ADAPTATION STUDY OF THE STATISTICAL ANXIETY SCALE ON A BANGLADESHI SAMPLE

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Abstract. Due to unavailability of a developed or adapted instrument for statistical anxiety in Bangladesh context, the present study was designed to adapt the Statistical Anxiety Scale (SAS) (Vigil-Colet et al., 2008). Adaptation procedure was done by following guidelines of the International Test Commission (ITC). The translated SAS was administered on a sample of 238 students from the Chittagong University who were selected though non-probability sampling techniques. The internal consistency reliabilities, content validity, and construct validity were determined for assessing the psychometric properties of the Bangla SAS. The item-total correlations, exploratory factor analysis, confirmatory factor analysis, correlation coefficients among the SAS and its subscales, *Cronbach's Alpha*s, split-half reliability, composite reliability suggested that the Bangla SAS would be a psychometrically sound measure to apply in Bangladesh context.

Keywords: anxiety, statistics, reliability, validity, factor analysis

Introduction

Nowadays statistics is very important because statistical knowledge is necessary for many situations including for conducting scientific research and advancing knowledge and technology. It plays significant role from a broad spectrum of Social and Natural Sciences fields. Basic statistical knowledge are used for making the reports of political elections, sports games, advertisements, census records, weather forecasts, and for many situations which we come across every day. For the importance of statistics, students at undergraduate level have to study statistics. However, a form of anxiety related to statistics presents among students.

Anxiety is defined as a feeling which sometimes encourages people to carry out creative and positive behaviors by motivating them in everyday life and sometimes hinders such positive attitudes and generally creates discomfort. Anxiety can be categorized into two groups-state anxiety and trait anxiety (Spielberger, 1983). State anxiety is defined as an unpleasant emotional arousal in face of threatening demands or dangers. Trait anxiety reflects the existence of stable individual differences in the anticipation of threatening situations. State anxiety reveals itself in a specific situation or time when it appears, it can point out a dangerous situation potentially. Trait anxiety reveals an anxiety that doesn't appear with regard to a specific situation and individuals who have this anxiety can be anxious in any situation (Croft, 2000; Dede, 2008).

Statistics anxiety refers to a state-anxiety reaction to any situation in which a student is confronted with statistics in any form and at any time. The reactions could include worry, tension and physiological symptoms of stress when students are faced with taking a statistical class (Zeidner, 1991; Onwuegbuzie et al., 1997). From the perspective of teaching, statistics anxiety can be an obstacle to students' learning. Some researchers suggested statistics anxiety as a necessary arousal to aid students to achieve optimal performance (Zeidner, 1991; Keeley et al., 2008). Anxiety while studying is a major predictor of academic performance.[1] Researchers revealed that high levels of anxiety influence

on the decrease of working memory, distraction, and reasoning in students (Aronen et al., 2004). Statistics anxiety can negatively affect student's performance and his or her overall psychological and physiological condition. Research revealed that some psychological symptoms such as depression, frustration, panic, and worry are observed in students while expressing their concerns over statistics anxiety along with physiological signs of headaches, muscle tension, perspirationetc. (Onwuegbuzie et al., 1997).

The antecedents of statistics anxiety can be classified as situational, dispositional, and environmental (Onwuegbuzie & Wilson, 2003). Situational antecedents refer to factors that surround the stimulus object or event and include variables such as mathematics anxiety (Baloğlu, 2004) and characteristics of statistics courses (Bell, 2005; DeVaney, 2010). Dispositional antecedents refer to the personality characteristics of an individual and include variables such as procrastination (Onwuegbuzie, 2004) and reading ability (Collins & Onwuegbuzie, 2007). Lastly, environmental antecedents refer to events which occurred in the past and include variables such as age and gender (Baloğlu et al., 2011; Bui & Alfaro, 2011). Because of the negative effects of statistics anxiety, the antecedents of statistics anxiety are important in identifying high-risk individuals for intervention.

Studies suggested negative relation between statistics anxiety and statistics achievement (Onwuegbuzie & Seaman, 1995; Tremblay et al., 2000; Onwuegbuzie, 2003; Hanna & Dempster, 2009). Students who experienced higher levels of statistics anxiety tend to have lower performance on a statistics examination (Keeley et al., 2008). As the negative relationship between statistics anxiety and achievement in statistics, it would be important for researchers and instructors to have a reliable and valid measure to identify students with statistics anxiety. However, there were no such measures either developed or adapted in Bangladesh context to identify undergraduate students' anxiety toward statistics.

There are several measures purported to measure anxiety related statistics. In the present study, authors intended to adapt the Statistical Anxiety Scale, SAS (Vigil-Colet et al., 2008) as it provides a specific measure of statistics anxiety. Chew & Dillon (2014) conducted a study to examine the psychometric properties of this measure among students in Singapore and Australia. The SAS provides a specific measure of statistics anxiety. They found acceptable internal consistency reliabilities ranged from .88 to .95 for the three factors of the SAS. Confirmatory factor analysis suggested that a modified three-factor model best describe the data. Scores on the SAS had positive correlation with another measure of statistics anxiety, and negative correlation with a measure of attitudes toward statistics.

The adapted measure would be helpful for intervening programs those were devised to reduce the statistical anxiety among undergraduate students. Findings of the present study would be helpful for the students, teachers, even policy makers to design student friendly curriculum that also would be meet the practical demands of the society and world. The main objective of the present study was to adapt the Statistical Anxiety Scale (SAS) in Bangladesh context. Other objectives were: (i) to estimate the item-total correlations of item in Bangladeshi culture; (ii) to explore the factor structure of the SAS; iii) to test the explored factor structure as good model fit; iv) to estimate the convergent validity of the SAS; v) to estimate the internal consistency reliabilities.

Method

Participants

The study population of the present study was university students of Bangladesh. Among universities, the Chittagong University was selected on the basis of convenient. Total 238 undergraduate students from Chittagong University were taken as sample following purposive sampling technique. Their age

mean was 21.53 years and *standard deviation* was 1.12 years. Sample distribution in terms of corresponding faculty and year by respondents' gender is presented in Table 1.

Table 1. Sample distribution in terms of corresponding faculty and year by their gender

Variable	Faculty			Years		
	Science	**Biological Science**	**Social Science**	**2nd**	**3rd**	**4th**
Male	47 (19.7%)	53 (22.3%)	32 (13.4%)	52 (21.8%)	52 (21.8%)	48 (11.8%)
Female	48 (20.2%)	42 (17.6%)	16 (6.7%)	38 (16.0%)	47 (19.7%)	21 (8.8%)
Total	95 (39.9%)	95 (39.9%)	48 (20.2%)	90 (37.8%)	99 (41.6%)	49 (20.6%)

Measures

The Statistical Anxiety Scale-SAS (Vigil-Colet et al., 2008) is 24 items measure that consist of three subscales. These subscales are: (i) *examination anxiety* (anxiety when taking statistics exams, e.g., going to a statistics exam without having had enough time to revise); (ii) *asking for help anxiety* (anxiety when asking the course teacher, another student, or a private teacher questions about statistics, e.g., asking one of your teachers for help in understanding a printout); and (iii) *interpretation anxiety* (anxiety when they have to interpret statistical data and understand the formulation used in statistics, e.g., interpreting the meaning of a table in a journal article). Distribution of items in each subscale of the SAS is given below: (a) *asking for help:* it includes 8 items and the item numbers are 3, 5, 7, 12, 17, 21, 23, 24; (b) *examination anxiety:* it includes 8 items and the item numbers are 1, 4, 9, 11, 13, 14, 15, 20; and (c) *interpretation anxiety:* it includes 8 items and the item numbers are 2, 6, 8, 10, 16, 18, 19, 22.

In this measure, respondents were required to express their opinion in 5-point Likert scale that ranged from 1 = No Anxiety (Strongly Disagree) to 5 = Considerable Anxiety (Strongly Agree). Vigil-Colet et al. (2008) reported internal consistency ranging from .82 to .92 for the subscales and .91 for the total scale. Additionally, the subscales were positively correlated with trait anxiety and neuroticism, and negatively correlated with statistics performance.

Procedures

Taking into account the rules or guidelines established by the International Test Commission (ITC) for the translation and adaptation of measurement instruments from one language to another and from one culture to another, the Statistical Anxiety Scale (SAS; Vigil-Colet et al., 2008) was adapted in Bangladeshi cultural context. Steps, used for the adaptation of the SAS, were following: (A) *Step 1: Ensuring construct equivalence and taking permission* - To determine whether the constructs of the original version of the SAS had the same meanings in Bangladeshi culture, journals and books written by Bangladeshi scholars had been reviewed. In addition, an expert from the Department of Psychology, University of Chittagong, had judged the construct equivalency between the two cultures. It appeared convincing from literature review along with expert's opinion that the construct of the instrument under the study was equivalent in Bangladesh context. So, corresponding authors of the measures were emailed to take their permission to adapt the scale in our cultural context; (B) *Step two: translation into Bangla language* - The SAS was translated into Bangla language by two master students – one from the Psychology department, and another from the English department of the University of Chittagong. Then these translations were evaluated by a news translator who expert in translation between English and Bangla and by a teacher of the Psychology department of the University of Chittagong. These experts put much effort in selecting the best words, expressions of items to translate and evaluate translations. Then the translations of the SAS were synthesized into one. This synthesized version was

examined for content validity by 5 teachers of the Psychology department of the University of Chittagong. They were requested to check and systematic revision of conceptual equivalence of words or phrases. They suggested some modifications of some words, items, expressions. According to their suggestions again translated versions of the SAS were synthesized; (C) *Step three: back translation* - The translated Bangla version of the SAS was back translated into original language (English) by two persons who were Bangladeshi and expert in English language. One of them was teacher of English department of Premier University, Chittagong, Bangladesh, and another was student of the A' level at Mastermind International School and College, Chittagong, Bangladesh. Their translations were synthesized into one. Then, items of the original English version and the back-translated version of the two scales were compared by two teachers of the Psychology Department of the Chittagong University to ensure that the translated English version maintained the same meanings and concepts as in the original version. The expert opined that the back translated version was very much similar to the original version: (D) *Step four: pilot study* - In this stage, the translated Bangla of SAS was administered on a sample of 30 students selected purposively from University of Chittagong. Questionnaire was administered on the students in classroom settings. The collected data of the pilot study were subjected to *item analysis* to estimate the *item-total correlations* and *internal consistencies.* The *Cronbach*'s *Alpha*s were ranged from .736 to .780 for subscales of the SAS. *Item analysis* also revealed that *corrected item-total correlations* were ranged from .021 (Item 1) to .705 (Item 7). Only item 21 had low item-total correlation (.021) with total score and rest of the item had sufficient item-total correlations. Translation of the Item 21 was reviewed, expert opinions were taken, and finalized for the final study; (E) *Step five: final study*- Being confirmed from the pilot test that translated Bangla version SAS was administered in the final study. At the beginning of administration of the questionnaire to respondents, they were requested to read the written instructions carefully. They were also given verbal instructions about their task. They were told that

there was no right or wrong answer but that it was important to answer all items honestly. They were also assured that the information collected from them would be strictly confidential and would be used only research purposes. They were asked to fill in the demographic information sheet and read the questionnaire and express their answers for each item by putting "tick" marks (√) on the appropriate response boxes. Students were requested to response all questions attentively and ask questions if they faced any difficulty in reading or understanding any item. They were also requested to check the questionnaire for ensuring the response of all items. After completing their task, they were thanked for their cordial cooperation.

Results

Item analysis

Collected data of the present study were subjected to the *item analysis* to estimate *corrected item-total correlations* for each item of the Bangla Statistical Anxiety Scale (SAS). *Corrected item-total correlations* and *Cronbach's Alpha*s *if item deleted* were presented in Table 2.

Table 2. Corrected item-total correlation and Cronbach's Alpha if the item deleted

Item	Corrected item-total correla-	Cronbach's Alpha if item deleted
Item 1	.464	.866
Item 2	.441	.867
Item 3	.400	.868
Item 4	.460	.867
Item 5	.382	.869
Item 6	.496	.866
Item 7	.517	.865
Item 8	.488	.866
Item 9	.507	.865
Item 10	.427	.868

Item 11	.552	.864
Item 12	.606	.862
Item 13	.402	.868
Item 14	.401	.868
Item 15	.458	.867
Item 16	.168	.875
Item 17	.523	.865
Item 18	.253	.872
Item 19	.224	.874
Item 20	.395	.869
Item 21	.520	.865
Item 22	.404	.868
Item 23	.545	.864
Item 24	.512	.865

From Table 2, *item-total correlations* of items of the Bangla SAS were ranged from .168 (item 16) to .606 (item 12).Only item 16 had insufficient item-total correlation. So, this item was excluded from the scale for further analysis.

Validity of the scale

The validity of the Bangla Statistical Anxiety Scale was measured by using following methods.

Face Validity: The Bangla SAS has a higher level of face validity because all members especially who were involved with the research such as, expert panel and researchers recognized all items of the scale seem to measure statistical anxiety of university level students. No one recommended these items were not appropriate to measure.

Content Validity: The essential remarks of the expert panels assured the content validity of the Statistical Anxiety Scale.

Construct validity: Construct validity of the Bangla version of the SAS was determined through *exploratory factor analysis* (exploring factor structure)

and *confirmatory factor analysis* (determining goodness to fit the structure model).

Exploratory Factor Analysis: To identify the factor structure of the Bangla version of SAS, 23 items were subjected to the *exploratory factor analysis (EFA)*. Before subjected to *EFA*, several statistics were examined to determine whether the collected data were suitable for *EFA* or not. The correlation matrix of 23 items revealed that all coefficient values were below .90 (coefficient above .90 possess the multi-collinearity problem). The determinant value (.001) was greater than the recommended value of the determinant .0001 (Yong & Pearce, 2013). The *Kaiser-Meyer-Olkin (KMO)* measure of sampling adequacy (.864) and the *Bartlett's test of sphericity* (χ^2 = 16564.67, df = 253, p<.001) suggested that the collected data were suitable for *EFA*.

In the present study, to be considered as a factor, a component must have at least 3 or more items and a *Eigen* value $\geq$ 1 (the Kaiser-Guttman criterion). For retaining in a factor, each item's factor loading must be $\leq$ .40. Total *variance* explained by extracted factors that fulfilled criteria is presented in Table 3.

Table 3. Total variance explained by extracted factors

Component	Initial Eigen Value		
	Total	**% of Variance**	**Cumulative %**
1	6.281	27.308	27.308
2	2.111	9.180	36.488
3	1.601	6.959	43.446
4	1.396	6.068	49.515

Extraction Method: Principal Component Analysis

Table 3 shows that the analysis with *eigen value* $\geq$ 1 extracted 4 factor that accounted for 49.515% variance. The scree plot presented through Fig. 1 shows two clear breaks in the 2nd factor and 5th factor. The 2nd major break suggested that the number of factors to be retained were 4. Information from both Table 3 and Figure 1 presented a contradiction in retaining number of factors.

For coming into decision about number of factors, the factor structure and factor loadings of items were considered.
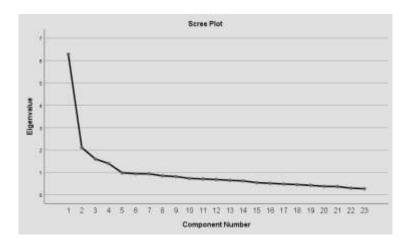

Figure 1. Scree plot generated through EFA of the Bangla SAS

Components structure matrix generated through the *EFA* of the Bangla version of SAS is presented through Table 4.

Table 4. Component structure matrix of the Bangla version of the statistical anxiety scale

Items	Component 1	Component 2	Component 3	Component 4
Item-23	.743			
Item-12	.702			
Item-7	.691			
Item-24	.636			
Item-17	.626			
Item-21	.624	.405		
Item-5	.589			
Item-3	.568			
Item-15		.727		
Item-13		.694		
Item-20		.678		
Item-9		.613		-.469
Item-11		.595		
Item-14		.570		

Item	1	2	3	4
Item-4		.529		-.449
Item-10			.730	
Item-6			.708	
Item-2			.660	
Item-8	.423		.605	
Item-18			.584	
Item-22			.486	
Item-19			.453	
Item-1		.464		-.625
Variance Explained	6.281	2.111	1.601	1.396
%Variance Explained	27.308	9.180	6.959	6.068

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Table 4 shows that the 1st component composed of item 3, 5, 7, 12, 17, 21, 23, and 24. These items' factor loadings were ranged from .568 (item 3) to .743 (item 23). Item 21 was cross loaded in component 1 (.624) and 2 (.405). For larger factor loading, item 23 was included in component 1. The 2nd component composed of item 4, 9, 11, 13, 14, 15, and 20. These items' factor loadings were ranged from .529 (item 4) to .727 (item 15). Item 4 and 9 were cross loaded in component 2 (.613, .529) and component 4 (-.469, -.449). These two items were included under component 2 as factor loadings under component 4 were negative. The 3rd component composed of item 2, 6, 8, 10, 18, 19, and 22. Factor loadings of these items were ranged from .453 (item 19) to .730 (item 10). Item 8 was cross loaded in component 1 (.423) and component 3 (.605). For larger factor loading, this item was included in component 3. The 4th component was composed of item 1. Factor loading of this item was -.625. However, this item was cross loaded in component 2 (.464) and component 4. This item was included in component 2 as factor loading under component 4 was negative. So, 3 components were retained to be considered as factor. The 1st factor was labeled as 'Anxiety related asking for help', the 2nd factor was labeled as 'Anxiety related to examination', and 3rd factor was labeled as 'Anxiety related to Interpretation'. Items under each factor were same as in the original scale.

Confirmatory Factor Analysis: To test the above factor structure as good fit, the collected data were subjected to *confirmatory factor analysis (CFA)*. The obtained fit statistics of *CFA* analysis are presented in Table 5.

Table 5. χ^2/df ratio, comparative fit index (CFI), root mean square error of approximation (RMSEA), standardized root mean square residual (sRMSR) for the Bangla version of the statistical anxiety scale obtained in CFA

Model fit indices	χ^2	df	χ^2/df	CFI	RMSEA	sRMR
1st **Model**	414.88	227	1.828	.872	.059	.060
2nd Model (Revised)	365.883	224	1.633	.904	.057	.052

Model fit indices from Table 5 show that χ^2/df = 1.828, CFI = .872, RMSEA = .059, and sRMR = .060. After examining the modification indices, the model was revised. From Table 5, except *CFI* statistic, all model fit indices were at acceptable level of fit. The diagram of the revised model is presented through Fig. 2.

Fig. 2 shows that all items of the Bangla SAS had sufficient factor loadings for retaining in a factor.

Convergent validity - The collected data were subjected to the *Pearson product moment correlation coefficient* for estimating the convergent validity of the Bangla SAS. Results of the analysis presented in the Table 6.
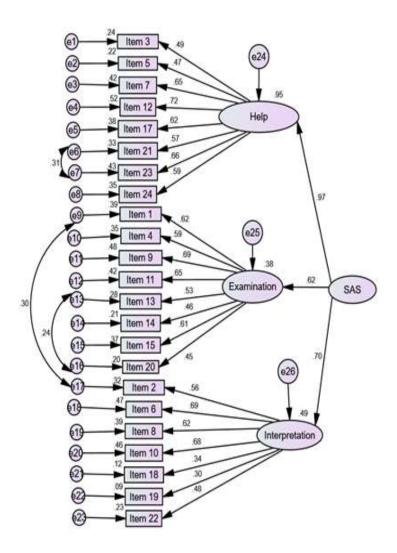
Figure 2. Model of the confirmatory factor analysis

Table 6 shows the Bangla SAS significantly correlated to the Anxiety related to asking Help subscale ($r=.841$, $p<.01$, 95% *CI* [.799, .875]), the Anxiety related to Examination subscale ($r=.800$, $p<.01$, 95% *CI* [.748, .841]), and the Anxiety related to Interpretation subscale ($r=.749$, $p<.01$, 95% *CI* [.687, .800]). The Anxiety related to asking for Help significantly correlated to the Anxiety related to Examination subscale ($r=.492$, $p<.01$, 95% *CI* [.389, .583]), and the Anxiety related to Interpretation subscale ($r=.510$, $p<.01$, 95% *CI* [.410, .598]). The Anxiety related to Examination subscale significantly correlated to

the Anxiety related to Interpretation subscale (*r*=.361, *p*<.01, 95% *CI* [.245, .466]).

Table 6. Correlation coefficients among statistical anxiety scale (SAS) and its three subscales (anxiety related asking for help [ARAH], anxiety related examination [ARE], anxiety related to examination [ARI]

Variable	SAS	ARAH	ARE
ARAH	.841** [.799, .875]		
ARE	.800** [.748, .841]	.492** [.389, .583]	
ARI	.749** [.687, .800]	.510** [.410, .598]	.361** [.245, .466]

**p<.01

Reliability

Internal consistency reliabilities: Collected data of the present study were subjected to the *item analysis* again to estimate the *internal consistency* reliabilities including *Cronbach's Alpha,* Split-half reliability through *Guttman split-half coefficient, Spearman-Brown coefficient*. Results of the analyses are presented in Table 7.

Table 7. Internal consistency reliabilities of the Bangla statistical anxiety scale (SAS) and its three subscales

Scale and Subscales	Cronbach's Alpha	Split-half reliability	
		Guttman Coefficient	Spearman-Brown Coefficient
SAS	.874	.833	.829
ARSH	.820	.788	.785
ARE	.780	.779	.764
ARI	.727	.748	.748

SAS = Statistical Anxiety Scale, ARSH = Anxiety related asking for help, ARE = Anxiety related examination, ARI = Anxiety related to examination

Table 7 shows the Bangla Statistical Anxiety Scale (SAS) has sufficient level of internal consistency reliabilities to apply in the Bangladeshi culture.

Composite reliability: Composite reliabilities of three subscales were .85, .83, and .80 respectively. All subscales had sufficient level of composite reliability.

Discussion

The current study was designed to adapt the Statistical Anxiety Scale, SAS (Vigil-Colet et al., 2008) in Bangladesh context. This measure had high reliability and validity in measuring anxiety related to statistics as reported by authors. Authors of the present study followed the guidelines of the International Test Commission (ITC) for translation and adaptation of a measure in foreign culture. For adaptation the SAS, permissions of authors were taken, translated and back translated. The pilot study of the Bangla SAS results suggested the measure could be applicable to in Bangladesh context. Then authors went on final administration of the Bangla SAS to determine the reliability and validity. Table 2 showed that except item 16, all items of the Bangla SAS had sufficient *item—total correlations*. So, item 16 was excluded from the measure to proceed in further analysis to explore the factor structure.

The *KMO measure of sampling adequacy* score (.855) suggested that sample was adequate to run the *exploratory factor analysis*. The *KMO* score below .50 unacceptable, .50 as miserable, .60 as mediocre, .70 as middling, .80 as meritorious, .90 as marvelous or superb (Kaiser, 1974). The *Barlett's test of sphericity* compares the original correlation matrix with the identity matrix and suggested suitability of the variables to be included in the *factor analysis*. In the present study, the *Barlett's test of sphericity* was significant. A significant *Barlett's test of sphericity* ($p<.001$) score suggests both matrices are not same and study variables are suitable to apply to *factor analysis* (Field, 2017). Table 3 suggested 4 factors fulfilled the criteria to be retained as factor. But, screes plot presented through *Figure 1* showed contradiction about deciding the number of

retained factors. Examining results about factor loadings from Table 4, the number of retained factors were 3 as same as original scale. Table 4 also suggested that all 23 items had sufficient level of factor loadings (minimum loading for item must be ≥ 0.40). The 1st factor was labeled as 'Anxiety related asking for help', the 2nd factor was labeled as 'Anxiety related to examination', and 3rd factor was labeled as 'Anxiety related to Interpretation'.

Model fit statistics, of confirmatory factory analysis, from Table 5 showed the explored factor structure of the Bangla SAS had acceptable level of model fit except the *CFI* value. To be fitted at acceptable level, a model's χ^2/df ratio should be < 5 (Marsh & Hocevar, 1988), *CFI* values should be in ≥.95 (Schreiber et al., 2006), *RMSEA* value should be .06to .08 (Schreiber et al., 2006), and *sRMR* value should be ≤.08 (Schreiber et al., 2006). However, some authors suggested the *CFI*value close to .90 shows a very good fit (Karadeniz et al., 2008). So, it could be said that all fit indices of recommended model had met these criteria. Standardized factor loadings from Fig. 1 suggested that all items had sufficient factor loadings. These results suggested that the explored factor structure had acceptable level of fit. Chew & Dillon (2014) suggested a modified three-factor model for students of Australia and Singapore.

Table 6 showed significant positive correlations among the Bangla SAS and its subscales suggested convergent validity of the measure. Table 7 showed that this measure had sufficient internal consistency reliabilities. As a rule of thumb, the *Cronbach*'s *Alpha* score should be ≤.70 for using as an instrument (Nunnally, 1978). Kilne (2000) suggested that alpha less than 0.50 is unacceptable, .50 to .60 is poor, .60 to .70 is acceptable, .70 to .90 is good, and above .90 is excellent. However, there are no clear cut-off points those separating poor and good reliabilities, but values between .70-.80 are viewed as sufficient (Furr, 2011). Chew & Dillon (2014) found acceptable internal consistency reliabilitiesfor three factors ranged from .88 to .95.

This adapted Bangla Statistical Anxiety Scale would be helpful for teachers, guardians, and others for intervening plan and program to reduce statistics related anxiety among students. However, the present study was conducted only on sample from the Chittagong University. The norm was not established. It is a limitation of this study. A large scale study would be required to establish the norm of this measure in Bangladesh culture.

NOTES

1. https://macquarieinstitute.com/company/proom/archive/encounter_journal_brain_jam.html

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APPENDIX: The Bangla Statistical Anxiety Scale (SAS)

এখানে পরিসংখ্যান নিয়ে আপনি উদ্বিগ্নতা অনুভব করেন কিনা তা চিহ্নিত করবেন। ডানপাশে পাঁচ মাত্রার মানকের মাধ্যমে আপনার অনুভূতি বা মনোভাব প্রকাশের জন্য ৫টি পছন্দক্রম (A, B, C, D, E) রয়েছে। প্রতিটি উক্তি মনোযোগ সহকারে পড়বেন এবং যে পছন্দক্রমটি আপনার অনুভূতি বা মতামতকে সবচেয়ে ভালো ভাবে বর্ণনা করে সেটিতে টিক চিহ্ন (√) দিন। কোনো উক্তি বাদ দেয়া যাবে না এবং না বুঝলে আমাকে জিজ্ঞাসা করবেন।

(A =একেবারেই একমত নই, B=একমত নই, C=অনিশ্চিত / মাঝামাঝি, D=একমত, E=সম্পূর্ণ একমত)

আমি উদ্বিগ্নতায় ভুগি….						
১.	পরীক্ষার জন্য পরিসংখ্যান কোর্স পড়ার সময়	A	B	C	D	E
২.	জার্নাল বা সাময়িকির সারণির (তালিকার) অর্থ ব্যাখ্যা করার সময়	A	B	C	D	E
৩.	বুঝতে পারছিনা এমন বিষয়ে পরিসংখ্যান শিক্ষকের ব্যক্তিগত সাহায্য চাওয়া নিয়ে	A	B	C	D	E
৪.	আমি যে বিষয় গুলো সহজ মনে করেছিলাম, পরীক্ষার আগের দিন সেগুলোর সমাধান করতে পারবো না বলে মনে হলে	A	B	C	D	E
৫.	একেবারেই বুঝতে পারছিনা এমন একটি বিষয় আমার গৃহশিক্ষককে বুঝিয়ে দিতে বলা নিয়ে	A	B	C	D	E
৬.	পরিসংখ্যানগত বিশ্লেষণ আছে এমন জার্নাল বা সাময়িকীর প্রবন্ধ পড়ার সময়	A	B	C	D	E
৭.	কিভাবে একটি সম্ভাব্যতার ছক ব্যবহার করতে হয় তা শিক্ষককে জিজ্ঞাসা করা নিয়ে	A	B	C	D	E
৮.	একটি গাণিতিক প্রমাণ বোঝার চেষ্টা করার সময়	A	B	C	D	E
৯.	পরিসংখ্যান কোর্সের চূড়ান্ত পরীক্ষা দেয়ার সময়	A	B	C	D	E
১০.	একটি মোটরগাড়ির জন্য গ্যাসমাইলের অতিক্রান্ত দূরত্ব, জনসংখ্যা নিয়ন্ত্রণের সঙ্গে সম্মতি, ইত্যাদি সংখ্যার সাথে সম্পর্কিত বিজ্ঞাপন পড়ার সময়	A	B	C	D	E
১১.	পরিসংখ্যান পরীক্ষা দেওয়ার জন্য পরীক্ষা কেন্দ্রের দিকে যাওয়ার সময়	A	B	C	D	E

১২.	কিভাবে অনুশীলন করতে হয় সে সম্পর্কে শিক্ষককে জিজ্ঞাসা করা নিয়ে	A	B	C	D	E
১৩.	পাঠ্যক্রম (সিলেবাস) পুন:পাঠের সময় না থাকায় পরীক্ষার আগের দিন পড়তে গেলে	A	B	C	D	E
১৪.	পরিসংখ্যান পরীক্ষার দিনে ভোরে ঘুম থেকে জেগে ওঠা নিয়ে	A	B	C	D	E
১৫.	পরীক্ষা দিতে যাওয়ার কিছুক্ষণ আগে অনুধাবন করা যে, নির্দিষ্ট বিষয়ে আমার প্রস্তুতি নেই।	A	B	C	D	E
১৭.	ছাপাপৃষ্ঠার তথ্যাবলী বোঝার ক্ষেত্রে সহযোগিতার জন্য শিক্ষককে জিজ্ঞাসা করার সময়	A	B	C	D	E
১৮.	একটি লটারিতে সম্ভাব্যতার মাত্রা বোঝার চেষ্টা করলে	A	B	C	D	E
১৯.	আমার সহপাঠী ছকের মাধ্যমে একটি সমস্যার সমাধান করার সময় তাকে মনোযোগ সহকারে দেখার সময়	A	B	C	D	E
২০.	পুনরায় পড়ার (রিভিশন দেয়ার) যথেষ্ট সময় না থাকার পরও পরিসংখ্যান পরীক্ষা দিতে গেলে	A	B	C	D	E
২১.	একটি ফলাফলের সারণি বা ছক ব্যাখ্যায় সহযোগিতা করার জন্য শিক্ষককে জিজ্ঞাসা করতে হলে	A	B	C	D	E
২২.	জার্নাল বা সাময়িকীর সংক্ষিপ্তসাও বর্ণিত পরিসংখ্যানগত বিশ্লেষণ বোঝার চেষ্টা করার সময়	A	B	C	D	E
২৩.	প্রশ্ন জিজ্ঞাসা করতে শিক্ষকের কাছে যাওয়ার সময়	A	B	C	D	E
২৪.	অনুশীলন কিভাবে করতে হয় তা জানার জন্য গৃহশিক্ষককে জিজ্ঞাসা করতে হলে	A	B	C	D	E

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