BMC Public Health

RESEARCH

Open Access

Psychometric validation of the Farsi Bergen social media addiction scale (BSMAS) among Iranian adults

Saeid Sadeghi[1*], Bita Shalani[1], Seyed Mahdi Firouzabadi[1], Zahra Babaei[1], Sara Arian Namazi[1] and Hamid Reza Pouretemad[1*]

Abstract

This study investigated the psychometric characteristics of the Bergen Social Media Addiction Scale (BSMAS) in a sample of Iranian adults aged between 19 and 73 years. In a cross-sectional study carried out between September 2023 and November 2023, 1044 participants (753 female and 291 male) were selected using a convenience sampling method to examine the relationship between BSMAS, Young's internet addiction (YIA), and mental health. Participants completed several questionnaires, including the BSMAS, YIA scale, and Depression Anxiety and Stress Scale (DASS-21). The BSMAS validity and reliability were evaluated using construct validity, reliability, and concurrent validity. Confirmatory factor analysis demonstrated good model fit (e.g., CFI = 0.94), with all items loading significantly. Additionally, the Cronbach's alpha coefficient (0.795), the Guttman's split-half coefficient (0.735), and the McDonald's omega coefficient (0.797) indicate acceptable reliability for the BSMAS. Significant positive relationships were found between the BSMAS and YIA ($r = 0.64$, p 0.01), depression ($r = 0.32$, $p < 0.01$), anxiety ($r = 0.32$, $p < 0.01$), and stress ($r = 0.37$, $p < 0.01$). We found that females scored higher on the Bergen than males. A negative correlation was also found between the Bergen score and age among all participants. The results suggest that the concurrent validity of the BSMAS is acceptable. In conclusion, the BSMAS is a valid and reliable scale for assessing social media addiction (SMA) evaluations in Iranian populations.

Keywords Bergen social media addiction scale, Mental health, Reliability, Validity, Iran

Introduction

We live in a world where social media systems such as Instagram, X, Facebook, and YouTube are ubiquitous. According to the 2024 Global Digital Reports by DataReportal [1], there were 5.35 billion users of the internet around the world. There were 5.04 billion social media users worldwide. The report shows that more than half of the world now uses social media (62.3%) and averages 2 h and 23 min daily on social media.

According to studies, excessive social media use can cause addiction, which disrupts work, personal, and family functions due to the amount of time spent on social media [2–4]. Research shows that addiction to technology and substance use disorder are similar in many ways and share similar neural correlates [5–7]. Over the past decade, the amount of research on problematic uses of social media has increased dramatically [8]. Addiction behaviors are characterized by six core criteria: a) salience, refers to the significance attributed to an activity

*Correspondence:
Saeid Sadeghi
sae_sadeghi@sbu.ac.ir
Hamid Reza Pouretemad
h-pouretemad@sbu.ac.ir
[1]Institute for Cognitive and Brain Sciences (ICBS), Shahid Beheshti University, Tehran, Iran

which interferes with various aspects of a person's life; (b) mood changes caused by attachment to a particular behavior; c) tolerance, which refers to escalating engagement to achieve anticipated outcomes; d) withdrawal syndrome, which occur when certain behaviors are reduced or ceased;; d) conflict arising from addictive behavior, whether interpersonal or intrapersonal; e) relapse following abstinence or a tendency to revert to problematic behaviors [5, 9].

In recent years, social media addiction (SMA) has become a global concern, prompting researchers around the world to investigate its causes and consequences [4, 8, 10, 11]. There is evidence that SMA is associated with mental health problems. For example, Sadeghi (2022) found that SMA was associated with an increased risk of eating disorders, orthorexia nervosa tendency, and low body image [12]. The systematic review conducted by Lopes, Valentini [13] indicates that problematic social media use is strongly correlated with depression and anxiety. A national sample of U.S. young adults was studied by Shensa, Escobar-Viera [14], who found that problematic social media use was strongly and independently associated with depression. A study by Lee, Kaur [15] also showed that SMA was associated with depression, anxiety, and stress in Malaysian medical students. Also, Weigle and Shafi [16] found that social media engagement has distinct effects on anxiety, depression, and suicidality.

SMA and problematic use can be associated with mental health problems, thus more research is needed on this emerging issue. Thus, some research has been conducted to develop a psychometrically robust measure of SMA, such as the Social Media Disorder Test (SMDT) [17] and the six-item Bergen Facebook Addiction Scale [18]. One of the most widely used measures of SMA is the Bergen Social Media Addiction Scale (BSMAS) [3].

The BSMAS has been adapted into several languages in various continents, including Korea [19], Hong Kong and Taiwan [20], Hungary [21], Italy [22], Spain [23], the USA, UK, New Zealand, and Australia [24]. However, despite its global application, there remains a lack of comprehensive validation of this scale among Iranian adult populations. While a previous study has explored the psychometric properties of the BSMAS in an Iranian sample [25], it was limited to a high school population and thus may not generalize to broader Iranian adult users. Adults and adolescents have different cognitive and emotional capabilities. Therefore, there may be differences in social media use patterns, predictors, and consequences between adolescents and adults. Also, adolescents and adults may have different access to or using habits concerning social media [26, 27]. So, the structure of the BSMAS may be slightly different between adolescents and adults.

This is a critical gap, as Iran presents a unique cultural, socio-political, and technological context that significantly influences how social media is used and experienced. For instance, despite governmental restrictions, platforms like Instagram and Telegram are still widely used, not only for entertainment and socialization but also for business promotion, political discourse, and even navigating around cultural limitations [28, 29]. Moreover, cultural values, family relationships, and religious beliefs strongly influence how Iranians use social media. Research has shown that the emotional atmosphere in families and how resilient they are can predict SMA among Iranian adolescents [30]. Attachment styles, shaped by both family and culture, also play a key role in SMA development [31, 32]. Gender norms further influence engagement patterns, with research suggesting that Iranian boys may experience more psychological distress linked to excessive social media use [33].

The cross-cultural literature also highlights significant differences in SMA patterns across countries. For example, individuals from collectivistic cultures like Iran may use social media more for maintaining social ties. In contrast, in more individualistic cultures, people may use it more for self-promotion or entertainment [34, 35]. Additionally, socio-economic variables such as internet accessibility and economic disparity can also affect how and why people use social media [36, 37].

In view of the socio-cultural characteristics of Iranian society, validating the BSMAS seems necessary. Without proper validation in the local context, assessments may miss culturally specific signs of addiction, which could lead to misdiagnosis or ineffective intervention. In this study, we aim to (1) examine the internal validity and reliability of the Farsi version of the BSMAS among Iranian adults, (2) Compares the BSMAS measurement invariances across age and sex groups, (3) Study the concurrent validity of the BSMAS with other SMA variables (e.g., Yung Internet Addiction Scale). Additional psychological factors are also incorporated (such as depression, anxiety, and stress scale).

Methods

Data were gathered in a cross-sectional design from September to November 2023.

Participants

To improve the study's methodological rigor, we employed the STROBE cross-sectional study checklist [38]. We selected 1044 participants through convenience sampling from the population of Iranian adults over 18 years old in Tehran, including 753 females and 291 males. The research was conducted using online questionnaires. Participants in this study had to fulfill several inclusion criteria: (1) age 18 years or older, (2) fluent

in Farsi (Persian), (3) be Iranian citizens, (4) be able to read and write well, and (5) provide written consent. To ensure the accuracy of the responses, we advised participants to read the questionnaire before responding. Furthermore, each item had required answers and participants' responses were anonymous; their names were not required, and their participation was voluntary. Participants were excluded if they (1) were under 18 years of age, or (2) provided random or non-serious responses to the questionnaires.

In accordance with Brislin's methodology [39], the three stages of the study were cultural adaptation, translation, and adaptation. During the initial stage, the BSMAS was translated back into Farsi. The measurement is first translated into the target language by one translation team, and then it is translated back into the source language by another translation team. The accuracy of the translation was assessed by contrasting the initial text with the version created by the second team. In the second stage, the instrument's psychometric properties were assessed, and translations were rated according to how closely they matched the originals.

In order to overcome this situation, the researchers hired three bilingual experts fluent in both Farsi and English and with backgrounds in psychology to ensure the scale's interpretation and presentation were accurate and consistent. Authors and translators worked independently and agreed on the final version. During the second phase of the study, the BSMAS was tested for reliability, validity, and confirmatory factor analysis. Concurrent validity of the scale was evaluated through Cronbach's alpha coefficient, Guttman's split-half coefficient, and McDonald's omega coefficient. An online form was used to collect data from a large sample of Iranians. No data was missing since participants were free to choose which items to answer.

Measures

A demographic characteristics checklist was used to collect information regarding participants' age, educational status, and occupation.

Bergen social media addiction scale (BSMAS) The BSMAS is a one-dimensional scale for measuring SMA that was created by Andreassen, Billieux [3], and consists of six items/indicators. salience, 2) tolerance, 3) mood swings, 4) relapse or loss of control, 5) disengagement, and 6) conflict or impairment of functioning. Choosing one of five options (1 = very rarely, 2 = rarely, 3 = sometimes, 4 = often, and 5 = very often) for each item determines the BSMAS raw scores. McDonald's Ω and Cronbach's $\alpha > 0.8$, indicating that the BSMAS is a reliable measure, but its internal structure has been confirmed to be one-dimensional in various cultural contexts [19, 23, 40].

Young's internet addiction scale (YIA) We used the Persian version of the YIA scale [41]. There are 20 items on the YIA that are answered on a 1–5 scale from 1 = rarely to 5 = always. The scale is self-administered and takes 5–10 min to complete. The YIA measures how internet use affects people's daily routines, social lives, productivity, sleeping patterns, and feelings. YIA scores range between 20 and 100, with higher scores indicating an increased tendency to become addicted to the internet. Based on the developer of this scale, a score of 20–39 points indicates a user who has complete control over their online usage; a score of 40–69 indicates frequent internet usage problems; a score of 70–100 indicates significant internet usage problems [6].

Depression anxiety stress Scale-21 (DASS-21) The DASS-21 Persian version with 21 items and three subscales (7 items for each subscale) was used in this study [42]. This tool's objective is to measure the frequency of stress, anxiety, and depression symptoms over the previous seven days. A four-point Likert scale, ranging from 0 ("does not apply to me at all") to 3 ("applies most of the time"), is used to rate each item on the scale. Higher scores indicate greater psychological distress. The subscale scores were determined by adding the scores of the individual items; the maximum sum for each subscale is 21. According to the original study, the Cronbach's Alpha coefficients for stress, anxiety, and depression were 0.90, 0.84, and 0.91, respectively [43].

Data analysis

Using IBM SPSS Statistics 24.0 (IBM SPSS Statistics, Inc., Armonk, USA), we performed a correlation analysis between the YIA, the BSMAS, and the DASS-21. We employed McDonald's omega coefficient, Cronbach's alpha coefficient, and Guttman's split-half coefficient to assess the internal consistency of the BSMAS. In addition, we developed the BSMAS's one-factor structure using a CFA model with Diagonally Weighted Least Squares (DWLS) estimation method with IBM SPSS Amos. Given that the questionnaire items were measured on an ordinal Likert scale, the DWLS method was especially appropriate for this analysis. A number of fit indices served as the foundation for our analysis, including the Normed Fit Index (NFI), the Incremental Fit Index (IFI), the Goodness of Fit Index (GFI), Root Mean Square Residual (RMR), the Adjusted Goodness of Fit Index (AGFI), the Comparative Fit Index (CFI), the Standardized Root Mean Square Residual (SRMR), and the Root Mean Square Error of Approximation (RMSEA).

Results

Characteristics of participants

For this study, 1044 questionnaires were analyzed from participants aged 19 to 73 from Tehran, Iran. Of the 1044 individuals who took part, 753 (72.1%) were female and 291 (27.9%) were male. Participants had the following levels of education: 80 (7.7%) had a secondary education, 272 (26.1%) had a diploma, 481 (46%) had a bachelor's degree, 185 (17.7%) had a master degree, and 26 (2.5%) had a PhD. degree. Participants' employment status was as follows: 54 (5.2%) were unemployed, 261 (25%) were self-employed, 139 (13.3%) were in government jobs, 313 (30%) were students, 196 (18.8%) were housewives, and 81 (7.7%) were retired.

Age and sex-related differences in BSMAS scores

For all participants, the mean (± standard deviation) of the BSMAS total score was 14.73 (± 4.93). The mean (± standard deviation) scores of the BSMAS items were: salience item = 2.38 (± 1.13), tolerance item = 2.58 (± 1.13), mood modification item = 2.65 (± 1.18), relapse/loss of control item = 2.48 (± 1.18), withdrawal item = 2.59 (± 1.28), and conflict/functional impairment item = 2.06 (± 1.10) for all participants.

We compared scores of males and females on the BSMAS's total score and items using an independent t-test. The results showed that females scored significantly higher than males on the BSMAS total score (t = 2.37, df = 1042, $p < 0.05$, $d = 0.16$), mood modification item (t = 4.15, df = 1042, $p < 0.001$, $d = 0.29$), relapse/loss of control item (t = 2.75, df = 1042, $p < 0.01$, $d = 0.19$), and withdrawal item (t = 3.07, df = 1042, $p < 0.01$, $d = 0.21$). However, we found no significant differences in salience item (t= -0.16, df = 1042, $p > 0.05$, d = -0.01), tolerance item (t= -0.48, df = 1042, $p > 0.05$, d = -0.03), and conflict/functional impairment item (t = 0.34, df = 1042, $p > 0.05$, $d = 0.02$).

Pearson's correlation coefficient was utilized to investigate the relationship between age and BSMAS score. SMA was negatively correlated with age (r= -0.16, $p < 0.01$) as shown in Fig. 1.

Factor structure

According to the results, all items showed statistically significant factor loadings over 0.40 (see Table 1). These findings showed that every item had statistically significant standardized factor loadings, which sufficiently supported each item for the main component. To test the one-factor model, a CFA was used, and it provided a marginal fit. The one-factor structure is presented in Table 2.

According to the results, the one-factor model fit the data well: SRMR = 0.06; CFI = 0.94; NFI = 0.94; AGFI = 0.97; IFI = 0.94; GFI = 0.99. However, the RMSEA and RMR were 0.16 and 1.11, respectively. The DWLS estimation resulted in a lower chi-square value (χ^2 = 133.35 vs. 250.26, $p < 0.001$) and improved most fit indices, including GFI (0.986 vs. 0.925), AGFI (0.967 vs. 0.825), NFI (0.938 vs. 0.884), and CFI (0.942 vs. 0.887). Although RMSEA remained relatively high (0.162), these changes suggest a better model fit under DWLS estimation. Factor loadings were also slightly improved. Therefore, the results are consistent with a one-factor model, as shown in Table 2; Fig. 2. Thus, all of the items from the original BSMAS are still included in the Persian version.

Internal consistency

In the Persian version of the BSMAS, Cronbach's alpha was 0.795, showing that all the items were assessing the same construct. Furthermore, the Guttman's split-half coefficient was 0.735 and McDonald's omega coefficient was 0.797. Both indicate acceptable reliability for the scale.

Concurrent validity

Table 3 presents the results of a correlation between the BSMAS and the YIA and the DASS-21 variables. There was a significant positive relationship between SMA and internet addiction ($r = 0.64$, $P < 0.01$). A significant positive relationship was also found between SMA and depression ($r = 0.32$, $P < 0.01$), anxiety ($r = 0.32$, $P < 0.01$), and stress ($r = 0.32$, $P < 0.01$). A significant correlation was also found between Internet addiction and depression ($r = 0.43$, $P < 0.01$), anxiety ($r = 0.43$, $P < 0.01$), and stress ($r = 0.39$, $P < 0.01$). According to these results, the BSMAS has acceptable concurrent validity among Iranian adults.

Discussion

This study aimed to assess the psychometric qualities of the Farsi (Persian) version of the BSMAS in Iranian adults between the ages of 19 and 73. Previous validation studies of the BSMAS have largely focused on Western contexts, leaving a gap in understanding cultural influences on SMA in non-Western societies. Our research contributes to closing this gap by examining the BSMAS within the socio-cultural framework of Iran. Cultural norms, family dynamics, and societal attitudes towards technology in Iran play a significant role in shaping social media use. For instance, family relationships in Iran, characterized by strong familial ties and collective values, may moderate the extent and nature of social media interactions [28–30]. The societal emphasis on family and community may influence how users engage with social media, potentially affecting responses to items measuring salience and conflict in the BSMAS.

Our study found that the Farsi version of the BSMAS exhibited strong reliability metrics, with a Cronbach's alpha of 0.795, aligning closely with reliability

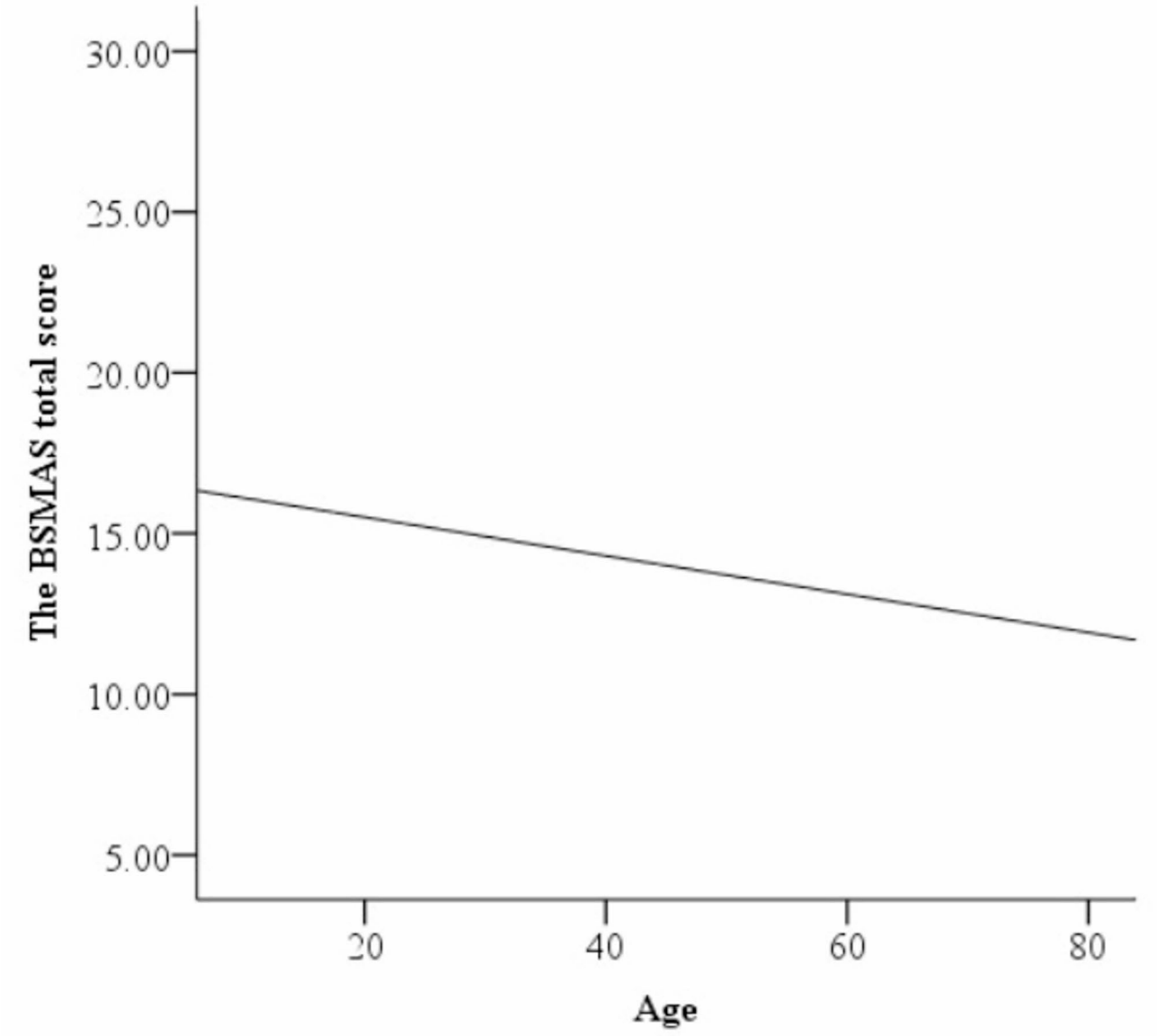

Fig. 1 Correlation between age and the BSMAS score

Table 1 Descriptive indices and factor loadings for the BSMAS items

	Item statistics					Item-total statistics		
Item	Component	Mean	Standard Deviation	Factor Loading		V	I.T.	C.D.
				ML Estimation	DWLS Estimation			
1	Salience	2.38	1.13	0.59	0.62	18.27	0.491	0.777
2	Tolerance	2.58	1.13	0.68	0.71	17.57	0.573	0.759
3	Mood modification	2.65	1.18	0.70	0.68	17.29	0.573	0.758
4	Relapse/loss of control	2.48	1.18	0.68	0.68	17.46	0.547	0.764
5	Withdrawal	2.59	1.28	0.71	0.70	16.65	0.572	0.759
6	Conflict/functional impairment	2.06	1.10	0.68	0.68	18.02	0.537	0.767

Legend: Maximum likelihood = ML, Diagonally Weighted Least Squares = DWLS, scale variance if item deleted = V, Cronbach's alpha if item deleted = C.D., corrected item-total correlations = I.T

Table 2 Fit indices for CFA models of one factor's BSMAS

Test indices	Results		Standard	Model fit Verification
	ML Estimation	DWLS Estimation		
RMSEA (Root Mean Square Error of Approximation)	0.160	0.162	≤ 0/08	Poor
GFI (Goodness of Fit Index)	0.925	0.986	≥ 0/9	Good fit
AGFI (Adjusted Goodness of Fit Index)	0.825	0.967	≥ 0/9	Good fit
NFI (Normed Fit Index)	0.884	0.938	≥ 0/9	Good fit
CFI (Comparative Fit Index)	0.887	0.942	≥ 0/9	Good fit
IFI (Incremental Fit Index)	0.888	0.942	≥ 0/9	Good fit
SRMR (Standardized RMR)	0.061	0.062	≤ 0/08	Good fit
RMR (Root Mean Square Residual)	0.104	0.108	≤ 0/08	Close

$_{sb}X^2 = 1671.07$

benchmarks established in other cultural contexts. However, Previous validations typically reported Cronbach's alpha values, Guttman's split-half, and McDonald's omega coefficients exceeding 0.8 [19–24], potentially reflecting cultural differences in interpreting certain items or the impact of socio-political factors on social media engagement. Despite these slight variations, our results confirmed the BSMAS's effectiveness in assessing SMA tendency among Iranian adults aged 19–73, and it has sufficient internal consistency. There was no removal of items from the analysis, and one component was extracted. Additionally, all item-wide associations were positive, reflecting underlying characteristics that were shared by all items. The BSMAS's internal structure (one-dimensional model) has been confirmed by numerous studies that we verified [3, 4, 19–23, 25, 40]. This study found good reliability values for the BSMAS, which were in agreement with findings from previous studies conducted on non-clinical populations [3, 21–23, 40, 44].

A key methodological contribution of this study was the use of the DWLS estimation method in confirmatory factor analysis. DWLS is recommended for ordinal or non-normally distributed data and has been shown to provide more accurate and robust parameter estimates [45, 46]. In line with this, our revised CFA using DWLS resulted in improved goodness-of-fit indices, particularly GFI, AGFI, and CFI, indicating a stronger alignment between the hypothesized factor structure and the data. Despite the RMSEA remaining slightly above the conventional threshold (< 0.08), this may reflect the over-penalization typical for simpler models with low degrees of freedom [47]. The consistent factor loadings and improvement in other indices reinforce the structural validity of the BSMAS and highlight the importance of selecting appropriate estimation methods in CFA for ordinal data.

Our study showed that age is negatively correlated with SMA. This is inconsistent with the findings of previous studies, which showed a reverse pattern. In this case, the disparity can largely be attributed to the studied age group. Youth, adults, and elders made up our age group. The tendency to become addicted to social networks is high among teenagers and university students, according to previous studies [25, 44, 48]. In our study, teenagers were not included. Thus, our findings are consistent with those of previous studies focused on teenagers, since SMA is expected to be higher in youth and to decrease with age.

In the Iranian context, age differences in SMA may be shaped by a mix of cultural and practical factors. Unlike many Western countries where access to social media is mostly open, Iranian users often face restrictions and need to use VPNs or proxies. Younger one usually adapt to these tools quickly, which may lead to more frequent and intense social media use [29]. On the other hand, older adults tend to have stronger ties to family and local communities, which can protect them from becoming overly reliant on online platforms [49, 50]. These cultural and developmental differences may help explain why younger users in our study showed higher levels of SMA.

We found that BSMAS scores are higher in females. Researchers have consistently identified gender differences in SMA, with females having higher levels of addiction than males [51–53]. Interestingly, research indicates that men are more likely than women to be addicted to online gaming as opposed to social media [52, 54]. The likelihood of developing a SMA was actually higher for women, who were also more likely to experience addictive symptoms associated with social media use [55, 56]. This phenomenon could be explained by the fact that females often place greater value on relationships than males and tend to use social media more for interactions [57, 58]. Research has shown that women who feel socially unfulfilled in real life often turn to social media to compensate for these unmet needs [59]. Women are also more likely to use social media for emotional expression, coping with stress, and social compensation. This aligns with findings that suggest females seek emotional support and connectedness through digital platforms [60]. Additionally, Biologically, hormonal differences, including greater sensitivity to oxytocin and the influence of estradiol, may enhance the rewarding aspects of social

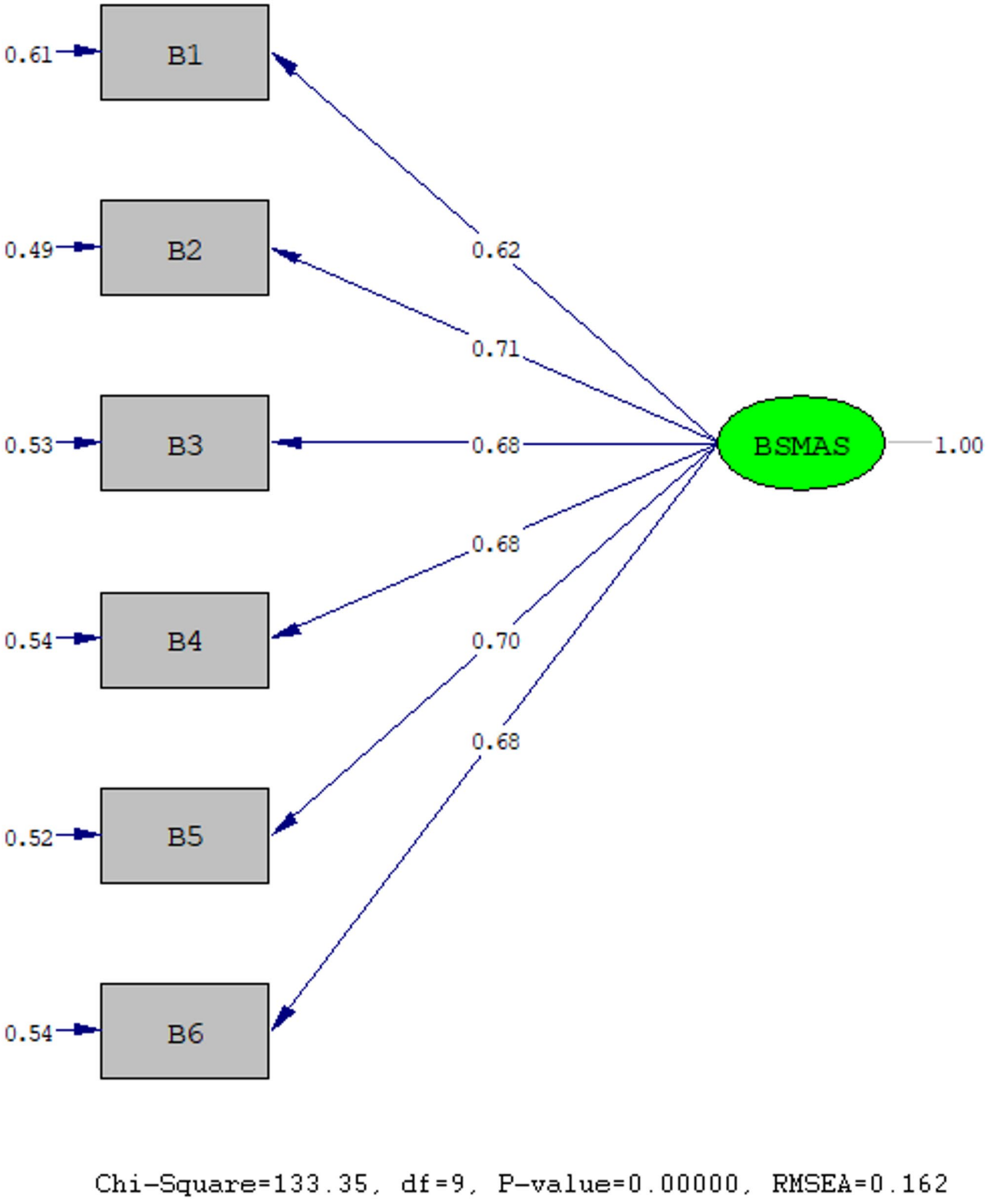

Fig. 2 Model fit indexes of the Persian version of BSMAS (with DWLS)

Table 3 Correlation between the BSMAS, the YIA, and DASS variables (depression, anxiety, and stress)

Variables	BSMAS	IAT	Depression	Anxiety	Stress
BSMAS	1				
IAT	0.64**	1			
Depression	0.32**	0.43**	1		
Anxiety	0.32**	0.43**	0.68**	1	
Stress	0.37**	0.39**	0.79**	0.66**	1

Legend: BSMAS = Bergen Social Media Addiction Scale, YIA = Young's Internet Addiction, $^{**}P < 0.01$

interaction for females, including those experienced via social media [61, 62]. In spite of the fact that this is an interesting finding, we do not have data on why women score higher on the SMA scale, and suggest that future research be conducted on this topic.

Significant correlation was found between the BSMAS and YIA scales. It was expected that the BSMAS score would have good concurrent validity with the YIA scale as another measure of addictive behavior, given previous research on this topic [20, 23, 25]. Additionally, a significant relationship between the participants' stress, anxiety, and depression and the BSMAS score was discovered. Our findings are in line with numerous studies that have demonstrated a relationship between SMA and depression, stress, and anxiety [13–16, 23, 25]. Abbouyi, Bouazza [63] postulated that the substantial rise in social media usage might lead to loneliness, a negative self-image, and an underestimation of one's intelligence. These factors, in turn, might result in fewer in-person interactions, disturbed sleep patterns, and less physical activity, all of which can exacerbate depression, anxiety, and stress. Overall, the Persian BSMAS offers a reliable measure of SMA in Iranian adults that is regularly correlated with outside assessments of mental health and SMA.

The current study's findings indicate that the BSMAS scale is a valid instrument for evaluating SMA in Iranian adults. Future research ought to look into whether the BSMAS is applicable to a variety of clinical populations. Additionally, we advise researching the causes and motivations behind women's propensity for SMA.

Limitations and future directions

Despite the strengths of this study, several limitations warrant consideration. First, the use of convenience sampling may restrict the generalizability of the findings. Although the sample was relatively large, it likely overrepresents younger, urban, and technologically engaged individuals. This may have skewed the observed prevalence and psychometric properties of SMA. Given that some Iranian adults may have limited or no interaction with social media (due to accessibility problems), these results might not fully reflect the broader adult population. Future studies should aim to include a more diverse sample of the Iranian adult population, representing varying levels of social media access, and researchers should explore the specific barriers to social media access among different age groups and socio-economic classes in Iran. The cross-sectional design also limits the ability to draw causal conclusions about the relationship between SMA and mental health indicators. Longitudinal studies are needed to explore how these variables influence one another over time. Additionally, while over a thousand participants were included, there was limited socio-economic and geographic diversity within the sample. Including a broader range of demographic backgrounds would provide a more comprehensive picture of SMA across different segments of Iranian society.

The cultural context of social media use was another area that received limited attention. Factors such as societal attitudes toward digital behavior, religious or family norms, and government-imposed internet restrictions may all play a role in shaping usage patterns. Future studies should take these influences into account to better understand addiction-related behaviors. Furthermore, potential confounders, such as participants' mental health history, socio-economic status, personality traits (e.g., impulsivity, neuroticism), sleep quality, or screen time habits, were not included in the analyses. Controlling for these variables in future research could lead to more robust conclusions regarding causality.

Additionally, while the study looked at the statistical performance of individual BSMAS items, it did not explore how well these items capture the broader concept of SMA in the cultural and social context of Iran. Including qualitative approaches, such as cognitive interviews, in future research could provide valuable insights into whether the items are culturally meaningful, easily understood, and truly reflective of how SMA is experienced by Iranian users. Lastly, future research could benefit from exploring areas such as the long-term psychological effects of SMA, developing and testing targeted intervention strategies, and evaluating the impact of educational or awareness-raising efforts. These directions may offer more practical insights for mental health professionals and policymakers, and help steer the field toward more preventive and solution-oriented approaches. Furthermore, future studies could utilize a more comprehensive validation process using various related measures in order to strengthen the credibility of the BSMAS.

Conclusion

According to this study, the Persian BSMAS shows one-dimensionality among Iranian adults. Our research revealed that the Persian BSMAS is a trustworthy instrument. The measurement remained consistent across distinct groups categorized by sex and age. Moreover, it showed compatibility with external assessments of SMA and mental health in a group of Iranian adults.

Abbreviations

BSMAS	Bergen Social Media Addiction Scale
SMA	Social Media Addiction
DASS-21	Depression, Anxiety and Stress Scale
YIA	Young's Internet Addiction
CFA	Confirmatory Factor Analysis
DWLS	Diagonally Weighted Least Squares
ML	Maximum likelihood

Acknowledgements

We thank the participants in this study.

Author contributions

SS and BSH: Conceptualization, Methodology, Data Curation, Formal analysis, and Writing - Original Draft. SMF, SAN, and ZB: Writing - Original Draft, HRP: Conceptualization, Methodology, and Writing - Original Draft. All authors reviewed and confirmed the final draft.

Funding

No funds were received for this study.

Data availability

This study's supporting data can be obtained from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

The research ethics committees of Tarbiat Modares University, Tehran, Iran approved the study, which was carried out in compliance with the Declaration of Helsinki (Approval ID: IR.MODARES.REC.1402.099). Participation had the freedom to decline participation at any time and the choice to provide information or not. The study was entirely voluntary. Responses to the questionnaires were anonymous. Participants gave their written informed consent prior to taking part in the survey.

Competing interests

The authors declare no competing interests.

Consent of publication

Not Applicable.

Received: 30 January 2025 / Accepted: 7 May 2025
Published online: 19 May 2025

References

1. Datareportal. *Digital 2024: Global Overview Report*. 2024 [cited January 2024 3/6/2024]; Available from: https://datareportal.com/reports/digital-2024-global-overview-report
2. Andreassen CS. Online social network site addiction: A comprehensive review. Curr Addict Rep. 2015;2(2):175–84.
3. Andreassen CS, et al. The relationship between addictive use of social media and video games and symptoms of psychiatric disorders: A large-scale cross-sectional study. Psychol Addict Behav. 2016;30(2):252–62.
4. Cheng C, et al. Prevalence of social media addiction across 32 nations: Meta-analysis with subgroup analysis of classification schemes and cultural values. Addict Behav. 2021;117:106845.
5. Griffiths M. A 'components' model of addiction within a biopsychosocial framework. Taylor Francis [. 2005. https://doi.org/10.1080/14659890500114359].
6. Sadeghi S, et al. Brain structures and activity during a working memory task associated with internet addiction tendency in young adults: A large sample study. PLoS ONE. 2021;16(11):e0259259.
7. Sadeghi S, et al. Brain anatomy alterations and mental health challenges correlate to email addiction tendency. Brain Sci. 2022;12(10):1278.
8. Pellegrino A, Stasi A, Bhatiasevi V. Research trends in social media addiction and problematic social media use: A bibliometric analysis. Front Psychiatry. 2022;13:1017506.
9. Kuss DJ, Griffiths MD. Social networking sites and addiction: ten lessons learned. Int J Environ Res Public Health, 2017. 14(3).
10. Salari N et al. The global prevalence of social media addiction among university students: a systematic review and meta-analysis. J Public Health, 2023.
11. Liang M et al. *Influencing factors of social media addiction: a systematic review.* Aslib Journal of Information Management, 2023. ahead-of-print(ahead-of-print)
12. Yurtdaş-Depboylu G, Kaner G, Özçakal S. *The association between social media addiction and orthorexia nervosa, eating attitudes, and body image among adolescents.* Eating and Weight Disorders - Studies on Anorexia. Bulimia Obes. 2022;27(8):3725–35.
13. Lopes LS, et al. Problematic social media use and its relationship with depression or anxiety: A systematic review. Cyberpsychol Behav Soc Netw. 2022;25(11):691–702.
14. Shensa A, et al. Problematic social media use and depressive symptoms among U.S. Young adults: A nationally-representative study. Soc Sci Med. 2017;182:150–7.
15. Lee MHL et al. Cyberbullying, social media addiction and associations with depression, anxiety, and stress among medical students in Malaysia. Int J Environ Res Public Health, 2023. 20(4).
16. Weigle PE, Shafi RMA. Social Media Youth Mental Health Curr Psychiatry Rep. 2024;26(1):1–8.
17. Wartberg L et al. A Four-Item questionnaire to measure problematic social media use: the social media disorder test. Behav Sci (Basel), 2023. 13(12).
18. Andreassen CS, et al. Development of a Facebook addiction scale. Psychol Rep. 2012;110(2):501–17.
19. Shin NY. Psychometric properties of the Bergen social media addiction scale in Korean young adults. Psychiatry Investig. 2022;19(5):356–61.
20. Leung H, et al. Measurement invariance across young adults from Hong Kong and Taiwan among three internet-related addiction scales: Bergen social media addiction scale (BSMAS), smartphone Application-Based addiction scale (SABAS), and internet gaming disorder scale-Short form (IGDS-SF9) (Study part A). Addict Behav. 2020;101:105969.
21. Bányai F, et al. Problematic social media use: results from a Large-Scale nationally representative adolescent sample. PLoS ONE. 2017;12(1):e0169839.
22. Monacis L, et al. Social networking addiction, attachment style, and validation of the Italian version of the Bergen social media addiction scale. J Behav Addict. 2017;6(2):178–86.
23. Copez-Lonzoy A, et al. Adaptation of the Bergen social media addiction scale (BSMAS) in Spanish. Acta Psychol. 2023;241:104072.
24. Zarate D, et al. Psychometric properties of the Bergen social media addiction scale: an analysis using item response theory. Addict Behav Rep. 2023;17:100473.
25. Lin CY, et al. Psychometric validation of the Persian Bergen social media addiction scale using classic test theory and Rasch models. J Behav Addict. 2017;6(4):620–9.
26. Bryant A. *The effect of social media on the physical, social emotional, and cognitive development of adolescents.* 2018.
27. Peat G, Rodriguez A, Smith J. Social media use in adolescents and young adults with serious illnesses: an integrative review. BMJ Supportive Palliat Care. 2019;9(3):235–44.
28. Akbari M, et al. Potential risk and protective factors related to problematic social media use among adolescents in Iran: A latent profile analysis. Addict Behav. 2023;146:107802.
29. Dagres H. Iranians on #socialmedia. Atlantic Council; 2022.
30. Khodarahmi E, Amanelahi A, Abbaspour Z. Predicting addiction to social media based on family resilience and family emotional atmosphere among adolecent girls. Journal of Counseling Research; 2023.
31. Salehi E, Fallahchai R, Griffiths M. Online addictions among adolescents and young adults in Iran: the role of attachment styles and gender. Social Sci Comput Rev. 2023;41(2):554–72.

32. Shafiee M, Ashouri A, Dehghani M. The relationship between attachment style and social network addiction with the mediating role of personality traits. Int J High Risk Behav Addict, 2020. 9(4).
33. Ostovar S, et al. Internet addiction and its psychosocial risks (depression, anxiety, stress and loneliness) among Iranian adolescents and young adults: A structural equation model in a cross-sectional study. Int J Mental Health Addict. 2016;14:257–67.
34. Ndasauka Y, Ndasauka F. Cultural persistence and change in university students' social networking motives and problematic use. Heliyon, 2024. 10(2).
35. Kalaitzaki A, et al. The prevalence and predictors of problematic mobile phone use: A 14-country empirical survey. Int J Mental Health Addict. 2024;22(1):746–65.
36. Casale S, et al. Has the prevalence of problematic social media use increased over the past seven years and since the start of the COVID-19 pandemic? A meta-analysis of the studies published since the development of the Bergen social media addiction scale. Addict Behav. 2023;147:107838.
37. Lopez-Fernandez O, et al. Problematic internet use among adults: A cross-cultural study in 15 countries. J Clin Med. 2023;12(3):1027.
38. Ni Q, et al. Risk factors for the development of hyperuricemia: A STROBE-compliant cross-sectional and longitudinal study. Med (Baltim). 2019;98(42):e17597.
39. Brislin RW. Back-translation for cross-cultural research. J Cross-Cult Psychol. 1970;1(3):185–216.
40. Stănculescu E. The Bergen social media addiction scale validity in a Romanian sample using item response theory and network analysis. Int J Ment Health Addict, 2022: pp. 1–18.
41. Mohammadsalehi N, et al. Psychometric properties of the Persian Language version of Yang internet addiction questionnaire: an explanatory factor analysis. Int J High Risk Behav Addict. 2015;4(3):e21560.
42. Kakemam E, et al. Psychometric properties of the Persian version of depression anxiety stress Scale-21 items (DASS-21) in a sample of health professionals: a cross-sectional study. BMC Health Serv Res. 2022;22(1):111.
43. Lovibond PF, Lovibond SH. The structure of negative emotional States: comparison of the depression anxiety stress scales (DASS) with the Beck depression and anxiety inventories. Behav Res Ther. 1995;33(3):335–43.
44. Chen Y, et al. Self-reported sleep and executive function in early primary school children. Front Psychol. 2021;12:793000.
45. Li C-H. The performance of ML, DWLS, and ULS Estimation with robust corrections in structural equation models with ordinal variables. Psychol Methods. 2016;21(3):369.
46. Mindrila D. Maximum likelihood (ML) and diagonally weighted least squares (DWLS) Estimation procedures: A comparison of Estimation bias with ordinal and multivariate non-normal data. Int J Digit Soc. 2010;1(1):60–6.
47. Kenny DA, Kaniskan B, McCoach DB. The performance of RMSEA in models with small degrees of freedom. Volume 44. Sociological methods & research; 2015. pp. 486–507. 3.
48. Yam CW, et al. Psychometric testing of three Chinese Online-Related addictive behavior instruments among Hong Kong university students. Psychiatr Q. 2019;90(1):117–28.
49. Jia Y, Liu T, Yang Y. The relationship between real-life social support and internet addiction among the elderly in China. Front Public Health. 2022;10:981307.
50. Rosell J, Leeson GW, Vergés A. Internet addiction of older women and its relationship with social influence and social networks use as a mediator. J Appl Gerontol. 2023;42(1):121–30.
51. Gómez P, et al. Screening of problematic internet use among Spanish adolescents: prevalence and related variables. Cyberpsychol Behav Soc Netw. 2017;20(4):259–67.
52. Su W, et al. Do men become addicted to internet gaming and women to social media? A meta-analysis examining gender-related differences in specific internet addiction. Comput Hum Behav. 2020;113:106480.
53. Chae D, Kim H, Kim YA. Sex differences in the factors influencing Korean college students' addictive tendency toward social networking sites. Int J Mental Health Addict. 2018;16(2):339–50.
54. Hawi N, Samaha M. Identifying commonalities and differences in personality characteristics of internet and social media addiction profiles: traits, self-esteem, and self-construal. Taylor Francis [. 2019. https://doi.org/10.1080/0144929X.2018.1515984].
55. Martínez-Ferrer B, et al. Child-to-parent violence and parenting styles: its relations to problematic use of social networking sites, alexithymia, and attitude towards institutional authority in adolescence. Psychosocial Intervention. 2018;27(3):163–71.
56. Andreassen CS, Pallesen S, Griffiths MD. The relationship between addictive use of social media, narcissism, and self-esteem: findings from a large National survey. Addict Behav. 2017;64:287–93.
57. Kim JH, Kim M-S, Nam Y. An analysis of self-construals, motivations, Facebook use, and user satisfaction. Taylor Francis [. 2010. https://doi.org/10.1080/10447318.2010.516726].
58. Mari E, et al. Gender differences in internet addiction: A study on variables related to its possible development. Computers Hum Behav Rep. 2023;9:100247.
59. Chae D, Kim H, Kim YA. Sex differences in the factors influencing Korean college students' addictive tendency toward social networking sites. Int J Mental Health Addict. 2018;16:339–50.
60. Manago AM, Walsh AS, Barsigian LL. The contributions of gender identification and gender ideologies to the purposes of social media use in adolescence. Front Psychol. 2023;13:1011951.
61. Borland JM, et al. Sex-dependent regulation of social reward by Oxytocin: an inverted U hypothesis. Neuropsychopharmacology. 2019;44(1):97–110.
62. Perry BL. Gendering genetics: biological contingencies in the protective effects of social integration for men and women. Am J Sociol. 2016;121(6):1655–96.
63. Abbouyi S, et al. Depression and anxiety and its association with problematic social media use in the MENA region: a systematic review. Egypt J Neurol Psychiatry Neurosurg. 2024;60(1):15.

Publisher's note