

Article Arrival : 26/09/2020

Published : 15.11.2020

Doi Number : <http://dx.doi.org/10.26449/sssj.2726>

Reference : Batmaz, H., Ulusoy, Y. &amp; Inceoğlu, F. (2020). "The Mediating Role Of Digital Game Addiction In The Correlation Between Cyber Victimization And Cyber Bullying" International Social Sciences Studies Journal, (e-ISSN:2587-1587) Vol:6, Issue:73; pp:5093-5108.

# THE MEDIATING ROLE OF DIGITAL GAME ADDICTION IN THE CORRELATION BETWEEN CYBER VICTIMIZATION AND CYBER BULLYING

Siber Mağduriyet ve Siber Zorbalık Arasındaki İlişkide Dijital Oyun Bağımlılığının Aracı Rolü

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## ABSTRACT

In the present study, the mediating role of digital game dependency was investigated in the correlation between cyberbullying and cyber victimization. The current study is a descriptive study in the relational screening model. A total of 284 college students, 194 females and 90 males, participated in the study. In the study, Digital Game Addiction Scale (Lemmens et al., 2009) was used to determine problem behavior among college students in digital game play, and E-Bullying and E-Victimization Scales (Lam and Li, 2013) were used to measure cyberbullying and cyber victimization levels. The study data were analyzed with AMOS 24 and SPSS 25.0 software. The role of digital game addiction in the correlation between cyber victimization and cyberbullying was tested with the Structural Equation Model (SEM) based on the bootstrap method. The study findings demonstrated cyber victimization significantly predicted cyber bullying and digital game addiction, while digital game addiction significantly predicted cyberbullying. And it was determined that there were significant and positive correlations between cyber victimization and cyberbullying and digital game addiction, and between digital game addiction and cyberbullying. The results of the path analysis based on the bootstrap method conducted to investigate the mediating effect of digital game addiction demonstrated that digital game addiction had a partially mediating role in the correlation between cyber victimization and cyberbullying. The study findings were discussed based on the literature, recommendations were presented for future research and applications.

**Keywords:** Cyberbullying, cybervictimization, digital game addiction

## ÖZET

Bu çalışmada, siber zorbalık ve siber mağduriyet arasındaki korelasyonda dijital oyun bağımlılığının aracı rolü araştırılmıştır. Mevcut çalışma ilişkisel tarama modelinde tanımlayıcı bir çalışmadır. Çalışmaya 194 kız ve 90 erkek olmak üzere toplam 284 üniversite öğrencisi katıldı. Çalışmada, dijital oyun oyununda üniversite öğrencileri arasında problem davranışını belirlemek için Dijital Oyun Bağımlılığı Ölçeği (Lemmens ve ark., 2009), ölçmek için E-Zorbalık ve E-Mağduriyet Ölçekleri (Lam ve Li, 2013) kullanılmıştır. siber zorbalık ve siber mağduriyet düzeyleri. Çalışma verileri AMOS 24 ve SPSS 25.0 yazılımı ile analiz edilmiştir. Siber mağduriyet ve siber zorbalık arasındaki korelasyonda dijital oyun bağımlılığının rolü, bootstrap yöntemine göre Yapısal Eşitlik Modeli (SEM) ile test edilmiştir. Çalışma bulguları siber mağduriyetin siber zorbalık ve dijital oyun bağımlılığını önemli ölçüde yordayken, dijital oyun bağımlılığı siber zorbalığı önemli ölçüde yordadığını göstermiştir. Siber mağduriyet ile siber zorbalık ve dijital oyun bağımlılığı arasında ve dijital oyun bağımlılığı ile siber zorbalık arasında anlamlı ve pozitif korelasyonlar olduğu belirlenmiştir. Dijital oyun bağımlılığının aracılık etkisini araştırmak için yapılan bootstrap yöntemine dayanan yol analizi sonuçları, dijital oyun bağımlılığının siber mağduriyet ve siber zorbalık arasındaki korelasyonda kısmen aracılık rolünü gösterdi. Çalışma bulguları literatür ışığında tartışılmış, gelecekteki araştırma ve uygulamalar için öneriler sunulmuştur.

**Anahtar Sözcükler:** siber zorbalık, siber mağduriyet, dijital oyun bağımlılığı

## 1. INTRODUCTION

Currently, games are not only played by children, but it became an entertaining activity for a larger population thanks to digital devices (phones, computers, tablets, etc.). The concept of 'digital game' has also evolved with rapid technological advances. Digital games allow users to sign in with a password, etc., progress through stages, and mostly preferred by children (Fleer M., 2014). Although children mostly prefer digital games, it is known that young adults also spend time playing digital games. Frequent game play on digital devices, leading to loss of time, and preventing the user from conducting other activities (such as daily chores) could lead to dependency behavior. Game addiction is described as an impulse control disorder characterized by symptoms such as “unawareness of the time spent during game play”, “lack of interest in other activities”, “persistence despite negative effects”, “feeling psychologically deprived when not playing” in psychiatry literature (APA, 2013). Computer or video game addiction is defined as excessive or compulsive use of computer and video games that prevent daily life activities (Weinstein, 2010).

The incidence of digital game addiction varies between 0.6% and 15% among 8-24 years old individuals (Desai, Krishnan-Sarin, Cavallo and Potenza, 2010; Gentile 2009, Grüsser, Thalemann and Griffiths, 2006, Lemmens et al., 2009 Poly and Agrimi, 2012; Porter, Starcevic, Berle and Fenech, 2010; Van Rooij, Schoenmakers, Vermulst, Van Den Eijnden and Van De Mheen, 2011). According to the American Medical Association, 90% of American teenagers play digital games and 15% are addicted to digital games (Tanner, 2007), 30% of the 14-19 years old adolescents are addicted to digital games in Turkey ( Irmak, 2014), half of young adults play digital games at least for 2 hours a day within 6 months (Kneer, Glock, Beskes, and Bente, 2012), college students spend most of their day playing games online (Bilge, Beğli, Yılmaz, Manap, and Korkmaz, 2018), demonstrating that both the time spent playing digital games and the rate of digital game addiction could not be underestimated.

Digital games could lead to problems such as distancing one's self from close relatives and friends, malnutrition, physical illnesses, academic failure and negative effects on interpersonal relationships, suicide and behavior that lead to death (Hagedorn & Young, 2011). There is a positive correlation between digital game addiction and violence (Hazar, Hazar, Gökyürek, Hazar, and Çelikbilek, 2017; Demirtaş Madran & Ferligül Çakılcı, 2014), psychological problems such as anxiety and depression, health problems such as eye diseases and deterioration in sleep quality (Mustafaoğlu & Yasacı, 2018). It was reported that digital games affected the psychological well-being of individuals, lead to the deterioration of their psychological strength, difficulties in problem-solving and coping with stress (Yuan et al., 2013, Kaya et al., 2016). Cyber victimization (Yang, 2012) was also included in these problems. It should be noted that those who play digital games experience cyber victimization during the game and accept this situation as normal (McInroy & Mishna, 2017).

Brown et al. (2014) argued that cyber victimization does not have a standard definition, but all definitions usually involve intentional and repetitive harm with technological means. According to Kowalski and Limber (2007), cyber victimization originates in technology such as social networking sites, e-mail and messaging. Cyber victimization is the experience of being harmed by a peer on the internet, electronic media or various social media platforms (Diaz and Fite, 2019). This reflects some type of psychological violence directed to an individual. It was reported in a study that about half of the adolescents were cyber victims in the USA (Raskauskas and Stoltz, 2007) and based on another study 20% were cyber victims (Carlyle and Steinman, 2007). About 30% of 11-21 years old students in Spain (Machimbarrena et al., 2018), one-fifth of adolescents in Spain, Poland, the Netherlands, Romania, Iceland and Greece experienced cyber victimization during a year (Tsitsika et al., 2015). In Turkey, the incidence of cyber victimization among the 14-15 years old adolescents varied between 5.1% and 56% (Topcu and Erdur-Baker, 2016), and 67,67% of college students experienced cyber victimization at least once within six months (Gönültaş, 2019).

It was reported that spending every hour on the internet was an effective predictor of cyber victimization (Çetin, Peker & Eroğlu, 2010; Li, 2007; Hinduja & Patchin, 2008; Peker & Eroğlu, 2010; Ybarra, 2004; Ybarra and Mitchell, 2004a; Ybarra, Mitchell, Wolak and Finkelhor, 2006; Yaman & Peker, 2012). The fact that most digital game players prefer online games (Entertainment Software Association, 2018) leads to spending more time online. Thus, it could be expected that being online every hour, which is one of the factors behind exposure to cyber victimization, would trigger digital game addiction. Whether

cyberbullying, often mentioned with cyber victimization, poses a risk for digital game addiction is a question that should be answered.

There are several definitions of cyberbullying in the literature. Cyberbullying was described as a type of psychological bullying conducted on electronic devices such as mobile phones, web logs, websites, chat rooms, etc. (Shariff & Gouin, 2005), a type of social violence conducted with electronic communication tools (Lacey, 2007), conducting hostile behavior conducted in e-mail, mobile phones, messaging, and harassing people on the internet (Li, 2006), persistent and repetitive use of electronic devices such as computers, cell phones etc. with the intention of harming someone (Hinduja & Patchin, 2014), reckless violent and hostile behavior online (Lee, 2005), social violence or sending negative messages on the internet or other communication tools (Willard, 2007), and an intentional online action to harm, embarrass and/or humiliate another individual (Heiman et al., 2015). The common feature of the descriptions was the fact that cyberbullying includes deliberate harm to someone on the Internet.

The incidence of cyberbullying varies between 4% and 59% among 14-25 years old individuals (Hinduja & Patchin, 2014; Kowalski, Limber & Agatston, 2012; Leung, Wong, & Farver, 2017; Taştekin, 2016). In the USA, one out of every five students between the ages of 10 and 17 was involved in bullying (Ybarra and Mitchell, 2004b), 43% of students between the ages of 10-15 were victims of cyberbullying in the USA, and 21% were online harassment victims (Ybarra et al., 2007), while 34.8% of Chinese college students were involved in cyberbullying behavior and 56.9% of these were victims (Zhou et al., 2013). Study findings demonstrated that 22% of Turkish college students experienced cyberbullying at least once (Dilmac, 2009). Furthermore, the cyberbullying incidence was 29.6% (Al-Harbi, 2013) and 31.5% (Al-Qahtani, 2008) in Saudi Arabia, 39% in Oman, 33% in Lebanon, 32% in Morocco, 21% in the United Arab Emirates (Fleming and Jacobsen, 2009), and 47% in Jordan (Al –Bitar et al., 2013).

In conclusion, the incidence of cyberbullying is significant both in Turkey and in the world. The positive correlation between cyberbullying and cyber victimization (İğdeli, 2018; Hinduja & Patchin, 2007), and the fact that the frequency of cyber victimization varies between 5.1% and 56% in Turkey (Topcu and Erdur-Baker, 2016) demonstrates that the magnitude of cyberbullying could not be neglected. Furthermore, it was determined that one out of every five students between the ages of 13 and 18 is a cyberbully and about half of them experience cyber victimization (Raskauskas and Stoltz, 2007), one out of every three young individuals under the age of 18 suffered cyber victimization, and one out of nine individuals is a cyberbully (Patchin & Hinduja, 2014). In a study conducted by Arıcağ (2009), it was reported that one fifth of college students experienced cyber bullying at least once, and half were cyber victims at least once. Certain studies reported that cyberbullies are often cyber victims themselves (Kowalski and Limber, 2007; Kowalski, Limber and Agatston, 2012). It was suggested that cyberbullying and also cyber victimization could also be observed in online games. Albeit it is a socially isolated environment, over 60% of those who play digital games play these online with other individuals (Entertainment Software Association, 2018). While sociability and teamwork are common in online multiplayer games, hostility and harassment, also known as online violence or cyberattacks, are also common (Gray, 2012, Kuznekoff & Rose, 2013, p. 541-556). The facts that continuous digital game play predicted cyberbullying (Chang et al., 2015); and cyberbullying is observed when playing online (digital) games (Fryling, Cotler, Rivituso, Mathews, and Pratico, 2015; Leung and McBride-Chang, 2013) demonstrated that digital game addiction may be a risk factor for cyberbullying.

Based on the above-mentioned findings, it could be suggested that some of the individuals who play digital games would experience cyberbullying or cyber victimization. Considering that digital game addiction would further increase both in Turkey and in the world, the significance of the research on the correlation between cyber victimization and cyberbullying and digital game addiction is evident. It could be suggested that not only children but young adults also face the risk of digital game addiction, and they are likely to experience cyberbullying and victimization. Thus, the correlation between cyberbullying and cyber victimization and digital game addiction among young adults was determined as the main research problem in the present study. The aim of the current study was to test the mediating role of digital game addiction in the correlation between cyberbullying and cyber victimization. Thus, the following research hypotheses were tested:

H<sub>1</sub>: Cyber victimization has a significant effect on cyberbullying.

H<sub>2</sub>: Cyber victimization has a significant effect on digital game addiction.



H<sub>3</sub>: Digital game addiction has a significant effect on cyberbullying.

H<sub>4</sub>: Digital game addiction plays a mediating role in the correlation between cyber victimization and cyberbullying.

## 2. METHOD

Relational screening model was employed in the present study. These research aim to collect data to determine certain properties of a group (Büyüköztürk et al., 2016: 14). The relational screening studies demonstrate that a part of the variation observed in one of the two variables may be due to the other variable; however, the causality could not be determined in this variation (Köklü and Büyüköztürk, 2000, p.125). Structural equation modeling (SEM), which is commonly employed in relational research design, was used in the study (Kline, 2005). Cyber victimization was determined as the independent variable and cyberbullying as the dependent variable. Digital game addiction was the mediating variable, whose effect on the correlation between the dependent and the independent variables was measured.

### 2.1. The Study Group

The study sample was assigned with convenience sampling method. A total of 284, including 90 male (31.7%), 194 female (68%) students with a mean age of 18.99 and attending the Department of Child Development and Physical Therapy and Rehabilitation in Karabük University, Faculty of Health Sciences, Faculty of Engineering, Mechatronics Department, and Faculty of Theology in the 2019-2020 academic year participated in the study voluntarily. The scales were applied to all students during class hours. The fact that the validity and reliability of the scales were determined on adolescents was effective on the selection of freshmen students. Thus, it was decided to study the freshmen students under 20 years of age, and close to adolescence.

### 2.2. Data Collection Instruments

#### 2.2.1. Digital game addiction scale (DGAS-7)

The scale was developed by Lemmens et al. (2009) to determine problematic digital game behavior of adolescents aged 12-18. DGAS-7 is the seven-item short form of the initial DGAS-21 instrument. The DGAS-7 is a five-point Likert type (1 = never, 5 = always) scale with a single-factor structure. The scale scores vary between 7 and 35. Based on the polythetic diagnosis, if the subject scores 3 points (sometimes) to at least four (7) or more items, the subject is diagnosed as a game addict (Irmak & Erdoğan, 2015). DGAS-7 was adapted to Turkish language by Irmak and Erdoğan (2015). Exploratory factor analysis (AFA) and Confirmatory factor analysis were conducted within the scope of construct validity. Based on the AFA, the scale with the single dimension explained 56.96% of the total variance and it was observed that the factor loads varied between 0.52 and 0.77. The confirmatory factor analysis (CFA) revealed that chi-square ( $\chi^2 = 14.22$ ,  $p = 0.37$   $sd = 14$ ) was insignificant and the model had good fit (RMSEA = 0.012, AGFI = 0.92, CFI = 0.99, GFI = 0.96, SRMR = 0.06). The scale content validity index was calculated as  $r = 0.92$ , Cronbach alpha coefficient was 0.72, and item total score correlations were between 0.52 and 0.76. The test-retest correlation within an interval of three weeks was 0.80. These findings demonstrated that all items in Turkish language DGAS-7 were valid and reliable items that could measure problem digital gaming behavior.

#### 2.2.2.E-bullying (E-BS) ve e-victimization (E-VS) scales

E-Bullying (E-BS) and E-Victimization (E-VS) scales were developed by Lam and Li (2013) to measure virtual bullying and virtual victimization among adolescents. E-Bullying (E-BS) scale includes 6 items and the E-Victimization (E-VS) scale includes 5 items, and each item could be scored between 0 and 6 points. High scores mean high e-bullying and victimization levels. Both scales were adapted to Turkish by Gençdoğan and Çikrikci (2015). Confirmatory factor analysis was conducted to determine construct validity and E-VS, which has a single factor structure, explained 47.01% of the total variance and it was observed that the factor load of the items varied between .63 and .75. Confirmatory factor analysis findings for E-VS ( $\chi^2 = 2.13$ ,  $\chi^2 / sd = .71$   $p = .54$ ; RMSEA = .00; CFI = 1.00; IFI = 1.00; GFI = 1.00; AGFI = .98; NFI = .99 ; SRMR = .01; RFI = .98) demonstrated that the model had perfect fit. Confirmatory factor analysis results for the adapted E-BS ( $\chi^2 = 9.34$ ,  $\chi^2 / sd = 1.55$ ,  $p = .15$ ; RMSEA = .05; CFI = .99; IFI = .99; GFI = .98; AGFI = .93; NFI = .97; SRMR = .03; RFI = .93) demonstrated that the model had perfect fit. Cronbach alpha for the E-BS was calculated as .75 and for E-VS, it was calculated as .79. It was

concluded that the two measurement tools psychometric properties of which were analyzed were valid and reliable for the Turkish sample.

### 2.3. Data Analysis

The study data were analyzed with AMOS 24 and SPSS 25.0 software. Initially, power analysis was conducted on the data obtained with the scales with the G-Power 3.1 software and the power ( $1-\beta$ ) was calculated as .99. The power analysis supported that the sample size was adequate. Power analysis calculates the statistical power of the sample size (Foul, Erdfelder, Burchner & Lang, 2009). The aim of power analysis during the study design is to ensure that the impact on the population could be determined with the highest probability (Cohen, 1988). The sample size was calculated as 300 with 0.13 effect size, 0.05 error margin and 0.99 population representation. Research conducted in behavioral sciences require a sample size calculated with a power value between .90 and .99 (Cohen, 1988).

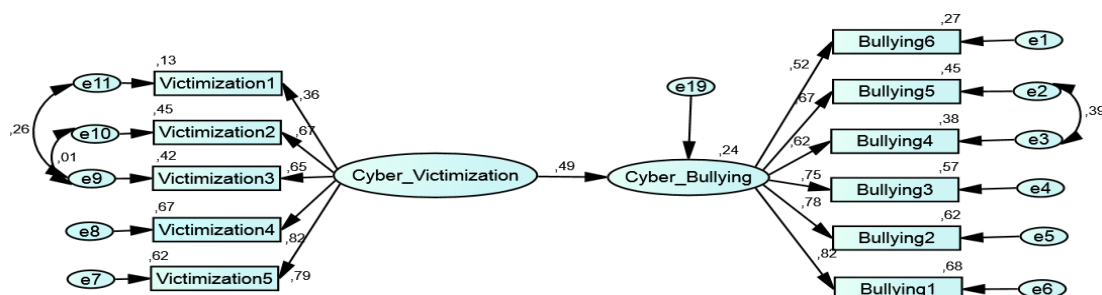
The sample size was determined as 300 with .05 error margin and .99 population representation power; however, 16 out of the collected data were removed since they were below the  $p < 0.01$  value obtained with the Mahalanobis Distance. To determine whether there is multivariate normal distribution, it is necessary to check whether multivariate outliers exist with the Mahalanobis Distance (Can, 2014). To confirm multivariate normal distribution, the formula  $p * (p + 2)$ , where  $p$  is the observed number of variables, should produce a value greater than the Mardia Coefficient (Multivariate value in AMOS software) (Mardia, 1974: 14). The analysis of the data skewness and kurtosis revealed that the variables met the  $\pm 2$  limit and the data were accepted to be distributed normally. Thus, it was determined that the data collected from 284 subjects with the scales confirmed the multivariate normal distribution assumption.

The study hypotheses were analyzed with SEM. Since multivariate normal distribution was confirmed for the data, the covariance matrix was developed with the Maximum Likelihood method and the mediation was analyzed with the Structural Equation Model (SEM). Models that test the mediation are used to test hypotheses associated with a link mechanism that mediates the impact of the independent variable on the dependent variable. The mediating variable helps to determine how and why the correlation between two variables exists (Gürbüz, 2019).

To test whether the digital game addiction variable played an mediation role in the correlation between cyber victimization and cyberbullying, path analysis with bootstrap method was conducted. It was suggested that the Bootstrap method provides more reliable findings when compared to the traditional method developed by Baron and Kenny and the Sobel test (Baron, Kenny, 1986, Hayes, 2018) Resampling was set to 5000. In the mediation effect analysis conducted with the Bootstrap method, the analysis findings within the 95% confidence interval (GA) should not include zero (0) to confirm the research hypothesis (Gürbüz, 2019).

### 3. FINDINGS

In the first analysis, the first model, where the cyber victimization was external, and cyberbullying was the internal variable constructed for the hypothesis “ $H_1$ : Cyber victimization has a significant effect on cyberbullying” and includes the measurement model, was tested. The diagram of the model is presented in Figure 1.



CMIN=145,629, df=40, CMIN/df=3,640, RMSEA=0,076, GFI =,913, CFI=0,920

Figure 1. SEM diagram for the first model.

Fit index values were determined as follows in the first model:  $\chi^2$  211,736, df 43,  $\chi^2/df$  4,924, RMSEA 0,118, GFI 0,873 and CFI 0,872. Since the expected results were not obtained for the goodness-of-fit indices of the model in the analysis, the binary residual terms (e2-e3, e9-e10 and e10-e11) were determined based on the model modification indexes.

A second model was obtained by associating the error covariances for the above mentioned items and in this model, it was observed that cyber victimization predicted cyber bullying ( $\beta = 0.49$ ;  $p < 0.01$ ). The cyber victimization variable explained 24% of the variance in cyberbullying. The goodness of fit index values obtained in the analysis were determined as follows:  $\chi^2$  145,629, df 40,  $\chi^2/df$  3,640, RMSEA 0,076, GFI 0,913 and CFI 0,920. Thus, the  $H_1$  hypothesis (“Cyber victimization has a significant effect on cyberbullying”) was supported and the second model, where digital game addiction was a mediator, was confirmed. The path diagram for the second model is presented in Figure 2.

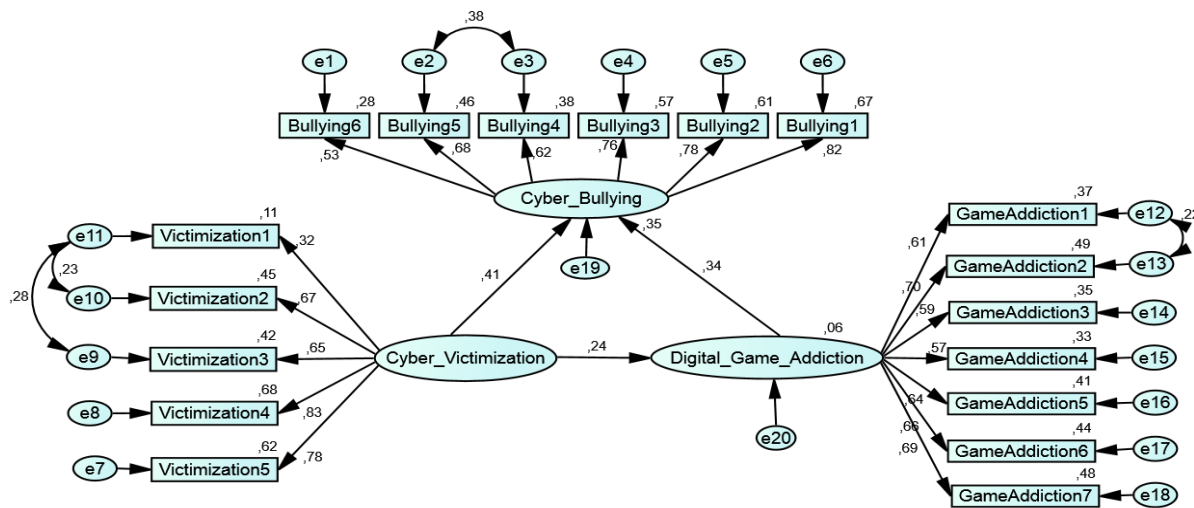


Figure 2. SEM diagram for the second model.

It was determined that the standardized regression weights presented above the arrows in the path diagram were statistically significant ( $p < 0.05$ ). The analysis of the mediated structural model revealed that cyber victimization significantly predicted digital game addiction ( $\beta = 0.25$ ;  $p < 0.01$ ). Thus,  $H_2$  Hypothesis (“Cyber victimization has a significant effect on digital game addiction”) was supported. Similarly, digital game addiction, which was the mediator variable, significantly predicted cyber bullying ( $\beta = 0.33$ ;  $p < 0.01$ ). Thus, the  $H_3$  hypothesis (“Digital game addiction has a significant effect on cyberbullying”) was also supported. The introduction of digital game addiction, which was the mediating variable demonstrated that the path coefficient from the cyber victimization variable to the cyber bullying variable was significant ( $\beta = 0.40$ ;  $p < 0.01$ ). Digital game addiction explained 34% of the variation (squared multiple correlation) in cyber victimization and cyberbullying. Cyber victimization explained 6% of the variation in digital game addiction. The total effect of victimization on bullying (standardized total effects) was  $\beta = 0.49$  ( $p < 0.01$ ), which was the effect obtained without the mediator variable.

Fit index values obtained in the path analysis with the first model were as follows:  $\chi^2$  307,893, df 129,  $\chi^2/df$  2,387, RMSEA 0,070, GFI 0,893 and CFI 0,910. Since the expected result was not obtained for the goodness of fit indexes obtained with the analysis of the model, the model was modified and covariance was plotted between e12 and e13. The goodness of fit indices obtained with the re-analysis were  $\chi^2$  298,971, df 128,  $\chi^2/df$  2,336, RMSEA 0,069, GFI 0,910 and CFI 0,915 (Figure 2). The model was compatible with the data and the goodness of fit indices were in the desired range.

To test whether the digital game addiction variable played a mediating role in the correlation between cyber victimization and cyberbullying, path analysis based on the bootstrap method was conducted. The results for the mediation model for the impact of cyber victimization and digital game addiction on cyber bullying are presented in Table 1.

**Table 1.** AMOS Results for the Mediation Model for the Effects of Cyber Victimization and Digital Game Addiction on Cyberbullying.

Perdictor Variable	Dependent Variable	Total Effect	Indirect Effect	% Explained	Standard Error	Critical Value
Victimization	Digital Game Addiction	0,24	-	%6	0,050	3,243*
Digital Game Addiction	Bullying	0,34	0,080	%35	0,054	4,337*
Victimization		0,41			0,037	5,257*

\*p&lt;0,05

Based on the Bootstrap results, it was determined that the indirect effect of cyber victimization on cyber bullying via digital game addiction was significant ( $\beta = 0.080$ , GA [0.014,0,015]). Bootstrap lower (0,014) and upper (0,015) confidence intervals obtained with the percentage method did not include zero (0).

Based on the study findings, digital game addiction has a partial mediating effect in the correlation between cyber victimization and cyberbullying. It was observed that the mediating variable did not fully explained the correlation between the two variables based on the partial mediation effect, and the full mediation effect demonstrated that the correlation between the two variables was explained by the indirect effect (Hayes, 2018). The cyberbullying explained 49% of the variance in cyber victimization in the measurement model; however, this ratio decreased to 41% in the partial mediation model, which also included digital game addiction. In other words, the partial mediating effect of digital game addiction was statistically significant in the correlation between cyber victimization and cyberbullying. Thus, H<sub>4</sub> (“Digital game addiction has an intermediary effect in the correlation between cyber victimization and cyberbullying”) hypothesis was also supported.

In the structural equation model, which determines whether the model established with the factors obtained in the study was confirmed with more than one fit index, all indices are analyzed rather than a single fit index. The model was found statistically significant since the calculated  $\chi^2/df$  value was below 3, and NFI, CFI and GFI values indicated that the model was fit (NFI> 0.90, CFI> 0.90, GFI> 0.90). In other words, the sample could be represented with the data, and the RMSEA demonstrated that the sample size was adequate (RMSEA <0.05) (Cole 1987, Jöreskog, Sörbom 1993).

#### 4. DISCUSSION

In the present study, the mediating effect of digital game addiction on the correlation between cyber victimization and cyber bullying was investigated, and it was determined that digital game addiction had a partial mediating effect on the correlation between cyber victimization and cyber bullying. In the literature, the correlation between digital game addiction and cyber victimization and cyberbullying was not investigated, while the correlations between digital game play, cyber victimization and cyberbullying were studied.

In present study, initially, the correlations between the variables were analyzed. The research hypotheses were tested. The first study hypothesis was “Cyber victimization has a significant effect on cyberbullying.” The hypothesis was confirmed. In other words, cyber victimization predicted cyberbullying significantly ( $\beta = 0.49$ ;  $p < 0.01$ ). This finding was consistent with the reports that the most important variable that predicted cyberbullying was cyber victimization (Bauman, 2010; Akbulut & Erişti, 2011), and cyber bullies were often cyber victims themselves (Kowalski & Limber, 2007; Ybarra & Mitchell, 2004b, Kowalski, Limber & Agatston, 2012). Furthermore, the fact that exposure to cyberbullying predicts cyber victimization (Del Rey, Elipe & Ortega-Ruiz, 2012; Walrave & Heirman, 2011; Accordino & Accordino, 2011) revealed that cyber victimization could lead to cyberbullying, and cyberbullying could lead to cyber victimization. Thus, it could be suggested that these two variables exhibit a nested structure.

The second study hypothesis, “Cyber victimization has a significant effect on digital game addiction.” was also confirmed. In other words, cyber victimization predicted digital game addiction significantly ( $\beta = 0.25$ ;  $p < 0.01$ ). In the literature, there are no studies which reported that cyber victimization predicted digital game addiction. The presence of a positive correlation between online (digital) gaming and cyber victimization (Yang, 2012), the exposure of online gamers to online attacks (Chang et al., 2015), that fact that adolescents who play digital games experience cyber victimization and consider it normal (McInroy and Mishna, 2017) and 52% of young individuals who play digital games experience cyber victimization (Ballard and Welch, 2017) revealed that there was a strong correlation between cyber victimization and

digital game play . The study findings demonstrated that cyber victimization was one of the determining variables of digital game addiction.

The third study hypothesis, “Digital game addiction has a significant effect on cyberbullying” was also confirmed. In other words, digital game addiction predicted cyberbullying significantly ( $\beta = 0.33$ ;  $p < 0.01$ ). In the literature, there was no study which reported that digital game addiction predicted cyberbullying. However, it was reported that digital game addiction predicted violence (Kim, Namkoong, Ku, & Kim, 2008), violent behavior played a role in digital game addiction (Mehroof & Griffiths, 2010), and there was a positive correlation between digital game addiction and violence tendency (Karabulut, 2019), demonstrating a correlation between digital game addiction and violence. Considering that cyberbullying is violence exhibited in virtual environment, digital game addiction could be expected to predict cyberbullying. Furthermore, the findings that continuous digital game play predicted cyberbullying (Chang et al., 2015), cyberbullying was observed when playing online (digital) games (Fryling et al., 2015; Leung and McBride-Chang, 2013), the positive correlation between digital gaming and cyberbullying (Cotler, Fryling & Rivituso, 2017), the adolescents who played online games for a long time experienced cyberbullying more frequently (Dittrick, Beran, Mishna, Hetherington, and Shariff, 2013), and 35% of young individuals who play digital games were cyberbullies (Ballard & Welch, 2017) supported that digital game addiction promoted cyberbullying.

The fourth study hypothesis, “Digital game addiction has an mediating effect on the correlation between cyber victimization and cyberbullying” was also confirmed. In other words, as cyber victimization increased, cyber bullying increased and digital game addiction played a mediating role in this increase (Beta = 0.082, GA [0.014-0.015]). In the literature, there was no study which reported that that digital game addiction mediated the correlation between cyber victimization and cyberbullying. The previous study findings that adolescents who experienced cyber victimization could become cyberbullies (Fryling and Rivituso, 2013; Shu Ching Yang, 2012; Fryling et al., 2015), there was a positive correlation between cyberbullying and cyber victimization (Akbulut & Eristi, 2011; Yang, 2012; Beran & Li, 2007; Huang & Chou, 2010; Tunca & Geleri, 2020), and as cyber victimization increased, cyberbullying increased as well were consistent with the present study findings. The fact that there was a positive correlation between digital game play and cyberbullying (Cotler, Fryling & Rivituso, 2017) and cyber victimization (Yang, 2012) revealed that digital game addiction was associated with both cyberbullying and cyber victimization. Furthermore, the present study finding that digital game addiction had a partial mediating effect revealed that digital game addiction played a role in the correlation between cyber victimization and cyberbullying. However, partial mediation means that the mediator variable explained some of the correlation between the variables, while it could not explain the rest (Hayes, 2018). Thus, there may be other mediating variables in the correlation between cyber victimization and cyberbullying, other than digital game addiction.

About 30 million people play digital games in Turkey (Digital Gaming Report, 2019). It was reported that 56% of 16-40 years old individuals played video games in Norway (Mentzoni et al., 2011), while 97% of Americans between the ages of 12-17 play video games (Lenhart et al. 2008). It should not be difficult to estimate that one of the groups who play digital games is college students. College students spend most of their time playing games on the internet, and one in 10 students experience game and internet dependency (Bilge et al., 2018), the incidence of cyberbullying among college students is 20.7% (Qudah et al., 2019), and the frequency of cyber victimization varies between 19% and 22% (Zalaquett & Chatters, 2014; Dilmac, 2009). It was observed that one fifth of the individuals between the ages of 11 and 18 experienced cyber victimization and one tenth of them were cyberbullies (Hinduja & Patchin, 2014). It could be suggested that the role of digital game addiction would be more prominent in the positive correlation between cyber victimization and cyberbullying, considering that the number of people who play digital games would increase every day and accordingly, digital game addiction would increase. The present study was conducted only with freshmen college students. Similar studies could be conducted on different samples such as more senior college students or high school students. In the study, the mediating role of digital game addiction in the correlation between cyber victimization and cyberbullying was investigated. In future studies, the effect of other variables (game types, time spent on the internet, etc.) on the correlation between cyber victimization and cyberbullying could be analyzed.

The present study had certain limitations. First, the study was conducted with college students attending Karabuk University; however, those in the same age group who did not attend formal education were not included in the study. The current study findings demonstrated that the increase of cyber victimization



among college students due to digital game addiction would increase the level of cyberbullying. Thus, it was recommended to include applications that would aim to reduce cyber victimization and application content that would reduce digital game addiction in the future. Since the time spent on the internet is a risk factor for cyber victimization, it was suggested that the counseling work to reduce the time spent on the internet, digital literacy education where the risks of the digital world and necessary precautions should be instructed should be conducted to include all college students, which would have a preventive impact. Finally, it was considered that the present study would contribute to fill the gap in the literature, since no previous research on the mediating role of digital game addiction in the correlation between cyber victimization and cyberbullying was found.

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