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ORIGINAL RESEARCH

Psychometric Validation of the Social Media Fatigue Scale and Social Anxiety Scale for Social Media Users Among Indonesian University Students

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Background: While social media fatigue and social anxiety may shape individuals' patterns of social media use, validated instruments assessing these constructs remain limited in Southeast Asian contexts.

Methods: The present study examined the psychometric properties of the Social Media Fatigue Scale (SMFS) and the Social Anxiety Scale for Social Media Users (SAS-SMU) using confirmatory factor analysis. A total of 1012 Indonesian university students completed both instruments. Measurement invariance across gender and academic discipline was further examined.

Results: Item 13 of the SMFS was removed due to a very low corrected item-total correlation ($r = 0.056$). After removal, both the Indonesian version of the SMFS and the SAS-SMU demonstrated satisfactory model fit, good internal consistency, and adequate convergent and discriminant validity. Measurement invariance across gender and academic disciplines was also confirmed. Concurrent validity supported that the two constructs were related yet distinct.

Conclusion: The findings provide evidence for the reliability and validity of both the SMFS and SAS-SMU in the Indonesian context, supporting their future use in research exploring social media-related psychological mechanisms or outcomes.

Keywords: psychometric validation, social media fatigue, social anxiety, Indonesia, digital mental health

Introduction

Social media, defined as websites and applications that enable their users to create and share content or participate in social networking, has been a prominent feature of modern technological society for more than two decades.[1] In response to user habits and market preferences, diverse platforms have developed distinct features and functionalities. For example, *YouTube* emphasizes video-based content creation and allows users to interact within virtual communities.[2] In contrast, *Threads* employs an algorithm to connect users with shared interests and aims to highlight emerging trends.[3] Despite these preference-oriented designs, social media has also, often unintentionally, generated hidden yet substantial distress and consequential influences among its users,[1] with insomnia, maladaptive eating, and increased suicidal ideation often being reported.[1,4,5]

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The relationship between social media use and its downstream psychosocial responses can be understood through the Transactional Model of Stress and Coping.[6] The model proposed that stress is perceived by the interaction between the environment and individuals' cognitive appraisals. More specifically, individuals engage in primary and secondary appraisal processes to evaluate the significance of the stressor and the adequacy of their coping resources, which subsequently shape their coping responses.

In the context of social media use, excessive engagement may be conceptualized as a potential stressor that places cognitive and emotional demands on users. Consequently, individuals may experience different forms of psychosocial responses depending on how they appraise and cope with these demands. Feelings such as fatigue due to overload or anxiety related to social evaluation may subsequently emerge. Within this framework, social media fatigue may reflect users' appraisal of social media demands as exceeding their cognitive and emotional resources, whereas social anxiety may reflect concerns about negative social evaluation in online-mediated interactions. Therefore, examining both constructs together may provide a more comprehensive understanding of stress-related responses to social media use.

Excessive social media use, information overload, social stress, and emotional exhaustion have all been identified as antecedents of social media fatigue.[7] Although prior studies have demonstrated that social media fatigue is associated with discontinuance intention and reduced interaction engagement,[7] it does not necessarily result in actual reduction in social media use. Such inconsistency may be explained by factors such as paradoxical use,[8,9] as well as users' fear of missing out[10–13] and perceived social obligations to maintain interpersonal connections,[14] which may sustain continued engagement despite experiencing fatigue. Therefore, further research is needed to clarify the mechanisms through which social media fatigue translates into actual usage behaviors.

In contrast, social anxiety, characterized by preoccupation with being judged by others, may be derived from social media use, subsequently shaping how individuals engage with social media[15] and resulting in divergent outcomes.[16] More specifically, studies have shown that social media use may increase social anxiety by provoking social comparison.[17] Therefore, individuals with higher social anxiety tend to engage more in passive forms of social media use (eg, browsing without interaction), whereas active engagement (eg, posting or direct communication) may help alleviate social anxiety by enhancing communication skills.[15] Given accumulating evidence supporting the associations between social media use patterns and distinct psychological as well as behavioral outcomes,[16] the role of social anxiety in shaping these pathways remains underexplored and warrants further investigation.

Social media use patterns differ between Southeast Asian and Western cultures, with Southeast Asian users being more likely to follow influencers and use social media for work-related activities.[18] Social media use is highly embedded in the daily routine of Indonesians. Qualitative evidence suggests that social, practical, and pleasurable activities are frequently conducted on social media platforms in Indonesian contexts, substantially contributing to the maintenance of social relationships.[19] In addition, compared to the individualist context in Western countries, social media use may extend beyond self-promotion and serves to strengthen group harmony, maintain interpersonal relationships, and reinforce collective identity in a collectivist cultural context such as Indonesia.[20] These findings highlight the distinctiveness of social media use in Indonesia, underscoring the need for valid and reliable instruments to advance this line of research.

Previous validation findings cannot necessarily be generalized to Indonesian university students because differences in the purposes and patterns of social media use may influence how individuals interpret and respond to items assessing social media-related psychological constructs, potentially affecting the psychometric properties of the instruments. In Southeast Asia, social media use is closely embedded in interpersonal and collective activities, and may serve functions that differ from those emphasized in Western contexts. Therefore, evidence established in other populations may not be assumed to apply directly to Indonesian university students without empirical validation.

Therefore, the present study aimed to validate the psychometric properties of two instruments that assess emotional distress induced by social media use, namely the Social Media Fatigue Scale (SMFS) and the Social Anxiety Scale for Social Media Users (SAS-SMU), among individuals from Indonesia. Measurement invariance across gender and academic discipline was also examined to support their applicability in diverse subgroups of university students. University students were particularly targeted because they are consistently reported to have higher likelihood of developing problematic social media use.[5] By establishing the reliability and validity of these instruments, the present study provides a necessary foundation for future research to more accurately explore the complex psychological and behavioral mechanisms within the context of

social media use. It may also support future intervention studies by providing reliable psychometric instruments for evaluating changes in social media-related emotional distress following intervention.

Methods

Participants and Procedure

The present study used a convenience sampling method to collect data from Indonesian university students, who served as the target population. This approach was considered practical and feasible for obtaining a sufficiently large sample for the psychometric validation of the SMFS and SAS-SMU. Those who (i) currently studied in an Indonesian university; (ii) were able to read and comprehend Indonesian, and (iii) had used at least one social media platform in past week were eligible to participate. An online survey, comprising both instruments and constructed using the *SurveyMonkey* platform, was distributed via academic and student communication networks between February and March 2026. The study was conducted in accordance with the Declaration of Helsinki, with the protocol reviewed by the Health Research Ethics Committee of the Faculty of Public Health, Airlangga University (IRB ref: 7/EA/KEPK/2026). All participants gave their written informed consent prior to receiving the survey link.

Instrument Translation Procedure

The translation and cultural adaptation of the instruments followed established forward- and back-translation procedures.[21] Moreover, this translation procedure is relevant to a previous study conducted by some of the present study's authors on a relevant topic (ie, translating Bergen Social Media Addiction Scale and the Internet Gaming Disorder Scale-Short Form into Bahasa Indonesian for psychometric validation).[22] Three bilingual translators who were fluent in both English and Indonesian were invited to conduct the translation. All three translators were female Indonesian, held the Bachelor degree of Arts in English language and literature, and had approximately eight years of translation experience. Both instruments were first forward-translated into Indonesian by two translators. The translated versions were then back-translated into English by the third translator. An expert panel, consisting of researchers with expertise in allied health, online behavior, and psychology, reviewed the translated versions and made necessary cultural and linguistic adaptations.

A pilot study was subsequently conducted with a small sample (n = 30, 93.3% female, mean age = 18.57 years [SD 1.81]) to evaluate the clarity and comprehensibility of the items. The sample size of 30 participants was based on guidelines proposed by Beaton et al.[23] Both scales demonstrated adequate to good internal consistency (Supplementary Table 1). Based on participant feedback, the expert panel made further revisions. No cognitive interviews were conducted. The finalized Indonesian versions of both instruments were then used for subsequent psychometric validation.

Measures

Background Information

Demographic information including age, gender, and university study major were collected as baseline characteristics of participants. University study majors were further classified into health-related majors, which included dentistry, medicine, nursing, pharmacy, public health and veterinary science, and non-health-related majors, which included advanced technology and multidisciplinary, marine and fisheries, science and technology, economic and business, psychology, social and political sciences, humanities, law and vocational studies, for further evaluating the measurement invariance across academic discipline.

Social Media Fatigue Scale (SMFS)

The 15-item SMFS[24] assesses individuals' tendency to withdraw from social media use due to overwhelming fatigue caused by social media use. The SMFS comprises three subscales (cognitive experiences, behavioral experiences, and emotional experiences), each consisting of five items. All items (eg, "I feel nervous when receiving friend requests on social media sites") are rated on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree), yielding a total score ranging from 15 to 105. A higher total score indicates greater fatigue. Psychometric properties of SMFS have been previously validated across multiple language versions (ie, Chinese, Polish, Turkish).[24–26]

The internal consistency of total scores and the cognitive and behavioral experiences subscales in the present sample ranged from good to very good (Cronbach's alpha [α] = 0.795–0.860, McDonald's Omega [ω] = 0.800–0.845). However, the

internal consistency of emotional experiences subscale was only acceptable (α = 0.630, ω = 0.660). Item-total statistics indicated a very low corrected item-total correlation for Item 13 ($r = 0.056$), which was below the recommended threshold of 0.30.[27] Therefore, Item 13 was removed from the Indonesian version of the SMFS, Following its removal, the internal consistency of emotional experiences subscale improved to a good level (α = 0.761, ω = 0.762) (Supplementary Table 2). Moreover, the entire SMFS (including English and Indonesia versions) is presented in Supplementary material A.

Social Anxiety Scale for Social Media Users (SAS-SMU)

The 21-item SAS-SMU[28] assesses individuals' sense of worry, dread or fear derived from social media use. The SAS-SMU comprises four subscales: shared content anxiety (seven items), privacy concern anxiety (five items), interaction anxiety (six items), and self-evaluation anxiety (three items). All items (eg, "I am concerned about the fact that the content I share will not be liked by other") are rated on a five-point Likert scale (1 = never, 5 = always), yielding a total score ranging from 21 to 105. A higher total score indicates greater online social anxiety.

The SAS-SMU exhibits excellent psychometric properties, including high reliability, internal consistency, and strong construct validity across multiple language versions (ie, Chinese, Persian, Swedish, Turkish).[28–31] The internal consistencies of total scores, shared content, privacy concern, interaction, and self-evaluation anxiety in the present sample were good to excellent (α = 0.852 to 0.940, ω = 0.852 to 0.940) (Supplementary Table 2). Moreover, the entire SAS-SMU (including English and Indonesia versions) is presented in Supplementary Material B.

Statistical Analysis

Baseline characteristics of age, gender and university study majors were analyzed using descriptive analysis. Reliability of internal consistency was evaluated using Cronbach's alpha and McDonald's omega. Values higher than 0.60 were considered indicative of acceptable reliability.[32]

Factorial structure was examined using confirmatory factor analysis (CFA). Although cultural and linguistic adaptation may potentially alter the underlying factor structure, the objective of the present study was to test the replicability of the previously established structure in the Indonesian context. Because both instruments had previously reported established factor structures, CFA provided the opportunity to evaluate their hypothesized structures explicitly. The sample size of 1012 participants was considered adequate because the participant-to-item ratio of 67.46 participants per item for the 15-item SMFS and 48.19 participants per item for 21-item SAS-SMU, greatly exceeded the common conservative sample sizes for CFA (ie, 20:1).[33]

Data normality was assessed using skewness and kurtosis for individual items and multivariate skewness and kurtosis for all items together. Absolute values of skewness below 3 and kurtosis below 10 for each individual item were considered acceptable.[34] Mardia's measures of multivariate skewness and kurtosis were then used to assess multivariate normality, and the normality results were used to decide appropriate estimator for CFA. All individual items had acceptable skewness (range between −0.909 and 0.141 for SMFS; between −0.802 and 0.415 for SAS-SMU) and kurtosis (range between −0.806 and 0.708 for SMFS; between −0.685 and 0.094 for SAS-SMU), while Mardia's test indicated a significant deviation from multivariate normality ($p < 0.001$ for both SMFS and SAS-SMU). Therefore, CFA was conducted using maximum likelihood estimation with robust standard errors (MLR) to obtain robust estimates in the presence of non-normality.[35]

Fit indices, including comparative fit index (CFI), and Tucker–Lewis Index (TLI), were used to evaluate model fitness, with values higher than 0.90 indicating acceptable fit.[36] The root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR) are also reported, with values lower than 0.08 and 0.06, respectively, indicating good fit.[37]

Concurrent validity was assessed using Pearson correlation. Given that the two instruments are theoretically related constructs, a positive correlation was expected. Convergent validity within each scale was evaluated using the average variance extracted (AVE) and composite reliability (CR). AVE values higher than 0.50 and CR values higher than 0.70 were considered indicative of adequate convergent validity.[38] The discriminant validity of the two scales was assessed using the heterotrait-monotrait ratio (HTMT). Values below than 0.85 were considered indicative of adequate discriminant validity.[39]

Measurement invariance across gender and academic discipline was examined using multi-group CFA. A stepwise approach was employed to evaluate configural, metric, and scalar invariance. $\Delta CFI \leq -0.01$, $\Delta RMSEA \leq 0.015$ and $\Delta SRMR \leq 0.03$ were considered supported.[40,41] All statistical analyses were conducted using *JASP 0.96.0* and *SPSS 29.0*, with a significance level set at $p < 0.05$.

Results

The analyses were conducted using complete cases. Of the 1034 participants initially recruited, 22 were excluded because of incomplete responses, resulting in a final sample of 1012 participants for the analyses. Participants (N = 1012; mean age = 19.12 years [SD = 0.87]) were predominantly females (n = 843, 83.3%). Those studying health-related disciplines (n = 551, 54.4%) included: dentistry (n = 76), medicine (n = 95), nursing (n = 34), pharmacy (n = 94), public health (n = 207), and veterinary science (n = 45). Those studying non-health-related disciplines (n = 461, 45.6%) included: advanced technology and multidisciplinary (n = 51), marine and fisheries (n = 26), science and technology (n = 56), economic and business (n = 55), psychology (n = 37), social and political sciences (n = 86), humanities (n = 47), law (n = 18), and vocational studies (n = 85) (Table 1).

Table 1 Baseline Characteristics (N = 1012)

Variables	Mean (SD) or N (%)
Age (in years)	19.12 (0.87)
Gender (male)	169 (16.7)
Major	
Health-related disciplines	551 (54.4)
Non-health-related disciplines	461 (45.6)
[a]Social Media Fatigue Scale (possible range: 14–98)	56.69 (12.43)
Cognitive experiences (possible range: 5–35)	23.42 (5.35)
Behavioral experiences (possible range: 5–35)	19.60 (5.82)
[a]Emotional experiences (possible range: 4–28)	13.67 (4.51)
Social Anxiety Scale of Social Media User (possible range: 21–105)	61.72 (15.43)
Shared content anxiety (possible range: 7–35)	19.46 (6.34)
Privacy concern anxiety (possible range: 5–25)	16.65 (4.26)
Interaction anxiety (possible range: 6–30)	15.93 (5.33)
Self-evaluation anxiety (possible range: 3–15)	9.69 (3.11)

Notes: [a]Item 13 was removed from the Indonesian version of the Social Media Fatigue Scale.

Table 2 Confirmatory Factor Analysis Model Fit Indices of the Social Media Fatigue Scale (SMFS) and Social Anxiety Scale for Social Media Users (SAS-SMU)

	[a]SMFS	SAS-SMU
Chi-square (df)/*p*-value	306.778 (74)/<0.001	1041.261 (183)/<0.001
CFI	0.929	0.920
TLI	0.913	0.908
RMSEA	0.056	0.068
90% CI	0.050, 0.061	0.065, 0.072
SRMR	0.047	0.049

Note: [a]Item 13 was removed from the Indonesian version of the SMFS.
Abbreviations: CFI, comparative fit index; TLI, Tucker–Lewis Index; RMSEA, root mean square error of approximation; CI, confidence interval; SRMR, standardized root mean square residual.

Factor Structure, Concurrent Validity, Convergent Validity, and Discriminant Validity

For the Indonesian version of the SMFS, CFA demonstrated an acceptable model fit, with all fit indices indicating acceptable values (CFI = 0.929, TLI = 0.913, RMSEA = 0.056 and SRMR = 0.047) (Table 2). The three-factor structure was supported, and factor loadings of the 14 items ranged from 0.494 to 0.819. AVE across the three subscales ranged from 0.444 to 0.470, while CR ranged from 0.762 to 0.811. Although the AVE values for the SMFS subscales were slightly below the conventional 0.50 threshold, the CR values exceeded 0.70, suggesting acceptable but not optimal

Table 3 Factor Loadings, Composite Reliability (CR) and Average Variance Extracted (AVE) of the Social Media Fatigue Scale (SMFS) and Social Anxiety Scale for Social Media Users (SAS-SMU)

Instrument Subscales	Item	Factor Loading	Skewness/ Kurtosis	AVE/CR
SMFS				
Cognitive experience	Item 1	0.768	−0.553/-0.177	0.453/0.797
	Item 2	0.767	−0.186/-0.643	
	Item 3	0.600	−0.909/0.708	
	Item 4	0.672	−0.222/-0.589	
	Item 5	0.494	−0.691/0.110	
Behavioral experience	Item 6	0.537	−0.074/-0.806	0.470/0.811
	Item 7	0.697	−0.050/-0.620	
	Item 8	0.764	0.055/-0.754	
	Item 9	0.819	0.141/-0.688	
	Item 10	0.595	−0.044/-0.546	
Emotional experience	Item 11	0.659	0.053/-0.517	0.444/0.762
	Item 12	0.668	0.123/-0.438	
	Item 14	0.680	0.292/-0.580	
	Item 15	0.660	0.542/-0.476	
Mardia's test of multivariate normality		Skewness 14.304	Kurtosis 300.633	χ^2(df)/p 343.484 (52)/ <0.001
SAS-SMU				
Shared content anxiety	Item 1	0.727	−0.172/-0.506	0.620/0.921
	Item 2	0.834	−0.051/-0.625	
	Item 3	0.854	−0.080/-0.684	
	Item 4	0.795	−0.064/-0.685	
	Item 5	0.694	0.313/-0.637	
	Item 6	0.797	−0.067/-0.671	
	Item 7	0.803	0.042/-0.658	
Privacy concern anxiety	Item 8	0.790	−0.104/-0.501	0.533/0.837
	Item 9	0.846	−0.148/-0.402	
	Item 10	0.714	−0.380/-0.351	
	Item 11	0.645	−0.802/0.094	
	Item 12	0.628	−0.140/-0.339	
Interaction anxiety	Item 13	0.828	0.192/-0.530	0.637/0.912
	Item 14	0.850	0.007/-0.592	
	Item 15	0.759	0.415/-0.348	
	Item 16	0.836	0.082/-0.481	
	Item 17	0.761	0.322/-0.558	
	Item 18	0.736	0.036/- 0.541	
Self-evaluation anxiety	Item 19	0.870	−0.278/-0.547	0.752/0.901
	Item 20	0.934	−0.262/-0.535	
	Item 21	0.794	−0.246/-0.573	
Mardia's test of multivariate normality		Skewness 20.529	Kurtosis 469.445	χ^2(df)/p 1043.667/<0.001

Table 4 Concurrent and Discriminant Validity Between the Social Media Fatigue Scale (SMFS) and Social Anxiety Scale for Social Media Users (SAS-SMU). (N=1012)

	1	2	3	4	5	6	7	8	9
SMFS									
1 Total score	–								
2 Cognitive experience subscale	**0.769 (<0.001)**	–	0.495	0.496					
3 Behavioral experience subscale	**0.826 (<0.001)**	**0.406 (<0.001)**	–	0.641					
4 Emotional experience subscale	**0.775 (<0.001)**	**0.409 (<0.001)**	**0.504 (<0.001)**	–					
SAS-SMU									
5 Total score	**0.436 (<0.001)**	**0.342 (<0.001)**	**0.358 (<0.001)**	**0.332 (<0.001)**	–				
6 Shared content anxiety subscale	**0.414 (<0.001)**	**0.300 (<0.001)**	**0.336 (<0.001)**	**0.351 (<0.001)**	**0.878 (<0.001)**	–	0.595	0.562	0.763
7 Privacy concern anxiety subscale	**0.323 (<0.001)**	**0.337 (<0.001)**	**0.227 (<0.001)**	**0.196 (<0.001)**	**0.737 (<0.001)**	**0.538 (<0.001)**	–	0.423	0.608
8 Interaction anxiety subscale	**0.330 (<0.001)**	**0.200 (<0.001)**	**0.300 (<0.001)**	**0.286 (<0.001)**	**0.778 (<0.001)**	**0.516 (<0.001)**	**0.385 (<0.001)**	–	0.617
9 Self-evaluation anxiety subscale	**0.310 (<0.001)**	**0.282 (<0.001)**	**0.267 (<0.001)**	**0.175 (<0.001)**	**0.829 (<0.001)**	**0.694 (<0.001)**	**0.531 (<0.001)**	**0.566 (<0.001)**	–

Notes: Values are presented as correlation coefficients (*p*-values). Significance is shown in **bold**. Concurrent validity was evaluated using Pearson's correlation and reported in the lower left corner, while discriminant validity was evaluated using the Heterotrait-Monotrait ratio and reported in the upper right corner.

convergent validity (Table 3). HTMT ratios across the three subscales ranged from 0.495 to 0.641, suggesting adequate discriminant validity (Table 4).

For the Indonesian version of the SAS-SMU, CFA indicated an acceptable model fit, as evidenced by fit indices within acceptable thresholds (CFI = 0.920, TLI = 0.908, RMSEA = 0.068, and SRMR = 0.049) (Table 2). The four-factor model was supported, with factor loadings of the 21 items ranging from 0.628 to 0.934. The AVE across the four subscales ranged from 0.533 to 0.752, while CR values ranged from 0.837 to 0.921, providing evidence of convergent validity (Table 3). In addition, HTMT ratios among the four subscales ranged from 0.423 to 0.763, indicating adequate discriminant validity (Table 4).

Concurrent validity between the two instruments showed weak to moderate positive correlations among the total instruments and their subscales (r = 0.175 to 0.414, all $p < 0.001$), suggesting the two constructs are related but conceptually distinct.

Measurement Invariance Across Gender and Academic Discipline

For the SMFS, configural, metric, and scalar invariance were supported across gender. Changes in model fit indices between nested models were within the recommended thresholds, indicating that the factor structure, factor loadings, and item intercepts were equivalent between males and females. Across academic discipline (health-related vs non-health-related), the chi-square difference test between the configural and metric models (M2–M1) was statistically significant (p = 0.020), suggesting that metric invariance was not supported based on this criterion. However, changes in practical fit indices remained within recommended thresholds, indicating that metric invariance may still be considered acceptable. Scalar invariance was further supported by minimal changes in fit indices between nested models.

For the SAS-SMU, measurement invariance was fully supported across both gender and academic discipline. Configural, metric, and scalar invariance were all established, with minimal changes in model-fit indices between nested models, indicating that the measurement model operated equivalently across groups (Table 5). Although the chi-square difference tests were significant for the comparisons between metric and scalar models across gender (p = 0.011) and

Table 5 Measurement Invariance of the Social Media Fatigue Scale (SMFS) and Social Anxiety Scale for Social Media Users (SAS-SMU) Across Gender and Academic Discipline

	Configural (M1)	Metric (M2)	Scalar (M3)	M2-M1	M3-M2
SMFS					
Across gender (Male [n = 169] vs Female [n = 843])					
χ^2 or $\Delta\chi^2(\delta df)$	406.21 (148)	418.15 (159)	433.77 (170)	11.94 (11)	15.62 (11)
p-value	<0.001	<0.001	<0.001	0.368	0.156
CFI or CFI	0.921	0.920	0.919	−0.001	−0.001
RMSEA or RMSEA	0.059	0.057	0.055	−0.002	−0.002
SRMR or SRMR	0.051	0.054	0.055	0.003	0.001
Across academic discipline (Health-related [n = 551] vs Non-health-related [n = 461])					
χ^2 or $\Delta\chi^2(\delta df)$	377.35 (148)	399.94 (159)	415.03 (170)	22.59 (11)	15.09 (11)
p-value	< 0.001	< 0.001	< 0.001	0.020	0.178
CFI or CFI	0.931	0.927	0.926	−0.004	−0.001
RMSEA or RMSEA	0.055	0.055	0.053	0	−0.002
SRMR or SRMR	0.051	0.056	0.057	0.005	0.001
SAS_SMU					
Across gender (Male [n = 169] vs Female [n = 843])					
χ^2 or $\Delta\chi^2(\delta df)$					
or	1336.97 (366)	1362.13 (383)	1395.10 (400)	25.16 (17)	32.97 (17)
p-value	< 0.001	< 0.001	< 0.001	0.091	0.011
CFI or CFI	0.911	0.911	0.909	0	−0.002
RMSEA or RMSEA	0.072	0.072	0.070	0	−0.002
SRMR or SRMR	0.052	0.054	0.054	0.002	0
Across academic discipline (Health-related [n = 551] vs Non-health-related [n = 461])					
χ^2 or $\Delta\chi^2(\delta df)$	1237.13 (366)	1260.87 (383)	1291.66 (400)	23.74 (17)	30.79 (17)
p-value	< 0.001	< 0.001	< 0.001	0.127	0.021
CFI or CFI	0.919	0.919	0.917	0	−0.002
RMSEA or RMSEA	0.069	0.067	0.066	−0.002	−0.001
SRMR or SRMR	0.052	0.055	0.056	0.003	0.001

Abbreviations: CFI, comparative fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual.

academic discipline ($p = 0.021$), the changes in approximate fit indices remained within recommended thresholds and were negligible, supporting measurement invariance across gender and academic discipline.

Discussion

Given that social media use may be associated with multiple co-occurring psychosocial variables, the present study examined the psychometric properties of two instruments assessing theoretically related but distinct constructs among Indonesian social media users to inform future research in this area. The findings can also be interpreted through the Transactional Model of Stress and Coping.[6] From this perspective, social media fatigue may be a stress-related response that arises when users perceive social media-related demands as exceeding their available cognitive, emotional, or behavioral coping resources. In contrast, social anxiety in social media contexts may reflect users' appraisal of online-mediated interactions as situations that could lead to negative evaluation, rejection, or unfavorable social comparison. The weak-to-moderate associations observed between the SMFS and SAS-SMU suggest that these constructs are related forms of online distress but not interchangeable.

Item 13 demonstrated a very low item-total correlation, and was therefore removed prior to the CFA. This finding may reflect differences in how the specific social media experience assessed by this item is perceived or interpreted in the Indonesian cultural context, where social media use is closely embedded in interpersonal and collective activities.[20] Several possible explanations may account for the removal of Item 13 ("I feel anxious when I was referred to [@] by others on the social media sites") from the SFMS. One possible explanation is that being tagged on social media may not be perceived as an anxiety-provoking situation in the Indonesian context, but rather as a form of social inclusion within the group, thereby weakening its association with social anxiety.

Moreover, tagging behaviors may be perceived as commonplace social interactions, given the high penetration of social media in the daily life of Indonesians and its primary role in supporting relational and social connectivity.[19] Consequently, tagging may be interpreted as a routine interaction, thereby limiting its ability to capture variability in social anxiety. This interpretation is consistent with the collectivist orientation of Indonesian society, in which online-mediated interactions may help maintain interpersonal ties and reinforce social belonging. Therefore, the poor performance of this item may reflect a culturally specific interpretation rather than a general weakness of the SMFS. However, this interpretation should be considered tentative because no cognitive interviews were conducted in the present study. Nevertheless, the finding deserves particular attention because it reflects the contextual influence on social media use, emphasizing the importance for psychometric validation across different cultures.

Despite the removal of item 13, the CFA results supported the three-factor structure of the SMFS, which is consistent with the original version.[24] Internal consistency of the total scores and its three subscales was good among individuals in the present sample. Discriminant validity was also supported, and measurement invariance across gender and academic discipline was established. However, the AVE values were slightly below the recommended threshold. This may be attributable to some items having relatively lower factor loadings, resulting in slightly less than 50% of the variance being explained by the corresponding latent construct.[38,42] The relatively lower factor loadings indicate that some items were less strongly associated with their respective latent constructs in the present study. Although this may potentially reflect differences in item interpretation or contextual characteristics of social media use, the specific reasons cannot be determined from the CFA results alone. Nevertheless, according to established guidelines,[42,43] an AVE below the recommendation threshold of 0.5 may still be considered acceptable for convergent validity when the CR is above 0.6. Given that the AVE values were only slightly below 0.50 and the CR values exceeded 0.70 in the present study, the convergent validity of the SMFS subscales was considered acceptable, but the findings should be interpreted with some caution.

Similarly, the four-factor structure of the SAS-SMU was supported. Factor loadings, as well as the indices for convergent and discriminant validity, were within acceptable ranges. Internal consistency of the total scores and the four subscales ranged from good to excellent among individuals in the present sample. Measurement invariance across gender was supported. Although scalar invariance across academic disciplines was less clear, changes in fit indices between nested models remained within acceptable thresholds, suggesting invariance across health-related and non-health-related disciplines. Concurrent validity between the two instruments showed weak to moderate correlations among their subscales, further supporting the notion that these constructs were theoretically related but distinct.

The psychometric properties of the Indonesian version SMFS were generally comparable with other language versions (ie, Chinese, Polish, Turkish).[24–26] Notably, the Indonesian version is the only version that has an item removed. Despite this difference, all language versions supported the original three-dimensional structure, and internal consistency was satisfactory to good across the total scale and subscales. These findings suggest that the core three-dimensional structure of the SMFS appears relatively stable across cultural and linguistic contexts, although item-level differences may emerge during cross-cultural adaptation. The psychometric properties of the SAS-SMU have shown slight differences across language versions (ie, Chinese, Persian, Swedish, Turkish,[28–31] and the present Indonesian version). While the Chinese[29] and Swedish[31] versions supported a three-factor structure, the Persian[30] and Indonesian versions retained the four-factor structure of the original Turkish[28] version. Nevertheless, all language versions showed good to excellent internal consistency, both for the total scale and its subscales. The variation in factor structure across language versions may indicate that the underlying dimensions of social media-related anxiety are interpreted somewhat differently across cultural contexts, while the consistently high internal consistency suggests that the constructs remain reliably assessed.

Overall, the Indonesian versions of both the SMFS and the SAS-SMU demonstrated satisfactory psychometric properties. Evidence was found for their factor structure, internal consistency reliability, convergent, discriminant, and concurrent validity, as well as measurement invariance across gender and academic discipline. The present study contributes to the literature by providing culturally adapted and psychometrically validated instruments for assessing social media-related emotional distress among Indonesian university students. This contribution is particularly relevant because most validation studies of these instruments have been conducted in non-Southeast Asian contexts. By validating both the SMFS and SAS-SMU among the same sample of individuals, the study also enables researchers to examine social media fatigue and social media-related anxiety as distinct yet interrelated dimensions of online distress. The availability of these instruments may facilitate future research on problematic social media engagement, passive and active social media use, fear of missing out, psychological distress, and well-being among Indonesian and broader Southeast Asian populations.

Results from concurrent validity analyses supported the theoretical relationship between the two constructs (ie, social media fatigue and social anxiety) while indicating that they were empirically distinct. Recent studies have examined the interplay between these constructs and their downstream behavioral implications. More specifically, previous research has shown that perceived dissimilarity was positively associated with both constructs, while social media fatigue was further positively associated with social anxiety and mediated the relationship between perceived dissimilarity and social anxiety.[44] Moreover, both constructs have been identified as mediators influencing individuals' online lurking behaviors (ie, silently reading and viewing online content without active participation),[45] highlighting their relevance in shaping social media engagement patterns. In addition, emerging evidence has further implied that both constructs are associated with social media use patterns.[7,15] Taken together, these findings underscore the importance of assessing social media fatigue and social anxiety concurrently. In the context of high social media engagement in Indonesia, the availability of psychometrically validated instruments may facilitate future research in elucidating the underlying psychological mechanisms of social media use.

Strengths and Limitations

The present study has several strengths. First, a relatively large sample size was employed, enhancing the stability and precision of the psychometric findings. Second, two instruments were concurrently validated, enabling a more comprehensive assessment of emotional distress associated with social media use. Third, the study contributes to the literature by providing evidence from an Eastern (particularly Southeast) Asian context, where research on social media fatigue and social anxiety remains less explored than in Westernized cultures. The availability of culturally validated psychometric instruments may facilitate cross-cultural research by enabling more meaningful comparisons of social media-related psychological outcomes across different cultural contexts. The validated instruments may also provide standardized psychometric measures for clinicians and educators to assess social media-related emotional distress among university students, while supporting digital well-being researchers in evaluating psychological outcomes in future intervention studies.

However, several limitations should be acknowledged. First, the relatively imbalanced gender distribution (females comprising 83% of the sample) and the use of convenience sampling may have introduced selection bias and limited the representativeness of the sample. Although the measurement invariance analysis provided support for comparable measurement across gender, the predominance of female participants may limit the generalizability of the psychometric findings to populations with a more balanced gender distribution or to other populations. Therefore, the psychometric findings should be interpreted cautiously. Second, the study's cross-sectional design limits the ability to draw causal inferences between the constructs. Third, all data were self-reported, which may introduce common method bias, such as social desirability bias and recall bias. Fourth, neither the external criterion measures, such as problematic social media use, fear of missing out, or sleep quality, nor any objective measure for social media engagement, were included in the present study. Therefore, the criterion-related validity of the Indonesian versions of the SMFS and SAS-SMU could not be fully supported.

Future research should employ probability-based or more diverse sampling approaches, with greater representation across gender and other demographic characteristics, and include broader populations to further evaluate the robustness and generalizability of the psychometric properties of the SMFS and SAS-SMU, as well as facilitate cross-cultural comparisons of these instruments. It can also extend the present findings by employing longitudinal or experimental designs to examine whether social media fatigue and social anxiety predict changes in social media use patterns, psychological distress, wellbeing,

and behavioral outcomes over time. In addition, future studies may examine measurement invariance across age groups, regions, types of social media platforms, and levels of social media engagement. Finally, qualitative or mixed-method studies could provide deeper insight into how Indonesian users interpret specific items, particularly those related to tagging, online evaluation, privacy concerns, and social interaction. Overall, the present study provides support for the two scales being psychometrically sound instruments for assessing social media-related emotional distress in the Indonesian context, thereby offering a valuable foundation for future research on the psychological mechanisms and behavioral consequences of social media use.

Conclusion

The present study examined the psychometric properties of two instruments assessing social media-related emotional distress, namely the Social Media Fatigue Scale (SMFS) and the Social Anxiety Scale for Social Media Users (SAS-SMU), in an Indonesian context. Measurement invariance across gender and academic discipline was also evaluated. Results indicated that both instruments demonstrated satisfactory reliability and validity, with acceptable model fit and internal consistency. Measurement invariance analyses further supported the comparability of the SMFS and SAS-SMU across gender and academic disciplines. The findings provide empirical support for the use of these instruments in assessing social media–related emotional distress in an Indonesian context. By establishing culturally relevant and psychometrically sound measures, the study's findings offer a foundation for future research to more accurately investigate the psychological mechanisms and behavioral consequences associated with social media use.

Abbreviations

AVE, Average variance extracted; CFA, Confirmatory factor analysis; CFI, Comparative fit index; CI, Confidence interval; CR, Composite reliability; HTMT, Heterotrait–monotrait ratio; MLR, Maximum likelihood estimation with robust standard errors; RMSEA, Root mean square error of approximation; SAS-SMU, Social Anxiety Scale for Social Media Users; SMFS, Social Media Fatigue Scale; SRMR, Standardized root mean square residual; TLI, Tucker–Lewis Index.

Ethics Approval and Informed Consent

The present study was approved by the Health Research Ethics Committee of the Faculty of Public Health, Airlangga University (IRB ref: 7/EA/KEPK/2026). The informed consent form appeared on the first page of the online survey. Participants had to press an "agree" consent box to complete the survey questions.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agreed to be accountable for all aspects of the work.

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Disclosure

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