Assessment of the Reliability of Bangla Version Children's Yale-Brown Obsessive-Compulsive Scale.

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Abstract

Background: *Now a day, frequencies of psychiatric disorders among children and adolescent accrued more attentions of healthcare professionals. Obsessive compulsive disorder (OCD) is one of the common psychiatric disorders among children and adolescent. In Bangladesh, prevalence of child and adolescent OCD is 2%. Gold standard Children's Yale-Brown Obsessive-Compulsive Scale (CY-BOCS) is a clinician-rated and most widely used scale in measurement of OCD symptom severity and thereby treatment response in children and adolescent age group.*

Aim of the study: *The aim of this study was to assess the reliability of Bangla Version Children's Yale-Brown Obsessive-Compulsive Scale in applying among Bangla speakingchild and adolescent with OCD.*

Methods: *This validation study was conducted in the period of July 2016 to September 2017 in the department of Psychiatry, Bangabandhu Sheikh Mujib Medical University, Dhaka. In this study researcher applied Bangla version of Children's Yale Brown Obsessive- Compulsive Scale in 47 child and adolescent with OCD and assessed the validity (Content validity, Face validity, Convergent validity and Factor analysis) and reliability (Internal consistency, Inter-rater reliability, Test-retest reliability).*

Results: *In assessing internal consistency, Cronbach's Alpha (a) value was 0.91, which reflects good reliability. Inter rater reliability was excellent for CY-BOCS total and each individual 10 items as the range of intraclass correlation was 0.96 to 0.98 which represented very strong positive correlation.Content validity and face validity was maintained by following standard procedures. Good convergent validity was found with culturally adapted Developmental and Well Being Assessment (DWABA) Bangla by using spearman's rho. Communalities were above accepted level.*

Conclusion: *All values represented that the CY-BOCS Bangla was reliable and useful scale for assessing symptom severity and thereby treatment response of Bangla speaking children and adolescent patient with OCD in Bangladesh context. Inter rater reliability was excellent for CY-BOCS total and each individual items as the range of intraclass correlation represented very strong positive correlation.*

Keywords: *Children's Yale- Brown Obsessive Compulsive Scale,Bangla version, Reliability, Obsessive compulsive disorder.*

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I.   Introduction

Now a day, frequencies of psychiatric disorders among children and adolescent accrued more attentions of healthcare professionals. Obsessive compulsive disorder (OCD) is one of the common psychiatric disorders among children and adolescent. In Bangladesh, prevalence of child and adolescent OCD is about 2%. Gold standard Children's Yale-Brown Obsessive-Compulsive Scale (CY-BOCS) is a clinician-rated and most widely used scale in measurement of OCD symptom severity and thereby treatment response in children and adolescent age group.Obsessions are persistent ideas, thoughts, impulses that are experienced as intrusive and inappropriate and that causes marked anxiety and distress, whereas compulsions are repetitive behaviors or mental acts the goal of which is to prevent or reduce anxiety or distress (APA, 2000) [1]. The Diagnostic and Statistical Manual for Mental Illness, 4th edition (DSM-IV) quotes lifetime prevalence of 2.5% and one-year prevalence of 1.5-2.1% for OCD but does not categorize these prevalence rates for children, adolescents, and adults. In a study in the Southeastern USA [2] of students from grade 7 to 9.7% one-year incidence of OCD and 8.4% one-year incidence of subclinical OCD is reported. They also quote studies of OCD in adolescents with community prevalence of 0.2-1.2%. In Germany, one epidemiological study reports the prevalence of obsessive-compulsive symptoms in children where 2.8-4.5% ranges are reported for sample of 8-year-olds (Thomsen, 2000). A New Zealand study of child and adolescents OCD up to 18-year-olds found 4.0% prevalence [3]. In one prevalence study of psychiatric disorder among child and adolescents of 5 to 10 years age group reveals OCD in Bangladesh is 2.0% [4]. Rating scales arc used in psychiatry mainly for assessing symptoms, to record, changes, either spontaneous or following intervention and for screening purpose [5]. It assesses pediatric OCD symptoms and severity over the previous week. The first section of the CY- BOCS assesses current and life-long presence of common obsessive and compulsive symptoms. Subsequently, obsessions and compulsions are rated in terms of their frequency, interference, distress, ability to which they can be resisted and perceived control over symptoms. A number of child and parent report measures can supplement the CY-BOCS [6]. Whereas the adult Y- BOCS relies on interview data from the client, the CY-BOCS culls ratings from both the child and the parent or guardian. Further, the instructions specify that "sometimes, however, it may also be useful to interview the child or parent alone" [7]. Other instruments designed to assess pediatric OCD symptoms, namely the Leyton Obsessional Inventory-Child Version survey (LOI-CV), the Children's Obsessional Compulsive Inventory (CHOCI), the Obsessive-Compulsive Inventory-Child Version (OCI-CV), the Child Saving Inventory, and the Obsessive Beliefs Questionnaire-Children's Version are promising assessments for assessing symptoms and the severity of OCD, but they do not assess the obsessive-compulsive dimensionality [8]. Whereas CY- BOCS regarded as gold standard [9]. There is still no validated instrument to measure symptoms severity and treatment response of children and adolescents OCD patients in Bangladesh with population is about 157 million which is projected to 250 million by 2050 (BBS, 2013) [10]. Bangla is the state language of this country. More than 230 million people use it as their first language in the world. It is ranked 7th in the world in terms of number of people who speak in Bangla [11]. The aim of this study was to assess the reliability of Bangla Version Children's Yale-Brown Obsessive-Compulsive Scale in applying among child and adolescent with OCD.

II.   Methodology

This validation study was conducted in the Department of Psychiatry of Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh during the period from January 2016 to September 2017. In total 51 Bangla speaking child and adolescent patients with obsessive compulsive disorder were selected as the study subjects by purposive and consecutive sampling methods. As per the inclusion criteria of this study newly diagnosed case of OCD of both gender and age between 6 1nd 17 years were selected. On the other hand, according the exclusion criteria, patient who is mute and non-communicable and/or suffering from any medical illness were excluded. The first instrument was the questionnaire for Socio-demographic and other relevant information for the study of "Adaptation and Validation of the Bangla version of Children's Yale-Brown Obsessive-Compulsive Scale: CY-110 Cti Bangle": Another instrument was the Development and Well-Being Assessment (DAWBA). Assessment of emotional and behavioral disorders was carried out using the DAWBA developed by [12]. It is an internationally well accepted research instrument, and a novel package of questionnaires, interviews, and rating techniques designed to generate DSM-IV psychiatric diagnoses among children and adolescents of 5 to 16 years (Extended up to 18 years). This instrument has been translated in Bangla and standardized and validated by Mullick and Goodman [4]. Another instrument was the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Test Revision (DSM-IV-TR) (APA, 2000). In 1952, the American Psychiatric Association published the first edition of DSM-I as an alternative to ICD-6, was influenced by the views of Adolf Meyer and Karl Menninger. DSM-IV was published in 1994. DSM-IV-Textual Revision was published in 2000. Another instrument was the Bangla version of Children's Yale-Brown Obsessive-Compulsive Scale. The Children's Yale-Brown Obsessive-Compulsive Scale has been translated into Bangla by two persons having competency on both Bangla and English. It is a clinician-rated, most widely used and accepted as the " gold standard" in the measurement of OCD symptom severity, type of symptoms, and treatment response. English version was introduced in 1986 (revised on 1990) by Goodman et al. (Scahil et al.,

1997) [13]. It consists of two parts: The Yale-Brown Obsessive-Compulsive Scale- Symptoms Checklist (CY-BOCS-SC) and The Yale-Brown Obsessive-Compulsive Scale-Severity Scale (CY-BOCS-SS). The assessments were performed in the following stages: In the first stage (Translation) the CY-BOCS questionnaire has been translated into Bangla by two persons having competency on both Bangla and English. Tl was performed by a psychiatrist (Informed translator). On the other T2 was performed by a person who have no medical or clinical background (Un-informed translator). In stage II (Synthesis) two translations was synthesized into one translation (T-12). Any discrepancies of the translator's reports were resolved. In stage III (Back translation) This part (T-12) was translated back to the original English version by two persons having competency on both Bangla and English. BT1 was conducted by a psychiatrist translated the T1 to English again. BT2 was conducted by a person who has no medical or clinical background will translate the T2 to English. In stage IV (Expert committee review) there were four psychiatrists having competency on both Bangla and English. The members who performed the translation process was a language professional. In stage V (Pretesting) the field test of the new questionnaire was used the pre-final version in 10 patients with OCD from the outpatient department. Then all the findings and assessments were accumulated. In assessment of validity and reliability of the CY-BOCS Bangla, reliability internal consistency was assessed to find out the degree to which items in CY-BOCS are related to each other. Researcher assessed Cronbach's alpha to find out internal consistency. As inter-rater reliability CY-BOCS was rated by researcher and a resident of department of psychiatry, BSMMU who has almost similar qualification with researcher working in the department as another rater of the scale. This was analyzed in the form of intra-class correlation. As the test-retest reliability the researcher assessed the respondents again during their follow-up in 14 days asthe initiation of treatment will not significantly change intensity of symptoms within this short duration. Pearson's correlation has done for this. In content validity, 4 members experts committee (Psychiatrists having competency on both Bangla and English) reviewed the Bangla version of CY-BOCS and provided their valuable opinion about the face validity. In face validity 4 members experts committee (Psychiatrists having competency in both Bangla and English) reviewed the Bangla version of CY-BOCS and provided their valuable opinion about the face validity. In factor analysis confirmatory Factor Analysis was done by Principal Component Analysis with distribution of Varimax Rotation of CY-BOCS Bangla. In convergentvalidity assessment, convergent validity of CY-BOCS Bangla withDAWBA was measured as by Spearman's rho. After collecting the data, it was checked and rechecked for omission, inconsistencies and improbabilities. Data had edited, coded and entered into the computer. Data analysis was performed by statistical package for social science (SPSS), version 16.

III. Result

This study showed that, among the 47 patients, 16 year was the most prominent age (21.28%), followed by 17 year (17.02) and 13 year (14.89%). Table 1 showed 'mean age of the study population was 13.72 years with a standard deviation of 2.38 years. The age distribution ranges from 8-17 years. Most common age group was 12-1 years. Among the 47 OCD patients 59.57% were male and 40.43% were female. In educational qualification, 40.43% of the respondents were found to have primary education and 59.57% of secondary education. It also showed that 80.85% respondents were from urban background and 19.15% were from rural background. Table 1 revealed most of the persons, 66% (n =31), were from nuclear family and the rest were 34% (n=16) from joint family. 91.49% of the respondents were from Muslim background and rest were Hindu. 17% of the respondents were being dropped out from school. Among the participants, 10 respondents (21.28%) had positive family history of psychiatric illness, where 7 respondents had family history of OCD and 3 respondents had family history of Schizophrenia. In this study, face validity, content validity and criterion validity were systematically assessed and maintained during the development of the research instrument and at the time of interview by the interview response. Construct validity was assessed done by Exploratory Factor Analysis (EFA) of the principal component with varimax rotation & internal consistency. The Exploratory Factor Analysis with the principal component with varimax rotation was used to detect the factorial structure in observed measurements. KMO &Barlett's test of Sphericity was applied to the fitness of data for factor analysis. The KMO and Barlett's Test of sampling adequacy was 0.77. A value of >0.50 of KMO is considered as a good sampling adequacy. Construct validity was assessed by factor analysis. It showed high communalities between the items before and after extraction (Table 3). The varimax rotation (Table 4) showed, two components were extracted. The rotation of the solution also revealed similar pattern of CY-BOCS Bangla. This study revealed very good communalities between the items. It ranges from 0.62- 0.86. Q9 loaded the lowest and Q3 load the maximum. However, loading greater than 0.5 is considered as significant. So, all the items of the construct can be retained. Factor loadings after the Principal Component Analysis with varimax rotation revealed 2 components. Q3 & Q8 have significant loadings. All other items were loaded in component 1. Loadings greater than 0.4 is considered significant and should be retained. In this study convergent validity of CY-BOCS Bangla measured by Spearman's rho revealed that the correlation between the DAWBA total global score and the CY-BOCS total score was high (Spearman's rho = 0.824, p = 0.0001), indicating very good convergent validity of

the CY-BOCS Bangla. The Cronbach's Alpha (a) value was 0.91. (When interpreting Cronbach's Alpha (a), it ranges from 0 to 1. A value of > 0.70 is reflects good reliability) (Arafat et al., 2016; Arafat 2016). Finally, in this study the test-retest correlation by Pearson Correlation; significant association was observed between two tests. Moreover, all the item correlation was found above 0.75. In this study, it was found that the reliability was excellent between rater 1 and rater 2 for CY- BOCS total and also for each individual items. All item showed excellent correlation between the raters.

Table 1: Socio-demographic characteristics
of the study population

Characteristics	n	%
Age distribution in year		
8-12	14	29.79
13-17	33	70.21
Mean SD	13.72 ± 2.83	
Gender distribution		
Male	28	59.57
Female	19	40.43
Educational status		
Primary Level	19	40.43
Secondary Level	28	59.57
Occupational Status		
Student	39	82.98
Dropped Out	8	17.02
Residence status		
Urban	38	80.85
Rural	9	19.15
Family structurers		
Nuclear	31	65.96
Joint	16	34.04
Religious status		
Muslim	43	91.49
Hindu	4	8.51
Family history		
Schizophrenia	3	6.38
OCD	7	14.9
Absent	37	78.72

Table 2: Distribution of
Kaiser-Meyer-Olkin measure of sampling
adequacy of CY-BOCS Bangla

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.77
Bartlett's Test of Sphericity	Approx. Chi-Square	362.3123
	df	45
	sig.	0

Table 3: Convergent validity of CY-BOCS
Bangla measured by Spearman's rho

Correlations			
Spearman's rho		CY-BOCS Bangla	DAWBA
CY-BOCS	Correlation Coefficient	1	0.824

Bangla	Sig. (2-tailed)		0
DAWBA	Correlation Coefficient	0.824	1
	Sig. (2-tailed)	0	

Table 3: Internal Consistency of CY-BOCS Bangla

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of items
0.91	0.92	10

Table 4: Test-retest reliability of CY-BOCS Bangla

Item	Pearson Correlation	p value
Q I	0.95	0
Q2	0.97	0
Q3	0.92	0
Q4	0.93	0
Q5	0.98	0
Q6	0.98	0
Q7	0.96	0
Q8	0.75	0
Q9	0.96	0
Q10	0.98	0

Table 5: Inter rater correlation of the construct measured by Intraclass Correlation

Item	Intra-class Correlation	95% Confident Interval		
		Upper	Lower	P value
Q	0.98	0.99	0.96	0
Q2	0.98	0.99	0.96	0
Q3	0.98	0.99	0.97	0
Q4	0.96	0.98	0.93	0
Q5	0.96	0.98	0.93	0
Q6	0.98	0.99	0.96	0
Q7	0.98	0.99	0.96	0
Q8	0.96	0.98	0.93	0
Q9	0.96	0.98	0.93	0
Q10	0.98	0.99	0.96	0

IV. Discussion

The aim of this study was to assess the reliability of Bangla Version Children's Yale-Brown Obsessive-Compulsive Scale in applying among child and adolescent with OCD. Children's Yale- Brown Obsessive Compulsive Scale is an internationally validated tool to diagnose the children suffering from OCD and it is considered as the gold standard tool for the same purpose. There was no psychometrically validated tool to be used among Bangla speaking population for this purpose. The CY-BOCS questionnaire was translated into Bangla and back translated by following standard procedure. An expert committee reviewed all the reports and produced final version. Final version was produced after pretesting and approved by the expert committee. Expert committee emphasized for thematic interpretation rather than literal translation. In this study, face

validity was systematically assessed and maintained during the development of the research instrument and at the time of interview by the interview response. Four professors of Psychiatry systematically assessed the instrument before. during and atter the translation. These procedures were followed by previous research [14]. During translation and back translation standard state of art procedure was followed that ensured the face validity as well. The instrument is considered as the gold standard for measuring OCD in the children. Moreover, the researcher himself, translators, the expert committee assessed the instrument vigorously to fix the contents of the instrument. KMO &Barlett's test of Sphericity was applied to the fitness of data for factor analysis. KMO was found to be .77 in this study and that was statistically significant. The Exploratory Factor Analysis with the principal component with varimax rotation was used to detect the factorial structure in observed measurements. It showed high communalities between the items before and after extraction. The varimax rotation showed two components in the construct. The rotation of the solution also resealed similar two components of Bangla CY-BOCS. Q3 and Q8 construct the second component and rest of the items construct the first component with high loadings. Confirmatory factor analysis done by Storch et al., found also two components such as Obsessions and Compulsions; Disturbance and Severity. Different studies also found two factor model but some of them had poor fit with the structure [15]. Extraction communalities estimates of the variance in each variable accounted for by the factors in the factor solution. Small values indicate variables that do not fit well with the factor solution and should possibly be dropped from the analysis. If one or more variables have a value for communality that is less than 0.50, the variable with the lowest communality should be excluded and the principal component analysis should be computed again [14]. Convergent validity was assessed by correlating the CY-BOCS Bangla with DAWBA which was found significantly correlated measured both by Pearson & Spearman rho analysis. Both analyses revealed statistically significant result. DAWBA was used in this study because it is the only available validated instrument to assess OCD in Bangla speaking children. To test internal consistency, The Cronbach's Alpha was used. The Cronbach's Alpha (a) value was 0.91 (When interpreting Cronbach's Alpha (a), it ranges from 0 to 1. A value of ≥ 0.70 is reflects good reliability). Another research found its value 0.80, 0.72, 0.76 [15]. A potential explanation for this disparity may be that the estimation of Cronbach's alpha is affected by the sample size and participants were case sensitive. Test-retest reliability is an important aspect of psychometric property of a questionnaire. Researcher found that there was significant correlation between the two tests. Researcher measured it by item wise correlation by Pearson Correlation and that found above 0.75 in all the items. It was measured by ICC and found. The reliability was significant between rater 1 and rater 2 for CY-BOCS Bangla total and the also for each individual 10 items. It was assessed by Intra Class Correlation (ICC). The range of ICC was 0.96-0.98 of the items. To ensure reliability, a value >0.71 is considered as substantial [14]. Moreover, sample size was calculated for the current study was estimated with presumptive ICC of 0.8 or above. This result also reaffirms the sample size calculation [16]. The tool had mean score of items, standard deviation of the responses; item total score correlation revealed a very significant relationship between the item and the total scale. It can be inferred from the results of evaluation of the CY-BOCS Bangla possesses good psychometric properties. This validated scale will be helpful to measure severity as well as treatment outcome of Bangla speaking children and adolescent patient with OCD in Bangladesh.

Limitation of the study:
This was a single centered study with a small sized sample. So, findings of this study may not reflect the exact scenario of the whole country.

V.   Conclusion & Recommendation
CY-BOCS is considered as the gold standard to measure the childhood OCD. The study result signifies its high reliability measured by Cronbach's a, test-retest reliability, inter rater reliability and validity measured by face validity, content validity, convergent validity. The study established that Bangla version of CY-BOCS is valid, accepted, and widely applicable in measuring severity and treatment outcome of childhood OCD in Bangla speaking population in clinical practice and research. Larger multicenter studies involving more heterogeneous patients may help to provide a more complete picture of the state, ways of improving, affecting factors, impact of OCD in child and adolescents in Bangladesh. For getting more specific information regarding this issue we would like to recommend for conducting more studies in several places with larger sized samples.

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