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Psychometric Properties of Bangla Young Mania Rating Scale

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Abstract

Introduction: The Young Mania Rating Scale (YMRS) is widely used clinician-rated instrument which measures the symptom severity of mania and considered as ″gold standard″. We aimed to assess the psychometric properties of Bangla YMRS. Methods: Current validation study was performed from January 2015 to September 2016 among patients of mania of department of psychiatry of Bangabandhu Sheikh Mujib Medical University, Dhaka. The adaptation of YMRS to Bangla was achieved according to the standard process of forward-backward translation. Data were collected from 51 manic patients and analyzed different forms of reliability and validity by Statistical Package for the Social Science version 16.0 software. Results: The Cronbach's alpha value was 0.89 and interrater reliability was measured by Cohen kappa coefficient and ranged from 0.80 to 0.98 those signifies an acceptable reliability statistic. Face validity and content validity were assessed systematically and construct validity was assessed by factor analysis. Only 1 factor was were extracted by exploratory factor analysis with varimax rotation signifying the unidirectionality of the construct. Conclusions: Bangla YMRS can be a psychometrically reliable and valid tool to use in clinical settings, research and primary care setting to assess the symptom severity of mania as well as the relapse of episode.

Keywords: Mania, YMRS, Rating Scale, Bangla, Bangladesh

Introduction

Bipolar I/Mania is a major psychiatric disorder, reduces the quality of life and causes functional impairment across multiple domains of life which is associated with severity of presenting symptoms [1]. Unfortunately, scientist, researchers, clinicians have to specific laboratory investigation to confirm the diagnosis and/or

measure the severity of the disorder. However, rating scales have addressed the problem and been utilized increasingly. Rating scales can systematically verify the hypotheses of clinical judgment, decision making, and psychopathology, as well as a measurement tool that transforms the implicit and explicit observation into quantitative data [2, 3]. The Young Mania Rating Scale (YMRS) is most widely used clinician-rated instrument which measures the symptom severity of mania and considered as ″gold standard″ [4]. It can also be used to detect a return to manic symptoms (relapse or recurrence). The scale has 11 items and is based on the patient's subjective report of his or her clinical condition over last 48 hours those include, elevated mood, increased motor activity energy, sexual interest, sleep, irritability, speech (rate and amount), language for thought disorder, content, disruptive - aggressive behavior, appearance and insight [4]. There are four items that are graded on 0 to 8 scale (irritability, speech, thought content, and disrupting -aggressive behavior), while the remaining seven items are graded on a 0 to 4 scale [4]. These four items are given twice the weight of the others to compensate for poor cooperation from severely ill patients. The range of score for the YMRS is 0 - 60. The average score on the YMRS were 13 for minimal severity, 20 for mild, 26 for moderate and 38 for severe [4].

Application of psychometrics is under addressed and newer concept in Bangladesh, a country of 160 million population [5, 6]. There is still no validated instrument to measure symptom severity and treatment response of mania in Bangla. Moreover, psychometrically valid scales in indigenous languages could facilitate research and better services to the patients. So, aim of the study is to adapt and validate Bangla version

of YMRS among patients with mania in Bangladesh. So, it was aimed to develop a culturally adapted and validated Bangla version of PSDQ for assessment of parenting style in Bangladesh.

Methods

Ethical Aspects

The study was conducted complying the declaration of Helsinki 1964. Formal permission was taken from the responsible authority for conducting the validation study. Before starting this study, the research protocol was approved by the institutional review board of Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka. Steps of the study were supervised by department of Psychiatry, BSMMU. Informed written consent was obtained from the patients without any influences. Data were collected anonymously; confidentiality of data was ensured adequately and any unauthorized access to data was not possible.

Instruments

Semi-structured Questionnaire for Socio demographic: This was a semi-structured questionnaire designed by researcher containing socio-demographic variables such as name, age, sex, occupation, religion, habitant, education, family history of psychiatric illness.

SCID-CV (The structured clinical interview for DSM-IV Axis-I disorders – Clinician Version): The structured clinical interview for DSM- IV is a semi-structured interview created to make reliable psychiatric diagnosis in adults according to the DSM-IV. The SCID has two parts: one for DSM-IV Axis- I Disorders (SCID- I) and another for DSM-IV Axis- II Personality Disorders

(SCID- II). SCID- I is available in two versions: The research Version and the clinical version. SCID-CV was applied by first author.

Bangla Young Mania Rating Scale: The Young Mania Rating Scale was adapted into Bangla by following standard procedure. It is a clinician-rated, most widely used and accepted as the "gold standard" in the measurement of manic symptom severity, and treatment response. English version was introduced in 1978 by Young et al., which is 11-item scale [4].

Adaptation of YMRS into Bangla

The adaptation of PSDQ into Bangla was performed according to the standard procedure of forward-backward translation [2, 3, 5, 6]. One psychiatrist (informed translator) and 1 lay person (uninformed translator) were involved in forward translation procedure. Both of the translators were native speakers of the Bangla and fluent in English. The forward translated versions were compiled from the two forward translations to address the discrepancies between the versions, as per recommendations [2, 3]. Then the compiled version was translated back into English by 1 lay person and by 1 psychiatrist, who had not been involved in forward translation steps. The back-translated versions were then compiled and compared by the researcher to resolve any discrepancy for complying the validation guideline [2]. After that all the 4 versions were submitted to the expert committee, formulated for this validation study. The expert committee finalized the items of the YMRS Bangla and then pretesting was conducted among 10 patients with mania. Minor modifications were addressed after the pretesting and final Bangla YMRS was prepared.

Study place and procedure

This validation study was conducted from January 2015 to September 2016 at the department of Psychiatry, BSMMU, Dhaka, Bangladesh semi-structured Bangla version of YMRS. Data were collected from 51 patients with mania chosen by purposive consecutive sampling. Sample size was determined based on inter-rater reliability. We defined Ho: $\rho0 = 0.8$ and H1: $\rho1 = 0.9$. Using a two-sided test as suggested by Walter et al. (1998) with β (probability of type II error) = 0.2 (80% power) and α (probability of type I error) = 0.05, a sample size of 46 was required [7]. Consideration of 10% dropout, sample was 51. The interview was performed by the first author through face-to-face interview technique.

Data analysis

Socio-demographic variables were analyzed and presented as frequency distribution. Psychometric properties of YMRS Bangla were assessed as per standard recommendations [2, 5, 6]. Reliability was assessed in internal consistency form by Cronbach's alpha coefficient and a cut-off of ≥0.70 was considered acceptable which is suggested by standard recommendations [2]. Face validity was assessed by following standard translation, back translation process and expert committee review which is supported by recommendations [2, 3, 5, 6, 8]. Content validity was also assessed by following standard translation process which is supported by existing recommendations [2, 3, 5, 6, 8]. Construct validity was assessed by exploratory factor analysis with Principal Component Analysis (PCA) with varimax rotation. Factor rotation was done to ascertain the factors of the construct which is preloaded in the SPSS software. Criterion validity could not be assessed due lack of culturally appropriate instrument.

Results

Sociodemoghraphy & Item Characteristics

A total of 51 clinically diagnosed manic patients were enrolled in the study. Age ranged from 18 to 55 years. Majority of the patients (47%) were on 21-30 age group, about 55% were female, 51% were married, about 90% came from nuclear family, about 59% came from rural background, and about 31% were students (Table 1).

Mean YMRS score of individual item ranged from 3.02 ± 1.11 to 3.30 ± 1.11. The highest score was 3.30 ± 1.11 for the item-6 "speech" and the lowest score was 3.02 ± 1.11 for item- 9 "Aggression" (Table 2).

Reliability Assessment

The Cronbach's alpha (α) value was 0.89 (When interpreting Cronbach's alpha (α), it ranges from 0 to 1. A value of ≥ 0.70 is reflects good reliability). Interrater reliability was measured by Cohen kappa coefficient and ranged from 0.80 to 0.98 (Table 3). Item-total reliability statistics was assessed based on the total Cronbach's alpha if item removed which didn't support dropping of the item.

Validity Assessment

Face validity and content validity were systematically assessed and maintained during the development of the research instrument (YMRS Bangla) [2, 3, 5, 6, 8]. Expert committee assessed translation of every item with comparing the translations and back translations [2, 3, 5, 8]. Construct validity was assessed done by EFA of the principal component with varimax rotation. The EFA with the principal component with varimax rotation was used to detect the factorial structure in observed measurements. The KMO & Barlett's test of Sphericity was applied to the fitness of data for factor analysis on the basis of sample size of the current validation study. The KMO of the present study was found 0.83 ($p<0.05$) and a value greater than 0.60 is considered as adequate sample size of study [2]. Thus, the YMRS Bangla revealed a statistically acceptable sample size and found to be fit to conduct factor analysis. Only 1 factor of YMRS Bangla based on Eigen values obtained from Principal Component Analysis (Table 4). Criterion validity cannot be assessed due to lack of culturally adapted instruments.

Table 1. Socio-demographic variables of respondents (n=51)

Variables	n	%
Age in year		
18-20	10	19.6
21-30	24	47.1
31-40	9	17.6
41-50	4	7.8
>50	4	7.8
Sex		

Male	23	45.1
Female	28	54.9
Marital status		
Unmarried	23	45.1
Married	26	51.0
Separate	2	3.9
Family status		
Nuclear	46	90.2
Joint	5	9.8
Religion		
Muslim	44	86.3
Hindu		
	7	13.7
Education		
Illiterate	3	5.9
Primary	8	15.7
Secondary	11	21.6
Higher secondary	17	33.3
Graduation and above	12	23.5
Occupation		
Unemployed	7	13.7
Student	16	31.4
Housewife	157	29.4
Businessman	16	5.9
Service	15	17.6
Retired	1	2.0

Table 2. Distribution of item characteristics of YMRS Bangla

Item	Name of items	Mean ± Standard Deviation (SD) (Range 1-5)	Corrected item total correlation
1	Mood	3.06 ± 1.03	0.88
2	Energy	3.20 ± 1.17	0.89
3	Sexual interest	3.22 ± 1.09	0.87
4	Sleep	3.14 ± 1.22	0.88
5	Irritability	3.10 ± 1.07	0.88
6	Speech	3.30 ± 1.11	0.86

7	Language-Thought disorder	3.22 ± 1.18	0.92
8	Content	3.24 ± 1.22	0.87
9	Disruptive-Aggressive behavior	3.02 ± 1.11	0.90
10	Appearance	3.22± 1.18	0.92
11	Insight	3.02 ± 1.11	0.90

Table 3. Inter-rater reliability of YMRS Bangla

Items	Inter-rater Reliability
Mood	0.83
Energy	0.81
Sexual interest	0.80
Sleep	0.85
Irritability	0.97
Speech	0.91
Language- Thought disorder	0.82
Content	0.85
Disruptive-Aggressive behavior	0.94
Appearance	0.94
Insight	0.98
YMRS Bangla Total	0.88

Table 4. Factor analysis by principal component analysis with distribution of varimax rotation of YMRS Bangla

Component matrix

Items	Component
	1
Mood	0.62
Energy	0.80
Sexual interest	0.41

Sleep	0.73
Irritability	0.84
Speech	0.76
Language-Thought disorder	0.67
Content	0.60
Disruptive-Aggressive behavior	0.81
Appearance	0.62
Insight	0.79

Extraction method: Principal component Analysis: 1 component extracted

Discussion

Reliability

The aim of this study was to assess the reliability and validity of Bangla YMRS. To the best of the authors' knowledge, this is the first study to report on the psychometric properties of Bangla YMRS. The Cronbach's alpha (0.89) measuring the internal consistency and Cohen kappa coefficient (0.80-0.98) reflect an acceptable reliability statistic. Similar reliability statistics were found in previous studies such as in Portuguese study, internal consistency was 0.67 [9]; Cronbach's alpha coefficient was 0.72 in Iranian study [10]; Cronbach's alpha coefficient was 0.83 in Spanish study [11]; 0.74 in German study [12]; 0.89 in Thai version [13]; 0.89 in Turkish study [14].

Forms of Validity

Face validity and content validity were methodically assessed and maintained during the development of the research instrument (YMRS Bangla) which is supported by previous studies [2, 5, 6, 8]. Expert committee assessed every item of YMRS Bangla with comparing the translations and back translations and ensured the required equivalences [2, 3]. Construct validity was assessed by EFA of the principal component with varimax rotation. The EFA with the principal component with varimax rotation was used to detect the factorial structure in observed construct. However, criterion validity of YMRS Bangla cannot be assessed due to lack of culturally adapted instruments which is supported by previous studies [2, 5, 6]. The number of factors of the PSDQ Bangla based on Eigen values obtained from PCA and only 1 factor was found which is similar and unidimensional construct was found in Spanish study [11]. However, in Iranian study it was found 3-dimensional construct [10].

Limitations

In the current study, test retest form of reliability was not assessed; criterion validity and discriminative validity could not be assessed due to lack of standard culture specific instrument. The study was conducted in a referred hospital set up in the capital which would thwart the generalizability of the study results as well as the representativeness of sample.

Conclusions

In a summery we can conclude that, Bangla YMRS can be a psychometrically reliable and valid tool to use in clinical settings, research and primary care setting to assess the symptom severity of mania as well as the relapse of episode. Certainly, it can strengthen the mental health services towards the manic patients in Bangladesh. Larger studies involving more heterogeneous patients may help to provide a more complete picture of the psychometric properties of Bangla YMRS. Further scales of similar constructs can be considered to validate in Bangla and culture sensitive construct development can be another step of action.

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