

## Research Article

## Social Media Addiction Scale for Adolescents: Validity and Reliability Study

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### Abstract

Nowadays, technology and Internet use has been increasing, and this increase brings along social, psychological, and physical problems. Social media addiction is one of the problems that arise from intensive Internet and technology use. This study aims to develop a Likert-type scale for identifying adolescents' social media addiction levels. The research data have been collected from public middle and high school students, 439 students for the exploratory factor analysis and 195 students for the confirmatory factor analysis. In the process of developing the scale, opinions have been received from 10 school counselors, two Turkish language teachers, two computer and instructional technologies teachers, and one expert in the field of addiction. A 9-item, one-factor structure has been obtained as a result of the exploratory factor analysis and 27-item draft scale. The obtained structure has been tested using exploratory factor analysis. The 9-item, one-factor scale explains 56.8% of the total variance. A positive, moderate correlation has been determined for the Social Media Addiction with the Game Addiction as a result of the correlation analysis performed for the purpose of determining the scale's validity. Cronbach's Alpha of reliability for the scale has been calculated as 0.904.

### Keywords

Addiction • Social media • Social media addiction

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A number of studies have focused on developing scales on concepts such as the Internet, Facebook, mobile phones, television, computers, digital and video game addiction, and technology addiction, which have gained a place in every sphere of life. Young's (1998) study on the Internet Addiction Scale was the first study conducted in this context. Likewise, scales have been developed in Turkey or adapted to Turkish on topics like smartphone addiction (Fidan, 2016; Kwon, et al., 2013; Noyan et al., 2015), computer and digital game addiction (Ayas, Çakır Balta, & Horzum, 2011; Horzum, Ayas, & Çakır Balta, 2008; Lemmens, Valkenburg, & Peter, 2009; Yalçın Irmak, & Erdoğan, 2015), Facebook addiction (Andreassen, Torsheim, Brunborg, & Pallesen, 2012; Seferoğlu & Yıldız, 2013), Internet addiction (Arıcak, Dinç, Yay, & Griffiths, 2018; Brian & Wiemer-Hastings, 2005; Ferraro, Caci, D'amico, & Blasi, 2006; Günüş, 2009; Günüş & Kayri, 2010; Kayri & Günüş, 2009; Koçer, 2012; Pontes & Griffiths, 2016), and television addiction (Balantekin, 2009). Furthermore, several scales are found in the literature in terms of social media that have been conducted for the purpose of determining social network usage levels (Doğan & Karakaş, 2016; Toraman, 2013), location sharing on social networks (Arslan & Kırık, 2013), purposes for using social media (Acun, Yücel, Belenkuyu, & Keleş, 2017; Erol & Hassan, 2014), social media attitude (Ortar & Argın, 2015), social media and inter-family communication (Demir, 2016), and social media addiction tendencies (Wilson, Fornasier, & White, 2010). However, only three studies are found to have been conducted in Turkey for determining social media addiction. The first scale is the Social Media Disorder Scale developed by Van den Eijnden et al. (2016) for adolescents 10-17 years old and adapted to Turkish by Tas (2017). The scale was implemented over high school students and is limited due to its Yes/No answers. The second scale, the Social Media Addiction Scale, was developed by Tutgun-Ünal (2015) by including individuals between 17 and 45 years old in the sample. The third scale was developed by Ayğar and Uzun (2018) for the purpose of assessing university students' social media addiction. As a result of the literature review, however, no Likert-type scale was found to have been developed for determining the social media addiction levels of both middle school and high school students; in other words, no scale of this type exists for adolescents. In this context, this study aims to develop an assessment tool for use in research studies conducted in the field of social media addiction that are valid, reliable, and practical and that conform to the DSM-5 criteria.

## Method

### Research Design

The main focus of this study is to develop a Likert type scale for practically, validly, and reliably assessing middle school and high school students' social media addiction levels. The survey design has been employed as a quantitative research method to accomplish this research study's objective. Survey design is a type of research design used to collect information on the study's universe (Neuman, 2017).

## Study Group

The researchers implemented the draft scale form over students studying in public middle schools and high schools within Pendik District's National Education Directorate in 2018. These students are between 11 and 18 years old. The study includes two study groups.

**Study Group I.** The first study group consists of 227 female (51.7%) and 212 male students (48.3%). In total, 439 students - 230 secondary school and 209 high school students- participated in the study in the range of 5<sup>th</sup>-grade and 12<sup>th</sup>-grade. The students were between 11 and 18 years old.

**Study Group II.** The second study group consists of 96 female (49.2%) and 99 male (50.8%) students. The findings show seniors to have the lowest participation rates and freshmen to have the highest participation rates. The study includes 94 middle school students (48.2%) and 101 high school students (51.8%).

## Data Collection Tools

**Information Form.** An information form has been used for collecting information on participants' gender, grade level, and school level.

**Game Addiction Scale for Adolescents (Short Form).** This scale, developed by [Anlı and Taş \(2018\)](#) in line with DSM-5 criteria, is comprised of one dimension and nine items. The scale is a 5-point Likert-type scale (1-Never, 2-Rarely, 3-Sometimes, 4-Very Often, 5-Always) with its Cronbach's alpha of reliability having been calculated as 0.87.

## Scale Development Process

Firstly in the scale development process, a literature review has been conducted and the mediums of social media and addiction types specified. Scales developed and adapted in the field of technology addiction on things such as smartphones, the Internet, computers, television, games, Facebook, and social media addiction have been examined. Interviews were carried out with middle school and high school students to receive their opinions on the social media use. The diagnostic criteria from the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders ([DSM-5, 2013](#)) have been analyzed. These criteria set the foundation of the study's theoretical background. In light of the collected data, developed and adapted scales, and theoretical knowledge, an item pool consisting of 43 items appropriate to the nine established diagnostic criteria have been formed. Opinions have been received from 10 school counselors, two Turkish language teachers, two computer and instructional technologies teachers, and one expert working in the field of addiction. In line with the expert and teacher opinions, a 27- item draft scale has been constructed from the item pool by choosing three items from each that represent the DSM-5's game addiction diagnostic criteria and that share the same meaning. A pilot

implementation has been carried out with a group consisting of 30 students to evaluate whether or not the items are clear for the target group. The draft scale forms were distributed to students, each item was read out loud, and students were asked to re-read the items and mark which items are unclear. The results of the pilot implementation show the items to be clear for the target group. In the factor analysis, the lower limit for item loading has been specified as 0.50, and the items have been analyzed in accordance with the nine criteria recommended by DSM-5. The *DSM-5 (2013)* has been considered as the key criterion for forming the item pool and selecting the items for factor analysis due to its being an internationally acknowledged source published by the American Psychiatric Association for determining criteria in diagnosing mental illnesses. Likewise, similar studies on scale development are found in the literature (*Andreassen, Torsheim, Brunborg, & Pallesen, 2012; Anlı & Taş, 2018*). In selecting the items, nine items with the highest item loads have been determined by considering each criterion to have an appropriate item that represents it. In other words, the items with the highest item loads reflecting each of the nine criteria for addiction and providing content validity have been selected. The factor analysis was performed again with the selected nine items. As a result of the analysis, a 9-item, one-factor structure has been obtained, and this structure was tested using confirmatory factor analysis by recollecting data.

The draft scale form is scored as a 5-point Likert-type scale (1-Never, 2-Rarely, 3-Sometimes, 4-Very Often, 5-Always). The scale has no reverse-scored items. Due to the scale consisting of nine items, a participant can get a minimum of 9 points and a maximum of 45 points. The answers given to each item are added together to receive the total score. Individuals with higher total scores indicate higher levels of social media addiction, whereas individuals with lower total scores indicate low levels of social media addiction.

### Data Analysis

A normality test, the Kaiser-Meyer-Olkin (KMO) test, and the Bartlett test of sphericity have been performed to determine if the data set is appropriate for factor analysis. The results show the data set to be appropriate for factor analysis; a 9-item structure has been obtained, as well as correlation and criterion validity coefficients between the items and total score. In order to test the 9-item, one-factor structure, first-level confirmatory factor analysis (CFA) has been performed.

As a result, the  $\chi^2$  and goodness-of-fit indexes (GFI) have been taken into consideration in terms of model evaluation (*Hu & Bentler, 1999*). These indexes are the  $\chi^2$ , test statistic,  $\chi^2 / df$  percentages, *GFI*, *AGFI*, *CFI*, *RMR*, and *SRMR* (*Jöreskog, 2004; Schumacker & Lomax, 2010*). For a model to be considered valid, goodness-of-fit indexes are recommended to be within the range of perfect fit ( $0 \leq \chi^2 / df \leq 3$ ;  $GFI \geq .95$ ,  $AGFI \geq .95$ ,  $CFI \geq 1.0$ ;  $RMR \geq 0$ ,  $SRMR \leq .05$ ) or acceptable fit ( $3 < \chi^2 / df \leq 5$ ;  $GFI$

$\geq 90$ ,  $AGFI \geq 90$ ,  $CFI < 95$ ;  $RMR > .05$ ,  $SRMR \leq .08$ ; Byrne, Shavelson, & Muthen, 1989; Hu & Bentler, 1999; Kline, 2011; Tabachnick & Fidell, 2007).

In order to provide evidence of the scale's reliability, Cronbach's alpha of reliability and the correlation values between item-total scores and item-residual scores have been calculated. Additionally, an independent samples *t*-test was carried out for determining whether the items distinguish between lower and upper groups.

## Findings

### Findings Related to Validity Studies

The analysis was initiated with a normality test. As a result of the normality test, the total-score skewness value was found to be 0.656 and the kurtosis value to be 0.423. Skewness and kurtosis values are among the most important criteria in terms of the normality test (Kalaycı, 2006). According to Çokluk, Şekerçioğlu, and Büyükköztürk (2012), skewness and kurtosis value limits within the range of  $\pm 1$  indicate normal data distribution. This study has found the Kaiser-Meyer-Olkin value to be 0.958 and the Bartlett test of sphericity value to be 8,345.031 ( $p < .000$ ). According to these results, the data set has been determined to be appropriate for factor analysis (Tatlıdil, 2002). Cronbach's alpha of reliability for the 27 items has been calculated as 0.962; no items were found with lower reliability coefficient values. The total score was calculated by adding the 27 items, the item-total score correlation values were examined, and correlation values have been found to vary between 0.595 and 0.768 ( $p < .01$ ). All items have been found to be correlated with the total score. The non-additivity test has been performed to provide evidence in determining whether or not the draft scale has an addable characteristic. The results of the non-additivity test demonstrate the items to show a significant difference ( $f = 15.832$ ;  $p < .001$ ). The possibility for non-additivity has determined as  $p = .736$ . Because the non-additivity value is not significant ( $p > .05$ ), the scale has been accepted as a scale with an addable characteristic (Özdamar, 2016). The results from Hotelling's *t*-test, which was performed to determine whether a significant difference exists between the item-score averages from the draft scale, show the item score averages to not equal each other ( $f = 6.168$ ;  $p < .001$ ). As the item averages show a significant difference, the items have been concluded to be perceived as a heterogeneous group (Özdamar, 2016).

The study's findings present the data to be distributed normally and the items to be addable and appropriate for factor analysis. The factor analysis was initiated with a principal component analysis to determine the factor loads of the items. To determine items' factor loadings, the amount of variance between factors should correspond to the 10% level and the total amount of variance should be high; therefore, the lower limit of items' factor loads should be at least 0.32 or higher (Tabachnick & Fidell, 2007). An item's factor loading

demonstrates the amount of variance a factor explains; for this reason, having high factor-load values has been suggested in factor analysis (Büyüköztürk, 2002). In line with this, the lower limit for items' factor-loading values is regarded as 0.50. Factor analysis has revealed no items with an item load less than 0.50 or that give an item load to more than one factor. The eigenvalues obtained from the first analysis and the explained variance quantities show the first factor to have a higher eigenvalue and variance compared to the other factors. Of the total variance of 61.655%, the first factor explains 50.818%, the second explains 5.780%, and the third factor explains 5.057%. The first factor is comprised of the second and third factors. The variance amount explained by the first factor is greater than 50%; the variance amounts explained by the second and third factors are each less than 10% and insufficient at explaining the potential structure. Therefore, the scale has been accepted as a one-factor scale (Özdamar, 2016). In addition, the scree plot analysis, which was conducted to produce evidence for determining if the items distribute to the factors, has demonstrated the scale to be able to be a one-factor scale. Thus rotation analysis has not been performed. While preparing the draft scale, the item loads for the items prepared according to the DSM-5 diagnostic criteria were examined, and three items associated with each criterion were identified among the items with the highest item loads. The findings demonstrate the factor loads of all items to be greater than 0.50. On account of items with higher item loads contributing more to factor formation (Özdamar, 2016), items labeled I3, I6, I8, I12, I14, I18, I21, I22 and I26 have been chosen. Exploratory factor analysis has been repeated with these chosen items. The analysis result shows the eigenvalue of the one-factor, 9 item-scale to be 5.111 and the total explained variance to be 56.787%. The scree plot graph of the 9 item-scale presents it as a one-factor scale. The item loads for the 9-item scale range between 0.690 and 0.790. The correlation analysis conducted on the validity of the 9 item-scale reveals the item-total score correlation values to range between  $r = .702$  and  $r = .790$  with a positive and significant relationship. Fit indexes have been evaluated in order to test the accuracy of the structure that emerged as a result of the exploratory factor analysis and to make a judgment on the accuracy of the structure that had been tested with the first-level exploratory factor analysis. Accordingly, the fit levels have been determined as:  $\chi^2 / df = 2.694$  perfect fit (Chi-Square Value [ $\chi^2 = 72.738$ ] / degrees of freedom [ $df = 27$ ]);  $GFI = .925$  (acceptable fit);  $AGFI = .875$  (acceptable fit);  $CFI = .950$  (acceptable fit);  $RMR = .068$  (acceptable fit); and  $SRMR = .041$  (acceptable fit).

The criterion validity process of the scale has been carried out after the exploratory factor analysis. Criterion validity is the process of comparing the developed scale to one with proven validity and reliability that assesses similar features (Seçer, 2015). The Game Addiction Scale has been used to determine the new scale's criterion validity as a valid and reliable assessment tool for similar features. As a result, a positive and significant relationship has been determined between Social Media Addiction and Game Addiction at the level of  $r = .554$ .

### **Findings Related to Reliability Studies**

The study's Cronbach's alpha of reliability, which enhances a scale's reliability, has been found as 0.904. The findings show the item-total and item-residual correlation coefficients, which had been performed to provide an argument for answering whether the items are consistent with each other and necessary for the scale, to be significant ( $p < .01$ ), the item-total correlation coefficients to range between  $r = 0.702$  and  $r = 0.790$ , and the item-residual correlation to range between  $r = 0.525$  and  $r = 0.721$ .

For the purpose of providing evidence of the items' successfulness in differentiating between the lower and upper groups, the study group was separated into the lower and upper 27%; their scores were sorted in ascending order, and an independent samples *t*-test was performed. The findings present a significant difference to exist between the independent samples of the lower and upper 27% ( $p < .01$ ), the items to differentiate the lower and upper 27%, and this significance to be in favor of the upper group. In other words, the lower and upper groups differentiate items differently.

### **Conclusion and Discussion**

The overall goal of the present research study has been to develop a practical, valid, and reliable Likert-type scale for the purpose of identifying adolescents' social-media addictions based on the DSM-5 diagnostic criteria. The results from this scale development study and its related analyses performed for assessing adolescents' social media addiction levels show the Social Media Addiction Scale for Adolescents to be a practical, valid, and reliable scale. However, the scale does have limitations. Future studies conducted on the Social Media Addiction Scale for Adolescents should take into consideration that this scale has not been developed for the purpose of diagnosing and that the test-retest method has not been applied. The present study has employed the easy sampling method; employing the random sampling method can be suggested for future studies, however. The validity of the scale can be tested using confirmatory factor analysis, and reliability coefficients can be calculated for evaluation consistency in future studies for using the scale in national and international fields.

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**EK***Ergenler için Sosyal Medya Bağımlılığı Ölçeği (ESMBÖ)*

Açıklama; *Saygıdeğer katılımcı, aşağıda verilen ifadeleri son 1 yıldaki sosyal medya (MySpace, Facebook, Bebo, LinkedIn, Tumblr, Bloglar, Instagram, WhatsApp, Viber, Line, Tango, Snapchat, Wikipedia, Podcast Apple iTunes, Forumlar, YouTube, Twitter, vb.) kullanımınızı düşünerek işaretleyiniz.*

	Hiçbir zaman	Nadiren	Bazen/ara sıra	Çoğunlukla	Her zaman
	1	2	3	4	5
1 Sosyal medyayı kullanmadığımda sinirli, endişeli veya üzgün olurum.					
2 Aklımda sürekli sosyal medyada yaptığım veya yapacağım etkinlikler vardır.					
3 Sosyal medyayı çok kullandığım için sinema, tiyatro, müzik, spor gibi diğer etkinliklere veya hobilerime zamanım kalmıyor.					
4 Sosyal medyada gezinirken “biraz daha” diyerek süreyi uzatırım.					
5 Sosyal medya iş, okul veya aile hayatımı olumsuz etkilemesine rağmen sosyal medyayı kullanmaya devam ediyorum.					
6 Sosyal medya kullanımımı kontrol etmeye, azaltmaya veya durdurmaya çalışırken zorlanıyorum.					
7 Kendimi mutlu hissetmek için sosyal medyayı daha fazla kullanırım.					
8 Sosyal medyada harcadığım zaman miktarını ailemden veya çevremdeki insanlardan gizlerim.					
9 Sosyal medyada harcadığım süre yüzünden insanlarla (aile, arkadaş ve sosyal çevre) ilişkilerimde ciddi çatışmalar yaşıyorum.					

*Not.* Referans gösterilerek izin alınmadan araştırma amaçlı kullanılabilir.