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Indonesian Validation of the YouTube Addiction Scale Among Young Adults

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Objective There is an increasing body of evidence suggesting that YouTube addiction may be associated with health issues among individuals in Indonesia. However, there is currently no validated instrument available in the Indonesian language to assess YouTube addiction. The present study represents the inaugural effort to translate and evaluate the psychometric properties of the Indonesian version of the YouTube Addiction Scale (YAS).

Methods An online survey was administered to 515 Indonesian university students (mean age=20 years; 79.8% female), who were recruited through convenience sampling. All participants were proficient in Bahasa Indonesian and completed the survey between February and March 2024. The YAS was evaluated through confirmatory factor analysis (CFA) to assess its one-factor structure. Additionally, multigroup CFA was employed to examine measurement invariance across sex and varying levels of behavioral addictions. Pearson correlation analysis was utilized to establish concurrent validity.

Results CFA confirmed that YAS has a one-factor structure. Moreover, multigroup CFA provided evidence for invariance across genders as well as varying levels of smartphone and social media addiction. The YAS had acceptable internal consistency (Cronbach's α=0.74, McDonald's ω=0.76). Additionally, the YAS was significantly correlated with scores from other social media behavior questionnaires.

Conclusion These results suggest that YAS is a psychometrically robust and valid tool for evaluating the risk of YouTube addiction among young adults in Indonesia. Healthcare professionals and researchers may utilize the YAS to determine the severity of YouTube addiction, thereby gaining valuable insights into this specific form of social media dependency. **Psychiatry Investig**

Keywords Psychometrics; Social media addiction; Young adults; YouTube addiction; Problematic YouTube use.

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INTRODUCTION

The rapid growth of the internet and technology has led to a significant increase in individuals using online platforms,[1] particularly social media.[2] Platforms such as Facebook, WhatsApp, and Instagram enable users to share ideas and experiences through text and visuals. Social media has become essential to daily life,[3,4] with users worldwide rising from 2.07 billion in 2015 to 5.22 billion in 2024, led by YouTube, Facebook, and Instagram.[5]

Social media platforms provide a range of benefits such as connecting with others, entertainment, and information sharing.[5] However, excessive use can lead to negative effects, including poor mental health and sleep disorders, often due to compulsive behavior known as social media addiction (SMA).[6] This study uses SMA as a comprehensive term for problematic social media use.[4,7] A recent review indicated that approximately 25% of the general population is at risk of developing SMA across various platforms.[8] As usage increases, SMA may pose significant health risks, often unnoticed by users. Among different types of social media platforms and SMA, YouTube is a special platform that requires attention.

More specifically, the significant influence of YouTube in modern digital culture, especially among young adults, underscores the need for a thorough investigation into its potential effects on psychosocial well-being.[9] YouTube differentiates itself from other social media platforms through its focus on video content creation and consumption, allowing users not only to passively view but also to actively produce and share their own visual narratives.[10] This participatory nature cultivates a sense of community and shared experience because users engage with content and interact with creators through comments, likes, and shares.[10,11] The platform's versatility, which encompasses a broad spectrum of content types, including education, entertainment, and information, further enhances its widespread appeal and utility.[12]

The latest Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) does not recognize SMA as a formal diagnosis due to a lack of clear definition[13] and empirical data supporting its classification as a distinct diagnostic entity. Nevertheless, SMA is a major concern for researchers because of its link to negative mental health outcomes across many different populations.[13] While diagnostic criteria for SMA as a psychiatric condition remain undeveloped, prior studies have indicated a correlation between excessive social media use and various mental health disorders.[11,13-16] Numerous investigations have defined behavioral addictions using the six criteria of the addiction components model: salience, tolerance, mood modification, relapse, withdrawal, and conflict.[13,17] It is linked to initial and escalating psychological distress.[13] Examining SMA can help with early detection and intervention, potentially reducing its negative effects on mental health.[18]

While existing evidence elucidates the connections between SMA and psychosocial health issues, further research is warranted, particularly given the diverse array of social media platforms available. Among these, YouTube stands out as one of the most widely utilized platforms, offering unique features that enable users to create and share video content encompassing education, information, and entertainment.[10,11] Indeed, the very characteristics that render YouTube engaging can also result in potential overuse and addiction, particularly among vulnerable individuals such as young adults.[19] The interactive features of YouTube, intended to boost user engagement and foster community, may inadvertently become sources of distraction and dependency, especially for individuals predisposed to addictive behaviors.[10] These findings align with the existing literature on SMA, which indicates that excessive engagement with online platforms can adversely affect mental health, interpersonal relationships, and overall quality of life.[20,21]

The widespread use of mobile devices has further enhanced YouTube's accessibility, as evidenced by the substantial proportion of viewership occurring on smartphones and tablets, enabling users to seamlessly incorporate the platform into their daily lives.[22] This integration may blur the boundaries between online and offline experiences, potentially displacing real-world activities and social interactions in favor of virtual engagement. The "displaced behavior hypothesis" posits that individuals possess limited self-control, and when confronted with stress, they may resort to behaviors that provide immediate gratification, which could be detrimental to their long-term objectives and well-being.[23] The continuous availability of short, engaging videos on YouTube may lead to rapid context switching, which can impair cognitive functions and diminish the ability to retain intentions.[24]

A global survey found that YouTube users increased from 2 billion in 2019 to 2.49 billion in 2024. In the study, India had the most users, followed by the United States, Brazil, and Indonesia.[25] In Indonesia, users spend an average of 31.5 hours per month on YouTube, the second most utilized social media platform after TikTok.[26] Surveys show that Indonesian influencers are increasingly using social media for marketing,[26,27] with 68% of users purchasing products based on their recommendations.[27]

Globally, marketers often integrate YouTube into their marketing strategies by targeting individuals with advertisements during video consumption.[26] Additionally, YouTube serves as an effective online marketing tool, utilizing video content to aid viewers in their purchasing decisions.[28] However, previous research has indicated that excessive use of YouTube may lead

to issues akin to other forms of online addiction.[24,29] Consequently, raising awareness about this concern could potentially mitigate the negative consequences linked to problematic or compulsive use of YouTube among users.

The survey found a strong link between internet usage and YouTube engagement, with 75% of Indonesian internet users accessing YouTube.[26] Prior research has connected SMA to negative health outcomes, such as mental health issues and eating disorders, among Indonesian adolescents and young adults.[1,16] Tools such as the Bergen Social Media Addiction Scale (BSMAS) and the Social Media Addiction Scale Student Form assess SMA, but the relationship between problematic YouTube use and health issues is still unclear.[1,4] Understanding this connection between YouTube addiction and health problems could aid healthcare providers in evaluating the health consequences of YouTube addiction and its health consequences.

Evidence suggests that general psychometric instruments for SMA do not align with YouTube's unique characteristics.[30] General SMA instruments typically assess an individual's total social media use because they typically have more than one social media account and may actively and/or passively engage in reading, sharing and/or creating online content on multiple platforms (e.g., messaging followers on Facebook, watching videos on TikTok, following celebrities on Instagram, providing work-related information on LinkedIn, etc.). However, to assess problematic use on specific social media platforms, such as a video-sharing platform such as YouTube,[30] bespoke measures are needed. Therefore, it is necessary to develop specific instruments that directly assess YouTube addiction. However, no validated instruments exist to assess YouTube addiction among Indonesians. Several instruments have been developed for assessing YouTube addiction,[12,30,31] including the YouTube Addiction Scale (YAS), based on the components model of addiction.[17,30] The YAS demonstrates strong psychometric properties[30] and a significant correlation with psychological distress, including depression, anxiety, and stress, and has a one-factor structure.[30,32]

Translating and validating the YAS into Indonesian will enhance evidence for YouTube addiction as a specific type of SMA in Indonesia, aiding healthcare providers and researchers in assessing addiction severity. The study hypothesized that the Indonesian YAS would exhibit a strong one-factor model fit and measurement invariance across subgroups, including sex, smartphone addiction levels, SMA, and gaming disorder. Additionally, YAS scores were expected to positively correlate with scores from other social media behavior questionnaires, such as Smartphone Application-Based Addiction Scale (SABAS), BSMAS, Internet Gaming Disorder Scale-Short form (IGDS9-SF), and Nomophobia Questionnaire (NMPQ).

METHODS

Participants

The present study was a cross-sectional survey of Indonesian university students approved by ethics committee of Universitas Airlangga (3016-KEPK) before data collection. The online recruitment occurred from February to March 2024. Using a convenience sampling method, all participants (n=515) were invited to participate via a link to an online survey (i.e., SurveyMonkey), distributed by trained research assistants. Before completing the survey, all participants obtained information about the present study (e.g., study objective and participation rights) and provided their informed consent on the introduction page of the online survey. Participants completed questions including basic demographic and social media-related behavior questionnaires (see 'Measures' section). University students above 18 years of age who could speak and understand Bahasa Indonesian, and university students in Indonesia in 2024 were eligible to participate.

Translation process of YAS

The translation procedure was guided by guidelines for cross-cultural adaption of self-report measures.[33] The procedures were completed through three steps as follows. The first procedure was a forward translation method; the original version of YAS was first reviewed by two researchers, who were proficient in both English and Bahasa Indonesian with experts in measure adaption (the translators were a public health practitioner and a nurse), who translated the YAS from English to Bahasa Indonesian language independently. Moreover, both forward translations were merged into a completed forward translation by reaching an agreement from the first two translators. The second procedure was a backward translation method; completed forward translation was blind to perform a back translation from Bahasa Indonesian to English languages by two bilingual independent translators (both translators were nurses) to ensure the accuracy of the constructed YAS. The final procedure was a reconciliation method; all materials (i.e., two forward translations, completed forward translation, two backward translations, and original version) were further reviewed and approved by an expert panel committee (comprising two psychologists and one person in the nursing profession) to improve the item performance of the final version of the YAS.

The YAS is in the public domain and was therefore translated without review or confirmation from the original developers. The translated version underwent thorough discussion and finalization, taking into account Indonesian cultural and linguistic factors while maintaining the integrity of the original content. Experts in psychometrics and social media were

engaged in this process. Following this process, it was deemed that the YAS was an appropriate instrument for assessing YouTube addiction among Indonesians.

Measures

Participants demographics

The participants were asked to provide their age, sex, any health conditions or diseases, and average time spent using social media (per day).

YAS

The YAS is a self-report measure containing six questions to assess the severity of problematic use of YouTube.[30] The YAS was initially developed with all items constructed using the six core components of addiction (i.e., salience, mood modification, tolerance, withdrawal, conflict, and relapse) proposed by Griffiths.[17] All items are rated using a 5-point Likert scale (1="Never," 2="Rarely," 3="Sometimes," 4="Often," and 5="Very often").[30] An example YAS item is "Do you think that watching YouTube videos has overtaken your daily life activities?." The total score of the YAS is obtained by summing participants' answers to each item, and a higher score on the scale indicates greater problematic use of YouTube.[30] The YAS had good internal consistency in both the Persian version (Cronbach's α of 0.85−0.91) and the Turkish version (Cronbach's α of 0.81).[30,32]

SABAS

The SABAS is a self-report measure containing six questions that assess the severity of problematic use of smartphone applications.[34] The SABAS was initially developed with all items constructed using the aforementioned six core components of addiction.[17] All items are rated using a 6-point Likert scale (1="Strongly disagree," 2="Disagree," 3="Slightly disagree," 4="Slightly agree," 5="Agree," and 6="Strongly agree"). An example SABAS item is "My smartphone is the most important thing in my life." The total score of the SABAS is obtained by summing participants' answers to each item. The cutoff point for the SABAS is 23 (out of 36), and participants who have a total score of above 23 has an increased risk of addiction to smartphone applications.[35] The SABAS has an acceptable internal consistency in both English (Cronbach's α of 0.81)[34] and Indonesian (Cronbach's α of 0.74)[36] versions. Moreover, the SABAS had acceptable internal consistency (Cronbach's α of 0.74) in the present study.

BSMAS

The BSMAS is a self-report measure containing six questions to assess the severity of SMA.[37] The BSMAS was originally developed with all items constructed using six core components of addiction proposed by Griffiths.[17] All items are rated using a 5-point Likert scale: (1="Very rarely," 2="Rarely," 3="Sometimes," 4="Often," and 5="Very often"). An example BSMAS item is "You spend a lot of time thinking about social media or planning how to use it." The total score of the BSMAS is obtained by summing participants' answers to each item. The cutoff point of BSMAS is 19 (out of 30). Participants who have a total BSMAS score above 19 are at greater risk of SMA.[14] The BSMAS has good internal consistency in both English (Cronbach's α of 0.88)[37] and Indonesian (Cronbach's α of 0.80)[1] versions. Moreover, the BSMAS had good internal consistency (Cronbach's α of 0.80) in the present study.

IGDS9-SF

The IGDS9-SF is a self-report measure containing nine questions that assess the severity of gaming disorder.[38] The IGDS9-SF was developed using the nine DSM-5 criteria for IGD.[39] All items are rated using a 5-point Likert scale (1="Never," 2="Rarely," 3="Sometimes," 4="Often," and 5="Very often"). An example IGDS9-SF item is "Do you feel preoccupied with your gaming behavior?." The total score of the IGDS9-SF is obtained by summing participants' answers to each item. The cutoff point of IGDS9-SF is 21 (out of 45), and participants who have total score of IGDS9-SF above 21 are at greater risk of internet gaming disorder.[40] The IGDS9-SF has a good internal consistency in both English (Cronbach's α of 0.87)[38] and Indonesian (Cronbach's α of 0.92)[1] versions. Moreover, the IGSDS9-SF had good internal consistency (Cronbach's α of 0.93) in the present study.

NMPQ

The NMPQ is a self-report measure containing 20 questions that assess severity of nomophobia (i.e., fear of being without a mobile phone).[41] All items are rated using a 7-point Likert scale from 1 ("Strongly disagree") to 7 ("Strongly agree"). An example NMPQ item is "I would feel uncomfortable without constant access to information through my smartphone." The NMPQ has four factors (not being able to communicate, losing connectedness, not being able to access information, and giving up convenience). The total score of the NMPQ is obtained by summing participants' answers to each item, and a higher score on this scale indicates greater nomophobia. The NMPQ has excellent internal consistency in both English (Cronbach's α of 0.95)[41] and Indonesian (Cronbach's α of 0.92)[1] versions. Moreover, the NMPQ had good internal consistency (Cronbach's α of 0.94) in the present study.

Statistical analyses

All statistical analyses were performed using the JASP 0.19.1.[42]

Descriptive analyses were first performed to summarize participants' characteristics and the measures' (i.e., YAS, SABAS, BSMAS, IGDS9-SF, and NMPQ) basic properties. Moreover, score distribution for each YAS item was checked using skewness and kurtosis, of which skewness ranging between -3 to 3 with kurtosis ranging between -8 to 8 was interpreted as an acceptable normal distribution[43,44] Moreover, factor loadings (which were obtained from confirmatory factor analysis [CFA]) and the corrected item-total correlations were applied for assessing item properties of YAS, and values for both factor loadings and the corrected item-total correlations above 0.4 were interpreted as acceptable.[45,46] Moreover, Cronbach's α and McDonald's ω coefficients were performed to examine internal consistency of the YAS, with values above 0.7 being interpreted as reliable.[47,48]

CFA was performed to explore the construct validity of Indonesian YAS, using a diagonally weighted least square (DWLS) estimator due to the Likert-type scale used in the YAS.[49] To evaluate CFA model fit, a set of fit indices, including the chi-square (χ^2) test, comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR), were performed. Criteria suggesting a good model fit were nonsignificant χ^2, CFI/TLI greater than 0.9,[50] and RMSEA/SRMR smaller than 0.08.[51]

The present study further examined whether there was measurement invariance evidence for the YAS across various subgroups, including sex (female vs. male), different levels of smartphone addiction (using SABAS cutoff score [<23 vs. ≥23]), SMA (using BSMAS cutoff score [<19 vs. ≥19]), and gaming disorder (using IGDS9-SF cutoff score [<21 vs. ≥21]), using multi-group CFA (MGCFA). Three nested models were performed to test for measurement invariance using the following steps: 1) Model 1 (M1) of configural model (invariance of factor structure across subgroups), 2) Model 2 (M2) of metric invariance model (invariance of factor loadings across subgroups), and 3) Model (M3) of scalar invariance model (invariance of intercepts across subgroups). To examine if the invariance was supported, every two nested models were compared using the following criteria: non-significant χ^2 difference test, and ΔCFI >-0.01, ΔRMSEA <0.015, ΔSRMR <0.03 (for factor loading) or <0.01 (for item threshold) to indicate measurement invariance of YAS across various subgroups.[52,53] Lastly, Pearson correlations were used to assess the concurrent validity of YAS with scores on the SABAS, BSMAS, IGDS9-SF, and NMPQ. Pearson r values of 0.1, 0.3, and 0.5 are recommended to indicate small, medium, and high effect sizes, respectively.[54,55]

RESULTS

Descriptive analyses

Table 1 shows characteristics of the study participants. More specifically, the participants (n=515) were predominantly female university students (n=411, 79.8%) with a mean age= 20 years (SD=1.5). Most participants reported no diseases or health condition (77.3%). The average daily hours of social media use was 5.5 hours (SD=3.4). Total mean score on the YAS was 12.8 (SD=3.8) and total mean score on the NMPQ was 94.3 (SD=19.6). A total of 245 participants (47.6%) had higher SABAS score than the cutoff point (23 out of 36). A total of 153 participants (29.7%) had higher BSMAS score than the cutoff point (19 out of 30). A total of 104 participants (20.2%) had higher IGDS9-SF score than the cutoff point (21 out of 45).

CFA and reliability analyses

Table 2 shows item properties and scale properties for the YAS. More specifically, all YAS items had lower mean score and SD with normal distribution of data (skewness ranging

Table 1. The characteristics of participants (N=515)

	Mean±SD	N (%)
Age (yr)	20.02±1.48	-
Sex		
Male	-	104 (20.2)
Female	-	411 (79.8)
Any condition or disease		
Yes	-	117 (22.7)
No	-	398 (77.3)
Daily hours on social media	5.46±3.41	-
YAS (T)	12.76±3.77	-
SABAS (T)	22.15±4.74	-
<23 score	18.57±2.98	270 (52.4)
≥23 score	26.09±2.78	245 (47.6)
BSMAS (T)	16.30±4.19	-
<19 score	14.24±3.00	362 (70.3)
≥19 score	21.16±2.02	153 (29.7)
IGDS9-SF (T)	15.16±6.83	-
<21 score	12.31±3.57	411 (79.8)
≥21 score	26.41±4.68	104 (20.2)
NMPQ (T)	94.27±19.58	-

SD, standard deviation; YAS (T), YouTube Addiction Scale (Total score); SABAS (T), Smartphone Application Based Addiction Scale (Total score); BSMAS (T), Bergen Social Media Addiction Scale (Total score); IGDS9-SF (T), Internet Gaming Disorder Scale-Short form (Total score); NMPQ (T), Nomophobia Questionnaire (Total score); -, not applicable.

between -0.11 to 1.96; kurtosis ranging between -0.92 to 3.54). The CFA results confirmed that the YAS had a good fit for the one-factor structure (χ^2(df)=25.476(9), CFI=0.978; TLI=0.963; RMSEA=0.060; SRMR=0.049) except for a significant χ^2 (p=0.002). Moreover, each YAS item had acceptable factor loadings (ranging between 0.45 to 0.85) and corrected item-total correlations (ranging between 0.41 to 0.67). The YAS had acceptable internal consistency (Cronbach's α=0.74, McDonald's ω=0.76).

Measurement invariance analyses

Table 3 shows measurement invariance across subgroups. More specifically, invariance across sex was supported by all fit comparisons (M2-M1: non-significant χ^2 difference, ΔCFI=-0.006, ΔRMSEA=0.000, ΔSRMR=0.005; M3-M2: ΔCFI=-0.017, ΔRMSEA=0.009, ΔSRMR=-0.001) except for a significant χ^2 difference (p=0.004) in the M3-M2 model. Invariance across smartphone addiction levels was supported by all fit comparisons (M2-M1: non-significant χ^2 difference, ΔCFI=0.002, ΔRMSEA=-0.009, ΔSRMR=0.003; M3-M2: non-significant χ^2 difference, ΔCFI=-0.001, ΔRMSEA=-0.002, ΔSRMR=-0.004). Invariance across SMA levels was supported by all fit comparisons (M2-M1: non-significant χ^2 difference, ΔCFI=0.001, ΔRMSEA=-0.008, ΔSRMR=0.004; M3-M2: non-significant χ^2 difference, ΔCFI=0.003, ΔRMSEA=-0.008, ΔSRMR=-0.006). Invariance across gaming disorder levels was not fully supported (M2-M1: ΔCFI=-0.014, ΔRMSEA=0.012, ΔSRMR=0.013; M3-M2: ΔCFI=-0.023, ΔRMSEA=0.012, ΔSRMR=0.000), and the nested model comparisons also showed significant χ^2 differences in both M2-M1 model (p=0.008) and M3-M2 model (p=0.001).

Table 2. Item properties and scale properties for the YAS

Items level	Factor loadings*	Item-total correlation	Mean±SD	Skewness	Kurtosis
Y1	0.49	0.42	1.92±0.93	0.70	-0.19
Y2	0.54	0.47	2.78±0.90	0.16	-0.61
Y3	0.51	0.44	2.90±1.16	-0.11	-0.92
Y4	0.85	0.67	2.07±1.06	0.60	-0.70
Y5	0.57	0.50	1.70±0.89	1.19	0.92
Y6	0.45	0.41	1.38±0.71	1.96	3.54
Scale level	α/ω	CFI	TLI	RMSEA (90% CI)	SRMR
YAS	0.74/0.76	0.978	0.963	0.060 (0.033–0.088)	0.049
Cutoff	>0.7	>0.9	>0.9	<0.08	<0.08

*factor loadings and fit indices were derived from the confirmatory factor analysis (DWLS estimator); chi-square(df)=25.476(9), p=0.002. YAS, YouTube Addiction Scale; SD, standard deviation; α, Cronbach alpha coefficient; ω, McDonald omega coefficient; CFI, comparative fit index; TLI, Tucker-Lewis index; RMSEA, root mean square error of approximation; CI, confidence interval; SRMR, standardized root mean square residual.

Correlation analysis

Table 4 shows the correlation matrix among the scores between YAS, SABAS, BSMAS, IGDS9-SF, and NMPQ. More specifically, the YAS score had a moderate correlation with the BSMAS score (r=0.34, p<0.001), a small correlation with the SABAS score (r=0.29, p<0.001), IGDS9-SF score (r=0.20, p<0.001), and NMPQ score (r=0.16, p<0.001). The SABAS score had a high correlation with the BSMAS score (r=0.67, p<0.001), a moderate correlation with the NMPQ score (r=0.38, p<0.001), and a small correlation with the IGDS9-SF score (r=0.22, p<0.001). The BSMAS score had moderate correlation with NMPQ score (r=0.41, p<0.001) and IGDS9-SF score (r=0.31, p<0.001). However, the IGDS9-SF score had no correlation with the NMPQ score (r=0.01, p=0.887).

DISCUSSION

The present study provides preliminary evidence in regard to the phenomenon of YouTube addiction in Indonesia. The present study aimed to translate and assess the psychometric properties of the Indonesian version of the YAS, a self-report questionnaire that assesses severity levels of YouTube use among young adults. Results from the CFA confirmed the one-factor structure of the YAS, as indicated by good fit indices. Additionally, the YAS had acceptable internal consistency (Cronbach's α=0.74). Results also indicated that the YAS was supported by measurement invariance across subgroups, including sex (female vs. male), and different levels of smartphone addiction and SMA (but not gaming disorder levels). Additionally, YAS has a positive correlation with other social media-related behavior scales (i.e., SABAS, BSMAS, IGDS9-SF, and NMPQ). Overall, the Indonesian version of YAS had acceptable levels of validity and reliability.

Moreover, the present findings highlight that the Indonesian version of YAS demonstrated similarities with the original study and the Turkish version in terms of its one-factor structure, acceptable internal consistency, and concurrent validity with the BSMAS and SABAS.[30,32] Additionally, the present study found that the Indonesian version of the YAS was positively correlated with the IGDS9-SF and NMPQ. The results also supported the measurement invariance of the YAS across sex as with the original version.[30] Moreover, measurement invariance was observed across other subgroups, including different levels of smartphone addiction (based on SABAS cutoff score: <23 vs. ≥23), SMA (based on BSMAS cutoff score: <19 vs. ≥19), and gaming disorder (based on IGDS9-SF cutoff score: <21 vs. ≥21). These findings extend the evidence

supporting the psychometric properties of the Indonesian version of YAS.

In line with the previous validation studies,[30,32] the results demonstrated a unidimensional construct of YAS in assessing YouTube addiction. In addition, the present finding (Cronbach's α=0.74) was also similar to the previous validation of YAS (Cronbach's α=0.80−0.91) in relation to internal consistency.[30,32] Therefore, the findings of the present study further support the robustness of the psychometric properties of YAS, which contributes significant evidence of the YAS being able to assess YouTube addiction in Indonesia.

However, the present study found a lower Cronbach's α value compared to those reported in two previous studies.[30,32] Evidence suggests that Cronbach's α value can be influenced by age differences.[56] While the previous validations of the YAS included participants with a mean age of 24 and 26 years,[30,32] the present study included a younger sample with a mean age of 20 years. The younger age in the present study may have contributed to the lower Cronbach's α value. Moreover, the YAS was originally developed in Iran (i.e., in the Persian language) and without any translation issues. Therefore, the Iranian sample had the highest Cronbach's α value. Given that the Turkish language shares a similar language system to Persian,[57] it is

Table 4. Correlation matrix among the YAS, SABAS, BSMAS, IGDS9-SF, and NMPQ

	YAS	SABAS	BSMAS	IGDS9-SF	NMPQ
YAS					
SABAS	0.29*				
BSMAS	0.34*	0.67*			
IGDS9-SF	0.20*	0.22*	0.31*		
NMPQ	0.16*	0.38*	0.41*	0.01	

*p<0.001. YAS, YouTube Addiction Scale; SABAS, Smartphone Application-Based Addiction Scale; BSMAS, Bergen Social Media Addiction Scale; IGDS9-SF, Internet Gaming Disorder Scale-Short form; NMPQ, Nomophobia Questionnaire.

Table 3. Measurement invariance across sex (female vs. male), SABAS (<23 vs. ≥23 scores), BSMAS (<19 vs. ≥19 scores), and IGDS9-SF (<21 vs. ≥21 scores) on the YouTube Addiction Scale

	χ^2 (or $\Delta\chi^2$)	p	CFI (or ΔCFI)	RMSEA (or ΔRMSEA)	SRMR (or ΔSRMR)
Sex					
M1 (df=18)	34.27	0.012	0.979	0.059	0.062
M2 (df=23)	43.87	0.005	0.973	0.059	0.067
M3 (df=28)	61.22	<0.001	0.956	0.068	0.066
M2-M1 (Δdf=5)	(9.60)	0.088	(-0.006)	(0.000)	(0.005)
M3-M2 (Δdf=5)	(17.35)	0.004	(-0.017)	(0.009)	(-0.001)
SABAS					
M1 (df=18)	29.20	0.046	0.984	0.049	0.059
M2 (df=23)	32.58	0.089	0.986	0.040	0.062
M3 (df=28)	38.43	0.091	0.985	0.038	0.058
M2-M1 (Δdf=5)	(3.38)	0.642	(0.002)	(-0.009)	(0.003)
M3-M2 (Δdf=5)	(5.85)	0.321	(-0.001)	(-0.002)	(-0.004)
BSMAS					
M1 (df=18)	31.65	0.024	0.980	0.054	0.061
M2 (df=23)	35.76	0.044	0.981	0.046	0.065
M3 (df=28)	38.64	0.087	0.984	0.038	0.059
M2-M1 (Δdf=5)	(4.11)	0.534	(0.001)	(-0.008)	(0.004)
M3-M2 (Δdf=5)	(2.88)	0.719	(0.003)	(-0.008)	(-0.006)
IGDS9-SF					
M1 (df=18)	29.00	0.048	0.985	0.049	0.056
M2 (df=23)	44.72	0.004	0.971	0.061	0.069
M3 (df=28)	66.30	<0.001	0.948	0.073	0.069
M2-M1 (Δdf=5)	(15.72)	0.008	(-0.014)	(0.012)	(0.013)
M3-M2 (Δdf=5)	(21.58)	0.001	(-0.023)	(0.012)	(0.000)

SABAS, Smartphone Application-Based Addiction Scale; BSMAS, Bergen Social Media Addiction Scale; IGDS9-SF, Internet Gaming Disorder Scale-Short form; M1, configural model; M2, loadings constrained equal; M3, loadings and thresholds constrained equal; CFI, comparative fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual.

reasonable that Turkish YAS would have an α value close to the Persian YAS. However, Bahasa Indonesian is a different language system from Turkish and Persian. Therefore, the translation issue may have also contributed to the lower α value in the present study. The present study's findings yielded a Cronbach's alpha of 0.74, which, while modest, exceeds the commonly accepted threshold of 0.7 for internal consistency, particularly in early-stage scale validation studies.[58] Moreover, the Indonesian version of the YAS also demonstrated acceptable internal consistency when evaluated using McDonald's ω coefficient. Taken together, these results support the reliability of the YAS as a tool for assessing YouTube addiction among Indonesian young adults.

The present findings also found that measurement invariance supported YAS across sex, concurring with sex invariance testing in the original version of YAS.[30] Moreover, the present results support measurement invariance of the YAS across different levels of smartphone addiction (assessed using the SABAS) and SMA (assessed using the BSMAS). However, the study found that measurement invariance was not fully supported for YAS across gaming disorder levels (assessed using the IGDS9-SF) due to the ΔCFI (ΔCFI=-0.023) not meeting the cutoff values (ΔCFI >-0.01). However, the IGDS9-SF does not assess a construct strongly related to social media use so this is not entirely unexpected. Moreover, a previous study reported that an unbalanced sample size could affect the values of ΔCFI.[52] According to the present results, there was a large difference in the number of participants who had IGDS9-SF scores between <21 scores (n=411) and ≥21 scores (n=104). However, to the best of the authors' knowledge, there have been no previous studies evaluating the measurement invariance of YAS across different levels of smartphone addiction, SMA, and gaming disorder. Therefore, these findings contribute to the evidence for the YAS and ensure the meaningful use of this instrument and valid group comparisons. Moreover, the present study encourages further research to investigate the measurement invariance of YAS across various subgroups.

The YAS score had a significant positive correlation with general SMA score (assessed using BSMAS) which was similar to the findings of the YAS validation studies.[30,32] The BSMAS[37] was developed by modifying the items of the Bergen Facebook Addiction Scale (BFAS) that also represented six core components of addiction.[17] The present study's findings confirmed that the six core features of the YAS also appear appropriate for assessing YouTube addiction. Moreover, the present results showed that there was a significantly high correlation between SABAS and BSMAS (r=0.67, p<0.001). Evidence indicates that SMA is strongly associated with smartphone addiction due to the fact that most individuals access social media platforms on their smartphones.[6]

Additionally, the present study suggests that the YAS can be used to more efficiently assess the risk of developing YouTube addiction in both clinical practice and research settings. For clinical practice, the YAS may enhance the accuracy of diagnosing YouTube addiction as a specific behavioral addiction. With improved diagnostic precision, the YAS could help clinicians establish effective treatment strategies to ensure better outcomes. In research settings, the YAS could be valuable for advancing the understanding of YouTube addiction and for developing psychometric tools specifically designed to assess SMA and for YAS scores to be compared with scales assessing other variables of related interest (e.g., poor psychological health, negative body image, eating disorders, etc.).

The present study has several limitations. First, a convenience sampling procedure was used to collect the data, which affects the representativeness of the samples. Second, all participants recruited were Indonesian university students. Therefore, the present samples may not be generalized to other population groups (e.g., children or older adults). Further validation across diverse populations is necessary to ensure the scale provides accurate assessment among groups other than university students. Third, all the measures used in the present study were self-report. Therefore, social desirability and recall bias may have affected the findings. Finally, the present study examined only the factor structure, internal consistency, and validity of YAS. Therefore, future research is needed to evaluate the test-retest reliability of YAS as well as to estimate the cutoff scores to differentiate addictive YouTube use from non-addictive use.

In conclusion, the present study's results suggested that the YAS is a valid and reliable instrument for assessing the addiction severity level of YouTube among Indonesian university students. This instrument is invariant across various subgroups (i.e., sex, different levels of smartphone addiction and SMA). Moreover, YAS scores were significantly correlated with scores on the SABAS, BSMAS, IGDS9-SF, and NMPQ. The findings generated preliminary evidence on screening potential risks of addictive YouTube use among Indonesian young adults. However, further studies should continue to assess the psychometric properties of the YAS, which may enhance the development of this instrument to deliver accurate and consistent results.

Availability of Data and Material

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

Mark D. Griffiths has received research funding from Norsk Tipping (the gambling operator owned by the Norwegian government). MDG has received funding for a number of research projects in the area of gambling education for young people, social responsibility in gambling and gam-

bling treatment from Gamble Aware (formerly the Responsibility in Gambling Trust), a charitable body which funds its research program based on donations from the gambling industry. MDG undertakes consultancy for various gambling companies in the area of player protection and social responsibility in gambling. All remaining authors have no potential conflicts of interest to disclose.

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