

ORIGINAL ARTICLE

Adapting the Digital Addiction Scale for Children to Turkish Culture: A Validity and Reliability Study

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Main Points

- While previous studies on digital addiction focused on issues such as game addiction, video game addiction, Internet addiction, and social media addiction by individuals over the age of 14, this study focuses on digital (device) addiction by elementary and middle school students of 9 – 14 years old.
- Digital Addiction Scale for Children (DASC) was developed based on nine diagnostic criteria for gaming disorder.
- Construct validity, criterion validity, predictive validity, and group comparisons were conducted for the validity of the DASC.
- In the analyses conducted for reliability, Cronbach Alpha coefficient 0.94, two-half correlation coefficient 0.86 and Guttman split-half reliability test coefficient 0.92 were found.
- Digital Addiction Scale for Children – Turkish Form is a valid and reliable tool to determine the digital addiction of children.

Abstract

Digital device addiction is described as the overuse or misuse of digital devices such as smartphone, tablets, laptops, desktops, or game consoles. The current study aims at adapting the Digital Addiction Scale for Children to Turkish culture and investigating its psychometric features. In line with the study purpose, we administered the scale to three different study groups aged between 9 and 14. We conducted confirmatory factor analysis to test the validity of the scale, and we investigated group comparisons (a high and low risk of addiction, gender, effect on a sleeping schedule, time spent on the Internet), criterion-related validity, and predictive validity. The first- and second-order confirmatory factor analyses results show that the scale is a valid measurement tool. Other results about validity also reveal that the scale is a valid tool. Furthermore, we conducted some analyses to test reliability and found out that both Cronbach's alpha coefficient and McDonald omega coefficient were 0.94, the correlation between the two halves was $r = .86$, and the Guttman split-half reliability coefficient was 0.92. The study findings show that Digital Addiction Scale for Children, which was adapted to Turkish, is a valid and reliable measurement tool to evaluate the digital devices addiction of children between the ages of 9 and 14.

Keywords: Digital addiction, digital addiction scale, Internet gaming disorder, loneliness, scale development, technology addiction

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Introduction

With the rapid growth of modern technology as well as the increase in the popularity of digital devices and the Internet, it is now easier to get access to these devices and the Internet, and they have become an important part of individuals' daily life. Regardless

of their age, all individuals have devices that have access to the Internet such as smartphones, tablets, laptops, desktops, and game consoles. Digital devices provide people with many advantages such as making it easier to have access to information, enriching communication sources, getting in touch with people over long distances in a short time, and

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offering various opportunities for entertainment (Zhang et al., 2014). However, when the use of digital devices is not managed properly, some problems appear such as overuse and addiction.

Digital devices addiction is described as the overuse or misuse of digital devices such as smartphones, tablets, laptops, desktops, or game consoles (Hawi et al., 2019). Overuse of digital devices has turned out to be an important source of anxiety all over the world (Seema et al., 2022). A study conducted by Pew Research Center (2022) reveals that teenagers aged 13 – 17 have increased their use of popular social media applications (e.g., YouTube, TikTok, Instagram, Snapchat), and smartphones, laptops, desktops, tablets, and game consoles are widely accessible by teenagers. According to the results of a study titled “A Study on Use of Information Technologies in Children” which was conducted with a group of children aged 6 – 15 in Türkiye between March and May 2021 (TÜİK, 2021), the percentage of Internet usage by children was 83%, while the percentage of Internet users who used the Internet every day reached 90%. When children who used the Internet regularly were asked about their purpose of using the Internet, 66% of them stated that they were using the Internet to play or download games, 61% of them stated that they were watching videos on social networking sites, and more than 50% stated that they were using the Internet to text a message, listen to music, and make a video call. Moreover, 64% of the children expressed that they were using a mobile phone or smartphone. When the use of a mobile phone or smartphone was investigated according to the age groups, it was concluded that this rate reached 53.9% for children aged 6 – 10 and 75% for children aged 11 – 15. The overuse of digital devices is said to cause digital device addiction (Kesici & Tunç, 2018).

The aforementioned percentages show that children’s access to digital devices is at a substantial level. Easy access to the Internet as well as attractive applications and contents increase the time and the percentage of the Internet use and encourage children to use digital devices which ensure access to these applications and contents. Although different age groups might be using digital devices for different purposes, children mostly use such devices to watch videos, play video games, communicate in real life, and interact with others on social media (Hawi et al., 2019). Children’s wish to attend such attractive occasions can lead to overuse or misuse of digital devices. This makes it necessary to focus on digital addiction. Also, the problematic use of technology has brought the necessity to identify if children’s use of digital devices is problematic (at a level of addiction) or not (Hawi et al., 2019).

Starting from this necessity, Hawi et al. (2019) developed the Digital Addiction Scale for Children (DASC) in order to identify children’s level of digital addiction. Digital Addiction Scale for Children was designed for children aged 9 – 14, and it is composed of 25 items. The scale was developed relying on nine diagnostic criteria designated to diagnose behavioral addiction (American Psychiatric Association, 2013). The literature review shows that there are quite many scales developed in or adapted to Turkish for various types of digital addiction such as Internet addiction, video game addiction, or smartphone addiction (e.g., Arıcaç et al., 2018; Fidan, 2016; Yılmaz et al., 2017). These scales are appropriate for individuals who are 12 or older, or they

mostly focus on types of addiction other than digital/digital devices addiction (e.g., gaming disorder, video game addiction, and Internet addiction). There is a limited number of scales developed for children younger than 12 to measure digital/digital devices addiction. Therefore, the current study aims at adapting the DASC developed by Hawi et al. (2019) in order to measure digital devices addiction in children aged 9 – 14.

Furthermore, there are various studies in the literature which concluded that different types of digital addiction were related to loneliness (e.g., Seki & Kurnaz, 2022) and Internet gaming disorder (Arıcaç et al., 2018), so we also investigated if loneliness and Internet gaming disorder predicted digital addiction or not as predictive validity. Investigating the relationship between digital addiction and psychosocial variables may help understand the behaviors of people who may be susceptible to addiction. Although many studies have been conducted on the negative effects of digital addiction types (such as Internet addiction, social media addiction, smartphone addiction, and Internet gaming disorder) on mental health and psychosocial health indicators (e.g., Caplan, 2002; Ceyhan & Ceyhan, 2008; Durak-Batıgün & Hasta, 2010; Esen & Siyez, 2011; Traş, 2019), studies with children and adolescents are relatively limited. Some individuals show more digital addiction behaviors due to the loneliness they experience, whereas others are isolated from society due to the overuse of digital tools and experience more loneliness (Ektiricioğlu et al. 2020). In other words, children who tend to overuse digital tools may distance themselves from the real world, become more sensitive to loneliness, and thus become deeply immersed in virtual life.

The fact that digital tools (smartphones, computers, tablets, etc.) are easily accessible has led children to use these tools excessively, thus increasing their wistfulness for video games. On the one hand, this situation triggers being busy with technology or games; on the other hand, it also brings problems such as loss of interest in other activities, social isolation, physical and emotional health problems, and a decline in academic performance. In this context, understanding the relationship between digital addiction and Internet gaming disorder in children may contribute to a more proactive approach to potential problems and produce possible solutions. Studies have examined the relationships between digital addiction types and Internet gaming disorder (e.g., Paulas et al., 2018; Pontes, 2017; Soraci et al., 2022; Traş, 2019). In summary, determining the relationships between digital addiction, loneliness, and Internet gaming disorder in children can provide evidence of validity for DASC on the one hand, and it is expected to provide clues to guide interventions in coping with digital addiction. By adapting the DASC to Turkish culture and identifying children’s level of digital addiction, this study is expected to ensure that children gain healthy screen-use skills and prevent potential problems that can negatively affect their mental and physical health.

In addition, group comparisons regarding sex, risk of addiction, duration of Internet use, and the effect of sleep patterns were examined in this study. Many studies provide mixed results regarding these variables (Eyimaya et al., 2020; Şar, 2013; Talan & Kalinkara, 2022; Ünsal, 2016). In addition, a significant

number of these studies have been conducted on adolescents and young adults, while studies on children are limited. In this study, by examining whether there are group differences in children, we aimed to provide clues for future research and to collect validity evidence for the scale.

Material and Methods

Participants

There were three different study groups in the current study. The first study group included 711 primary and secondary school students, 391 of whom were female (55%) and 320 (45%) of whom were male, aged 9 – 14 (Mean = 11.70, standard deviation (SD) = 1.64), and the data gathered from this group were used to analyze the validity and reliability of the Digital Addiction Scale for Children – Turkish Form (DASC – TF). The second group included 283 primary and secondary school students, 140 of whom were female and 142 of whom were male (one of the students did not specify gender), and the data gathered from this group were used to analyze criterion-related validity. The ages of students in this group varied between 9 and 14, while the mean of their ages was 11.65 (SD = 1.67). The data gathered from the third group were used to analyze predictive validity, and this group included 369 primary and secondary school students, 207 of whom were female and 162 of whom were male. The ages of students in this group varied between 9 and 15, while the mean of their ages was 11.71 (SD = 1.67). Table 1 shows the detailed information on study groups.

Measures

Digital Addiction Scale for Children

This scale was developed by Hawi et al. (2019), and it consists of 25 items. It was developed relying on nine diagnostic criteria included in DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition) and designated for the Internet gaming disorder. The scale consisted of nine sub-dimensions based on nine diagnostic criteria. It is a 5-point scale (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always). The validity of the scale was tested via factor analysis, confirmatory factor analysis (CFA), concurrent validity, criterion-related validity, and differences among groups were investigated in terms of gender and time spent on the Internet. The analyses showed that the scale was a valid and reliable measurement tool. The scale relies on evaluation by total scores, and a high score refers to a high level of digital addiction.

Internet Gaming Disorder Scale Short Form

This scale was developed by Pontes and Griffiths (2015) and adapted to Turkish culture by Arıcağ et al. (2018), and it consists of 9 items. It is a 5-point scale (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always). The construct validity of the scale was tested via explanatory factor analysis and CFA. The results showed that the scale was valid. The reliability of the scale was tested via Cronbach’s alpha coefficient, which was $\alpha = .87$, and the correlational coefficient which was calculated via test re-test was $r = .78$. A high score gathered from the scale refers to a risk of Internet gaming disorder. In the current study, Cronbach’s alpha coefficient was calculated to be $\alpha = .86$ in the

Table 1.
Demographic Information about the Study Groups

Variables		Study Group 1		Study Group 2		Study Group 3	
		f	%	f	%	f	%
Gender	Boys	391	55.0	140	49.5	207	56.1
	Girls	320	45.0	142	50.2	162	43.9
	Total	711	100	282	100	369	100
Age	9	34	4.8	18	6.4	16	4.5
	10	226	31.8	92	32.5	119	33.3
	11	64	9.0	21	7.4	31	8.7
	12	99	13.9	7	2.5	50	14.0
	13	144	20.3	98	34.6	71	19.9
	14	131	18.4	33	11.7	66	18.5
Time period (Weekday)	15 minutes – 2 hours	255	35.9				
	2 – 4 hours	228	32.1				
	4 hours or more	165	23.2				
Time period (Weekend)	15 minutes – 2 hours	186	26.2				
	2 – 4 hours	245	34.5				
	4 hours or more	227	31.9				
Effect on sleeping schedule	Yes	254	35.7				
	No	453	63.7				

Note: Group 1 = CFA and group comparisons; Group 2 = Criterion-related validity; Group 3 = Predicting Digital Addiction Scale for Children – Turkish Form.

criterion-related validity group and $\alpha = .81$ in the predictive validity group.

School-Based Loneliness Scale

This scale was developed by Asher et al. (1984) and adapted to Turkish culture by Kaya (2005). It includes 24 items in total with filler and real items. There are 19 items in the primary school form of the scale, while the secondary school form includes 23 items. There is a 5-point scale (1 = always true, 2 = mostly true, 3 = sometimes true, 4 = not true, 5 = not true at all). Some of the items in the scale are reverse items. The internal consistency coefficient for primary and secondary school samples was found to be $\alpha = .87$. In the current study, we calculated it to be $\alpha = .73$ for primary school and $\alpha = .88$ for secondary school.

Translating Digital Addiction Scale for Children into Turkish

First of all, we sent an e-mail and got permission from the researchers who developed DASC in order to adapt it to Turkish culture. Then the scale was translated into Turkish by 6 experts who were proficient in English (2 experts in English language, 2 psychological counselors with a doctoral degree, and 2 professors lecturing in the field of psychological counseling). We compared the translations done by each expert and decided on the best translation for each item. After that, an expert who was proficient in English did back-translation into English. We then compared the back-translation and the original form in terms of clarity, accuracy, and cultural appropriateness. We created the final version of the scale after some minor revisions. Lastly, we administered the scale to one class at the primary level and one class at the secondary level to see if the items were understandable and to identify the problems if there were any. At the end of this process, we concluded that the items were understandable, which meant that the scale was ready for use.

Procedures

First, we got permission from the researchers who developed DASC to adapt it to Turkish culture. Right after that, we started the translation process as mentioned above. Before we started to gather data, the COVID-19 pandemic broke out, and distance education was started in March 2020 in Türkiye, so we gathered data after face-to-face education restarted in 2021. We conducted the study in line with the Helsinki Declaration and ethical permission from Gazi University Ethical Commission as to the fact that it was ethically permitted (Decision No: 2021-1032). An informed consent form was given to the parents of students who would participate in the study, and they were asked for permission to let their children participate in the study. The students who were allowed by their parents to participate in the study were informed about the purpose of the study, and they were told that they could withdraw from the study whenever they wanted. Then the researchers and school counselors administered the scales to the participant students. It took around 30 – 35 minutes for the students to respond to the items on the scales. We started the analysis after gathering the data.

Data Analysis

We analyzed the study data on the programs of Statistical Package for Social Sciences (SPSS) 24 (SPSS Inc., Chicago, Ill, USA) and LISREL (linear structural relations) 8.8 (SSI Inc., Chicago, Ill, USA). We reviewed the data set for the missing data and investigated the normality of the distribution. We observed

that there were missing data in different items responded by 17 participants in the first study group, 7 students in the second study group, and 14 students in the third study group, and we replaced the missing values. Then we analyzed the Mahalanobis distance to identify outliers, and we saw those 14 observations in the first study group, 5 observations in the second study group, and 11 observations in the third study group were outliers, and we removed them from the data set. Also, we investigated the skewness and kurtosis values and saw that the items had a normal distribution. After that, we started analysis for 711 students in the first group, 282 students in the second group, and 369 students in the third group. We conducted CFA to test the construct validity of the scale, calculated the Pearson correlation coefficient for criterion-related validity, carried out inter-group tests for other proofs for validity (*t*-test, one-way analysis of variance), and analyzed the Cronbach's alpha internal consistency coefficient to test the reliability.

Results

Construct Validity

We conducted first- and second-order CFA in order to test the construct validity of DASC – TF. We conducted CFA on LISREL 8.80 program. χ^2/sd , RMSEA (root mean square error of approximation), NFI (normed fit index), CFI (comparative fit index), NNFI (non normed fit index) (TLI; tucker – lewis index), and SRMR (standardized root mean square residual) values were used to determine the goodness of fit of the model in CFA models. According to the first-order CFA results of 25-item DASC – TF, $\chi^2/SD = 3.74$, RMSEA = 0.062, NFI = 0.97, CFI = 0.98, NNFI = 0.97, and SRMR = 0.042. We then reviewed the suggestions for modifications and added error variance between the items of the sub-scale of “deception” (4th and 16th items). Then we conducted the analysis again and reached the coefficients of concordance as $\chi^2/SD = 3.26$, RMSEA = 0.056, NFI = 0.97, CFI = 0.98, NNFI = 0.98, and SRMR = 0.039. We reviewed the other suggestions for modifications, but we did not conduct any more modifications as they resulted in an insignificantly low level of decreases in χ^2 rate, and we ended the first-order CFA. In the following step, assuming that the relation between the dimensions resulted from a latent variable, we conducted second-order CFA and tested if the nine sub-scales measured the digital addiction or not. According to the second-order CFA results, coefficients of concordance were $\chi^2/SD = 2.76$, RMSEA = 0.050, NFI = 0.98, CFI = 0.98, NNFI = 0.98, and SRMR = 0.036. The standardized path coefficient of the items varied between 0.46 and 0.74 for the first order, between 0.47 and 0.74 for the first-order modified model, 0.51 and 0.78 for the second order. Both first- and second-order CFA results showed that data gathered from primary and secondary school students via DASC – TF had a good fit for the theoretical model (Kline, 2011; Schreiber et al., 2006). Table 2 shows the first- and second-order CFA results.

Group Comparisons

We conducted group comparisons according to the risk of addiction, gender, time spent on the Internet (weekday/weekend), and sleeping schedule in order to gather extra proof for the validity of DASC – TF. First of all, as was done in the original study (Hawi et al., 2019), we relied on DSM-5 Internet Gaming Disorder criteria, and we divided the students into two groups as those who met

Table 2.
First- and Second-Order CFA Results of Digital Addiction Scale for Children – Turkish Form

Model	Publication Date:			RMSEA	NFI	CFI	NNFI (TLI)	SRMR
	August 18, 2023	df	χ^2/df					
First-order (25-1)	1028.31	275	3.74	0.062	0.97	0.98	0.97	0.042
First-order (25-1)-Modification	893.46	274	3.26	0.056	0.97	0.98	0.98	0.039
Second-order (25-9-1)	734.34	266	2.76	0.050	0.98	0.98	0.98	0.036

Note: RMSEA = root mean square error of approximation; NFI = normed fit index; CFI = comparative fit index; NNFI = non normed fit index; TLI = Tucker – Lewis index, SRMR = standardized root mean square residual.

five or more criteria (a high risk of addiction) and those who met fewer than five criteria (a low risk of addiction). In determining the groups, a 5-point scale was used, and those whose subscale averages were 4 and above and who met at least five of the nine criteria were determined as the group with high addiction risk. Those who did not meet this criterion were classified into the group with a low risk of addiction.

The number of participants in the group that had a high risk of addiction was 19 (2.7% of all participants), and Kolmogorov – Smirnov test produced a significant result ($p < .05$). We concluded that parametric tests did not meet the assumptions, and so we conducted Mann – Whitney U test. Table 3 shows the related results.

As is seen in Table 3, Mann – Whitney U test showed that there was a statistically significant difference between digital addiction scores of students who had a high and low risk of addiction ($U = 13,124.500$, $p = .000$, $z = -7.418$). The effect size was low ($r = -.23$).

We conducted independent samples t -test in order to see if students’ scores gathered from DASC – TF varied according to gender and the question if using digital devices affected their sleeping schedule or not.

As is seen in Table 4, boy students’ score gathered from DASC – TF is significantly higher than girl students’ mean score ($t_{(709)} =$

2.345, $p < .05$, $d = 0.18$). Similarly, the participant students who stated that using digital devices had affected their sleeping schedule and they were sleeping very late at night had a significantly higher mean score in DASC – TF than those who stated that they were not affected ($t_{(705)} = 11.631$, $p < .001$, $d = 0.88$).

Lastly, we identified mean and SD values regarding the score gathered from the digital addiction scale according to the time spent on the Internet during the week and at the weekend, and we conducted a one-way analysis of variance to investigate the inter-group differences. Table 5 shows the related results.

As is seen in Table 5, there was a statistically significant difference between the scores the participant students gathered from the digital addiction scale according to the time spent on the Internet during the week ($F_{(2,645)} = 48.490$, $p < .001$) and at the weekend ($F_{(2,655)} = 81.257$, $p < .001$). According to the results of the Tukey test which was conducted to see between which groups there was a significant difference, there were statistically significant differences in the time spent both during the week and at the weekend. On the other hand, the effect size was at a low level for the weekday group, while it was high for the weekend group.

Criterion-Related Validity

We investigated criterion-related validity (validity among similar scales) of DASC – TF and analyzed the correlations between DASC – TF and IGDS – SF (Internet Gaming Disorder Scale – Short Form) via Pearson product – moment correlation

Table 3.
Mean, Standard Deviation Results, and Mann – Whitney U Test Results of the Scores the Participant Students Gathered from Digital Addiction Scale for Children – Turkish Form According to the Risk of Addiction

Risk of Addiction	n	M	SD	Mean Rank	Sum of Ranks	U	z	p	r
Low High	692	46.69	16.52	346.53	239,801.50	13,124.50	-7.418	.000*	.28
	19	101.53	9.39	700.76	13,314.50				

* $p < .001$.

Table 4.
Students’ t -Test Results Regarding the Digital Addiction Scale for Children – Turkish Form Total Score According to their Gender and Sleeping Schedule Being Affected or Not

Variable		n	M	SD	t	p	d
Gender	Girls	391	46.68	19.01	-2.345	.020*	0.18
	Boys	320	49.96	17.97			
Sleeping schedule being affected or not	Yes	254	58.19	19.79	11.631	.000**	0.88
	No	453	42.61	15.36			

* $p < .05$; ** $p < .001$.

Table 5.

Analysis of Variance Results Regarding the Digital Addiction Scale for Children – Turkish Form Total Score According to the Time Students Spent on the Internet and Their Sleeping Schedule

Time Period	Group	n	M	SD	Source	Sum of Squares	df	Mean Square	F	p	η^2	Difference
Time spent during the week	1	255	40.85	14.29	Between groups	28,894.43	2	14,447.21	48.490	.000	0.13	All groups
	2	228	50.49	17.01	Within groups	192,172.50	645	297.94				
	3	165	57.41	21.34	Total	221,066.93	647					
Time spent at the weekend	1	186	38.85	12.43	Between groups	46,154.66	2	23,077.33	81.257	.000	0.20	All groups
	2	245	46.51	16.28	Within groups	186,022.14	655	284.01				
	3	227	59.60	20.27	Total	232,176.81	657					

Note: Group: 1 = 15 minutes – 2 hours; Group 2 = 2 – 4 hours; Group 3 = 4 hours and more.

coefficient. To analyze criterion-related validity, we administered the scales to 283 primary and secondary school students in the second group which was described in detail in Table 1. There was a statistically significant high correlation in the positive direction between the scores gathered from both scales administered simultaneously ($r = .82, p < .001$).

Predictive Validity

We gathered data from the third group to investigate the predictive validity of DASC – TF. In line with this purpose, we conducted multiple regression analyses to test if Internet gaming disorder and loneliness predicted students' scores gathered from the digital addiction scale. Table 6 shows the related results. The results show that the regression analysis was statistically significant ($F_{(2,366)} = 348.992, p < .001$), and the two variables explained 66% of the variance regarding DASC – TF. The most powerful predictor was Internet gaming disorder ($\beta = 0.759, p < .001$). On the other hand, the predictive power was $\beta = 0.123 (p < .001)$ for loneliness.

Reliability Analysis

We calculated the Cronbach's alpha coefficient in order to calculate the internal consistency reliability coefficient of DASC – TF, and we analyzed split-half reliability test. The Cronbach's alpha reliability coefficient for the whole scale was found to be $\alpha = .94$. Similarly, McDonald omega coefficient was found to be $\omega = .94$. Also, the stratified alpha coefficient was calculated and found to be $\alpha_s = .94$. According to the results of split-half test, the correlation between the two halves was $r = .86$, and the Guttman test-half reliability coefficient was .92.

Table 6.

Results of Regression Analysis Regarding the Prediction of Scores to be Gathered From Digital Addiction Scale for Children – Turkish Form

Variables	B	SD	β	t	p	r
Constant	10.573	1.681		6.291	.000	–
IGDS	2.038	0.088	0.759	23.188	.000	.80
LSC	0.188	0.050	0.123	3.774	.000	.39

Note: IGDS = Internet Gaming Disorder Scale; LSC = Loneliness Scale for Children.

$R = 0.81; R^2 = 0.66; F_{(2,366)} = 348.992; p < .001$.

Discussion

The current study aims at adapting DASC, which was developed by Hawi et al. (2019), relying on Internet Gaming Disorder DSM-5 criteria (American Psychiatric Association, 2013) and the components of Griffiths' (2005) addiction model. For that purpose, we conducted validity and reliability analyses with primary and secondary school students aged between 9 and 14 or 15. Digital Addiction Scale for Children – Turkish Form underwent a detailed psychometric review, and the results of validity and reliability analysis showed that DASC – TF was appropriate for use to identify the level of children's digital addiction.

This study was conducted with a sample group of primary and secondary school students. The literature review shows that most of the scales developed in or adapted to Turkish on components such as digital addiction, Internet addiction, and Internet gaming addiction were designed to identify the level of addiction among individuals older than 15. However, there is a limited number of developed or adapted scales in Turkish designed for children aged 10 – 14 (e.g., Arıca et al., 2018; Hazar & Hazar, 2017; Horzum et al., 2008; Yılmaz et al., 2017). Considering this gap in the literature, this study is expected to contribute to the literature in this respect and fill in the gap in the literature. The analyses conducted for the validity of the scale included construct validity, group comparisons, criterion-related validity, and predictive validity. We conducted CFA for construct validity. Goodness-of-fit indices obtained at the end of first- and second-order CFA displayed a good and perfect fit. The factor structure of DASC, which was adapted to Turkish, was confirmed with the current study group. In other words, it is clear that DASC – TF has the same factor structure as a Turkish sample as the original scale. We also conducted group comparisons and gathered extra proof. As was the case in the original study (Hawi et al., 2019), we identified two groups with a high and low risk of addiction relying on Internet gaming disorder criteria. According to that, the group that had a high risk of addiction had a higher level of digital addiction than the other group that had a low risk of addiction. Moreover, boy students had a higher level of digital addiction than girl students, while the students who stated that their sleeping schedule had been affected had a higher level of digital addiction than those who stated that their sleeping schedule was not affected. Lastly, we investigated the time spent on the Internet during the week and at the weekend for group comparisons. According to

the study results, the level of digital addiction increased as the time spent on the Internet during the week and at the weekend. Considering all these findings together, DASC – TF, whose factor structure was confirmed with the Turkish sample, can be discriminant regarding features that are naturally part of the concept of digital addiction (risk of addiction, effect on sleeping schedule, and the time spent on the Internet). The current study findings are supported by some other studies in the literature (e.g., Arslan, 2019; 2020; Eryılmaz & Çukurluöz, 2018; Hawi et al., 2019; Marufoğlu & Kutlutürk, 2021; Tuncay & Göger, 2022). Trying to get another proof of validity, we investigated if Internet gaming disorder and loneliness predicted digital addiction scores or not. According to the study findings, both variables predicted digital addiction at a statistically significant level, explaining 66% of the total variance. These results might be implying that digital game addiction has a predictive validity. This finding is supported by other studies in the literature (e.g., Anlı, 2018; Öncel & Tekin, 2015).

Considering all these findings together, the results of the analysis conducted to test the validity of the scale show that the reliability of the scale is high. In fact, there are quite many studies in the literature supporting the current findings (e.g., Hawi et al., 2019; Pontes et al., 2014; Sarıalioğlu et al., 2022). Moreover, it should be noted that as the level of digital addiction increases, the time spent on using the Internet increases, the sleeping schedule is disturbed, and there is a positive relationship between Internet gaming addiction and loneliness. This might result from the fact that owning a device that has access to the Internet increases access and exposure to the Internet, which in turn leads to prolonged use of the Internet until late hours at night and a decrease in interaction with peers.

Limitations and Directions/Suggestions for Future Research

Although analyses conducted to test the validity and reliability of DASC – TF show that it is a valid and reliable measurement tool confirmed with a sample group of Turkish primary and secondary school students, the current study has some limitations. First, the sample was chosen via the convenience sampling method. It is no doubt that this sampling method is a viable one, but further studies can employ random sampling, which will increase the level of representability. Second, this measurement tool cannot be used as a diagnostic tool. Although the current study focuses on the differences between the groups with a high and low level of addiction, it is a grouping done for this study rather than a clinical diagnosis. Before using the scale for such a clinical diagnosis, it should be analyzed with further studies with different variables and sample groups to create a norm. Because of that reason, further studies can consider this and focus on creating a norm. Furthermore, conducting further studies with a sample group including individuals who have been clinically diagnosed with Internet addiction or Internet gaming addiction will support the validity of the scale.

In addition to all these, school psychological counselors and other mental health practitioners can determine whether students are at risk of addiction by applying this scale. Thus, they could take measures to reduce the risk of digital addiction. Similarly, psychological counselors working in schools can monitor changes

in students by applying the scale at regular intervals and can develop intervention strategies. Based on the results of the scale, psychological counselors can organize individual/group guidance and/or psychological counseling for students to gain awareness of digital addiction, develop coping strategies, and solve problems.

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