

Translation, cross-cultural adaptation and validation of English start back screening tool into Bangla for patients with low back pain

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Abstract

This study was intended to translate and culturally adapt the STarT back screening tool to produce an equivalent Bangla version. Total 58 patients with low back pain completed the newly developed Bangla version of STarT back screening tool and Bangla version of Ronald Morris Disability Questionnaire seven days apart. Reliability was assessed by internal consistency (Chronbach's alpha for overall score 0.81 and for psychosocial subscale was 0.76) and test-retest reliability (intraclass correlation coefficient for overall score was 0.78 and for psychosocial subscale was 0.71). Reliability of Bangla version of STarT back screening tool was very good. Pearson's correlation coefficient was carried out on the Bangla version of STarT back screening tool and Bangla version of RMDQ to assess construct validity (overall score was 0.88 and psychosocial subscale score was 0.83) which indicate a strong correlation between them. This study shows that the Bangla version of STarT back screening tool is a reliable, valid and culturally adapted responsive screening tool for the patients with low back pain.

Introduction

Low back pain is a costly musculoskeletal problem and major public health issue in today's economically advanced world.¹ Low back pain may interpret as aches and pains which affects the area between the lower border of the 12th rib and gluteal folds with or without radiation to the lower limb.² Low back pain is among the top 10 diseases and injuries according to The 2010 Global Burden of Disease Study which is the highest number of disability-adjusted life year worldwide.³ Standardized self-reported instruments are very user-friendly way to collect a large amount of data on activity limitation.⁴ The STarT back screening tool is a validated and popular instrument in clinical practice and research. The original version of the STarT back screening tool is now available in the number of versions like English (original),⁵ Arabic (Saudi Arab),⁶ Chinese,⁷ Danish,⁸ Dutch,⁹ Finnish,¹⁰ French,¹¹ German,¹² Iranian,¹³ Italian,¹⁴ Brazillian,¹⁵ Spanish,¹⁶ Swedish,¹⁷ isiZulu(South African).¹⁸ A substantial number of papers have been published on the psychometric properties, validity and reliability of the STarT back screening tool. Its' wide use in different studies carried out worldwide, have convinced the need to develop a version to be used in Bangladesh. The importance for translation, cross-cultural adaptation and validation of

STarT back screening tool from English to Bangla arises among the Bangla speaking people with low back pain due to growing international collaboration in clinical research and disability for proper rehabilitation program. The objective of this study was to develop a culturally adapted Bangla version of STarT back screening tool for use in Bangla speaking people. The developed Bangla version was applied in Bangladeshi patients with low back pain to study its acceptability, reliability and validity.

Materials and Methods

The STarT back screening tool

The STarT back screening tool is a validated simple, brief, and practical way to subgroup patients with nonspecific low back pain in primary care. The new STarT back screening tool identifies potentially modifiable prognostic indicators that may be appropriate targets for primary care interventions.⁵

The STarT back screening tool's appeal is obvious. It is short, easy to complete (most responses yes/no format), and quick to score. It can be easily implemented into busy clinical practice by health care practitioners. The care pathway for each subgroup is well-defined. The low risk subgroup is appropriate for self-



management advice/education, reassurance, analgesics, and need re-consult only if necessary. The medium risk subgroup is appropriate for referral to physiotherapy.

The high risk subgroup should be referred to an appropriately skilled Rehabilitation physician to address psychological and physical obstacles to recovery. The keele STarT back screening tool is a 9-item, self-reported questionnaire that includes treatment modifiable domains (spread of pain, disability, and psychological factors). It subgroups patients with non-specific low back pain into low, medium, and high risk of future disability with the purpose of matching each subgroup to a care pathway.

The adaptation process

The STarT back screening tool was adapted to the Bangladeshi population according to the guidelines of the Beaton et al forward-backward method.¹⁹ Two bilingual translator independently translated the original English version of STarT back screening tool into Bangla. The independent translation matched absolutely. The two resulting Bangla draft versions were then synthesized into a single Bangla version by two translators. This version was then given to a third researcher, an independent native English speaker fluent in Bangla for back translation into English. The back translation matched the original version. To remove any comprehension barriers, the pre-final Bangla version was tested on

20 volunteer patients to guarantee that participants would define each item as originally intended. The final Bangla version was then evaluated to verify its reliability and validity.

Participants

Inclusion criteria: Native Bangladeshi patients who are diagnosed with low back pain by a physician, aged from 18 to 80 years, and whose mother language were Bangla.

Exclusion criteria: Patients with tumor, ankylosing spondylitis, spinal fracture, history of surgery, and with comorbid serious systemic diseases were excluded. Patients who are unable to fill the questionnaire due to visual, cognitive, literacy related problems are also excluded.

Psychometric Properties

Reliability

Internal consistency: Bangla version of STarT back screening tool was tested in 58 patients to yield internal consistency by Cronbach's alpha. A Cronbach's alpha of 1.0 indicates a perfect correlation among all items, whether ≥ 0.7 indicates satisfactory internal consistency.

Test-retest reliability: For test-retest reliability, the Bangla version of STarT back screening tool was served to consecutive subjects of 58 low back pain patients after being enrolled along with their informed consent where the participants were requested to fill questionnaire again after 7 days of the first enrollment without any medications adjustment in between. Intraclass correlation coefficient was used to assess the test-retest reliability. The intraclass correlation coefficient was expected to be found ≥ 0.70 ; if so considered as acceptable for test-retest reliability.

Validity

Construct validity: Construct validity was assessed by correlating the Bangla version of Roland Morris Disability Questionnaire (RMDQ)²⁰ with Bangla version of STarT back screening tool and examined by Pearson correlation coefficient. RMDQ is a widely used outcome measure which showed excellent responsiveness in Bangladeshi population. Correlation coefficient were rated as follows: Strong correlation >0.6 , moderate ≤ 0.6 and >0.3 and poor ≤ 0.3 .

Analysis

Cronbach's alpha was used to evaluate internal consistency, on the other hand Intraclass correlation coefficient was used to assess the test-retest reliability. Construct validity was assessed by correlating the RMDQ with Bangla version of STarT back screening tool and examined by Pearson correlation coefficient. All statistical analyses were performed using SPSS version 24.0. A p value less

English (Original) STarT Back Screening Tool			
Patient name: _____ Date: _____			
Thinking about the last 2 weeks tick your response to the following questions:			
S/N	Items	Agree (1)	Disagree (0)
1	My back pain has spread down my leg(s) at some time in the last 2 weeks		
2	I have had pain in the shoulder or neck at some time in the last 2 weeks		
3	I have only walked short distances because of my back pain		
4	In the last 2 weeks, I have dressed more slowly than usual because of back pain		
5	It's not really safe for a person with a condition like mine to be physically active		
6	Worrying thoughts have been going through my mind a lot of the time		
7	I feel that my back pain is terrible and it's never going to get any better		
8	In general I have not enjoyed all the things I used to enjoy		
9	Overall, how bothersome has your back pain been in the last 2 weeks ?		
<p style="text-align: center;">Not at all Slightly Moderately Very much Extremely 0 0 0 1 1</p> <p>Total score (all 9): _____ Psychosocial Sub Score (Q5-9): _____</p>			
Patients are allocated to the high risk group if the psychosocial subscale score is ≥ 4 . The remaining patients are allocated to the low risk group if the overall tool score is ≤ 4 and to the medium risk group if the overall tool score is ≥ 4 .			

Figure 1. English (Original) SBST

than 0.05 was considered statistically significant.

Results

Among our study population just more than 20 were female and 38 were male. The mean age of which was 37.4 ± 12.4 years, for the most part of them were middle aged and older. Regarding literacy level, 6 were illiterate, 12, 14 and 19 went up to primary, secondary and higher secondary level respectively and 7 were graduate. Regarding profession most of them (21) were housewives, 7 were businessmen, 9 were garment worker, 5 were teacher, 6 were rikshaw puller, 4 were retired person, 4

were unemployed, and 2 were guard.

Translation process

We didn't come across any major linguistic or cultural barrier during forward and back translations. There was some minor inconsistencies. 6 of our patients were rikshaw puller and they were illiterate. For them some words had no equivalent in Bangla and were translated to the closest possible meaning, such as 'short distance' in questions 3, 'worrying' in question 6, 'terrible' in question 7, 'enjoy' in question 8 and 'bothersome' in question 9. Certain phrases such as 'spread down' in question 1 and 'physically active' in question 5 posed difficulties for both forward translators.

But after finalize the Bangla version of STarT back screening tool almost all of our participants had no intricacy to recognize the translated items, and all of them responded to all components of the Bangla version of STarT back screening tool.

Psychometrics

Reliability

Internal consistency (Cronbach's alpha): Internal consistency with Cronbach's alpha for Bangla version of STarT back screening tool instrument is 0.81 for overall score and 0.76 for psychosocial subscale. Alpha should be >0.7 , which is standard for all scores.²¹

Test-retest reliability

Intra-class correlation co-efficient of Bangla version of STarT back screening tool: Calculated overall tool score is 0.78 and Psychosocial subscale score is 0.71 which signified substantial reliability.²²

Validity

Construct validity: The construct validity of Bangla version of STarT back screening tool is presented in Table I, which demonstrated that the overall tool score is 0.88 and psychosocial score is 0.83 against reference standard RMDQ. All of the items were statistically significant ($p < 0.001$).

Bangla STarT Back Screening Tool (B-SBST)					
রোগীর নাম: _____ তারিখ: _____		বিগত দুই সপ্তাহের কথা চিন্তা করে, নিচের প্রশ্নগুলোতে টিক দিনঃ			
ক্রমিক নং	প্রশ্নমালা	একমত (১)	দ্বিমত (০)		
১	আমার কোমড়ের ব্যথা গত দুই সপ্তাহের কোন না কোন সময়ে পায়ে নেমেছে				
২	গত দুই সপ্তাহের কোন না কোন সময়ে আমার ঘাড়ে বা কাঁধে ব্যথা ছিলো				
৩	কোমড়ের ব্যথার জন্য আমি শুধু স্বল্পদূরত্ব হেটেছি				
৪	গত দুই সপ্তাহে কোমড়ের ব্যথার জন্য অন্য যেকোন সময়ের তুলনায় অনেক ঘরে পোষাক পরেছি				
৫	আমার এই অবস্থায় শারীরিকভাবে সচল থাকা নিরাপদ না				
৬	আমার মনে এ নিয়ে অনেক সময় দুশ্চিন্তা এসেছে				
৭	আমি মনে করি আমার কোমড়ের ব্যথা ভয়াবহ এবং এটা কখনো ভালো হবার নয়				
৮	স্বাভাবিক ভাবে আমি যেসব কাজ উপভোগ করি তার কিছুই করতে পারিনি				
৯	মোটের উপর, গত দুই সপ্তাহে আপনার কোমড়ের ব্যথা কতোটা অসুবিধাজনক ছিলো ?				
একদম না		সামান্য	মোটামুটি	অনেক	তীব্র
০		০	০	১	১
টোটাল স্কোর (৯): _____		সাইকো-সোস্যাল স্কোর (৫-৯): _____			
সাইকো-সোস্যাল স্কোর ৪ বা ৪ এর বেশী হলে উচ্চঝুঁকি, বাকি রোগীদের মধ্যে যাদের টোটাল স্কোর ৪ বা ৪ এর বেশী তারা মধ্যমঝুঁকি এবং যাদের টোটাল স্কোর ৪ এর নিচে তারা নিম্নঝুঁকিতে আছেন					

Figure 2: Bangla version of STarT back screening tool

Table I					
Reliability and validity of Bangla version of STarT back screening tool					
Reliability				Validity	
Internal consistency expressed by Chronbach's alp		Test-retest reliability expressed by intra-class correlation co-efficient		Construct validity expressed by Pearson's correlation coefficient	
Overall	Psychosocial	Overall	Psychosocial	Overall	Psychosocial
0.81	0.76	0.78	0.71	0.88	0.83
P value <0.001					

Discussion

The STarT back screening tool is one of the critically demanding and internationally renowned tools for screening low back pain patients and is called for its reliability, validity, development in different cultures, and responsiveness to clinical development.²³ The Bangla version of STarT back screening tool takes approximately 10 min to be completed, so it doesn't foist any extra strain on patients and researchers.

Reliability and validity is the core point of quality assessment. A reliable instrument yields the Xerox result on diverse occasions. Test-retest and internal consistency are two main established facets of reliability as a measurement tool of a patient's evaluation. In our study Overall score (Cronbach's alpha 0.81) and psychosocial subscale (Cronbach alpha 0.76) were very good which quite fairly indicates that the internal consistency measures a single concept of the questions of a scale supported by the results from the English (Original), Portuguese, Iranian, Brazilian, and French version of the STarT back screening tool (Table II).

Same result in repeated application attested the true reflection of Test-retest reliability.²⁴ Bangla version of STarT back screening tool brings in an excellent result in test-retest repeatability with Intraclass Correlation coefficients for overall score is 0.78 which was as good as English (original), isiZulu (South African), Portuguese, Finnish, Norwegian and Chinese versions of STarT back screening tool and for psychosocial score is 0.71 which was comparable to English (original), Portuguese and Norwegian version of STarT back screening tool.

An instrument is referred to be a valid one, when it measures what it is intended to measure. Bangla version of STarT back screening tool were correlated with Bangla version of RMDQ for the measurement of construct validity which was very good and statistically significant. In Bangla version of STarT back screening tool, overall score 0.88 shown strong correlation as like as English (original), Iranian, Swedish and Chinese version of STarT back screening tool in contrast to German version which shown moderate correlation. On the other hand, psychosocial score is 0.83 which shown strong correlation such as English (original) and Swedish version of STarT back screening tool compared to German version which shown moderate correlation.

Conclusion

The Bangla version of STarT back screening tool is a well translated and culturally adapted Bangla version of STarT Back Screening Tool as per internationally recommended guidelines. Findings suggest that reliability was very good and strong correlation with other psychometric instruments reflected relevant construct validity. We think that the Bangla version of STarT back screening tool will be an applicable and useful screening tool for clinical research in patients with low back pain.

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Table II

Comparing reliability and validity of Bangla version of STarT back screening tool with different studies

Versions	Chronbach		Intraclass correlation coeffi-		Validity		Validity comparing tool
	Overall	Psychosocial	Overall	Psychosocial	Overall	Psychosocial	
Bangla	0.81	0.76	0.78	0.71	0.88	0.83	RMDQ
English	0.79	0.74	0.73	0.69	0.92	0.90	RMDQ
isiZulu	0.68	0.68	0.73	-	-	-	-
Swedish	-	-	-	-	0.61	0.60	OMPSQ
Portuguese	0.93	0.91	0.74	0.76	-	-	-
Iranian	0.82	0.79	-	-	0.81	-	ODI
Brazilian	0.74	0.72	-	-	-	-	-
French	-	0.74	-	-	-	-	-
Finnish	-	0.52	0.78	0.68	0.45	-	OMPSQ
Norwegian	0.51	0.58	0.89	0.82	-	-	-
German	-	-	-	-	0.55	0.46	RMDQ
Chinese	-	-	0.93	-	0.89	-	RMDQ

Ethical Issue

This study was approved by the institutional review board of Bangabandhu Sheikh Mujib Medical University, (BSMMU/2019/8433) Dhaka, Bangladesh and all participants signed an informed consent to participate in the study.

Conflict of Interest

The authors declare no conflict of interest.

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