

The Psychometric Properties of the Persian Version of the "Problematic Social Media Use Scale for Adolescents": A Cross-Sectional Methodological Study

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ARTICLE INFO	ABSTRACT
<p>Article type: Original Article</p> <hr/> <p>Article History: Received: 31 Dec 2024 Accepted: 16 Feb 2025</p> <hr/> <p>Keywords: Adolescents, Quality of life, Reliability, Problematic social media use</p>	<p>Introduction: Problematic social media use is very common and there is a need for a valid tool to determine this misuse. This study was conducted with the aim of evaluation the validity and reliability of the Persian version of problematic social media use scale for adolescents (PSMUSA).</p> <p>Materials and Methods: This research is a methodological study that was conducted in 2024, after obtaining the permission from the questionnaire designer and the code of ethics. Among the adolescent population, 200 students were included in the study according to the inclusion criteria. The data collection tools were the demographic information form and the translated version of PSMUSA. The Data analysis was performed using AMOS and SPSS version 23 software. Davis content validity method, exploratory factor analysis, confirmatory factor analysis, reliability of Cronbach's α-coefficient, and correlation were used.</p> <p>Results: The average age of the participants was 15.33 ± 1.89 years. The content validity was obtained at 1.00 which was suitable. The exploratory factor analysis resulted the validate scale of 34.75% for the instrument, indicating that the instrument was a single factor and was in the appropriate range. The confirmatory factor analysis indicated that the single-factor instrument was valid and the fit indices were suitable. The internal homogeneity analysis showed that Cronbach's α-coefficient for the entire scale was 0.767, indicating sufficient correlation among the items.</p> <p>Conclusion: The Persian version of PSMUSA is valid and reliable. It is suggested that this scale can be used to assess Iranian teenagers problematic social media use.</p>
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Introduction

The social media enables people to interact with each other in a digital and online environment. Social media platforms include social networking sites, text messaging, blog sites, dating applications, and various video-sharing sites (1). These media platforms fulfill people's social and cultural needs and enable them to work in mobile environments, follow developments in virtual platforms and communicate with people (2). A research conducted by the American Academy of Child and Adolescent Psychiatrists has shown that 90% of young people between 13 and 18 years old are social network users (3). In the "Children's Information Technology Use Survey" conducted by Tweak in 2021, the internet usage rate among children was 82.7%, while this rate has been 50.8% in 2013 (4). Another research has shown that there are 4.66 billion internet users in the world, that approximately consists 60% of the world's population (5). The number of people who use social media increases by 13.2% every year, the average duration of people's daily Internet use has been reported as 7 hours, and they spending 3.5 hours daily in mobile environments. The number of social media users is expected to reach 4.75 billion by 2026 (6). There are many social media platforms in use today. The most well-known of these platforms are Facebook, WhatsApp, YouTube, Instagram, Twitter, Tik Tok, Telegram, blogs, and LinkedIn. The social media platforms that are most commonly used by teenagers include Facebook, Instagram, Twitter and blogs (7).

Teenagers' misuse of social networks can cause psychological problems, because it leads individuals to socially compare themselves with their peers. It can be stated that some social network posts containing certain messages can create orientation in teenage users and this orientation can lead to results such as lifestyle change, attitude changes, and comparisons. This situation increases the social pressure on teenagers and creates negative psychological consequences along with the inconsistency between goals and egos (8). Spending a lot of time by teenagers on social media causes many negative situations for teenagers, such as psychological problems, dissatisfaction

with self-image, risky behavior patterns, and irregular eating.

The concept of problematic social media use can be defined as a situation in which people have an irresistible desire to use social media environments, cannot exhibit intentional behavior in this regard, they spend a long time on social media platforms. They reach to the point of disruption in their daily life, social interactions, or communication activities (9).

Although the fear of losing progress is a result of problematic social media use, but it can also be a reason for it. It has been stated that young people who actively use social media platforms are more sensitive to the fear of missing out because they need more socialization (10).

A study shows that connecting to social media platforms has many negative effects on people's lives. As problematic social media use causes many negative influences in people's family life, it can be seen that negative feedback on the social media profiles of teenagers also causes self-esteem problems (11).

It is also important to determine the influential variables in order to reduce or eliminate the negative effects of problematic social media use on children and adolescents. During this period, the adolescent's sense of self and the need for independent action grow (12). With the rapid emergence of technological advances, the ways in which adolescents meet certain psychosocial needs in interacting with their peers are also changing. Social media platforms have become very important for teenagers engage in these activities. Since the parental control mechanisms on social media platforms are weak, these platforms are preferred and used by teenagers (13).

Social media platforms have become very important for teenagers because they provide mutual communication and access to information (14). As people experience more emotional problems during adolescence, they use these platforms as a way to escape from these problems (15). Although the Internet was once seen as a savior in the field of education, today's research assesses that the Internet has harmful aspects as well. Studies show that teenagers who misuse the Internet have

more severe psychiatric symptoms than those who do not misuse it (16). In a systematic review examining the impact of social media on adolescents, social media was categorized into four domains, defined as time spent, activity, investment, and misuse. It has been found that all domains are related to depression, anxiety and psychological distress (17). Therefore, finding the right tool to diagnose this problem seems necessary. In the review of literature, the problematic social media use scale for teenagers was found to be a suitable and short tool. For the application and adaptation of this scale, it is necessary to assess the validity and reliability of the translated version of this scale, considering the cultural norms of the society. Thus, this study was conducted with the aim of determining the validity and reliability of the Persian version of the problematic social media use scale for teenagers.

Materials and Methods

This methodological study was conducted between May and July 2023 after obtaining the necessary permissions from the designer of the questionnaire (Uzgenel) and receiving the code of ethics from Ardabil Azad University. It has been stated in validity and reliability studies, the sample size should be 5-10 times of the total items number of the questionnaire. Regarding to the 9-item scale in the questionnaire, a sample of 200 students (100 girls and 100 boys) in the age group of 13 to 18 years was considered, who were included in the study by quota sampling

method from the schools of Ardabil city. Informed consent was obtained from their parents or legal guardians.

The inclusion criteria were the ability to speak and understand Farsi, being between the ages of 13 and 18, and consent to participate in the research. Data collection tools were "Personal Information Form" (1-2 minutes) and the "Problematic Social Media Use Scale for Adolescents (PSMUSA)" (1-2 minutes). The personal information form contained students' demographic characteristics (age, gender, educational level, family structure and economic status and employment status of parents). The problematic adolescent social media use scale was designed by Özgenel et al. in 2018 to determine the level of adolescent problematic social media use based on the APA DSM-5 criteria (questionnaire 1). This scale is rated on a 5-point Likert scale (never-1, rarely-2, sometimes-3, often-4, always-5). There are no reverse-scored items on the scale. Since the scale consists of 9 items, the participant can score a minimum of 9 points and a maximum of 45 points from the scale. To obtain a total scale score, responses to all items are summed. In addition, the arithmetic mean is calculated by dividing the total score to the number of items.

A calculated total score or a high arithmetic mean indicates that a person's problematic social media use is high, while a low total score or a low arithmetic mean indicates that a person's problematic social media use is low (9). English version of questionnaire was also provided.

Questionnaire 1. Turkish Version of the PSMUSA

Açıklama; Saygıdeğer katılımcı, aşağıda verilen ifadeleri son 1 yıldaki sosyal medya 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 her zaman sosyal medyada yaptığım veya yapacağım olaylar oluyor.					
3	Sosyal medyayı çok kullandığım için sinema, tiyatro, müzik, spor gibi diğer etkinite ve hobilere vaktim kalmıyor.					
4	Sosyal medyada dolaşırken "biraz daha" diyerek süreyi artırıyorum.					
5	Sosyal medya iş, okul veya aile hayatımı olumsuz etkilese de sosyal medyayı kullanmaya devam ediyorum.					
6	Sosyal medya kullanımımı kontrol etmeke, azaltmakta veya durdurmakta zorluk çekiyorum.					
7	Sosyal medyayı kendimi mutlu hissetmek için fazla kullanıyorum.					
8	Sosyal medyada harcadığım zaman miktarını ailemden veya çevremdeki insanlardan saklıyorum.					
9	Sosyal medyada geçirdiğim zamandan dolayı insanlarla (aile, arkadaş ve sosyal çevre) ilişkilerimde ciddi çatışmalar yaşıyorum.					

Questionnaire 2. English Version of the PSMUSA

Explanation: Dear participant, please check the following statements regarding your use of social media in the past year. Social media includes the following: (My Space, Facebook, Bebo, LinkedIn, Tumblr, Blogs, Instagram, WhatsApp, Viber, Line, Tango, Snapchat, Wikipedia, Podcast Apple iTunes, Forums, YouTube, Twitter)		Never	Rarely	Sometimes	Most of the time	Always
1	When I don't use social media, I get angry, worried, or sad					
2	In my mind, there are always activities that I do or will do on social networks.					
3	Since I use social networks a lot, I don't have time for other activities or hobbies like movies, theater, music, sports.					
4	When using social media, I increase the amount of time I use it by saying "a little more ."					
5	Although social media is negatively affecting my work, school or family life, I continue to use social media.					
6	Trying to control, reduce or stop using social networks is difficult for me.					
7	I use social networks too much to feel happy.					
8	I hide the amount of time I spend on social media from my family or friends.					
9	Because of the time I spend on social networks, I have serious conflicts in my relationships with people (family, friends and social environment).					

Data evaluation

Data evaluation was conducted on computer using AMOS and SPSS version 23 software. Descriptive statistics (percentage distribution, mean, standard deviation), validity and reliability analyses, were employed in the data analysis. In the translation of the translation and back-translation of the questionnaire with a expert group, the Davis technique of content validity, exploratory factor analysis of Kaiser-Meyer-Olkin construct validity and Bartlett's test of sphericity, principal component analysis, comparative fit indices GFI, AGFI, CFI, RMSEA, SRMR, χ^2/sd were utilized. Additionally, confirmatory factor analysis, PATH diagrams and the Cronbach- α reliability coefficient, and total item correlation of were used to exam the validity and reliability analysis of the PSMUSA for internal consistency.

Validity of language

First, the questionnaire was translated from Turkish to Farsi by a researcher who was fully aware of the subject and familiar with the scale. Again, the translation repeated by the linguist who was not knowledgeable about the subject of the scale. These two translations were evaluated by the researcher and combined into a single scale. Subsequently, the Farsi scale was translated back to Turkish by two experts. The original version of the scale was compared with the translated version and it

was found that there was no change in the meaning of the expressions in the scale.

After obtaining permission from the ethics committee and the institute, the questionnaire was implemented as a test on a group of 10 girls and 10 boys, and the data used for the pilot program were included in the research. In the preliminary study group, the comprehensibility of the statements in the scale was evaluated and subsequently presented to an expert for content validity.

Validity of content

In order to check the validity of the questionnaire, the Turkish and Persian versions of the scale were sent to 10 experts via email. Experts' opinions on the relevance, clarity and comprehensibility, and simplicity of the items in the most appropriate form (Content Validity Index) (CVI) were requested for each item. Each item was evaluated on a scale between of 1 and to 4 points: 4: "completely appropriate", 3: "appropriate", 2: "somewhat appropriate", 1: "inappropriate". Experts' opinions were obtained using the Davis method. As a result of the evaluation, the comments that were extremely appropriate according to the experts were accepted as definitive. Comments suggesting changes or deemed inappropriate were reviewed and corrected. As a result of these evaluations, domain validity was calculated.

The validity of the structure

Factor analysis was used to evaluate the construct validity of the PSMUSA. Before that, KMO and Bartlett tests were performed to assess the adequacy of the sample and the appropriateness of the data for factor analysis.

Internal stability

The internal consistency of the scale was examined using the correlation of Cronbach's alpha coefficient and the total score of the items. For each statement, Cronbach's alpha coefficient should be at least 0.60 and the correlation of all items should be at least 0.20 (19).

Moral principles

Before starting the study, permission to adapt the scale to Iranian culture (Persian language) was obtained from the instrument designer via email. Written permissions were obtained from the Ethics Committees of Health Sciences Faculty of Atatürk

University and Ardabil Azad University IR.IAU.ARDABIL.REC.1401.102. Participants participated in the study with informed consent and were assured that their information would not be shared with others and that the "principle of confidentiality" would be observed.

Findings

This research was conducted on 200 students with the age range of 12-20 years. The average age of participating teenagers was 15.33±1.89 years, their mothers was 40.60±5.26 years, and their fathers was 46.74±5.13 years. 50% of participants were girls and 50% were boys, 23% were 12th grade students, 45% were four-person families, 48% of fathers were self-employed, and 64% of mothers were housewives. Additionally, 55.5% of the teenagers were the second child of the family and 74% of the participants had a good financial status. Demographic information of adolescents was shown in Table 1 (Table 1).

Table. 1. Demographic information of participating teenagers in the study

Demographic information		N (%)	
Gender	Girl	100 (50)	
	Boy	100 (50)	
Education (class)	7	41 (20.5)	
	8	21 (10.5)	
	9	37 (18.5)	
	10	16 (8.0)	
	11	39 (19.5)	
	12	46 (23.0)	
Number of households	2	10 (5.0)	
	3	55 (27.5)	
	4	93 (46.5)	
	5>	42 (21.0)	
Birth order	1	111(55.5)	
	2	59 (29.5)	
	3	16 (8.0)	
	4>	14 (7.0)	
Financial situation	Good	148 (74.0)	
	Bad	52 (26.0)	
Parent's Job		Father's N (%)	Mother's N (%)
	Physician	8 (4.0)	1 (0.5)
	Engineer	19 (9.5)	1 (0.5)
	Midwife	0 (0)	1 (0.5)
	Employee	65 (32.5)	20 (10)
	Self-employed	96 (48)	25 (12.5)
	House wife	0 (0)	128 (64)
	Teacher	3 (1.5)	11 (5.5)
	Nurse	1 (0.5)	1 (0.5)
	Lawyer	1 (0.5)	0 (0)
	University professor	5 (2.5)	1 (0.5)
	Others	2 (1.0)	2 (1.0)

In this study, 10 experts were consulted and it was found that the content validity index result was 1.0 (Table 2).

According to these results, the PSMUSA was a suitable measurement tool in terms of linguistic and content validity.

Table 2. Content validity index scores of the PSMUSA

Item	1	2	3	4	Score
1 When I don't use social media, I get angry, worried, or sad	-	-	1	9	1
2 In my mind, there are always activities that I do or will do on social networks.	-	-	-	10	1
3 Since I use social networks a lot, I don't have time for other activities or hobbies like movies, theater, music, sports.	-	-	-	10	1
4 When using social media, I increase the amount of time I use it by saying "a little more."	-	-	-	10	1
5 Although social media is negatively affecting my work, school or family life, I continue to use social media.	-	-	-	10	1
6 Trying to control, reduce or stop using social networks is difficult for me.	-	-	-	10	1
7 I use social networks too much to feel happy.	-	-	-	10	1
8 I hide the amount of time I spend on social media from my family or friends.	-	-	-	10	1
9 Because of the time I spend on social networks, I have serious conflicts in my relationships with people (family, friends and social environment).	-	-	1	9	1
validity index scores	1				

KMO and Bartlett tests were used to check the adequacy of the sample, which was shown in Table 3. The KMO value of the scale was 0.744, the chi-square value for Bartlett's test was 366.075, and the p value was 0.000. In line with these results, the data were

suitable for factor analysis. The principal components method and Varimax transformation were applied as EFA in the PSMUSA, which includes 9 items for adolescents (Table 3).

Table 3. Test values KMO and Bartlett tests

Test	p
KMO	0.744 (good)
Bartlett	$\chi^2=366.075, p=0.000$

In the exploratory factor analysis, when the factor pattern of all the items was examined, it was found that the items of the scale were collected in one dimension and grouped similarly to the original version. The factor loading value explains the relationship

between items and factors. Factor loadings of all scale items ranged from 0.502 to 0.661. According to the results of the exploratory factor analysis, the adapted scale explained 34.75% of the total variation (Table 4).

Table 4. exploratory factor analysis of the items in the PSMUSA

Item	Factor load values
1 When I don't use social media, I get angry, worried, or sad	0.613
2 In my mind, there are always activities that I do or will do on social networks.	0.525
3 Since I use social networks a lot, I don't have time for other activities or hobbies like movies, theater, music, sports.	0.502
4 When using social media, I increase the amount of time I use it by saying "a little more ."	0.634
5 Although social media is negatively affecting my work, school or family life, I continue to use social media.	0.554
6 Trying to control, reduce or stop using social networks is difficult for me.	0.661
7 I use social networks too much to feel happy.	0.638
8 I hide the amount of time I spend on social media from my family or friends.	0.549
9 Because of the time I spend on social networks, I have serious conflicts in my relationships with people (family, friends and social environment).	0.608
Total explained variance (%)	34.75%

The path diagram for the model was given in Figure 1. It can be observed that the scale

consists of a single sub-dimension similar to the main one

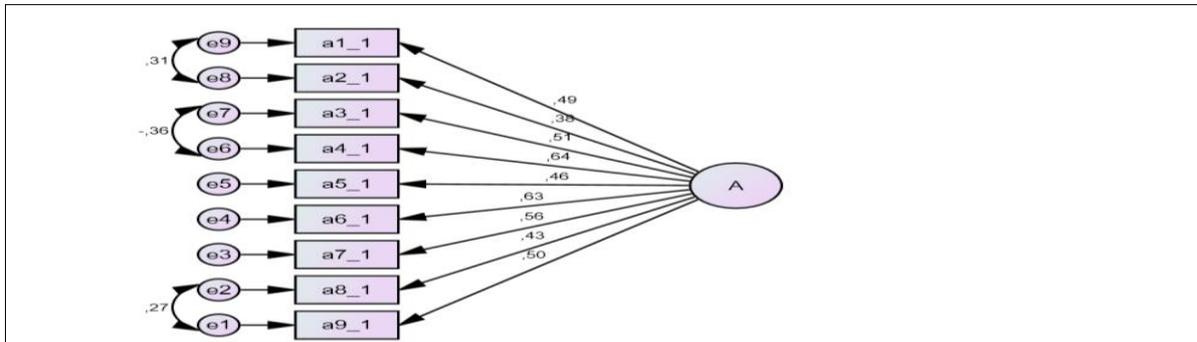


Figure 1. Statement path diagram for the PSMUSA

Table 5. Confirmatory factor analysis for the PSMUSA

Measure	Acceptable	Fit	Model fit index	outcom
X ² /SD	3 < χ^2 /sd ≤ 5	0 < χ^2 /sd ≤ 3	2.192	Good fit
CFI	.90 < GFI ≤ .94	.95 < GFI ≤ 1	.950	Good fit
RMSEA	.05 ≤ RMSEA ≤ .08	0 ≤ RMSEA ≤ .05	.077	Acceptable fit
SRMR	0.05 ≤ SRMR ≤ .10	0 ≤ SRMR ≤ .05	.0545	Acceptable fit
CFI	.90 < CFI ≤ .94	.95 < CFI ≤ 1	.915	Acceptable fit
AGFI	.85 < AGFI ≤ .89	.90 < AGFI ≤ 1	.902	Good fit
IFI	.90 < IFI ≤ .94	.95 < IFI ≤ 1	.918	Acceptable fit
Sd	24			
(X ² /SD) Chi-squared / Degrees of Freedom (RMSEA) Root Mean Square Error of Approximation (CFI) Comparative Fit Index (NFI) Normed Fit Index (GFI) Goodness of Fit Index (AGFI) Adjusted Googness of Fit Index				

To determine the status of this structure in Iranian culture, confirmatory factor analysis was performed. According to the fit index values in Table 5, CMIN/DF=2.192, RMSEA=0.077, IFI=0.918, CFI=0.915, GFI=0.950, and AGFI=0.902 were calculated. All paths of the model were significant at the 0.001 level. As a result of the analysis, suggestions for correction were reviewed.

Therefore, based on the obtained values, it is considered that the confirmatory factor analysis performed on the adaptation of the Farsi version of the scale shows an acceptable and good fit compared to the reference values, indicating that this scale has reliable construct validity (Table 5).

Table 6. Item-Total Correlation and Cronbach-α Reliability Coefficient of Propositions Related to the PSMUSA

Items No	Ort.	SS	corelation	The Cronbach Alpha coefficient if the item is deleted
M1	2.14	1.36	0.468	0.739
M2	2.26	1.20	0.391	0.750
M3	1.79	1.11	0.366	0.753
M4	2.36	1.21	0.485	0.736
M5	1.92	1.14	0.416	0.746
M6	2.27	1.37	0.509	0.731
M7	2.37	1.30	0.490	0.735
M8	1.78	1.23	0.403	0.748
M9	1.82	1.15	0.462	0.740
CronbachAlpha coefficient	0.767			

Total item correlation and Cronbach's alpha reliability coefficient of items related to the PSMUSA were shown in Table 6. It has been stated that the minimum required value should be 0.30 for the item-total test correlation to be sufficient. When item correlations are examined, scale items with values below 0.30 should not be included in the analysis. When the table was examined, the test item-total correlation values of the adolescents' answers to the scale questions were examined and it was determined that there were no items below 0.30. In the correlation of the total score of the modified item of the PSMUSA, it was found that the values ranged between 0.509-366. It seen that the PSMUSA, which has 9 items, does not have such a problematic item, and its Cronbach's α coefficient was 0.767 with an arithmetic mean of 18.65 ± 6.56 . All these findings indicate that the consistency of the internal structure of the PSMUSA, which consists of 9 items, is high (Table 6).

Discussion

To evaluate the validity and reliability of the Persian version of the PSMUSA, the terms of language validity, content validity, structural validity and reliability were assessed. In general, the findings of the study showed that this scale for teenagers is a valid and reliable tool.

Problematic social media use creates situations where teenagers socially compare themselves with their peers. For this reason, it can also cause psychological problems in teenagers. The fact that some social media posts contain certain messages may create an orientation in that direction during the user's adolescence.

This situation arises from the increase of social pressure on young people and the inconsistency between goals and egos caused by social impositions and leading to psychological problems (20).

Based on research, it has been stated that the time young people spend on social networks causes psychological problems, self-image aversion, risky behavior patterns, and irregular consumption of negative situations (17). Therefore, it is very useful to have a tool suitable for the context and culture of the country to measure the degree

of dependence of young people on virtual networks. Consequently, this research was conducted with the aim of investigating the validity and reliability of the Farsi PSMUSA.

As mentioned in the method section using the back translation method showed that there were no changes in the meaning of the expressions in the scale during the translation of scale from Turkish to Farsi. Zhang et al. (2024) also used back translation method in the translation of problematic Social Media Use Scale to Chinese (21). Content validity was evaluated by using the Davis technique (22), which is based on the agreement of most experts. The opinions of 10 experts were utilized to ensure the validity of the content. The experts were asked to review each item. Confirmation of the content validity by the Davis method required a CVI score of 0.80 or higher (22).

In this study, the CVI score for all scale statements was set at 1.00. Therefore, it can be concluded that the scale has sufficient content validity. Bonnet (2024) also used this method to assess their tools (23). In this study, the KMO value was 0.744. Bartlett's test yielded as $\chi^2=366.075$, $p=0.00$.

These results demonstrate the adequacy and suitability of the samples for factor analysis. The validity criteria of the problematic social media use scale for teenagers were first determined by examining the factor structure, then explanatory factor analysis was used. In this study a factor structure similar to the original structure was obtained, factor loadings of all scale items ranging between 0.502 and 0.661. Boer et al. (2022), Angelidou et al. (2024) used structural validity through Principal Component Analysis (PCA) and Exploratory Factor Analysis (EFA) as well as construct validity using known-group tests (23-24).

The total factorial variance of the PSMUSA is 34.75%. Therefore, it was found that the factor load and explained variance are lower than the critical level of 40% (25).

In this study, after conducting explanatory factor analysis, confirmatory factor analysis was performed to obtain clearer findings. Many indicators were used to assess the appropriateness of the problematic social media use scale model for teenagers. To

check the fit of the PSMUSA, fit indices were utilized. Bi et al. (2024) employed confirmatory factor analysis to evaluate the validity of the social networking addiction scale for college students and obtained similar results subsequently declaring that these ranges of data confirmed an acceptable model fit (26). As a result, the Persian version of adolescents' problematic social network use scale was confirmed as a single factor and had construct validity.

The reliability of the scale adapted to the target language should also be tested in scale adaptation studies.

The Cronbach- α coefficient, which is used to measure the internal consistency of the Likert scales, ranges from 0.00 to 1.00, and the closer the value is to 1.00 indicates the higher the reliability. In the study of the consistency of the PSMUSA, information about its reliability was obtained by observing the internal consistency coefficient based on Cronbach's α -internal consistency coefficient, the Persian version of the scale has a Cronbach's α -value of 0.767 which is within acceptable level of 0.6-0.8 (27), while the original version has a Cronbach's α -value of 0.87 (23).

Boer et al. (2022) in a study about the cross-national validation of the social media disorder scale reported the Cronbach's α -value of 0.84 and declared that the scale provides reliable scores (24). Another procedure for internal consistency evaluation is the item-total score correlation.

The item-total correlation between the scores obtained from the statements of the measuring instrument and positive total score, indicating similar situations of the statements in the scale and high internal consistency of the scale. In this research, the correlation between 0.366 and 0.509 was shown the high similarity of the obtained data. Spaci et al. (2024) reported that an item-total score correlation of higher than 0.3 is suitable (28).

Conclusion

The problematic social media use scale for adolescents has good validity and reliability in Iranian society. Therefore, Iranian teenagers can use this scale to assess their problematic social media use.

Declarations

Abbreviations

PSMUSA Problematic Social Media Use Scale for Adolescents
CVI Content Validity Index

Ethics approval and consent to participate

The study design was approved by the Ethics Committee on Ardabil Azad University, IR.IAU.ARDABIL.REC.1401.102 on 2022-10-18. All methods were carried out in accordance with Declaration of Helsinki. Informed consent to participate was obtained from the parents and their parent's or legal guardians by each participant before participating. Personal privacy was protected when handling personal data, and we kept individual records completely secret.

Consent for publication

Not Applicable.

Availability of data and materials

Data are available from the corresponding author on request.

Competing Interests

The authors declare no competing interests.

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Authors' contributions

"SAJ, SAA, SSH, RM Design of the study; Supervision of research implementation and data accuracy SAA; Conceptualization, methodology, analysis and draft writing, editing and finalization of the research and review article and sources: SAJ, SAA, SSH, RM. All authors read and approved the manuscript."

Human Ethics and Consent to Participate declarations

Not applicable'.

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