

## Mediating Effect of Self-Regulation on the Relationship Between Digital Game Addiction and School Refusal in Adolescents

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### Abstract

Digital game addiction is a prevalent problem among adolescents and can cause undesirable outcomes such as school refusal. Although digital games have such an important share in the lives of adolescents, the literature on how these games influence school refusal and which mediating variables affect this relationship is limited. In particular, the mediating effects of self-regulation, which is considered a factor that can enhance adolescents' school engagement and commitment and reduce school refusal, have not been discussed. In this context, this study aims to discover the mediating effect of self-regulation on the relationship between digital game addiction and school refusal. The present study was carried out with a sample group of students between the 5th and 12th grades (N=663). The data were collected by using short forms of the digital game addiction scale, school refusal assessment scale, and self-regulation scale. PROCESS-v4.2 program integrated with SPSS 25 was used during the mediation relationship testing process by using the Bootstrap method. The results revealed that digital game addiction is a significant factor in the development of school refusal among adolescents and that self-regulation mediates this relationship. Consequently, enhancing self-regulation skills in adolescents with digital game addiction might be an effective way to reduce school refusal. Furthermore, it was observed that digital game addiction negatively predicted self-regulation and that self-regulation negatively predicted school refusal. These results suggest that digital game addiction can be considered as a factor that reduces self-regulation skills, while self-regulation can be viewed as a factor that prevents school refusal.

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### Introduction

Digital game addiction and school refusal are important problems among adolescents (Aksoy & Erol, 2021; Rohrig et al., 2023). Digital game addiction has also rapidly increased together with the increase in web-based applications (Gentile, 2009), and gradually more adolescents started playing such games in the course of time (Tateno et al., 2022). Digital game addiction or excessive digital gaming, which is becoming a gradually growing social issue, was defined as a mental health problem named internet gaming disorder/gaming disorder in diagnostic systems like DSM-5-TR and ICD-11 (revised) (APA, 2022; WHO, 2018). Digital game addiction, which is considered as a sub-dimension of internet addiction, is a result of the excessive and uncontrollable digital game playing. As emphasized previously, problematic, or excessive digital gaming has been classified by the APA (2022) as internet gaming disorder, but

there are various debates as to the term "Internet" used in the definition. Some argue that the term "internet" is used in order to describe electronic and technological gaming, hence suggesting that the internet doesn't influence gaming behavior (Laconi et al., 2017). Even though the game addiction is considered as a sub-category of internet addiction, it is recommended to be evaluated separately (Király et al., 2015). Thus, the concept of digital game addiction was used in the present study in general.

Upon classifying digital game addiction as a psychiatric disorder, there is an increasing concern about the problems associated with it (Tateno et al., 2022). Previous studies revealed that digital game addiction causes structural changes in the brain and is associated with attention deficit hyperactivity disorder, autism spectrum disorder (Ostinelli et al., 2021),

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depression, anxiety, obsessive-compulsive symptoms, and social phobia (González-Bueso et al., 2018). A study carried out particularly in Türkiye reported that the prevalence of digital game addiction among adolescents is approx. 24% (Aksoy & Erol, 2021). Considering the fact that the global prevalence of digital game addiction is 1.96% (Stevens et al., 2020), this is a worrisome percentage. Playing games in digital environments, whether online or offline, causes various psychological and physical harms. Therefore, digital game addiction should be considered as a subject that requires further research (Kavanagh et al., 2023).

Playing digital games is a common leisure activity, especially among adolescents (Tateno et al., 2022). Although it is argued that playing digital games provides significant experiences for adolescents (Laconi et al., 2017), digital game addiction is also the most significant predictor of school refusal (Tateno et al., 2022), in addition to the aforementioned neurodevelopmental issues and mood disorders. School is considered to be the primary place for raising citizens in many cultures (Pellegrini, 2007). Attending school is an essential prerequisite for the academic, social, and emotional development of adolescents. Nevertheless, school absenteeism is a serious problem in many countries (Havik & Ingul, 2021). Considering the fact that school is an important opportunity for the adaptive development of adolescents (Chai & Lin, 2021), identifying the factors influencing the school refusal, developing intervention options, and prioritizing the determination of factors that will reduce the school refusal should be emphasized in order to ensure attendance (Havik & Ingul, 2021).

### ***Digital game addiction and self-regulation***

Some studies carried out before argued that, due to their socializing potential, online games cause a higher level of addiction when compared to offline games. However, whether online or offline, when played excessively or problematically, digital games increase the risk of digital game addiction (Lemmens & Hendriks, 2016). It is essential to reduce the risks of digital game addiction for adolescents, who are significantly affected, to ensure healthy development and be more productive socially. Another important concept associated with

digital game addiction is the self-regulation. Self-regulation is defined as directing one's behaviors towards the desired outcome (Baumeister & Vohs, 2007). Adolescents having poor self-regulation skills are more likely to develop digital game addiction (Fujita et al., 2022). Low self-regulation has been classified by Billieux (2012) as high impulsivity and thrill-seeking, low inhibitory control, and poor decision-making abilities. Moreover, self-regulation has automatic and controllable aspects. The automatic aspect of self-regulation is the response of an individual's motivational systems when faced with a stimulus. The controllable aspects of self-regulation, however, are considered as the individual's capacity to regulate their thoughts, behaviors, and emotions. Longitudinal studies show that self-regulation is associated with not only gaming addiction (Sumiyana et al., 2022) but also substance addiction (Quinn et al., 2022), depression (Barton et al., 2023), criminal behavior, and risky behavior (Zimmerman et al., 2007) among adolescents. It's argued that adolescents having high self-regulation skills have a lower risk of problematic online gaming and social networks addiction (Gan et al., 2022; Mills & Allen, 2019). Moreover, adolescents with low self-control skills have higher maladaptive gaming motivations (Mills & Allen, 2019). Therefore, considering the empirical evidence listed, it was concluded that digital game addiction could influence self-regulation.

### ***School refusal and self-regulation relationship***

School refusal is not a clearly defined mental disorder, diagnostic entity, or syndrome; it is rather a heterogeneous problem which has medical or psychological origins. School refusal has negative consequences for students' psychosocial development, and it is often the result of a mental disorder and/or the result of peer family members or a stressful situation at school. School refusal should not be viewed only as a negative psychological behavior; attending school is important and legally required in many cultures (Jans & Warnke, 2004). Kearney & Silverman (1996) defined school refusal as a child refusing to go to school or not staying in class. This definition includes children aged between 5 and 17 years, who (a) are completely absent, (b) go to school and then

run away, (c) go to school with various emotional (temper tantrums - somatoform complaints) reactions, and (d) requesting to not attend school. School refusal is a multifaceted issue with various causes. It is necessary to identify the factors that trigger and continue school refusal, which poses a serious problem for children's social and educational development, and develop appropriate interventions (Jans & Warnke, 2004). Self-regulation is a significant psychological and motivational factor contributing to school refusal (Ahmadi & Najafi, 2014). Self-regulation is a broad concept and there are many self-regulation models. It is defined as the individual exhibiting certain desired behaviors (such as physical exercises), thoughts or attitudes (such as being compassionate), or emotional states (such as being content) in order to achieve goals or desired outcomes (Gross, 2015). Therefore, self-regulation encompasses the regulation of not just behaviors but also thoughts and emotions (Inzlicht et al., 2021). Students with self-regulation skills believe that they will perform well by using self-regulatory strategies (positive self-efficacy) and set multiple personal goals. Furthermore, these students engage in three crucial processes: self-observation (a person observing their own activities), self-judgment (a person assessing how good their performance in comparison to a standard or those of others), and self-reaction (reacting to performance assessment results) (Eccles & Wigfield, 2002; Zimmerman, 2000). Previous studies have shown that students having high self-regulation skills achieve higher academic achievements (Blume et al., 2022; Keshi & Tas Ahmadi, 2013) and that self-regulation is the most important predictor of academic success (Pintrich & De Groot, 1990). Moreover, self-regulation serves as a buffer against school refusal (McCluskey et al., 2004). It is a skill that increases adolescents' ability to suppress impulsive behaviors (Billieux, 2012) and enhances their commitment to school and their likelihood of participating in school-related activities (Shapiro, 2000). Therefore, self-regulation improves students' school adaptability (Makila et al., 2017). Students with high self-regulation skills are also more likely to exhibit prosocial behaviors at school (Yang & McGinley, 2022). As a result, they establish better relationships with their peers and teachers and are more competent at avoiding negative behaviors (Aydoğdu, 2022; Robson et al.,

2020). Given the literature explained above, it was concluded that self-regulation might be a factor influencing school refusal.

### ***Digital game addiction: Role of school refusal***

Playing digital games is a type of behavior that is becoming increasingly common among adolescents, and it brings many problems with it. A previous study showed that about 52% of adolescents under the age of 17 use the internet for gaming (Tateno et al., 2022). Digital game addiction would be likely developed when an excessive time is allocated to gaming. This behavioral addiction can cause mental issues, is potentially associated with neurodevelopmental disorders like autism spectrum disorder and hyperactivity disorder, and about a third show depression symptoms (Ostinelli et al., 2021) and suffer from anxiety disorders (Sofia et al., 2016). Gaming is also seen as a dysfunctional coping strategy to reduce psychological distress and escape reality (Kardefelt-Winther, 2015). Previous studies have suggested that problematic internet use might be associated with school refusal (Fujita et al., 2022). It can be seen that there has been an increase in clinic visits related to game addiction in recent years. In addition to its results mentioned before, one of the most significant consequences of game addiction is the school refusal. School refusal is a prevalent problem and 85% of adolescents presenting to clinics with school refusal issues have been found to have digital game addiction (Tateno et al., 2022). School refusal is not a diagnosable DSM disorder, but many adolescents with school refusal may show symptoms of phobia, general anxiety, social anxiety, and separation anxiety (Hella & Bernstein, 2012). Long-term school refusal can also lead to social withdrawal. Considering the fact that game addiction is considered as the most important factor increasing the school refusal, early diagnosis and intervention are crucial. It's important to understand and develop mechanisms to help at least some adolescents recover from this disorder (Tateno et al., 2022). The risk factors related to severe and chronic school refusal should particularly be identified. In this parallel, support should be provided to adolescents and their families, and interventions should be made to reduce these risks (Al & Al, 2023).

The probability of adolescents to develop digital game addiction increases when the digital games, which reach gradually increasing usage rates among adolescents, when there are difficulties in controlling these behaviors. Digital game addiction is worth investigating particularly because it leads to significant consequences such as school refusal. However, there's limited literature on digital game addiction and school refusal, and it can be clearly seen that intermediary mechanisms haven't been sufficiently studied. Furthermore, the literature on how self-regulation, which is an essential skill for adolescents to achieve their goals in school life, affects digital game addiction and school refusal is very limited. To the best of our knowledge, no study has addressed these three variables. Considering the individual and societal problems caused by school refusal and digital game addiction, developing models to enhance adolescents' development and adaptability levels is essential from the aspect of the societal life. In summary, given the fact that school refusal mainly develops in adolescence (Mcshane et al., 2001) and because of the previously mentioned effects, determining the relationship between digital game addiction, self-regulation, and school refusal will contribute to expanding the literature and understanding their effects on adolescent development.

### ***The present study***

Considering that digital game addiction is a significant factor in the development of school refusal, it is important to identify the mediating mechanisms between digital game addiction and school refusal, to develop intervention options, and establish a theoretical framework. The abovementioned theories regarding the

relationship of digital game addiction and school refusal with self-regulation suggest that self-regulation could mediate between these two variables. However, no study that has investigated the mediating effects of the self-regulation in this relationship could be found. Thus, this study aimed to examine the mediating role of self-regulation in the relationship between digital game addiction and school refusal. Given the previous studies on digital game addiction, school refusal, and self-regulation (Fujita et al., 2022; Kavanagh et al., 2023; Ostinelli et al., 2021; Tateno et al., 2022), it was concluded that self-regulation might be an effective factor in digital game addiction. Accordingly, the hypotheses of the study are as follows:

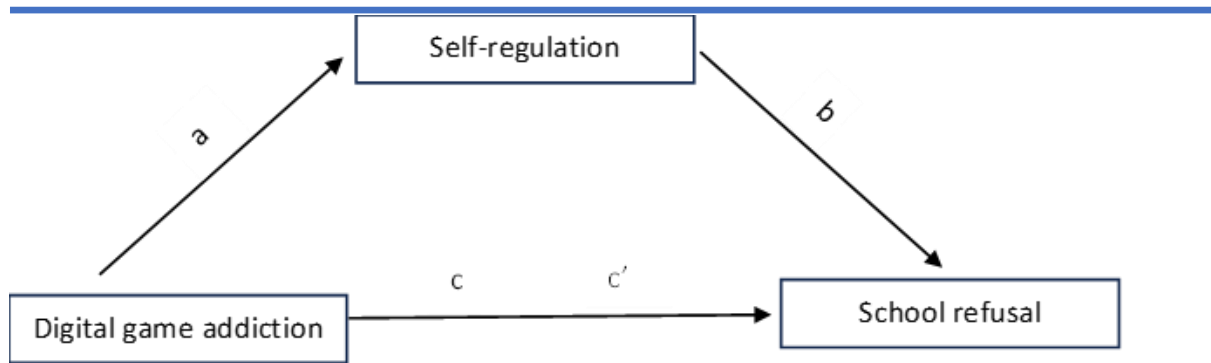
*H1: Digital game addiction and self-regulation predict school refusal.*

*H2: Self-regulation mediates the relationship between digital game addiction and school refusal.*

The hypotheses tested during the research process were based on findings from studies in the literature on digital game addiction-school refusal (Tateno et al., 2022), school refusal-self-regulation (McCluskey et al., 2004), and self-regulation-digital game addiction (Sumiyana et al., 2022) and it was determined that it is necessary to investigate the mediating role of the level of self-regulation in the relationship between digital game addiction and school refusal. Within the relevant literature, the mediating role of self-regulation in the relationship between the research variables was theoretically established and the tested model is illustrated in Figure 1.

### **Figure 1.**

Suggested simple mediation model; Effects of digital game addiction on school refusal. Note:  $c$ = total effect  $c'$ = direct effect



**Method**

**Design**

This study was designed in accordance with the correlational survey model.

**Participants**

In the present study, a power analysis was used in determining the sample size. The power analysis conducted indicated a sample size of 107 participants having a moderate effect size (Cohen's  $f^2 = .15$ ), a power of .95, and a significance level of  $p = .05$  (Cohen, 2016). Considering the requirements provided by the power analysis, data was collected from 663

adolescents. The participants of the study consisted of students between the 5th and 12th grades in the city center. The study group was determined by using the convenience sampling method. Accordingly, an online form was created, the link of that form was shared in various school groups, and the students were requested to fill out the form. Participants were informed about the study and assured regarding the confidentiality of the data collected. Informed consent was obtained from all participants. The data were collected from 663 students (405 girls, 258 boys) studying in grades between 5 and 12, and the demographic information of the participants is shown in Table 1.

**Table 1.**  
Demographic information of the participants

	Level	Number (N)	%
<b>Gender</b>	Girl	405	61.1
	Boy	258	38.9
<b>Grade</b>	5 <sup>th</sup> grade	141	21.3
	6 <sup>th</sup> grade	93	14.0
	7 <sup>th</sup> grade	83	12.5
	8 <sup>th</sup> grade	85	12.8
	9 <sup>th</sup> grade	52	7.8
	10 <sup>th</sup> grade	45	6.8
	11 <sup>th</sup> grade	109	16.4
<b>Absence</b>	1-3 days	540	81.4
	4-7 days	85	12.8
	8-11 days	25	3.8
	12 days and longer	13	2.0
<b>Time spent in digital media</b>	1 hour	240	36.2
	2 hours	221	33.3
	3 hours	125	18.9
	4 hours and longer	77	11.6

**Data collection tools**

**Digital game addiction scale**

Participants' digital game addictions were measured using the Turkish version (Yalçın Irmak & Erdoğan, 2015) of the Digital Game

Addiction Scale, which consists of seven items (Lemmens et al., 2009). The scale is a unidimensional 5-point Likert scale (1: never to 5: always). The score range is between 7 and 35, with higher scores indicating a higher level of game addiction. If a participant scores three (sometimes) or higher on all seven items, or three (sometimes) on four of the seven items, then they are defined as game addicted. The adaptation study of the scale was found to have Cronbach's  $\alpha$  value of .91. In this study, the reliability of the scale was found to be satisfactory ( $\alpha = .86$ ).

### ***School refusal assessment scale (SRAS)***

The school refusal assessment scale, developed by Kearney and Silverman (1993), was adapted to the Turkish language by Seer (2014). The scale is a 22-item Likert type measure. It consists of four sub-dimensions, namely avoidance of negative situations related to school, difficulty in social relationships, resistance to separation from parents, and interest in out-of-school activities. The internal consistency scores for these sub-dimensions were found to be .83, .82, .79, and .73, respectively. In the current study, the internal consistency coefficient of the scale was calculated to be Cronbach's  $\alpha = .87$ .

### ***Self-regulation scale – short form (SRS-SF)***

The short form of the self-regulation scale, developed by Neal & Carey (2005) and adapted into Turkish by Ay (2013), was used in order to determine the self-regulation levels of the participants. This scale is a 5-point Likert scale (1: strongly disagree to 5: strongly agree). The scale has three sub-dimensions: planning, implementation, and assessment. A total score ranges between 30 and 150. High scores indicate that the individual has a high level of self-regulation. In this study, the internal consistency coefficient of the scale was found to be Cronbach's  $\alpha = .91$ .

### ***Data analysis***

The steps of the simple mediation model proposed by Preacher and Hayes (2008) were followed in the present study. The bootstrap technique was used in calculating both total and specific effects, including total and indirect effects for the mediator variable. Accordingly, data analysis was conducted using PROCESS v4.2 developed by Hayes

(2022) and integrated with SPSS 25. In the initial step of the study, descriptive statistics for the main variables were calculated, and bivariate correlations were computed by using Pearson's correlation analysis. Before the mediation test, a hierarchical regression analysis was performed for the analysis of the hypothesis constructs. First, gender and school absenteeism were entered as control variables. In the second step, digital game addiction (predictor variable) was incorporated into the school refusal regression model and self-regulation (mediator variable) was added in the third step. Subsequently, an analysis using Hayes' (2022) model 4 was conducted in order to determine the mediating effects of self-regulation on the relationship between digital game addiction and school refusal (see Figure 1). The relationship (path a) between the predictor variable (digital game addiction) and the mediator variable (self-regulation) and the relationship (path b) between the mediator variable (self-regulation) and the outcome variable (school refusal) were analyzed. Then, the total direct effect (path c) on the predictor variable (digital game addiction) on both the mediator and the outcome variable (school refusal) was analyzed. Finally, the indirect effects (path c') on the predictor variable (digital game addiction) on both the mediator and the outcome variable (school refusal) were investigated (see Figure 1). The 95% confidence interval (with 5000 resampling) was used in determining whether the indirect effects were statistically significant, and the level of statistical significance was set at  $p < .05$ .

### ***Ethic***

This study was approved to be in compliance with science ethics by Atatürk University's Ethics Committee of Social Sciences and Humanities (Session Nr.20, Decree Nr. 298, Date: 03.11.2022).

### ***Findings***

#### ***Preliminary analysis***

Table 2 includes descriptive statistics and correlations for all the variables used. Examining the correlation coefficients, it was found that there is a moderate relationship between digital game addiction and school refusal (.35\*\*), and self-regulation (-.34\*\*)

and a low-level significant relationship between self-regulation and school refusal (-.27\*\*). Therefore, there are significant

correlations between all variables in the tested mediation model.

**Table 2.**  
Descriptive statistics and correlation coefficients

Variables	M	SE	Girl		Boy		1	2	3	
			Skewnes	Kurtosis	M	SE				Skewnes
1. DGA	11.91	5.1	.940	.468	14.43	5.6	.534	-.292	1	
2. SRAS	40.45	8.0	.509	-.288	40.18	8.4	.597	-.005	.35**	1
3.SRS-SF	76.60	13	-.046	-.583	78.95	12	-.114	-.597	-.27**	.34**

\*\*p<0.01; DGA: Digital Game Addiction; SRAS: School Refusal Assessment Scale; SRS-SF: Self-Regulation Scale – Short Form

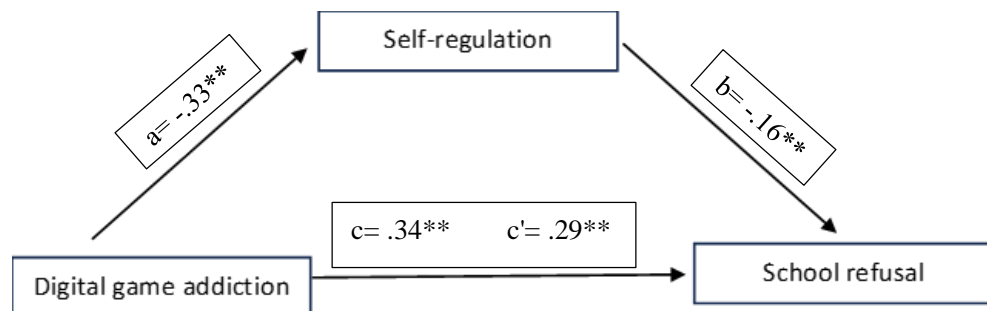
A multiple regression analysis was performed after the descriptive and relational analysis. Accordingly, in the first step, it was found that sex had no effect on school refusal ( $b = -.44, \beta = -.03, SE = .64, p = .491$ ) but school absenteeism had a significant effect on school refusal ( $b = 2.3, \beta = .18, SE = .500, p = .000$ ). These variables were found to explain 3% of the variance. In the second step, it was determined that digital game addiction significantly predicted school refusal ( $b = .19, \beta = .29, SE = .02, p = .000$ ), explaining 8% of the variance. In the third step, we observed that self-regulation had an effect on school refusal ( $b = -.12, \beta = -.18, SE = .03, p = .000$ ), and it was found to explain 3% of the total variance. Given the regression analysis results, the overall regression model explained 14% of the total variance ( $F[1.659] = 22.691, p = .000$ ).

**Mediation model**

In the next step, a simple mediation analysis was conducted in order to determine if self-regulation mediated the relationship between digital game addiction and school refusal. In the preliminary analysis, since absenteeism had a significant effect on the dependent variable, the absenteeism variable was sued as a control variable while conducting the mediation analysis. The results of the parallel mediation analysis showed that digital game addiction had a significant negative effect on self-regulation ( $a: b = -.76, \beta = -.33, SE = 1.5, p = .000$ ). Furthermore, self-regulation has a significant relationship with school refusal ( $b: b = -.10, \beta = -.16, SE = .02, p < .000$ ). The total effect of digital game addiction on school refusal was also found to be significant ( $c: b = .51, \beta = .34, SE = .05, p = .000$ ) (see Figure 2).

**Figure 2.**

Mediation effects of self-regulation on the relationship between digital game addiction and school refusal. Note: c- total effect c' – direct effect \*\*p< .001



After adding self-regulation as a mediating variable to the model, the effect of digital game addiction on school refusal remained significant, although reduced ( $c': b = .43; \beta = .29, SE = .06, p = .000$ ). Analysis conducted using the Bootstrap technique (5,000 resamples) showed that the total indirect effect of digital game addiction on school refusal through self-regulation is significant ( $b = .08, \beta = .05$ ) boot  $SE = .01$ , boot 95% CI [.03, .08]. We determined that approximately 14% of the effect of digital game addiction on school refusal (.05/.34) originated from self-regulation. Lastly, the overall model explained 17% of the total variance in school refusal ( $F[3.659] = 44.8128, p = .000$ ).

### Discussion and Conclusion

In parallel with the present study's objective, the relationship between digital game addiction and school refusal was addressed initially. The results indicated a direct positive relationship between digital game addiction and school refusal. This result supports our  $H_1$  hypothesis. This finding implies that digital game addiction is a significant factor affecting school refusal, and high levels of game addiction influence the development of school refusal. This aligns with the results suggesting that digital game addiction is the most important indicator of school refusal (Tateno et al., 2022) and that problematic internet use can trigger school refusal (Fujita et al., 2022) and digital game addiction can be considered as a variable predicting the school refusal of adolescents. Consequently, these findings suggest that adolescents with digital game addiction may exhibit indicators of school refusal such as absenteeism, skipping school, anger while going to school, resistance to attending (Jans & Warnke, 2004), anxiety, depression, avoidance of social and evaluative situations, reduced peer interaction, development of somatic symptoms, and orientation towards non-school activities (Kearney & Silverman, 1996).

In the second step of this study, the mediating effect of self-regulation on the relationship between digital game addiction and school refusal was examined. The results obtained confirmed  $H_2$ , revealing that digital game addiction predicts school refusal through the mediation of self-regulation. Accordingly, the effect of digital game addiction on school

refusal decreases through self-regulation. Students with high self-regulation skills have better capacities to align their behaviors with their goals and are more successful in controlling their behaviors (Inzlicht et al., 2021). Previous studies have shown that adolescents having low self-regulation skills have a higher risk of developing game addiction (Lemmens et al., 2009). A previous study revealed that teenagers having poor self-control have highly maladaptive game-playing motivations (Mills & Allen, 2019). The studies listed here support the results achieved in the present study and it was concluded that enhancing self-regulation skills in adolescents with digital game addiction could be a factor in reducing school refusal.

The present study also found a negative and significant relationship between digital game addiction and self-regulation skills. Individuals having low self-regulation skills might act impulsively in situations such as playing games or they might face difficulties controlling their emotions, thoughts, and behaviors (Billieux, 2012). Previous studies primarily focused on the relationship between self-regulation skills and problematic internet use. Many results in these studies indicate that poor self-regulation capacity results in game addiction or problematic internet use (Billieux, 2012; Metcalf & Pammer, 2011; WHO, 2015). This study, however, highlights the predictive effect of digital game addiction on self-regulation skills.

Another finding is that self-regulation negatively affects the school refusal. Many previous studies have considered self-regulation skills as a strengthening factor for students in terms of participating in school activities (Makila et al., 2017), academic achievements (Blume et al., 2022; Keshi & Tas Ahmadi, 2013), school adaptation, and school commitment (Makila et al., 2017). Students with high self-regulation skills are also more competent in social skills (Yang & McGinley, 2022) and tend to avoid negative behaviors (Aydođdu, 2022; Robson et al., 2020). The relevant research results support the findings obtained in the present study.

In this study, various correlational results were achieved by determining the



mediating effects of self-regulation in the relationship between digital game addiction and school refusal and these results contribute to a more detailed understanding of the relationships between these variables. The present results indicate that increasing the capacity of self-regulation might reduce the school refusal among individuals having digital game addiction. The findings suggest that there might be mutual interactions between digital game addiction and self-regulation. The research results achieved in this study contribute to the knowledge base. These results implied that individuals with digital game addiction and high self-regulation levels may have lower levels of school refusal. These results reaffirm the importance of the effect of self-regulation on school refusal.

In this regard, it can be said that this study has many practical and theoretical contributions to the field. The results of the model test regarding school refusal, which is considered a cause variable in terms of school dropout among school attendance problems, and the relationship patterns between self-regulation and digital game addiction variables were revealed. While this situation contributes to theoretical knowledge, it can be considered a skill that should be included in prevention and intervention studies within the scope of the relationship between self-regulation skills and school refusal.

### Limitations

In addition to the results achieved, the present study has also various limitations. Firstly, the data were obtained from self-report measurement tools and represent a non-clinical sample group. Therefore, it's not a study that can be generalized to clinical groups. This study also represents a sample group with a low level of school refusal and digital game addiction. Thus, conducting the study in larger and more heterogeneous groups might yield different results. Since this research was not designed to produce causal outcomes, there's a need for longitudinal and experimental studies. Besides that, the analysis of mediating relationships among school refusal, self-regulation, and digital game addiction variables makes this study significant.

### Acknowledgments

The participants were read the necessary protocols regarding the data collection process. The participants voluntarily agreed to participate in the study without any pressure or coercion and completed the data collection tool.

### Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author upon reasonable request.

### Conflict of interest

No conflict.

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