

Cross-Cultural Adaptation And Psychometric Validation Of The Columbia Suicide Severity Rating Scale (Lifetime/Recent- Clinical Version) Into Bangla

Dr. Mahabuba Rahman¹, Dr. Jebun Nahar², Dr. Nusrat Jahan Tanzilla³, Dr. Mohsin Ali Shah⁴

¹Assistant Professor, Department of Psychiatry, Medical College for Women and Hospital, Dhaka, Bangladesh

²Resident Psychiatrist, National Institute of Mental Health and Hospital, Dhaka, Bangladesh.

³Child and Adolescent Psychiatrist, Department of Psychiatry, Bangladesh Medical University (Ex-BSMMU), Dhaka, Bangladesh.

⁴Professor, Department of Psychiatry, Bangladesh Medical University (Ex-BSMMU), Dhaka, Bangladesh

KEYWORDS

Psychosocial stress, adolescent, psychiatric disorder..

ABSTRACT

Background: Suicidal behavior, including ideation, attempts, and non-suicidal self-injury (NSSI), represents a major public health challenge globally, particularly in low- and middle-income countries like Bangladesh. Despite the widespread use of the Columbia-Suicide Severity Rating Scale (C-SSRS) for suicide risk assessment, a validated Bangla version of the C-SSRS Lifetime/Recent - Clinical version is currently lacking.

Aim of the study: To translate, culturally adapt, and validate the Bangla version of the Columbia-Suicide Severity Rating Scale (C-SSRS) Lifetime/Recent – Clinical version for the assessment of suicidal ideation and behaviors in Bangladeshi adolescents and adults.

Methods: A cross-sectional study was conducted from October 2021 to September 2023 at the Department of Psychiatry, BSMMU, Dhaka, Bangladesh, enrolling 201 participants aged ≥ 13 years using purposive sampling. A rigorous forward-backward translation procedure was employed. Content validity was evaluated through expert review. Construct validity was assessed via exploratory factor analysis, and convergent validity was tested by correlating C-SSRS scores with Beck Depression Inventory-II (BDI-II) scores. Internal consistency was measured using Cronbach's alpha, and predictive accuracy was assessed through sensitivity and specificity analysis.

Result: The sample included adolescents (50.2%) and adults (49.8%) with and without suicidal behavior. Content validity indices (I-CVI) were ≥ 0.83 for all items. Factor analyses supported the structural validity of the scale, with acceptable variance explained across subscales: severity (61.85–69.93%), intensity (53.76–73.93%), and behavior (41.93–47.9%). Cronbach's alpha values ranged from 0.523 to 0.76 across subscales and age groups. Convergent validity was stronger for recent (past one-month) suicidal ideation and intensity ($r = 0.686$ and $r = 0.406$, $p < 0.01$) compared to lifetime measures. Sensitivity for detecting suicidal behaviors was high (92.9%–100%), while specificity ranged from 18.3% to 40%.

Conclusion: The Bangla version of the C-SSRS Lifetime/Recent – Clinical version is a reliable, valid, and culturally appropriate tool for assessing suicidal ideation and behavior among both adolescents and adults in Bangladesh. Its use may significantly enhance suicide prevention efforts in clinical and research settings.

INTRODUCTION

Suicidal behavior remains a significant public health concern globally, contributing substantially to death and disability [1]. According to the World Health Organization (WHO) report of 2019, the global age-standardized suicide rate is 9.0 per 100,000 people, with approximately 703,000 deaths by suicide recorded in that year. Suicide is also identified as the fourth leading cause of death among adolescents aged 15-19 years, with males exhibiting higher suicide rates (12.6 per 100,000) compared to females (5.4 per 100,000) [2]. Suicidal behaviors encompass a range of self-directed actions, including suicide ideation, attempts, and non-suicidal self-injury (NSSI). NSSI, defined as deliberate self-inflicted injury without suicidal intent, is increasingly recognized as a significant risk factor for future suicide attempts [1]. It is associated with mental health conditions such as depression, borderline personality disorder, and substance use disorder, which are frequently found in individuals who have attempted or died by suicide [3,4]. The epidemiology of suicide and related behaviors varies globally due to factors such as country, age, gender, socioeconomic status, and healthcare access, with higher suicide rates observed in low-and-middle-income countries. In these regions, the prevalence of suicidal ideation and attempts presents a pressing public health challenge [5]. The Centers for Disease Control and Prevention (CDC) defines suicide as death resulting from self-directed injurious behavior with the intent to die, while a suicide attempt is a non-fatal, self-directed act with intent to die [6]. Suicidal ideation, the contemplation or planning of suicide, is a key predictor of suicide and has a lifetime prevalence of 9.2% globally [7]. The Columbia-Suicide Severity Rating Scale (C-SSRS), developed under the Columbia Lighthouse Project, is a leading tool for assessing suicidal ideation and behavior. It provides a structured framework for evaluating suicide risk severity and intensity. With subscales for ideation severity, intensity, behavior, and lethality, the C-SSRS effectively measures ideation and attempts separately [8]. This scale has been adopted widely, with over 140 translations, including in 131 languages across 81 countries [9]. The validation of the C-SSRS in various languages and cultural contexts has proven essential for ensuring its utility in global suicide prevention efforts. In Bangladesh, suicide rates have been steadily increasing, yet the issue remains underaddressed [10]. A national survey conducted among adolescents revealed that 4.7% of youths had suicidal thoughts, and 1.5% had made at least one suicide attempt. Notably, suicidal ideation was more prevalent among females (2.6%) than males (6.6%) and higher in urban areas (8.2%) compared to rural regions (3.7%) [11]. These statistics emphasize the need for culturally adapted, validated tools for effective suicide risk assessment in Bangladesh. The Columbia-Suicide Severity Rating Scale (C-SSRS), particularly the Lifetime/Recent-Clinical version, is widely used for evaluating suicidal ideation and behaviors but lacks a validated Bengali version. The aim of this study is to develop, culturally adapt, and validate a Bangla version of the Columbia Suicide Severity Rating Scale (C-SSRS) Lifetime/Recent – Clinical version for assessing suicidal risk.

METHODOLOGY & MATERIALS

This cross-sectional study was conducted in the Department of Psychiatry, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh. The study spanned from October 2021 to September 2023 and focused on patients attending various outpatient, inpatient, and specialized clinics in the Department of Psychiatry at BSMMU. A purposive sampling method was used, and the total sample size was 201.

Inclusion Criteria:

Participants aged 13 years and above.

Ability to read and understand Bangla.

Exclusion Criteria:

Patients with serious medical or psychiatric illnesses causing cognitive impairment.

Participants who did not provide informed written consent.

Data Collection

A pre-tested semi-structured questionnaire was used to gather patient demographics, clinical characteristics, and relevant psychiatric variables. The key variables included age, gender, education, occupation, marital status,

religion, habitation, and family type. Additionally, the Columbia-Suicide Severity Rating Scale (C-SSRS) was used to assess suicidal behavior, and the Beck Depression Inventory-II (BDI-II) was employed to measure depression severity. Both tools were translated into Bangla following a rigorous process to ensure linguistic and cultural appropriateness.

Study Procedures

The study was approved by the Institutional Review Board (IRB) of BSMMU. Participants were selected through purposive sampling based on the inclusion and exclusion criteria. Informed consent was obtained after explaining the study's objectives and procedures. Clinical and laboratory evaluations, including psychiatric assessments using the C-SSRS and BDI-II, were conducted through face-to-face interviews. Participants with suicidal behavior were provided appropriate treatment and counseling.

For the translation of the C-SSRS, a forward-backward translation method was employed, and the final version was pre-tested with 10 participants to ensure clarity. The study adhered to all ethical guidelines, including maintaining confidentiality and the right to withdraw from the study at any time.

Statistical Analysis

Data were analyzed using SPSS version 27. Descriptive statistics, including mean, median, and standard deviation, were calculated for continuous variables, while categorical variables were expressed as frequencies and proportions. To evaluate the reliability of the tools, Cronbach's Alpha was calculated. Convergent validity was assessed using correlations with the BDI-II, while content validity was determined using the Content Validity Index. For comparing groups, an unpaired t-test, Mann-Whitney U test, and Chi-square test were used as appropriate. A p-value of ≤ 0.05 was considered statistically significant.

RESULT

A total of 201 participants were included in the study, divided into adolescents and adults, with further classification based on the presence or absence of suicidal behavior (SB). Figure 1 showed a nearly equal distribution: adults without SB (24.90%), adults with SB (24.90%), adolescents without SB (24.90%), and adolescents with SB (25.40%). In adolescents with SB, 50.5% were aged 13-22 years, and in adults, most participants were aged 23-32 years. Gender distribution was fairly balanced. Education levels varied, with primary education common among adolescents with SB and higher secondary education more prevalent among adolescents without SB. Among adults, half of the participants in both groups had attained honors or higher education. Family types differed, with nuclear families being most common in adolescents with SB and extended families in adolescents without SB. Residence was predominantly urban across all groups, especially among adults without SB. Marital status showed that most adolescents were unmarried (Table 1). Figure 2 demonstrated the distribution of participants by occupational status, showing that students made up the largest group (54.2%), followed by service holders (21.9%) and housewives (13.4%). The content validity of the C-SSRS was assessed by expert evaluations, showing high relevance for most items in all subscales, with the severity of suicidal ideation subscale achieving I-CVI values of 1 for most items (Table 2). Factor analysis for the severity of suicidal ideation subscale revealed three factors across all participants, with acceptable alpha values (overall: 0.585, adolescents: 0.659, adults: 0.523) and variance explanations ranging from 61.85% to 69.93% across groups (Table 3). Table 4 presented that the intensity subscale factor analysis revealed good internal consistency (overall: 0.72, adolescents: 0.76, adults: 0.683), with variance explanations of 73.28% for the overall sample, higher for adults (73.93%) than adolescents (53.76%). The suicidal behavior subscale factor analysis identified two factors, with acceptable internal consistency (overall: 0.732, adolescents: 0.732, adults: 0.725) and variance explanations ranging from 41.93% to 47.9% (Table 5). Convergent validity showed stronger associations for the past one-month subscales of suicidal ideation and intensity ($r = 0.686$, $p < 0.001$ and $r = 0.406$, $p = 0.002$, respectively) compared to lifetime measures (Table 6). The C-SSRS Bangla lifetime subscales showed weak correlations with loss of energy ($r = 0.06$, $p = 0.398$; $r = 0.277$, $p = 0.062$), while past one-month subscales had stronger correlations ($r = 0.285$, $p <$

0.001) (Table 7). Table 8 showed the sensitivity and specificity of the C-SSRS in predicting suicidal behavior over three months. Sensitivity is high for all behaviors: 92.90% for "Actual attempt" (specificity 40%), 100% for "Interrupted attempt" (specificity 25%), and 100% for "Aborted or self-interrupted attempts" (specificity 18.30%).

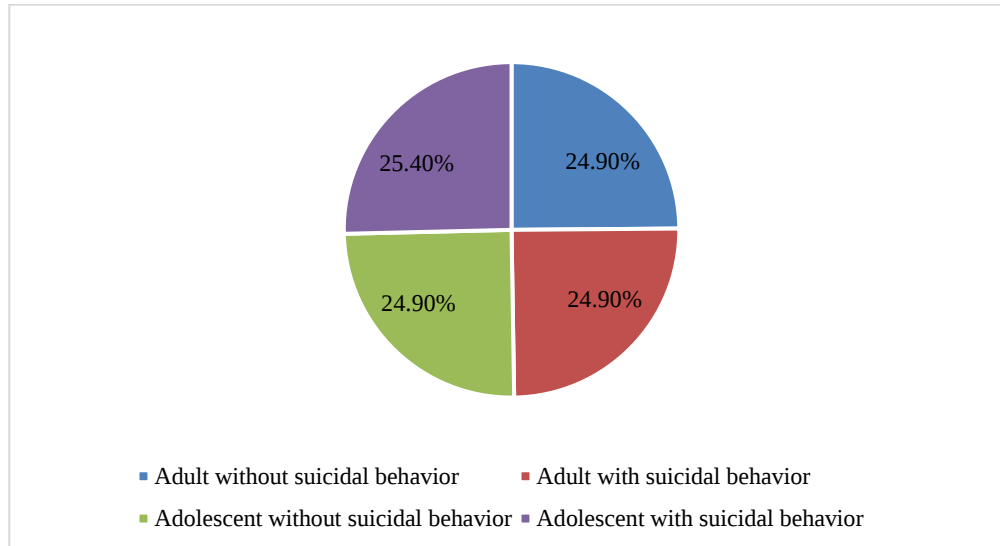


Figure 1: Distribution of participants based on age and suicidal behavior (N=201)

Table 1: Group-wise sociodemographic characteristics of participants (N=201)

Variable	Adolescent				Adult			
	With SB		Without SB		Without SB		Without SB	
	n	%	n	%	n	%	N	%
Age								
13-22	51	50.5	50	49.5	-	-	3	2.9
23-32	-	-	-	-	33	52.4	30	47.6
33-42	-	-	-	-	14	50	14	50
> 42	-	-	-	-	3	50	3	50
Gender								
Male	20	20.4	27	27.6	22	22.4	29	29.6
Female	31	30.1	23	22.3	28	27.2	21	20.4
Education								
Primary	22	31	28	39.4	11	15.4	10	14.1
Secondary	15	28.8	18	34.6	9	17.3	10	19.2
Higher secondary	14	46.7	3	10	6	20	7	23.3
Honors and higher	-	-	-	-	24	50	24	50
Family type								
Nuclear	47	30.5	29	18.8	37	24	41	26.6
Extended	4	8.5	21	44.7	13	27.7	9	19.1
Residence								
Urban	42	26.6	32	20.3	39	24.7	45	28.5
Rural	9	20.9	18	41.9	11	25.6	5	11.6
Marital status								
Unmarried	43	37.4	46	40	10	8.7	16	13.9
Married	5	6.5	3	3.9	35	45.5	34	44.2
Others	3	33.3	1	11.1	5	55.6	-	-

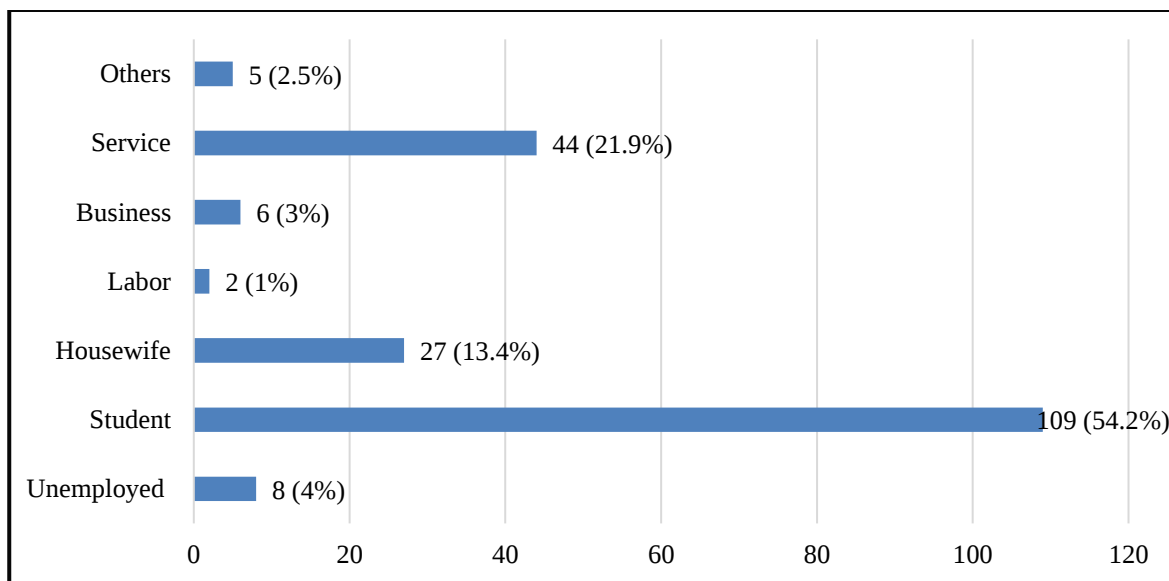


Figure 2: Occupational statuses of participants (N=201)

Table 2: Content validity of C-SSRS

Subscales	Item	Number of very relevant response	Item-CVI
Severity of suicidal ideation	1	6	1
	2	5	0.83
	3	5	0.83
	4	6	1
	5	6	1
Intensity of suicidal ideation	1	6	1
	2	6	1
	3	6	1
	4	6	1
	5	6	1
Suicidal behavior	1	6	1
	2	5	0.83
	3	6	1
	4	6	1
	5	6	1
Lethality	1	6	1
	2	6	1

Table 3: Factor loading and other statistics of severity of suicidal ideation subscale

Variables	All	Adolescents	Adults
Alpha	0.585	0.659	0.523
KMO	0.75	0.747	0.727
Factors	3	3	3
% of total variance explained	61.85	66.43	69.93
Factor 1- Past one month			
Wish to be dead	0.786	0.872	0.368
Non-specific active thoughts	0.792	0.831	0.495
Active suicidal ideation without intent	0.834	0.868	0.674
With specific plan and intent	0.768	0.742	0.895

With intent to act	0.708	0.727	0.901
Factor 2 – Lifetime			
Wish to be dead	0.851	0.759	0.786
Non-specific active thoughts	0.89	0.88	0.856
With specific plan and intent	0.559	-0.349	0.493
Factor 3 – Lifetime			
Active suicidal ideational without intent	0.462	0.853	0.934
With intent to act	0.957	0.894	0.947

Table 4: Factor loading and other statistics for the intensity subscale (lifetime)

Variables	All	Adolescents	Adults
Alpha	0.72	0.76	0.683
KMO	0.664	0.748	0.653
Factors	2	1	2
% of total variance explained	73.28	53.76	73.93
Factor 1			
Frequency	0.739	0.805	0.78
Duration	0.761	0.64	0.783
Controllability	0.659	0.857	0.78
Deterrents	0.941 (2)	0.698	0.957 (2)
Reason for ideation	0.838	0.637	0.799

Table 5: Factor loading and other statistics for the suicidal behavior subscale

Variables	All	Adolescents	Adults
Alpha	0.732	0.732	0.725
KMO	0.62	0.371	0.543
Factors	2	2	2
% of total variance explained	47.9	41.93	45.76
Factor 1 – Lifetime			
Actual attempt	0.497	0.812	0.662
NSSI	0.657	0.556	0.675
Interrupted attempt	0.795	0.855	0.812
Aborted attempt	0.87	0.303	0.545
Preparatory act	0.718	-0.155	0.654
Factor 2 – Past three months			
Actual attempt	-0.777	0.52	0.673
NSSI	0.714	0.665	0.713
Interrupted attempt	0.667	0.767	0.66
Aborted attempt	0.76	-0.3	0.78
Preparatory act	-0.21	0.722	0.715

Table 6: Convergent validity of C-SSRS Bangla

Variables	Correlation coefficient	P-value
Severity of suicidal ideation – lifetime	0.164	0.02
Severity of suicidal ideation – past one month	0.686	0
Suicidal intensity – lifetime	0.129	0.393
Suicidal intensity – past one month	0.406	0.002

Table 7: Divergent validity of lifetime subscales and past one-month subscales of C-SSRS Bangla

BDI item	Severity of ideation		Intensity of ideation	
	r	P value	r	P value

Lifetime subscales of C-SSRS Bangla				
Loss of energy	0.06	0.398	0.277	0.062
Sleep disturbance	0.045	0.528	0.391	0.007
Appetite disturbance	0.057	0.423	0.254	0.089
Fatigue	0.104	0.141	0.338	0.022
Past one-month subscales of C-SSRS Bangla				
Loss of energy	0.285	0	0.338	0.012
Sleep disturbance	0.217	0.002	0.478	0
Appetite disturbance	0.255	0	0.381	0.004
Fatigue	0.368	0	0.372	0.006

Table 8: Sensitivity and specificity of C-SSRS for predicting suicidal behavior in past three months

Outcome	Sensitivity	Specificity
Actual attempt	92.90%	40%
Interrupted attempt	100%	25%
Aborted or self-interrupted attempt	100%	18.30%

DISCUSSION

The Columbia Suicide Severity Rating Scale (C-SSRS) Lifetime/Recent - Clinical version was translated and psychometrically validated into Bangla to ensure its cultural relevance and clinical applicability [12]. The present study evaluated the effectiveness of the Bangla C-SSRS in assessing suicide risk among adolescents and adults in Bangladesh. Reliability and validity analyses in individuals aged 13 and above, with and without suicidal behavior, support its use as a standardized risk assessment tool. As Gudmundsson (2009) noted, translated tools cannot be presumed to retain the psychometric properties of the original [13]. Sousa and Rojjanasrirat (2010) offer a practical framework for cross-cultural adaptation and validation of such instruments [14]. This approach ensures linguistic accuracy and cultural relevance, enhancing the tool's applicability across diverse populations, including those with and without suicidal behavior. The C-SSRS has been validated in children, adolescents, adults, veterans with PTSD, and psychiatric outpatients [15]. During its development, Posner et al. studied high-risk groups and documented sociodemographic variables for standardization [8]. Participants (mean age 23.6±9.5; range 13–65) were mostly aged 13–22, aligning with WHO's report of suicide as the 4th leading cause of death in ages 10–19. Overall, the male–female ratio was nearly equal; however, female adolescents predominated in the suicidal behavior group, reflecting findings from the NIMH survey on youth suicide in Bangladesh [2]. Researchers have linked the gender gap in suicidal behavior to method lethality, noting that females often survive due to using less lethal means. Most participants were from nuclear families and urban areas, aligning with national trends [11]. Urbanization in Bangladesh is largely driven by internal migration for better job opportunities, influenced by socio-economic factors, education, and climate conditions [16]. Most adolescents in the study were students, while adults were mainly housewives or employed in service sectors, consistent with urban occupation patterns reported by Khalequzzaman et al. [17]. Educationally, adolescents were still studying, and many adults held honors or higher degrees, reflecting national educational progress. Standardizing psychometric tools ensures consistent scoring and fair comparisons across groups [18]. The Bangla C-SSRS showed acceptable internal consistency: Cronbach's alpha was 0.585 for severity, 0.720 for intensity, and 0.732 for behavior. Only the severity subscale fell below the 0.7 threshold, similar to findings by Cooper (2017), who also reported lower reliability in the behavior subscale across age groups [19]. While previous studies have reported mixed results regarding the reliability of certain subscales, the present study achieved Cronbach's alpha values around or above 0.7 for all three subscales in the full sample, which is considered acceptable. For validity assessment, face, content, construct, convergent, and divergent validities were examined. Face validity was evaluated during translation, back-translation, and expert committee review. The Item-CVI for the C-SSRS Bangla was above 0.79 for each item, indicating that experts found no need for further revisions. According to Zamanzadeh et al., an I-CVI > 0.79 suggests an item is relevant, between 0.70 and 0.79 indicates the need for revision, and below 0.70 suggests the item should be eliminated [20]. If the S-CVI/Ave ≥ 0.9, the scale is considered to have excellent content validity,

and the C-SSRS Bangla version met both criteria [21]. For construct validity, exploratory factor analysis was performed. The KMO coefficient was above 0.6 for all subscales in the full sample, meeting the threshold suggested by Cetin & Dincer (2020) [22]. However, for the subsample analysis of the intensity subscale (past month), the KMO value was below 0.60, so it was excluded from factor analysis. Cooper (2017) also reported low KMO values for the behavioral subscale: 0.458 for adolescents, 0.513 for preadolescents, 0.411 for adults, and 0.468 for the full sample. These KMO values varied across studies and populations [19]. Principal component analysis with varimax rotation identified three factors for the severity of suicidal ideation subscale, two factors for the suicidal intensity subscale, and two factors for the suicidal behavior subscale, explaining 61.85%, 73.28%, and 47.9% of the variance in each subscale, respectively. In contrast, Posner et al. did not assess construct validity [8]. However, recent studies like Cooper (2017) assessed construct validity, reporting a two-factor solution for the severity subscale, a one-factor solution for the intensity subscale, and a three-factor solution for the behavior subscale [19]. Convergent validity was assessed by correlating the severity and intensity subscales with BDI-II item 9 (suicidality). Statistically significant positive correlations were found, except for the lifetime subscales, where both correlation coefficients were below 0.3, indicating negligible correlation [23]. For divergent validity, Posner et al. found weak to moderate correlations between certain BDI items (e.g., sleep disturbance, fatigue, appetite loss) and suicide severity or intensity scores, with most lifetime severity items showing no significant correlation-except two [8]. Weak correlations in the past month were likely due to overlapping symptoms from underlying psychiatric conditions. Chronic sleep problems, even without depression, have been identified as a suicide risk factor (Bernert et al.), supporting the strong divergent validity of the C-SSRS [24]. The adapted C-SSRS Bangla version demonstrated excellent content validity. Exploratory factor analysis revealed satisfactory KMO coefficients for the full sample, although some subsample analyses yielded lower values, consistent with previous studies. In this study, the C-SSRS showed high sensitivity for both recent and lifetime suicidal behavior subscales in identifying actual (92.9%, 94.9%), interrupted (100%, 87.5%), and aborted attempts (100%, 66.7%). Specificity was notably lower for recent behaviors (40%, 25%, 18.3%), reflecting the common trade-off between sensitivity and specificity. In suicide risk assessment, higher sensitivity is prioritized to avoid missing at-risk individuals. The original scale demonstrated excellent accuracy in adolescents, with 100% sensitivity and specificity for aborted attempts, and nearly perfect scores for interrupted and actual attempts. In adults, it showed 93% sensitivity and 99% specificity for lifetime aborted attempts. Another study involving 3,776 patients reported 67% sensitivity and 76% specificity at follow-up screenings [25]. In this study, the C-SSRS demonstrated good sensitivity in predicting suicide attempts. The findings underscore the importance of considering the context and characteristics of the population when evaluating the C-SSRS's predictive ability in assessing suicidal ideation and behavior.

Limitations of the study: Every hospital-based study has some limitations and the present study undertaken is no exception to this fact. The limitations of the present study are mentioned. This study utilized purposive sampling with a relatively small, urban-based sample, limiting generalizability to rural or socioeconomically diverse populations. Reliance on self-reported data may introduce response bias. One subscale showed lower internal consistency, raising concerns about measurement reliability. The cross-sectional design prevents assessment of suicidal risk over time, and predictive validity was not thoroughly evaluated. Future studies with larger, more diverse samples and longitudinal designs are needed to strengthen the psychometric properties of the adapted Bangla C-SSRS.

CONCLUSION AND RECOMMENDATIONS

The adapted Bangla version of the C-SSRS Lifetime/Recent clinical scale demonstrated strong reliability, validity, sensitivity, and specificity, affirming its effectiveness as a psychometric tool for assessing suicidal ideation and behavior in the Bangladeshi population. Its rigorous six-step adaptation process ensures its suitability for both clinical use and research. Incorporating this tool into suicide risk assessment protocols may enhance early identification and intervention. Researchers are encouraged to employ this scale in exploring suicidal trends and risk factors. However, future studies should include more diverse populations and employ longitudinal designs to strengthen generalizability and examine temporal changes in suicide risk. Further validation, including criterion and predictive validity, will enhance the scale's utility in mental health interventions and suicide prevention

strategies.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee.

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