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ORIGINAL ARTICLE

The Psychometric Properties of the Arabic Bergen Social Media Addiction Scale

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Abstract

The rapid development of internet technology has substantially improved individuals' social media use. However, a minority group of individuals may experience social media addiction. In order to help healthcare providers in Algeria identify potential individuals with social media addiction, the present study translated a commonly used instrument (i.e., the Bergen Social Media Addiction Scale [BSMAS]) to Arabic and validated the Arabic BSMAS. A cross-sectional study design, via convenience sampling, comprised 757 Algerian university students (485 females; mean [SD] age = 21.41 [2.87] years) who completed the following scales in Arabic in classroom settings: the BSMAS, the Satisfaction with Life Scale (SWLS), and the Center for Epidemiologic Studies-Depression Scale (CES-D). A unidimensional-factor structure was verified for the BSMAS with the support of confirmatory factor analysis (comparative fit index = 0.966; Tucker-Lewis index = 0.943) and Rasch analysis results (infit mean square = 0.83 to 1.16; outfit mean square = 0.82 to 1.15). Moreover, the BSMAS had acceptable internal consistency ($\alpha = 0.74$; $\omega = 0.78$) with adequate factor loadings (range between 0.402 and 0.670) and item-total correlations (range between 0.349 and 0.529) for all items. The Arabic BSMAS was also found to be measurement invariant across gender. Furthermore, the Arabic BSMAS was significantly associated with the CES-D ($r = 0.290$; $p < 0.001$) and SWLS ($r = -0.232$; $p < 0.001$). The present study demonstrated satisfactory psychometric properties of the Arabic BSMAS in an Arabic context, specifically in Algeria. These findings have important implications for researchers and practitioners working with Arabic-speaking populations in assessing and addressing problematic social media use while also pointing to areas for future research and intervention.

Keywords Social media addiction · Item response theory · Arabic version · Psychometric properties

In contemporary society, social media use has become an essential part of individuals' daily lives. It enables communication, information sharing, and social interaction (Ruckwongpatr et al., 2022; Tan, 2023). Social media encompasses various online applications, including text services like email and instant messaging, forums such as *Quora*, *Reddit*, and *Digg*, social networking sites like *Facebook*, *WhatsApp*, *Twitter*, *Instagram*, *QQ*, and

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WeChat, as well as other online communities for travel, dating, business, enterprise, shopping, games, hobbies, among others (Aichner et al., 2020; Kaplan & Haenlein, 2010). However, concerns have been raised about its potentially problematic and addictive nature (El Abiddine et al., 2022; Chang et al., 2023; Huang et al., 2023; Kukreti et al., 2023; Kuss & Griffiths, 2017). Moreover, there is also an ongoing debate regarding its impact on mental well-being in relation to potential addictive use (Marino et al., 2023; Zhang et al., 2024).

Andreassen and Pallesen (2014) define social media addiction as devoting so much time on social media that it clinically impairs individuals' psychological health and wellbeing, as well as compromising their personal relationships, occupation, and/or education. Given that "social media addiction" has not been formally recognized, the present paper uses the term "problematic social media use" (PSMU). Moreover, PSMU includes the tendency of individuals to use social media in order to regulate their mood and preoccupation to the extent to which they engage in compulsive use that results in negative outcomes in daily life for the user (Marino et al., 2023; Zhang et al., 2024).

The components model of addiction also presents a framework for understanding addictive disorders by identifying their shared characteristics (Griffiths, 2005). According to this model, all addictive behaviours encompass six fundamental components: (i) salience, where the addictive behaviour becomes the dominant focus in a person's life, often accompanied by preoccupation or cravings; (ii) mood modification, which involves subjective experiences of enhancement, such as achieving a high or relieving negative emotions, essentially serving as a coping mechanism; (iii) tolerance, which describes the need to escalate the frequency, duration, or intensity of the addictive behaviour to attain the same desired effects; (iv) withdrawal symptoms, which encompass unpleasant physiological and psychological effects that occur when the addictive behaviour is ceased; (v) conflict, arising both within oneself and in interpersonal relationships, as well as negatively impacting on occupational and/or educational activities, resulting from persistent engagement in addictive behaviours; and (vi) relapse, denoting a return to previous levels of involvement after attempting to reduce or quit the addictive behaviour. Griffiths (2005) argued that a behavior or substance must exhibit all of these components to be classified as an addiction. This model offers a notable strength by simplifying the complexities of addiction into six core components. However, one potential weakness of this concise model is its omission of other components that could be significant characteristics of both behavioural and substance addictions, such as compulsivity.

Recent research suggests that specific internet-related activities such as online gaming, social networking, and online gambling may lead to addictive behaviors among a minority of individuals (Chen et al., 2023; Ghazi et al., 2024; Müller et al., 2022; Wu et al., 2023). Such addictions can seriously affect mental and social well-being and typically include the aforementioned core components. Those with addictions on or to the internet may experience preoccupation, cognitive distortions, and a decline in social behaviors, as well as unpleasant feelings or physical discomfort when they are unable to go online (El Abiddine et al., 2022; Aljaberi et al., 2021; Griffiths & Szabo, 2013; Griffiths, 2005, 2013, 2017).

The fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) recognizes internet gaming disorder as a potential disorder that can have a negative impact on an individual's well-being (American Psychiatric Association, 2013). However, gaming is just one of many potentially addictive activities that can be done online. Recent studies have shown that PSMU is also becoming an increasing mental health concern (Griffiths et al., 2014; Pantic, 2014; Ryan et al., 2014). Consequently, some researchers have developed psychometric instruments to assess PSMU, such as the Bergen Facebook Addiction

Scale (Andreassen et al., 2012) and the Facebook Intrusion Questionnaire (Elphinston & Noller, 2011).

The Bergen Social Media Addiction Scale (BSMAS), modified from the Bergen Facebook Addiction Scale, is an instrument that addresses the limitations of previous scales. That is, unlike other scales focusing on specific social media platforms, the BSMAS assesses PSMU as a whole (Andreassen et al., 2016). Its utility could be attributed by a strong theoretical framework, i.e., the components model of addiction (Griffiths, 2000, 2005). Moreover, the BSMAS has been used to assess the risk of PSMU across different cultures and languages (Chen et al., 2020a, 2020b, 2020c; Ghazi et al., 2024; Leung et al., 2020; Tung et al., 2022; Yam et al., 2019).

It is essential to investigate the effects of PSMU on mental health. Several studies have investigated the associations between BSMAS scores and mental health indicators, especially depression and life satisfaction. Research has consistently found a positive association between PSMU, as assessed using the BSMAS, and depression (Brailovskaia & Margraf, 2022; Huang et al., 2023; Özbek & Karaş, 2022; Tullett-Prado et al., 2023; Žmavc et al., 2022). Brailovskaia and Margraf (2022) reported a negative association between addictive social media use and positive mental health across nine representative population samples in multiple countries. Similarly, several longitudinal studies conducted in Asian regions have reported associations between higher BSMAS scores and depression (Chang et al., 2022; Chen et al., 2022; Chen et al., 2021a, Chen et al., 2021b; Chen et al., 2020a, 2020b, 2020c). This suggests that PSMU may contribute to or exacerbate symptoms of depression. On the other hand, PSMU, as assessed by the BSMAS, has been negatively associated with life satisfaction (Varela et al., 2023). Moreover, El Abiddine et al. (2022) determined that excessive use of social media was associated with insomnia and decreased well-being.

Different studies have analyzed the psychometric properties of the BSMAS across various countries with other language versions and populations, such as Italian (Monacis et al., 2017), Hungarian (Monacis et al., 2017), Polish (Balcerowska & Bereznowski, 2022), Chinese, French, German, Polish, Russian, Spanish, Swedish, English (UK and USA) (Brailovskaia & Margraf, 2022), Korean (Shin, 2022), Greek (Dadiotis et al., 2021), Romanian (Stănculescu, 2023), Slovenian (Žmavc et al., 2022), Turkish (Çam & Isbulan, 2012; Demirci, 2019), and Persian (Lin, Broström, et al., 2017) populations. Andreassen et al. (2016) reported strong internal consistency in the original Norwegian version (Cronbach's alpha = 0.88). Similarly, Çam and Isbulan (2012) reported excellent reliability in the Turkish BSMAS (Cronbach's alpha = 0.91). Marino et al. (2016) investigated the Italian version and reported robust internal consistency (Cronbach's alpha = 0.87).

The BSMAS has also demonstrated different forms of validity across various languages, including consistent (single-factor) structure, as well as convergent, and discriminant validity. Brailovskaia and Margraf's (2022) cross-national findings demonstrated that the BSMAS is a unidimensional, reliable, and valid instrument. Balcerowska et al. (2022) also reported that the BSMAS demonstrated good reliability. The BSMAS has also been shown to distinguish between individuals with and without PSMU, demonstrating discriminant validity (Lin, Broström, et al., 2017). Although there are a few Arabic scales that assess PSMU (e.g., El Abiddine et al., 2022; Al-Menayes, 2015; Atwan et al., 2022; Obeid et al., 2023), the BSMAS has never been psychometrically validated in Arabic (Al-Menayes, 2015).

Adapting psychological scales for cross-cultural use is crucial to ensure their relevance and accuracy in diverse contexts (Hambleton et al., 2004), including the Arabic-speaking population. Studies conducted in the United Arab Emirates that have

employed Arabic-translated versions of the BSMAS have done so without testing the validity of the measure to ensure its cultural and linguistic suitability (Vally & Helmy, 2022; Vally et al., 2023). Moreover, there are limitations to using an unvalidated version of an assessment measure (Vally & Helmy, 2022; Vally et al., 2023). While the internal reliability coefficients of the BSMAS in previous psychometric studies have tended to be satisfactory (typically $\alpha > 0.8$), a suitably validated Arabic version of the BSMAS is needed to address the uncertainty of its reliability and validity among Arabic populations. Several studies have also noted the gap in the availability of validated Arabic-translated versions of scales that assess social media-related addictive tendencies and have emphasized the need for a culturally adapted Arabic version of the measures (Al-Menayes, 2015; Brailovskaia & Margraf, 2022; Ghali et al., 2019; Gunter et al., 2016; Lenze, 2017).

Developing an Arabic version of the BSMAS is essential for various reasons. First, the Arabic language has unique features that may require specific translations and adaptations of the scale's items to accurately capture the cultural nuances associated with social media use. Second, there are 25 countries in the Middle East and North Africa where Arabic is an official (or in some cases, co-official) language. This equates to approximately 422 million people and does not include those who may be residents elsewhere in the world, such as expatriates or refugees (SIL International, 2020). Therefore, adapting and validating this measure to Arabic could potentially benefit a substantial proportion of people whose principal language is Arabic.

Third, Arab societies have distinct cultural norms and values that may influence social media behavior and potentially contribute to the excessive use of social media. For example, given the unique social norms that govern the interactions between young men and women, interactions and friendships between unmarried young people in the real world in these countries are typically discouraged. Therefore, as a necessity, individuals use social media as their primary means of communication to circumvent their society's social rules (Vally et al., 2021).

Finally, the Arab world is a diverse and dynamic region with varying degrees of social media adoption. However, in most cases, smartphone ownership rates tend to be high with most individuals reporting the use of their devices to facilitate access to social media (Global Media Insight, 2020). Developing a culturally adapted Arabic version of the BSMAS would facilitate research into PSMU across Arab countries and provide valuable insights into regional trends. Therefore, the current study evaluated the psychometric properties of Arabic Bergen Social Media Addiction Scale among those living in Algeria.

Methods

Study Design

The present study used Rasch models and confirmatory factor analysis (CFA) (Aljaberi et al., 2022; Ato et al., 2013; Montero & León, 2007) to assess the psychometric properties of the Arabic version of the BSMAS. The study relied on convenience sampling, with university students voluntarily completing a survey in Arabic.

Participants and Procedure

The participant sample comprised 757 Algerian university undergraduates (485 females and 272 males; age range 16 to 49 years old, with a mean age of 21.41 years [SD = 2.87]). These participants were selected via convenience sampling from various faculties at the University of Sidi Bel Abbes in Algeria. The students were recruited by their university teachers and teacher assistants to complete a written Arabic survey in classroom settings. More specifically, after obtaining consent from the participants and their parents (for the few participants under 18 years), the participants completed a background information sheet regarding their socio-demographic characteristics, the BSMAS, and the Satisfaction with Life Scale. A total of 805 students were approached, and 48 declined to participate. The remaining 757 participants completed the survey with no withdrawals (once they had started the survey) or data missing. Out of the total sample, 430 participants additionally completed the Center for Epidemiologic Studies-Depression Scale.

Instruments

Socio-Demographics

These socio-demographics items included gender, age, academic specialization, and some questions related to the internet and social media, such as (i) how many days a week they spent online, (ii) how many hours they spent on the internet daily for social networking, and (iii) how many hours they normally slept at night.

Bergen Social Media Addiction Scale (BSMAS)

The BSMAS (Andreassen et al., 2016) was utilized and translated into Arabic in the present study. This scale comprises six items based on the components model of addiction (Griffiths, 2000, 2005). Participants rate each item (e.g., *You spend a lot of time thinking about social media or planning how to use it*) on a five-point Likert scale from 1 (*very rarely*) to 5 (*very often*). A standard back-translation technique was used to translate the parent English version of BSMAS into Arabic. The translation of the Arabic version of the BSMAS was a collaborative effort comprising a total of 29 educational professionals from the departments of English and Psychology, as well as from secondary schools. The iterative procedure was carried out until there was equivalence in the meaning between the English and Arabic forms. More specifically, the process was divided into two main stages: initial translation and back-translation. In the initial translation phase, five bilingual individuals translated the scale from English to Arabic. Following this, a separate team of 10 professionals, proficient in both languages, thoroughly reviewed the translated items to verify their semantic and conceptual equivalence to the original English version.

The back-translation was then conducted by an additional five different bilingual individuals who retranslated the Arabic version back into English. This step was essential to detect and rectify any discrepancies that may have arisen during the initial translation. A group of nine professionals, different from the initial reviewers, scrutinized the back-translated version against the original BSMAS to ensure accuracy. Throughout this iterative process, particular attention was paid to cultural adaptation. This entailed careful examination and adjustment of each item to align with the sociocultural context of Algeria. For

instance, linguistic expressions, idiomatic phrases, and examples that were not culturally resonant with Algerian society were replaced with more familiar and relevant counterparts (Appendix 1). This cultural tailoring was conducted in close consultation with cultural experts and psychologists to maintain the scale's psychometric properties while ensuring cultural relevance and comprehension for Algerian respondents. Appendix 1 further elaborates on these cultural adaptations to clearly understand how the BSMAS was contextualized for the target population.

The Satisfaction with Life Scale (SWLS)

The SWLS was used to assess life satisfaction (Diener et al. (1985). The scale comprises five items (e.g., *I am satisfied with my life*) rated on a seven-point scale from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). The scores on the scale can range from 5 to 35, with higher scores indicating a higher level of satisfaction with life. The SWLS had acceptable internal consistency in the present sample (Cronbach's alpha = 0.74).

The Center for Epidemiologic Studies-Depression Scale (CES-D)

The CES-D (Radloff, 1977) was used to assess depressive symptomatology. The scale comprises 20 items (e.g., *I felt lonely*) rated on a four-point scale from 0 (*rarely or none of the time*) to 3 (*most or almost all the time*). The scores on the scale can range from 0 to 60, with higher scores indicating a higher level of depressive symptomatology. The CES-D had acceptable internal consistency in the present sample (Cronbach's alpha = 0.85).

Ethics

The study was approved by the Faculty of Humanities and Social Sciences research ethical committee of the University of Djillali Liabes Sidi Bel Abbes, Algeria, with ethical approval reference number UDL/Lab RPE03/2021. University students (and with the parents' permission of those under 18 years) voluntarily agreed to participate in the study and provided their written consent. They were assured that all their data were confidential and that they could withdraw from the study at any time. In conducting the research, the study adhered to the Declaration of Helsinki.

Data Analysis

The participants' characteristics were first analyzed using descriptive statistics, including means (and standard deviations) and frequencies (percentages). Pearson's correlations were used to examine the relationship between the Arabic BSMAS and other relevant variables. Therefore, the concurrent validity of the Arabic BSMAS was established. Additionally, classical test theory and Rasch methods evaluated the psychometric properties of the BSMAS. Using classical test theory, the following were tested: ceiling/floor effects (a percentage of $< 3\%$ suggests negligible; Lin et al., 2013), internal consistency (ordinal α or McDonald's $\omega > 0.7$ indicates satisfactory; Lin et al., 2018), corrected item-total correlation (a value of > 0.4 is acceptable; Wang et al., 2007), and factor structure (through CFA).

The CFA used a diagonally weighted least squares (DWLS) estimator to assess whether the Arabic BSMAS was a single-factor structure. The DWLS estimator was applied because prior studies concluded that it is appropriate for Likert-type scales and provides

more accurate parameter estimates (e.g., Lin, Burri, et al., 2017; Lin, Oveisi, et al., 2017) of which the BSMAS uses. Fit indices derived from the CFA were used to examine whether the Arabic BSMAS was unidimensional: comparative fit index (CFI) (≥ 0.90) and Tucker-Lewis index (TLI) should be ≥ 0.90; root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR) should be ≤ 0.08 (Hoyle, 1995).

After confirming the factor structure of the BSMAS, multigroup CFA was conducted to examine the properties of its measurement invariance across gender. Three nested models were then constructed. The baseline model is the configural model that freely estimates all the factor loadings and item intercepts for the factor structure of BSMAS across genders. Then, the metric invariance model was constructed with factor loadings constrained to be equal across gender. Finally, the scalar invariance model was constructed with factor loadings and item intercepts constrained to be equal across genders (Cheung & Rensvold, 2002). Metric invariance is supported when the CFI difference (ΔCFI) between every two nested models is larger than -0.01, RMSEA difference (ΔRMSEA) is smaller than 0.03, and SRMR difference (ΔSRMR) is smaller than 0.03. Scalar invariance is supported when ΔCFI between every two nested models is larger than -0.01, ΔRMSEA is smaller than 0.015, and ΔSRMR is smaller than 0.03 (Chen, 2007). However, when full invariance is not supported, partial invariance with relaxing factor loadings or item intercepts can be tested (Milfont & Fischer, 2010).

Rasch's analysis used a partial credit model to report Arabic BSMAS item difficulty and validity. Item and person separation reliability was also examined in the Rasch analysis. An interval unit (i.e., logit; a higher logit represents a more difficult item) was used to illustrate the item's difficulty. The information-weighted fit statistic (infit) mean square (MnSq) and outlier-sensitive fit statistic (outfit) MnSq were used to test the unidimensionality of the Arabic BSMAS, and a recommended range is set between 0.5 and 1.5 (Alareqe et al., 2022; Jafari et al., 2012). Both infit and outfit MnSq indicate more redundancy through a lower value and greater misfit through a higher value (Aljaberi et al., 2022; Khan et al., 2013). Item and person reliability derived from the Rasch models were used to understand reproducibility in the order of item difficulty, and the individual's underlying ability, and a value greater than 0.7 is recommended (Michalos, 2014). All the statistics were performed using IBM SPSS 24.0 (IBM Corp., Armonk, NY), the lavaan package (Rosseel et al., 2012) in R software, or the WINSTEPS 3.75.0 (Winsteps, Chicago, IL).

Results

Table 1 shows the characteristics of the participants, including their age (mean = 21.41 years; SD = 2.87), average days spent online per week (mean = 6.18; SD = 1.63), average hours spent on social media per day (mean = 3.43; SD = 1.22), and average hours of daily sleep (mean = 5.55; SD = 1.22). The self-rated scores on the three instruments were Arabic BSMAS (mean = 14.79 out of 30; SD = 4.64), CES-D (mean = 22.42 out of 60; SD = 10.69), and SWLS (mean = 23.78 out of 35; SD = 6.13). Most participants majored in Law ($n = 187$; 24.7%) and medicine ($n = 151$; 19.9%).

The correlation matrix shown in Table 2 further demonstrates the relationships among the studied variables. More specifically, the Arabic BSMAS score was (i) significantly and positively correlated with the CES-D score ($r = 0.290$; $p < 0.001$), time spent online ($r = 0.257$; $p < 0.001$), and time spent on social media ($r = 0.394$; $p < 0.001$) and (ii) significantly and negatively correlated with SWLS score ($r = -0.232$; $p < 0.001$) and time spent

Table 1 Participants characteristics ($N=757$)

	Mean ± SD or *n* (%)
Age (in years)	21.41 ± 2.87
Gender (males)	272 (35.9)
Average days spent online per week	6.18 ± 1.63
Average hours spent on social media per day	3.43 ± 1.22
Average sleep hours per day	5.55 ± 1.22
Bergen Social Media Addiction Scale (score)	14.79 ± 4.64
Center for Epidemiologic Studies Depression Scale[a] (score)	22.42 ± 10.69
Satisfaction with Life Scale[a] (score)	23.78 ± 6.13
Study major	
Economic sciences	75 (9.9)
Literature	44 (5.8)
Languages	102 (13.5)
Social sciences	25 (3.3)
Law	187 (24.7)
Medicine	151 (19.9)
Biology	74 (9.8)
Civil engineering	51 (6.7)
Electronic engineering	48 (6.3)

[a]$n=430$

Table 2 Correlation matrix among tested variables ($N=757$)

r (*p*-value)

	1. BSMAS	2. CES-D[a]	3. SWLS[a]	4. Online	5. Social media	6. Sleep[d]
1	–	0.290 (< 0.001)	− 0.232 (< 0.001)	0.257 (< 0.001)	0.394 (< 0.001)	− 0.169 (< 0.001)
2.[a]		–	− 0.456 (< 0.001)	0.047 (0.331)	0.168 (< 0.001)	− 0.136 (0.005)
3			–	− 0.074 (0.041)	− 0.127 (< 0.001)	0.063 (0.081)
4				–	0.365 (< 0.001)	0.009 (0.807)
5					–	− 0.040 (0.272)
6						–

BSMAS Bergen Social Media Addiction Scale, *CES-D* Center for Epidemiologic Studies Depression Scale, *SWLS* Satisfaction with Life Scale

[a]$n=430$

[b]Average days spent online per week

[c]Average hours spent on social media per day

[d]Average sleep hours per day

sleeping daily ($r = -0.169$; $p < 0.001$). Therefore, these associations with the various variables supported the concurrent validity of the BSMAS.

The results in Tables 3 and 4 also show the Arabic BSMAS's psychometric properties at both item and scale levels. At the item level, the factor loadings (ranging between 0.402 and 0.670), corrected item to total correlations (ranging between 0.349 and 0.529), infit MnSq (ranging between 083 and 1.16), outfit MnSq (ranging between 0.82 and 1.15), and DIF contrast (ranging between − 0.22 and 0.13) were all satisfactory (Table 3). At the scale level, both classical test theory and Rasch analysis supported the reliability and factor structure of the Arabic BSMAS (Table 4). In particular, internal consistencies assessed using ordinal α (0.74) and McDonald's ω (0.78) were good; fit indices of the CFA were good (CFI = 0.966, TLI = 0.943, RMSEA = 0.066, and SRMR = 0.052); ceiling and floor effects were negligible (0 and 2.8%); and separation reliability in the Rasch analysis was fair to excellent (0.95 in item reliability and 0.65 in person reliability).

Regarding measurement invariance of the Arabic BSMAS, only partial invariance was achieved (Table 5). More specifically, the partial invariance was identified in the metric level (i.e., invariance in factor loading) across gender. Therefore, BSMAS Items 2, 3, and 4 were relaxed to achieve the recommended cutoff suggesting invariance (i.e., ΔCFI > − 0.01, ΔRMSEA < 0.03, and ΔSRMR < 0.03) for metric invariance. After relaxing the three-item factor loadings, the scalar invariance was supported without relaxing any item intercepts (i.e., ΔCFI > − 0.01, ΔRMSEA < 0.015, and ΔSRMR < 0.03).

Discussion

The absence of a validated Arabic language version of the BSMAS has been noted by scholars as a significant gap in the literature (Al-Menayes, 2015; Brailovskaia & Margraf, 2022). Therefore, the present study tested the psychometric properties of the Arabic BSMAS among individuals from a North African country (i.e., Algeria). The importance of an Arabic adaptation of the BSMAS is evident for several compelling reasons, including the unique linguistic features of the Arabic language and the distinct cultural norms and values of Arab societies that influence social media use (Ghali et al., 2019; Gunter et al., 2016).

The BSMAS was translated into Arabic and tested among Algerian university students. Both classical test theory and Rasch analysis were used to examine the psychometric properties of the Arabic BSMAS. The findings demonstrated satisfactory psychometric properties of the Arabic BSMAS, including concurrent validity, ceiling and floor effects, reliability of internal consistency, and single-factor structure (through CFA), as well as Rasch findings that supported unidimensionality, separation reliability, and DIF-free items (Tables 1, 2, 3, and 4).

The results of the present study align with previous research examining the psychometric properties of BSMAS in different languages and cultural settings. For instance, studies have validated the BSMAS in Korean (Shin, 2022), Turkish (Demirci, 2019), Greek (Dadiotis et al., 2021), Italian (Monacis et al., 2017), Romanian (Stănculescu, 2023), Slovenian (Žmavc et al., 2022), and Polish (Balcerowska & Bereznowski, 2022) populations. These studies consistently reported satisfactory BSMAS psychometric properties in various languages, including reliability, unidimensionality, and criterion validity. Moreover, the present study's findings were consistent with previous research that has identified factors associated with higher scores on the BSMAS, such as lower age, being female, not being

Table 3 Psychometric properties of the Bergen Social Media Addiction Scale (BSMAS) at the item level

Item #	Classical test theory		Inter-item correlation using Pearson correlation coefficients[a]						Rasch analyses			
	Factor loading[b]	Item-total correlation	BSMAS1	BSMAS2	BSMAS3	BSMAS4	BSMAS5	BSMAS6	Infit MnSq	Outfit MnSq	Difficulty	DIF contrast[c]
BSMAS1	0.511	0.406	–						1.02	1.02	0.16	− 0.22
BSMAS2	0.603	0.467	0.434	–					0.95	0.94	− 0.21	0.00
BSMAS3	0.523	0.418	0.263	0.311	–				1.00	0.99	0.22	0.13
BSMAS4	0.465	0.405	0.205	0.209	0.237	–			1.04	1.05	− 0.04	− 0.02
BSMAS5	0.670	0.529	0.288	0.415	0.376	0.317	–		0.83	0.82	0.10	0.12
BSMAS6	0.402	0.349	0.164	0.170	0.185	0.337	0.282	–	1.16	1.15	− 0.25	0.00

MnSq mean square error, *DIF* differential item functioning

[a]All p-values < 0.001

[b]Based on confirmatory factor analysis

[c]DIF contrast across gender = difficulty for females − difficulty for males; and a value > 0.5 indicates substantial DIF

Table 4 Psychometric properties of Bergen Social Media Addiction Scale at scale level

Psychometric testing	Value	Suggested cutoff
Classical test theory		
Ceiling effects (%)	2.8	< 20
Floor effects (%)	0	< 20
Internal consistency (McDonald's ω)	0.78	> 0.7
Internal consistency (Ordinal α)	0.74	> 0.7
Confirmatory factor analysis		
χ^2 (*df*)/*p*-value	38.86 (9)/ < 0.001	Nonsignificant
Comparative fit index	0.966	> 0.9
Tucker-Lewis index	0.943	> 0.9
RMSEA (90% confidence interval)	0.066 (0.046, 0.088)	< 0.08
SRMR	0.052	< 0.08
Rasch analysis		
Item separation reliability	0.95	> 0.7
Person separation reliability	0.65	> 0.7

RMSEA root mean square error of approximation, *SRMR* standardized root mean square residual

in a relationship, being a student, lower education, lower income, lower self-esteem, and narcissism (Andreassen et al., 2017). In one study, these factors were found to explain a total of 17.5% of the variance in BSMAS scores, suggesting the importance of considering demographic and psychological variables when assessing PSMU (Andreassen et al., 2017).

The present study's findings also have implications for the relationship between social media use, subjective well-being, and insomnia. El Abiddine et al. (2022) reported that insomnia plays an essential role in mediating the association between subjective well-being and problematic social media use. This highlights the importance of addressing factors such as insomnia in the development of problematic use of social media among university students.

Recent studies have examined the psychometric properties of different Arabic scales assessing PSMU including the Social Media Addiction Scale (Al-Menayes, 2015), Social Media Addiction Scale (Atwan et al., 2022), and Problematic Use of Social Networks Scale (Obeid et al., 2023). These other scales highlight the nuanced differences in problematic use patterns and the importance of culturally adapted assessment tools in emphasizing the multidimensional nature of PSMU. Their findings complement the present study's confirmation of the BSMAS's unidimensional factor structure, internal consistency, and measurement invariance across genders within the Algerian context. Together, these studies underscore the need for robust tools to gauge the growing concern of PSMU across diverse populations.

Balcerowska et al. (2022) and El Abiddine et al. (2022) extended the understanding of PSMU by examining the comparability of problematic behavior across different social networking sites (SNSs) and the interrelationship between internet disorder and PSMU. They collectively validated the BSMAS and other scales, reinforcing the notion that PSMU, including problematic *Facebook* use, is a significant source of stress for affected individuals and impacts their overall psychosocial well-being. These findings concur with the present study's associations of high BSMAS scores with depression and low life satisfaction, indicating that the consequences of PSMU are multifaceted and measurable.

Table 5 Measurement invariance of the Bergen Social Media Addiction Scale across gender

Fit indices	Model					
	M0, configural	M1, metric	M1P[a], partial metric	M1P2[a,b], partial metric	M1P3[a,b,c], partial metric	M2[a,b,c], scalar
χ^2 (df) or $\Delta\chi^2$ (Δdf)	37.576 (18)	30.403 (5)	21.517 (4)	16.392 (3)	10.872 (2)	7.051 (5)
p-value	0.004	< 0.001	< 0.001	< 0.001	0.004	0.22
CFI or ΔCFI	0.978	− 0.029	− 0.020	− 0.015	− 0.010	− 0.002
TLI or ΔTLI	0.963	− 0.029	− 0.020	− 0.016	− 0.011	0.007
RMSEA or ΔRMSEA	0.054	0.018	0.013	0.010	0.007	− 0.004
SRMR or ΔSRMR	0.044	0.015	0.011	0.009	0.006	0.004

CFI comparative fit index, *TLI* Tucker-Lewis index, *RMSEA* root mean square error of approximation, *SRMR* standardized root mean square residual

M0 configural model, *M1* metric invariance model (i.e., factor loadings constrained equal across groups), *M1P* first partial metric invariance model (i.e., factor loadings constrained equal across groups with one item relaxed for factor loading), *M1P2* second partial metric invariance model (i.e., factor loadings constrained equal across groups with two items relaxed for factor loading), *M1P3* third partial metric invariance model (i.e., factor loadings constrained equal across groups with three items relaxed for factor loading), *M2* scalar invariance model (i.e., factor loadings and item intercepts constrained equal across groups, except for three items relaxed for factor loading)

[a]Relaxed the factor loading of BSMAS4

[b]Relaxed the factor loading of BSMAS2

[c]Relaxed the factor loading of BSMAS3

Luo et al. (2021) examined the criteria for diagnosing PSMU and determined an optimal clinical cut-off for BSMAS and the predictive power of specific addiction criteria. Moreover, research by Smith (2023), and Smith and Short (2022) highlighted the psychological dimensions of PSMU, exploring the role of online emotional expression and the specific needs afforded by different platforms like *TikTok* and *Facebook*. Their work on the emotional and cognitive aspects of PSMU resonates with the present study's findings on the associations between PSMU and psychological distress. Taken together, these studies suggest that interventions for PSMU should consider emotional regulation and platform-specific characteristics. Overall, these studies collectively affirm the significance of culturally sensitive, psychometrically robust instruments like the Arabic BSMAS for assessing PSMU, while also suggesting the need for targeted interventions that consider emotional and cognitive factors.

The present study demonstrated that the Arabic version of BSMAS is a psychometrically sound and robust instrument for assessing PSMU among Algerian university students, given its excellent concurrent validity and good internal consistency. This is an important consideration for researchers and practitioners working with Arabic-speaking populations because the availability of valid and reliable instruments is crucial for accurately assessing and addressing problematic social media use in these countries. Overall, the present study provides evidence for the satisfactory psychometric properties of the Arabic BSMAS in a North African context. The study also highlights the importance of considering demographic and psychological factors associated with higher BSMAS scores in the relationship between subjective well-being and problematic social media use.

Implications

The present study has important implications for understanding PSMU in Arabic-speaking populations and supports the use of the Arabic BSMAS for assessing this potential disorder. These findings can inform interventions and prevention strategies targeting problematic internet and social media use, especially among university students. The present study's findings for addressing problematic social media use in Algeria have implications in several areas:

Tailored Interventions: This tool is essential for identifying at-risk individuals and evaluating the effectiveness of interventions designed to reduce problematic social media use. The findings here and elsewhere (Andreassen et al., 2017) suggest the need for tailored interventions that take into account various factors associated with higher BSMAS scores, such as age, gender, relationship status, education, income, depression, life satisfaction, self-esteem, and narcissism. By addressing these factors, interventions can be more effective in reducing problematic social media use among the target population.

Awareness and Education: Raising awareness about the potential risks and negative consequences of excessive social media use is essential for promoting responsible use of social media platforms. Educational campaigns targeting students, parents, educators, and mental health professionals could help foster a better understanding of problematic social media use and its potential impact on well-being.

Policy and Regulation: The study's findings can also inform policymakers and regulators in Algeria as they develop and implement policies to mitigate the negative effects of problematic social media use. This may include developing guidelines for social media

platforms, promoting digital literacy programs, and supporting research on the impact of social media on mental health and well-being.

Strengths of the Study

The present study had several significant strengths contributing to its findings' robustness and applicability in Arabic-speaking populations. These include the following:

Comprehensive Assessment of Psychometric Properties: The study utilized a robust methodology, including rigorous statistical analyses, Rasch analysis, and a validated translation process, to assess the psychometric properties of the Arabic BSMAS. This approach facilitated a comprehensive understanding of the scale's reliability and validity, demonstrating its suitability for use in an Arabic-speaking population (Algeria) and ensuring the accuracy and reliability of the findings.

Cultural Adaptation: The successful cultural adaptation of the BSMAS to the unique linguistic and social context of the Arabic-speaking population is a major strength. This adaptation ensured that the scale accurately captured the nuances of PSMU in Arabic. Moreover, the cultural novelty of the present study lies in its meticulous validation of the Arabic BSMAS in an Algerian context, a region where research on PSMU has been relatively limited. This contrasts with studies from more frequently researched regions, such as the European context (Balcerowska et al., 2020) and the Caribbean context (Smith, 2023). While Balcerowska et al. emphasized the growing concern of problematic *Facebook* use among a population of young European adults, Smith's research in Jamaica explored the broader emotional implications of social media use. Smith and Short (2022) and Luo et al. (2021) provided further insights into the prevalence and characteristics of PSMU among university students, with Luo et al. determining a cut-off point for BSMAS among a Chinese adolescent population. These studies suggest varied prevalence rates and cultural nuances in the manifestation of PSMU. The present study's demonstration of the BSMAS's psychometric robustness in the Arabic context, with its unique socio-cultural dynamics, adds a valuable dimension to a more global understanding of PSMU. It helps in the development of culturally sensitive research and interventions while providing a benchmark for comparing PSMU across diverse cultural landscapes, which is critical given the global penetration of social media and the cultural specificity of its use and impact.

Associations with Mental Health Indicators: The exploration of associations between BSMAS scores and mental health indicators, such as depression and life satisfaction, adds to the existing body of literature on the psychological implications of PSMU.

Limitations and Future Research

Despite the study's strengths, there are some limitations to consider. First, the sample was drawn from university students, which may limit the generalizability of the findings to other populations in Algeria. Furthermore, the sample selected in an Algerian context may not be representative of other Arabic populations. Second, the study used self-report measures subject to biases such as social desirability and memory recall, and the study design was cross-sectional using convenience sampling. Future research could benefit from using more diverse and representative samples and incorporating objective measures, such as actual time spent on social media or sleeping, to provide a more comprehensive

understanding of PSMU. Based on the study's findings, it is recommended that practitioners and researchers working with Arabic-speaking populations use the Arabic BSMAS as a valid and reliable instrument to assess PSMU. Future research should continue to investigate the psychometric properties of the Arabic BSMAS in different Arabic populations and settings (e.g., Egypt, Oman, and Yemen) to validate its applicability and utility further.

Another notable limitation of the present study was the absence of a test–retest reliability assessment. Test–retest reliability is crucial for determining the stability of a measure over time, ensuring that the instrument yields consistent results across different testing occasions. Without this, it is difficult to ascertain the temporal consistency of the Arabic BSMAS, which is particularly important when monitoring changes in PSMU or the effectiveness of interventions over time. This gap underscores a potential variability in the repeated application of the scale, which could be influenced by situational factors or changes in individual social media use patterns that are not related to the construct being assessed.

Another limitation is the lack of cognitive interviewing in the research methodology. By not incorporating cognitive interviews, the study may have omitted nuanced insights into how participants interpret the BSMAS items within their unique cultural and linguistic context. This could lead to potential misinterpretations or inaccuracies in how the items are intended versus how they are perceived by respondents. Including such interviews in future research could help refine the instrument to better capture the construct of PSMU as experienced by Arabic-speaking populations, and enhancing the scale's validity.

Conclusion

The present study demonstrated the satisfactory psychometric properties of the Arabic BSMAS in a North African context, specifically Algeria. The findings are consistent with previous research on the BSMAS in various languages and cultural settings, further supporting its use as a valid and reliable instrument for assessing PSMU. The study highlighted the importance of considering demographic and psychological factors associated with higher BSMAS scores. These findings have important implications for researchers and practitioners working with Arabic-speaking populations in assessing and addressing problematic internet and social media use while pointing to areas for future research and intervention.

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Data Availability The data are available upon reasonable request from the corresponding author.

Declarations

Ethics Approval The study was approved by the Faculty of Humanities and Social Sciences research ethical committee of the University of Djillali Liabes Sidi Bel Abbes, Algeria, with ethical approval reference number UDL/Lab RPE03/2021. University students (and with parents' permission of those under 18 years) voluntarily agreed to participate in the study and provided their written consent. They were assured that

all their data were confidential and that they could withdraw from the study at any time. In conducting the research, the study adhered to the Declaration of Helsinki.

Conflict of Interest The authors declare no competing interests.

References

Aichner, T., Grünfelder, M., Maurer, O., & Jegeni, D. (2020). Twenty-five years of social media: A review of social media applications and definitions from 1994 to 2019. *Cyberpsychology, Behavior, and Social Networking, 24*(4), 215–222. https://doi.org/10.1089/cyber.2020.0134

Alareqe, N. A., Hassan, S. A., Kamarudin, E. M. E., Aljaberi, M. A., Nordin, M. S., Ashureay, N. M., & Mohammed, L. A. (2022). Validity of adult psychopathology model using psychiatric patient sample from a developing country: Confirmatory factor analysis. *Mental Illness, 2022*, 9594914. https://doi.org/10.1155/2022/9594914

Aljaberi, M. A., Alsalahi, A., Juni, M. H., Noman, S., Al-Tammemi, A. A. B., & Hamat, R. A. (2021). Efficacy of interventional programs in reducing acculturative stress and enhancing adjustment of international students to the new host educational environment: A systematic review and meta-analysis. *International Journal of Environmental Research and Public Health, 18*(15), 7765. https://doi.org/10.3390/ijerph18157765

Aljaberi, M. A., Lee, K.-H., Alareqe, N. A., Qasem, M. A., Alsalahi, A., Abdallah, A. M., Lin, C.-Y. (2022). Rasch modeling and multilevel confirmatory factor analysis for the usability of the Impact of Event Scale-Revised (IES-R) during the COVID-19 pandemic. *Healthcare*, *10*(10). https://doi.org/10.3390/healthcare10101858

Al-Menayes, J. (2015). Psychometric properties and validation of the Arabic Social Media Addiction Scale. *Journal of Addiction, 2015*, 1–6. https://doi.org/10.1155/2015/291743

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders*. American Psychiatric Association.

Andreassen, C. S., & Pallesen, S. (2014). Social network site addiction - An overview. *Current Pharmaceutical Design, 20*(25), 4053–4061.

Andreassen, C. S., Billieux, J., Griffiths, M. D., Kuss, D. J., Demetrovics, Z., Mazzoni, E., & Pallesen, S. (2016). The relationship between addictive use of social media and video games and symptoms of psychiatric disorders: A large-scale cross-sectional study. *Psychology of Addictive Behaviors, 30*(2), 252–262. https://doi.org/10.1037/adb0000160

Andreassen, C. S., Pallesen, S., & Griffiths, M. D. (2017). The relationship between addictive use of social media, narcissism, and self-esteem Findings from a large national survey. *Addictive Behaviors, 64*, 287–293. https://doi.org/10.1016/j.addbeh.2016.03.006

Ato, M., Lopez, J. J., & Benavente, A. (2013). A classification system for research designs in psychology. *Anales De Psicología, 29*(3), 1038–1059.

Atwan, W., Salha, N., & Mahamid, F. (2022). Psychometric properties and factorial structure of the Social Network Addiction Scale within the Arabic language and Palestinian context. *Computers in Human Behavior Reports, 8*, 100228. https://doi.org/10.1016/j.chbr.2022.100228

Balcerowska, J. M., & Bereznowski, P. (2022). The Generalized Problematic Internet Use Scale 2 in a Polish sample: Psychometric validation and relationship with specific Internet-related disorders and psychosocial functioning. *Current Issues in Personality Psychology, 11*(3), 228–239. https://doi.org/10.5114/cipp/151869

Balcerowska, J. M., Bereznowski, P., Biernatowska, A., Atroszko, P. A., Pallesen, S., & Andreassen, C. S. (2022). Is it meaningful to distinguish between Facebook addiction and social networking sites addiction? Psychometric analysis of Facebook addiction and social networking sites addiction scales. *Current Psychology, 41*(2), 949–962. https://doi.org/10.1007/s12144-020-00625-3

Brailovskaia, J., & Margraf, J. (2022). Addictive social media use during Covid-19 outbreak: Validation of the Bergen Social Media Addiction Scale (BSMAS) and investigation of protective factors in nine countries. *Current Psychology*, 1–19. https://doi.org/10.1007/s12144-022-03182-z

Brislin R, W. (1980). Translation and content analysis of oral and written materials. *Methodology*, 389–444. https://cir.nii.ac.jp/crid/1573105975614656128

Çam, E., & Isbulan, O. (2012). A new addiction for teacher candidates: Social networks. *Turkish Online Journal of Educational Technology, 11*(3), 14–19.

Chang, C.-W., Chen, J.-S., Huang, S.-W., Potenza, M. N., Su, J.-A., Chang, K.-C., & Lin, C.-Y. (2023). Problematic smartphone use and two types of problematic use of the internet and self-stigma among people with substance use disorders. *Addictive Behaviors, 147*, 107807. https://doi.org/10.1016/j.addbeh.2023.107807

Chang, C.-W., Huang, R.-Y., Strong, C., Lin, Y.-C., Tsai, M.-C., Chen, I.-H., Griffiths, M. D. (2022). Reciprocal relationships between problematic social media use, problematic gaming, and psychological distress among university students: A 9-month longitudinal study. *Frontiers in Public Health, 10,* 858482. https://doi.org/10.3389/fpubh.2022.858482

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling, 14*(3), 464–504. https://doi.org/10.1080/10705510701301834

Chen, I. H., Pakpour, A. H., Leung, H., Potenza, M. N., Su, J.-A., Lin, C.-Y., & Griffiths, M. D. (2020). Comparing generalized and specific problematic smartphone/internet use: Longitudinal relationships between smartphone application-based addiction and social media addiction and psychological distress. *Journal of Behavioral Addictions, 9*(2), 410–419. https://doi.org/10.1556/2006.2020.00023

Chen, I. H., Strong, C., Lin, Y.-C., Tsai, M.-C., Leung, H., Lin, C.-Y., & Griffiths, M. D. (2020). Time invariance of three ultra-brief internet-related instruments: Smartphone Application-Based Addiction Scale (SABAS), Bergen Social Media Addiction Scale (BSMAS), and the nine-item Internet Gaming Disorder Scale-Short Form (IGDS-SF9) (Study Part B). *Addictive Behaviors, 101*, 105960. https://doi.org/10.1016/j.addbeh.2019.04.018

Chen, I. H., Chen, C.-Y., Liu, C.-H., Ahorsu, D. K., Griffiths, M. D., Chen, Y.-P., & Wang, S.-M. (2021). Internet addiction and psychological distress among Chinese schoolchildren before and during the COVID-19 outbreak: A latent class analysis. *Journal of Behavioral Addictions, 10*(3), 731–746. https://doi.org/10.1556/2006.2021.00052

Chen, I.-H., Chen, C.-Y., Pakpour, A. H., Griffiths, M. D., Lin, C.-Y., Li, X.-D., & Tsang, H. W. H. (2021). Problematic internet-related behaviors mediate the associations between levels of internet engagement and distress among schoolchildren during COVID-19 lockdown: A longitudinal structural equation modeling study. *Journal of Behavioral Addictions, 10*(1), 135–148. https://doi.org/10.1556/2006.2021.00006

Chen, I.-H., Chang, K.-C., Chang, C.-W., Huang, S.-W., Potenza, M. N., Pakpour, A. H., & Lin, C.-Y. (2022). Temporal associations between problematic use of the internet and self-stigma among people with substance use disorders: A cross-lagged model across one year. *Journal of Psychiatric Research, 156*, 339–348. https://doi.org/10.1016/j.jpsychires.2022.10.044

Chen, I.-H., Chang, Y.-L., Yang, Y.-N., Yeh, Y.-C., Ahorsu, D. K., Adjorlolo, S., & Lin, C.-Y. (2023). Psychometric properties and development of the Chinese versions of Gaming Disorder Test (GDT) and Gaming Disorder Scale for Adolescents (GADIS-A). *Asian Journal of Psychiatry, 86*, 103638. https://doi.org/10.1016/j.ajp.2023.103638

Chen, I.-H., Ahorsu, D. K., Pakpour, A. H., Griffiths, M. D., Lin, C.-Y., & Chen, C.-Y. (2020). Psychometric properties of three simplified chinese online-related addictive behavior instruments among mainland Chinese primary school students. *Frontiers in Psychiatry, 11*. https://doi.org/10.3389/fpsyt.2020.00875

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structual Equation Modeling, 9*(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5

Dadiotis, A., Bacopoulou, F., Kokka, I., Vlachakis, D., Chrousos, G. P., Darviri, C., & Roussos, P. (2021). Validation of the Greek version of the Bergen Social Media Addiction Scale in undergraduate students. *EMBnet journal, 26*, e975. https://doi.org/10.14806/ej.26.1.975

Demirci, I. (2019). The adaptation of the Bergen Social Media Addiction Scale to Turkish and its evaluation of relationship with depression and anxiety symptoms. *Anatolian Journal of Psychiatry, 20*(1), 15–23. https://doi.org/10.5455/apd.41585

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment, 49*(1), 71–75. https://doi.org/10.1207/s15327752jpa4901_13

El Abiddine, F. Z., Aljaberi, M. A., Gadelrab, H. F., Lin, C.-Y., & Muhammed, A. (2022). Mediated effects of insomnia in the association between problematic social media use and subjective well-being among university students during COVID-19 pandemic. *Sleep Epidemiology, 2*, 100030. https://doi.org/10.1016/j.sleepe.2022.100030

Elphinston, R. A., & Noller, P. (2011). Time to face it! Facebook intrusion and the implications for romantic jealousy and relationship satisfaction. *Cyberpsychology, Behavior, and Social Networking, 14*, 631–635. https://doi.org/10.1089/cyber.2010.0318

Ghali, H., Ghammem, R., Zammit, N., Fredj, S. B., Ammari, F., Maatoug, J., & Ghannem, H. (2019). Validation of the Arabic version of the Bergen Facebook Addiction Scale in Tunisian adolescents. *International Journal of Adolescent Medicine and Health*, *34*(1). https://doi.org/10.1515/ijamh-2019-0077

Ghazi, F. R., Gan, W. Y., Tung, S. E. H., Chen, I. H., Poon, W. C., Siaw, Y.-L., . . . Lin, C.-Y. (2024). Problematic gaming in Malaysian university students: Translation and psychometric evaluation of the Malay language versions of Gaming Disorder Test and Gaming Disorder Scale for young adults. *Evaluation & the Health Professions*, *47*, 93–104. https://doi.org/10.1177/01632787231185845

Global Media Insight. (2020). *UAE social media usage statistics (2020)*. https://www.globalmediainsight.com/blog/uae-socialmedia-statistics/

Griffiths, M. (2000). Internet addiction – Time to be taken seriously? *Addiction Research, 8*(5), 413–418. https://doi.org/10.3109/16066350009005587

Griffiths, M. (2005). A 'components' model of addiction within a biopsychosocial framework. *Journal of Substance Use, 10*, 191–197. https://doi.org/10.1080/14659890500114359

Griffiths, M. D. (2013). Social networking addiction: Emerging themes and issues. *Journal of Addiction Research & Therapy, 4*, e118. https://doi.org/10.4172/2155-6105.1000e118

Griffiths, M. D. (2017). Commentary: Development and validation of a self-reported questionnaire for measuring Internet search dependence. *Frontiers of Public Health, 5*, 95. https://doi.org/10.3389/fpubh.2017.00095

Griffiths, M. D., & Szabo, A. (2013). Is excessive online usage a function of medium or activity? An empirical pilot study. *Journal of Behavioral Addictions, 3*(1), 74–77. https://doi.org/10.1556/JBA.2.2013.016

Griffiths, M. D., Kuss, D. J. & Demetrovics, Z. (2014). Social networking addiction: An overview of preliminary findings. In K. Rosenberg & L. Feder (Eds.), *Behavioral addictions: Criteria, evidence and treatment* (pp.119-141). New York: Elsevier https://doi.org/10.1016/B978-0-12-407724-9.00006-9

Gunter, B., Elareshi, M., & Al-Jaber, K. (2016). *Social media in the Arab world: Communication and public opinion in the Gulf states*. Bloomsbury Publishing. https://doi.org/10.5040/9781350988057

Hambleton, R. K., Merenda, P. F., & Spielberger, C. D. (2004). *Adapting educational and psychological tests for cross-cultural assessment*. Psychology Press.

Hoyle, R. H. (1995). *Structural equation modeling: Concepts, issues, and applications*. Sage.

Huang, P.-C., Latner, J. D., O'Brien, K. S., Chang, Y.-L., Hung, C.-H., Chen, J.-S., & Lin, C.-Y. (2023). Associations between social media addiction, psychological distress, and food addiction among Taiwanese university students. *Journal of Eating Disorders, 11*(1), 43. https://doi.org/10.1186/s40337-023-00769-0

Jafari, P., Bagheri, Z., Ayatollahi, S. M. T., & Soltani, Z. (2012). Using Rasch rating scale model to reassess the psychometric properties of the Persian version of the PedsQLTM 4.0 Generic Core Scales in school children. *Health and Quality of Life Outcomes, 10*(1), 27. https://doi.org/10.1186/1477-7525-10-27

Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of social media. *Business Horizons, 53*(1), 59–68. https://doi.org/10.1016/j.bushor.2009.09.003

Khan, A., Chien, C.-W., & Brauer, S. G. (2013). Rasch-based scoring offered more precision in differentiating patient groups in measuring upper limb function. *Journal of Clinical Epidemiology, 66*(6), 681–687. https://doi.org/10.1016/j.jclinepi.2012.12.014

Kukreti, S., Strong, C., Chen, J.-S., Chen, Y.-J., Griffiths, M. D., Hsieh, M.-T., & Lin, C.-Y. (2023). The association of care burden with motivation of vaccine acceptance among caregivers of stroke patients during the COVID-19 pandemic: Mediating roles of problematic social media use, worry, and fear. *BMC Psychology, 11*(1), 157. https://doi.org/10.1186/s40359-023-01186-3

Kuss, D. J., & Griffiths, M. D. (2017). Social networking sites and addiction: Ten lessons learned. *International Journal of Environmental Research and Public Health, 14*(3), 311. https://www.mdpi.com/1660-4601/14/3/311.

Lenze, N. (2017). Social media in the arab world: Communication and public opinion in the Gulf states. *European Journal of Communication, 32*(1), 77–79. https://doi.org/10.1177/0267323116687821

Leung, H., Pakpour, A. H., Strong, C., Lin, Y.-C., Tsai, M.-C., Griffiths, M. D., & Chen, I. H. (2020). 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). *Addictive Behaviors, 101*, 105969. https://doi.org/10.1016/j.addbeh.2019.04.027

Lin, C.-Y., Luh, W.-M., Cheng, C.-P., Yang, A.-L., Su, C.-T., & Ma, H.-I. (2013). Measurement equivalence across child self-reports and parent-proxy reports in the Chinese Version of the Pediatric Quality of Life Inventory Version 4.0. *Child Psychiatry & Human Development, 44*(5), 583–590. https://doi.org/10.1007/s10578-012-0352-8

Lin, C.-Y., Broström, A., Nilsen, P., Griffiths, M. D., & Pakpour, A. H. (2017). Psychometric validation of the Persian Bergen Social Media Addiction Scale using classic test theory and Rasch models. *Journal of Behavioral Addictions, 6*(4), 620–629. https://doi.org/10.1556/2006.6.2017.071

Lin, C.-Y., Burri, A., Fridlund, B., & Pakpour. (2017). Female sexual function mediates the effects of medication adherence on quality of life in people with epilepsy. *Epilepsy & Behavior, 67*, 60–65. https://doi.org/10.1016/j.yebeh.2016.12.012

Lin, C.-Y., Oveisi, S., Burri, A., & Pakpour, A. H. (2017). Theory of Planned Behavior including self-stigma and perceived barriers explain help-seeking behavior for sexual problems in Iranian women suffering from epilepsy. *Epilepsy & Behavior, 68*, 123–128. https://doi.org/10.1016/j.yebeh.2017.01.010

Lin, C.-Y., Pakpour, A. H., Broström, A., Fridlund, B., Årestedt, K., Strömberg, A., … . . . Mårtensson, J. (2018). Psychometric properties of the 9-item European Heart Failure Self-care Behavior Scale using confirmatory factor analysis and Rasch Analysis among Iranian patients. *Journal of Cardiovascular Nursing*, *33*(3). https://journals.lww.com/jcnjournal/Fulltext/2018/05000/Psychometric_Properties_of_the_9_item_European.15.aspx

Luo, T., Qin, L., Cheng, L., Wang, S., Zhu, Z., Xu, J., Chen, H., Liu, Q., Hu, M., Tong, J., Hao, W., Wei, B., & Liao, Y. (2021). Determination the cut-off point for the Bergen social media addiction (BSMAS): Diagnostic contribution of the six criteria of the components model of addiction for social media disorder. *Journal of Behavioral Addictions, 10*(2), 281–290. https://doi.org/10.1556/2006.2021.00025

Marino, C., Vieno, A., Moss, A. C., Caselli, G., Nikčević, A. V., & Spada, M. M. (2016). Personality, motives and metacognitions as predictors of problematic Facebook Use in university students. *Personality and Individual Differences, 101*, 70–77. https://doi.org/10.1016/j.paid.2016.05.053

Marino, C., Manari, T., Vieno, A., Imperato, C., Spada, M. M., Franceschini, C., & Musetti, A. (2023). Problematic social networking sites use and online social anxiety: The role of attachment, emotion dysregulation and motives. *Addictive Behaviors, 138*, 107572. https://doi.org/10.1016/j.addbeh.2022.107572

Michalos, A. C. (2014). *Encyclopedia of quality of life and well-being research (Vol. 171)*. Netherlands Dordrecht: Springer.

Milfont, T. L., & Fischer, R. (2010). Testing measurement invariance across groups: Applications in cross-cultural research. *International Journal of Psychological Research, 3*(1), 111–130. https://doi.org/10.21500/20112084.857

Monacis, L., Palo, V. D., Griffiths, M. D., & Sinatra, M. (2017). Social networking addiction, attachment style, and validation of the Italian version of the Bergen Social Media Addiction Scale. *Journal of Behavioral Addictions, 6*(2), 178–186. https://doi.org/10.1556/2006.6.2017.023

Montero, I., & León, O. G. (2007). A guide for naming research studies in psychology. *International Journal of Clinical and Health Psychology, 7*(3), 847–862.

Müller, S. M., Wegmann, E., Oelker, A., Stark, R., Müller, A., Montag, C., & Brand, M. (2022). Assessment of Criteria for Specific Internet-use Disorders (ACSID-11): Introduction of a new screening instrument capturing ICD-11 criteria for gaming disorder and other potential Internet-use disorders. *Journal of Behavioral Addictions, 11*(2), 427–450. https://doi.org/10.1556/2006.2022.00013

Obeid, S., González-Nuevo, C., Postigo, Á., el Dine, A. S., Azzi, V., Malaeb, D., & Hallit, S. (2023). Psychometric properties of the Problematic Use of Social Networks (PUS) Scale in Arabic among adolescents. *PloS One, 18*(9), e0291616. https://doi.org/10.1371/journal.pone.0291616

Özbek, M. G., & Karaş, H. (2022). Associations of depressive symptoms and perceived social support with addictive use of social media among elderly people in Turkey. *Psychogeriatrics, 22*(1), 29–37. https://doi.org/10.1111/psyg.12770

Pantic, I. (2014). Online social networking and mental health. *Cyberpsychology, Behavior, and Social Networking, 17*(10), 652–657. https://doi.org/10.1089/cyber.2014.0070

Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*(3), 385–401. https://doi.org/10.1177/014662167700100306

Rosseel, Y. (2012). lavaan: An R Package for structural equation modeling. *Journal of Statistical Software, 48*(2), 1–36.

Ruckwongpatr, K., Chirawat, P., Ghavifekr, S., Gan, W. Y., Tung, S. E. H., Nurmala, I., & Lin, C.-Y. (2022). Problematic Internet use (PIU) in youth: A brief literature review of selected topics. *Current Opinion in Behavioral Sciences, 46*, 101150. https://doi.org/10.1016/j.cobeha.2022.101150

Ryan, T., Chester, A., Reece, J., & Xenos, S. (2014). The uses and abuses of Facebook: A review of Facebook addiction. *Journal of Behavioral Addictions, 3*(3), 133–148. https://doi.org/10.1556/JBA.3.2014.016

Shin, N. Y. (2022). Psychometric properties of the Bergen Social Media Addiction Scale in Korean Young Adults. *Psychiatry Investigation, 19*(5), 356–361. https://doi.org/10.30773/pi.2021.0294

SIL International. (2020). *Documentation for ISO 639 identifier*. Retrieved from https://iso639-3.sil.org/code/ara

Smith, T., & Short, A. (2022). Needs affordance as a key factor in likelihood of problematic social media use: Validation, latent profile analysis and comparison of TikTok and Facebook problematic use measures. *Addictive Behaviors, 129*, 107259. https://doi.org/10.1016/j.addbeh.2022.107259

Smith, T. (2023). Unraveling the digital emotion web: Exploring the relationship between online emotional expression, perception, management, psychopathologies, and social media use. *Current Psychology.* Advance online publication. https://doi.org/10.1007/s12144-023-05350-1

Stănculescu, E. (2023). The Bergen Social Media Addiction Scale validity in a Romanian sample using item response theory and network analysis. *International Journal of Mental Health and Addiction, 21*(4), 2475–2492. https://doi.org/10.1007/s11469-021-00732-7

Tan, N. (2023). Toward an integrated framework for examining the addictive use of smartphones among young adults. *Asian Journal of Social Health and Behavior, 6*(3), 119–125. https://doi.org/10.4103/shb.shb_206_23

Torsheim, Andreassen T., Brunborg, G. S., & Pallesen, S. (2012). Development of a Facebook addiction scale. *Psychological Reports, 110*(2), 501–517. https://doi.org/10.2466/02.09.18.PR0.110.2.501-517

Tullett-Prado, D., Doley, J. R., Zarate, D., Gomez, R., & Stavropoulos, V. (2023). Conceptualising social media addiction: A longitudinal network analysis of social media addiction symptoms and their relationships with psychological distress in a community sample of adults. *BMC Psychiatry, 23*(1), 509. https://doi.org/10.1186/s12888-023-04985-5

Tung, S. E. H., Gan, W. Y., Chen, J.-S., Ruckwongpatr, K., Pramukti, I., Nadhiroh, S. R., & Griffiths, M. D. (2022). Internet-related instruments (Bergen Social Media Addiction Scale, Smartphone Application-Based Addiction Scale, Internet Gaming Disorder Scale-Short Form, and Nomophobia Questionnaire) and their associations with distress among Malaysian university students. *Healthcare, 10*(8), 1448. https://www.mdpi.com/2227-9032/10/8/1448.

Vally, Z., & Helmy, M. (2022). The association between psychological burden related to COVID-19 and addictive social media use: Testing the mediational role of anxious affect. *PloS One, 17*(7), e0271332. https://doi.org/10.1371/journal.pone.0271332

Vally, Z., Alghraibeh, A. M., & Elhai, J. D. (2021). Severity of depression and anxiety in relation to problematic smartphone use in the United Arab Emirates: The mediational roles of rumination and fear of missing out. *Human Behavior and Emerging Technologies, 3*(3), 423–431. https://doi.org/10.1002/hbe2.259

Vally, Z., Helmy, M., & Fourie, L. (2023). The association between depression and addictive social media use during the COVID-19 pandemic: The mediating role of sense of control. *PloS One, 18*(9), e0291034. https://doi.org/10.1371/journal.pone.0291034

Varela, J. J., Pérez, J. C., Rodríguez-Rivas, M. E., Chuecas, M. J., & Romo, J. (2023). Wellbeing, social media addiction and coping strategies among Chilean adolescents during the pandemic. *Frontiers in Psychiatry, 14*, 1211431. https://doi.org/10.3389/fpsyt.2023.1211431

Wang, Y.-S., Wang, H.-Y., & Shee, D. Y. (2007). Measuring e-learning systems success in an organizational context: Scale development and validation. *Computers in Human Behavior, 23*(4), 1792–1808. https://doi.org/10.1016/j.chb.2005.10.006

Wu, T.-Y., Huang, S.-W., Chen, J.-S., Ruckwongpatr, K., Kukreti, S., Strong, C., & Pakpour, A. H. (2023). Translation and validation of the Gaming Disorder Test and Gaming Disorder Scale for Adolescents into Chinese for Taiwanese young adults. *Comprehensive Psychiatry, 124*, 152396. https://doi.org/10.1016/j.comppsych.2023.152396

Yam, Chun-Wai., Pakpour, Amir H., Griffiths, Mark D., Yau, Wai-Yan., Lo, Cheuk-Long Matthew., Ng, Jennifer M. T., Lin, Chung-Ying., & Leung, Hildie. (2019). Psychometric testing of three Chinese online-related addictive behavior instruments among Hong Kong university students. *Psychiatric Quarterly, 90*(1), 117–128. https://doi.org/10.1007/s11126-018-9610-7

Zhang, J., Marci, T., Marino, C., Canale, N., Vieno, A., Wang, J., & Chen, X. (2024). Factorial validity of the problematic social media use scale among Chinese adults. *Addictive Behaviors, 148*, 107855. https://doi.org/10.1016/j.addbeh.2023.107855

Žmavc, M., Šorgo, A., Gabrovec, B., Crnkovič, N., Cesar, K., & Selak, Š. (2022). The protective role of resilience in the development of social media addiction in tertiary students and psychometric properties of the Slovenian Bergen Social Media Addiction Scale (BSMAS). *International Journal of Environmental Research and Public Health, 19*(20), 13178. https://doi.org/10.3390/ijerph192013178

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