bernstein et al., 1994). Childhood adversities were associated with health problems (Hughes et al., 2017) as well as they were the

predictor of lifetime psychiatric disorders (Kessler et al., 2010). Furthermore, childhood adversities associated with maladaptive family functioning (e.g. child abuse and neglect) were the strongest predictors of psychiatric disorders (Kessler et al., 2010) and more than half of the individuals with psychological disorders reported at least one type of childhood trauma (Xie et al., 2018).

Childhood traumas had an association with substance disorders (Zhang et al., 2020) as well as behavioral addictions such as gambling (Horak et al., 2020), Internet gaming disorder (Grajewski & Dragan, 2020; Kircaburun et al., 2019) and IA (Dalbudak et al., 2014; Evren et al., 2019). The association with IA and childhood traumas is in line with previous theoretical models. Cognitive-Behavioral Model for Pathological Internet Use (CBM) (Caplan, 2010) proposes that individuals with psychological problems have a tendency to prefer online interaction, which may lead to use of Internet for mood regulation. This path may result in deficient self-regulation, which cause to the development of pathological use of Internet. In the recent reviewed Interaction of Person-Affect-Cognition-Execution (I-PACE) model, Brand et al. (2019) claims that early negative childhood experiences are among the predisposing variables of addictive behaviors such as addictive Internet use. The I-PACE model provides an integrative structure arguing that the interaction between predisposing factors, affective and cognitive responses to a specific stimuli, and executive functions, such as reduced inhibitory control contribute to the development of addictive behaviors. Consistent with these theoretical models, addictive use of Internet could be seen as a psychological mechanism that enables to cope with psychological suffering of negative early experiences. Recent studies found that depression and/or anxiety (Grajewski & Dragan, 2020; Shi et al., 2020), alexithymia (Schimmenti et al., 2017), low self-esteem (Zhang et al., 2012) and emotion dysregulation (Evren et al., 2019) mediated the relationship between childhood trauma and online addictive behaviors.

The Role of Dissociative Experiences and Online Dissociation

Dissociation was described in the DSM-5 as “a disruption or discontinuity in the normal integration of consciousness, memory, identity, emotion, perception, body representation, motor control and behavior” (American Psychiatric Association, 2013). Dissociative symptoms are common in both general population (Seedat et al., 2003; Şar et al., 2007) and psychiatric patients (Foote et al., 2006; Şar et al., 2000). There is a considerable body of studies demonstrating that dissociative experiences were associated with addictive use of Internet (Bernardi & Pallanti, 2009; De Berardis et al., 2009; Lee et al., 2016) and adverse childhood experiences (Kong et al., 2018; Sar et al., 2012). Moreover, addictive use of Internet was associated with dissociation (Boysan et al., 2017; Canan et al., 2012; Dalbudak et al., 2014) and childhood trauma (Evren et al., 2019; Kircaburun et al., 2018) in Turkish university students.

Considering the relationship between dissociative symptoms and psychological disorders, similarly to other symptoms of psychological disorders, dissociative experiences may be seen as a predisposing factor for IA. On the other hand, it can also have a mediating role facilitating coping with psychological problems. This is consistent with theoretical models of addictive Internet use, which propose that not only the psychological disorders have a role, but also maladaptive coping and deficient self-regulation have a role in the formation and continuation of

IA (Brand et al., 2019; Caplan, 2010; Kardefelt-Winther, 2014). Therefore, dissociative experiences, as a dysfunctional self-regulation mechanism, may have a role in the relationship between childhood trauma and addictive use of Internet. Supporting this claim, in a recent study with 912 Turkish university students, Evren et al. (2019) found that severity of dissociative symptoms and emotion dysregulation mediated the relationship between childhood trauma and IA. Moreover, in another recent study, Grajewski and Dragan (2020) demonstrated that adverse childhood experiences and anxiety had an indirect effect on Internet addiction mediated by the tendency to dissociation.

On the other hand, mood-regulated and escapism-related construct of Internet may have an association with dissociation. Griffiths (2003) considered dissociative experience as one of the factors that make online activities potentially seductive or addictive. The unique construct of online activities includes experiences such as losing track of time, feeling like someone else and blacking out, which can arouse dissociative feelings. Therefore, these reinforced dissociative experiences in the net may lead to addictive online behaviors (Griffiths, 2003). In an experimental study, Aardema et al. (2010) found that virtual reality induced dissociation and an initial tendency to dissociation increased the dissociative symptoms after online activities. Furthermore, Lung et al. (2020) reported that longer time spent online may cause confusion between virtual life and real life. Boysan et al. (2019) also suggested the term of "online dissociation" reflecting the dissociative experiences during online activities, including identity confusion, escapism/detachment, impairment in reality monitoring/absorption and losing the sense of reality. They also found that individuals with higher score of the online dissociation exhibited addictive use of the Internet. Accordingly, considering the mutual relationship between dissociation and IA, it may be proposed that along with the tendency to dissociation in offline daily life, the dissociative experiences on the net may also have a role in the development of behavioral addictions.

The Present Study

Although previous studies demonstrated the association between childhood trauma and Internet addiction, and the role of dissociative experiences in online addictive behaviors, there is a substantial gap in the literature to understand the underlying psychological mechanism of the path from early adverse experiences to addictive Internet use. Moreover, previous studies examining the association between IA and dissociation considered dissociative experiences as a predisposing factor independent of online activities. However, Jacobs' (1989) general theory of addiction claims that a tendency to dissociative experiences during addictive behaviors provides a distinction between individuals with addiction and without addiction. Furthermore, Boysan et al. (2019) developed an instrument measuring the construct of online dissociative experiences and indicated its relationship with addictive Internet use. In parallel to these theoretical assumptions, present study aims to investigate the role of online dissociative experiences on the association between IA and childhood trauma. In line with this general aim, as diagrammed in Figure 1, we tested a structural equation model in which childhood trauma was the independent variable, dissociative experience was the first-level mediator, online dissociation was the second-level mediator and Internet addiction was the outcome variable. Furthermore, recent studies in Turkey indicated that the rates of IA vary 8.75% to 12.4% among Turkish university students (Ceyhan et al., 2019;

Evren et al., 2019). The high prevalence of IA among university students increase the educational and psychological specialist to prevention and treatment of IA. In their review study, Vondráčková and Gabrhelík (2016) reported that prevention studies should focus on improvement of specific skills and the determining the risk factors of IA is essential for the development of effective preventive programs. Therefore, investigating the role of dissociative experiences on IA, could be beneficial to develop preventive psycho-educational programs and tools in educational settings.

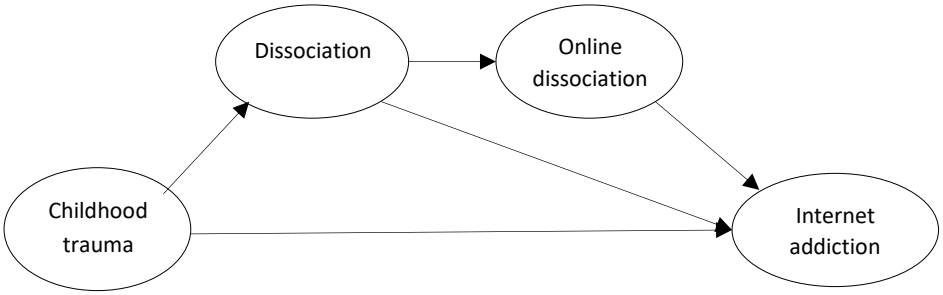

Figure 1. Hypothesized Model

METHOD

Present study was conducted using a cross-sectional correlational research design in which the relationships among two or more variables are investigated. In current study, we aimed to examine the association between childhood trauma, dissociative experiences, online dissociation and Internet addiction by performing the structural equation model (SEM). SEM as a combination of multiple regression, factor analysis and path analysis is a sophisticated method providing an examination of possible causation among several variables (Fraenkel et al., 2012).

Participants

Using convenience sampling method, 286 college students from various departments (192 females, 67%; 94 males, 33%) ranging in age from 18 to 30 (M= 21.19, Sd= 1.80) were recruited via classroom announcement. Following an informed consent, participants completed the questionnaires. To compute the statistical power of a structural model, we performed power analysis using RMSEA (Preacher & Coffman, 2006) and found that the statistical power of the present study is .90, showing that it has adequate statistical power. The mean time spent online was 4.81 with 2.63 of standard deviation. While 33.2% of participants reported pathological level of dissociation, 19.9% of them were defined as probable of Internet addicts (Table 1).

Table 1. Socio-demographic Statistics of Participants

Age		(Mean, SD)	21.19	1.80
Time spent online		(Mean, SD)	4.81	2.63
Gender	Male	(n, %)	94	32.90%
	Female	(n, %)	192	67.10%
Pathological dissociation	DES ≥ 30	(n, %)	95	33.20%
Internet addiction	CIAS > 63	(n, %)	57	19.90%

Note. DES = Dissociative Experiences Scale; CIAS = Chen Internet Addiction Scale

Measures

Childhood Trauma Questionnaire (CTQ)

CTQ, developed by Bernstein et al. (1994), measures the adverse childhood experiences. The CTQ has 28 items with a five-point Likert scale and five dimensions including psychical and emotional abuse, emotional neglect, sexual abuse and physical neglect. Higher scores show higher level of childhood traumas. CTQ was adapted to Turkish culture by Şar et al. (2012) with the original factor structure and high internal reliability (.97). The Cronbach's alpha coefficient of the CTQ in the present study was .74 (Table 2).

Dissociative Experiences Scale (DES)

The DES is a measure of dissociative experiences with 28 item rated on a scale ranging from 0 to 100 (Carlson & Putnam, 1993). The total DES score is the average of the responses of 20 item. Scores higher than 30 may indicate the pathological dissociation. The Turkish form of DES, translated by Yargic et al. (1995) consisted of similar sub-factors to original form and had a high reliability (.97). The internal reliability coefficient of the DES in the current study was.93

Chen Internet Addiction Scale (CIAS)

CIAS is 26 four-point item questionnaire designed to assess addictive use of Internet (Chen et al., 2003). In addition to composite scores, CIAS provides scores on five dimensions: compulsive Internet use, withdrawal symptoms, tolerance, interpersonal and health problems, and time management difficulties. A score higher than 63 may demonstrate the Internet addiction. The Turkish form of CIAS had had the original five sub-dimensions and high internal reliability (Ceyhan et al., 2019). The scale had also good Cronbach alpha internal reliability coefficients (.94) in the present study.

Van Online Dissociative Experiences Scale (VODES)

VODES, developed by Boysan et al. (2019), is a measure of dissociative symptoms during online activities. The VODES has 62 items rated on a scale ranging from 0 to 10, in which higher scores indicate the higher intensity of online dissociation. The VODES has five dimensions including identity confusion, escapism/detachment, impairment in reality monitoring/absorption and losing the sense of reality. The internal consistency of the VODES was .93. The scale had also excellent internal reliability (Cronbach alpha= .97) in the current study.

Data Analysis

Initially, we used skewness and kurtosis to examine normality and then we computed descriptive statistics for the sample and the correlation coefficients between variables. We investigated the predictive variables of Internet addiction using logistic regression analysis. We regressed demographics along with the DES and VODES total scores onto the cut-off scores of the CIAS.

We performed an SEM path analysis to investigate the relationships between variables as well as the role of dissociative experiences and online dissociation in IA using AMOS 24. Following Anderson and Gerbing's (1988) two-step SEM procedure, we tested our structural model after performing a confirmatory factor analysis of the

measurement model. In accordance with the recommendation of Wen et al. (2004), we used following fit-statistics and their cut-off points; chi-square values (χ2), the comparative fit index (CFI; >.90), the Tucker-Lewis fit index (TLI; >.90), the root mean square error of approximation (RMSEA; <.08), and the standardized root-mean-square residual (SRMR; <.08). Moreover, we examined the indirect effects using bootstrapping method with 2000 bootstrap and 95% bias-corrected confidence interval that does not contain zero shows the significant indirect effect.

FINDINGS

Descriptive Statistics

We computed the Pearson product-moment correlation coefficients between scale scores. There were significant positive correlations between Internet addiction, childhood trauma, dissociative symptoms and online dissociation and correlation coefficients ranged from low to moderate (r= .154 – 558). Correlation coefficients, means, standard deviations and internal reliability scores of the measures are demonstrated in Table 2.

Table 2. Correlation matrix and descriptive statistics.

	1	2	3	4	α	Mean	Sd
1. Internet addiction	-				.94	50.44	16.79
2. Childhood trauma	.154**	-			.74	43.94	13.81
3. Online dissociation	.558**	.214**	-		.97	109.50	80.84
4. Dissociative experiences	.333**	.269**	.557**	-	.93	23.85	15.34

Notes. **= $p < .01$; α= Cronbach alpha internal reliability coefficients

Structural Model

Given these significant association, we proceeded to investigate the role of dissociative experiences and online dissociation on these association using path analysis. Before testing our structural model, we performed measurement model. CIAS subscales were used as observed indicator of the latent variable of Internet addiction. We also used subscales of DES and VODES to determine the latent construct of dissociative experiences and online dissociation, respectively. Similarly, CTQ subscales were used as observed indication of the latent construct of childhood trauma. The measurement model had good model fit (χ^2 = 277.393, df = 113, χ^2/df = 2.455, p < .001, RMSEA = .071 [90% confidence interval (CI) = .061-.082], SRMR = .053, CFI = .95, TLI = .94). All latent variables significantly correlated each other at .01 level and intercorrelations among the latent variables ranged from .18 to .59. Moreover, each observed variable significantly loaded on its relevant latent variable and regression weights of observed variables ranged from .49 to .97.

After obtaining good model fit for measurement model, we examined our structural model. The structural model fit the data well, χ^2 = 230.49, df = 112, χ^2/df = 2.058, p < .001, RMSEA = .061 [90% confidence interval (CI)= .050-.072], SRMR= .053, CFI = .97, TLI = .96. Standardized regression coefficients demonstrated that childhood trauma positively predicted dissociative experiences (β= .35, SE= .45, p < .001), which positively predicted the online dissociation (β = .59, SE = .09, p < .001) and thus positively predicted the IA (β = .56, SE = .01, p < .001). However, both childhood trauma and dissociative experiences fell short of significance in predicting Internet addiction (see dashed lines in Figure 2). Therefore, we examined an “indirect model” without direct associations between

childhood trauma, dissociative experiences, and Internet addiction. This model had relatively better fit statistics (χ^2 = 231.079, df = 114, χ^2/df = 2.027, p < .001, RMSEA = .060 [90% confidence interval (CI) = .049-.071], SRMR = .054, CFI = .97, TLI = .96; Figure 2). We compared the BIC values of two models and found that the "indirect model" should be highly preferred ΔBIC = 10.7. The indirect model accounted for 32% of unique variance in Internet addiction.

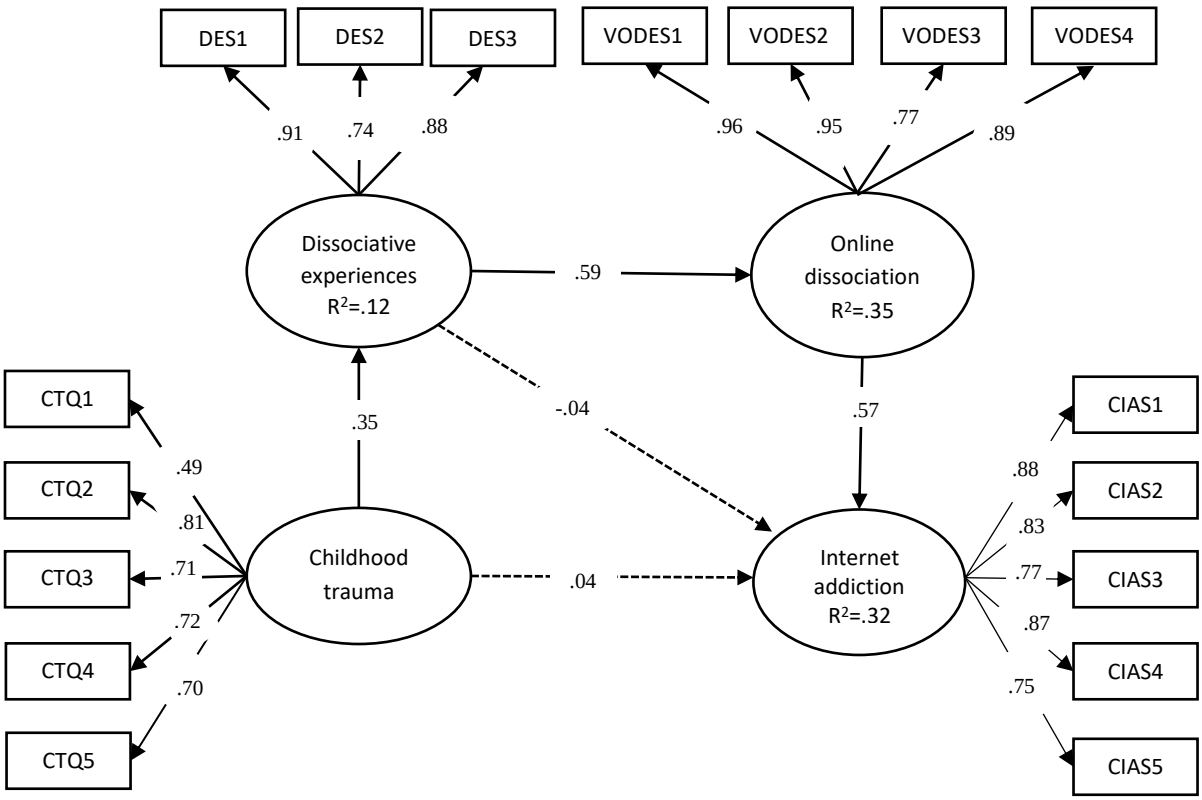

Figure 2. Structural Model (Indirect Model) Demonstrating Regression Coefficients between Variables.

Notes: The dashed lines represent direct path tested in hypothetical model. CTQ1: Emotional abuse, CTQ2: Psychical abuse, CTQ3: Psychical neglect, CTQ4: Emotional neglect, CTQ5: Sexual abuse, CIAS1: Compulsive use, CIAS': Withdrawal, CIAS3: Tolerance, CIAS4: Problems in interpersonal relationships, CIAS5: Health/time management, DES1: Depersonalization, DES2: Absorption, DES3: Amnesia, VODES1: Identity confusion, VODES2: Escapism/detachment, VODES3: Impairment in reality monitoring/absorption, VODES4: Losing the sense of reality. All paths except the dashed lines are significant at p < .001 level.

To further examine the indirect effect of childhood trauma on Internet addiction, a bias-corrected bootstrap with 2000 sample indicated the indirect effect of childhood trauma on Internet addiction through dissociative experiences and online dissociation in serial (β= .208, SE = .05, p < .01, 95% confidence interval (CI) = .095-.268). Table 3 presented the indirect effects.

Table 3. Indirect Effects of Childhood Traumas on Internet Addiction

	Standard coefficient	Standard error	p	95% Confidence Interval	
				Lower	Upper
CTQ-DES-VODES-CIAS	.106	.035	.001	.059	.173
CTQ-DES-VODES	.208	.050	.001	.132	.296
DES-VODES-CIAS	.347	.070	.001	.241	.471

Note: All coefficients have a significant effect as determined by the 95% bias-corrected and accelerated confidence interval based on 2000 bootstrap samples.

Predictive Role of Dissociative Experiences and Online Dissociation

After we found that childhood trauma had an indirect effect on Internet addiction through dissociative experiences and online dissociation, we investigated the predictive role of dissociation and online dissociation. To this end, we carried out a logistic regression analysis in which pathological dissociation (DES ≥ 30) as an independent variable was regressed on addictive Internet use (CIAS > 63). Logistic regression analysis indicated that participants whose DES score greater than 29 were more inclined to Internet addiction (Odds ratio = 1.123, 95% CI = 1.694 – 5.578, $p < 0.001$, Nagelkerke $R^2 = 0.74$). 33% of the participants with pathological level of dissociate symptoms had also Internet addiction (n=32). Then, we regressed dissociative experiences and online dissociation onto the addictive Internet use (CIAS > 63) after controlling demographics (age, gender, time spent online). We found that only time spent online (Odds ratio = .196, 95% CI = 1.075 – 1.376, $p < 0.01$) and online dissociation (Odds ratio = .011, 95% CI = 1.006 – 1.016, $p < 0.001$) were significantly correlated with addicted Internet use (Table 4).

Table 4. Multiple Logistic Regression onto the Internet Addiction (CIAS > 63)

	B	Se	O.R.	Wald	p	%95 CI
Constant	-3.918	2.407	.020	2.651	.103	
Gender	-.210	.356	.810	.348	.555	.403 – 1.629
Age	-.031	.111	.969	.081	.776	.780 – 1.203
Time spent online	.196	.063	1.216	9.636	.002	1.075 – 1.376
Online dissociation	.011	.002	1.011	21.060	.000	1.006 – 1.016
Childhood trauma	.013	.012	1.013	1.120	.290	.989 – 1.038
Dissociative experiences	.012	.013	1.012	.826	.364	.986 – 1.038

Note. Nagelkerke $R^2 = .306$

DISCUSSION

The present study was planned to explore the interaction between childhood trauma and Internet addiction by performing a serial mediation model in which childhood trauma had an indirect effect on IA through dissociative experiences and online dissociation in serial. The results revealed that dissociative experiences and online dissociation were serial mediators between childhood trauma and IA. Childhood trauma also fell short of significance in predicting IA when taking into account dissociative experiences and online dissociation. Moreover, this study also showed that dissociative experiences was not a mediator between childhood trauma and IA but it mediated this relationship through online dissociation. Lastly, the results of logistic regression analysis demonstrated that time spent online and online dissociation were predictors of addicted Internet use.

The first main result of this study is that childhood trauma and IA were related. This result is in line with the theoretical suppositions that childhood trauma has a role in the formation of IA (Brand et al., 2019; Caplan, 2010). This result was also consistent with previous studies showing the association between childhood trauma and IA (Dalbudak et al., 2014; Evren et al., 2019; Schimmenti et al., 2017; Zhang et al., 2012). Similarly, previous studies also showed that childhood trauma could predispose individuals to develop other behavioral addictions such as gambling (Imperatori et al., 2017) and Internet gaming disorder (Grajewski & Dragan, 2020; Kircaburun et al., 2019). This result is also consistent with Ehlers and Clark's (2000) cognitive development model of posttraumatic

stress disorder claiming that individuals who were exposed to traumatic experiences have a disposition to use dysfunctional coping strategies – such as an addictive use of the Internet. Thus, individual who had childhood traumas might excessively use Internet as a dysfunctional coping and mood-regulation strategy. Previous studies also supported this claim, which demonstrate that depression and anxiety (Grajewski & Dragan, 2020; Shi et al., 2020), alexithymia (Schimmenti et al., 2017), and emotion dysregulation (Evren et al., 2019) had a mediating role on the relationship between childhood trauma and online addictions.

Present study also indicated that childhood trauma had an indirect effect on IA via dissociative experiences and online dissociation in serial. According to this result, childhood trauma leads to dissociative experiences, which in turn increase online dissociation and, which in turn predict addictive use of Internet. This result is also in line with previous theoretical models about online addictions (Brand et al., 2019; Caplan, 2010; Cheng et al., 2018; Kardefelt-Winther, 2014) which emphasize that not only previous psychological disorder but dysfunctional coping and deficient self-regulation have also an important role in the formation and perpetuation of addictive use of the Internet. Because dissociation as a cognitive cut-off state is related with deficient emotion regulation (De Berardis et al., 2009), people with childhood trauma may use the Internet to escape from psychological stress of traumatic experiences. This phenomenon is also consistent with psychological mechanism of trauma. For instance, Foa and Hearst-Ikeda (1996) claimed that dissociation in response to trauma is an imminent cognitive strategy to cope with severe emotions, which can turn into a life-long avoidance mechanism. Furthermore, consistent with this result, Evren et al. (2019) and Grajewski and Dragan (2020) demonstrated that the tendency to dissociation mediated the association between childhood trauma and addictive online behaviors.

Last but not least, present study indicated that dissociative experiences were not a mediator between childhood trauma and IA but it mediated the relationship between childhood trauma and addictive Internet use through dissociative experiences on the net. This result shows that a tendency to general dissociation may cause individuals exhibit more dissociative symptoms while they are on the net. Moreover, logistic regression analysis reveals that not dissociation but online dissociative experiences predict the addicted Internet use. In a recent study, Boysan et al. (2019) supported this finding and found that online dissociation was related with addictive Internet use. These findings are also in agreement with Jacob's (1989) general theory of addiction stating that individuals with addictive behaviors tend to share a common set dissociative-like experiences. Consistent with the present study, Klanecky et al. (2012) also found that desire to dissociate rather than dissociative tendencies alone mediated the relationship between childhood trauma and problematic alcohol use. In the present study, online dissociation predicted by childhood trauma may have a similar function in increasing IA. Moreover, similar to Jacob's theory, in their study reviewing studies about gambling disorder, Schluter and Hodgins (2019) proposed to distinguish dissociation occurred generally from "in game dissociation" reported during gambling. They also reported that individuals with a tendency to general dissociation might prone to experience dissociation during gambling, which in turn to an escapism mechanism in response to emotional stress resulting in part from psychological problems such as depression, childhood trauma, etc. Therefore, similar to gambling disorder, dissociative experiences on the net may have a similar function in the formation and perpetuation of

IA. Supporting this claim, Aardema et al. (2010) asserted that spending time in virtual reality resulted in increasing dissociative symptoms. Furthermore, another study found that spending time in social media was related to fragmented personality and dissociation between real life and virtual life (Bekiroğlu & Hülür, 2016). Consequently, because of the unique characteristics of the Internet (e.g. anonymity, losing track of time), the predisposition to dissociation makes individuals with childhood trauma to experience dissociative symptoms on the net, which in turn increases to addictive Internet use.

The present study has several limitations. First, the cross-sectional design of the present study makes it difficult to interpret the results and longitudinal studies are needed in order to explore causal relationship between variables. Secondly, self-rated scales were used in the present study. Lastly, the present study included non-clinical university students and future studies should be conducted by using different sample groups.

To conclude, this is the first study to investigate the mediating role of online dissociation between childhood trauma and IA. It demonstrated that addictive Internet users with a history of childhood trauma have higher levels of online dissociation, which lead to IA. These findings are in accordance with the previous theoretical models (Brand et al., 2019; Kardefelt-Winther, 2014) considering IA as a maladaptive coping mechanism for childhood trauma. These findings might offer some potential psychological and educational implications. This study shows that childhood trauma is a potential risk factor for subsequent Internet addiction as well as other psychological disorders. Thus, preventive psycho-education studies aiming to prevent childhood traumas and treat negative consequences of childhood traumas might be beneficial to eliminate the path from childhood trauma to IA. Because dissociative experiences on the net have a mediating role and dissociative experiences could be considered a maladaptive coping skill, clinicians and school counselors could also develop prevention/intervention programs aiming to gain adaptive coping skills and self-regulation skills. Moreover, considering that the unique construct of Internet may cause to online dissociative experiences, educational interventions aiming to develop healthy Internet use should take into account of the unique construct of the Internet which may provide a place to experience dissociation.

ETHICAL DECLARATION

In this article, the journal writing rules, publication principles, research and publication ethics, and journal ethical rules were followed. In addition, the research was approved by the Erzincan Binali Yıldırım University Ethic Committee (30.03.2020/03-23).

Author Contribution Rate: The author's contribution rate is 100%. The author designed the study, developed the theoretical framework, collected and analyzed the data and wrote the manuscript. The author declare no conflict of interest and that any institution or organization did not financially support the current study. The author would like to acknowledge the precious contribution of Oğuzhan Çelik and Lale Unur on data collection.

REFERENCES

Aardema, F., O'Connor, K., Cote, S., & Taillon, A. (2010). Virtual reality induces dissociation and lowers sense of presence in objective reality. *Cyberpsychol Behav Soc Netw*, *13*(4), 429-435. https://doi.org/10.1089/cyber.2009.0164

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (DSM-5®)*. American Psychiatric Pub.

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological bulletin*, *103*(3), 411.

Beard, K., & Wolf, E. (2001). Modification in the proposed diagnostic criteria for internet addiction. *CyberPsychology & Behavior*, *4*(3), 377-383. https://doi.org/10.1089/109493101300210286

Bekiroğlu, H. A., & Hülür, A. B. (2016). A research on university students' uses of Facebook and digital schizophrenia. *Social Sciences Research Journal*, *6*(14), 146-175.

Bernardi, S., & Pallanti, S. (2009). Internet addiction: a descriptive clinical study focusing on comorbidities and dissociative symptoms. *Comprehensive Psychiatry*, *50*(6), 510-516. https://doi.org/10.1016/j.comppsych.2008.11.011

Bernstein, D. P., Fink, L., Handelsman, L., Foote, J., Lovejoy, M., Wenzel, K., Sapareto, E., & Ruggiero, J. (1994). Initial reliability and validity of a new retrospective measure of child abuse and neglect. *The American Journal of Psychiatry*, *151*(8), 1132-1136. https://doi.org/10.1176/ajp.151.8.1132

Block, J. J. (2008). Issues for DSM-V: Internet Addiction. *American Journal of Psychiatry*, *165*(3), 306-307. https://doi.org/10.1176/appi.ajp.2007.07101556

Boysan, M., Eşkisu, M., & Çam, Z. (2019). Development of a new instrument for assessing dissociation in the net: the Van Online Dissociative Experiences Schedule (VODES). *Yeni Symposium*(0). https://doi.org/10.5455/nys.20190920012130

Boysan, M., Kuss, D. J., Barut, Y., Ayköse, N., Güleç, M., & Özdemir, O. (2017). Psychometric properties of the Turkish version of the Internet Addiction Test (IAT). *Addictive Behaviors*, *64*, 247-252. https://doi.org/10.1016/j.addbeh.2015.09.002

Brand, M., Wegmann, E., Stark, R., Muller, A., Wolfling, K., Robbins, T. W., & Potenza, M. N. (2019). The Interaction of Person-Affect-Cognition-Execution (I-PACE) model for addictive behaviors: Update, generalization to addictive behaviors beyond internet-use disorders, and specification of the process character of addictive behaviors. *Neurosci Biobehav Rev*, *104*, 1-10. https://doi.org/10.1016/j.neubiorev.2019.06.032

Brand, M., Young, K. S., Laier, C., Wolfling, K., & Potenza, M. N. (2016). Integrating psychological and neurobiological considerations regarding the development and maintenance of specific Internet-use disorders: An Interaction of Person-Affect-Cognition-Execution (I-PACE) model. *Neurosci Biobehav Rev*, *71*, 252-266. https://doi.org/10.1016/j.neubiorev.2016.08.033

Canan, F., Ataoglu, A., Ozcetin, A., & Icmeli, C. (2012). The association between Internet addiction and dissociation among Turkish college students. *Compr Psychiatry*, *53*(5), 422-426. https://doi.org/10.1016/j.comppsych.2011.08.006

Caplan, S. E. (2010). Theory and measurement of generalized problematic Internet use: A two-step approach. *Computers in Human Behavior*, *26*(5), 1089-1097. https://doi.org/10.1016/j.chb.2010.03.012

Carlson, E. B., & Putnam, F. W. (1993). An update on the Dissociative Experiences Scale. *Dissociation: Progress in the Dissociative Disorders*, *6*(1), 16-27.

Ceyhan, E., Boysan, M., & Kadak, M. T. (2019). Associations between online addiction attachment style, emotion regulation depression and anxiety in general population testing the proposed diagnostic criteria for internet addiction. *Sleep and Hypnosis*, *21*(2), 123-139.

Chen, S.-H., Weng, L.-J., Su, Y.-J., Wu, H.-M., & Yang, P.-F. (2003). Development of a Chinese Internet Addiction Scale and Its Psychometric Study. *Chinese Journal of Psychology*, *45*(3), 279-294.

Cheng, C., Cheung, M. W. L., & Wang, H.-y. (2018). Multinational comparison of internet gaming disorder and psychosocial problems versus well-being: Meta-analysis of 20 countries. *Computers in Human Behavior*, *88*, 153-167. https://doi.org/10.1016/j.chb.2018.06.033

Cheng, C., & Li, A. Y. (2014). Internet addiction prevalence and quality of (real) life: a meta-analysis of 31 nations across seven world regions. *Cyberpsychol Behav Soc Netw*, *17*(12), 755-760. https://doi.org/10.1089/cyber.2014.0317

Dalbudak, E., Evren, C., Aldemir, S., & Evren, B. (2014). The severity of Internet addiction risk and its relationship with the severity of borderline personality features, childhood traumas, dissociative experiences, depression and anxiety symptoms among Turkish University Students. *Psychiatry Research*, *219*(3), 577-582. https://doi.org/https://doi.org/10.1016/j.psychres.2014.02.032

De Berardis, D., D'Albenzio, A., Gambi, F., Sepede, G., Valchera, A., Conti, C. M., Fulcheri, M., Cavuto, M., Ortolani, C., Salerno, R. M., Serroni, N., & Ferro, F. M. (2009). Alexithymia and its relationships with dissociative experiences and Internet addiction in a nonclinical sample. *Cyberpsychol Behav*, *12*(1), 67-69. https://doi.org/10.1089/cpb.2008.0108

Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, *38*(4), 319-345. https://doi.org/https://doi.org/10.1016/S0005-7967(99)00123-0

Evren, C., Evren, B., Dalbudak, E., Topcu, M., Kutlu, N., & Elhai, J. D. (2019). Severity of dissociative experiences and emotion dysregulation mediate the relationship between childhood trauma and Internet addiction symptom severity among young adults. *Dusunen Adam: The Journal of Psychiatry and Neurological Sciences*, *32*, 332-344. https://doi.org/10.14744/dajpns.2019.00048

Foa, E. B., & Hearst-Ikeda, D. (1996). Emotional Dissociation in Response to Trauma. In L. K. Michelson & W. J. Ray (Eds.), *Handbook of Dissociation: Theoretical, Empirical, and Clinical Perspectives* (pp. 207-224). Springer US. https://doi.org/10.1007/978-1-4899-0310-5_10

Foote, B., Smolin, Y., Kaplan, M., Legatt, M. E., & Lipschitz, D. (2006). Prevalence of dissociative disorders in psychiatric outpatients. *Am J Psychiatry*, *163*(4), 623-629. https://doi.org/10.1176/appi.ajp.163.4.623

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education* (8 ed.). McGraw-hill New York.

Grajewski, P., & Dragan, M. (2020). Adverse childhood experiences, dissociation, and anxious attachment style as risk factors of gaming disorder. *Addict Behav Rep*, *11*, 100269. https://doi.org/10.1016/j.abrep.2020.100269

Griffiths, M. D. (2003). Internet gambling: issues, concerns, and recommendations. *Cyberpsychol Behav*, *6*(6), 557-568. https://doi.org/10.1089/109493103322725333

Ho, R. C., Zhang, M. W. B., Tsang, T. Y., Toh, A. H., Pan, F., Lu, Y., Cheng, C., Yip, P. S., Lam, L. T., Lai, C.-M., Watanabe, H., & Mak, K.-K. (2014). The association between internet addiction and psychiatric co-morbidity: a meta-analysis. *BMC Psychiatry*, *14*(1), 183. https://doi.org/10.1186/1471-244X-14-183

Horak, N. S., Eagle, G., Stein, D. J., & Lochner, C. (2020). Gambling Disorder and Childhood Trauma: A Complex Association. *J Gambl Stud*. https://doi.org/10.1007/s10899-020-09983-w

Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A., Mikton, C., Jones, L., & Dunne, M. P. (2017). The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis. *The Lancet Public Health*, *2*(8), e356-e366. https://doi.org/10.1016/s2468-2667(17)30118-4

Imperatori, C., Innamorati, M., Bersani, F. S., Imbimbo, F., Pompili, M., Contardi, A., & Farina, B. (2017). The Association among Childhood Trauma, Pathological Dissociation and Gambling Severity in Casino Gamblers. *Clinical Psychology & Psychotherapy*, *24*(1), 203-211. https://doi.org/https://doi.org/10.1002/cpp.1997

Internet Live Stats. (2019). *Internet users*. https://www.internetworldstats.com/stats.htm

Jacobs, D. F. (1989). A general theory of addictions: rationale for and evidence supporting a new approach for understanding and treating addictive behaviors. In H. J. Shaffer, S. Stein, F. Gambino, & T. Cummings (Eds.), *Compulsive gambling: Theory, research, and practice.* (pp. 35-64). Lexington Books.

Kardefelt-Winther, D. (2014). A conceptual and methodological critique of internet addiction research: Towards a model of compensatory internet use. *Computers in Human Behavior*, *31*, 351-354. https://doi.org/10.1016/j.chb.2013.10.059

Kessler, R. C., McLaughlin, K. A., Green, J. G., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., Aguilar-Gaxiola, S., Alhamzawi, A. O., Alonso, J., Angermeyer, M., Benjet, C., Bromet, E., Chatterji, S., de Girolamo, G., Demyttenaere, K., Fayyad, J., Florescu, S., Gal, G., Gureje, O., Haro, J. M., Hu, C. Y., Karam, E. G., Kawakami, N., Lee, S., Lepine, J. P., Ormel, J., Posada-Villa, J., Sagar, R., Tsang, A., Ustun, T. B., Vassilev, S., Viana, M. C., & Williams, D. R. (2010). Childhood adversities and adult psychopathology in the WHO World Mental Health Surveys. *Br J Psychiatry*, *197*(5), 378-385. https://doi.org/10.1192/bjp.bp.110.080499

Kircaburun, K., Demetrovics, Z., Király, O., & Griffiths, M. D. (2018). Childhood Emotional Trauma and Cyberbullying Perpetration Among Emerging Adults: A Multiple Mediation Model of the Role of Problematic Social Media Use and Psychopathology. *International Journal of Mental Health and Addiction*, *18*(3), 548-566. https://doi.org/10.1007/s11469-018-9941-5

Kircaburun, K., Griffiths, M. D., & Billieux, J. (2019). Psychosocial factors mediating the relationship between childhood emotional trauma and internet gaming disorder: a pilot study. *Eur J Psychotraumatol*, *10*(1), 1565031. https://doi.org/10.1080/20008198.2018.1565031

Klanecky, A., McChargue, D. E., & Bruggeman, L. (2012). Desire to Dissociate: Implications for Problematic Drinking in College Students with Childhood or Adolescent Sexual Abuse Exposure. *The American Journal on Addictions*, *21*(3), 250-256. https://doi.org/https://doi.org/10.1111/j.1521-0391.2012.00228.x

Kong, S. S., Kang, D. R., Oh, M. J., & Kim, N. H. (2018). Attachment insecurity as a mediator of the relationship between childhood trauma and adult dissociation. *Journal of Trauma & Dissociation*, *19*(2), 214-231. https://doi.org/10.1080/15299732.2017.1329772

Lee, T. K., Roh, S., Han, J. H., Park, S. J., Soh, M. A., Han, D. H., & Shaffer, H. J. (2016). The relationship of problematic internet use with dissociation among South Korean internet users. *Psychiatry Research*, *241*, 66-71. https://doi.org/10.1016/j.psychres.2016.04.109

Lung, F.-W., Shu, B.-C., Chiang, T.-L., & Lin, S.-J. (2020). From dissociative experience and internet use to happiness: A Taiwan Birth Cohort Study. *Research Square*. https://doi.org/10.21203/rs.3.rs-32607/v1

Preacher, K. J., & Coffman, D. L. (2006). *Computing power and minimum sample size for RMSEA*. In Available from http://quantpsy.org/

Sar, V., Ozturk, E., & Ikikardes, E. (2012). Validity and reliability of the Turkish version of childhood trauma questionnaire. *Türkiye Klinikleri Tıp Bilimleri Dergisi*, *132*(1054-1063).

Schimmenti, A., Passanisi, A., Caretti, V., La Marca, L., Granieri, A., Iacolino, C., Gervasi, A. M., Maganuco, N. R., & Billieux, J. (2017). Traumatic experiences, alexithymia, and Internet addiction symptoms among late adolescents: A moderated mediation analysis. *Addict Behav*, *64*, 314-320. https://doi.org/10.1016/j.addbeh.2015.11.002

Schluter, M. G., & Hodgins, D. C. (2019). Dissociative Experiences in Gambling Disorder. *Current Addiction Reports*, *6*(1), 34-40. https://doi.org/10.1007/s40429-019-0238-y

Seedat, S., Stein, M. B., & Forde, D. R. (2003). Prevalence of dissociative experiences in a community sample: Relationship to gender, ethnicity, and substance use. *The Journal of Nervous and Mental Disease*, *191*(2), 115-120. https://doi.org/10.1097/01.Nmd.0000050940.16782.6b

Shi, L., Wang, Y., Yu, H., Wilson, A., Cook, S., Duan, Z., Peng, K., Hu, Z., Ou, J., Duan, S., Yang, Y., Ge, J., Wang, H., Chen, L., Zhao, K., & Chen, R. (2020). The relationship between childhood trauma and Internet gaming disorder among college students: A structural equation model. *J Behav Addict*, *9*(1), 175-180. https://doi.org/10.1556/2006.2020.00002

Şar, V., Akyüz, G., & Doğan, O. (2007). Prevalence of dissociative disorders among women in the general population. *Psychiatry Research*, *149*(1), 169-176. https://doi.org/10.1016/j.psychres.2006.01.005

Şar, V., Öztürk, E., & İkikardeş, E. (2012). Validity and reliability of the Turkish Version of Childhood Trauma Questionnaire. *Turkiye Klinikleri Journal of Medical Sciences*, *32*(4), 1054-1063. https://doi.org/10.5336/medsci.2011-26947

Şar, V., Tutkun, H., Alyanak, B., Bakim, B., & Baral, I. (2000). Frequency of dissociative disorders among psychiatric outpatients in Turkey. *Comprehensive Psychiatry*, *41*(3), 216-222. https://doi.org/10.1016/s0010-440x(00)90050-6

Vondráčková, P., & Gabrhelík, R. (2016). Prevention of Internet addiction: A systematic review. *Journal of Behavioral Addictions J Behav Addict*, *5*(4), 568. https://doi.org/10.1556/2006.5.2016.085

Wen, Z., Hau, K.-T., & Herbert, W. M. (2004). Structural equation model testing: Cutoff criteria for goodness of fit indices and chi-square test. *Acta psychologica sinica*, *36*(02), 186-194.

Xie, P., Wu, K., Zheng, Y., Guo, Y., Yang, Y., He, J., Ding, Y., & Peng, H. (2018). Prevalence of childhood trauma and correlations between childhood trauma, suicidal ideation, and social support in patients with depression, bipolar disorder, and schizophrenia in southern China. *J Affect Disord*, *228*, 41-48. https://doi.org/10.1016/j.jad.2017.11.011

Yates, T. M., Gregor, M. A., & Haviland, M. G. (2012). Child maltreatment, alexithymia, and problematic internet use in young adulthood. *Cyberpsychol Behav Soc Netw*, *15*(4), 219-225. https://doi.org/10.1089/cyber.2011.0427

Young, K. (1998). Internet addiction: The emergence of a new clinical disorder. *CyberPsychology & Behavior*, *1*(3), 237-244. https://doi.org/10.1089/cpb.1998.1.237

Zhang, S., Lin, X., Liu, J., Pan, Y., Zeng, X., Chen, F., & Wu, J. (2020). Prevalence of childhood trauma measured by the short form of the Childhood Trauma Questionnaire in people with substance use disorder: A meta-analysis. *Psychiatry Res*, *294*, 113524. https://doi.org/10.1016/j.psychres.2020.113524

Zhang, Z., Yang, L., Hao, J., Huang, F., Zhang, X., & Sun, Y. (2012). Relationship of childhood physical abuse and internet addiction disorder in adolescence: the mediating role of self-esteem. *Zhonghua liu xing bing xue za zhi, 33*(1), 50-53. http://europepmc.org/abstract/MED/22575110