
AN EVIDENCE-BASED MULTIDIMENSIONAL SCALE FOR ASSESSING DIGITAL ADDICTIONS

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Abstract

The present study sets out the development and psychometric validation of the Multidimensional Digital Addiction Scale (MDDS), a novel instrument designed to assess digital addiction across eight distinct yet interrelated domains: social media, internet, gaming, phone, video, viewing, online shopping, and information-seeking anxiety. In response to the growing public health concern surrounding digital overuse, the MDDS offers a comprehensive and evidence-based approach to measuring problematic digital behaviour. The scale development process was meticulously executed through item generation, expert evaluation, and a three-phase empirical study. Exploratory and confirmatory factor analyses were conducted to confirm the scale's multidimensional structure (e.g., RMSEA = 0.075, CFI = 0.938). The reliability coefficients (Cronbach's α) exhibited a range from .904 to .958 across the subscales. Convergent and discriminant validity were supported by CR, AVE, and HTMT analyses. The scale demonstrated a substantial correlation with an established measure of mobile phone addiction, thereby substantiating its criterion-related validity. The MDDS has the capacity to facilitate the identification and classification of digital addiction patterns, to inform therapeutic interventions, and to support prevention programmes targeting technology-related behavioural issues.

Keywords: Digital Addiction, Multidimensional Scale, Social Media Addiction, Gaming Addiction, Scale Development.

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Introduction

It has been established through significant research findings that the majority of an individual's time is spent on digital platforms. Kemp (2020) posited that each individual with access to the internet spends approximately 2.5 hours daily on digital platforms, with an estimated 3.8 billion social media users worldwide. Indeed, a joint research project conducted in 57 countries revealed that the majority of individuals prefer digital platforms over traditional forms of media, such as television (Zenith Media, 2019). In a study conducted by Deloitte (2018) and Vox (2020), it was found that the average American checks their mobile phone between 50 and 80 times a day. The rapid proliferation of digital technologies has led to a significant increase in the prevalence of digital platform addiction, which has emerged as a prominent public health concern (Kuss & Griffiths, 2017). This situation demonstrates that humanity is becoming increasingly reliant on digital platforms. Concurrently, this circumstance gives rise to a phenomenon known as digital addiction. This phenomenon is perceived by many as being analogous to other forms of addiction, such as those associated with smoking, drugs, and gambling (Alter 2018; Newport 2019). In a similar vein, Allcott et al. (2022) cite the World Health Organisation's (2018) characterisation of digital addiction as a 'medical condition' at the point that it can be considered a disease state. It is to be expected that a medical condition will have a number of psychological effects. Digital addiction is a condition characterised by impairments in social, academic, occupational and psychological functioning resulting from excessive and uncontrolled use of digital devices and platforms (Young, 1998). The present study analyses this type of addiction in a number of different dimensions and classifies it in a variety of ways. It is acknowledged that the various forms of digital addiction are interrelated and that the underlying factors are of a complex nature (Andreassen et al., 2012). The Multidimensional Digital Addiction Scale (MDDS) developed in this study aims to examine digital addictions in eight different dimensions: Social Media Addiction, Internet Addiction, Gaming Addiction, Phone Addiction, Video Addiction, Streaming Addiction, Online Shopping Addiction and Information Seeking Anxiety.

In addition to the psychological and social outcomes previously mentioned, it is important to highlight that many individuals use digital platforms as a form of escape from real-life problems. This form of avoidance-oriented behaviour, frequently observed in cases of digital addiction, can function as a coping mechanism to alleviate underlying emotional distress, loneliness, or anxiety. Consequently, digital addiction can be regarded not only as a behavioural excess but also as a potential manifestation of underlying psychological needs ((Kardefelt-Winther, 2014; Elhai et al., 2017). The present study analyses this type of addiction in a number of different dimensions and classifies it in a variety of ways. It is acknowledged that the various forms of digital addiction are interrelated and that the

underlying factors are of a complex nature (Andreassen et al., 2012). The Multidimensional Digital Addiction Scale (MDDS), developed in this study, aims to examine digital addictions in eight different dimensions: The following phenomena are the subject of increasing concern: social media addiction, internet addiction, gaming addiction, phone addiction, video addiction, streaming addiction, online shopping addiction and information seeking anxiety.

Literature Review

Social Media Addiction

Social media offers a digital environment that allows individuals to spend time on online platforms and generally supports social interactions. Social media addiction is a condition in which individuals overuse these platforms, cannot control this use, and consequently experience impairments in their daily functioning (Griffiths, Kuss, & Demetrovics, 2014). Social media addiction has been found to be associated with psychological problems such as low self-esteem, depression, and anxiety (Andreassen et al., 2017; Khan et al., 2024). This situation provides important clues about the possible problems that young individuals may face.

Internet Addiction

Internet addiction is the impairment of social, academic or professional functioning as a result of excessive and uncontrolled use of the Internet (Young, 1998). This type of addiction is often associated with social isolation, poor academic performance and psychological disorders (Kuss & Griffiths, 2012). Internet addiction is also closely related to other types of digital addictions and therefore it is important to address digital addictions in a holistic manner (Dong, Lu, Zhou, & Zhao, 2011). Due to the holistic structure of the digital world, it is often possible for individuals to harbour different types of addiction together.

Game Addiction

Digital games are especially popular among the young population and excessive use of these games can lead to game addiction (Kuss & Griffiths, 2012). Game addiction is defined as individuals playing digital games uncontrollably, which negatively affects social and academic functioning (Lemmens, Valkenburg, & Peter, 2009). This type of addiction is associated with consequences such as low academic achievement, deterioration in social relationships, and sleep disorders (Pontes & Griffiths, 2015). The fact that there are many types of games, especially on digital platforms, pushes young individuals towards it.

Telephone Addiction

Phone addiction is the excessive and uncontrolled use of mobile phones by individuals, resulting in impairments in their daily functioning (Billieux, Maurage,

Lopez-Fernandez, Kuss, & Griffiths, 2015). This type of addiction is especially common among young people and can lead to various negative consequences such as distraction, social isolation, and sleep disorders (Elhai, Levine, Dvorak, & Hall, 2016). This situation causes the mobile phone to become an indispensable tool.

Video Addiction and Watching Addiction

Video addiction is a type of addiction that occurs when individuals consume online video content excessively (Balakrishnan & Griffiths, 2017). In a broader framework, viewing addiction can be defined as the situation in which individuals continuously watch videos, series or films on online platforms and cannot control these activities (Sung, Kang, & Lee, 2018). These addictions are associated with negative consequences such as time management problems and social isolation, especially in young people.

Online Shopping Addiction

Online shopping addiction is characterised by individuals' inability to control their online shopping behaviour, which leads to financial and psychological problems (Rose & Dhandayudham, 2014; Maraz, & Yi, 2022). This type of addiction is closely related to impulse control disorders and low self-control (LaRose, Lin, & Eastin, 2003). Of course, it is likely that many different factors play a role in the background of online shopping addiction.

Information Seeking Anxiety

Information seeking anxiety is a condition in which individuals experience intense anxiety and stress in the process of searching for information over the internet (Rothbaum, Weisz, & Johnson, 2012). This situation is related to the fact that individuals feel the need to constantly search for up-to-date information in the digital environment and cannot control this process (Case & Given, 2016). Information seeking anxiety becomes more evident in situations that require intensive access to information, especially in academic and professional fields.

Present Study

This study aims to evaluate the validity and reliability of the Multidimensional Digital Addiction Scale (MDDS), which was developed to examine the multidimensional structure of digital addiction. Multidimensional Digital Addiction Scale (MDDS) consists of eight sub-dimensions that comprehensively address different aspects of digital addiction: Social Media Addiction, Internet Addiction, Gaming Addiction, Phone Addiction, Video Addiction, Streaming Addiction, Online Shopping Addiction, and Information Seeking Anxiety. The primary goal of the research is to validate the psychometric

properties of this scale and to better understand the effects of digital addictive behaviours on individuals.

In this study, a three-stage data collection process was carried out. In the first stage, the factor structure of the scale was determined by exploratory factor analysis (EFA). In the second stage, confirmatory factor analysis (CFA) was used to test the accuracy of the factor structure of the scale. In the third stage, criterion validity was evaluated. For criterion validity, additional data were collected using the "Telephone Addiction Scale" developed by Yılmaz and Okan (2021), and its relationship with the relevant sub-dimensions of the MDDS was examined.

Method

Research Model

This study is a scale development study conducted to develop the "Multidimensional Digital Addiction Scale" (MDDS). The scale was designed as a tool aiming to measure different dimensions of digital addictions. The study includes exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) processes. The research was approved by Fırat University, Social and Human Sciences, Research Ethics Committee: 20.06.2023-16907. Written informed consent was obtained from all participants.

Participants

The sample of the study consists of individuals in emerging adulthood (18-28 years old). Three stages were carried out in the data collection process. In the first stage, data were collected from 218 participants (169 females and 49 males) for exploratory factor analysis. In the second stage, data were collected from a total of 258 participants (198 females and 60 males) for confirmatory factor analysis. In addition, data were collected from 74 participants for criterion validity. The age distribution of the participants ranged between 18 and 28, and the highest density was observed in the 21 age group. In the initial phase of the study, data were collected from 218 participants ($M = 21.4$, $SD = 2.4$); in the subsequent phase, from 258 participants ($M = 21.6$, $SD = 2.3$). The participants were predominantly undergraduate university students enrolled in various faculties across urban and semi-urban universities in Türkiye. The sample displayed moderate diversity in terms of socio-economic background, ranging from lower-middle to upper-middle class. However, the homogeneity of the sample, which is predominantly drawn from academic settings, represents a limitation in terms of generalizability to the broader population.

Scale Development Process

Creating the Item Pool: At the beginning of the scale development process, a large item pool was created by utilising the relevant literature and qualitative data. The item pool included 10 items for each sub-dimension, totalling 80 items.

Expert Opinions: The item pool was analysed by 7 experts in their fields. The experts evaluated the content validity of the items and made suggestions. In addition, two Turkish language experts gave their opinions on the conformity of the items with grammar rules. Using Lawshe (1975) technique, the items were eliminated according to the content validity ratios and a total of 72 items were made ready for the application.

Data Collection

The data collection process was carried out in three stages. In the first stage, data were collected for exploratory factor analysis and a preliminary form with 72 items was applied. In the second stage, data were collected from the same sample for confirmatory factor analysis. In the third stage, the reliability and validity of the scale were evaluated. In addition, additional data were collected from 74 participants for criterion validity assessment.

Measurement Tools Used

In this study, two different measurement tools, "Multidimensional Digital Addiction Scale" (MDDS) and "Telephone Addiction Scale", were used for the purpose of the research.

Multidimensional Digital Addiction Scale (MDDS): Multidimensional Digital Addiction Scale (MDDS) developed within the scope of the research is a scale designed to measure various dimensions of digital addiction. The scale consists of eight sub-dimensions, namely Social Media Addiction, Internet Addiction, Game Addiction, Phone Addiction, Video Addiction, Watching Addiction, Online Shopping Addiction and Information Seeking Anxiety. Each sub-dimension was measured with a series of questions consisting of 44 items in total, which were prepared to evaluate the addictive behaviours exhibited by individuals on digital platforms. In the scale development process, content validity was ensured based on expert opinions and then the factor structure was determined by exploratory factor analysis.

Telephone Addiction Scale: The "Telephone Addiction Scale" developed by Yılmaz and Okan (2021) was used for criterion validity assessment. This scale aims to measure the addiction levels that individuals develop due to the use of mobile phones. In particular, this scale, which evaluates the difficulties faced by individuals in their lives related to phone use, frequency of use, loss of control, and psychological effects related to phone use, was selected with the idea that it may be related to the "Phone Addiction" sub-dimension of the MDDS. The scale has

undergone various psychometric tests and has been included in the literature as a valid and reliable tool. In this study, the data collected with the Phone Addiction Scale were analysed in order to evaluate the validity of the MDDS and its relationship with different digital addiction dimensions.

Analyses

Exploratory Factor Analysis (EFA): EFA was conducted to reveal the factor structure of the scale. In this analysis, principal component analysis and varimax rotation method were used. As a result of the analyses, 8 sub-dimensions and 44 items were determined. These sub-dimensions were named as "Social Media Addiction", "Internet Addiction", "Game Addiction", "Phone Addiction", "Video Addiction", "Watching Addiction", "Online Shopping Addiction" and "Information Search Anxiety".

Confirmatory Factor Analysis (CFA): CFA was applied to test the accuracy of the factor structure of the scale. The analyses were conducted with structural equation modelling (SEM) and the model fit indices (CFI, TLI, RMSEA, SRMR) were evaluated. The results showed that the eight-factor structure of the scale was valid and reliable. The confirmatory factor analysis (CFA) was conducted using IBM AMOS (version 24) with the Maximum Likelihood (ML) estimation method. Prior to the analysis, the assumptions of normality, linearity, and absence of multicollinearity were verified and found to be satisfied. The measurement model comprised eight latent constructs and 44 observed variables. A power analysis was conducted to ensure sufficient sample size for structural equation modeling. According to the guidelines by Kline (2011) and Wolf et al. (2013), a minimum of 200 participants is recommended when estimating models with moderate complexity using the ML method. Given that the CFA sample consisted of 258 participants, the study exceeded this threshold, indicating adequate statistical power for model estimation and validation.

Validity and Reliability

Validity: The construct validity of the scale was confirmed by EFA and CFA. Content validity was evaluated with the Lawshe technique based on expert opinions. In addition, criterion validity was assessed by examining the correlations of the scale with different digital addiction measures in the analyses conducted with the data collected from 74 participants.

Reliability: The internal consistency of the scale was evaluated with Cronbach's alpha coefficient. Cronbach's alpha values for all sub-dimensions were above 0.70, which indicates that the scale is reliable.

In addition to exploratory and confirmatory factor analyses, further validity tests were performed in order to evaluate the internal consistency and construct distinctiveness of the MDDS. Construct reliability (CR) and average variance

extracted (AVE) were calculated for each of the eight latent dimensions. All CR values exceeded or approached the 0.70 threshold, while AVE values ranged between 0.50 and 0.76, indicating satisfactory convergent validity. Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT), a robust method recommended in recent SEM literature (Cheung et al., 2023). The HTMT values for all factor pairs were below the conservative threshold of 0.85, with the exception of Social Media and Viewing Addiction (HTMT = 0.871), a finding that was theoretically justified due to the conceptual and behavioural overlap in content consumption patterns. The findings of this study demonstrate that the MDDS evinces robust reliability, convergent validity, and satisfactory discriminant validity across its eight dimensions (See Table 1).

Table 1. Construct Reliability (CR) and Average Variance Extracted (AVE) Values for Each Dimension of the MDDS

Factor	Number of Items	Construct Reliability (CR)	Average Variance Extracted (AVE)
Social Media Addiction	6	0.594	0.510
Internet Addiction	6	0.788	0.522
Gaming Addiction	5	0.709	0.541
Phone Addiction	6	0.696	0.505
Video Addiction	6	0.734	0.516
Viewing Addiction	5	0.705	0.517
Online Shopping Addiction	5	0.718	0.505
Information-Seeking Anxiety	5	0.754	0.571

Findings

In this section, the development process of the Multidimensional Digital Addiction Scale developed within the scope of the research is discussed. The procedures and statistical information for the development of the scale are presented in a certain order.

Validity

Undoubtedly, conducting validity and reliability studies while developing a scale will not only make that scale reliable, but also help to look at it from a scientific perspective. In this context, the validity results of the adapted scale are presented under this title.

Structure Validity

Both exploratory factor analysis and confirmatory factor analysis were used for the construct validity of the adapted scale. In this context, firstly, Exploratory Factor Analysis (EFA) was used to test the construct validity of the scale.

Table 2. Explained Variance of Multidimensional Digital Addiction as a Result of EFA

Factor	Total Explained Variance (%)	Cronbach's α
Social Media Addiction	12.21%	.921
Internet Addiction	11.93%	.920
Gaming Addiction	10.70%	.927
Phone Addiction	9.52%	.942
Video Addiction	9.14%	.922
Viewing Addiction	8.29%	.904
Online Shopping Addiction	8.24%	.958
Information Search Anxiety	7.89%	.939
Total	77.91%	.968

According to the data in Table 2, eight factors explain 77.912% of the total variance in the explanatory factor analysis (EFA) of digital addiction. The first factor explained the highest variance with 12.212%, followed by factors explaining 11.932%, 10.699%, 9.520%, 9.136%, 8.288%, 8.235% and 7.889% variance respectively. These results show that digital addiction has a multidimensional structure and these eight factors explain a large part of the overall structure by representing different aspects of addiction. The fact that 77.912% variance was explained in total indicates that the model reveals important information about digital addiction and has a strong structure. For social sciences, the variance explained between 40% and 60% is considered sufficient (Şahin and Okan, 2024). According to Cronbach's Alpha values, the internal consistency coefficients of the subscales are as follows: .921 for Social Media Addiction, .920 for Internet Addiction, .927 for Gaming Addiction, .942 for Phone Addiction, .922 for Video Addiction, .904 for Viewing Addiction, .958 for Online Shopping Addiction and .939 for Information Search Anxiety. The total Cronbach's Alpha value of the scale is .968. These high internal consistency coefficients indicate that each sub-dimension and the overall structure of the scale are reliable and can consistently measure the multidimensional structure of digital addiction. These findings support the usability and validity of the scale in research. The generally accepted value in Social Sciences is expected to be .70 and above (Büyüköztürk, 2015). This shows a good result in terms of the reliability of the items of the Multidimensional Digital Addiction scale.

According to the analysis, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was found to be 0.933, indicating that the data set is very suitable for factor analysis. As the KMO value approaches 1, it is considered perfect, and if

it is below 0.50, it is considered unacceptable (Tavşancıl, 2010). The chi-square value of Bartlett's Test of Sphericity was reported as 11808.659, the degree of freedom was 990 and the p value was 0.000. These results indicate that there is sufficient correlation between the variables and that factor analysis is appropriate. In short, both KMO value and Bartlett's test indicate that the data form a strong basis for factor analysis and the results of the analysis are reliable.

Table 3. Load Values of Multidimensional Digital Addiction Scale Items

Items	1.	2.	3.	4.	5.	6.	7.	8.
m40	.827							
m41	.812							
m43	.791							
m39	.764							
m45	.750							
m44	.740							
m42	.732							
m37		.877						
m36		.872						
m35		.872						
m34		.869						
m38		.869						
m33		.759						
m16			.882					
m14			.878					
m12			.860					
m13			.812					
m11			.811					
m15			.764					
m21				.788				
m17				.787				
m19				.770				
m18				.748				
m20				.632				
m23					.786			
m26					.763			
m22					.713			
m25					.665			

Items	1.	2.	3.	4.	5.	6.	7.	8.
m24					.636			
m3						.787		
m5						.741		
m4						.736		
m2						.696		
m1						.693		
m10							.748	
m8							.716	
m6							.692	
m7							.637	
m9							.597	
m31								.806
m30								.753
m29								.721
m32								.654
m28								.515

Table 3 shows the loading values of the items of the Multidimensional Digital Addiction Scale with an eight-factor structure. In the first factor, the highest load value belongs to item m40 with 0.827 and the lowest load value belongs to item m42 with 0.732. In the second factor, items m37 and m36 have the highest loading values with 0.877 and 0.872, while item m33 has the lowest loading value with 0.759. In the third factor, the highest load value belongs to item m16 with 0.882 and the lowest load value belongs to item m15 with 0.764. In the fourth factor, item m21 has the highest load value with 0.788 and item m20 has the lowest load value with 0.632. In the fifth factor, the highest load value belongs to item m23 with 0.786 and the lowest load value belongs to item m24 with 0.636. In the sixth factor, item m3 has the highest load value with 0.787 and item m1 has the lowest load value with 0.693. In the seventh factor, the highest load value belongs to item m10 with 0.748 and the lowest load value belongs to item m9 with 0.597. Finally, in the eighth factor, item m31 has the highest loading value with 0.806 and item m28 has the lowest loading value with 0.515. The total score can be used in the scale or each sub-dimension can be calculated separately. These results reveal that each factor represents different dimensions of digital addiction and the loading values of the items in each dimension vary. Subsequently, a confirmatory factor analysis (CFA) was conducted to assess the construct validity of the scale. The results of the CFA are presented in Figure 1.

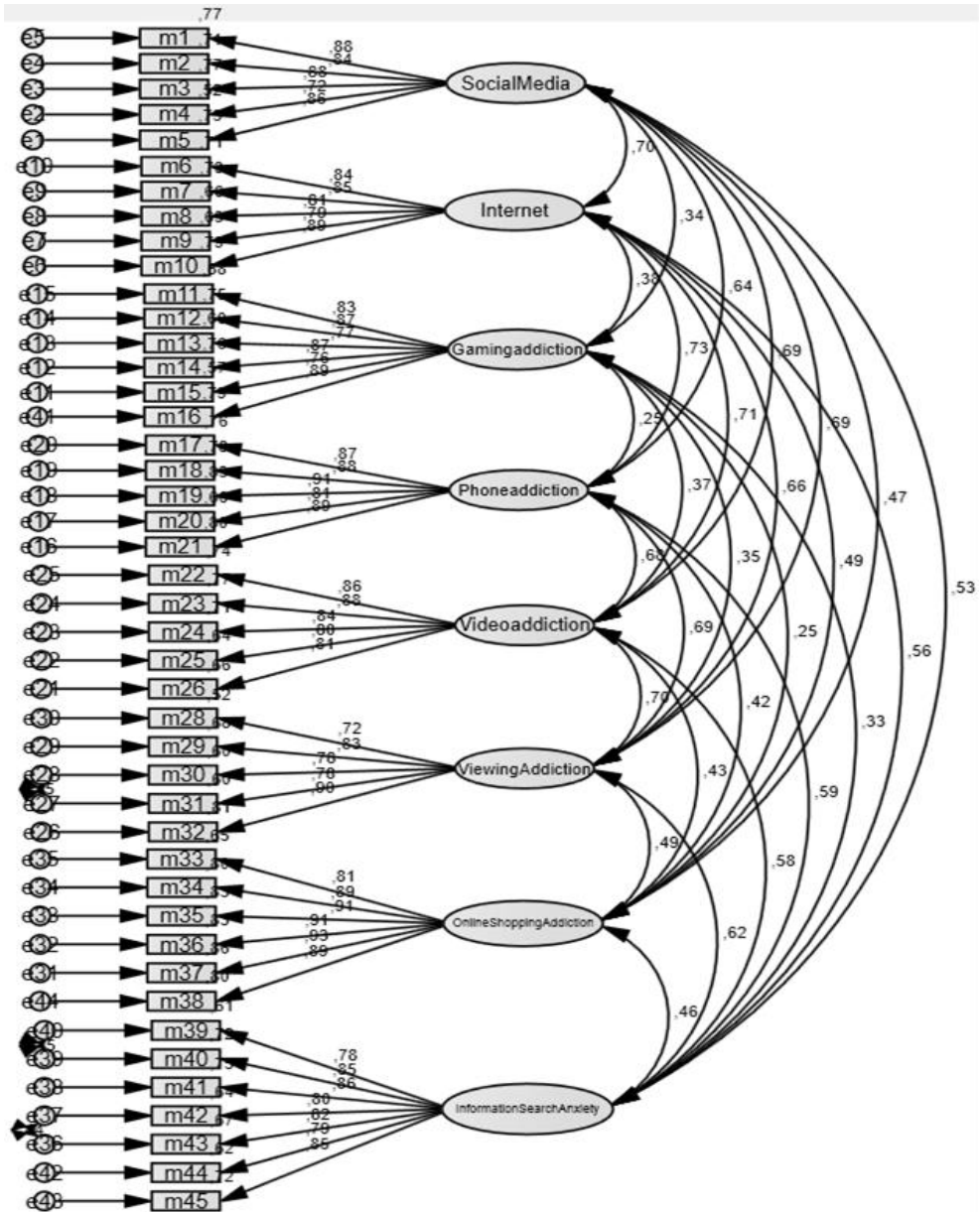


Figure 1. Confirmatory Factor Analysis Path Diagram of Multidimensional Digital Addiction Scale (Şahin and Okan, 2024)

The Confirmatory Factor Analysis (CFA) path diagram of the multidimensional digital addiction scale above shows that digital addiction has an

eight-factor structure. Each factor is represented by specific items, and the factor loadings strongly reveal their relationship with these items. For example, the "Social Media" factor has high loadings with items m1, m2, m3, m4 and m5 (between 0.77 and 0.88), while the "Internet" factor has similarly high loadings with items m6, m7, m8, m9 and m10 (between 0.72 and 0.86). The other factors similarly have strong loading values with their own items: "Gaming Addiction" (m11-m16), "Phone Addiction" (m17-m21), "Video Addiction" (m22-m26), "Viewing Addiction" (m27-m32), "Online Shopping Addiction" (m33-m38) and "Information Search Anxiety" (m39-m45). Moreover, the correlations between the factors show that different dimensions of digital addiction are interrelated. These results reveal that the scale offers a valid and reliable structure and that digital addiction should be considered in a multidimensional structure.

Table 4. Comparison of Standard Goodness of Fit Criteria and Research Results (Schermelleh-Engel, 2003; Şahin and Okan, 2024).

Fit Dimensions	Good Fit	Acceptable Compliance	Concordance Values Obtained in the Study
χ^2/df	$0 \leq \chi^2/df \leq 2$	$2 \leq \chi^2/df \leq 3$	2.453
RMSEA	$0 \leq RMSEA \leq 0.05$	$0.05 \leq RMSEA \leq 0.08$	0.075
SRMR	$0 \leq SRMR \leq 0.05$	$0.05 \leq SRMR \leq 0.10$	0.092
NFI	$0.95 \leq NFI \leq 1.00$	$0.90 \leq NFI \leq 0.95$	0.925
CFI	$0.95 \leq CFI \leq 1.00$	$0.90 \leq CFI \leq 0.95$	0.938
GFI	$0.90 \leq GFI \leq 1.00$	$0.85 \leq GFI \leq 0.90$	0.889
RFI	$0.90 < RFI < 1.00$	$0.85 < RFI < 0.90$	0.915

The eight-dimensional and 44-item structure of the Multidimensional Digital Addiction Scale was subjected to a Confirmatory Factor Analysis (CFA), the results of which are presented in Table 4. The obtained fit indices were deemed to be acceptable ($\chi^2/sd=2.453$; $p<.001$; RMSEA=0.075; SRMR=0.092; NFI=0.925; CFI=0.938; GFI=0.889; RFI=0.915). The values considered appropriate by Schermelleh-Engel et al. (2003) and the fit indices of the study are listed in the table above. According to these results, the fit indices obtained in the study are within acceptable limits. The χ^2/sd value is within acceptable limits of fit with 2.453. The RMSEA value of 0.075 is within the acceptable fit range and indicates that the model shows excellent fit. SRMR value is within the acceptable limits with 0.092. NFI (0.925), CFI (0.938) and RFI (0.915) values are also in the acceptable fit range and indicate that the model shows a good fit. The GFI value of 0.889 is within the acceptable fit limit and supports the general fit of the model. These fit indices indicate that the eight-dimensional structure of the Multidimensional Digital Addiction Scale is valid and reliable. Several error terms were allowed to correlate based on both modification indices and theoretical rationale, such as shared item

wording or content overlap. For instance, items addressing passive content consumption (e.g., watching videos, browsing feeds) may reflect common method variance and therefore justified correlated residuals.

Criterion Validity of the Scale

Table 5 shows the correlations between the sub-dimensions of the Multidimensional Digital Addiction Scale (MDDS) and Mobile Phone Addiction Scale (Mobile Phone Addiction Scale). The results reveal that the sub-dimensions of the Multidimensional Digital Addiction Scale show significant positive correlations with the Mobile Phone Addiction Scale. In particular, there are strong relationships between Social Media Addiction and Phone Addiction ($r = .874, p < .05$) and between Internet Addiction and Phone Addiction ($r = .510, p < .05$). Other sub-dimensions, such as Video Addiction ($r = .767, p < .05$) and Viewing Addiction ($r = .705, p < .05$), also showed significant relationships with the Phone Addiction Scale. These findings support that the MDDS is appropriate in terms of criterion validity and that different dimensions of digital addictions are related to phone addiction. This is an important indicator that strengthens the validity of the scale.

Table 5. The Relationship Between Multidimensional Digital Addiction and Mobile Phone Addiction Scale Subscales

Variables	1	2	3	4	5	6	7	8	9
Mobile Phone Addiction	1	,494*	,510*	,292*	,874*	,350*	,510*	,322*	,293*
Social Media Addiction		1	,807*	,341*	,510*	,788*	,871*	,658*	,648*
Internet Addiction			1	,244*	,394*	,725*	,768*	,561*	,568*
Gaming Addiction				1	,343*	,324*	,347*	,366*	,322*
Phone Addiction					1	,400*	,528*	,311*	,276*
Video Addiction						1	,767*	,545*	,561*
Viewing Addiction							1	,576*	,705*
Online Shopping Addiction								1	,517*
Information Search Anxiety									1

* $P < .001$

Reliability

Cronbach Alpha (α) internal consistency coefficients were analysed to calculate scale reliability. The findings related to these are presented in Table 1.

Conclusion, Discussion and Suggestions

Discussion

This study evaluated the validity and reliability of the "Multidimensional Digital Addiction Scale" (MDDS) developed to understand the multidimensional structure of digital addictions. Multidimensional Digital Addiction Scale (MDDS) is a comprehensive measurement tool covering eight sub-dimensions of digital addiction (Social Media Addiction, Internet Addiction, Gaming Addiction, Phone Addiction, Video Addiction, Tracking Addiction, Online Shopping Addiction and Information Seeking Anxiety). The findings of the study showed that this scale is a valid and reliable measurement tool.

Multidimensional Structure of Digital Addiction

The results of the research show that digital addiction is not limited to a single dimension, on the contrary, it can occur in many different types of digital platforms and behaviours. This finding coincides with other studies in the literature that digital addictions cannot be handled in a single category (Eriksen et al., 2023; Kessler et al., 2023; Kuss & Griffiths, 2017; Montag et al., 2015). For example, different types of digital addictions, such as social media addiction and gaming addiction, are each associated with different psychosocial outcomes and risk factors (Andreassen et al., 2013; Griffiths, Kuss, & Demetrovics, 2014). Therefore, taking a holistic approach to digital addictions and comprehensively assessing the different aspects of these addictions is critical for developing effective intervention strategies.

Social Media and Internet Addiction

Social media and internet addiction are the most common and most studied dimensions of digital addictions. Social media addiction is defined as individuals' uncontrolled use of social media platforms, which has negative effects on psychological and social functioning (Andreassen et al., 2017). Internet addiction, on the other hand, is associated with problems such as social isolation and low academic performance resulting from excessive and uncontrolled use of the Internet (Kuss & Griffiths, 2012; Young, 1998). In our study, it was observed that these dimensions could be measured in a valid and reliable way, which emphasises the critical role of these dimensions in digital addiction research.

Game and Telephone Addiction

Gaming addiction is a common and growing concern, especially among young people. It is known that gaming addiction has serious consequences such as low academic achievement, sleep disorders, and deterioration in social relationships (Green et al., 2021; Lemmens, Valkenburg, & Peter, 2009; Pontes & Griffiths, 2015).

Phone addiction has become an important problem, especially with the widespread use of smartphones. Studies show that phone addiction is associated with psychological problems such as distraction, social isolation, and increased anxiety levels (Elhai et al., 2016; Billieux et al., 2015). In this study, both dimensions were measured in a valid and reliable way and provided important data in understanding the relationships between different dimensions of digital addictions.

Video and Viewing Addiction

Video and viewing addiction has attracted more attention with the increasing consumption of online content. These types of addictions cause individuals to experience impairments in social, academic, or occupational functioning as a result of excessive consumption of online videos or series (Sung, Kang, & Lee, 2018). This study shows that video and viewing addictions also have an important place in the digital addiction spectrum and that these addictions can also be validly measured with the MDSS.

Online Shopping Addiction and Information Search Anxiety

Online shopping addiction is characterised by individuals' inability to control their online shopping behaviour, which leads to financial and psychological problems (Rose & Dhandayudham, 2014). Information seeking anxiety, on the other hand, is defined as a state in which individuals experience intense anxiety and stress during the process of searching for information over the internet (Case & Given, 2016). In this study, both types of addictions were measured validly and reliably, and the diverse and multidimensional nature of digital addictions was underlined.

The results of the MDSS can be interpreted at both the overall scale level and the subscale level. It is evident that elevated scores on each subdimension are indicative of a propensity towards particular digital addictive behaviours. For instance, an elevated score on the Online Shopping Addiction Scale may be indicative of compulsive and uncontrolled online purchasing as a coping strategy. Practitioners can utilise individual subscale scores to customise specific interventions based on a client's most salient risk areas. While gender was not a focal variable in the present study, preliminary comparisons revealed no statistically significant gender differences across subscales. However, further exploration is warranted in future studies, with a view to investigating gender-based patterns in digital addiction.

The present study makes a theoretical contribution to the existing literature by conceptualising digital addiction as a multidimensional construct, thus extending the scope of traditional unidimensional approaches. In practice, the MDSS can function as a diagnostic and psychoeducational instrument for clinicians, school counsellors, and mental health professionals. To illustrate this point, consider a counsellor working with adolescents who exhibit high scores in the Social Media and Information Seeking Anxiety subscales. In such a case, the counsellor would be

able to focus on the establishment of digital boundaries and the identification and addressing of underlying cognitive distortions related to constant connectivity. Furthermore, educational institutions can utilise the MDDS to screen for high-risk behaviours and implement preventative interventions tailored to specific digital domains.

Limitations of the Study

This study has some limitations. Firstly, the sample consisted only of individuals in emerging adulthood, so the findings cannot be generalised to other age groups. Secondly, the study is based on self-reported data, which means that factors such as social desirability bias may influence the results (Podsakoff et al., 2003). Finally, since the study was conducted with participants from Turkey only, the effects of cultural differences on digital addiction were not fully assessed. Despite the inclusion of participants from multiple universities in the sample, the data were predominantly gathered from undergraduate students in Turkey, which may limit the generalizability of the results. The socio-economic distribution was concentrated within middle to upper-middle-class groups, and the geographical representation was primarily urban or semi-urban. It is recommended that future studies encompass a more extensive sample of the population, including individuals from diverse geographical locations, various age groups, and a range of socio-economic backgrounds. Furthermore, while gender-based and cultural comparisons were not the primary focus of the present study, they are recommended for future research to further validate the multidimensional structure of the MDDS.

Conclusion

In conclusion, the Multidimensional Digital Addiction Scale (MDDS) demonstrates strong psychometric properties and provides a robust, evidence-based tool for assessing digital addiction across eight domains. By capturing the distinct forms of digital dependency, the scale enables practitioners and researchers to understand and address the complexity of technology-related behavioural issues. Its practical utility lies in identifying individuals' risk areas and guiding targeted interventions, particularly in clinical, educational, and preventive settings. Future studies are encouraged to expand the scale's application across cultures and demographic groups to further refine its predictive and diagnostic value.

Recommendations

1. **Suggestions for Future Research:** Considering the multidimensional nature of digital addiction, more research should be conducted in different age groups and cultural contexts. In addition, longitudinal studies may be

useful to examine the developmental processes of digital addiction and the long-term effects of these processes on individuals.

2. **Recommendations for Implementation:** Educators, psychologists and professionals struggling with digital addiction should develop customised intervention and training programmes for individuals, taking into account the different dimensions of digital addictions. Awareness programmes and trainings aimed at preventing digital addictions, especially among young people, should be expanded.
3. **Recommendations for Policymakers:** In order to reduce the impact of digital addictions on society, policy makers should develop legal frameworks to regulate the use of digital platforms and conduct campaigns to raise public awareness on this issue.

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References

- Allcott, H., Gentzkow, M., & Song, L. (2022). Code for: Digital addiction. *American Economic Association*. <https://doi.org/10.3886/E163822V1>
- Alter, A. (2018). *Irresistible: The rise of addictive technology and the business of keeping us hooked*. Penguin Press.
- Andreassen, C. S., Griffiths, M. D., Gjertsen, S. R., Krossbakken, E., Kvam, S., & Pallesen, S. (2013). The relationships between behavioral addictions and the five-factor model of personality. *Journal of Behavioral Addictions, 2*(2), 90–99. <https://doi.org/10.1556/JBA.2.2013.003>
- Balakrishnan, J., & Griffiths, M. D. (2017). Social media addiction: What is the role of content in YouTube? *Journal of Behavioral Addictions, 6*(3), 364–377. <https://doi.org/10.1556/2006.6.2017.058>

- Billieux, J., Maurage, P., Lopez-Fernandez, O., Kuss, D. J., & Griffiths, M. D. (2015). Can disordered mobile phone use be considered a behavioral addiction? An update on current evidence and a comprehensive model for future research. *Current Addiction Reports*, 2(2), 156–162. <https://doi.org/10.1007/s40429-015-0054-y>
- Byrne, B. M. (2010). *Structural equation modeling with AMOS: Basic concepts, applications, and programming* (2nd ed.). Routledge.
- Case, D. O., & Given, L. M. (2016). *Looking for information: A survey of research on information seeking, needs, and behavior*. Emerald Group Publishing.
- Deloitte. (2018). 2018 global mobile consumer survey: US edition. *Deloitte*. <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/technology-media-telecommunications/us-tmt-global-mobile-consumer-survey-exec-summary-2018.pdf>
- Dong, G., Lu, Q., Zhou, H., & Zhao, X. (2011). Precursor or sequela: Pathological disorders in people with Internet addiction disorder. *PLOS ONE*, 6(2), e14703. <https://doi.org/10.1371/journal.pone.0014703>
- Elhai, J. D., Levine, J. C., Dvorak, R. D., & Hall, B. J. (2016). Fear of missing out, need for touch, anxiety and depression are related to problematic smartphone use. *Computers in Human Behavior*, 63, 509–516. <https://doi.org/10.1016/j.chb.2016.05.079>
- Eriksen, J. W., Fiskaali, A., Zachariae, R., Wellnitz, K. B., Oernboel, E., Stenbro, A. W., Marcussen, T., & Petersen, M. W. (2023). Psychological intervention for gambling disorder: A systematic review and meta-analysis. *Journal of Behavioral Addictions*, 12(3), 613–630. <https://doi.org/10.1556/2006.2023.00034>
- Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). Sage.
- Green, R., Delfabbro, P. H., & King, D. L. (2021). Player-avatar interactions in habitual and problematic gaming: A qualitative investigation. *Journal of Behavioral Addictions*, 10(2), 223–233. <https://doi.org/10.1556/2006.2021.00038>
- Griffiths, M. D., Kuss, D. J., & Demetrovics, Z. (2014). Social networking addiction: An overview of preliminary findings. In K. P. Rosenberg & L. Curtiss Feder (Eds.), *Behavioral addictions: Criteria, evidence, and treatment* (pp. 119–141). Elsevier Academic Press. <https://doi.org/10.1016/B978-0-12-407724-9.00006-9>
- Kardefelt-Winther, D. (2014). A conceptual and methodological critique of internet addiction research: Towards a model of compensatory internet use. *Computers in Human Behavior*, 31, 351–354. <https://doi.org/10.1016/j.chb.2013.10.059>
- Kemp, S. (2020). Digital 2020 reports. *We Are Social*. <https://wearesocial.com/digital-2020>
- Kessler, A., Schmidt, L. D., Brand, M., & Wegmann, E. (2023). Implicit cognitions in problematic social network use. *Journal of Behavioral Addictions*, 12(3), 590–598. <https://doi.org/10.1556/2006.2023.00035>

- Khan, A., Thomas, G., Karatela, S., Morawska, A., & Werner-Seidler, A. (2024). Intense and problematic social media use and sleep difficulties of adolescents in 40 countries. *Journal of Adolescence*, *96*, 1116–1125. <https://doi.org/10.1002/jad.12321>
- Kuss, D. J., & Griffiths, M. D. (2012). Internet gaming addiction: A systematic review of empirical research. *International Journal of Mental Health and Addiction*, *10*(2), 278–296. <https://doi.org/10.1007/s11469-011-9318-5>
- Kuss, D. J., & Griffiths, M. D. (2017). Social networking sites and addiction: Ten lessons learnt. *International Journal of Environmental Research and Public Health*, *14*(3), 311. <https://doi.org/10.3390/ijerph14030311>
- Lawshe, C. H. (1975). A quantitative approach to content validity. *Personnel Psychology*, *28*(4), 563–575. <https://doi.org/10.1111/j.1744-6570.1975.tb01393.x>
- Lemmens, J. S., Valkenburg, P. M., & Peter, J. (2009). Development and validation of a game addiction scale for adolescents. *Media Psychology*, *12*(1), 77–95. <https://doi.org/10.1080/15213260802669458>
- Maraz, A., & Yi, S. (2022). Compulsive buying gradually increased during the first six months of the Covid-19 outbreak. *Journal of Behavioral Addictions*, *11*(1), 88–101. <https://doi.org/10.1556/2006.2022.00002>
- Montag, C., Lachmann, B., Herrlich, M., & Zweig, K. (2019). Addictive features of social media/messenger platforms and freemium games against the background of psychological and economic theories. *International Journal of Environmental Research and Public Health*, *16*(14), 2612. <https://doi.org/10.3390/ijerph16142612>
- Newport, C. (2019). *Digital minimalism: Choosing a focused life in a noisy world*. Penguin Random House.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>
- Pontes, H. M., & Griffiths, M. D. (2015). Measuring DSM-5 internet gaming disorder: Development and validation of a short psychometric scale. *Computers in Human Behavior*, *45*, 137–143. <https://doi.org/10.1016/j.chb.2014.12.006>
- Rose, S., & Dhandayudham, A. (2014). Towards an understanding of internet-based problem shopping behavior: The concept of online shopping addiction and its proposed predictors. *Journal of Behavioral Addictions*, *3*(2), 83–89. <https://doi.org/10.1556/JBA.3.2014.003>
- Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research-Online*, *8*(2), 23–74.
- Sung, Y., Kang, E. Y., & Lee, W. (2018). Why do we indulge? Exploring motivations for binge watching. *Journal of Broadcasting & Electronic Media*, *62*(3), 408–426. <https://doi.org/10.1080/08838151.2018.1451851>

- Şahin, Y., & Okan, N. (2024). Development of a scale examining post-disaster coping motivations in Turkey after the 6 February earthquake. *International Journal of Methods in Psychiatric Research*. <https://doi.org/10.1002/mpr.2031>
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Pearson.
- Vox. (2020). Tech companies tried to help us spend less time on our phones. It didn't work. *Vox*. <https://www.vox.com/recode/2020/1/6/21048116/tech-companies-time-well-spent-mobile-phoneusage-data>
- Yılmaz, N., & Okan, N. (2021). Development and psychometric investigation of the Telephone Addiction Scale. Presented at the *New Norms in Education-II International Covid-19 e-Congress*, Artvin.
- Young, K. S. (1998). Internet addiction: The emergence of a new clinical disorder. *CyberPsychology & Behavior*, *1*(3), 237–244. <https://doi.org/10.1089/cpb.1998.1.237>
- Zenith Media. (2019). Consumers will spend 800 hours using mobile internet devices this year. *Zenith Media*. <https://www.zenithmedia.com/consumers-will-spend-800-hours-using-mobile-internet-devices-this-year/>

