



## Research article

## The psychometric properties of Social Anxiety Scale for Adolescents (SAS-A) short form-Bangla

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## ABSTRACT

There is a lack of available valid assessment tools (published) for assessing social anxiety symptoms among Bangladeshi people. Therefore, this study was aimed to examine the psychometric properties of the Social Anxiety Scale for Adolescents (Short Form) to assess the social anxiety symptoms among Bangladeshi young adults. In this study, the data ( $N = 683$ ) from the 'Social Media Addiction among University Students' project were utilized. Results regarding item-level information using classical test theory and item response theory demonstrated that all items of the scale had a higher discrimination index and acceptable infit and outfit mean squares. The confirmatory factor analysis supported a three-factor structure for the scale and strict invariance between males and females. Scale level results showed that this translated scale had good internal consistency reliabilities, composite reliability, as well as acceptable average variance extracted values, standard error of measurement, and discrimination power. Regarding validity, this scale had moderate to low correlations with loneliness and the big five personality traits. To sum up, the SAS-A-SF Bangla is a psychometrically sound measure that would be helpful for practitioners and researchers to assess the social anxiety symptoms among Bangladesh young adults.

## 1. Introduction

Social anxiety is a debilitating condition that entails exposure to embarrassment or scrutiny of an individual in conjunction with highly negative images of performance in any social situation. Individuals with social anxiety experience more negative feelings about their body and related manifestations compared to the general population (Edelmann and Baker, 2002). It seems to be very prominent in adolescence, but oftentimes goes undetected during the developmental process with its internalized nature; however, it can be expressed through the young adult years. Wittchen, Lieb et al. (2000) confirmed that high prevalence of social anxiety was found within 14 to 24-year-old adults. At this stage, social anxiety often manifested through persistent fears, shyness or inhibited temperaments and avoidance of situations where individuals feel like they will be negatively evaluated by others (Clark and Wells, 1995). Carleton et al. (2006) have suggested that fear of negative evaluation is a type of fear which is responsible for other types of fears, pathologies, and anxieties, one of which is social anxiety.

Symptoms of social anxiety persist over a longer period and hamper the daily life functioning, which can lead to Social Anxiety Disorder (SAD; American Psychiatric Association, 2013). Several previous studies

identified considerable factors regarding social anxiety like a new social environment (Miers et al., 2013), academic settings (Brook and Willoughby, 2015; Piray et al., 2019), poor peer acceptance and difficult peer relationships (Bracik et al., 2012), negative relationships with parents (Knappe et al., 2012), and low positive affect (Brown et al., 1998). O'Connor and Fitzgerald (2020) found that individuals with social anxiety often show an avoidance tendency towards social interaction with others.

Primarily, subjective feelings of social anxiety often expressed as difficulty in concentrating and mood changes, also have an increased risk of alcohol dependence and substance use disorder among adolescents and young adults (Buckner et al., 2008; Buckner et al., 2008). Additionally, in extreme cases it reduced quality of life, disrupted social functioning, with poorer reported general and mental health conditions; this was also shown to be negatively correlated with employment, work performance and social relationships (Wittchen et al., 2000), along with an increase in stigmatization (Rodríguez-Rivas, 2021). Barrera and Norton (2009) found that undergraduate students having social anxiety, generalized anxiety disorder or panic disorder were quite dissatisfied with their quality of life than non-anxious students.

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Due to the detrimental impacts of social anxiety, it is often recommended that social anxiety be diagnosed early to potentially indicate a need for immediate accessible interventions to provide appropriate services to people (Morrison et al., 2019). Such research is vital to draw valid conclusions regarding alarming developmental trends in social anxiety symptoms. Therefore, a clearer understanding of social anxiety and its measurement tools are important to identify the risk factors about how social anxiety develops among adolescents and adults.

There are several ways to assess social anxiety symptoms, such as the Social Anxiety Scale for Children (La Greca et al., 1988; revised: La Greca and Stone 1993), the Social Anxiety Scale for Adolescents (La Greca and Lopez 1998), the Social Phobia and Anxiety Inventory for Children (Beidel et al., 1998), the Social Phobia Inventory (Connor et al., 2000), the Social Phobia Screening Questionnaire for Children (Gren-Landell et al., 2009), and the Social Interaction Anxiety Scale (SIAS; Mattick and Clarke, 1998). Recently, researchers have been interested in using shorter instruments to assess psychological constructs. In the present study, we used the psychometric properties of the Social Anxiety Scale for Adolescents Short Form (SAS-A-SF; Nelemans et al., 2019) for the purpose of assessing social anxiety among Bangladeshi young adults. The SAS-A-SF comprises three distinct subscales (Fear of Negative Evaluation [FNE], Social Avoidance and Distress – New [SAD-N], and Social Avoidance and Distress – General [SAD-G]) and each subscale contains four items. Various studies have also found that this scale provides a valid and reliable social anxiety measure for either clinical or community samples (Ronchi et al., 2019).

### 1.1. Present study

Studies have suggested that social phobia or social anxiety usually begins in adolescence and is found more frequently in the young adult period (Schneier et al., 1992; Wittchen et al., 1999). Social phobia or social anxiety is persistent and intense and can increase the possibility of negative consequences (Beidel et al., 1998). As per evidence, due to its prevalence social anxiety within adolescent and young adult period it is necessary to address such anxiety with appropriate measures. However, there is no scale for assessing young adults' social anxiety in the Bangla language. Because of the necessity of a relatively shorter tool for assessing social anxiety symptoms, the SAS-A-SF was translated into the Bangla language and its psychometric properties were examined. Although the SAS-A-SF was originally developed for assessing the social anxiety among adolescents, this scale was translated for assessing social anxiety among Bangladeshi young adults.

## 2. Materials and methods

### 2.1. Participants

The present study was a part of the project titled 'Social Media Addiction among University Students: Role of Personality Traits, Social Need for Belongingness, Social Anxiety, and Loneliness' that was carried out between January 2019 and May 2019. The target population was Bangladeshi university students and the study sample was comprised of 683 university students (Male 63.1%) who were selected through purposive sampling technique from the University of Chittagong, Bangladesh and the Jagannath University, Bangladesh. The only inclusion criterion was that participants had to be between 19 to 30 years old. Participants' age mean was 20.99 years with a standard deviation of 1.93 years. Among participants, 33.5% were first-year undergraduate students, 21.4% were second-year students, 22.8% were third-year students, 15.5% were fourth-year students and 6.7% were Master's degree students. In terms of current residence, 35.4% were living with their family, 41.1% were in a private house and the rest 23.4% were in university student dormitories.

### 2.2. Measures

The present study included the following scales – i) the Social Anxiety Scale for Adolescents (La Greca and Lopez, 1998) Short Form (SAS-A-SF; Nelemans et al., 2019), the Big Five Personality Inventory-10 (BFPI-10; Ahmed and Hossain, in press [Bangla version]; Rammstedt and John, 2007), the UCLA Loneliness scale (Russell et al., 1980) – Short Form (Ahmed, 2019 [Bangla version]; Hays and DiMatteo, 1987), and demographic information including participants' age, gender, residence, academic year, family type, sleep duration, etc.

#### 2.2.1. Social Anxiety Scale for Adolescents (SAS-A) short form

The Social Anxiety Scale for Adolescents (SAS-A; La Greca and Lopez, 1998) is an 18-item scale for assessing social anxiety among adolescents. Nelemans et al. (2019) shortened this scale to a 12-item measure that contains three subscales (Fear of Negative Evaluation, Social Avoidance and Distress-New, and Social Avoidance and Distress-General); there are 4 items in each subscale. Nelemans et al. (2019) also found good internal consistency reliability (alpha) and latent reliability (Composite reliability) for this scale. Participants rated their responses in this scale using a 5-point Likert-type scale, ranged from 0 (*totally not applicable to me*) to 4 (*totally applicable to me*). Total scores ranged from 0 to 48. The higher scores indicate higher social anxiety symptoms.

The scale was translated for assessing social anxiety symptoms among Bangladeshi young adults following the International Test Commission (ITC, 2018) guidelines for the test translation and adaptation. The SAS-A-SF was translated into the Bangla language from English independently by two language experts and a draft translated version was prepared from these two translations. The draft forward translation was sent to be back translated into English by another two language experts. Then, the back translated version was finalized from these two back translations and compared to the original English version to assess discrepancy in meaning between the original and back translated versions. There were no major discrepancies in meaning between these two. Then, the translated version of the scale was placed in a pilot study on a sample of 20 participants. Observations and cognitive interviews suggested that meaning of items were clear and the same to all participants. Then, the translated scale was placed in the final study.

#### 2.2.2. Big five Personality Inventory-10 (BFPI-10)

The Big Five Personality Inventory-10 (BFPI-10; Rammstedt and John, 2007) is a 10-item reliable and valid tool for assessing the 'Big Five' personality traits (extraversion, agreeableness, conscientiousness, neuroticism, and openness) in which each trait was assessed by two items. Authors reported this scale highly correlated (.51–.70) with the Revised NEO Personality Inventory (Costa and McCrae, 1992). Participants rated their responses in this scale using a five-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The Bangla version of this scale (Ahmed and Hossain, in press) had satisfactory test-retest reliability (.60–.79) and convergent validity. In the present study, the BFPI-10 Bangla version had acceptable average inter-item correlations (.225–.359). This scale also had acceptable model fits in this study ( $\chi^2/df = 3.94$ , goodness of fit index [GFI] = .97, comparative fit index [CFI] = .91, root mean square error of approximation [RMSEA] = .066).

#### 2.2.3. UCLA loneliness scale- short form

The UCLA Loneliness scale is a 20-item reliable and valid scale for assessing subjective feelings of loneliness (Ahmed, 2019 [Bangla version]; Hays and DiMatteo, 1987). There are several short forms of this scale, and the 8-item short form is one of these. This short form is also a reliable and valid tool for assessing loneliness. Authors reported high correlation between the full-length scale and the short form ( $r = .91$ ). Participants rated their responses in this scale using a four-point Likert-type scale, ranging from 1 (*never*) to 4 (*always*). Total scores ranged from 8 to 32. Higher scores indicate higher subjective feelings of loneliness. In the present study, this scale had good internal consistency

reliabilities ( $\omega = .775, \alpha = .772$ ). This scale also had acceptable model fits in this study ( $\chi^2/df = 3.01, GFI = .98, CFI = .97, RMSEA = .054$ ).

### 2.3. Statistical analysis

In the present study, IBM SPSS version 26, IBM AMOS version 24.0, JSAP 0.12.1.0, Microsoft Excel 10, and R were used for data management and data analysis. The psychometric properties of the SAS-A-SF were assessed using both the Classical Test Theory (CTT) and Item Response Theory (IRT). Descriptive statistics (skewness and kurtosis) were used to assess the normality of the data. For larger sample ( $N > 300$ ), a skewness value more than 2 and kurtosis value more than 7 indicate non-normality of the data (Kim, 2013).

Under the CTT, item analysis (item total correlations [accepted value  $\geq .3$ : Field, 2017], Cronbach's alpha, McDonald's Omega, split-half reliability [accepted reliability  $\geq .7$ : Nunnally, 1978]), confirmatory factor analysis [CFA], and measurement invariance test were performed. Using the CFA, three models (model 1: single-factor model, model 2: three-factor model, and model 3: bi-factor model) were tested. Model fits were assessed through  $\chi^2/df$  ratio ( $< 5$ ; Marsh and Hocevar, 1988), comparative fit index [CFI], Tucker–Lewis index [TLI] ( $\geq .90$ ; Dimitrov, 2012), root mean square error of approximation [RMSEA], and standardized root mean square residual [SRMR] ( $\leq .08$ ; Schreiber et al., 2006). Multigroup CFA (MGCFA) was performed to assess the measurement invariance (configural, metric, scalar, and strict) between male and female. Changes in  $\chi^2, CFI, RMSEA,$  and SRMR, across models (configural  $>$  metric  $>$  scalar  $>$  strict) suggest the measurement invariance of a tool. Non-significant  $\Delta\chi^2, \Delta CFI > -.010, \Delta RMSEA < .015,$  and  $\Delta SRMR < .01$  are indicators of measurement invariance (Chen, 2007). Then, a Pearson product moment correlation test was performed to assess the convergent validity of the correlation of the scores of the SAS-A-SF to scores of the Big-Five Personality Scale–10 and the UCLA Loneliness scale.

Under the IRT, items' validity (infit mean square [MnSq] and outfit mean square [MnSq]) was assessed using the Rating Scale Model (RSM). Infit MnSq and outfit MnSq values between .5 and 1.5 are acceptable (Linacre, 2012). Dimitrov (2012) suggested most of Rasch based analysis involved following guidelines – at least 10 observations in each category, regular distribution of observation, average outfit MnSqs less than 2, thresholds advance monotonically with categories, etc. The thresholds advancement with categories was checked through item characteristic curves using RSM. The 'mirt' package (v 1.3) was used to analysis the data.

### 2.4. Ethics

This study was carried out in accordance with the Declaration of Helsinki and its later amendments. There is no formal Ethical Review

Board in the authors' institutions. However, the Planning Committee of the Department of Psychology (the committee for experimentation, ethics, and discipline), University of Chittagong, Bangladesh approved and gave moral support to conduct this study. All procedures followed in the study were in accordance with the ethical standards of this responsible committee of the Department of Psychology, Chittagong University. Before collecting data from participants, study objectives, confidentiality of data, costs and benefits were explained and the signature of the informed consent form was requested. Each participant received a wooden key ring (engraved university logo) after completing the survey as a retribution for the time expended.

### 3. Results

The skewness and kurtosis values in Table 1 suggested the normality of the data. All values are below the suggested cut off by Kim (2013). Item analysis results (Table 1) explored that all items had higher corrected item-total correlation (ranged between .681 and .793 for the Fear of Negative Evaluation subscale; between .515 and .705 for the Social Avoidance and Distress – New subscale; and between .545 and .678 for the Social Avoidance and Distress – General subscale). Table 1 also shows that the Bangla SAS-A-SF had accepted item validity in IRT model (rating scale model). The infit mean squares ranged between .57 and .93 and outfit mean squares ranged between .55 and 1.02. Item characteristic curves (ICC) suggested that thresholds advanced monotonically with categories (Supplementary Figure 1).

The model fit indices (Table 2) of the models (single-factor model, three-factor model, and bi-factor model) suggested that both three-factor model ( $\chi^2/df = 4.741, GFI = .942, CFI = .953, TLI = .940, RMSEA = .074, SRMR = .0433$ ) and bi-factor model ( $\chi^2/df = 3.014, GFI = .973, CFI = .981, TLI = .968, RMSEA = .054, SRMR = .0323$ ) had good model fit where bi-factor model had better model fit than three-factor model. However, three-factor loadings of the Social Avoidance Distress – General subscale were non-significant in the bi-factor model. Therefore, the three-factor model was accepted over the bi-factor model. The factor loadings were ranged from .72 to .87 for the Fear of Negative Evaluation Scale, .57 to .81 for the Social Avoidance and Distress – New subscale, and .64 to .77 for the Social Avoidance and Distress – General subscale.

Measurement invariance statistics in Table 3 suggest that the SAS-A-SF Bangla had measurement invariance at configural ( $\chi^2/df = 3.04, CFI = .950, RMSEA = .077, SRMR = .044$ ), metric ( $\Delta\chi^2 = 9.219, p = .417, \Delta CFI = 0, \Delta RMSEA = -.003, \Delta SRMR = .003$ ), scalar ( $\Delta\chi^2 = 7.247, p = .841, \Delta CFI = -.001, \Delta RMSEA = -.005, \Delta SRMR = .001$ ), and strict level ( $\Delta\chi^2 = 12.875, p = .378, \Delta CFI = 0, \Delta RMSEA = -.003, \Delta SRMR = .001$ ). These suggested that the Bangla SAS-A-SF assesses the same construct, social anxiety, between young males and females.

**Table 1.** The item level psychometric properties of the SAS-A Short Form Bangla.

Subscales	Items	Mean	SD	Skewness	Kurtosis	Corrected item-total correlation	Factor loading	IRT item validity	
								Infit MnSq	Outfit MnSq
Fear of Negative Evaluation	Item 1	1.42	1.30	.60	-.73	.681	.72	.95	.86
	Item 2	1.50	1.23	.44	-.79	.793	.87	.57	.55
	Item 3	1.56	1.28	.40	-.91	.756	.81	.69	.64
	Item 4	1.37	1.28	.53	-.89	.690	.79	.93	.79
Social Avoidance and Distress–New	Item 5	1.66	1.29	.27	-1.04	.664	.75	.78	.74
	Item 6	1.57	1.27	.32	-.99	.702	.80	.68	.64
	Item 7	1.60	1.28	.31	-.99	.705	.81	.68	.64
	Item 8	2.09	1.21	-.02	-.94	.515	.57	1.04	1.02
Social Avoidance and Distress–General	Item 9	1.88	1.30	.06	-1.12	.545	.77	.95	.92
	Item 10	1.54	1.22	.34	-.90	.647	.69	.72	.67
	Item 11	1.18	1.25	.66	-.74	.616	.76	.84	.74
	Item 12	1.48	1.26	.39	-.94	.678	.64	.68	.64

Note. SD = standard deviation; IRT = item response theory; MnSq = mean square.

**Table 2.** Model fit indices of the tested models of the SAS-A Short Fform Bangla.

Models	$\chi^2/df$	GFI	CFI	TLI	RMSEA	SRMR
Single	17.685	.759	.780	.731	.156	.0854
Three	4.741	.942	.953	.940	.074	.0433
Bi-factor	3.014	.973	.981	.968	.054'	.0323

Note. GFI = goodness of fit index, CFI = comparative fit index, TLI = Tucker-Lewis index, RMSEA = root mean square error of approximation, SRMR = standardized root mean square residual.

**Table 3.** Measurement invariance of the SAS-A Short Form Bangla between male and female.

Model	$\chi^2$	df	$\Delta$	p-value	CFI	$\Delta$	RMSEA	$\Delta$	SRMR	$\Delta$
Configural	300.960	99			.950		.077		.044	
Metric	310.179	108	9.219	.417	.950	0	.074	-.003	.047	.003
Scalar	317.426	120	7.247	.841	.951	-.001	.069	-.005	.048	.001
Strict	330.301	132	12.875	.378	.951	0	.066	-.003	.049	.001

Note. CFI = comparative fit index, RMSEA = root mean square error of approximation, SRMR = standardized root mean square residual.

Table 4 shows that the scale had a minimum floor effect (2.3%) and no ceiling effect (0%). The scale had good internal consistency reliabilities (alpha ranged from .805 to .874, omega ranged from .808 to .876, and split-half reliability through Spearman-Brown formula .814 to .837), composite reliability (ranged between .809 and .875), and average variance extracted (ranged between .515 to .638). Table 4 also showed that the scale had accepted standard error of measurement (3.28) and discrimination ability (Ferguson's delta .99). Table 5 shows that scores of the Bangla SAS-A-SF had moderate correlations with neuroticism and loneliness scores and lower correlations with extraversion, agreeableness, conscientiousness, and openness personality traits. These correlations suggested the convergent validity of this scale.

#### 4. Discussion

The present study was aimed to assess the adequacy of the psychometric properties of the Social Anxiety Scale for Adolescents (La Greca and Lopez, 1998) short form (SAS-A-SF; Nelemans et al., 2019) for assessing social anxiety among Bangladeshi young adults. Results demonstrated that the all items of the Bangla SAS-A-SF had a higher discrimination measured through corrected item-total correlations (>.3) which suggested that these items adequately discriminate between people having higher vs. lower social anxiety. This is a strong psychometric feature of this scale. Results regarding the rating scale model also supported the item validity as all items had acceptable infit and outfit mean squares (ranging between the recommended range; Linacre, 2012). Item characteristics curves suggested that thresholds in all items advanced monotonically with categories.

The results regarding the CFA supported the first-order three factors structure of the Bangla SAS-A-SF. This model had acceptable model fits

and adequate factor loading of each item. Factor loading values indicate the relationship strength of the items for the latent trait. These results were also consistent with the factor structure of the English version (Nelemans et al., 2019). Results regarding MGCFA suggested that the scale under study had strict invariance between males and females. This result suggested that the Bangla SAS-A-SF assesses the same construct between males and females. It also emphasizes the adequacy of this measure to assess the mean differences between males and females in observed social anxiety scores. Nunes et al. (2018) also suggested that the Portuguese version of the SAS-A had scalar invariance between male and females.

Results regarding reliability of the scale demonstrated that all subscales and full scale had good internal consistency reliabilities (i.e., alpha, omega, and split-half reliability) and acceptable standard error of measurement and Ferguson's delta (discrimination power). Although there is no clear cutoff value for a good reliability, some authors suggest .80 or higher reliability as suitable for screening purposes (Bardhoshi and Erford, 2017; Erford, 2013). Besides this all subscales had acceptable AVE (>.50) values and composite reliabilities (>.70). Results also demonstrated strong support regarding the convergent validity for the scale. The moderate correlations with scores of the loneliness scale and the neuroticism subscale as well as the lower correlations with all big five personality traits subscales, except neuroticism—support the convergent validity of the scale.

##### 4.1. Limitations and recommendations

The present study had some limitations. First, participants were recruited from somewhat limited geographical areas. This might pose some problems regarding generalizability. Potential users should be careful about this issue while applying to people other than university

**Table 4.** The scale level psychometric properties of the SAS-A Short Form Bangla.

Psychometric properties	Value	Suggested cut off
Floor effect	2.3	15%
Ceiling effect	0	15%
Cronbach's alpha	.805-.874 (Subscales), .903 (full scale)	≥.7
McDonald's Omega	.808-.876 (Subscales), .903 (full scale)	≥.7
Split-half reliability	.814-.837 (Subscales), .894 (full scale)	≥.7
Average variance extracted	.515 - .638 (Subscales),	≥.5
Composite reliability	.809 - .875 (Subscales),	≥.7
Standard error of measurement	3.28	Smaller than SD/2 (SD = 10.53)
Ferguson's delta	.99	≥.9

**Table 5.** Correlation coefficients of the SAS-A Short Form Bangla to the Big Five Personality Inventory-10 and the UCLA Loneliness scale – Short Form.

Construct	Correlation with SAS-A Short Form Bangla
Extraversion	$r = -.297, p < .001, 95\% \text{ CI } [-.364, -.227]$
Agreeableness	$r = -.222, p < .001, 95\% \text{ CI } [-.292, -.150]$
Conscientiousness	$r = -.198, p < .001, 95\% \text{ CI } [-.269, -.124]$
Neuroticism	$r = .312, p < .001, 95\% \text{ CI } [.242, .378]$
Openness	$r = -.240, p < .001, 95\% \text{ CI } [-.310, -.168]$
Loneliness	$r = .459, p < .001, 95\% \text{ CI } [.398, .516]$

students. Second, due to its cross-sectional nature, the test-retest reliability properties of the SAS-A-SF were not evaluated. Third, this is a self-report measure where responses might be subjected to social desirability bias. Fourth, the data were collected from general people. There were no data from a clinical sample. The cut off value of this scale was not assessed also due to the availability of social anxiety measures in Bangla. Further studies are recommended including a clinical sample to assess the psychometric properties of this scale.

### 5. Conclusion

The present study suggests that the Bangla SAS-A-SF had good psychometric properties for quick assessment of social anxiety symptoms among Bangladeshi young adults. This measure would be helpful to mental health practitioners to assess social anxiety symptoms and formulate therapeutic interventions for the well-being of patients.

### Declarations

#### Author contribution statement

Najifa Alam: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Oli Ahmed: Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Lutfun Naher: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Wrote the paper.

Fatema Akhter Hiramoni: Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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#### Data availability statement

Data will be made available on request.

#### Declaration of interests statement

The authors declare no conflict of interest.

#### Additional information

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