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Examining Psychometric Properties of the Bangla Version of the Boredom Proneness Scale

Samsad Afrin Himi[a] and Fatema -Tu- Zohra Binte Zaman[a*]

Abstract: The aim of the present study was to investigate the psychometric properties of the Bangla version of Boredom Proneness Scale (BPS). A sample of 210 adolescents participated in this study. The first step of this study involved translating the original BPS into Bangla and translating it back to English. The translation was performed by the subject- matter experts. Finally, a panel consisting of three psychologists having expertise in psychology and proficiency in English reviewed and discussed the back-translation to confirm that the translation was consistent with the original meaning. The result of the exploratory maximum likelihood analysis yielded a five factor structure of the BPS Bangla with 25 items: external stimulation, internal stimulation, low self regulation, creativity, and monotonous. This supports the multi-dimensionality nature of the BPS within the adolescent people. The five factors explained together 31.63% of the total variance. The Bangla version of the BPS and its five factors demonstrated acceptance level of internal consistency, and good content and convergent validity. Therefore, the BPS Bangla appears to be valid and reliable tool, and thus suggests to investigating boredom proneness in further studies and developing appropriate intervention strategies.

Keywords: boredom, boredom proneness scale, psychometric, Bangla, adolescents

Introduction

Boredom represents a distinct emotional and unpleasant state in which individual feels a persistent lack of interest in concentrating on the current activity. Boredom proneness is a consequence of a propensity to attention lapses (Cheyne, Carriere, & Smilek, 2006). Several theories have posited different conceptualization of boredom in literature. For example, Mikulas and Vodanovich (1993) defined

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boredom as a state of relatively low arousal and dissatisfaction, which is attributed to an inadequate stimulating situation. According to O'Hanlon (1981), this construct is a unique psychophysical condition, produced by prolonged exposure to monotonous stimulation.

Individual differs in their propensity to experience boredom. Boredom proneness has been negatively related to the cognitive and behavioral aspects, such as, aggression (Dahlen, Martin, Ragan, & Kuhlman, 2004), cognitive shortcomings (e.g., Wallace, Kass, & Stanny, 2002; Wallace, Vodanovich, & Restino, 2003), lower educational achievement (e.g., Branton, 1970; Drory, 1982), poor impulse control (Leong & Schneller, 1993), procrastination (Vodanovich & Rupp, 1999), narcissism (Wink & Donahue, 1997), and poor work performance (e.g., Kass, Vodanovich, & Callander, 2001; Kass, Vodanovich, Stanny, & Taylor, 2001).

One of the widely used measures of boredom is Boredom Proneness Scale (BPS; Farmer & Sundberg, 1986), which attempts to represent the general tendency of experiencing boredom. Farmer and Sundberg (1986) suggested that the BPS assesses the extent to which an individual is connected to the environment. It has been translated and validated in different languages (e.g., French: Gana, & Akrami, 1998; Italian: Craparo, Faraci, Fasciano, Carrubba, & Gori, 2013; Tarkish: Dursun, & Tezer, 2013; Polish: Flakus & Chełkowska, 2013). Additionally, the validation studies on boredom proneness are mainly conducted on adult people (e.g., Dursun & Tezer, 2013; Vodanovich, Watt, & Piotrowski, 1997). However, recently boredom proneness (conceived as a personality trait) is found to be involved in adolescents' addictive internet use (Biolcati, Mancini, & Trombini, 2017; Chou, Chang, & Yen, 2018). Therefore, it would be very logical to validate the BPS on the adolescents in order to develop appropriate intervention strategies in this regard.

The BPS does not represent a single construct, rather appearing a multi-factorial structure (Ahmed, 1990; Vodanovich & Kass, 1990). However, the BPS factor structure seems to be highly unstable. Formerly, Farmer and Sundberg (1986) proposed a single score of boredom. Later, Ahmed (1990) used true/false item format of BPS, and conducted an exploratory factor analysis, which extracted two constructs: 'apathy' and 'inattention'. Gana and Akremi (1998) used the same format on French people and revealed two factors, which are labeled as 'internal and external stimulation'. In order to increase the sensitivity, Vodanovich and Kass (1990) used 7-point likert type format and found five factors (i.e., 'external stimulation', 'internal stimulation', 'affective responses', 'perception of time', and 'constraint'), whereas Vodanovich et al. (1997) yielded eight factors (conducted with African-American people): 'perception of time', 'creativity', 'monotony (external stimulation)', 'constraint', 'affect', 'patience', 'attention maintenance

(internal stimulation)', and 'challenge (external stimulation)'. On the basis of this likert-type format, Gordon, Wilkinson, McGrown, and Jovanoska (1997) identified five factors, recognized as 'needs a buzz', 'low self regulation', 'lack of creativity', and 'restless in restraint', whereas Craparo et al. (2013) found three factor solution with Italian people: 'creativity', 'apathy', and 'challenge'. Finally, Vodanovich, Wallace and Kass (2005) revised this 28-item, and suggested a short form of 12-item with two constructs: 'lack of internal stimulation and external stimulation'. Vodanovich and Kass (1990) advocated that the external factor assesses an individual's inability to satisfy a high need for excitement, challenge, and change, whereas the internal factor assesses an individual's inability to self-generate interest and engagement.

However, the factor structure of the BPS differs across cultures - even within the same culture, which indicates that it is important to validate the BPS to be useable in new culture. Therefore, in order to advance our understanding of the boredom proneness, we aimed to adapt and validate the BPS within the socio-cultural context of Bangladesh. We examined the psychometric properties of the BPS Bangla and established the culture-based factor structure of this instrument for the adolescents.

Methods

Participants

All participants were taken using convenience and purposive sampling technique from five different Bangla medium schools (government, nongovernment, and private) around Dhaka city. A total of 210 students (51% females & 49% males), studying in different classes (from class seven to class ten) willingly participated in this study. Two inclusion criteria were followed: participants (a) attended the school regularly, and (b) had no severe physical or neural problem that might interfere with the assessment. The age of the participants ranged from 12 to 18 years with a mean of 14.72 years and standard deviation (*SD*) of 1.21 years.

Measures

Boredom Proneness Scale (BPS). The BPS is originally developed by Farmer and Sundberg (1986). The scale comprises 28 items, arranged on true/false format in original version. However, we converted the true/false format of the BPS into a 7-point likert-type format, which typically ranges from "1" (*highly disagree*) to "7" (*highly agree*) (Vodanovich & Kass, 1990). Eighteen items are scored in such a

way, which reflect high boredom proneness (e.g., "Time always seems to be passing slowly"), but ten items (item no. 1, 7, 8, 11, 13, 15, 18, 20, 22, 25) are reverse scored (e.g., "I find it easy to entertain myself"). A higher score on the BPS is indicative of high boredom proneness. Test–retest reliability of the original true/false version of the BPS was found to be .83 after a one-week interval (Farmer & Sundberg, 1986) and .79 after a two-week (McGiboney & Carter, 1988). Internal consistency estimates for the 7-point scale ranges between .79 to .84 across a wide range of studies (e.g., Watt & Blanchard, 1994; Watt & Ewing, 1996).

Procedures

Bangla Translation of the BPS

The original BPS items were translated into Bangla. Then it was given to four judges (including one expert in Bangla, one expert in English and two experts in Psychology). Their mother tongue was Bangla and their medium of education was English. Their task was to evaluate the precision of translation and relevancy of each item for measuring boredom proneness in the socio-cultural context of Bangladesh. The researchers headed together with the translated versions and selected the best words, expression, or items by arriving at a consensus. Thus, the preliminary Bangla version of BPS was prepared. Regarding backward translation, a teacher of psychology, proficient in both English and Bangla language was entrusted with the task of translating the Bangla version into English. Finally, a panel consisting of three psychologists having expertise in psychology and proficiency in English reviewed and discussed the back-translation to identify any discrepancies in the meaning of the BPS Bangla.

Pre-testing and cognitive interviewing

The pre-testing was carried out by administering the Bangla version of BPS on a group of 30 students (age ranged from 14 years to 16 years). The student responded to each item by indicating how they perceived the certain statement. During the test administration, if the students did not understand any words or concepts, they were allowed to ask questions. The words that the student asked about were noted by the administrator to check whether it was necessary to modify them. Additionally, individual interview method was used to ask students whether there was anything that they found confusing, difficult, unacceptable or offensive. For some items, several possible alternative words were given. In these cases, the students were asked to choose the best option, which was conformed better to their

usual language. Corrected item-to-total correlation was analyzed in order to determine the appropriateness of each item. Internal consistency reliability (alpha coefficient) of this version was acceptable (α = .59).

Final data collection

Before collecting the proposed data, the researchers sent official letters to the respective authorities for seeking permission to carry out this research while stating clearly the purpose of the study with a pledge of confidentiality. A research assistant administered the scale following a detailed testing protocol. Students were directed to read the written instruction very carefully. They had to respond each item honestly. There was no right or wrong answer. They were assured that no one knows their responses since their names were not on the questionnaire. Students were also asked to respond silently, but if they faced any difficulty in reading or understanding any of the items they could raise their hands. After completing the task, all the respondents were thanked for their cooperation.

The data analysis was performed using SPSS 24 for Windows version to test reliability, convergent validity, and exploratory factor analysis with varimax rotation for tracking whether the 28 Bangla BPS items were divided into valid components, representing the Bangla version of boredom proneness. An internal reliability test was carried out in the form of Cronbach's alpha.

Results

Item analysis

A descriptive analysis of item distribution showed that all the item scores were normally distributed with the values of skewness and kurtosis under the general accepted values (i.e., skewness < 2 and kurtosis < 4; Kline, 1998), excepting item no. 10 and item no. 18. Therefore, these two items were excluded from further analyses. The correlation matrix of 26 items represented that out of 351 inter-item correlation coefficients, 108 were significant (Table 1).

We computed corrected item-to-total correlations for the 26 items to see how individual item went with the total BPS score. The corrected item-total correlation values of 26 items ranged from r = - .02 (item no. 25) to r = .41 (item no. 12). After deleting the item no. 25 (because of the negative value), we again computed this analysis, and found that the deletion of any other item was not likely to improve the reliability of the scale (see Table 2).

Factor analysis

First, we examined whether data were suitable for the factor analysis. The Kaiser-Meyer-Olkin (KMO) measure indicated a value of .70 and Barlett's test of sphericity was significant (χ^2 (300) = 970.90, $p < .001$)), which suggested that the factor analysis was deemed to be suitable with all 25 items. Second, in order to investigate the structure of this measure, an exploratory factor analysis was conducted. The parallel analysis recommended a five-factor solution for the BPS items. Thus, we analyzed the data limiting the number of factors to five using maximum likelihood extraction method (varimax rotation), and all factor loading < .20 were suppressed. Results further revealed that these five factors explained together 31.63% of the total variance in which Factor 1 accounted for 10.88% of variance, Factor 2 accounted for 7.99% of variance, Factor 3 accounted for 5.92% of variance, Factor 4 accounted for 3.45% of variance, and Factor 5 accounted for 3.40% of variance. As the items 2, 4, 3, 7, and 9 were cross loaded on more than one factor, we considered the highest loading of the items on the corresponding factors (Table 3). However, item 24 was loaded equally with Factor 1 and Factor 3. We retained this item in Factor 3, as the meaning of this item is equivalent with the other items of this factor. Therefore, Factor 1 includes items 3, 6, 12, 14, 19, 23, and 28, which we labeled as 'external stimulation'; Factor 2 includes items 8, 11, 13, 20, and 22, which we recognized as 'internal stimulation'; Factor 3 includes items 2, 4, 17, 21, 16, and 24, which we recognized as 'low self regulation'; Factor 4 comprises 1, 7, and 15, which we termed as 'creativity'; and Factor 5 comprises items 5, 9, 26, and 27, which we labeled as 'monotonous'.

Reliability

Internal consistency

For understating internal consistency, the coefficients of Cronbach's alpha was computed and found to be acceptable ($\alpha = .69$). The values of Cronbach's alpha for the subscales of the Bangla BPS – 'external stimulation', 'internal stimulation', 'low self regulation', 'creativity', and 'monotonous' were .64, .65, .57, .61, and .51, respectively.

Validity

Content validity

This study involved the subject- matter experts to assess whether the content of each Bangla version of BPS items represented the assessment of boredom proneness. They gave their essential remarks and suggested that the translated items were related to the concept of the boredom proneness

Table 1

Correlations between the BPS Items

Items	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*
Item 1	1																								
Item 2	-.13	1																							
Item 3	-.09	.30**	1																						
Item 4	-.13	.29**	.13	1																					
Item 5	.06	.17*	.25**	.13	1																				
Item 6	-.01	.09	.25**	-.05	.08	1																			
Item 7	.33**	-.02	.02	-.03	.23**	.05	1																		
Item 8	.17*	.06	.08	.15*	.06	-.07	.14*	1																	
Item 9	.05	.19**	.34**	.09	.37**	.19**	.12	.27**	1																
Item 11	.14*	.20**	.13	.20**	.16*	-.12	.17*	.24**	.19**	1															
Item 12	.13	.13	.20**	-.01	.11	.33**	.17*	-.01	.20**	-.03	1														
Item 13	.01	.01	.14*	.13	.03	-.01	.07	.27**	.03	.19**	-.03	1													
Item 14	.12	.07	.13	-.06	-.05	.35**	.01	-.10	.04	-.04	.39**	-.04	1												
Item 15	.40**	-.10	-	-.05	.08	-.07	.30**	.14*	.09	.02	.09	.02	.08	1											
Item 16	-.05	.32**	.25**	.24**	.13	.12	.03	.10	.13	.13	.20**	-.06	.08	-	1										
Item 17	-.19**	.36**	.23**	.23**	.13	.12	.10	-.09	-.04	-.00	.24**	.02	.08	-.03	.34**	1									
Item 19	-.07	.17*	.24**	-.07	.01	.28**	-.02	-.04	.05	.02	.24**	.05	.21**	-.16*	.20**	.18*	1								
Item 20	.12	.09	.09	.09	.09	-.03	.23**	.37**	.093	.23**	-.02	.22**	.01	.18**	.07	.03	.03	1							
Item 21	-.01	.14*	-.05	.11	.14*	.09	.11	-.01	.03	-.07	.15*	-.09	.04	-.06	.29**	.29**	.14*	.05	1						
Item 22	.14	.00	.05	.24**	.09	-.11	.14*	.21**	.10	.13	-.04	-.02	.03	.13	-.04	-.03	-.07	.23**	-.06	1					
Item 23	.03	-.05	-.04	.03	.15*	-.08	.09	.02	.00	.05	-.08	.10	-.15*	.15*	-.00	.02	-.07	.05	.11	.05	1				
Item 24	.00	.25**	.08	.07	.06	.21**	.08	-.01	.10	-.05	.28*	.09	.23**	.01	.19**	.17*	.27**	.01	.26**	-.15*	.05	1			
Item 25	-.13	-.01	-.13	.03	-	.05	-.12	-.09	-	-.05	.14*	-.07	.14*	-.09	.04	.02	.11	-.12	-.03	.01	-.04	.02	1		
Item 26	.08	-.03	-.11	.09	.05	-.12	.11	.03	.10	.02	-.03	.10	-.10	.13	-.09	-.06	-.06	-.04	-.02	.02	.17*	.04	.05	1	
Item 27	.12	.02	.11	.09	.27**	-.03	.21**	.14*	.31**	.04	.12	.11	-.05	.07	.08	-.01	-.06	.03	.15*	-.03	.20**	.10	-.29**	.16*	1
Item28	.16*	.04	.17*	-.05	.11	.36**	.13	-.15*	.05	-.16*	.33**	-.14*	.32**	.05	.16*	.15*	.26**	.05	.18**	.01	-.13	.30**	.07	-.05	-.05

Note. $^{**}p < .01$; $^{*}p < .05$.

Table 2

Corrected Item-total Correlation

Items	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha if item deleted
Item 1	93.79	217.82	.16	.69
Item 2	94.23	210.41	.31	.68
Item 3	94.82	210.08	.33	.68
Item 4	93.94	216.05	.22	.68
Item 5	94.07	209.71	.35	.67
Item 6	95.30	213.91	.23	.68
Item 7	94.32	210.02	.34	.68
Item 8	94.33	213.73	.23	.68
Item 9	94.84	206.76	.37	.67
Item 11	94.32	216.00	.21	.69
Item 12	94.89	206.50	.38	.67
Item 13	94.16	219.17	.14	.69
Item 14	94.99	214.86	.20	.69
Item 15	93.79	218.64	.13	.69
Item 16	94.36	210.73	.32	.69
Item 17	94.07	210.72	.27	.68
Item 19	94.75	217.32	.21	.68
Item 20	94.39	213.09	.27	.68
Item 21	94.43	215.68	.23	.68
Item 22	94.33	221.81	.12	.69
Item 23	93.61	223.33	.08	.70
Item 24	94.77	209.83	.32	.68
Item 26	93.99	224.33	.04	.70
Item 27	94.22	213.17	.25	.68
Item 28	94.93	212.43	.26	.68

Convergent validity

Convergent validity of the Bangla version of BPS was determined by estimating inter-factor correlations and the factor-full BPS correlations, as seen in Table 4. Although all the inter-factor correlations were not significant, the five BPS factors was significantly correlated with the full BPS (ranging from $r = .40$ to .70).

Table 3
Factor Loadings for the Exploratory Factor Analysis of the BPS Items

Items	Factor				
	1	*2*	*3*	*4*	*5*
Item 6: Having to look at someone's home movies or travel slides bores me tremendously.	.59				
Item 14: Much of the time, I just sit around doing nothing.	.58				
Item 28: When I was young, I was often in monotonous and tiresome situations.	.57				
Item 12: I am seldom excited about my work.	.56				
Item 19: It would be very hard for me to find a job that is exciting enough.	.43				
Item 3: Time always seems to be passing slowly.	.37	.26		-.35	.28
Item 24: Among my friends, I am the one who keeps doing something the longest.	.33		.33		
Item 23: I have so many interests; I don't have time to do everything.	-.25				
Item 8: I find it easy to entertain myself.		.56			
Item 20: I would like more challenging things to do in life.		.53			
Item 11: I get a kick out of most things I do.		.50			
Item 22: Many people would say that I am a creative or imaginative person.		.37			
Item 13: In any situation, I can usually find something to do or see to keep me interested.		.32			
Item 17: In situations, where I have to wait, such as a line or queue, I get very restless.			.63		
Item 16: I often find myself with nothing to do—time on my hands.			.50		
Item 21: I feel that I am working below my abilities most of the time.			.49		
Item 2: Frequently, when I am working, I find myself worrying about other things.		.23	.45	-.24	
Item 4: I often find myself at "loose ends," not knowing what to do.		.29	.37		

Cont.

Items	Factor 1	2	3	4	5
Item 15: I am good at waiting patiently.				.60	
Item 1: It is easy for me to concentrate on my activities.				.56	
Item 7: I have projects in mind all the time, things to do.		.20		.49	
Item 9: Many things I have to do are repetitive and monotonous.	.22	.26			.67
Item 27: It seems that the same things are on television or the movies all the time; it's getting old.					.53
Item 5: I am often trapped in situations where I have to do meaningless things.					.48
Item 26: It takes a lot of change and variety to keep me really happy.					.22

Note. Values less than < .20 were excluded

Table 4

Correlations between the BPS Factors

	Factor 1	*Factor 2*	*Factor 3*	*Factor 4*	*Factor 5*
Factor 1	1				
Factor 2	.44**				
Factor 3	-.03	.09			
Factor 4	.08	-.09	.26**		
Factor 5	.16*	.17*	.20**	.23**	
Full BPS	.70**	.66**	.47**	.40**	.55**

Note. BPS = boredom proneness scale

**$p < .01$; *$p < .05$

Discussion

The present study was design to examine the psychometric properties of the Bangla version of the BPS. To the best of our knowledge, this is the first study to report the factor structure, reliability, and validity of the BPS Bangla. The results indicate that this Bangla version of the BPS has satisfactory properties for serving as a screening instrument of boredom proneness among the adolescents in Bangladesh. This BPS Bangla was validated with the aim of promoting standardized methods for assessing boredom, thus facilitating generalization of results as well as intercultural study replications.

An exploratory factor analysis (using maximum likelihood estimation method) was performed on the 25 items from the BPS and found five factors solution, which explained together 31.63% of the total variance, and individual factors accounted for 3.44% to 10.88% of variance. This five factor structure indicates the multidimensional nature of the BPS (Struk et al., 2017) and is consistent with previous studies (Vodanovich & Kass, 1990; Gordon et al., 1997). However, our distribution of items in each factor was not similar with prior works, and thus labelling of the factor construct was different. Factor 1 (external stimulation) pertains to items that explore the lack of environmental variety. Among the eight items clustered within this factor, the five items (6, 12, 14, 19, and 28) also belong to same category in previous studies (e.g., Ahmed, 1990; Melton & Schulenberg, 2009; Vodanovich & Kass, 1990). The Factor 2 (internal stimulation) refers to the ability to produce interesting activities, and also showed overlap with Gana and Akremi (1998), and Vodanovich and Kass (1990). Factor 3 (low self regulation) represents the ability to control emotion, which is resemblance with the factor 'affective responses' of five factor structure of the BPS, proposed by Vodanovich and Kass (1990). Factor 4 (creativity) and Factor 5 (monotonous) correspond to

the second and third factor of the English version (Vodanovich et al., 1997), respectively. The inconsistency in factor structure between the Bangla and other versions of the scale could be partly explained by the differences between the cultural variations among the countries. Another possibility might be the use of principal component analysis process in conducting exploratory factor analysis in the previous studies (e.g., Vodanovich et al., 1997). Because, the exploratory factor analysis (maximum likelihood) finds a latent structure of observed variable by uncovering common factors that influence the measured variables, whereas the principal component analysis reduces the measured variables to a smaller set of index variables. However, it is worth to noting that previous factor analytic studies have not established a stable factor structure of BPS (Melton & Schulenberg, 2009).

The internal consistency of the instrument was relatively low for the overall BPS items (α = .69) and the five sub-scales as well (Cronbach's alpha ranged from .51 to .65), compared to those that was reported by the original developers (Farmer & Sundberg, 1986). The Cronbach's alpha value of .70 or above is considered as acceptable and the values ranging from .60 to .69 are marginally acceptable. However, the Cronbach's alpha yielded in this study is concordant with studies carried out on other cultures (e.g., Craparo et al., 2013). Additionally, the item-to-total correlations were comparatively lower than what other authors have reported (e.g., Dursun & Tezer, 2013). We would argue that the emergence of low internal consistency of the BPS may be attributed to the item wording of the reverse-scored items, as this kind of item wording leads to low reliability and validity (Struk et al., 2017). Rewording these items in a manner as positively endorsed statements might reduce this extraneous source of variance in future.

The result of this study revealed that content validity was good, indicating that the Bangla version of the BPS includes the appropriate content to measure boredom proneness. The scale also demonstrated a fair level of convergent validity through statistically significant positive correlations between the five factors and the full BPS, but all the inter-factor correlations were not significant. Nevertheless, we opine that despite the relatively weak psychometric characteristics of the BPS Bangla in terms of the lower internal consistency and convergent validity, it is still applicable in assessing the level of boredom proneness.

This study has several limitations. The study was conducted on adolescent people (secondary school students), and thus restricted in age range and might limit the generalizability of the results to other populations. Further studies with more cognitively diverse samples, such as young adult or elderly would be more representative. Moreover, the BPS factors name reflects the commonality of the retained items, but don't necessarily imply adequate model of that specific domain.

Additional validation on factor solution is obviously needed. Furthermore, the present study did not assess divergent validity. Future researchers may consider this issue.

Conclusion

The present work is a preliminary step toward providing a standardized method for assessing boredom proneness in the Bangla-speaking population. The BPS Bangla is a simple and applicable questionnaire, which was adapted with appropriate psychometric properties. Although further studies are needed to test the generalizability of the results, this study may contribute in furthering our understanding about the nature of boredom proneness. Considering the prevalence of boredom proneness among the Bangladeshi population, the application of this instrument can assist educational and organizational authority in first detecting, and then finally reducing boredom proneness.

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Appendix

Bangla version of the Boredom Proneness Scale (BPS)

নির্দেশনা : নিম্নের উক্তিগুলো ব্যক্তির নিজের সম্পর্কে অনুভূত ধারণাগুলো বর্ণনা করে। প্রতিটি উক্তি সর্তকতার সাথে পড়ুন এবং ভাবুন যে এটি আপনার ক্ষেত্রে কতটা প্রযোজ্য, এবং তা বিবৃতিগুলোর ডান পাশে প্রদত্ত সাত বিন্দু পছন্দের মধ্যে উপযুক্তটিতে টিক (√) চিহ্ন দেয়ার মাধ্যমে প্রকাশ করুন।

ক্রমিক নং	উক্তি সমূহ	একেবারেই সঠিক নয়	সঠিক নয়	কখনও কখনও সঠিক	অনিশ্চিত	সঠিক	একটু বেশি সঠিক	অনেক বেশি সঠিক
১.	আমি খুব সহজেই কাজে মনোযোগ দিতে পরি।							
২.	কাজ করার সময় আমি প্রায়ই অন্য ব্যাপারে চিন্তিত হয়ে পড়ি।							
৩.	সব সময় মনে হয় সময় খুব আস্তে আস্তে যাচ্ছে।							
৪.	প্রায়ই এমন হয় যে আমি ঠিক বুঝে উঠতে পারি না কি করবো।							
৫.	যে কাজ করতে চাইনা সে ধরনের কাজই আমাকে করতে হয়।							
৬.	কারো পারিবারিক ও ভ্রমনের ছবি দেখা আমার কাছে ভীষণ বিরক্তিকর মনে হয়।							
৭.	আমি সবসময় কর্মপরিকল্পনা করি।							
৮.	সহজেই আমি আনন্দিত হই।							
৯.	আমার বেশির ভাগ কাজই একঘেয়ে এবং বারবার করতে হয়।							
১০.	আমার বেশির ভাগ কাজেই আনন্দকর।							
১১.	আমার কাজের ব্যাপারে আমি খুব কম উদ্যমী ।							
১২.	সাধারণত যে কোন পরিস্থিতি আমাকে কৌতুহলী করে তোলে।							
১৩.	বেশির ভাগ সময়ই আমি চুপচাপ বসে থাকি।							
১৪.	আমি ধৈর্য্য সহকারে অপেক্ষা করতে পারি।							
১৫.	সময় থাকা স্বত্ত্বেও প্রায়ই আমি কাজ করিনা।							

Cont.

ক্রমিক নং	উক্তি সমূহ	একেবারেই সঠিক নয়	সঠিক নয়	কখনও কখনও সঠিক	অনিশ্চিত	সঠিক	একটু সঠিক	বেশি	অনেক বেশি সঠিক
১৬.	অপেক্ষা করার সময় আমি খুব অস্থির হয়ে পড়ি।								
১৭.	আমার পক্ষে চ্যালেঞ্জিং কাজ খুজে পাওয়া কঠিন।								
১৮.	আমি জীবনে অনেক প্রতিদ্বন্দ্বিতামূলক কাজ করতে চাই।								
১৯.	বেশির ভাগ সময়ই আমি আমার সাধ্যের চেয়ে কম কাজ করি বলে মনে হয়।								
২০.	অনেকেই বলে আমি কল্পনাপ্রবন এবং নতুন সৃষ্টিতে পারদর্শী।								
২১.	আমার অনেক কিছু করার ইচ্ছা থাকলেও সময়ের অভাবে সব করা সম্ভব হয় না।								
২২.	বন্ধুদের মধ্যে আমিই কোন কাজ করতে বেশি সময় নেই।								
২৩.	আমার সন্তুষ্টির জন্য অনেক পরিবর্তন ও বৈচিত্র্য প্রয়োজন।								
২৪.	টেলিভিশন অথবা সিনেমায় সবসময় একই জিনিস দেখানো হয় বলে মনে হয়।								
২৫.	ছোটবেলায় আমি প্রায়ই একঘেয়েমি এবং ক্লান্তিকর পরিস্থিতির সম্মুখীন হতাম।								

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Mental Health Status of Hazardous and Non-Hazardous Child Worker

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Abstract : The purpose of the present study was to compare mental health status of hazardous child worker with non-hazardous child worker. A total of 78 respondents (36 Hazardous children & 42 Non-hazardous Children) from Mirpur, Jatrabari, and Savar, constituted the sample of the present study which was selected by using purposive sampling technique. Data collection was carried out from 01 March to 30 March, 2018. In order to measure the variables of the study, Bangla version (Uzzaman & Karim, 2016) of Hopelessness Scale, Bangla version of Depression Scale (Uddin & Rahman, 2005) and of Hostility Scale (Uzzaman & Karim, 2016) were used. Independent sample *t*-test was carried out to see the nature of mental health status of hazardous and non-hazardous children. Results partially confirmed the hypotheses. Inferential statistics analysis indicated significant differences between hazardous and non-hazardous children in terms of their depression ($t = 4.10$; $p < .05$) and hostility behavior ($t = 2.56$, $p < .05$), but not for hopelessness behavior ($t = 1.13$, $p > .05$). The results have been interpreted in the light of past studies. The findings of the present study have both theoretical and practical implication.

Keywords: mental health, depression, hostile, hopelessnes

Introduction

How people live with mental disability is one of the challenging areas of research in psychology. In the present study, the effort is to understand the self-perception of the children (Hazardous & non-hazardous children) with mental disability, to understand their mental state, and to plan out the rehabilitation and

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well being strategy. According to International Labor Organization (ILO, 2005 the children who work in dangerous or unhygienic conditions that could result in a child being killed or injured are called hazardous child labor. On the other hand, the children who do not involve in hazardous work environment and not experience any mental health problem are recognized as non-hazardous child.

Earlier research shown that many child workers cannot go to school due to unexpected harmful hazardous work. Even, they don't get enough amusement and leisure time (Dorman, 2008). It is the biggest category of the worst forms of child labour with an estimated 85 million children, aged between 5 to17, working in dangerous conditions in sectors as divergent as agriculture, mining, construction, manufacturing, service industries, hotels, bars, restaurants, tailoring, garments sector, and domestic service. It is found in both industrialized and developing countries. Both girls and boys often start their hazardous work at very early stages of their life. Globally, the ILO reported that approximately 22,000 children passed away at work in every year, on the other hand, the number of injuries or illness are unknown (Smolin, 2003; World Bank, 2005).

Hazard workplace situations are those which expose employees to hazardous materials or chemicals. Among them, some places are immediately harmful for workers while others have catastrophic effects years later (Ingram & Media, 2009). Mental health is a wide area. It is defined as a state of well-being in which every individual realizes his or her own potential. In the present study depression, anxiety, hostility, and hopelessness would be considered for measuring child's mental health status.

Bangladesh Bureau of Statistics (BBS, 2015) noted that child labors are increasing rapidly in Bangladesh. They mentioned that approximately 1.2 million children are still ambushed in its worst forms and 3.2 million childs are involved in child labours aged between 5 to17. Many child labors are still deprived of their basic right such as education because they do not have enough time to go to school. Even, many working children involved in hazardous work are stated that they experienced physically punished at their own work place.

Hosen, Hossain, and Islam (2010) reported that there is a negative relationship between child education and child labor indicating child who is engaged with hazardous child work their rate of school going is very much low and rate of absenteeism is high than normal control group. Furthermore, Amon, Buchanan, Cohen, and Kippenberg (2012) found that the children who is involved in the hazardous work such as agriculture, construction work and mining sectors, they have great safety and environmental hazards which pose significant risks to their life. Moreover, from different research findings it is seen that the younger the child

is, the longer the hours or the frequency of the shift work, the more hazardous the occupation and the lower the salary (Forastieri, 2002; UNICEF, 1997). For instance, streets children have higher risk for facing abuse (Hadi, 2000).

Mennen and Trickett (2011) conducted a study on children of maltreating mother. They found that mothers of hazardous child workers have much higher levels of depression and anxiety from other mothers. Habib and Sufi (2003) also reported in their study that most of the employers appoint child as a labour for their cheaper wages while some owner never employed child labour in their work place even in rural areas. Indeed, many child workers get very cheap salary (e. g., average 50 taka per day) that are hardly commensurate to the labor they put in (Khair, 2005). In another study it was seen that child laborers possessed positive attitudes towards those employers who scored high on adult ego state (Habib & Sufi, 2004) though there is a variation in ego states of the employers in every sector (Habib, 2012)

Tripathi (2012) did an impressive study on mental health of female child workers and reported that disabled girls who perceived and evaluated themselves positively have sound mental health though they have a lot of disparities in their work place which they have to adjust. In addition, it was seen that hazardous male children have higher level of mental health problem (such as depression & anxiety) who work in unhygienic environment than male who don't work on unhygienic environment (Arshad, Razzaq, & Mahmood, 2015). Similarly, Saddik, Nuwayhid, Williamson and Black (2003) explored that there is a significant differences between children exposed to solvent and non-exposed group in terms of their fatigue, impaired memory and depression.

Rationale of the study

Children are the capital of tomorrow. Every child has the right to grow up in the right way. The emotional, social and physical development of young children have a direct effect on their overall development. The childhood period is vital because of socialization process, where attitude, norm, and behaviour are transmitted through the influence of the family and society (Bharti, & Agarwal). Therefore, childhood age is important for sound development of any child. It is the phase of in-between childhood and adulthood and the foundation for success or failure in learning and further life. However, it is a matter of great regret that child labor is highly prevalent in this country, and all child workers are deprived of their rights. Most of the research have focused on their physical health, education, human rights etc, but we cannot deny the importance of mental health of the children. All developmental aspects of child depend on sound development of mental health.

Against this background, the present researchers have considered the problem, and tried to find out the nature of mental health of child labour in the context of Bangladesh.

Problem

Does mental health (depression, anxiety, and hopelessness) vary according to nature of hazardous and non-hazardous child work?

Objectives

1. To investigate differences in depression between hazardous and non-hazardous child workers.
2. To examine differences in anxiety between hazardous and non-hazardous child workers.
3. To understand differences in hopelessness between hazardous and non-hazardous child workers.

Methods

Target population

A total of 36 hazardous (Criteria: engage in plastic factory, aluminium factory, leather/ engineer/ vulcanizing, motor workshop, bakery/biscuit factory, construction work etc). and 42 non-hazardous (Criteria: involve in mobile servicing, handy craft,

Table 1
Distribution of Sample Children by District.

District	Sampling Procedure	Hazardous Children (n = 36, age 10-15)			Non-Hazardous Children (n = 42, age 10-15)		
Dhaka		Boys (50%)	Girls (50%)	Total (100%)	Boys (50%)	Girls (50%)	Total (100%)
(Mirpur)	Purposively	06	06	12	07	07	14
(Savar)	Purposively	06	06	12	07	07	14
(Jatrabary)	Purposively	06	06	12	07	07	14
Total		18	18	36	18	21	42
Grand Total							78

bag making, cake seller, handy craft, and tailoring) children aged between 10 to 20 years from Mirpur, Savar, and Jatrabary were participated in the present study.

Measuring Instruments: For quantitative measure the following scales/ questionnaire were used for data collection

1. Depression scale (Zigmond & Snaith, 1983)
2. Children Hopelessness scale (Uzzaman & Karim, 2017)
3. Hostility scale (Uzzaman & Karim, 2017)

Depression Scale (DS)

Depression scale was developed by Uddin and Rahman (2005) to measure depression of Bangladeshi people. It was a 5-point rating scale consisting of 30 items with 1 (not at all applicable) to 5 (totally applicable). All items were scored in positive direction. Higher scores indicate higher level of depression. Highest score in this scale was 150 and lowest was 30. The split-half and test-retest reliability coefficients of the scale were 0.76 and 0.59 respectively. The scale had high levels of content, concurrent and constructs validity. It had two types of norms-severity norm of the depression scale consisting 4 types of depression: minimal (scores from 30 to 100), mild (scores from 101 to 114), moderate (115-123) and severe (scores from 124 to 150). For screening norm the score of 94 or more should be designated as "depressed." The Alpha coefficient of the Depression scale in the present study was .93.

Children Hopelessness Scale (CHS)

Kazdin, French, Unis, Esveldt-Dawson, and Sherick (1983) developed the CHS scale. This scale measures a child's negative (Hopeless) expectations for the future. The CHS scale has 17 items. Each item has two response alternatives such as 'Yes' (indicates lack of hopelessness) and 'No' (indicate hopelessness). Eight positively worded items (Items no. 1, 3, 4, 5, 6, 7, 11, and 16) are reversed coded. Responses are added to derive an overall score. Higher score indicates (17) high hopelessness and lower score indicates (0) low hopelessness. The scale has good reliability and validity also in Bangla version (Kazdin et al., 1983; Uzzaman & Karim, 2016)). The internal consistency value of the CHS was .62 (Kazdin et al., 1983) while Cronbach's α (Unstandardized) for the Bangla version CHS was .64.

Hostility Scale (HS)

Derogatis, Rickels, and Rock (1976) developed the HS scale. It measures symptoms of underlying hostility (such as aggression, irritability, and resentment

etc.). The scale has six (6) Likert-type items with 4 response alternatives such as from 'never' (1) to 'most of the time' (4). The possible range of scores is from 1-4 (higher score indicating more hostility). The internal consistency of the scale is .73. The scale was reported to be valid (Derogatis et al., 1976). The adapted Bangla version HS (Uzzaman & Karim, 2016) scale has good reliability and validity (Cronbach's α = .68).

Procedures

At first, a good rapport was established with the subjects through describing the general purpose of the study. The participants were assured that their information would be kept confidential until their permission. Thus, after taking their consent, the above mentioned instruments and techniques were administered to the selected participants.

Results

The results (such as mean, median, standard deviation, percentage, independent sample *t*-test, effect size etc.) of the present study are depicted serially in the following table.

Table 2

Frequency Distribution of Participants According to Nature of Profession

Name of profession (Non-hazardous children)	Frequency	%	Name of profession (Hazardous children)	Frequency	%
Zori	3	3.8	Servant	5	6.3
Handicraft	5	6.3	Risk sewing	2	2.5
Mobile servicing	6	7.6	Box maker	1	1.3
Karcori	11	13.9	Risk tailoring	1	1.3
Tailoring	9	5.1	Saloon	1	1.3
Cake seller	4	5.1	Glass factory	2	2.5
Dress seller	3	3.8	Engine/ motor workshop	16	20.3
Departmental store keeper	1	1.3	Helper	2	4
			Plastic/ aluminium worker	4	1
			Rajmistri	1	1
			Biscuit factory	1	1
Total	42	53.85	Total	36	46.15

From the above Table 2 it is seen that total non-hazardous participants were 42 while hazardous participants were 36. Among the total participants, the highest participants were coming from karcori profession under non-hazardous category whereas engine/motor workshop was the highest hazardous category from where the participants were came.

Table 3

Descripted Statistics of Depression, Hopelessness and Hostile Score of Hazardous and Non-Hazardous Children

Name of variable	Category of children	N	M	SD	t	Sig. (2-tailed)	R
Depression	Hazardous	36	90.44	15.78	4.10	.01*	.43
	Non-hazardous	42	74.21	18.74			
Hopelessness	Hazardous	36	1.81	1.14	1.13	.26	-
	Non-hazardous	42	1.50	1.23			
Hostility	Hazardous	36	14.36	3.80	2.56	.01*	.28
	Non-hazardous	42	12.14	3.82			

Note. *$p > .05$; r = Effect size.

The mean score of depression of hazardous children ($M = 90.44$, $SD = 15.78$) was higher than that of non-hazardous children ($M = 74.21$, $SD = 18.74$) which is significant at 5% level ($p < .05$). That is, hazardous children faced more depression in their workplace as well as their life compared to non-hazardous children. It was seen large effect size ($r = .43$: For calculating the standardized mean difference between two groups, it was subtracted the mean of one group from the other ($M1 - M2$) and dividing the result by the standard deviation (SD) of the population from which the groups were sampled) which represent a substantive findings or differences between two means. That is, background of generalization from sample to population is strong. Again, the mean score of hopelessness of hazardous children ($M = 1.81$, $SD = 1.14.78$) was higher than that of non-hazardous children ($M = 1.50$, $SD = 1.23$) which is not significant at 5% level ($p > .05$). That is, there is no differences between hazardous and non-children considering their hopelessness. Finally, the mean score of hostility of hazardous children ($M = 14.36$, $SD = 3.80$) was higher than that of non-hazardous children ($M = 12.14$, $SD = 3.82$) which is significant at 5% level ($p < .05$). That is, hazardous children are more hostile in their workplace as well as life compared to non-hazardous children. It was seen medium effect size ($r = .28$) which represent a good findings between two means.

Discussion

In the present study the general objective was to see the nature of mental health status of child worker (hazardous & non-hazardous children). After analyzing the results, it was seen that the results largely support the objectives. That is, there was significant differences between hazardous and non-hazardous children in depression ($t = 4.10$, $p < .05$) and hostility behavior ($t = 2.56$, $p < .05$) except hopelessness behavior ($t = 1.13$, $p > .05$). Even effect size is large for depression ($r = .43$) and medium ($r = .28$) for hostile behavior. That is there is substantive difference between two means of depression and hostility of hazardous and non-hazardous children. Why both categories of children are differences in their depression and hostility behavior? Why doesn't in hopelessness behavior?

This may be explained in the way that hazardous childrens are working in very much risky conditions. They operate high and heavy machine which involves gas transmission, electrical wave, and other technical instrument. So, when a child works under these situation and environment, always they feel anxiety and phobia. These mental condition may lead them to become depressed and hostile. This finding is consistent with previous studies (e. g., Arshad, Razzaq, & Mahmood, 2015). Again, most of the hazardous workplace are not scientifically planned. Faulty design, out of dated machine, unskilled labor, short circuit problem, sometimes explosion of gas transmission etc. are always prevails in the workplace. As a result, children always feel insecurity which may be causes for their depression and hostile behavior.

Furthermore, most of the hazardous children moderately confined below age 20. This immature age is not fit for hazardous work. Many children cannot operate machine properly. Even man-machine setting is not sufficient for many employees. Sometimes children cannot manage and handle heavy instrument. So, it may another cause of depression and hostile among the children. Moreover, in the hazardous workplace there is no enough space for children thinking about the child's emotion, motives, feelings etc. The owner always want profit from their employee. If any worker falls into physical problem or accident the owner doesn't look after them properly, as a result many hazardous children think that it is their fate to work under unhealthy environment. It causes different types physical and mental problem among the children.

Furthermore, most of the child labour are higher chance of experienced abuse (Hadi, 2000). Finally, sometimes children remain detached from their home due to nature of work. Many employees only get leave in religious festival. This long time detached from home, parents, near and dear can causes of mental illness among the hazardous children. At the end, in Bangladesh no institution properly obeys the laws

of child labour. Even the owner doesn't give freedom properly to their employee. If any employee protests any anomaly then owner dominated their employee, endanger to sack etc. These may cause mental health illness among the employee.

Another finding of the results indicates that hazardous and non-hazardous children have no significant difference in their hopelessness behavior. This may be explained in the way that both hazardous and non-hazardous children are basically needy. They maintain their family earning money from their workplace. Thus, always they remain anxious about their family future. So, though they face different difficulties in their work place, but they think that it is their fate. They admit and obey their physical and mental problem. As a result, they take their risky work easily for personal and family wellbeing and safety. Their expectation regarding life is small. They can't see better future in their work. The finding is line with the findings of Khair (2005).

Limitations

It is required to apply Focus Group Discussion (FGD) with large sample from whole country so that it can be identified why hazardous children suffer from mental problem in the workplace for better generalization and prediction of the total population. Further, random sample is needed for scientific inquiry. Finally, variables like age and education may also be studied. So future researcher can consider the above mentioned causes for further research regarding mental health status of hazardous children in Bangladesh.

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Psychometric Assessment of the Bangla UCLA Loneliness Scale - Version 3

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Abstract: In response to scarcity of developed or adapted instrument for measuring the subjective feeling of loneliness, the present study was aimed to verify the psychometric properties of the UCLA Loneliness Scale – version 3 in Bangladeshi context. The translated version of the scale was administered to a sample of 322 university students selected via convenience sampling techniques. Results explored that all items had sufficient item-total correlations except two items. The confirmatory factor analysis confirmed two-factor structure. The measurement invariance test suggested the presence of variance at intercept level across gender and latent class analysis identified three latent groups. This scale had sufficient internal consistency reliabilities, test-retest reliability, composite reliability, standard error of measurement, and discriminatory power. The results also suggested the differential item functioning contrast between male and female group in three items. Accepted infit and outfit mean squares, and thresholds advancement monotonically with categories suggested that this inventory had satisfactory psychometric properties. This scale would be helpful to interested users to assess the subjective feelings of loneliness among Bangladeshi people.

Keywords: loneliness, confirmatory factor analysis, measurement invariance, latent class analysis, differential item functioning, rasch analysis

Introduction

Most of us have some experience of loneliness in any stages of our lives (Rokach & Brock, 1997). It is a widespread serious social problem regardless of gender, age, race, and culture (Rokach & Neto, 2000). Loneliness can be defined as isolation from meaningful social relations (Fees, Martin, & Poon, 1999). It is a state of emotional distress that results from incongruity between the actual

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(perceived) and the desired social relationship (Peplau & Perlman, 1982). It negatively impacted on social activities (Morahan-Martin & Schumacher, 2003), self-esteem (Brage, Meredith, & Woodward, 1993; Civitci & Civitci, 2009), life satisfaction (Civitci & Civitci, 2009), etc. It adversely effect our well-being by increasing the risk of anxiety (Johnson, LaVoie, Spenceri, & Mahoney-Wernli, 2001), depressive symptoms (Lau, Chan, & Lau, 1999; Cacioppo et al., 2006), hypertension (Cacioppo et al., 2002). It positively associated with suicidal ideation (Roberts, Roberts, & Chen, 1998). Moreover, loneliness also impacts on physical health as it negatively associated with quality of sleep (Cacioppo et al., 2002), level of blood pressure (Hawkley, Thisted, Masi, & Cacioppo, 2010).

Several measures have been developed to assess the loneliness. Some of these measures are – the UCLA (University of California, Los Angeles) Loneliness Scale (Russell, Peplau, & Ferguson, 1978, Russell, Peplau, & Cutrona, 1980, Russell, 1996), the NYU Loneliness Scale (Rubenstein & Shaver, 1982), the Differential Loneliness Scale (Schmidt & Sermat, 1983), the Social and Emotional Loneliness Scale for Adults (DiTommaso & Spinner, 1993), etc. Among these measures, the UCLA Loneliness scale is the most used measure in the research as a standard scale (Russell, 1996). Despite the vast use of the UCLA Loneliness scale (version 1 & version 2), these versions were criticized in terms of wording of items. The UCLA Loneliness scale comprised of 20 items (10 positively worded, 10 negatively worded). There were systematic biases in responding negatively worded items (lonely). This measure developed based on the assumption of the unidementionality of loneliness. Studies, those explored the factor structure of the UCLA Loneliness scale, rejected the unidimentionality of this measure and suggested multidimensionality (Austin, 1983; Hays & DiMatteo, 1987, Knight, Chisholm, Marsh, & Godfrey, 1988; Mahon & Yarcheski, 1990; Miller & Cleary, 1993). Moreover, high correlation of the loneliness score of this measure with self-esteem, and depression also raised question regarding discriminant validity of this measure. To overcome these criticisms, Russell (1996) revised the items' wording. This revised version (version-3) also had sufficient reliability and validity across the samples (Russell, 1996). The UCLA Loneliness scale has been validated and used in many countries including, Iran (Hojat, 1982), Portugal (Neto, 1992), Greece (Anderson & Malikiosi-Loizos, 1992), Germany (Döring & Bortz, 1993), South Africa (Pretoirus, 1993), Russia (Ruchkin, Eisemann, and Hägglof, 1999), Denmark (Lasgaard, 2007), Taiwan (Wu & Yao, 2008), Turkey (Durak, & Senol-Durak, 2010).

There is scarcity of developed or adapted instruments for measuring loneliness among young adults in Bangladesh. The translated version (Parvin, 2007) of the

UCLA Loneliness Scale – revised version (Russell et al., 1980) is available in Bangladesh. Translation reliability of this scale was .88 as reported by the author. Authors of the present study were intended to suitability of the UCLA Loneliness Scale – version 3 (Russell, 1996) in Bangladesh culture as this measure has some degree of superiority over previous versions. The main objective of the study was to assess the psychometric properties of the UCLA Loneliness Scale – version3 in Bangladesh context. Specific objectives were - (i) to estimate the item-total correlations of items in Bangladeshi culture; (ii) to test factor structure of the measure; iii) to estimate the measurement invariance of the scale across gender; iv) to identify latent class of respondents while measuring loneliness using this scale; v) to estimate the reliabilities of the measure; vi) to assess the differential item functioning of items; and vii) to assess the item validity through item response theory.

Methods

Participants

For selecting study sample, the University of Chittagong was selected on the basis of convenience. From this University, a sample of 322 students was selected via purposive sampling technique. Their age *mean* was 20.52 years (95% *CI* [20.31, 20.73]) with *standard deviation* 1.97 years. Among respondents, 139 (43.2%) were male and 183 (56.8%) were female. Among them, 187 (58.1%) were in Honors 1st year, 22 (6.8%) in 2nd year, 64 (19.9%) in 3rd year, 35 (10.9%) in 4th year, and 14 (4.3%) in Masters.

Measures

The UCLA Loneliness Scale (UCLALS: Russel, Peplau, & Ferguson, 1978) - version 3 (Russel, 1996) contains 20 items that measure one's subjective feelings of loneliness as well as feelings of social isolation. Respondents' were expressed their opinion regarding items using a 4 –point Likert type scale (1 = never to 4 = always). Total scores are ranged from 20 to 80. The higher scores indicate greater subjective feelings of loneliness. The UCLALS has good reliability and validity to accept as sound measure for assessing loneliness. The internal consistency reliabilities (*Cronbach's Alpha)* of this scale ranged from .89 to .94 across samples. In the main study, author reported that this measurement instrument had high correlations with the NYU Loneliness scale (Rubenstein & Shaver, 1982) and Differential Loneliness scale (Schmidt & Sermat, 1983).

The original version of the UCLA Loneliness Scale (UCLALS) – version 3 was translated in Bangla language. The procedure for the translation and adaptation of this scale was carefully done with following the rules and guidelines of the International Test Commission (ITC, 2018) for the translation and adaptation of measurement instruments. Following steps were used for assessing psychometric properties of the Bangla version of the scale–

Step One: Forward translation

The UCLALS–version 3 was translated into Bangla by two translators who were expert in both English and Bangla language. Their translations of the scale were combined into one that examined by two other experts. These experts examined the conceptual equivalence of words or phrases rather than word for word translation and recommended some changes. The translated version was edited according to experts' recommendations.

Step Two: Back translation

In this stage, the translated draft of the UCLALS–version 3 was back translated into English by two translators who were expert in both languages. Then, these back translations were combined into one. Two experts compared the content in original scale and back translated version. They suggested that both versions had same content.

Step Three: Pilot study

Next, this translated Bangla UCLALS–version 3 was administered on a sample of 36 students, selected via convenient sampling technique, from the University of Chittagong. The *Cronbach's Alpha* was .86 (95% *CI* [.79, .92]) and corrected item-total correlation ranged from .10 to .69. Only item 8 had low *item-total correlation* (.10). Translation of this item was reviewed, expert opinions were taken, and finalized for the final study.

Statistical analysis

The IBM SPSS version 25.0, IBM AMOS version 24.0 version, Microsoft Excel 2010, DIFAS (Differential Item Functioning Analysis System) 5.0 (Penfiled, 2013), jMetrik, and R were used to analyze the data. Descriptive statistics (e.g., mean, standard deviation, skewness, and kurtosis), item analysis (item total correlations, intra class correlation coefficient, split-half reliability), confirmatory factor analysis (structural validity), multi-group analysis (measurement invariance),

latent class analysis (explore the latent class in the data), Pearson product moment correlation coefficient (test-retest reliability), differential item functioning (DIF), rasch analysis (rating scale model) were performed to assess the psychometric properties of the UCLA Loneliness Scale version 3 Bangla. Besides these, discriminatory power and standard error of measurement were assessed.

Kim (2013) suggests that a skewness value more than 2 and kurtosis value more than 7 indicate non-normality of the data for larger sample ($N > 300$). Both classical test theory and item response theory were used to assess the psychometric properties of the scale in Bangladesh context. Item analysis was performed to assess the corrected-item total correlations of items. Field (2017) suggests .30 as minimum item-total correlation for sufficient discrimination.

Then, construct validity was assessed through confirmatory factor analysis. In this study confirmatory factor analysis was performed over exploratory factor analysis as factor structures of the UCLA Loneliness scale were available in the literature. In this study, these models were tested to verify which model would be fitted to this data. There were four models - Model 1 (one-factor model), Model 2 (two-factor first order model), Model 3 (two-factor second order model), and Model 4 (bifactor model). In Model 2-4, one factor comprised of included positively worded items and another factor comprised of negatively worded items. These models are presented in Figure 1. Model fits were assessed through the χ^2/df ratio, comparative fit index (CFI), goodness-of-fit index (GFI), Tucker–Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). The χ^2/df ratio value of 2 or less suggests a good fit (Schermelleh- Engel & Moosbrugger, 2003). Marsh and Hocevar (1988) suggested that this value should be less than 5. The CFI, GFI, TLI values of .95 or greater suggest the good fit model (Hu & Bentler, 1999). Dimitrov (2012) suggests values of .90 for CFI, GFI, TLI are acceptable. The RMSEA value should be .06 to .08 (Schreiber, Stage, King, Nora, & Barlow, 2006), and SRMR value should be $\leq .08$ (Schreiber et al., 2006) for a better-fitted model.

Measurement invariance test is important to compare the latent construct across the groups. This test confirms whether same construct is assessed in each group. The multi-group confirmatory factor analysis is frequently used method for testing measurement invariance. Multigroup CFA was carried out to test the measurement invariance of the scale between male and female groups. There are six model in multigroup CFA – Model 1 (configural invariance model: same structure across the groups), Model 2 (metric model: factor loadings constrained equal across the groups), Model 3 (scaler model: factor loading and intercepts

constrained equal across the groups), Model 4 (factor variance invariance model: factor loading, intercepts, and factor variance constrained equal across the groups), Model 5 (factor covariance invariance model: factor loading, intercepts, factor variance, and factor covariance constrained equal across the groups), and Model 6 (measurement error model: factor loading, intercepts, factor variance, factor covariance, and residual errors constrained equal across the groups). Non-significant $\Delta\chi 2$ suggests measurement invariance across the group. But, non-significant $\Delta\chi 2$ is questioned as an excessive stringent test of invariance (MacCallum, Roznowski, & Necowitz, 1992). The ΔCFI >.010, ΔRMSEA< .015, and ΔSRMR< .01are suggested the measurement invariance (Chen, 2007).

Latent class analysis (LCA) was performed to explore the groups who are in extreme feelings of loneliness, who are not. The LCA was performed with two to four classes. Several indices are examined to assess the number of latent groups. These are - the Akaike information criterion (AIC), the Bayesian information criterion (BIC), and the sample- size-adjusted bayesian information criterion (SSABIC), the entropy value, the Lo-Mendell- Rubin adjusted likelihood ratio test (L-M-R test). Lower AIC, BIC, and SSABIC values suggest more parsimonious model. The entropy value is related to accuracy. A value of .80 or more suggests a higher accuracy of the model (Clark & Muthén, 2009). The L-M-R test compares an estimated model (for example, three classes) with another model that has one less class. The significant p value ($p < .05$) suggests that the tested model fit better than the model with the one less class (Muthén & Muthén, 1998-2012).

The reliability of this scale was assessed through Cronbach's Alpha, split half reliability through Spearman-Brown formula, test-retest reliability, and composite reliability. Moreover, standard error of measurement (*SEM*) was assessed. Nunnally (1978) suggested that minimum reliability to use for an instrument is .70. A *SEM* value less than *SD*/2 is acceptable (Wuang, Su, & Huang, 2012). The discriminatory power was assessed for this scale (Ferguson's $\delta \geq .90$ expected; Kline, 2015).

Item response bias is assessed through the differential item functioning test. Differential item functioning indicates the item is biased and unfair for a group of test examinees. Several statistics (Mantel-Haenszel χ^2, Standardized Liu-Agresti Cummulative Common Log-Odds Ratio, and Standardized Cox's Noncentrality Parameter) were assessed to identify DIF contrast between male and female groups. Mantel-Haenszel χ^2 value ≥ 3.84 ($p < .05$), and LOR Z and COX Z values greater than from -2 to +2 suggest the presence of DIF (Penfield, 2013).

In Rasch analysis, the rating scale model (RSM) was used to verify the item validity (infit MnSq and outfit MnSq), item and person reliability, and separation

index. Infit MnSq and outfit MnSq values between .5 to 1.5 are acceptable (Linacre, 2012). The thresholds advancement with categories were checked through item characteristic curves using RSM. Absence such advancement suggest category disordering.

Results

Table 1 shows descriptive statistics of all items of the scale. Skewness and kurtosis values of items suggest normality of the data, so that we can proceed to further analysis. Table 2 shows that two items (items15 & 17) had low item-total correlation (< .2) and these two items excluded from further analysis.

Table 1
Descriptive Statistics of the UCLA Loneliness Scale Version 3 Bangla Version

Items	Mean	SD	Minimum	Maximum	Skewness	Kurtosis
Item1	1.91	.85	1.00	4.00	.57	-.49
Item2	2.55	.96	1.00	4.00	-.30	-.90
Item3	2.12	.97	1.00	4.00	.30	-1.05
Item4	2.48	.94	1.00	4.00	-.10	-.91
Item5	1.74	.90	1.00	4.00	1.02	.12
Item6	2.35	.76	1.00	4.00	.04	-.37
Item7	2.16	.99	1.00	4.00	.32	-1.03
Item8	2.39	.94	1.00	4.00	-.04	-.93
Item9	1.81	.88	1.00	4.00	.73	-.48
Item10	1.93	.78	1.00	4.00	.36	-.64
Item11	2.27	.93	1.00	4.00	.12	-.91
Item12	2.21	.99	1.00	4.00	.31	-.98
Item13	2.42	1.02	1.00	4.00	.03	-1.13
Item14	2.19	.98	1.00	4.00	.34	-.92
Item15	2.29	.99	1.00	4.00	.26	-.96
Item16	2.17	.98	1.00	4.00	.42	-.82
Item17	2.68	1.04	1.00	4.00	-.20	-1.14
Item18	2.62	.89	1.00	4.00	-.13	-.70
Item19	1.89	.85	1.00	4.00	.62	-.40
Item20	2.06	.95	1.00	4.00	.45	-.81

Structural validity

Based on previous studies those explored the factor structure of the UCLA Loneliness scale, four models were tested to confirm the factor structure of this scale in Bangladeshi culture. Model fit indices from Table 3 shows that none of

Table 2

Corrected Item-total Correlations, Factor Weights through Confirmatory Factor Analysis (CFA), Differential Item Functioning Statistics, and Rasch Analysis Fit Statistics of the Bangla UCLA Loneliness Scale Version 3

Items	Corrected item-total correlation	Factor weights of CFA	Differential Item Functioning			Rasch Analysis fit statistics	
			Mentel χ^2	LOR Z	COX Z	Infit MnSq	Outfit MnSq
Item1	.526	.670	.834	-.882	-.913	.92	.86
Item2	.557	.649	.017	.253	.127	1.08	1.07
Item3	.579	.673	2.392	-1.41	-1.541	1.09	1.09
Item4	.515	.637	1.126	-1.043	-1.059	1.06	1.06
Item5	.523	.686	.354	.546	.594	1.08	1.03
Item6	.384	.543	.537	-.676	-.734	.88	.93
Item7	.643	.711	2.594	1.502	1.613	1.01	.98
Item8	.632	.741	3.017	1.728	1.736	.82	.80
Item9	.460	.584	.098	.332	.316	1.01	.95
Item10	.557	.650	1.834	1.42	1.356	.70	.70
Item11	.507	.640	9.936**	3.008	3.153	1.01	1.06
Item12	.627	.664	4.374*	2.03	2.095	1.13	1.13
Item13	.541	.671	.549	-.73	-.74	1.14	1.19
Item14	.696	.769	4.428*	-2.012	-2.107	.86	.85
Item15	.199						
Item16	.463	.553	.025	-.14	-.158	1.24	1.20
Item17	.139						
Item18	.631	.724	2.407	-1.56	-1.55	.79	.81
Item19	.386						
Item20	.493	.568	.06	-.226	-.244	1.24	1.22

Note. Reference group = Male, Focal group = Female; LOR Z = Standardized Liu-Agresti Cummulative Common Log-Odds Ratio, Noncentrality Parameter Estimator; COX Z = Standardized Cox's Noncentrality Parameter Estimator; Infit = information-weighted fit statistic; Outfit = outlier-sensitive fit statistic; MnSq= mean square error.
*$p < .05$, **$p < .01$.*

these models had accepted level of model fits. Therefore, estimates and modification indices were checked. Item 19 had low factor weight in all models. So, this item was excluded from analysis. Again, four models were tested. Table 3 shows that

model 2 and model 3 had accepted level of model fits. Both first order and second order had the same level of model fits (χ^2/df = 2.623, CFI = .915, GFI = .902, TLI = .901, RMSEA = .071, SRMR = .052). Factor weights were ranged from .543 to .769. Models are presented in *Figure 1*.

Measurement Invariance

Table 4 shows information regarding measurement invariance of the scale between male and female groups. In configural model (model 1), all estimates were freely estimated. The configural model had acceptable model fits (χ2/df = 2.313,

Table 3
Model Fit statistics of Factor Structure of the UCLA Loneliness Scale Version 3

Models	χ^2/df	CFI	GFI	TLI	RMSEA	SRMR
Model 1	6.051	.715	.731	.677	.125	.102
Model 2	3.549	.857	.859	.837	.089	.061
Model 3	3.549	.857	.859	.837	.089	.061
Model 4	3.745	.865	.869	.825	.092	.093
Revised model						
Model 1	5.281	.773	.779	.738	.115	.095
Model 2	2.623	.915	.902	.901	.071	.052
Model 3	2.623	.915	.902	.901	.071	.052
Model 4	2.734	.920	.907	.894	.074	.047

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

CFI = .869, RMSEA = .064, SRMR = .057). Table 4 shows significant $\Delta\chi^2$s in model 2 and model 3 and ΔCFI in model 3 was exceeded the minimum criterion (< .01). However, other fit statistics changes are at accepted level. As ΔRMSEA and ΔSRMR were non-significant, factor invariance (model 4), factor covariance invariance (model 5), and measurement error invariance (model 6) were assessed. Non-significant changes in model fit statistics of model 4-6 suggested the invariance across gender.

Latent class analysis

In Table 5, AIC, BIC, SSBIC scores are continuously decreased as the number of classes increased. Entropy scores higher accuracy for all solutions. The non-significant *p* values of L-M-R test rejected the four-class solution in favor of three classes. Based on AIC, BIC, SSABIC, entropy, *p* value of L-M-R test, three-class solution was selected. Latent class 1 included 53 participants (16.46%), class 2 included 125 participants (38.82%), and class 3 included 144 participants (44.72%).

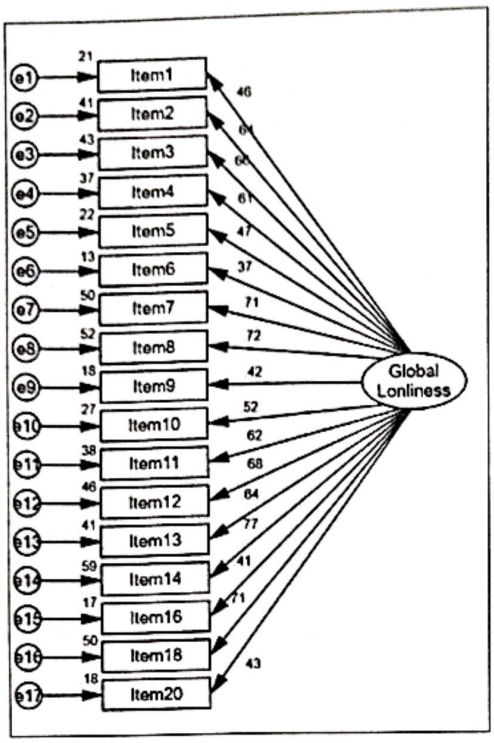

Figure 1a: Model 1

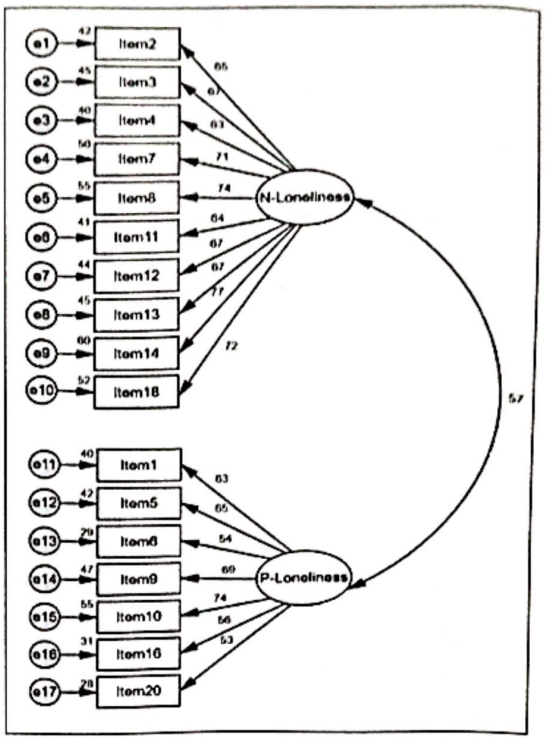

Figure 1b: Model 2

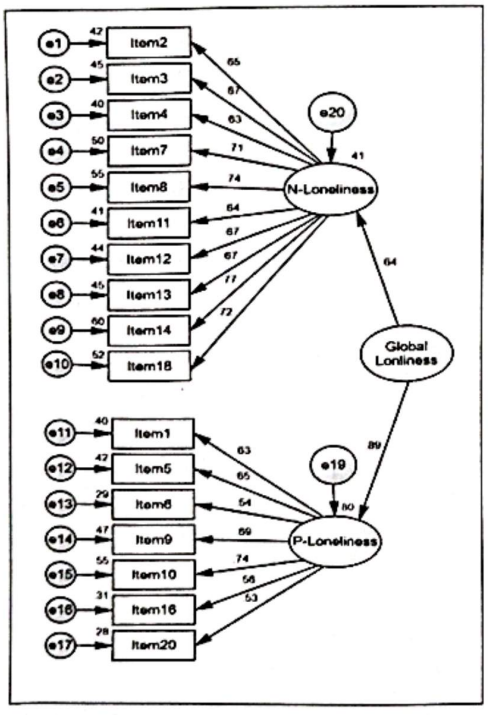

Figure 1c: Model 3

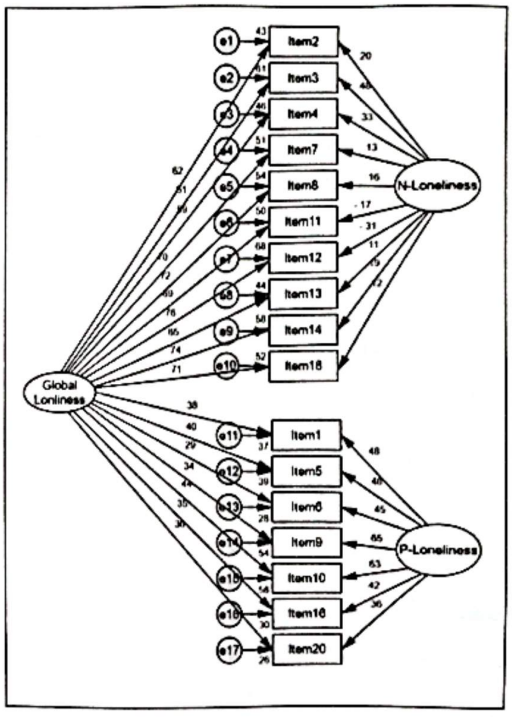

Figure 1d: Model 4

Figure 1. Factor Models of the UCLA Loneliness scale version 3 Bangla. In the figure, P = positively worded items, and N = negatively worded items

Table 4
Model Fit Indices and Models Invariance Comparison of the UCLA Loneliness Scale across Gender

Models	χ^2	CFI	RMSEA	sRMR	Model Comparison	$\Delta\chi^2$	ΔCFI	ΔRMSEA	ΔsRMR
Model 1	541.171	.869	.064	.057					
Model 2	568.711	.864	.063	.061	M2-M1	27.54*	.005	.001	.004
Model 3	610.927	.853	.064	.062	M3-M2	42.216**	.011	-.001	.001
Model 4	612.591	.854	.063	.065	M4-M3	1.664	-.001	.001	.003
Model 5	614.952	.853	.063	.064	M5-M4	2.361	.001	0	-.001
Model 6	635.040	.852	.062	.066	M6-M5	20.088	.001	.001	.002

Note. CFI: comparative fit index; RMSEA: root mean square error of approximation; SRMR: standardized root mean square residual.
*p<.05, **p<.01

Examining the response patterns in saved file, class 1 labeled as in high loneliness group, class 2 as at somewhat risk of loneliness, and class 3 as at no risk of loneliness. Based on total loneliness score of the 53 respondents, 47 might be used as the cut-off score the UCLA Loneliness scale Bangla.

Reliability

The cronbach's alpha of this scale was .898 (95% CI [.881, .914]), split half reliability through Spearman-Brown coefficient was .888, composite reliability was .93, test-retest reliability was .83 (95% [.71, .91], $p < .01$, $n = 40$), and *SEM* was 3.105. All reliability values are at accepted level (> .7). The SEM was less than the half of *SD* of the scale (4.86).

Discriminatory power

The discriminatory power (Ferguson δ) of this scale was .99.

Differential item functioning (DIF)

Table 2 shows the DIF contrasts of this scale between male and female groups. Mentel χ^2 statistics have ranged from .06 to 9.94, *Standardized Liu-Agresti*

Table 5
Fit indices for the Latent Class Analysis of the UCLA Loneliness Scale Version 3 Bangla

Classes	AIC	BIC	SSABIC	Entropy	L-M-R test	*P*
2	12614.685	13003.463	12676.762	.940	1377.571	.0001
3	12262.077	12847.132	12355.494	.939	455.092	.0021
4	12078.907	12860.239	12203.664	.944	281.386	.8304

Note. AIC=Akaike Information criterion; BIC=Bayesian Information Criterion, SSABIC=Sample-siz e-adjusted Bayesian Information Criterion; L-M-R test=Lo-Mendell-Rubin adjusted likelihood ratio test

Cumulative Common Log-Odds Ratios statistics are from -2.01 to +3.01, *Standardized Cox's Noncentrality Parameters* are from -2.11 to 3.15. Item 11, 12, and 14 had DIF contrast. Among these 3 items, item 11 and 12 had preference to male and item 14 had preference to female.

Rasch analysis

From Table 2, rasch model's infit MnSqs (ranged from .70 – 1.24 for positively worded items, .79 to 1.14 for negatively worded items) and outfit MnSqs (ranged from .70 – 1.22 for positively worded items, .80 to 1.19 for negatively worded items) were at accepted level. Figure 2 shows the thresholds advanced monotonically with categories. Item charaacteristics curves are presented in *Figure 2*.

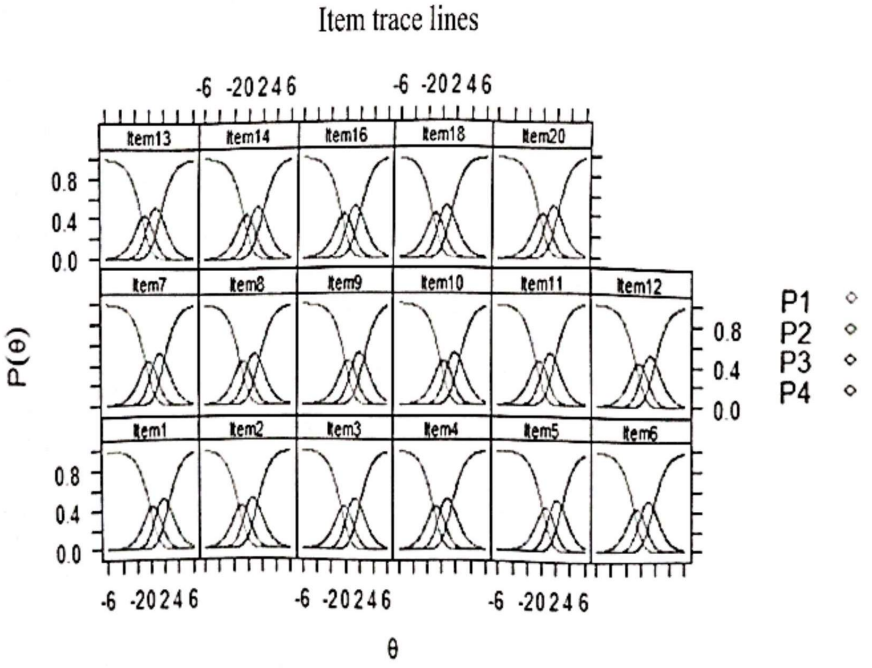

Figure 2. Item characteristics curves of the UCLA Loneliness scale – version 3 Bangla using the rating scale model (RSM)

Discussion

The present study was aimed to verify the psychometric properties of the UCLA Loneliness Scale (Russel et al., 1978) - version 3 (Russel, 1996) in Bangladesh culture for measuring loneliness among Bangladeshi individuals specifically young adults. Table 2 showed *item-total correlations* ranged from .139 to .643. Item-total correlation provides information regarding item discrimination. An item having item-total correlation value at least .3 or above indicates that this item discriminate sufficiently between high scorers and low scorers in the test that contains the item. Two items of this scale failed to meet this criterion. These items were excluded from further analysis.

Findings regarding the factor structure of this scale contribute to the contradictions among previous studies. The confirmatory factor analysis confirmed two-factor structure of this scale. One factor comprised of positively worded items and other comprised of negatively worded items. This finding support the previous studies (Alnajjar & Dodeen, 2017; Knight et al., 1988; Miller & Cleary, 1993) those identified two-factor structure. In psychological tests, both positively and negatively items encourage to answer carefully so that response bias could minimize (Schriesheim & Eisenbach, 1995; Sauro & Lewis, 2011). Inclusion of both types of items increases the validity of the test (Salazar, 2015). However, recent studies suggested that response style related to item wording distort the factor structure of the scale (Pilotte & Gable, 1990; Schmitt & Stuits, 1985). Studies have questioned the inclusion of positively and negatively worded items (Barnette, 2000; Pilotte & Gable, 1990). Barnette (2000) suggested using positively worded items.

Information from Table 4 suggested the presence of measurement variance between male and female groups at intercepts. Measurement variance suggests that two groups responded on this scale different way. Studies suggested gender differences in subjective feelings of loneliness (Borys & Perlman, 1985; Theeke, Carpenter, Mallow, & Theeke, 2019; Wiseman, Guttfreund, & Lurie, 1995).

Table 5 suggested there latent groups based on respondents endorsement on items of the scale. The LCA is an effective method for estimating empirically based cutoff score and also for estimating the prevalence rate of a certain psychological problem that is under measurement. In this study, 16.46% respondents were in the high loneliness group. This percentage could be considered as the prevalence rate of the Loneliness. Shevlin, Murphy, and Murphy (2014) performed the LCA and found four latent groups (Low Loneliness, Intermediate Isolated Loneliness, Intermediate Loneliness, and High Loneliness). Based on LCA results, they also suggested the prevalence rate of the loneliness (8%).

The internal consistency reliabilities, test-retest reliability, composite reliability, standard error of measurement, and discriminatory power were at the satisfactory level. Furr (2011) opined that there are no clear cut-off points those separating poor and good reliabilities, but values between .70-.80 are viewed as sufficient. Nunnally (1978) suggested that minimum reliability to use an instrument is .70. A reliability coefficient of .80 or higher is suitable for screening-level clinical decisions (Erford, 2013 as cited in Bardhoshi & Erford, 2017). Based on these recommendations, the reliabilities of the UCLA Loneliness scale – version 3 Bangla are good.

Item response bias between male and female groups was existed in three items. This DIF contrast supported the measurement variance at intercept level. Fit statistics of Rasch analysis suggest that all items had acceptable item fit statistics (infit MnSq and outfit MnSq). 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. In this study, UCLA Loneliness scale-version 3 meets these criteria. In this study, each category had more than 10 observations, observations were normally distributed (Table 1), outfit MnSqs were less than 2 (Table 2), and thresholds advanced monotonically with categories (figure 2).

Psychometric properties described and discussed above indicated that the UCLALS-version 3 is a sound scale for assessing the subjective feeling of loneliness of the Bangladeshi people. However, this study has some limitations. A major limitation existed regarding sample selection. This study comprised a sample of university students only. Another major limitation was unavailability of screening norms. A study including a large representative sample would be taken to develop the norms of this scale for measuring loneliness among Bangladeshi people. Provable users should be cautious about using this scale to other aged groups in Bangladesh. This measure would be helpful to the mental health practitioner to formulate therapeutic innervations for clients' wellbeing.

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Validation Study of the Profile of Emotional Competence in Bangladesh

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Abstract: This study aimed at investigating whether the Profile of Emotional Competence (PEC) can use to measure intrapersonal and interpersonal emotional competence in Bangladesh, and analyzing the criterion validity and convergent validity of the PEC. Emotional competence refers to individual differences in the identification, comprehension, expression, regulation, and utilization of one's own emotions (intrapersonal emotional competence) and others' emotions (interpersonal emotional competence) (Brasseur, Grégoire, Bourdu, & Mikolajczak, 2013). A total of 400 university students, including both public and private universities, participated in this study. Findings revealed that the PEC can be used as a measurement of emotional competence in Bangladesh. Moreover, this study confirmed the criterion and convergent validity of the PEC. Higher emotional competence is associated with higher life satisfaction and greater happiness, while emotional competence is negatively correlated with depression, anxiety, and stress. Furthermore, emotional competence is positively related with emotional intelligence.

Keywords: validation, profile of emotional competence, Bangladesh

Introduction

Individuals markedly differ their emotional competence level while we experience emotions. Even though one may know how to appropriately manage emotions in a stressful situation, he may not be able to actually execute the warranted behavior. Likewise, some individuals may be able to practice the strategies how to handle their emotions if explicitly asked to do so, while not actually applying these strategies in their daily life. Thus, individuals differ in the extent to which they can identify, understand, express, regulate, and use their own emotions (intrapersonal emotional competence) and others' emotions (interpersonal emotional competence) (Brasseur, Grégoire, Bourdu, & Mikolajczak, 2013).

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Emotional competence had been considered as intrapersonal and interpersonal social emotional information (Bar-On, 2006; Gardner, 1983; Saarni, 1990), which encompasses emotional-related individual differences. Boyatzis, Goleman, and Rhee (2000) presented a framework of emotional competencies, comprising twenty competencies nest in four clusters: self-awareness, self-management, social awareness, and relationship management/social skills. It has been conceptualized as abilities (Mayer, Caruso, & Salovey, 2000; Mayer & Salovey, 1993), traits (Petrides & Furnham, 2003), and a mix of both (Bar-On, 2006; Mayer, Salovey, & Caruso, 2000). Existing studies have indicated that EC can be taught and learned (Kotsou, Nelis, Grégoire, & Mikolajczak, 2011; Nelis et al., 2011).

Recently, Mikolajczak (2009) proposed a tripartite model of EC (see Figure 1) based on the past studies of Barrett and Salovey (2002), Lane and Schwartz (1987), Matthews, Zeidner, and Roberts (2002), and Palmer, Gignac, Ekermans, and Stough (2008). The three-level model consists of three levels: emotion-related knowledge, emotion-related abilities and emotion-related dispositions. The first level focuses on a person's knowledge about own and others' emotions, and how to handle with emotion-laden situations in an emotionally intelligent manner. For example, people identify their emotions and others' emotions, but they are not able to manage emotions in their daily lives. The second level, the emotion-related ability

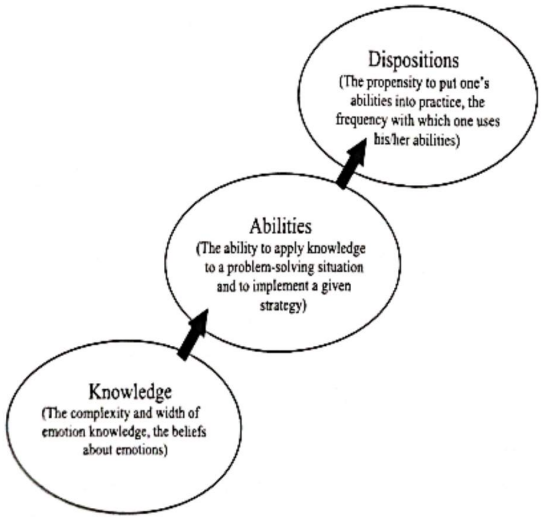

Figure 1. The three-level model of EC (Mikolajczak, 2009)

level, refers to the ability to apply knowledge of own and others' emotions in the real-world situation. Even though one may know how to appropriately react to an emotional situation, s/he may not be able to actually do the appropriate behavior in real situation. Finally, the third level, the emotion-related disposition, refers to the

propensity to behave in a certain way in emotional situations. The focus is not on what people know or can do, but on what they are able to do or consistently do. The third level implies their typical performance. For instance, some individuals may be able to practice the strategies how to manage emotions if explicitly asked to do so, while not actually using these strategies. This tripartite model is the hierarchical structure that while lower levels do not necessarily entail higher levels, higher levels supposedly entail lower levels. This model implies that knowledge underlies skill, which in turn underlies emotion-related dispositions.

There have been a myriad of studies dealing with EC as an important predictor both in the intrapersonal and interpersonal level. Higher EC is associated with greater happiness (Brasseur, Grégoire, Bourdu, & Mikolajczak, 2013; Nozaki & Koyasu, 2016), better mental and physical health (Mikolajczak et al., 2015), more satisfaction with life (Nozaki & Koyasu, 2016), greater occupational success (Joseph & Newman, 2010; Van Rooy & Viswesvaran, 2004), and higher leadership performance (Cavallo & Brienza, 2006). At the interpersonal level, higher EC is related with more satisfying social relationships (Min & Takai, 2018), and is more likely to attempt to regulate the ostracized individuals' sadness (Nozaki, 2015).

Recent studies suggested cultural differences and gender differences of EC (e.g., Min, Islam, Wang, & Takai, 2018; Nozaki & Koyasu, 2016). Gender differences also seem to be prevalent in the literature. Women have also been noted to express their emotions more than men (Fabes & Martin, 1991; Grossman & Wood, 1993; Johnson & Shulman, 1988).

Profile of emotional competence

The Profile of Emotional Competence (PEC; Brasseur et al., 2013) was used to examine the two facets: competence of own emotions (intrapersonal EC) and competence of others' emotions (interpersonal EC). Each facet includes five competencies: identification, comprehension, expression, regulation, and use of emotions. Brasseur et al. (2013) conducted an exploratory factor analysis, deriving two second-order factors structure of intrapersonal and interpersonal EC. The PEC has been validated in Belgium, French, Dutch, and Japanese languages. More recently, Min et al. (2018) also indicated that the PEC has adequate fit to be used as a measurement of EC in Myanmar, Japan, China, and Bangladesh, paying special attention to factorial invariance. This article extends to do the validation study of the PEC in Bangladesh, including investigating criterion and convergent validity.

Research on EC found that the PEC has been related with other psychological measures. For instance, the PEC has been significantly correlated to Big Five

Personality Traits (Nozaki & Koyasu, 2016), Subjective Happiness Scale (Brasseur et al., 2013; Nozaki & Koyasu, 2016), Rosenberg Self-Esteem Scale (Nozaki & Koyasu, 2016), Satisfaction With Life Scale (Nozaki & Koyasu, 2016), Loneliness Scale (Nozaki & Koyasu, 2016), and TEIQue-SF (Brasseur et al., 2013; Nozaki & Koyasu, 2016).

Purposes of the study

The main purposes of this study were to investigate whether the PEC can be used as a measurement of EC in Bangladesh, and to examine the criterion validity of the PEC in terms of life satisfaction, subjective happiness, depression, anxiety, and stress, as well as the convergent validity of the PEC in terms of emotional intelligence.

Methods

Participants and procedure

Participants in this study were recruited from four universities in Bangladesh, comprising both public and private universities. A total of 400 university students aged from 16 to 24 years (M_{age} = 19.54, SD_{age} = 1.60, 50 % female) participated in this study. Questionnaire was administered in Bangla language. Data were collected via paper-and-pencil questionnaire. All participants were recruited from universities by the researcher, given a thorough explanation about the study, and asked if they wanted to participate in this study voluntarily with informed consent.

Measures

Profile of Emotional Competence. The Profile of Emotional Competence (PEC) had been primarily developed in Belgium by Brasseur et al. (2013), and also validated in French, Dutch, and Japanese (Nozaki & Koyasu, 2016) languages. Recent study also indicated that the PEC has adequate fit to measure EC in Bangladesh, paying special attention to factorial invariance (Min et al., 2018). The PEC comprises 50 items on a five-point Likert scale ranging from 1 (*totally disagree*) to 5 (*totally agree*). It consists of two second-order subscales: intrapersonal EC and interpersonal EC. Each second-order factor includes five first-order subscales. Specifically, intrapersonal EC contains identification, comprehension, expression, regulation, and use of own emotions, while interpersonal EC includes identification of, comprehension of, listening to, regulation of, and use of others' emotions. In this study, Cronbach's alphas of intrapersonal EC and interpersonal EC were .74 and .81, indicating that EC variables were ≥ .70; hence having good internal consistency reliability.

Satisfaction with Life Scale. Life satisfaction was measured using the Satisfaction with Life Scale (SWLS: Diener, Emmons, Larsen, & Griffin, 1985; Bangla translation: Karim & Sagar, 2014). The SWLS comprises 5 items scored on a 7-point Likert scale. Cronbach's alpha in this study was .72 that indicated satisfactory reliability.

Subjective Happiness Scale. Happiness was administered by Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999). The SHS consists of 4 items answered on a 7-point Likert scale. Cronbach's alpha was .70 that had adequate internal consistency.

Depression Anxiety Stress Scale. Depression, anxiety and stress were assessed by the Depression Anxiety Stress Scale (DASS; Lovibond & Lovibond, 1995; Bangla translation: Alim et al., 2014). The DASS includes 21 items rated on a 4-point scale. Cronbach's alpha was .89 that showed very high internal consistency.

Emotional Intelligence Scale. Emotional intelligence was assessed by Emotional Intelligence Scale (EIS: Hyde, Pethe, & Dhar, 2002; Bangla translation: Uzzaman & Karim, 2017). This scale consists of 34 items rated on a 5-point Likert scale ranging from "strongly agree" to strongly disagree". Cronbach's alpha in this study was .84 that had good internal consistency.

Results

Confirmatory factor analysis

We conducted confirmatory factor analysis using Mplus 8 (Muthén & Muthén, 2017) with the robust maximum likelihood estimator to evaluate whether the two second-order factors model of the PEC fit the data adequately for the sample. The PEC consists of two second-order factors: intrapersonal and interpersonal EC. Intrapersonal EC subscale includes identification, comprehension, expression, regulation, and use of own emotions, whereas interpersonal EC subscale comprises identification of, comprehension of, listening to, regulation of, and utilization of others' emotions. First, the five items of each PEC subscale were converted into two item parcels. Item parceling has several advantages such as exploring more stable indicators of a latent construct, reducing the risk of spurious correlations, and deriving more efficient estimates of latent parameters (Little, Cunningham, Shahar, & Widaman, 2002). Therefore, the PEC consists of two second-order factors with 10 first-order latent variables. It comprises a total of 20 parcels with 50 observed indicators. Fit indices for the CFA solution of the PEC were $X^2 = 276.177$, $df = 141$, RMSEA (90% CI) = .049 (.040-.057), SRMR = .049, CFI = .910. The overall model fit was examined through the assessment of several

Table 1
Standardized Factor Loadings for the Profile of Emotional Competence

	Standardized factor loadings
Second-order factor loadings	
Intrapersonal EC	
Identification of own emotions	.90
Comprehension of own emotions	.71
Expression of own emotions	.79
Regulation of own emotions	.91
Utilization of own emotions	.50
Interpersonal EC	
Identification of others' emotions	.91
Comprehension of others' emotions	.89
Listening to others' emotions	.76
Regulation of others' emotions	.86
Utilization of others' emotions	.60

fit indices according to Hu and Bentler's (1999) recommendation. Results revealed that the standardized root mean square residual indicated good fit (SRMR $\leq$ .08), the root mean square error of approximation was also good fit (RMSEA $\leq$ .06), and the comparative fit index showed acceptable fit (CFI $\geq$ .90) (Brown, 2006; Browne & Cudeck, 1993; Byrne, 2012). With respect to the 90% confidence interval of the RMSEA, the model fit can be accepted since the upper bound of this confidence interval is $\leq$ .10 (Chen, Curran, Bollen, Kirby, & Paxton, 2008; Rossi, Elklit, & Simonsen, 2010). Therefore, results indicated that the fit of the two second-order factors model of the PEC was overall adequate. Table 1 shows the standardized second-order factor loadings based on the model.

Criterion and convergent validity

Criterion validity was investigated by assessing Pearson correlations between EC scores and scores with life satisfaction, happiness, depression, anxiety, and stress as shown in Table 2. Findings revealed that intrapersonal EC and interpersonal EC were highly correlated with life satisfaction and subjective happiness. Results also indicated that the association was stronger for intrapersonal EC than interpersonal EC.

As expected, correlations with depression, anxiety and stress yielded that intrapersonal EC and interpersonal EC were negatively associated with depression,

Table 2

Correlation between Intrapersonal EC, Interpersonal EC, and Validity Measures

	Intrapersonal EC	Interpersonal EC
Satisfaction with Life Scale (SWLS)	,31**	,21**
Subjective Happiness Scale (SHS)	,26**	,20**
Depression Anxiety Stress Scale (DASS)		
Depression	-,39**	-,31**
Anxiety	-,23**	-,15**
Stress	-,36**	-,28**
Emotional Intelligence Scale (EIS)	,42**	,49**

Note. $^{**}p < .001$.

anxiety and stress. Findings also showed that correlations with depression, anxiety and stress were stronger for intrapersonal EC than interpersonal EC.

To evaluate convergent validity, the Pearson correlations between EC scores and EIS scores were calculated. Results found that intrapersonal and interpersonal EC were positively related to EIS score.

Discussion

First, this study indicated whether the PEC is viable in examining intrapersonal and interpersonal EC in Bangladesh. Findings confirmed that internal consistency values of intrapersonal and interpersonal EC were good, and the two second-order factors structure of the PEC fit the data adequately in the total sample. Results were consistent with the exploratory factor analysis conducted by Brasseur et al. (2013) and the two-country (Japan and Belgium) study by Nozaki and Koyasu (2016). Thus, this suggests that the PEC can use to measure EC in Bangladesh, including identification, comprehension, expression, regulation, and utilization of own and others' emotions.

This study adds the criterion and convergent validity of the PEC. Findings revealed that intrapersonal and interpersonal EC were positively associated with life satisfaction and subjective happiness, and were negatively related with depression, anxiety, and stress. In addition, the results were consistent with past studies that high EC scores were associated with higher life satisfaction (Brasseur et al., 2013) and greater happiness (Brasseur et al., 2013; Nozaki & Koyasu, 2016). Drawing from this work, we suggest that people who have higher scores in EC have greater satisfaction in life as well as happiness. Similarly, those who have higher EC scores have low levels of negative affects in terms of depression, anxiety and stress. Particularly, the results confirmed the criterion validity of the PEC.

As regards convergent validity of the PEC, EC scores were positively related with emotional intelligence scores. The finding provides clear evidence of confirming the convergent validity of the PEC in Bangladesh.

Implications, limitations and future directions

This study has three major implications. First, we provided evidence that the PEC measure has adequate reliability to measure intrapersonal and interpersonal EC in Bangladesh. Moreover, this study confirmed that the two second-order factors structure of the PEC fit the data adequately. Furthermore, this study contributes to confirm the criterion and convergent validity of the PEC in Bangladesh.

This study recruited only university students in Bangladesh. University students may not be the best representatives of their cultural EC prototypes, so sampling should go beyond students, and into the general population. However, this study attempts to contribute to the establishment of the PEC as a measurement of EC, paying special attention to the criterion and convergent validity of the PEC, and we concluded that the PEC is a viable measure to assess EC in Bangladesh.

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Effect of Elaborative Rehearsal and Imagery on Learning

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Abstract : The concern of the present experiment was to test whether learning can be enhanced through self-generated coding. A randomly drawn sample of 72 primary students was subjected to four conditions, namely control, specific coding, self-generated coding, and dual coding. We measured the recall rate of each group for 20 words. We expected that the effect of self-generated coding would be significantly better than specific coding on learning. We further expected that the effect of dual coding learning would be significantly higher than both specific and self-generated codings. Data were analyzed through One-Way Analysis of Variance followed by post-hoc pairwise comparison. Results confirmed our hypotheses partially. Overall, results indicated that the groups differ significantly from one another. The first hypothesis had been supported indicating that self-generated coding is significantly better than specific coding. However, the second hypothesis was not accepted indicating that dual coding is not significantly better than self-generated coding. It is a matter of surprise that self-generated coding was slightly better than dual coding condition. Therefore, we can instruct students to emphasize on self-generated coding.

Keywords: learning, coding, control process, specific coding, dual coding

Introduction

Learning is a relatively permanent change in a person's knowledge or behavior due to experience. It depends largely on memory. We can control learning using some control processes, such as elaborative rehearsal, coding, and imagery (Atkinson & Shiffrin, 1968). Elaborative rehearsal involves repeating information by thinking about the meaning of the information and connecting it to other information one already has stored in his or her long-term memory. Coding attempts to place the information to be remembered in the context of additional easily

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retrievable information, such as a mnemonic phrase or sentence. Coding can be one of two types; specific coding and self-generated coding. Specific coding involves interpretation of an item or event given by the context or experimenter; it's specific because one doesn't have the opportunity to change its meaning. Self-generated coding allows the participants to generate an elaborative meaning to a word as they wish.

Gallimore, Lam, and Speidel (1977) conducted a study on elaboration and overt rehearsal titled as 'The Effects of Elaboration and Rehearsal on Long-Term Retention of Shape Names by Kindergarteners'. In a study with both theoretical and curriculum-development implications, they compared these two control processes to facilitate kindergarteners' retention of shape names. They defined elaboration as the association of two unconnected stimuli (a shape name and a common object). Induced overt rehearsal involves merely repetition of the shape names. A third condition, which held other elements of instruction constant, served as control. The results indicated that superior long-term retention was produced in the elaboration condition. Analysis of short-term data suggested acquisition was complexly affected by experimental conditions. Shepard (1967) showed that recognition accuracy for visual imagery is very high. Subjects in his experiment viewed 612 pictures at a self-paced rate and were later given a recognition memory test on pairs of pictures. Each pair consisted of a picture they had previously seen and a novel picture. When they were tested 2 hours later, the participants were virtually perfect in identifying which member of the pair they had seen.

The main purpose of the present study was to investigate the differential effects of experimenter-instructed and control codings on learning. Then we would compare these results with the effect of dual coding learning. That means we wanted to find out whether provided elaboration, specific coding, of a particular word helps to recall that word better than the elaboration created by the students themselves, self-generated coding. Finally, we also wanted to find out whether dual coding strategy is really the best technique to remember a word as expected by Paivio (Paivio, 1969).

Practically, we were actually trying to provide teachers with more effective learning strategies with a theoretical base at hand, especially for primary students in Bangladesh, where they (strategies) will be more effective. Students may find learning interesting and more effective than ever before. Moreover, we know that school dropout is a significant problem in Bangladesh, especially in the rural areas. We expected that this initiative may decrease the level of school dropout of the students who omit school earlier as they find learning difficult. Ultimately, we may find a more educated Bangladesh.

To differentiate our study from the one conducted by Gallimore et al. (1977), it should be noted that they were concerned with pair-associate stimuli. In contrast, we presented students with only a single word by each 5-second interval, and they coded the word as they wished. That means we emphasized totally on self-generated coding. As a result, we can generalize our findings more efficiently. In addition, we wanted to compare these results with the effect of dual coding learning which is a unique addition. If our hypotheses would come out as successful, we would be able to encourage our students to apply the more useful control process to learning, whenever possible, with reference to a better theory at hand.

Methods

Participants

To conduct this study, we purposively selected 72 students from three primary schools. All of them were from either class IV or V. We chose those students with good academic results because we needed those who were fluent in reading and writing. Participants were then randomly assigned to four conditions, 18 in each.

Apparatus

A software which presents a list of 20 common Bengali words for a certain period of time, data collection sheet, paper and pencil were used as apparatus. Stimuli were presented on a computer display in Bengali format.

Procedures

Participants positioned in front of a computer display at a viewing distance of 40 cm. At first, under control condition, participants were presented with a list of 20 words. Each word lasted for a period of 5 seconds, followed by the next word in the list. No special instruction about the control processes was given to this group. They were simply asked to try to retain those words. It would formulate a baseline condition to compare with. The dependent variable of the present experiment was the number of correct response participants could recall out of 20. Slight spelling mistakes had been accepted but notation of a totally new word was not allowed. Spelling mistake was allowed because our intention was to measure learning capacity not intelligence level of individual students. It should also be considered that misspelt words are quite common and acceptable in primary levels. No time limit was determined for recalling words. Participants could recall until they themselves gave up.

It should be noted that throughout all of the conditions, participants had been given a simple mathematical task, which lasted for approximately one minute, immediately after presenting the list. It kept them busy and vanished items from the short-term memory (STM). Then their recall would be retrieved from the long-term memory (LTM) - the items which they really learnt from this task. So, we could be sure of that the items they recalled were the items they really learnt. Participants were allowed to recall items in any order they wished.

Secondly, under specific coding condition, participants were presented with the same 20 words consequently. Participants were given a specific mnemonic code introduced by the experimenters (us) for each word. These are the codes that they were compelled to use to facilitate learning. Thirdly, under self-generated coding condition; participants were given the freedom to use any code they wished to relate to each word, which in turn related the words to the information stored in LTM. Only the words were displayed. Remember, they were not compelled to use a specific code for each word as the previous condition instructed. They were taught carefully how to use various control process to facilitate learning. But they were free to use any method they preferred. Although it seems that instructions for control and self-generated coding are almost the same, we should consider the grade levels of the participants studied. Naturally it can be assumed that students of class IV and V are not able to use highly effective learning strategies on their own. It should be noticed that participants in the self-generated coding are carefully introduced with the effective learning strategies but not for the control one. This is the experimental difference.

Finally, rather than presenting merely with words and their associated codes, participants in the dual coding group were presented with both the words and their associated visual pictures. Thus, they got both the visual codes and semantic codes which might increase the rate of recall. The dependent variable was the number of items that students could recall out of 20 under each condition. This was the measure on the basis of which we would compare the four conditions.

Data analysis

One-way Analysis of Variance was used to analyze the data. It usually provides an overall estimate of all of the conditions concerned. But we also employed a post-hoc test to compare the conditions pair-wise.

Results

We observed from the Table 1 that the lowest score was obtaind by specific coding group ($M = 6.17$) and the largest value by self-generated coding group (M

= 10.72). This result apparently supported our first hypothesis which stated that the effect of self-generated coding would be significantly better than specific coding group. The second largest value was for the dual coding group (M = 9.39).

Table 1

Descriptive Statistics for the Four Conditions

Group	N	*M*	*SD*	*SE*
1	18	8	1.879	.443
2	18	6.17	1.917	.452
3	18	10.72	3.25	.766
4	18	9.39	2.45	.578

Note. 1 = Control Group
2 = Specific Coding Group
3 = Self-generated Group
4 = Dual Coding Group
M = Mean Value
SD = Standard Deviation
SE = Standard Error

Remember our second hypothesis which stated that dual coding group would have a greater recall than self-generated group. Here we apparently observed a contradiction. However, these all were mere observations. These differences could be due to some extraneous variables of which we were not aware, or the differences could be so insignificant for the sample concerned that we could easily neglect them. To be sure of whether the groups really differed significantly from one another we needed to run statistical test on the obtained data. In this regard we preferred one-way ANOVA, and its subsequent post-hoc test. We preferred one-way analysis of variance (ANOVA), because we had four groups at hand; we wanted to compare each of them with another (pair-wise) simultaneously.

Table 2 displays $F_{(3, 68)} = 11.505$, which was significant at $p = .000$ level, that, in turn, indicated, overall a highly significant difference among four groups. We concluded from the Table 2 that each of our conditions differed significantly from one another, since $p < .05$. But from this overall estimation alone we could not determine which condition differed from which and how much significant were

Table 2

Overall Comparisons of the Conditions

	SS	*df*	*MS*	*F*	*p*
Between Groups	205.264	3	68.421		
Within Groups	404.389	68	5.947	11.505	.000
Total	609.653	71			

they. That's why we proceeded to run a post-hoc test including all of these conditions and scores which provided a pair-wise comparison between groups.

In Table 3 - *a.Control Group versus others:* The first row compared between the control group and the specific coding group. Since $p < .05$, there was a significant difference between these two groups. It should be noted that from the Table 1 we found that the mean for the control group was 8.00, whereas 6.17 for the specific group. Although the difference was significant for these two groups, we favored the control group over the specific one.

Table 3
Post-hoc Test; Pair-wise Comparisons among Groups

Conditions	Mean Difference	*SE*	*p*
a. 1 versus 2	1.833*	.813	.027
b. 1 versus 3	-2.722*	.813	.001
c. 1 versus 4	-1.389	.813	.092
d. 2 versus 3	-4.556*	.813	.000
e. 3 versus 4	1.333	.813	.106

Note. * $p < .05$

b. Control group versus Self-generated coding: The second row put the scores of the self-generated coding condition against the baseline. The p-value ($p = .001$) indicated that these groups were highly significant ($p < .05$) in difference from each other.

c. Control versus Dual Coding group: The third row compared the dual coding group with the baseline. With a p-value of .092, it indicated that there was not any difference between these groups.

d. Specific coding versus Self-generated coding: The fourth row of Table 3 directly compared the mean scores of the specific and self-generated coding groups. This was the concern of the first hypothesis which stated that the effect of self-generated coding would be significantly better than specific coding on learning. From the Table we observed that the significance level ($p = .000$) absolutely supported this hypothesis. The mean score for the self-generated group ($M = 10.72$) differed significantly from that of the specific group ($M = 6.17$).

e. Self-generated coding versus Dual coding: Finally, there was a comparison between self-generated and dual coding groups. The significance value, $p = .106$, indicated that there was no significant difference between these two experimental group. It should be noted that it was a clear contradiction of our last hypothesis which stated that the effect of the dual coding learning would be significantly higher

than the other three conditions. From Table 1 we found that the mean value for the self-generated group ($M = 10.72$) was higher than the dual coding group ($M = 9.39$). It proved that students under the self-generated coding condition recalled more items than those in the dual coding group.

Discussion

Learning is a relatively permanent change in a person's knowledge or behavior due to experience. The purpose of the present study was to test whether learning can be enhanced by using some control processes. Drawing 72 elementary level students randomly from the target population, we conducted this experiment under four conditions to determine whether each of these conditions has differential effect on the learning capacity of the students in general. Results of the present study differed somewhat from our hypotheses. Overall, we observed a highly significant difference among four groups. We can conclude that each of our conditions differs significantly from one another. That means each condition contributes to learning differentially. To specify the individual contribution of each condition we ran a post-hoc test. The first comparison was between control and specific codings. Although the difference was significant for these two groups, we favored the control group over the specific one, which was contradictory to hypothesis. In practice, we can conclude that specific coding given for each word during conduction under specific coding condition didn't help students to learn the words on the list. Rather they would do much better without such instruction. When we compared self-generated coding with the baseline, we found that these groups are highly significant in difference. It should be noted that it was our main concern and the self-generated group was our main experimental group. Since the self-generated group differed significantly from the baseline group, we can conclude that whatever treatment we presented for this special group was effective and this special instruction helped them to recall more words than the baseline group which did not have any special instruction.

On the contrary, the comparison of dual coding with the baseline indicated that there was not so difference between these groups. Here we also observed another anomaly of our last hypothesis which stated that dual coding learning was the best of all. However, we saw from the significance value that the dual coding group was only slightly better than the baseline. The comparison between specific and self-generated coding group satisfied our first hypothesis. The mean score for the self-generated group ($M = 10.72$) differed significantly from that of the specific group ($M = 6.17$). In practice, we can say that special instructions given to the self-

generated group about how to make learning more effective did actually help this group to recall more words than other three groups. Students learn more information and thus learning becomes more effective when they learn to make strategies by themselves and think more creatively.

Finally, the last comparison was between self-generated and dual coding group. The significance value indicated that there was actually no significant difference between these two experimental groups. It should be noted that it was a clear contradiction of our last hypothesis which stated that the effect of the dual coding learning would be significantly higher than the other three conditions. We found that the mean value for the self-generated group ($M = 10.72$) was higher than the dual coding group ($M = 9.39$). It proved that students under the self-generated coding condition recalled more items than those in the dual coding group. So, the hypothesis has been reversed in this case. We can explain this finding by arguing that when students make learning strategies from their own experiences independently and more logically, the effectiveness of their learning is enhanced. It can even exceed the findings of dual coding theory (Paivio, 1969), which states that visual imagery is the most effective learning strategy ever proposed.

In conclusion, we can say that self-generated coding is the best of all control processes. When students are motivated to use their own unique talents to code materials, they find learning more effective and more permanent. The next contribution is for the dual coding group. We can further conclude that when students are motivated to apply dual coding techniques organized by them, they will learn best.

Self-generated coding should be more acceptable as the best control process when we skim through the finding of a study conducted by Mei-Liang Amy Kuo and Simon Hooper (2004). They investigated the effects of different approaches to learning Chinese characters. The results indicated that participants who generated their own mnemonics demonstrated higher posttest performance than those in visual coding, verbal coding, and translation groups; subjects in the dual coding group scored higher than those in the translation group.

One limitation of this finding can be ascribed to its generalizability. The sample consisted of students from class IV and V who were collected from three schools in a village. This finding might not be applicable to students studying at upper level. It should be also noted that primary students are naturally noisy and frequently go out of control. Only one research assistant cooperated with me. If we could control environment more strictly, we might find a more accurate and reliable result.

We all know the importance of education in a general way. Education is the backbone of a nation. Here in Bangladesh we also believe it. But the use of effective learning strategy is a matter of concern. Do teachers use the effective strategies appropriate to the different levels of students? If yes, then what is their theoretical base? If not, then it should be ensured. We were actually trying to provide teachers with more effective learning strategies with a theoretical base at hand, especially for primary level students, where they would be more effective. Now we expect that by applying our research findings, students will find learning interesting and more effective than ever before. Moreover, we expect that this will decrease the level of school drop out of the students who omit school earlier as they find learning difficult. Ultimately, we will find a more educated Bangladesh.

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Adaptation of the Student Engagement Scale in Bangladeshi Culture

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Abstract : Current study was designed to translate and adapt the Student Engagement Scale (SES). This tool was used pervasively to measure the levels of the student engagement (*i.e.* transition, academic, student-staff, peer, intellectual, beyond-class and online engagement). The scale adapted following the guidelines and systematic procedure. To confirm the final version of the instrument, all items with five point Likert scale were presented final round evaluation and 61 items were selected based on 90% judges' agreement. Item analysis was used to fulfill the two criterion, discrimination value (α value .01) and corrected item total correlation (α value .01). Final translated Bangla version was applied on 120 university students selected purposively aged between 18 and 25 years. Highly satisfactory and significant level of Cronbach's alpha coefficient (α = .94) was observed. Significant correlation between the subscales determined the convergent validity. Thus, the Bangla version of SES appears to be psychometrically sound and hence suitable for use in Bangladesh.

Keywords: engagement, student engagement scale, adaptation, Bangla

Introduction

Student engagement is rapidly becoming a dominant concept in the management and organization of higher education (Leach & Zepke, 2012). In education, student engagement refers to the degree of attention, curiosity, interest, optimize and passion that students show level of motivation earn and progress in their education (cited in Zaman, Tani, Mohammad & Rahman, 2018). A review of the student engagement literature clearly illustrates that among the many

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scales measuring different dimensions of engagement (Appleton, Christenson, & Furlong, 2008; Fredricks et al., 2004; Sharkey, You, & Schnoebelen, 2008; Stafford, 2011) and scales measuring engagement in two factors (Finn, 1989; Marks, 2000; Newmann et al., 1992), the three-dimensional structure is the most popular (i.e., scales consisting of cognitive, emotional, and behavioral, measurement tools) (Appleton et al., 2006; Fredricks et al., 2004; Jimerson, Campos, & Greif, 2003). Appleton et al. (2006) did not include academic engagement in their subdimensions of student engagement. Although there are various measurement tools in the literature, there was no evidence of measurement tools for mentioned dimensions (cognitive, behavioral, and emotional.

Student engagement Student engagement is rapidly becoming a dominant concept in the management and organization of higher education (Leach & Zepke 2012). In education, student engagement refers to the degree of attention, curiosity, interest, optimism, and passion that students show when they are learning or being taught, which extends to the level of motivation they have to learn and progress in their education. Engagement embraces a specific understanding of the relationship between students and institutions. It was extended by Finn and Vole (1993) for including both behavioral and affective or psychological components that are viewed as mutually beneficial. Psychological indicators of engagement incorporate student-teacher relationships and include a sense of school community (Finn & Vole, 1993).

Generally, the students' academic attainment largely depends on involvement or engagement in their school activities. In this regard Astin (1993) found that the learners were able to attain best results by engaging in school environment. Past studies connected student involvement with academic attainment and it has repeatedly declared one of the robust predictor in the education sector (Appleton, Christenson, & Furlong, 2008; Shernoff & Schmidt, 2008). Previous studies regarding student engagement clearly illustrates that different engagement instruments were applied to measure two factors (Marks, 2000; Newmann et al., 1992, and the three-dimensional structure (*i.e.,* cognitive, emotional, and behavioral) respectively (Appleton et al., 2006; Fredricks et al., 2004; Jimerson, Campos, & Greif, 2003). Although in the literature different types of measurement tools was found, but present instrument with six dimensions was selected for the adaptation in Bangla language.

The Student Engagement Scale is a valid and reliable scale for measuring student engagement. Therefore, measuring the student engagement is highly substantial to the educational psychologists. That is why the western psychologists

developed some engagement scales to measure the students' academic engagement. The Student Engagement Scale (SES) is one of the significant scales developed by Kerri-Lee Krause and Hamish Coates, (2000). .

Considering the importance of this scale the present authors were designed to adapt the Student Engagement Scale (SES) according to Bangladeshi ethnicity. Through adaption we can maximize cultural appropriateness and also minimize bias. It is an accepted practice for any psychological test which has been developed in one language and for one ethnic group, to be translated for using in another language and ethnic group. It differs from the traditional concept of translation because it not only produces a linguistically equal version in another language but also takes into account different cultural issues as well. The aim of the current investigation was to translate and adapt SES as a valid and reliable tool for measuring the level of student engagement of the learners in our country.

Methods

Participants

A cross-sectional survey research method was used for this research. By using purposive and convenience sampling techniques researchers collected data from 120 (60 male and 60 female) participants aged from 18 to 25 years. Every respondent were chosen from different public and private universities.

Description of Student Engagement Scale (SES)

The original scale (SES) was developed by Kerri-Lee Krause and Hamish Coates, (2000). It contains 61 items and participants rated each item using a 5 point scale anchored " 1" (*Not at all*), "2"(*A little*),"3" (*Uncertain*), "4" (*A lot*), "5" (*Very much*). The 61 items of the scale evaluates seven engagement statuses of first year students: *i.e.* (a) Transition engagement: 7 items measure undergraduate views on the transition process. (b) Academic engagement: 10 items measure students' capacity to manage time, study habits and academic strategies for success. (c) Peer engagement: 9 items of this dimension measure three contexts regarding peer group which related for the occurrence of engagement. (d) Student-staff engagement: 11 items measure the role of academic staff plays in helping first year undergraduates to involve with their academic activities. (e) Intellectual engagement: 5 items of this part measure learners' views regarding to the subject which provide intellectual stimulation and challenge after almost one year of study. (f) The next dimension online engagement: 13 items of this tool measure learner engage in online activities during the time of first year. (g) Beyond-class engagement: 6 items measures sense

of belonging as well as social connectedness with the other students beyond classroom setting. To find out the internal reliability the following tool has demonstrated and achieving a Cronbach alpha coefficient of .942 (N = 120). The sum of the scores of all items was the score for the individual. Through the high scores (305) high level of student engagement indicates where as low scores (61) indicate the opposite.

The details about the internal consistency regarding the items of student engagement variables are shown in Table 1 below.

Table 1
Internal Consistency Regarding the Items of Student Engagement Scale

Student Engagement Variables	No. of Item	Total Item	Internal Consistency
Transition Engagement	01-07	07	.721
Academic Engagement	08-17	10	.778
Peer Engagement	18-26	09	.859
Student-staff Engagement	27-37	11	.861
Intellectual Engagement	38-42	05	.716
Online Engagement	43-55	13	.871
Beyond-class Engagement	56-61	05	.723

The adaptation process consisted of six steps: namely (1) Ensuring construct equivalence, (2) Forward translation, (3) Back translation, (4) Pre-testing-1, cognitive interviewing, (5) Pre-testing - 2, and (6) Determine the reliability and validity

First Step: *Ensuring construct equivalence*

Available literature regarding SES published in various Bangladeshi scientific journals, books and magazines written by various psychologists and experts in the field of education. It has been appraised to find out whether the constructs have the similar meaning in Bangladeshi culture as in western society. The opinions of professionals from the Psychology department have also been sought as to the equivalence of the constructs between the two societies. However it appeared convincing from previous literature along with educational experts' opinions it revealed that the constructs under study bears the same measuring in Bangla culture and literature.

Second Step: *Forward translation*

The translator whose mother tongue was Bangla, and medium of education was English, and also familiar with English language and culture was selected independently translated the English version inventory into Bangla. Without consulting one another the three translators headed together the translated versions and tried out to choose the best words, items or expression by arriving at a consensus. Thus, the preliminary part (Bangla version) inventory was prepared. A professor of the Jagannath University requested to check the language structure and quality of forward translation, and also conceptual equivalence of words or phrases, but not a word-for-word translation. However, few modifications of some words, or items expression were made by following his valuable suggestions.

Third Step: *Back translation*

In the following steps a professor from psychology department who is proficient in both native and foreign languages was requested and given the task of translating the two versions (*i.e.* Bangla to English). A panel expert and psychologists (three members) in this field have judged the equivalence of the both versions of the SES. On the similarity issue of the given version all the panel members were corrected few words and phrases of the forward translated version before agreement. Finally the Bangla version of the tool was then subjected to subsequent procedures.

Fourth Step: *Pre-testing-1, cognitive interviewing*

To get primary validity for individual item following methods (*i.e.*, scale administration by the researchers, cognitive interviewing of the sample, and item analysis) were used. By applying purposive sampling technique the first pre-testing was carried out by administering SES (Bangla version) on a targeted group of 40 university students (ages 18 to 25 years). All the samples were informed clearly about the significance and objective of the research. Only the respondents who showed interest to participate in the investigation were selected.

Scale administration

The scale was administered on the respondents in a classroom following the standard procedure. After reading the instructions on the top of the items of the scale, the examiner also orally explained the whole procedure. They were said that were no right or wrong answers. They were also asked to give honest response to every question and select proper answer for an individual statement. The

respondents attentively responded to each item during the test period. During this activity, the respondents were allowed to ask type questions regarding words or concepts which found them difficult to understand. All the words or expressions which the respondents asked about were noted carefully by the administrator. Later these queries checked whether it was necessary to modify them or not.

b) Interview

After completing the answer sheet every respondent individually interviewed by the administrator while collecting answer sheet. They were asked about any word, expression or concept about the items, whether that they found very confusing, most difficult, and unacceptable or offensive. It is mentionable that for few items of the tools there were several alternative words or expressions. In these cases, they were asked to choose the best option which they found to be conformed better the usual language.

Item analysis

To determine corrected item-to-total correlation and to find out the appropriateness of each item responses every dimension of the SES were analyzed. However, negative or poor correlation of an item score with total score in the scale indicates that the item is defective in measuring what the whole inventory is supposed to. Item analyses for each subscale individually revealed that a total of 05 subscales had low but consist positive correlation and 02 subscales had low negative correlations. However, reliability α coefficient for each subscale was found to be very high (ranging from .721 to .871). Interestingly, these were the items which the respondents criticized. With total score the remaining 11 items of the instrument had significant and acceptable correlation. Consensuses with each other the panel of expert and psychologists worked on the back translation phase (see third step) had modified the language of the faulty items. This resulted in the revised preliminary Bangla version of SES.

Fifth Step: *Pre-testing-2*

Revised preliminary Bangla version of student engagement scale was employed to check the validity of the items. In this stage, following methods were followed by the administrator.

i) Scale administration ii) Item analysis.

i) Scale administration

In this phase by using purposive sampling method on a group of 80

respondents (ages between 18 to 25 years) the Bangla version of the tool was employed. All data's were collected by following the same testing protocol followed at the first pre-test phase.

ii) Item analysis

In this part item total correlation was found highly satisfactory for each dimension of the instrument of SES. However, internal consistency reliability (α) for each sub-scale was very high (ranged .721 to .871). The coefficients are observed very nearer to the original English version of SES.

Sixth Step: *Reliability and validity determination*

In order to, establish the reliability as well as validity of the corrected Bangla version of the SES, final field test was undertaken by the researchers. In this step purposive and convenience sampling techniques were chosen. All data were collected from 120 (60 male and 60 female) participants aged from 18 to 25 years from different public and private universities. After getting permission from the institution authorities, the testing was carried out conveniently in the pointed class rooms. Respondents who were available and wanted to willingly participate in the study data were collected only from them. However, many respondents were available in the classroom, researchers purposively included samples only those who met following inclusion criteria: (a) studied at university, (b) attended the university regularly, and (c) had no severe type of physical illness or mental disorder that might be interfere with the assessment. Before administering the test all selected respondents were informed about the objectives and purpose of the investigation. They were also told that their names and identity would not appear on the tests. Trained research assistants administered the scale following a testing protocol and standard procedure.

Results and Discussion

The findings of the study implicated the computation of coefficients of the reliability and validity of the SES. The results were presented in Table 2 through Table 5.

Item analysis

Here, corrected item-to-total correlations were computed to find out how individual item goes with the total score for each sub-dimension. Primarily, the item analysis was calculated for 1st Phase (*i.e.*, Pre-testing-1) and 2nd Phase (*i.e.*, Pre-

Table 2
Item Analysis of the Sub-scale Scores and Total Scale Score for Pre-test-I & II

Sub-scale and Total Scale	Alpha	
	Pre-test - 1 (N= 40)	*Pre-test -2 (N= 80)*
Transition Engagement	.608	.631
Academic Engagement	.692	.744
Peer Engagement	.769	.776
Student-Staff Engagement	.726	.764
Intellectual Engagement	.747	.769
Online Engagement	.738	.761
Beyond-class Engagement	.731	.740
SES (total items)	.770	.771

testing-2) (Table-2). However, the convergent validity measured by assessing the correlation between individual item score and total test score of the scale. Here, in SES, all 61 items were thoroughly analyzed. Further, corrected item-total correlation was also determined. So, it can be said that, the corrected item-total correlation value of 61 items was found to be considerable and significant (Table 3).

Cronbach Alpha

To determine the internal consistency reliability of the SES Cronbach alpha was computed. The cronbach α level was found to be .942. According to the value it can be said that computed value is highly significant and satisfactory with an α level of .01 (Table 4). The reliability coefficients were quite equivalent to the original scale.

Correlation among the subscales of SES

To assess the convergent validity of the scale, inter-correlations among the sub-dimensions of SES was determined. These results provided evidences about the internal structure of the instrument. In the field test group it was observed that the scores of the overall SES were significantly correlated with each other. Correlations between the sub-dimensions (*i.e.* transition, academic, peer, student-staff, intellectual, online and beyond-class engagement) were ranging from .187 to .626 (Table 5). However, a notably good and highly correlation was observed between scores on the peer and student-staff engagement (r = .626). These were further comparable to the original version of the instrument.

Table 3
Item-total Correlation and the Reliability in Field Test (N= 120)

Item	Scale mean (if item deleted)	Scale Variance (if item deleted)	Corrected item total correlation	Cronbach Alpha (if item deleted)
1	20.4000	23.637	.569	.704
2	20.6333	25.159	.495	.722
3	19.9333	27.105	.313	.758
4	21.4000	26.830	.268	.772
5	20.6167	23.852	.547	.709
6	20.7583	22.874	.601	.696
7	20.4583	24.418	.541	.712
8	24.2000	49.926	.331	.751
9	25.1833	49.126	.352	.748
10	24.7917	46.301	.477	.732
11	24.7500	44.996	.546	.722
12	24.7833	49.768	.185	.778
13	25.6333	45.579	.507	.728
14	25.3667	46.990	.408	.741
15	25.4000	45.570	.500	.728
16	24.8667	44.974	.474	.732
17	25.0750	46.020	.495	.730
18	26.1667	51.401	.748	.863
19	26.2750	52.016	.727	.865
20	26.5000	51.261	.728	.864
21	25.7417	54.832	.604	.875
22	26.0083	53.218	.661	.870
23	26.5167	53.008	.607	.875
24	26.1000	54.948	.516	.883
25	25.5333	52.923	.662	.870
26	25.4917	57.479	.465	.885
27	37.2417	52.386	.653	.860
28	36.8333	56.073	.655	.860
29	36.7500	54.021	.756	.853
30	36.6583	55.941	.718	.857
31	36.7667	54.399	.738	.855
32	37.3250	55.650	.495	.872

Table Conti

Item	Scale mean (if item deleted)	Scale Variance (if item deleted)	Corrected item total correlation	Cronbach Alpha (if item deleted)
33	37.4083	55.471	.526	.869
34	36.6500	57.305	.616	.863
35	37.0250	58.411	.407	.876
36	36.5000	59.244	.435	.873
37	36.7583	56.235	.510	.870
38	14.1250	12.362	.359	.752
39	15.0333	11.377	.428	.732
40	14.5333	11.175	.645	.654
41	14.5583	11.509	.527	.692
42	14.5167	10.420	.615	.656
43	39.4083	99.017	.639	.865
44	39.2833	100.222	.610	.867
45	39.4417	100.753	.596	.867
46	39.2333	105.525	.400	.877
47	39.7000	101.892	.479	.873
48	40.0917	99.277	.555	.869
49	39.1083	101.425	.563	.869
50	39.1667	100.611	.580	.868
51	39.3750	101.816	.510	.872
52	40.0167	97.546	.623	.865
53	39.9667	94.789	.707	.860
54	39.6083	100.946	.491	.873
55	40.5000	100.555	.501	.873
56	19.5250	11.680	.523	.600
57	19.7333	11.407	.481	.611
58	19.5000	11.916	.578	.591
59	19.6250	12.640	.363	.651
60	20.5833	11.388	.350	.665
61	20.0750	12.994	.235	.696

Note. Total alpha (α) of the scale = .942

Table 4
Reliability of the Student Engagement Instrument and it's Sub-Dimension (N = 120).

SES Alpha (Number of Items 61)							
Total	.942 (*N* = 120)						
Sub-Scales	*TES*	*AES*	*PES*	*SSES*	*IES*	*OES*	*BCES*
	.756	.759	.885	.875	.744	.878	.678

After, analyzing the data, it was found that the present employed instrument is reliable. Further, internal consistency and corrected item-total correlation indicated that all items of the following tool are significant as well as important. It can also be said that in other words that the instrument is non-redundant. This study demonstrated the internal consistency reliability of all subscales and findings

Table 5
Inter-Correlations among the Sub-dimensions of the SES for the Final Field Test.

Variables	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1.Transition Engagement	-						
2. Academic Engagement	.405**	-					
3. Peer Engagement	.583**	.451**	-				
4. Student-staff Engagement	.442**	.451**	.626**	-			
5. Intellectual Engagement	.470**	.551**	.450**	.622**	-		
6. Online Engagement	.355**	.345**	.436**	.408**	.187*	-	
7. Beyond-class Engagement	.447**	.440**	.500**	.573**	.461**	.266**	-

Note. ** $p < .01$; * $p < .05$.S
$N = 140$.

appeared acceptable because the Cronbach's alpha was observed ranged between .591 and .883. The rules of thumb for evaluating alpha coefficient can be described as follows: "$\alpha \geq .9$ = Excellent, $.9 > \alpha \geq .8$ = Good, $8 > \alpha \geq .7$ = Acceptable, $.7 > \alpha \geq .6$ = Questionable, $.6 > \alpha \geq .5$ = Poor, and $.5 > \alpha$ = Unacceptable"(George & Mallery 2003; cited in Uddin, Huque, & Shimul, 2011. According to the response of the respondents' the reliability and validity of the SES were determined. In the

procedure of determination of the reliability of the modified and adapted edition of the SES, findings revealed that the Cronbach alpha is .942. Further, the correlations among the subscales ranged from .187 to .626 were also observed. These findings specify that the adapted version of the SES possesses a high level of reliability which also ensures the usability of this scale in Bangladesh. The inter-correlations among seven sub scales of the Bangla SES are indicative of high convergent validity. Thus, according to the findings it can be concluded that the adapted and modified Bangla version of student engagement scale is suitable for assessing six main dimensions of student adjustments (transition, academic, peer, student-staff, intellectual, online and beyond-class engagement) in Bangladesh.

Few limitations of this present study are to be noted. Firstly, the participants were not selected from all corners of Bangladesh. Secondly, it was difficult to compare the reliability and also the validity of the SES across the culture, as SES was employed on a small number of respondents. Further new research is still required in this dimension to discover the association with quite a many other elements. However, the study will help upcoming researchers to be motivated on researching in this ground.

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Appendix

Bangla version of the Student Engagement Scale (SES)

নিচের প্রশ্নগুলো প্রাতিষ্ঠানিক বিভিন্ন বিষয় সম্পর্কিত। এই প্রশ্নগুলোর মাধ্যমে আপনার প্রাতিষ্ঠানিক বিভিন্ন বিষয় সম্পর্কে তথ্য সংগ্রহ করা হবে। এজন্য প্রশ্নগুলো মনযোগ সহকারে পড়ুন এবং আপনার মতামত টিক চিহ্নের মাধ্যমে প্রকাশ করুন।

a) Transition Engagement (T.E)

SL	উক্তি সমূহ	খুব সামান্য	সামান্য	অনিশ্চিত	বেশি	খুব বেশি
১.	নবীণ-বরণ অনুষ্ঠান আমাকে এই বিশ্ববিদ্যালয়ের একজন ভাবতে সাহায্য করে।					
২.	বিশ্ববিদ্যালয়ের নবীণ-বরণ অনুষ্ঠান আমাকে সুন্দরভাবে পড়াশুনা করতে সাহায্য করে।					
৩.	বিশ্ববিদ্যালয়ের শিক্ষার্থী হয়ে থাকতে আমি পছন্দ করি।					
৪.	বিভাগ/বিষয় বাছাইকরণ সময়ে আমি অন্যের সাহায্য বা উপদেশ পেয়েছিলাম।					
৫.	এই বছর যে বিভগ/বিষয় এর পরিসর থেকে আমি বিষয়/বিভাগ বাছাই করেছিলাম তাতে আমি সন্তুষ্ট।					
৬.	বিশ্ববিদ্যালয় আমার প্রত্যাশা পূরণ করেছে।					
৭.	এই বছর যে বিষয়গুলো বাছাই করেছি তাতে আমি সন্তুষ্ট।					

b) Academic Engagement (A.E.)

SL	উক্তি সমূহ	খুব সামান্য	সামান্য	অনিশ্চিত	বেশি	খুব বেশি
৮.	আমি কৌশলগতভাবে আমার শিক্ষা সম্পর্কিত কাজগুলো ব্যবস্থাপনা করে থাকি।					
৯.	আমি সবসময় সপ্তাহশেষে/সাপ্তাহিক ছুটির দিনে পড়াশোনা করি।					
১০.	আমি সর্বদাশিক্ষকদের কাছ থেকে উপদেশ এবং সাহায্য নেই।					
১১.	ব্যক্তিগতভাবে পড়াশোনার জন্য সময় ব্যয় করি।					
১২.	আমি খুব কমই ক্লাস বাদ দেই।					
১৩.	আমি নিয়মিত বিশ্ববিদ্যালয়ের গ্রন্থাগার থেকে বই তুলি।					
১৪.	আমি বিশ্ববিদ্যালয়ের গ্রন্থাগাওে সময় ব্যয় করি ।					
১৫.	আমি ক্লাসে নিয়মিত প্রশ্ন করি।					
১৬.	আমার পড়াশোনা অথবা অ্যাসাইনমেন্ট সম্পন্ন করে আমি সাধারণত ক্লাসে যাই।					
১৭.	আমি নিয়মিত ক্লাসে আমার পড়া উপস্থাপন করি।					

c) Peer Engagement (P.E.)						
SL	উক্তি সমূহ	খুব সামান্য	সামান্য	অনিশ্চিত	বেশি	খুব বেশি
১৮	আমি নিয়মিত ক্লাসের অন্য শিক্ষার্থীর সাথে আমার সমস্যাগুলো নিয়ে আলোচনা করি ।					
১৯.	আমি নিয়মিত ক্লাসের অন্য শিক্ষার্থীর সাথে বিষয়/বিভাগ সম্পর্কিত আলোচনা করার জন্য একত্রিত হই।					
২০.	আমিঅন্য শিক্ষার্থীর সাথে নিয়মিত পড়াশোনা করি।					
২১.	অন্যান্য শিক্ষার্থীর সাথে পড়াশোনা আমার জন্য অনেক সহায়ক।					
২২.	আমি নিয়মিত ক্লাসের বাইরে এবং গ্রুপ অ্যাসাইনমেন্ট এর ব্যপাওে অন্য সহপাঠী শিক্ষার্থীর সাথে কাজ করি।					
২৩.	ক্লাসের সময় আমি নিয়মিত অন্য শিক্ষার্থীর সাথে প্রজেক্ট নিয়ে কাজ করি।					
২৪.	একই বিভগ/বিষয়ের বন্ধু/বান্ধবীর কাছ থেকে আমি কোর্স নোট এবং আনুষঙ্গিক জিনিস নিয়ে থাকি।					
২৫.	আমি ছাত্র-ছাত্রীদের গ্রুপের একটি অংশ হিসেবে নিজেকে অনুভব করি এবং শিখতে অঙ্গীকারবদ্ধ।					
২৬.	আমার সাথে যে শিক্ষার্থীরা রয়েছে তাদের শিক্ষণের প্রতি ইতিবাচক ধারনা রয়েছে।					
d) Intellectual Engagement (I.E.)						
SL	উক্তি সমূহ	খুব সামান্য	সামান্য	অনিশ্চিত	বেশি	খুব বেশি
২৭.	আমার পড়াশোনার ক্ষেত্রে, যে বিষয় বুদ্ধিগত কাজ বেশী থাকে, তা উপভোগ করি ।					
২৮.	আমি আমার পড়া খেকে যথেষ্ট তৃপ্ত।					
২৯.	ক্লাসে যে পাঠদান হয় তা আমার বিষয়ের প্রতি আগ্রহ বাড়াতে উৎসাহিত করে।					
৩০.	আমি আমার কোর্সের মধ্যে বুদ্ধিদীপ্ত তথ্য পাচ্ছি।					
৩১.	আমি সাধারণত পড়াশোনার উৎসাহী।					

e) Student-Staff Engagement (S-S.E)						
SL	উক্তি সমূহ	খুব সামান্য	সামান্য	অনিশ্চিত	বেশি	খুব বেশি
৩২.	শিক্ষকরা সত্যিকার অর্থে শিক্ষার্থীদের কাজের ক্ষেত্রে তারা যে সমস্যার সম্মুখীন তা বুঝার চেষ্টা করে।					
৩৩.	আমার উন্নতিতে অধিকাংশ শিক্ষকরা উৎসাহিত হয়।					
৩৪.	শিক্ষকরা যে কোন কিছু খুব সুন্দরভাবে ব্যাখ্যা দিয়ে থাকেন।					
৩৫.	শিক্ষকরা আমার উন্নতিতে ভালো মনোভাব পোষন করে।					
৩৬.	শিক্ষকরা বিষয়বস্তু আকর্ষণীয় করে তোলার জন্য সচেষ্ট থাকেন।					
৩৭.	অধিকাংশ শিক্ষকদের সাথে সহজেই কথা বলতে পারি।					
৩৮.	আমরা কাজ নিয়ে আলোচনা করার সময় শিক্ষকদের সহজেই পাই।					
৩৯.	শিক্ষক যে বিষয়ে পড়ান তিনি সে বিষয়ে অনেক উৎসাহী।					
৪০.	শিক্ষকদেরসাথে ব্যক্তিগত পরামর্শ করা খুবই উপকারী।					
৪২.	আমি আত্মবিশ্বাস অনুভব করি কারণ অন্তত একজন শিক্ষক আমার নাম জানেন।					
৪৩.	শিক্ষকরা শুরুতেই পরিষ্কার ধারনা দিয়ে দেন, যে তারা শিক্ষার্থীদের নিকট কি প্রত্যাশা কওে থাকেন।					
f) Beyond-Class Engagement (BCE)						
SL	উক্তি সমূহ	খুব সামান্য	সামান্য	অনিশ্চিত	বেশি	খুব বেশি
৪৪.	আমি মনে করি, আমি বিশ্ববিদ্যালয়ের একজন					
৪৫.	আমি ক্যাম্পাসে থাকতে পছন্দ করি।					
৪৬.	আমি বিশ্ববিদ্যালয়ের অন্যান্য শিক্ষার্থীদের সাথে মিশে থাকি।					
৪৭.	আমার বিশ্ববিদ্যালয়ের একজন অথবা দুইজন ঘনিষ্ঠ বন্ধু-বান্ধবী আছে।					
৪৮.	আমি বিশ্ববিদ্যালয়ের কোর্স বহিভূত কার্যক্রমে অভ্যস্ত।					
৪৯.	কোর্স বহিভূত যেসব কার্যক্রম রয়েছে অথবা বিশ্ববিদ্যালয় থেকে অন্যান্য যে সুযোগ সুবিধা দেয়া হয় আমি তাতে আগ্রহী।					

g) Outline Engagement (O.E.)						
SL	উক্তি সমূহ	খুব সামান্য	সামান্য	অনিশ্চিত	বেশি	খুব বেশি
৫০.	অনলাইনে অন্যান্য শিক্ষার্থীদের সাথে আলোচনা খুবই সহায়তা করে।					
৫১.	ই-মেইলের মাধ্যমে অন্যান্য শিক্ষার্থীদের সাথে যোগাযোগ খুবই সহায়ক।					
৫২.	অনলাইনে শিক্ষাদান খুবই সহায়ক।					
৫৩.	কম্পিউটারে উপযুক্ত নকশাকৃত সফটওয়্যার যা আমাদের কোর্সে ব্যবহৃত হয় তা আমার জন্য সহায়ক।					
৫৪.	ই-মেইলের মাধ্যমে শিক্ষকদের সাথে যোগাযোগ করা সহায়ক।					
৫৫.	মুখোমুখি ক্লাসের পরিবর্তে অনলাইনে নির্দেশিত বিষয় বেশী উপকারী।					
৫৬.	অনলাইনে তথ্যগুলো আমার নিজস্ব শিক্ষার ক্ষেত্রে খুবই উপকারী।					
৫৭.	আমি নিয়মিত ওয়েব-উৎস থেকে পাওয়া তথ্য ও নকশা যা কোর্সের সাথে সম্পর্কিত তা ব্যবহার করি।					
৫৮.	আমার কোর্সের বিষয়ে নিয়মিত আমার বন্ধু-বান্ধবীর সাথে ই-মেইলে যোগাযোগ করি।					
৫৯.	আমার কোর্সের বিষয়ে দলীয় আলোচনা করি, যা আমার পড়াশোনা সাথে সম্পর্কিত।					
৬০.	পড়ার উদ্দ্যেশে আমি নিয়মিত ওয়েব ব্যবহার করি।					
৬১.	আমি নিয়মিত শিক্ষকদের সাধে ই-মেইল এর মাধ্যমে যোগাযোগ করি।					

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Efficacy of Acceptance and Commitment Therapy on Psychological Outcomes in Diabetic Patients: A Review

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Abstract: In today's world one of the most common chronic disorders that affect a large number of people is Diabetes mellitus. The patient with diabetes deals with various emotions and need psychological support in their life. This helps them to manage their diabetes effectively and control their disease. (Chew, Shariff-Ghazali & Fernandez, 2014). For this reason, our current study aims to conduct a review on literatures to find the efficacy of ACT on different psychological outcomes in diabetic patients. For this we searched different electronic database and found ten studies for final synthesis. The studies proved the efficacy of ACT on different psychological outcomes in diabetic patients.

Keywords: diabetes, diabetes mellitus, acceptance and commitment therapy, systematic review

Introduction

In today's world Diabetes Mellitus is a very common disorder. It is a chronic disease that affects many people throughout the world. At present, a rapid increase of the prevalence of Diabetes has been seen globally which can be alarming. Diabetes mellitus, commonly known as diabetes, is actually a group of metabolic disorders where high sugar level is present for a prolonged period. In a report of International Diabetes Federation (IDF, 2017), it is stated that at present the number of people who has diabetes is around 415 million throughout the world.

World Health Organization (WHO, 2016) defines diabetes as a condition which occurs when our pancreas does not produce sufficient amount of insulin anymore or when our body is not able to use the insulin it generates. The function of insulin is to regulate the sugar level in blood. Thus, a general consequence of uncontrolled diabetes is hyperglycemia or raised blood sugar. Moreover if hyperglycemia lasts for long time, it can cause major damage to our body's systems.

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In Bangladesh more than 7.1 million men and women have diabetes. According to WHO (2014), 10 million people or 8.4% of the total adult population is affected by diabetes around the world. By the year 2040 it will be increased to 13.6 million. The study showed 10% of its participants have diabetes and around 23% have prediabetes.

The effect of diabetes can be life threatening. For example, it can harm different internal and external organs of the body. The adults with diabetes have possibility of having cardiac arrest and strokes. Again the probability of suffering from foot ulcer and infection is increased due to the reduced blood circulation along with damage in nerve of the feet can finally result to limb amputation. Diabetic retinopathy can occur due to prolonged aggregated damage in the retina and eventually blindness can be resulted. Again 2.6% of the blindness occurs because of diabetes throughout the world. At present, one of the leading reasons for kidney failure is diabetes (Diabetes Control and Complications Trial Research Group, 1993).

The main objective for diabetes management is Glycaemic control. (Watson & Dokken, 2014). Because if it is kept uncontrolled for longtime it can cause serious complications. The people who have diabetes face challenges every day because their daily preferences and actions like exercise, stress, medication management etc. have direct effect on blood glucose.

The treatment of Diabetes can disrupt individual's psychological well-being as well as social activities. It can also have negative impact on family function .There is a high chance of occurrence of adverse psychological outcomes with the individuals with diabetes, particularly adolescents and children. They are also frustrated from the medical treatment process. So there is a necessity of interventions in the different areas of psychology. Most of the studies on the diabetic patients are commonly done with self-care training and they are carried out publicly (Moazzezi, Moghanloo, Moghanloo & Pishvaei, 2015).

Researches that were subjected on diet or exercise have found positive effect on measures of diabetic control (Appuhamy et al., 2014). There was also effective result in diabetic management in the studies which used educational interventions (Pal, Pal, Barua, & Ghosh, 2010).

Though psychological interventions to control diabetes have shown effectiveness, the diabetes control highly depends on self-management. Also the advantages of these interventions are short -termed. Apart from the development of various types of treatments, specific protocols were developed specifically for people with diabetes mellitus inside the acceptance and commitment therapy (ACT).

Furthermore, many ACT interventions were found effective to in different psychological outcomes of Diabetes patients.

Acceptance and commitment therapy (ACT) can be defined as a psychological intervention that applies mindfulness approaches and acceptance together with commitment and behavior change approaches, to increase psychological adaptability.

According to Harris (2009), Acceptance and Commitment Therapy (ACT) can be defined as an action-oriented approach to psychotherapy. In this approach client learn to admit that their deeper emotions and feelings are correct responses in certain conditions but they should not stop their advancement in lives. Thus, they stop their battle with their inner emotion. As a result of this, they start to accept their problems and commit to carry out required alteration in their actions, despite of the current situation in their lives, and their feelings about it. For the studies which used ACT on diabetic patients, the goal of ACT was to support diabetic patients to lead a prosperous and purposeful life and accepting the hardships faced by them.

Educating diabetic patients with mindfulness skills to manage distressful thoughts and feelings efficiently, in such a manner that they have less effect and impact.

Supporting diabetic patients to explain what is important and purposeful .That is really is, explain values and apply that knowledge to encourage persons to fix targets and carry actions which will enrich their life (Harris, 2009).

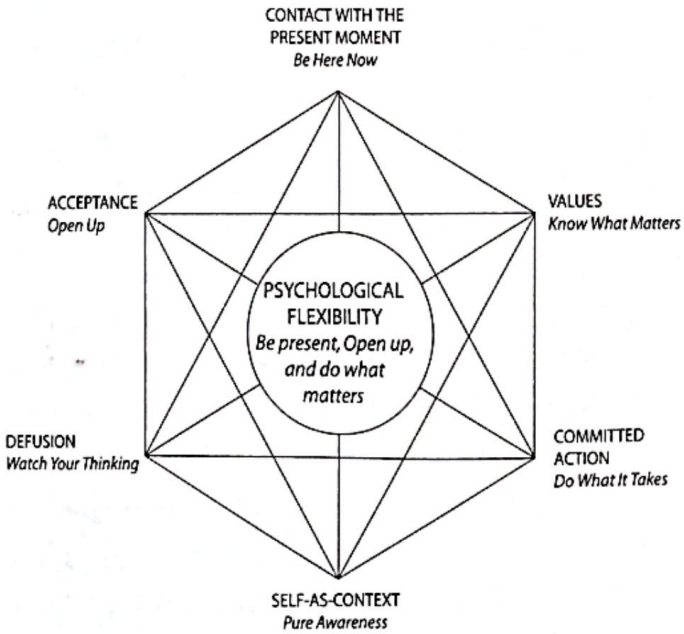

Figure 1. ACT Hexaflix (Harris, 2009)

ACT hexaflix, or the core six therapeutic procedure are Contacting the present moment (Be here and now), Diffusion (watch your thinking), Acceptance (Open up), Self as context (Pure awareness), Values (Know what matters) and Committed Action (Do what it takes) (Harris, 2009).

Diabetic patient go through the psychological problems like stress, sadness, anger and denial and can finally go to depression. Individuals with diabetes have greater chances of depression than individuals without diabetes (Lin et al., 2008; Fischer et al., 2008). Studies showed that the prevalence of mental- illness is associated with diabetes. For example, major depressive disorder is associated with diabetes across lifespan. Again in contrast with those without diabetes depression is higher among youth with type 1 diabetes (Gonzalez, 2013). Anxiety and depression can exist together in diabetic patients, causing a condition that can be stated as anxious depression, which was recognized as a strong predictor of cardiovascular outcomes (Bruce et al., 2016).

As many people are related with this disease, the problem requires immediate attention. Diabetes being a chronic disease and involved with multi-organ along with its high cost of treatment all of these impacts on the quality of life of both the diabetic patients and their family members. Diagnosing and managing anxiety and depression can result in increased quality of life as well as increased clinical outcomes (Saleh, Mumu, Ara, Hafez, & Ali,2014). One study showed the efficacy of the intervention program in improving quality of life among individuals with diabetes (Didarloo, Shojaeizadeh, & Alizadeh , 2016). Forgiveness could decrease the emotional problems related to diabetes by decreasing stress levels and could improve the quality of life among the diabetic patients. (Yazla et al., 2018). Again, a wide range of studies on psychosocial and behavioral interventions, and current interventions have demonstrated very good effect on patients with chronic pain. It may prove useful for the patients with diabetes. (Kemani, Kanstrup, Jordan, Caes, & Gauntlett-Gilbert, 2018). Again systematic reviews and Meta analyses has showed the effectiveness of ACT interventions in cancer patients and in patients with chronic pain. (Veehof, Trompetter, Bohlmeijer, & Schreurs, 2016, Mohabbat-Bahar, Maleki-Rizi, Akbari, & Moradi-Joo, 2015) But no systematic review has been done on the efficacy of ACT on diabetic patients though it was found effective in many psychological outcomes.

Our current study to estimate the efficacy of acceptance and commitment therapy in psychological outcomes for patients with diabetes is significant because it will help the diabetic patients to know about the psychological intervention available and its effectiveness in different psychological outcome so that they can reduce their distress (Virtanen et al., 2014) and possibly have normal life.

Such findings can help the Doctors and other mental health professionals understand which intervention is more effective for such patients and to prepare treatment plan for diabetic patients who come for psychological support.

The aim of the present study is to carryout systematic review on literatures to find the efficacy of ACT on different psychological outcomes in diabetic patients and to guide the future research.

Methods

We followed the PRISMA preferred reporting method for conducting this research. (Moher, Liberati, Tetzlaff, Altman & Group, 2009). PRISMA is a specific and standardized method to recognize, select, and review relevant research. PRISMA helps gather and analyze data from the studies that are included in the review in a systematic way. It contains a checklist and a flow diagram with four steps. Its aim is to help authors to create improved report for Systematic review and Meta analysis. The four phase flow diagram along with the findings is shown on the result section.

Search strategy

We searched the literature carefully .We used a set of key words with the concepts of Diabetes Mellitus and Acceptance and Commitment therapy; the detail about the search terms are given below. Results were categorized in specific orders and duplicates were removed using Mendley review manager. Additional papers were identified through manual searches. We searched the literature between May 2018 and July 2018, no publication year was fixed in order so that highest number of papers existing can be reached.

Electronic database

We searched two electronic databases. They are PUBMED and Google Scholar.

Search terms:

The following search terms were combined to identify publications relating to Acceptance and Commitment Therapy with Diabetes"(Acceptance and Commitment Therapy)" AND (Diabetes OR "Diabetes Mellitus " OR "Type 2 Diabetes " OR "Type 1 Diabetes") .

Inclusion criteria

1. Patient with any type of diabetes. (type 1or type 2).

2. Patient with all age group.
3. Used acceptance and commitment therapy as intervention alone or along with psycho education.

Exclusion criteria

1. Pregnancy associated diabetes (gestational diabetes).
2. Any other intervention than ACT, Mindfulness and Psycho-education.
3. Full text couldn't be accessed.
4. Research published in other than English language.
5. Full research done to see the effect of ACT in different group, not study protocol/pilot study.

Results

Search strategy

The outcome of the study selection process is presented in the chart. Initially, 42 papers were selected from which 4 studies were excluded by eliminating duplicates, more 10 studies were removed after investigating according to the inclusion criteria, and further 18 studies were eliminated by the exclusion criteria. Finally ten ACT studies on adults with diabetes mellitus were selected for inclusion in this study. We examined various types of ACT interventions given for all age group and both types of diabetes mellitus. The finally selected ten studies are shown in Table 1 with a narrative detail presented on Table 1 and Table 2.

Features of the included studies

The study design were both experimental and quasi experimental. One study included qualitative design. Almost all the studies had pre test and post test measurement. Most of the studies had follow up measurement except four. The length of the session in 4 studies was 8 weekly session, 3 studies 10 weekly sessions and 3 studies 1 day workshop. All the studies except one had control group. The studies were facilitated by psychologist and mental health nurse. In one study the facilitator was the author of the intervention protocol.

Recruitment

Most of participants of the studies were recruited from local hospitals/diabetic associations.

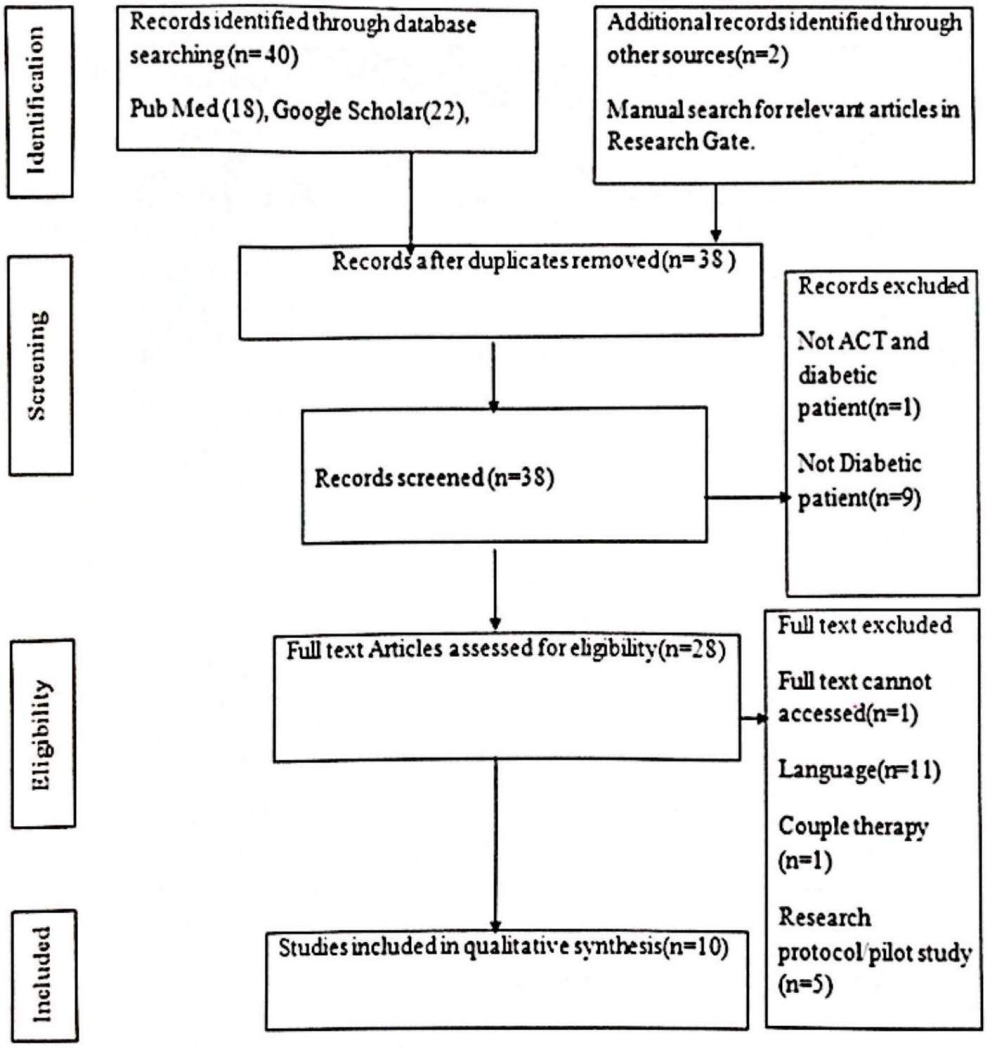

Figure 2. PRISMA Flow Chart for the Identification and selection of studies.

Review of study outcome measures

Our present review included different psychological outcomes e.g. coping strategies (2), diabetes self-care(2), depression (3), perceived stress(2) , special health self-efficacy /self-efficacy (2), resiliency, mental health, psychological wellbeing, self-management (2), acceptance of diabetes, anxiety etc

ACT interventions

The ACT interventions that were involved in this study were mixed in material and delivery. Most of the studies used different manual or their short form developed for ACT intervention. Again most of them covered the items of ACT hexaflix.

(Harris, 2009).The components like mindfulness, acceptance and values were covered by all of the studies. Three of them contained cognitive diffusion (Table 2).

Effect on the psychological outcomes

The studies found ACT effective in different psychological outcomes among diabetic patients. Three studies found ACT effective in reducing depression (Moghanloo, Moazezi et al., 2015; Ahmadsaraei et al.,2017;Whitehead et al., 2017a); Two research showed ACT effective in coping strategies and diabetic self care (Shayeghian et al., 2016; Gregg et al., 2007). Two studies found ACT effective in increasing psychological wellbeing (Moghanloo, Moazezi et al, 2015; Moghaddasfar et al., 2017). One research found ACT effective in special health efficacy (Moghanloo, Pishvaei et al., 2015). Again, in another study ACT increased self efficacy (Khashouei et al., 2016). Both of these previously mentioned studies had found ACT effective on reducing perceived stress. In one study ACT was no effective in increasing resiliency in the post test stage but was found effective on follow up stage (Khashouei et al., 2016). In two studies ACT was effective in increasing self management behavior which directly or indirectly improved the condition of the patient (Khashouei, et al., 2016; Gregg, et al., 2007). Again, it was found that self management behavior was more effective in the ACT along with education intervention than in education only intervention (Kaboudi et al., 2017).

Strength and limitations of the studies

The strengths and limitation of the reviewed studies is shown in Table 2. The studies indicated that Acceptance and Commitment Therapy (ACT) is a helpful extension to assistance given to patients suffering from diabetes in different ways. For example, ACT is effective for the role of coping style, raising special health self-efficacy or reducing depression and perceived stress among diabetic patients (Shayeghian et al., 2016; Moghanloo, Moazezi et al., 2015).

These studies indicated that ACT can be used along with drug therapy to improve mental health and the total mental state of the patients with diabetes. Increase in self-management behavior, coping and acceptance results the increase in psychological wellbeing. In one study, participants felt that the process of evaluation has given them insight particularly in the area of knowledge which they obtained through involving themselves in management of diabetes. (Whitehead et al., 2017b).

The studies had some limitations too. They are shown in Table 2 .The limitations included lack of long term follow up (Shayeghian et al.,2016) , lack of large population most of the studies done on small population (Moghanloo , Moazezi et al., 2015; Moghanloo, Pishvaei et al., 2015), inability to generalize due to lack of similar studies, lack of heterogeneous group (Khashouei et al., 2016) etc.

Discussion

The purpose of our research was to carry out systematic review to find out if ACT is effective on diabetes patients. We identified ten studies utilizing ACT as interventions for the final systematic review, and found proof of effectiveness and advantage for these ACT interventions in pointing the psychological outcomes of diabetic patients. We reviewed different interventions from the different studies in this systematic review and showed potential benefits such as improved self efficacy, stress coping, resiliency, self care, psychological wellbeing and mental health. All the advantages reported by participants have proved the usefulness of the ACT for diabetic patients. Our current study has some limitations. Firstly, very small number of studies was used in this systematic review, although psychological/emotional support is important for diabetic patients. Patients with type 2 diabetes need constant self care and emotional support from others .Despite this obvious need; a very small number of interventions are available to decide effective ways of decreasing the psychological trouble they experience.

The second limitation is the language. Many of the studies were done in Iran and the research papers were not available in English. Thus, lots of studies were excluded in the initial stage. The third limitation is with the database search. Only limited amount of search term was used. So, further possible studies can be identified by applying additional search terms. Again only 2 databases were searched due to time limit. If more databases were searched than more studies could be identified. Moreover, due to time limit some unclear reports couldn't be clarified by contacting with the authors. The fourth issue is related to the outcome measures. As a variety of questionnaire were used and different studies measured different outcomes. Moreover, only one of the ten studies measured Acceptance of diabetes. Meta-analysis couldn't be applied because the studies employed various kinds of interventions, the outcome measures or instruments were different in every study. The fourth issue is that no specific age group and no time limit were selected for the current study due to scarcity of similar studies. Thus, additional clinical trials are needed to enhance the evidence base. Finally, the estimation of risk of biasness couldn't be done due to time limit.

Table 1
Studies Included for Final Analysis

Author & Location	Study Design	Final Sample(n)	Engagement	Session	Facilitator	Outcome Measures	Outcome
Shayeghian , Hassanabadi , Aguilar-Vafaie, Amiri , Besharat (2016) Tehran, Iran	Pre-test, post-test design with follow-up control-group.	Treatment group (n = 53) Control group (n = 53)	Experimental group was engaged 10 weekly sessions which consisted association of group-based Acceptance and Commitment Therapy and education. Control group received 2 hour workshop on education about diabetes control	Not reported clearly	Not reported	Glycaemic hemoglobin Summary of diabetes self-care activities(SDSCA) The acceptance and action diabetes question (AADQ) The brief COPE questionnaire.	Increased coping strategies, improved diabetes self-care and kept glycated hemoglobin (HbA1C) levels in the target range
Moghanloo ,V Moghanloo,R Moazezi (2015) Tebriz, Iran	Clinical trial along with control group with random assignment and pre-test -post-test.	Treatment group(n=17) Control group (n=17)	Experimental group participated in therapy 10 weekly sessions, 90 minutes per session as intervention Control group was given no intervention	Group session	Psycholo gist	Reynolds child depression scale (RCDS), Eysenck feelings of guilt scale and Satisfaction with life scale (SWLS).	ACT was effective on reducing depression, decreasing guilt feeling and increasing psychological well-being.

(Cont)

Author & Location	Study Design	Final Sample(n)	Engagement	Session	Facilitator	Outcome Measures	Outcome
Moazzezi, Moghanloo,V Moghanloo, R Pishvaei, (2015) Tebriz, Iran	clinical trial with a pretest-posttest design together with control group and random assignment	Treatment group(n=18) Control group (n=18)	Experimental group received 90 therapy minutes session every week, for ten weeks therapy session as intervention Control group was given no intervention.	Group session	Psychologist	special health self-efficacy scale perceived stress scale (PSS)	ACT was efficient on reducing perceived stress and improving special health self-efficacy
Ahmadsaraei, Doost, Manshaee,, Nadi, (2017) Karaj ,Iran	Quasi-experimental design with three months follow-up.	Experimental group (n=20) Control group (n=20)	Experimental group got eight 90 minutes therapy session as intervention Control group received no therapy session	Not reported clearly	Not reported	Beck Depression Inventory (BDI)	Decrease in depression score

(Cont)

Author & Location	Study Design	Final Sample(n)	Engagement	Session	Facilitator	Outcome Measures	Outcome
Khashouei, Ghorbani, Tabatabaei, (2017) Isfahan, Iran	quasi-experimental design (pre-test, post-test) with follow up stages	Experimental group (n=16) Control group (n=16)	Experimental group received eight 90 minutes ACT treatment sessions Control group no treatment	Not reported clearly	Not reported	The Scherer & et. al self-efficacy scale The Cohen et al perceived-stress scale The Connor Devidson Resiliency Scale (CD-RISC)	After the treatment, the scores of self-efficacy and perceived-stress were reduced significantly compared to the control group. No significant difference was found in resiliency in post test stage. Though, the scores decreased in follow-up stage compared to the control group.
Kaboudi, ,Dehghan, Ziapour,(2017) Kermanshah ,Iran	experimental design together with pretest-posttest control group design	Experimental (n=13) Control (n=13)	Experimental group received eight 90 minutes therapy session as intervention Control group received no therapy session	Not reported clearly	Not reported	General health questionnaire(GHQ)	The posttest scores of mental health were significant in the experimental group compared to the control group.

(Cont)

Author & Location	Study Design	Final Sample(n)	Engagement	Session	Facilitator	Outcome Measures	Outcome
Gregg, Callaghan, Hayes, Glenn-Lawson (2007) San Francisco, U.S.A	Not clearly mentioned	Experimental (n=43) Control (n=38)	Experimental group participated in 7 hour workshop on ACT and education Control group participated in 7 hour workshop on education	Not reported clearly	Author of the manual and masters level graduate students	HbA1C Self-management was measured with totals of three self-report items on exercise, diet, and glucose monitoring Diabetes Care Profile (DCP) Acceptance and Action Diabetes Questionnaire (AADQ)	Increased the use of coping strategies, improved diabetes self-care, glycated hemoglobin (HbA1C) remained in desired range in the ACT condition. Through meditational analyses it was found that increase in acceptance coping and self-management behavior resulted on changes in HbA1C
Moghaddasfar , ,Dehghan, ,Barahooyi (2018) Kermanshah ,Iran	Quasi-Experimental design with pre-test, post-test and control group	Experimental (n=20) Control (n=20)	Experimental group received eight 90 minutes therapy session as intervention Control group received no therapy session.	Group session	Not reported	Ryff's Psychological Well-being scale (PWB)	Commitment and acceptance therapy was found effective for increasing patient's psychological wellbeing

(Cont))

Author & Location	Study Design	Final Sample(n)	Engagement	Session	Facilitator	Outcome Measures	Outcome
Whitehead et al. (2017a) New Zealand	Qualitative design along with random assignment to an intervention	Treatment (n=39) Control (n=34)	Education intervention one day workshop Education and acceptance intervention one day workshop	Group session	Primary Health care based nurse	written feedback guided by open-ended questions Semi structured interview.	The sense of personal responsibility and the knowledge on diabetes self-management was increased Increase in self-management activities resulted better diabetes management.
Whitehead, et al. (2017b) New Zealand	3 arm parallel group randomized controlled trial	Treatment (n=73) Control (n= 45)	Experimental group :Education group (n=34) received day workshop on education programme education plus ACT group one day workshop on education and ACT component (n = 39) control group(n=45) received routine diabetes care	Group session	mental health nurse who is specialized in ACT	Glycaemic control (HbA1c). The Acceptance and Action Diabetes Questionnaire (AADQ) Hospital Anxiety and Depression Scale (HADS) Diabetes Care Profile The Diabetes Treatment Satisfaction Questionnaire (DTSQ) The summary of diabetes self-care activities	Statistically significant reduction in HbA1 Significant changes were found among the groups in participants' acceptance of diabetes (AADQ), anxiety and depression, understanding of diabetes, satisfaction with treatment, or satisfaction with blood glucose control. Self-management activities improved in the education plus ACT group but decreased in the education group.

Table 2
Interventions, Strength and Limitations.

Study	ACT Intervention	Strength	Limitation
Shayeghian et al.(2016)	Workshop based on ACT manual (Gregg et al.2004). a) Mindfulness and acceptance training. b) Exploration of personal values related to diabetes. c) A focus on the ability to act in a valued direction while contacting difficult experiences.	• This study indicated ACT as a valuable inclusion to services provided to diabetic patient for its role of coping style.	• No follow-up was carried on after than 3-months. • The long-term effects of ACT interventions could not be estimated
Moghanloo , Moazezi et al. (2015	1)Building the therapeutic contract and functional analysis. 2) Creative hopelessness 3) Values clarification and building commitment. 4) Control exercises 5) Acceptance exercises 6) Cognitive diffusion 7) Self as context 8) Acceptance and commitment, fear of commitment. 9) Remember session. 10) Remember session and relapse prevention.	• The study showed the effectiveness of ACT.	• Limited number of study population • Scarcity of same type of studies, thus studies couldn't be generalized.

(Cont)

Study	ACT Intervention	Strength	Limitation
Moghanloo, Pishvaei et al. (2015)	1) Building the therapeutic contract and functional analysis. 2) Creative hopelessness 3) Values clarification and building commitment. 4) Control exercises 5) Acceptance exercises 6) Cognitive diffusion 7) Self as context 8) Acceptance and commitment, fear of commitment. 9) Remember session. 10) Remember session and relapse prevention.	• This study found ACT efficient for improving special health self-efficacy and decreasing perceived stress among children with DM	• The population of the study was very small. • Lack of ability to generalize on large population. • Lack of availability of same type of studies. • Due to lack of matching confounding variables some of the obtained differences are related to possible differences in confounding variables
Ahmadsaraei et al.(2017)	1) Education, information and the limits of control 2) Values 3) Cognitive diffusion. 4) Committed action.	• This study showed that acceptance and commitment therapy can be useful tool for reducing depression among the type II diabetic patients.	• This intervention actually a public education program to reduce depression. It was not a special program for patients with diabetes • The sample size required for this study was not calculated in the experimental and size, controlled conditions • The number female participant was more than the male participant.
Khashouei et al. (2017)	Not reported clearly	• This study found ACT as an effective psycho-cognitive function in type II diabetes patients	• The results cannot be generalized to illiterate people as the study included only subjects with at least a high school diploma • The results can be generalized only to the female gender.

(Cont)

Study	ACT Intervention	Strength	Limitation
Kaboudi et al. (2017)	1) The limits of control and focus on experience. 2) Values 3)Cognitive diffusion 4) Mindfulness 5)Commitment action 6)Self as context 7)Reviewing and continued action in support of values 8)Moving forward	• This study indicated that ACT can be used as a complementary treatment to improve mental health and the complete mental state of patients with diabetes along with drug therapy.	• No limitations reported
Gregg et al.(2007)	Gregg et al 2004, manual a) Mindfulness and acceptance training. b) Exploration of personal values related to diabetes. c) A focus on the ability to act in a valued direction while contacting difficult experiences.	• The study showed that changes in HbA1was resulted from the increase in coping, self-management behavior and acceptance.	• The assessment of fidelity of the treatment manuals did not take place. • Therapist effects may influence the result because the ACT intervention was delivered by a single individual; thus • The long term effect couldn't be assessed because the follow-up period was only 3 months.
Moghaddasfar et. al. (2018)	1) The limits of control and focus on experience. 2) Values 3)Cognitive diffusion 4) Mindfulness 5)Commitment action 6)Self as context 7)Reviewing and continued action in support of values 8)Moving forward.	• ACT is effective on improvement of psychological wellbeing of diabetes patients.	• No limitations reported

(Cont)

Study	ACT Intervention	Strength	Limitation
Whitehead et al. (2017a)	Not reported clearly	• The participants reported that they had gained important insight through the process evaluation into the area of specific information which they acquired by involving themselves in the intervention areas of diabetes management.	• The evaluation process have given only insight problems faced by the participants but it did not showed any proof relating to experience and outcomes. • Due to lack of having a large sample no differences was found for gender or time. • If the follow up of the participants was carried on for more than 6 months, so, more knowledge can be gathered in the areas of self-management and sustainability of the benefits.
Whitehead et al. (2017b)	• Mindfulness and acceptance training • Exploration of personal values	• The nurse led education intervention is found to be an effective process in increasing results for type 2 diabetic patients.	• It is not clear how the group process effected on outcomes • The duration of effect of the interventions on glycaemic control found in this study was not stated clearly.

In conclusion, the key finding of this systematic review is that ACT interventions are effective in different psychological outcomes among diabetic patients. It is potentially beneficial for people with all type of diabetes. So using Acceptance and Commitment Therapy (ACT) on diabetic patient for their different psychological issues can bring positive outcome. This review also suggest more and more research in the area of Acceptance and Commitment Therapy (ACT) on diabetic patients .Also further similar research can be carried on Bangladeshi population to see its effectiveness. For this we should consider some adaptations to the ACT along with the need of our Bangladeshi Population .This review also suggest the use of brief version of ACT intervention, brief session duration, brief treatment course duration; and adaptability of the facilitator in conduction and the context and setting. This might enhance the quality of intervention for the studies with Acceptance and Commitment Therapy (ACT) that will take place in both our country and abroad.

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Impact of Perceived Community Connectedness and Job Satisfaction on Organizational Citizenship Behavior

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Abstract: The current study was intended to explore the impact of employees' perceived community connectedness and job satisfaction on their organizational citizenship behavior. Inclusion of Community in Self Scale, the adapted Bengali version of the Job Satisfaction Scale and the Organizational Citizenship Behavior Scale were used to collect data from 200 employees following the purposive sampling technique. Results indicate that organizational citizenship behavior was notably positively correlated to perceived community connectedness (r = .771, p < .01) and job satisfaction (r = .703, p < .01). Strong inter-correlation has been found between the two independent variables- perceived community connectedness and job satisfaction (r = .744, p < .01). In addition, these two variables are predictors of organizational citizenship behavior which jointly explained 67.6% of the variance. The strongest predictor was perceived community connectedness which alone explained 59.5% of variance. The outcomes proffer imperative allusions for upcoming research and prevention curriculums that aim to influence organizational schemes to take required actions for the advancement of the employees and to cherish their civic engagement in the organization they work for as well as the community they live in.

Keywords: job satisfaction, perceived community connectedness, organizational citizenship behavior

Introduction

We are innately communal and all of us rely on an impassable network of connection in order to grow and flourish. Perceived community connectedness is something that can be considered as a feeling of affiliation and belongingness. It is a feeling that affiliates matter to one another and to the group, and a shared socio-

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emotional bond which ensure that everyone's need will be met through their assurance of being together (Unger & Wandesman, 1985; McMillan & Chavis, 1986). People can feel allied through their personal relationships and the roles they play in their family, community as well as their workplace. Sense of belongingness may modify employees' view toward their job and provide satisfaction for job (Barak, 2000).

Job satisfaction is something that mirrors employees feeling about their work (Brief, 1998; Spector, 2003) and leads them in exact path in accomplishing the organizational objectives. It is the consequence of employees' sense and assessment of their personage points contained by organizational goals and meeting those expectations while working. Satisfied employees perform their duties well and they are dedicated to their work as well as to the organization (Vroom, 1982). They engage themselves in different activities in the organization which are considered to be of optional rather than those delineated as job responsibilities and are known as organizational citizenship behavior (Organ, 1988).

Organizational Citizenship Behavior (OCB) can be described as employee's spontaneous and preferred pledge beyond his legitimate job liabilities. The employee does not receive any extra benefit from the organization because of this personal predilection (Organ, 1988; Organ, Podsakoff, & Mackenzie, 2006) toward the organization he works for. At present, it is the precedence of different foundations having OCB in order to conquer the challenges of becoming vibrant, effectual, advanced, and flourishing organizations and being proficient to swiftly retort toward changes (Lapierre & Hackett, 2007) and promote the overall organizational efficiency (Podsakoff, Whiting, Podsakoff, & Blume, 2009). Many employees consider that their chief accountability is to ensure the assigned work and stay away from activities that could be supposed incommodious, whereas some employees consider their work as important, evocative and beneficial to the organization.

Yıldız (2016) affirmed that employees with OCB contribute significantly to foster organizational execution as well as exhibit good relations with co-workers, taking decision to help others expecting nothing in return, refraining from complaining or gossiping and stay in good spirits even when something not go in desired way, coming into work early to complete a task even when these are not outlined in the job description. It means that OCB can be experienced in the form of vigorous involvement in an organization, speaking favorably about the organization to those outside of it, and evasion of activities potentially risky for the organization. It provides them the opportunity to sense that they have greater

control over their work and prevents them from the feeling of exhaustion and clear up the role nebulousness.

There is growing evidence indicating that employees' organizational citizenship behavior is closely associated with their inclusion of self in the organization. In a study, Lenzi, Vieno, Pastore, and Santinello (2013) found that community connectivity is linked to advanced levels of civic engagement in adolescence. Additionally, previous studies also reveal that employees with high level of job satisfaction have a propensity of engaging in organizational citizenship behaviors (Finkelstein, 2006; Organ et al., 2006; Subhadrabandhu, 2012; Dehghani, Hayaviehaghighi, Kianpory, & Sheibani, 2014; Sadodin, Daghian, Esmaily, & Hooshmand, 2016). Lu, While, and Barriball (2005) identified job satisfaction as an important indication of OCB. In 2005, Begum also proposed that employees having satisfaction in their job will have higher organizational citizenship behavior. In 2015, Rahman found that employees satisfied with their job carry out better citizenship behavior. In 2018, Ferdus and Kabir also found similar findings for bankers of Bangladesh.

Rationale of the study

To attain the mission and objectives of any organization within a short period without conveying additional expenses, raising the level of employees' sense of belongingness, satisfaction toward job and participation in organizational voluntary acts is of crucial importance (Yurcu & Akinci, 2017). A huge body of literature around the world in the organizational sector has focused the area of job satisfaction and organizational citizenship behavior, but specifically it is hard to find any conclusive study that had dealt with the impact of perceived community connectedness and job satisfaction on organizational citizenship behavior. The majority of the studies on the liaison between job satisfaction and organizational citizenship behavior were carried out in the Western culture (Finkelstein, 2006; Organ et al., 2006; Subhadrabandhu, 2012; Dehghani et al., 2014; Sadodin et al., 2016). Additionally, literature on perceived community connectedness in organizational context is inadequate in worldwide and such undertakings are apparently also rare in Bangladesh. There is hardly any study in Bangladesh that has directly assessed the impact of perceived community connectedness and job satisfaction on employees' organizational citizenship behavior. To fill up this slit in the literature, the current study aims to investigate the relationship between the variables and their influences on one another. The findings of the current research will add value to the existing literature and the outputs are likely to be useful to the

organizational authority to enhance the effectiveness of organization as well as to boost up the employees to be more engaged in organizational voluntary acts.

Objectives of the study

a. The central aim of the present study was to explore the impact of employees' perceived community connectedness and job satisfaction on their organizational citizenship behavior. Specific objectives of the study were -
b. To appraise whether perceived community connectedness has any significant correlation with organizational citizenship behavior.
c. To assess whether job satisfaction has any significant correlation with organizational citizenship behavior.
d. To determine the individual impact of community connectedness and job satisfaction on organizational citizenship behavior.
e. To determine the joint impact of community connectedness and job satisfaction on organizational citizenship behavior.

Methods

Participants

A total of 200 employees, age ranging from 20 to 50 years, were selected on the basis of purposive sampling technique from different multinational companies located in the Dhaka city. Among them, 152 were males and 48 were females.

Measuring instruments

Following instruments were used to collect data from the participants:

a. Inclusion of Community in Self (ICS) Scale to assess perceived community connectedness.
b. Bangla version of the Job Satisfaction Scale (JSS) to assess the satisfaction of the employees toward their job.
c. Bangla version of the Organizational Citizenship Behavior Scale (OCBS) to assess the organizational citizenship behavior of employees.

In addition, a personal information form was used to collect the demographic information like age, sex, educational qualification, relationship status, socioeconomic status, job duration etc.

Description of the instruments

1. *Inclusion of Community in Self (ICS) Scale:* A single-item pictorial measure

of community connectedness is developed by Mashek, Cannaday, and Tangney (2007). It is consisting of six pairs of overlapping circles, with each pair of same-sized circles overlapping slightly more than the preceding pair. Scoring of ICS scale is ranging from 1 to 6 where the minimum score is 1 and the maximum score is 6. The test-retest reliability of the ICS over a two-week period was $r = .74$.

2. *Job Satisfaction Scale (JSS):* The Bangla version of Job Satisfaction Scale (Khaleque, 1995) was originally developed by Brayfield and Rothe (1951). The scale is composed of 18 items, of which 9 were positive (item 1, 2, 5, 7, 9, 12, 13, 15, 17) and the remains were negative. For the positive items, score values range from 5 (strongly agree) to 1 (strongly disagree). A reverse order was followed for negative items. The sum of scores of all the items was the total score of the scale for an individual. High score indicates high job satisfaction. The lowest possible score is 18, highest possible score is 90 and mid-point is 54. If the total score is above the midpoint then it indicates high level of job satisfaction. Its reliability coefficient was .87. Validity was investigated by comparing job satisfaction scores of two groups: (1) 40 students who had personnel jobs, and (2) 51 persons who did not. The value of coefficient alpha was .92.

3. *Organizational Citizenship Behaviour Scale (OCBS):* The Bangla version of Organizational Citizenship Behaviour Scale (Muhammad & Afrin, 2017) was developed by Sharma and Jain (2014). It is composed of 36-item. The score values range from 7 (for strongly agree) to 1 (for strongly disagree). The sum of scores of all the items was the total score of the scale for an individual. High scores indicate high organizational citizenship behaviour. The lowest possible score is 36, highest possible score 252 and mid-point is 126. The reliability of the scale as determined by split half reliability method on the sample of 260 subjects is .89. In order to find out the validity from the coefficient of reliability, the reliability index was calculated, which indicated high validity on account of being .94. To ascertain the reliability of the instrument in the context of Bangladeshi culture, it was administered on 30 bank officers. The scale has the internal consistency of .95.

Procedures

At first, formal permission was taken from the authority of the company. The data were collected through the questionnaires mentioned above from the respondents who were spontaneous and showed positive attitudes towards the research. For taking consent, at the beginning, each respondent was explained about the general intention of the study. The respondents were also assured that all information given by them would remain confidential. Both written and verbal

instructions were provided to them for clarification about what to do, and how to fill up all questionnaires. After completion, all the respondents were thanked for their participation.

Results

In order to scrutinize the data Pearson product moment correlation and stepwise multiple regression analyses were applied on the obtained scores. The findings are presented in the following tables.

Table 1 reveals that both perceived community connectedness ($r = .771, p < .01$) and job satisfaction ($r = .703, p < .01$) were significantly positively correlated with organizational citizenship behavior. Results further indicate that there was strong

Table 1
Correlations among Perceived Community Connectedness, Job Satisfaction and Organizational Citizenship Behavior

Variables	1	2	3
1. Perceived Community Connectedness	-		
2. Job Satisfaction	.744**	-	
3. Organizational Citizenship Behavior	.771**	.703**	-

** $p < .01$, $N = 200$

inter-correlation between two independent variables, perceived community connectedness and job satisfaction ($r = .744, p < .01$).

In order to analyze the effects of independent variables on employees' organizational citizenship behavior, multiple regression analysis was performed.

Dependent variable: Organizational Citizenship Behavior

The partial standardized betas (βs) indicate that the two independent variables in the model were predictors of organizational citizenship behavior: perceived

Table 2
Results of Stepwise Multiple Regression of Perceived Community Connectedness and Job Satisfaction

Independent Variables	β	t	Sig.
Perceived Community Connectedness	.491	8.609	.001
Job Satisfaction	.400	7.010	.001

community connectedness (β = .491, p < .001) and job satisfaction (β = .400, p < .001). Here, perceived community connectedness was the strongest predictor.

Table 3 indicates that the strongest predictor of employees' organizational citizenship behavior was perceived community connectedness which alone explained 59.5% of variance. Result further indicates that job satisfaction was

Table 3

Selected statistic from Regression of Organizational Citizenship Behavior (OCB) on Perceived Community Connectedness (PCC) and Job satisfaction (JS).

Variables	R	R^2	R^2 Change	Sig.
PCC	.771	.595	.595	.001
PCC and JS	.822	.676	.081	.001

Dependent variable: Organizational Citizenship Behavior (OCB)

Note. R = Multiple correlation coefficient, R^2 = Variability

another important predictor of employees' organizational citizenship behavior which explained 8.1% of variance. R^2 value indicated that these two variables jointly explained 67.6% of variance in employees' organizational citizenship behavior.

The mean and standard deviation of the scores are presented in Table 4.

Table 4 indicates that the mean scores for perceived community connectedness, job satisfaction and organizational citizenship behavior were 4.42, 65.19 and 198.60 respectively.

Table 4

Means and Standard Deviations of the Scores for Perceived Community Connectedness, Job Satisfaction and Organizational Citizenship Behavior of the Respondents.

Variables	N	Mean	Standard Deviation
Perceived Community Connectedness	200	4.42	1.528
Job Satisfaction	200	65.19	13.100
Organizational Citizenship Behavior	200	198.60	39.535

Predictors: Perceived community connectedness and job satisfaction

Dependent variable: Organizational citizenship behavior

Note. *SS*= Sum of Square, *df* = Degree of Freedom, *MS*= Mean Square

Table 5
Results of Overall F-test for Regression of Organizational Citizenship Behavior on Perceived Community Connectedness and job Satisfaction.

Source of variance	*SS*	*df*	*MS*	*F*	Sig.
Regression	314.08	2	157.045		
Residual	150.631	197	.765	205.388	.001
Total	464.720	199			

The significant F [F (2, 197) = 205.388, $p < .001$] of Table 5 indicates that the variation in organizational citizenship behavior was accounted for by joint liner influences of employees' sense of belongingness in the community and satisfaction toward their job.

Discussion

The present study aimed to explore the influence of perceived community connectedness and job satisfaction on organizational citizenship behavior among the employees. Inclusion of Community in Self Scale, the adapted Bangla version of the Job Satisfaction Scale and the Organizational Citizenship Behavior Scale were used to collect data from 200 participants following the purposive sampling technique. Results from Table 1 reveal that both perceived community connectedness and job satisfaction had significant positive correlation with organizational citizenship behavior which means that employees' organizational citizenship behavior is positively inclined by perceived community connectedness and job satisfaction. This result is also constant with the findings of Lee and Allen (2002). Individuals' connection with others influences their voluntary acts. Hamilton (2007) claimed that employees who show behaviors like helping coworkers by giving feedback, guidance on work related matters are more connected with others in the workplace as well as community. They are also satisfied toward their jobs and involve themselves more in organizational voluntary acts. This is supported by the earlier studies as well (Barak, 2000; Finkelstein, 2006; Organ et al., 2006; Hartog, Hoogh, & Keegan, 2007; Subhadrabandhu, 2012; Lenzi et al., 2013; Sadodin, et al., 2016). Results further indicate that there was strong inter-correlation between two independent variables, perceived community connectedness and job satisfaction. In a recent study, Ferdous and Roy (2018) also found that employees having the sense of belongingness in the community they live are satisfied with their job and ultimately perform well.

The result Table 2 shows that the two independent variables- perceived community connectedness and job satisfaction are predictors for organizational citizenship behavior. Lu et al. (2005) also found job satisfaction as an important indicator of OCB. The present authors found perceived community connectedness as the strongest predictor of OCB which alone explained 59.5% of the variance and another predictor job satisfaction explained 8.1% of variance. These two predictors jointly explained 67.6% of variance in employee organizational citizenship behavior. Employees who feel connected with the community they live in, most of the cases, inevitably they feel connected to the organization too they work for. It happens so as they have to spend maximum time of their days in the workplace which becomes a part of their regular life. Feeling of connectedness gives employees self-confidence and pleasure to do their job which encourages them to involve in such behaviors in the organizational setting which are not their job requirements, but have a constructive impact on the entire organization as well as their intra personal and interpersonal relationships.

The authority of organizations can appoint employees reporting higher levels of community connectedness and job satisfaction. It may allow the organization to accomplish its organizational goals in the long run. Training programs focusing the different aspects of these three variables can be implemented for the current employees to motivate them in engaging different organizational voluntary acts by enhancing their perceived community connectedness and satisfaction in job. Though these types of behaviors are not officially rewarded, but are necessary for organizational setting (McNeely & Meglino, 1994; Podsakoff et al., 2009). This present study suffers from limitations, suggesting paths for imminent studies. One limitation is the reliance on a sample of small size and data were collected only from the Dhaka city. A larger and more exhaustive sample of all over Bangladesh would be taken for more amendment results. It is suggested to integrate some moderating or intervening variables to scrutinize the cause and effect relationship of community connectedness and job satisfaction on organizational citizenship behavior.

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Relations of Hope and Emotional Intelligence with Academic Achievement of Undergraduate Students

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Abstract: Now a day's Emotional intelligence and hope has become a major topic of interest in academics and corporate circles globally. Thus this study was carried to explore the relationship among Trait hope, emotional intelligence and academic achievement of undergraduate students. For this purpose we selected 110 young adults studying at the Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj. We selected the participants by using convenient sampling technique. The Bangla version of the trait hope scale (Joarder & Khan, 2015) and the trait of emotional intelligence questionnaire (Tushar, 2013) were used in this study. The collected data was analyzed by using simple correlation via SPSS to examine the relationship among academic achievement, hope and emotional intelligence. The findings of the present study revealed that there was a significant gender difference in trait hope score and in academic achievement score. But no significant gender difference was found in trait emotional intelligence score. The result also reveals that academic achievement is positively correlated with trait hope and emotional intelligence score. That means, when hope and emotional intelligence increased then the academic achievement increased or vice-versa.

Keywords: emotional intelligence, trait hope, academic achievement, undergraduate students.

Introduction

It is important for the students of university to be aware about their ability or inability to control emotions because it will directly impact their academic performance. There are some variables that can lead to high or low results of a

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student. Among that emotional intelligence and hope are the most important variables which can influence a student's performance.

Emotional intelligence can be defined as a process of recognizing the individual's and others emotions of self, and using this in the problem-solving process (Mayer, Caruso, & Salovey, 2000; Salovey, 1990). Emotional intelligence needs empathy and ability to control the feelings and reactions to emotions with the right way (Abraham, 1999). On the other hand, and Megerian (1999) defined Emotional Intelligence as the consciousness of self and others feelings, understanding of those feelings and the capacity to use the information in the process of understanding. Doğan and Demiral (2007) state that emotional intelligence is a complete skill of an individual that can display throughout the life. According to Salovey and Mayer (1990) emotional intelligence is composed of five elements, which are self-knowledge, self-motivation, empathy, management of emotional state, and managing relationship. Emotional intelligence is also played a significant function in interpersonal communication (Bar-On, 2001). Results of different studies indicated that individuals who use emotional intelligence can make every part of life simpler (Schutte et. al., 1998). Results of many studies also revealed that people with elevated emotional intelligence in both personal and professional lives are happier as well as more productive (Szczygieł and Mikolajczak, 2017).Emotional Intelligence is influenced by many factors including gender but there is a contradictory result about the influence of gender. Singh (2006) showed that females have greater emotional intelligence than male. On the other hand, some research found no difference of emotional intelligence from gender perspective (Nasir & Masrur, 2010; Shehzad & Mahmood, 2013).

Hope is described as "the process of thinking about one's goals, along with the motivation to move toward those goals (agency), and the ways to achieve those goals (pathways)" (Snyder, 1995, p. 355). Hope is a favorable structure that motivates people towards a goal, makes them feel comfortable with today and have faith in tomorrow (Mousa et. al, 2017).In other words, hope is the capacity of an individual to exercise some control over the evolving events (Snyder, 2002).Hope makes a person feel good as well as motivate that person to make an action (Snyder, 2002). Therefore, Snyder et al. (1991) states that hope is not an emotional state rather a dynamic-cognitive motivational system (Snyder et al., 1991). Hope can also be evaluated as a cross- situational structure that positively correlates with self-esteem, perceived problem solving capacities, control attitudes, optimism, positive affectivity, and expectations of positive results (Snyder et al., 1991).

The concept of emotional intelligence has been strongly associated with hope. One study indicated that individuals with high level of emotional intelligence

can cope with life in vibrant and affectionate pattern, they are more capable of handling conflicts of their lives and can fuel themselves effectively though self-encouragement and hope (Batool, Niazi, & Ghayas, 2014). It is believed that these individuals use positive feelings to direct the goals of their life and increases their motivation to achieve these goals. For this reason such individuals are usually happy and hopeful in their lives. Previous study shows that there is an association between emotional intelligence with hope, which helps to have optimistic perspective about future lives (Saricam, Celik, & CoŞkun, 2015).

Academic achievement or academic performance on the other hand is defined by the degree to which a student can achieve their short or long-term educational goals. In other words, how well one does his or her studies is called academic performance. In generally cumulative GPA and completion of educational benchmarks represent a person's academic achievement. Therefore if a student gets poor grades that are considered as a bad academic achievement of that particular student.

Several studies have been conducted to see the effect of emotional intelligence and hope on the academic success of the students. Parker et al. (2004) found different variables of emotional intelligence that are used as predictors of academic success of students. They found that on three subsets of emotional intelligence (interpersonal ability, stress management and adaptability) highly successful students scored higher than unsuccessful students. Rode et al. (2007) concluded from their study that for two reasons emotional intelligence was related to academic performance. One is, academic performance involves a great deal of uncertainty and the other is, majority of academic work is self-directed, requiring high levels of self-management. Therefore, students who have high emotional intelligence would likely to perform better in their academic life. Due to a significant relationship between emotional intelligence and academic achievement, Svetlana (2007) focuses on the importance to incorporate emotional intelligence training into secondary education curricula.Rao (2012) conducted a study among 561MBA students which indicated that EI covers a range of skills such as motivating others, self-motivation, ability to communicate and listen effectively, building rapport and demonstrating empathy which had a great link with academic success. Another study examined the relationship between emotional intelligence and academic motivation among adolescents. The result of this study indicated that emotional intelligence has a positive link with academic motivation among both boys and girls (Dubey, 2012).One of the important studies of Nasir (2011) conducted on undergraduate students studying in various departments in Rawalpindi University including education, agricultural sciences, management sciences, information

technology sciences. The result of this study indicated that there is a positive and significant correlation among emotional intelligence and academic achievement of the university students. Similar result was found by Nassir & Masrur (2012), in their study. They found a significant positive correlation between emotional intelligence and academic achievement.

Like emotional intelligence hope is another important predictor of academic achievement. According to Conti (2000), hope allows students to approach issues with a focus on achievement, therefore increasing the probability of achieving their academic goals. Snyder et al. (2002)did a longitudinal study across 6 years to find the impact of hope on academic achievement. In this study participants were subdivided into three groups (high, medium, and low hope groups) using the dispositional hope scale (Snyder et al., 1991). They found that hope was correlated with mean grade point average (GPA) scores (r = .21), and led toa higher GPA 6 years later after controlling for baseline scores. In another study Curry et al. (1997) compared hope scores amongst American college athletes. They found from their study that, trait hope significantly predictedend of semester GPA scores (R2 = .08).Ciarrochi, Heaven, and Davies (2007), Leeson, Ciarrochi, and Heaven (2008) and Rand (2009) have found similar results from their studies.

University life is a crucial phase of a person's life which is full of stressors and challenges, which requires the intelligent use of one's own emotions as well the sensitive response to others' emotions. Moreover, possessing certain degree of hope is required in this stage in order to go through the long path of this phase of life and to gain the necessary motivation to enhance practice. To achieve the goals of university life, gender has a great influence in varying degree of hope, emotional intelligence and academic achievement. Considering this perspective, the present study aims to determine the gender differences among Trait hope, emotional intelligence and academic achievement. And to explore the relationship among trait hope, emotional intelligence, academic achievement of undergraduate students.

Methods

Participants

The present study consisted of 110 undergraduate students, studying at the Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj. Among them 55 (50%) were female and 55 (50%) were male. The participants were selected conveniently from the university. Their ages ranged from 19 to 25 with a mean age of 21.07 years (SD = 1.08). The students were from 2nd year to 4th year with their academic results (CGPA) ranged from 2.00 to 3.97 with

mean CGPA being 3.08 (*SD* = .40). All the participants were from middle class family background.

Measures

All participants in this research responded to the following two self-report questionnaires.

The Trait of Emotional Intelligence Questionnaire. The Bangla version of emotional intelligence questionnaire (TEIQ) (Tushar, 2013) originally developed by Petrides and Furnham (2003). The TEIQ is a self-reporting instrument containing 30 items in which 15 are positive items and 15 are negative or reversed code items. Respondents rate each item on a 7-point Likert-Type scale: "1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = neither disagree nor agree, 5 = somewhat agree, 6 = agree, 7 = strongly agree". The possible score ranges from a low of 30 to a high of 210 along with the midpoint of 120. Scores above the scale midpoint reflects high in emotional intelligence and below midpoint indicates low emotional intelligence.

The Trait Hope Scale. The trait hope scale was originally developed by Snyder et al. (1991). The Bangla version of the trait hope scale was adapted by Joarder & Khan, (2015). The reliability of the Bangla hope scale was determined by employing both the parallel form and test-retest reliability technique. The parallel reliability coefficient for the Bangla version was .91(= .01). The test-retest reliability was found 0.84 (=.01) and parallel form reliability coefficient was found .91 (= 0.01).

The Bangla version of the trait hope scale consists of 12 items. The scale is divided into two sub scales, such as: (1) *agency* (i.e., goal-directed energy) and (2) *pathway* (i.e., planning to accomplish goals). Among the 12 items, 4 makes up the Agency sub-scale and 4 make up the Pathway sub-scale. The remaining 4 items are fillers. Each item is answered using an 8 point Likert scale, ranging from definitely false to definitely true. These are 1= Definitely false, 2= Mostly false, 3= Somewhat false, 4= Slightly false, 5= Slightly true, 6= Somewhat true,7= Mostly true and 8= Definitely true. The *agency* sub-scale score is derived by summing items 2, 9, 10, and12, and scores of the sub-scale ranges from 4 to 32. Here higher scores indicate higher levels of *agency* thinking and lower scores indicate lower levels of *agency* thinking. The *pathway* sub-scale score is derived by summating items 1, 4, 6, and 8, and score range of the sub-scale is from 4 to 32. Here higher scores indicate higher levels of *pathway* thinking and lower level scores indicate lower levels of *pathway* thinking. The items of 3, 5, 7 and 11 are fillers and they are not considered at the time of scoring. The total trait hope scale score is derived by summating the

four *agency* and the four *pathway* items and score ranges from 8-64. The higher scores indicate higher levels of hope and the lower scores indicate lower levels of hope.

Procedures

Standard data collection procedure was followed for this study. At the beginning of the study, each participant was briefed about the general purpose of the study and assured that their responses would be kept confidential and used only for the research purpose. Participants were given a general instruction verbally and were asked to read carefully the standard instructions of how to respond before going through the items of the scale. Also further clarifications were done whenever they faced any problems to understand the items. It took 20 minutes on an average to complete the task. Thus the survey was administered and data were collected over a 2-weeks period from all the participants.

Data processing and analysis

Each participant's responses were scored according to the scoring principle of the trait hope scale and the trait of emotional intelligence questionnaire. Then the obtained data were fed into computer for analyzing through SPSS. At first independent sample "*t*" test was carried out to examine the difference between male and female. Then the simple correlation was carried out to examine the relationship among academic achievement, hope and emotional intelligence.

Results

In order to test gender difference in trait hope independent sample *t*-test was calculated. Results of *t*-test shown in Table 1 reveal significant gender difference in trait hope score. Results also showed that male students were more hopeful than female.

In order to test gender difference in trait emotional intelligence scores,independent sample *t*-test was calculated. Results of *t*-test shown in Table 2

Table 1
Mean Difference in Trait Hope Scores of Male and Female Students.

Group	*n*	*Mean*	*SD*	*df*	*t*	*p-value*
Male	55	50.35	10.16	108	-2.496	.01
Female	55	45.20	11.43			

revealed no significant gender difference existed in trait emotional intelligence scores.

Table 2

Mean Difference in Trait Emotional Intelligence Scores of Male and Female Students.

Group	*n*	*Mean*	*SD*	*df*	*t*	*p-value*
Male	55	136.18	21.2	108	-.357	.721
Female	55	134.71	21.95			

In order to test gender difference in academic achievement independent sample t-test was calculated. Results of *t*-test shown in Table 3 reveal significant gender difference in academic achievement score. Results also showed that academic achievements of female students are higher than male students.

Table 3

Mean Difference in Academic Achievement Scores of Male and Female Students.

Group	*n*	*Mean*	*SD*	*df*	*t*	*p*
Male	55	2.98	.386	108	2.63	.01
Female	55	3.18	.397			

In order to explore the relationship among variables Pearson product moment correlation was computed. Results of analysis presented in Table 4 showed that academic achievement is positively correlated with trait hope and emotional intelligence score. That means if hope and emotional intelligence increased,

Table 4

Correlation Matrix of Variables.

Variables	Academic achievement	Trait hope	Emotional intelligence	Age
Academic achievement	1			
Trait hope	.202*	1		
Emotional intelligence	.264*	.499*	1	
Age	-.083	-.302**	-.104	1

Note. $* p < .05$, $** p < .01$

academic achievement also increased or vice-versa. Results also showed that trait hope is positively correlated with emotional intelligence and negatively correlated with age. That means, when a person become hopeful then his/her emotional

intelligence score increase or vice-versa. But, if a person gets older, his/her hope will be lower.

Discussion

The aim of the present study was to investigate the gender differences among trait hope, emotional intelligence and academic achievement. From the result we found that significant gender differences exists in trait hope score. Results showed that male students are more hopeful than female. One study conducted by Snyder et al. (2002) to measure hope and academic success among college students found no gender differences in their study. No significant gender differences were found in trait emotional intelligence in the present study. This result is quite consistent with the previous studies conducted on this field. This result isalso supported by the study conducted by Abdullah (2006). In his study he found no difference in the emotional intelligence scores of male and female students. This finding can also be contrasted with Reiff et al. (2001), and Petrides and Furnham (2000), which reveal differences in only one element of emotional intelligence whereas the general emotional intelligence results are not substantially different. This result, however, contradict with the results of the studies conducted by Harrod and Scheer (2005), Adeyemo (2008), and Mandell and Pherwani (2003), which found that the emotional intelligence scores differ significantly among male and female participants. Results also revealed significant gender difference in academic achievement score. That means, academic achievement of female students are higher than male students. Lao (1980) investigatedacademic performance at pre-collegiate level and finds female students obtain higher CGPA compared to males. Similar result was found by Wilberg and Lynn (1999) and Kimball (1989).

This study also aims to explore the relationship among trait hope, emotional intelligence, and academic achievement.The results of this study showed that academic achievement is positively correlated with trait hope and emotional intelligence score. That means if hope and emotional intelligence increased then academic achievement will also increase or vice-versa.The reason may be that hope offers advantages for conceptualizing academic motivation. Students who have High-hope can conceptualize their goals clearly on the other hand low-hope students are more ambiguous and uncertain about their goals (Snyder, 1994). This result is consistent with the studies conducted by Curry, Snyder, Cook, Ruby, and Rehm (1997); Snyder et al.(2002). They found from their studies that hope is positively correlated with academic achievement.

The results of this study emphasize on the importance of emotional intelligence in academic achievement. The results of this study are consistent with

the existing research literature (e.g., Fennin, 2002; Parker, Summerfeldt, Hogan& Majeski, 2004; Marquez, Martin &Brackett, 2006; Jaeger &Eagan, 2007; Holt, 2008). An important positive correlation between emotional intelligence and academic achievement shows that academic success depends not only on cognitive elements of intelligence but also on emotional skills. These results are similar to the result of the study conducted by Holt (2008), who found that 14% of variance in the GPA of college students can be explain by emotional intelligence.

The present study also found a significant positive correlation between increased level of emotional intelligence and raised hope among the undergraduate students. This can be ascribed to the fact that emotionally intelligent people will have a high amount of self-awareness due to the nature of their characteristics and have more self-regulation skills to increase their level of hope. This result was consistent with Umphrey and Sherblom (2014), who tested the association between hope and wellbeing variables. Their findings discovered significant relationships between emotional intelligence and hope. Furthermore, the current results were similar with a study done by Batool et al. (2014). They investigated the role of emotional intelligence in developing a sense of humor and hope among adults. Another results also revealed that emotional intelligence has a significant correlation with hope (Batool et al., 2014).

Implications and applications of study

The findings of the study will help to raise awareness among students and teachers about how to address and improve emotional competencies such as emotional intelligence among undergraduate students. This can be accomplished by adding some learning activities in the curricula involving more instructional experience on how to apply emotional intelligence in social and working lives. A situation of role play in which students can learn and apply emotional intelligence skills, attentive listening and empathy abilities could be of higher assistance. In addition, psycho educational program which include emotional recognition and emotional intelligence enhancement could be introduced.

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Exploring Predictors of Academic Success of the First Year Undergraduate Students of the University of Dhaka

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Abstract : Admission to an undergraduate program at the University of Dhaka is stiffly competitive. However, it is merely based on merit score comprising of admission test score plus weights on GPAs in Secondary (SSC) and Higher Secondary (HSC) Examinations without evidence-based justification. This prompted us to examine whether admission test score, GPA of SSC and HSC can really predict academic success of the first year undergraduates. We also examined the predictive power of academic stress, self-efficacy, everyday memory, degree of satisfaction, and order of preference. A questionnaire package comprised of a Personal Information Form (eliciting Admission Test Score, C/GPAs and other information) along with Bangla translated versions of the Academic Stress Inventory, General Self-Efficacy Scale, and Cognitive Failure Questionnaire was administered to a stratified random sample of 279 second year undergraduate students of 15 departments under 3 units. Data were analyzed computing mean, standard deviation, *t*-value, *F*-value, Pearson *r* and linear regression using SPSS version 20.0. - Multiple regression analysis revealed admission test score as the best predictor (β = .315) followed by degree of satisfaction with the subject being studied (β = .257), and then GPA of HSC (β = .201) for Unit A; GPA of HSC was the only significant predictor (β = .342) for Unit B; order of preference given to the subject being studied (β = - .253) followed by GPA of HSC (β = .238), admission test score (β = .219), and then by self- efficacy (β = .214) for Unit C. These findings can be taken to suggest that the entire admission system of the university should be revised with no weights on GPA of SSC and lesser weights on GPA of HSC. Furthermore, admission test system of Unit B should be thoroughly revised and must not be based on Bangla, English, and General Knowledge per se. The findings have implications for educators, policy makers, teachers, and parents.

Keywords: GPAs, admission test score, academic stress, self-efficacy, everyday memory, degree of liking, order of preference

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Introduction

It is believed that enrolling under-qualified students in a university is a misuse of resources. Similarly, failing to recruit the most able candidates has long-term negative consequences on a discipline. After completion of Secondary School Certificate (SSC) and Higher Secondary Certificate (HSC) examinations, students sit for university admission test conducted by the university. The criteria for application vary from year to year depending on the capacity of the university and number of students passed. These measures are used to limit the number of applicants to match the capacity of the university. The assessment of predictive validity of these variables is of utmost importance. The capacity to enroll in undergraduate program at the University of Dhaka is limited compared with the number of students completing the higher secondary education every year. This demands devising a scientific admission system to single out best out of huge applicants.

The selection of the most efficient students for admission to higher learning institution has been a focus of concern for many years (Robi, 2014) as the quality of university education is determined to a considerable extent by the abilities of the students enrolled. Quality of education can be understood on the basis of academic performance which is considered to be its primary indicator. There is also a widespread agreement that success in university education is strongly related to pre-university academic preparation and achievement of students (Kuh, 2007). So there is a need to identify the factors that can affect academic performance. Understanding of these factors can help suggest some measures for improving the quality of education (Nasir, 2012).

Research findings on future academic success emphasizes on two types of predictor variables, namely cognitive (prior academic achievements) and non-cognitive (socioeconomic variables). A number of studies have been conducted to determine which would be better predictors of future academic success in postsecondary institutions. Some researchers found cognitive predictors better (Kuncel, Credé, Thomas, Seiler, Klieger, & Woo, 2005).

In reviews of more than 60 studies, Mathiasen (1984) posited that high school marks and standardized entrance test scores are the best predictors of university success as they account for approximately 25% of the variance when predicting first-year college grades. Elert (1992) stated that the strength of college entrance exams is in the prediction of first-year college grade point averages, and that their predictive power disappears after the first year. Since most predictive validity studies have concluded that high school (means college in America) marks and

standardized entrance test scores were more strongly related to college (means university) performance than any other predictors, this study focused on these two cognitive predictors. Again first year first semester university grade is one of the major responsible factors for early dropout of students from college (McGrath & Braunstein, 1997), so studying the factors that influence first year university grade is necessary.

Besides prior academic achievement, researchers found several academic and non-academic factors influencing academic achievement of undergraduates. Wintre and Yaffe (2000) found that high level of stress during the first year of college forecast lower level of overall adjustment and can make the students more susceptible to many social and psychological problems, thus leading to a lower grade point average (GPA) in the final year. Academic stress was found to have negative effect on academic performance, i.e., the higher the stress the lower the academic achievement. Perceived academic stress was found to be higher in younger students than older students (Khan, Altaf & Kausar, 2013). Stress arises when there are burden on the person which taxes his available resources. If stress is harsh and extended, it can lessen academic performance, hinder a student's capability to involve in and add to campus life, and raise the probability of substance abuse and other destructive behavior (Richlin-Klonsky & Hoe, 2003). Undergraduate students stated that stress was the most common factor among all health factors which impact their academic performance. Stress harmfully affects their physical and psychological health (Dwyer & Cummings, 2001). Given this relationship between stress and performance, it is probably beneficial to understand how much stress one is currently experiencing at work.

Wilhite (1990) found that self-assessment measure of memory (the Everyday Memory Questionnaire) was the best predictor of final course grades, followed by scores on a locus of control measure and scores on the Self-efficacy. Perceived self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance. Self-efficacy directs how people feel, think, motivate themselves and behave. A strong sense of efficacy facilitates human accomplishment and personal well-being in many ways. People with high assurance in their capabilities approach difficult tasks as challenges to be mastered rather than as threats to be avoided. They can quickly recover their sense of efficacy after failures or setbacks. On the contrary, people who doubt their capabilities shy away from difficult tasks which they view as personal threats. They are slow to recover the failures. Because they view insufficient performance as deficient aptitude it does not require much failure for them to lose faith in their capabilities. They fall easy victim to stress and depression (Bandura, 1994).

It is evident that students' university success depends on some criteria. It is further evident that students had to face further examination before they are being admitted to any university. Therefore, it is extremely important to examine whether the criteria used in the selection and admission process in the universities of Bangladesh help admit students with the best chance of success and eliminate those with the poorest chance of success. Unfortunately, no such attempt has so far been made in case of admission into any universities in Bangladesh let alone in the University of Dhaka. The present study is, therefore, designed to address the issue of explaining academic success of the University of Dhaka.

More specifically, we are interested to find out predictors of first-year academic success of undergraduates at Dhaka University. Are they pre-university academic achievement (GPAs of SSC and HSC) and admission test score? Additionally, we plan to explore predictive power of academic stress, everyday memory, self-efficacy, and degree of satisfaction as well as order of preference given to the subject being studied.

Aims of the research

One general question and several specific questions are asked in this research. These are:

General research question

What makes academic achievement of 1st-year undergraduates of the University of Dhaka better or worse?

Specific research questions

1. Can GPAs of SSC and HSC Examinations predict first year academic achievement?
2. Can admission test score in admission test predict first year academic achievement?
3. Can academic stress predict first year academic achievement?
4. Can everyday memory predict first year academic achievement?
5. Can self-efficacy predict first year academic achievement?
6. Can degree of satisfaction with the subject being studied predict first year academic achievement?
7. Can order of preference given to the subject being studied predict first year academic achievement?

Hypotheses

After reviewing past literatures we hypothesized the following statements.

1. The higher the GPAs of SSC and HSC Examinations the higher would be the first year academic achievement.
2. The higher the admission test score the higher would be the first year academic achievement.
3. The more the academic stress the poorer would be the academic achievement.
4. The better the everyday memory the better would be the academic achievement.
5. The greater the self-efficacy the better would be the academic achievement.
6. The greater the degree of satisfaction with the subject being studied the better would be the academic achievement.
7. The farther the order of preference given to the subject being studied the poorer would be the academic achievement.

Significance of the study

The competition to enroll in the University of Dhaka is exceedingly high. So, the selection of best students is of utmost concern. This study may help to elucidate the justification of the current admission test and to identify factors that are predictive of first year undergraduates' academic achievement and this in turn would help educators to devise better admission process.

Methods

Participants

Two hundred seventy nine second year undergraduate students of the University of Dhaka constituted the sample of the study. The age of the respondents ranged from 18 to 23 years with a mean age of 20.35 years. Table 1 shows the percentages of respondents by several demographic variables.

Inclusion criteria

Undergraduate students of the University of Dhaka who got admission in the session 2015-2016.

Table 1

Percentages of Respondents by Gender, Admission Unit, Admission through Quota and Socio- economic Status (N = 279)

Gender	Admission Unit	Socioeconomic Status
Female = 59.5%	A = 35.5%	Lower Class = 4.7%
Male = 40.5%	B = 34.4%	Lower Middle Class = 19.7%
	C = 30.1%	Middle Class = 67.4%
		Upper Middle Class = 8.2%

under Unit A (Science), B (Humanities) or C (Business Studies) were chosen as respondents.

Research design

Cross-sectional survey design was used following quantitative approach.

Sampling

The field study was conducted on a sample of 279 respondents (after excluding the missing cases) though we planned to include approximately 384 students of the University of Dhaka evenly distributed by their enrollment units in admission tests (namely A, B, and C). We also planned to take 22 students from each six departments under each three units. The sample covered students from second year and were selected employing stratified random sampling. As the number of students enrolled in different departments is highly variable (some departments have a small number of students while some have a large number of students), we applied a statistical technique called Probability Proportional to Size (PPS) to select the sample from the population. This approach is applicable for disproportionate sample. Here larger clusters have bigger probability of being sampled, so it is required to sample exactly the same number of individuals per cluster and thus individuals in larger clusters have smaller probability of being sampled. The later stage compensates the former stage, so that each individual in the population has the same probability of being sampled.

The following formula was used to determine the sample size:

$$n = \frac{z^2 p(1-p)}{d^2}$$

Here,
n = Sample size
z = z *value at 95% confidence interval* = *1.96*
p = Estimation of proportion = 0.5
d = Allowable margin of error = 0.05
Calculating this equation, we got a sample size of 384.

But due to time constraints we approached five departments instead of six in each unit and the sample size became smaller. Five departments under each unit were selected following PPS and then 22 students from each selected department were randomly chosen. If any department would be found to have less than 22 students we planned to include all the students of that class to have been included.

Measures

1. The following measures were administered in the sequence they are appearing:
2. Academic Stress Inventory
3. General Self-efficacy Scale
4. Cognitive Failure Questionnaire
5. Personal Information Form

Academic Stress Inventory (ASI). The ASI was developed by Ying Ming Lin† & Farn Shing Chen‡ (2009) and translated into Bangla by Uddin and Raisa (2017). This 34- item inventory has seven subscales. Each item is scored on a 5-point Likert type scale ranging from 5 "completely agree", to 1 "completely disagree". The higher the points for each factor, the higher is the degree of stress produced by this factor. The possible causes of stress that can be faced in the academic stress inventory developed for this research were:

a. *Stress from teachers*: including teaching materials, teaching and exercise items.
b. *Stress from results*: stress from parents, including conflicts between expectations and opinions and drops in grades.
c. *Stress from tests*: worry about how to prepare for a test and redo the compulsory courses.
d. *Studying in group stress*: included exercise reports, grouping, etc.
e. *Peer stress*: included academic competition, peer interferences, etc.
f. *Time management stress*: social activities and student association, time management and choices, etc.
g. *Self-inflicted stress*: such as self-expectation, interests of course selection, etc.

There were no reverse coded items. The original scale had good test-retest reliability. For the first group, the test-retest correlation coefficient was 0.80 *(n* = 57); for the second group, 0.82 *(n* = 32). In our study we discarded four items of the subscale named self-inflicted stress. The Cronbach alpha observed in the present study was 0.84 for 30 items. This scale is used to measure university and college students' academic stress.

General Self-efficacy Scale (GSS). The GSS was developed by Schwarzer and Jerusalem (1995) and was translated into Bangla by Uddin and Raisa (2017). It is a 10-item 4-point Likert type scale ranging from 4 "almost always true of me" to 1 "almost never true of me". There is no reverse scoring. Higher score on this scale indicates higher level of self-efficacy and lower score indicates lower level of self-efficacy. The original scale has a good reliability and validity. The split half reliability of the original scale was 0.91. The Cronbach alpha observed in the present study was 0.87.

Cognitive Failure Questionnaire (CFQ). The original CFQ was developed by Broadbent, Cooper, FitzGerald & Parkes (1982) the CFQ was translated from English to Bangla by Uddin, Shama, and Khatun (2017). This scale is used to measure everyday memory ability. This scale measures three dimensions of forgetfulness which is related to everyday memory ability. It has a total of 25 items. Each item is scored on a 5-point Likert type scale ranging from 4 "very often", to 0 "never". There is no reverse scoring item. The higher the scores in CFQ the poorer is the everyday memory. The original scale has a Cronbach alpha coefficient of 0.79. The Cronbach alpha observed in the present study was 0.90. Studies have indicated that this inventory has a good reliability and validity.

Personal Information Form (PIF). The PIF elicited demographic, personal, academic and social information about respondent's gender, age, GPA of SSC, GPA of HSC, merit score in admission test of Dhaka University and related information, academic achievement of first year, degree of satisfaction with the subject being studied, the order of preference of the subject being studied, number of siblings, birth order, family size, parental education, parental occupation, family socioeconomic status, religious affiliation, types of family etc.

Procedures

A pilot study was conducted on 2nd year undergraduate students of the University of Dhaka. Thirty students were approached purposively and they were given the survey form. Their feedback and suggestions were noted and a cognitive interview was sought for each respondents. During the field study we selected total eighteen departments under Unit A, B and C following PPS. Then we sought permission to the chair of each department for collecting data. After that we approached the departments according to their convenient time. Our questionnaire contained 93 items in total. The students were placed in their classrooms. Then they were selected following the inclusion criteria. At first a standardized verbal instruction was given. Then they were provided the questionnaires. They were instructed to carefully read the written instruction over questionnaire and to answer all the items. They were assured that they would be provided specification where needed. The average response time was 25 minutes. After the task was over, each participant was given a pen as souvenir and thanked and said goodbye.

Data processing and analysis

The data were checked out over and over again. The questionnaires which lacked essential information or contradicted with inclusion criteria were discarded. Then all the sorted data were fed into SPSS version 20.0 for analyses. At first *t* test

was computed to see gender differences in major variables. Then, *F*-test was conducted to see differences in major variables among units. Then, correlations among major variables were computed separately for each unit. Finally, stepwise regression analysis was carried out separately for each unit.

Results

To investigate gender differences in the major variables, independent sample *t* test was conducted. The Table 2 shows descriptive statistics and *t*-values.

Table 2

Descriptive Statistics and Gender Differences in Major Variables (N = 279)

Variables	Female (*N* = 166)		Male (*N* = 113)		*t*
	M	*SD*	*M*	*SD*	
1. Merit Score	72.55	9.56	79.18	9.28	-5.75***
2. GPA of SSC	4.94	.13	4.93	.17	.58
3. GPA of HSC	4.91	.17	4.89	.20	.98
4. Degree of Satisfaction	2.93	.41	2.72	.69	3.29**
5. Order of Preference	4.45	3.71	3.91	4.31	1.12
6. Academic Stress	83.25	10.91	83.01	10.19	.18
7. Everyday Memory	38.28	14.23	39.58	15.01	-.73
8. Self-Efficacy	28.59	5.85	28.71	6.55	-.16
9. First Year C/GPA	3.27	.27	3.24	.33	1.00

***$p < .001$ and **$p < .01$

Table 2 shows that Admission Merit Score of male students was higher than their female counterparts. The degree of satisfaction with the subject being studied was higher among females than males. However, no significant gender differences were observed in other variables. To see unit-wise differences in major variables, an *F* test was run. The Table 3 shows *F*-value and associated probability.

Table 3 shows there were significant differences among Units A, B and C in terms of merit score, GPA of SSC examination, GPA of HSC examination, order of preference and first year C/GPA.

Then, Pearson correlation was seen among major variables for each unit. Subsequently, stepwise regression was run separately for each unit to find out which variables best predict first year academic achievement.

Table 4 shows that for Unit A, first year C/GPA was positively correlated with merit score ($r = .33$), GPA of HSC Examination ($r = .25$), and degree of satisfaction with the subject ($r = .30$); negatively with order of preference ($r = -.24$) and academic

Table 3

F-test Showing Differences in the Major Variables Across Unit A, B and C

Variables		Unit A (N = 99) M (SD)	Unit B (N = 98) M (SD)	Unit C (N = 82) M (SD)	F
1.	Merit Score	73.16 (8.01)	71.93 (11.19)	81.68 (7.33)	29.699***
2.	GPA of SSC	4.98 (.06)	4.87 (.19)	4.96 (.12)	17.202***
3.	GPA of HSC	4.95 (.11)	4.84 (.22)	4.92 (.18)	11.345***
4.	Degree of Satisfaction	2.81 (.62)	2.84 (.51)	2.90 (.51)	.677
5.	Order of Preference	6.33 (4.99)	3.45 (3.26)	2.63 (1.56)	26.589***
6.	Academic Stress	83.45 (12.02)	83.92 (10.25)	81.87 (9.11)	.898
7.	Cognitive Failure	38.70 (15.69)	38.98 (14.46)	38.73 (13.32)	.011
8.	Self-Efficacy	27.98 (6.13)	29.61 (6.56)	28.27 (5.49)	1.971
9.	First Year C/GPA	3.34 (.33)	3.13 (.22)	3.31 (.29)	15.77

Note. ***$p < .001$

stress (r = -.26). For Unit B, first year C/GPA is negatively correlated with merit score (r = -.34) and academic stress (r = - .25); positively with GPA of HSC Examination (r = .38), degree of satisfaction with the subject (r = .26), order of preference (r = .24). For Unit C, first year C/GPA is positively correlated with merit

Table 4

Correlation of Major Variables with First Year C/GPA *(academic achievement)*

		Undergraduate First Year C/GPA		
		Unit A (N = 99)	Unit B (N = 96)	Unit C (N = 84)
1.	Merit Score	.33**	-.34**	.37**
2.	GPA of SSC	.15	.18	.11
3.	GPA of HSC	.25*	.38***	.38***
4.	Degree of Satisfaction	.30**	.26*	.16
5.	Order of Preference	-.24*	.24*	-.36**
6.	Academic Stress	-.26*	-.25*	-.35**
7.	Everyday Memory	.14	-.13	-.13
8.	Self-Efficacy	-.14	.04	.31**

Note. ***$p < .001$, **$p < .01$ and *$p < .05$

score (r = .37), GPA of HSC Examination (r = .38), and self-efficacy (r = .31); negatively with order of preference (r = -.36) and academic stress (r = -.35). Based on significant relationships of first year C/GPA with major variables, we conducted simultaneous regression separately for different units.

Table 5 shows that when all the variables were entered into the regression equation admission test score, degree of satisfaction with the subject and GPA of HSC examination were found to be the significant predictors for Unit A. These 3 variables accounted for about 24% variance in first year grade. The most powerful predictor was admission test score followed by degree of satisfaction and then by GPA of HSC Examination.

For unit B, when we entered all the variables into the regression equation we found GPA of HSC Examination only the significant predictor. Interestingly, admission

Table 5

Simultaneous Regression of First Year Undergraduates' C/GPA on Admission Test Score, GPA of SSC, GPA of HSC, Degree of Satisfaction, Order of Preference, Academic Stress, and Self-Efficacy separately for Unit A, B, and C

Units	Predictors		β	R^2	Adjusted R^2	F
Unit A	1.	Admission Test Score	.315**			
	2.	GPA of HSC	.201*			
	3.	Degree of Satisfaction	.257*	.248	.208	6.15***
	4.	Order of Preference	.014			
	5.	Academic Stress	-.079			
Unit B	1.	Admission Test Score	-.193			
	2.	GPA of HSC	.342***			
	3.	Degree of Satisfaction	.106	.287	.248	7.40***
	4.	Order of Preference	.155			
	5.	Academic Stress	-.154			
Unit C	1.	Admission Test Score	.219*			
	2.	GPA of HSC	.238*			
	3.	Order of Preference	-.253*	.395	.355	9.92***
	4.	Academic Stress	-.162			
	5.	Self-Efficacy	.214*			

Note. ***p < .001, **p < .01 and *p < .05

test score was negatively (though marginally) significant. These 2 variables accounted for 22% variance in first year grade.

For unit C, when we entered all the variables into the regression equation admission test score, GPA of HSC, order of preference, and self-efficacy were found to be significant predictors. These 4 variables accounted for about 37% variance in first year grade. The most powerful predictor was order of preference followed by GPA of HSC and admission test score and then by self-efficacy.

Discussion

The present study was conducted to examine the extent to which the admission criteria of the University of Dhaka are justified. More specifically, we examined the power of GPAs of HSC and SSC, and admission test score in predicting academic success of admitted undergraduates in various departments under different faculties. We selected second year students of the University of Dhaka who got admission under Units A, B, or C in session 2015-16. We selected them because they have their first year's grade and previous literature suggested. We constructed a questionnaire package comprised of academic stress inventory, general self-efficacy questionnaire, cognitive failure questionnaire and demographic variables eliciting previous GPAs of secondary and higher secondary examination, admission test score etc. We conducted a pilot study on 30 and field study on 279 second year undergraduate students following stratified random sampling. We analyzed data using SPSS version 20.0.

At first descriptive statistics of the predictors and outcomes were computed. Gender differences in major variables were examined using independent sample *t* tests which are shown in Table 2. It was found that admission test score (out of 120) was higher among males than their female counterparts. On the contrary, female students were more satisfied with the subject they studied than males. Since no significant gender differences were observed in the major variables of interest, data across gender were collapsed for subsequent analysis. We ran a One-Way Analysis of Variance to see whether there was any significant difference in the variables of interest among Units A, B and C. Table 3 showed that there were significant differences among Unit A, Unit B and Unit C in terms of admission test score, GPA of SSC Examination, GPA of HSC Examination, order of preference and first year grade. The results are in general harmony with the differing criteria set for different units. Because of the significant differences observed, subsequent correlation and regression analyses were performed separately for each unit.

For Unit A, it is evident from Table 4 that first year C/GPA is positively correlated with admission test score (r = .33, degree of satisfaction with the subject (r = .30), and GPA of HSC examination (r = .25); negatively with order of preference (r = -.24) and academic stress (r = -.26). That means the higher the admission test score, degree of satisfaction, and GPA of HSC the higher was the first year C/GPA; and the farther the order of preference and greater the academic stress the poorer was the first year C/GPA. We ran simultaneous regression for the variables that were significantly correlated with first year C/GPA. It was noted that merit score, degree of satisfaction with the subject and GPA of HSC examination were the significant predictors. The predictors jointly explained 24.8% of variance in first year grade (R^2 = .248).

For Unit B, first year C/GPA was observed to have positively correlated with GPA of HSC Examination (r = .34), degree of satisfaction with the subject (r = .26), and order of preference (r = .24); negatively with admission test score (r = -.34) and academic stress (-.25). The negative relationship of admission test score with C/GPA contradicts with popular belief and our prediction. The higher the admission test score the lower was the first year C/GPA. When we entered all the variables into the regression equation, only GPA of HSC Examination appeared to be a significant predictor. The variable accounted for 13.5% of variance in first year grade (R^2 = .286). Admission test score was found to have negatively (though marginally) predicted first year C/GPA which is quite contrary to the prediction and popular belief.

For Unit C, it is evident from Table 4 that first year C/GPA is positively correlated with admission test score (r = .37), GPA of HSC examination (r = .38), and academic self-efficacy (r = .31); negatively with order of preference (r = -.36) and academic stress (r = -.35). That means the higher the admission test score, GPA of HSC, and self-efficacy the higher was the first year C/GPA; and the farther the order of preference and greater the academic stress the poorer was the first year C/GPA. We ran simultaneous regression for the variables that were significantly correlated with first year C/GPA. It was observed that admission test score, GPA of HSC Examination, academic self-efficacy, order of preference, and academic stress were the significant predictors. The predictors jointly explained 39.5% of variance in first year grade (R^2 = .395).

It is evident that admission test score and GPA of HSC are good predictors of first year C/GPA for Units A and C. These findings are consistent with the findings of Mathiasen (1984) who posited that high school marks and standardized entrance test scores are the best predictors of college success as they account for

approximately 25% of the variance when predicting first-year college grades. However, it is unclear as to why admission test score in Unit B tended to have negatively predicted first year C/GPA.

One plausible explanation might be the level of difficulty across departments of Unit B. The difficulty level of the departments under Units A and C are more or less homogenous whereas it is heterogeneous for those under Unit B. That is to say, difficulty level is highly variable among different departments in Unit B as due to the course requirements; some departments in Unit B might require proficiency in English, Some in Mathematics, some in both English and Mathematics, some in Bangla or other languages, some do not. Students getting good marks on admission test, get their preferred subjects but may not cope with the difficulty level of the subject or the demand of the subject. Thus they are failing to get good marks on the exam. On the other hand, students who have scored lower in the admission test, get the less difficult subject which may be in lower rank of their order of preference. Because of the lower difficulty level they may excel in first year examination in comparison with the students enrolled in other departments which have higher difficulty level. This picture is evident in the inter department comparison where significantly higher admission test score was found for Law, followed by English, Sociology, Bangla, and then by Philosophy.

Recommendation

It is recommended that the selection criteria of admission in undergraduate programs of the University of Dhaka should be altered. Weight given on GPA of SSC in determining merit score is meaningless. A minimum requirement of GPA of SSC should be kept for appearing in the admission test, but value of the GPA of SSC must not be added to the merit score for determining the merit position. The GPA of HSC is a valid predictor for all units (A, B, and C). So, weight given on the GPA of HSC should be maintained but should be revised its magnitude. Admission test score is a valid predictor for Units A and C but an invalid (negative) predictor for Unit B. Therefore, system of admission test for Units A and C should be maintained or unchanged but revised altogether for Unit B.

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