Advances in Bioresearch
Adv. Biores., Vol 14 (2) May 2023: 83-92
©2023 Society of Education, India
Print ISSN 0976-4585; Online ISSN 2277-1573
Journal's URL:http://www.soeagra.com/abr.html
CODEN: ABRDC3
DOI: 10.15515/abr.0976-4585.14.3.8392

Advances in Bioresearch

ORIGINAL ARTICLE

Cross Cultural Adaptation and Tamil Translation of Low Back Activity Confidence Scale (LOBACs) and Evaluation of Its Reliability and Validity

Queen Elcy Prosper[1], Shanmugananth.E[2], Kimiko. A. Yamada[3]
[1]Research Scholar, Department of Physiotherapy, Mahatma Gandhi Medical College and Research Institute, Sri Balaji Vidyapeeth, Puducherry, India.
[2]Professor and Head of the Department of Physiotherapy, Mahatma Gandhi Medical College and Research Institute, Sri Balaji Vidyapeeth, Puducherry, India.
[3]Associate Professor of Clinical Physical Therapy, Division of Biokinesiology and Physical Therapy, University of Southern California, Los Angeles, California.
Corresponding Author: Prof. Shanmugananth.E
Professor and Head, Department Of Physiotherapy, Mahatma Gandhi Medical College and Research Institute, Sri Balaji Vidyapeeth, Pondicherry.
Email – Email: shankutty1981@gmail.com

ABSTRACT
Lower back pain is a common ailment in India, with a lifetime prevalence ranging from 60 to 80%. Self-efficacy, or confidence in accomplishing daily activities given one's current situation, is an important aspect in controlling low back pain. The Low Back Activity Confidence Scale (LoBACS) is a reliable and valid self-efficacy tool for patients suffering from low back pain. The purpose of this project was to culturally adapt the LoBACS for English and Tamil-speaking populations in India. The scale's modifications were allowed by the original inventor and the Institutional Human Ethical Committee of Sri Balaji Vidyapeeth University, Pondicherry Cosmin Standards were used to calculate the sample size. The cross-cultural adaptation method followed the standards of the American Association of Orthopaedic Surgeons Committee (AAOS) and included translators and consolidators with varied levels of education, as indicated for self expressed measure of cross-cultural adaptation. According to the study, the customised LoBACS is reliable and valid for application in India. The whole self-efficacy scale had a strong Cronbach alpha value of 0.995. The content validity index (CVI) was determined to be 96%, suggesting good content validity. The face validity index (FVI) was also calculated, and the adapted scale had an overall FVI of 100%, indicating that it was appropriate and relevant for the target audience. In conclusion, the LoBACS was successfully modified for use in India, offering an important instrument for assessing self-efficacy in people suffering from low back pain. These learning adjustments are anticipated to contribute to narrowing the gaps in impairment associated with chronic low back pain.
Keywords: *coastal life ,Low Back Activity Confidence Scale (LoBACS), cross-cultural adaptation, self-efficacy, reliability, validity, Tamil translation.*

Received 11.01.2023 Revised 16.03.2023 Accepted 21.04.2023

How to cite this article:
Queen Elcy P, Shanmugananth.E, Kimiko. A. Y. Cross Cultural Adaptation and Tamil Translation of Low Back Activity Confidence Scale (LOBACs) and Evaluation of Its Reliability and Validity. Adv. Biores. Vol 14 [3] May 2023. 83-92

INTRODUCTION

Low back pain (LBP) is a common condition in India, with a 60-80% lifetime prevalence. Low back pain is more common in India than in other nations, particularly in rural regions and among women. Low back pain can have a variety of reasons, ranging from biomechanical and degenerative to inflamed, oncologic, and viral. Pain drugs such as NSAIDs and narcotics tranquillizers, topical analgesics, and gabapentin make up some of the treatment choices for low back pain. Exercise, manual therapy, and patient education are all examples of conservative management.

Self-efficacy is a crucial aspect in low back pain treatment since it analyses a person's conviction in their capacity to succeed in a given objective or complete a specific exercise. Patients who lack self-efficacy

avoid activities, resulting in lower functional performance in daily tasks. Measuring self-efficacy is critical when assessing functional outcomes across a wide range of disease and disability spectrums, including low back pain.

The Low Back Activity Confidence Scale (LoBACS) measures self-efficacy in people experiencing from low back pain. It is made up of 15 items separated into three categories: functioning self-efficacy, self-regulating self-efficacy, and exercising self-efficacy. The LoBACS was demonstrated to be a reliable and valid self-efficacy indicator for people suffering from low back pain.

Cross-cultural adaptation is essential for ensuring that a tool is appropriate for the target culture and comparable to the original instrument. Because non-English-speaking countries express their disease in a variety of ways, it could prove vital for researchers to create novel strategies or use already existing tools in another language. The LoBACS questionnaire has been verified and cross-culturally adapted in Brazilian-Portuguese and is currently being translated and culturally adapted in Spanish.

Tamil is one of India's 22 official languages, with about 69 million people speaking it. Because the LoBACS questionnaire is not currently in use in India, there is a demand for culturally adapted variants of the tool for both the English-speaking and Tamil-speaking communities. This study intends to develop a culturally customised form of the LoBACS for both communities, taking into consideration variations in health concern expression. This would enable the assessment of self-efficacy levels in individuals suffering from low back pain [1-12], resulting in better prediction of functional outcomes and improved treatment alternatives.

MATERIAL AND METHODS

Sampling

The original developer approved the alterations to the scale, which were approved as well by the Institutional Human Ethical Committee of Sri Balaji Vidyapeeth University, Pondicherry. This is a prospective observational cross-sectional study in which non-probability convenient sampling was used. The sample for this study was drawn from patients with low back pain who were referred to physiotherapy at MGMCRI, Pondicherry's inpatient and outpatient services. The sample size was determined using the Cosmin Standards for the Selection of Health Measurement Instruments, which state that a sample size greater than 100 or seven times the number of items on a scale is required. The pilot study will use a sample size of 100 people [13].

Selection criteria:

The study comprised men and women over the age of 20 with particular and non-specific low back pain who could read and write in both English and Tamil. The present research eliminated patients who had communication issues or cognitive disabilities. Each of the people who took part in the study provided written informed permission. Participants who refused to participate in the study had to be excluded.

Tool description:

The Low Back Activity Confidence Scale (LoBACS) is a questionnaire used to assess patients' self-efficacy in dealing with low back pain. It was created to identify which actions are simple to perform, which are more challenging, and which cannot be performed successfully in the current state. This self-efficacy questionnaire aids in determining a patient's clinical prognosis. LoBACS is made up of 15 things, each having a score of 100%. There are seven items on the self-confidence subscale of the functional self-efficacy (FnSE) subscale. Three items on the self-regulatory self-efficacy (Self-RegSE) subscale assess confidence in caring for, managing, and dealing with a back issue. ns The exercise self-efficacy (ExSE) subscale consists of five items that address how to maintain regular exercise for back health in the face of various obstacles.

Strength of self-efficacy Low Back Activity scale is assessed on a 11-point scale ranging from 0% (no confidence) to 100% (complete confidence), marked in 10% increments [10].

Tool Procurement:

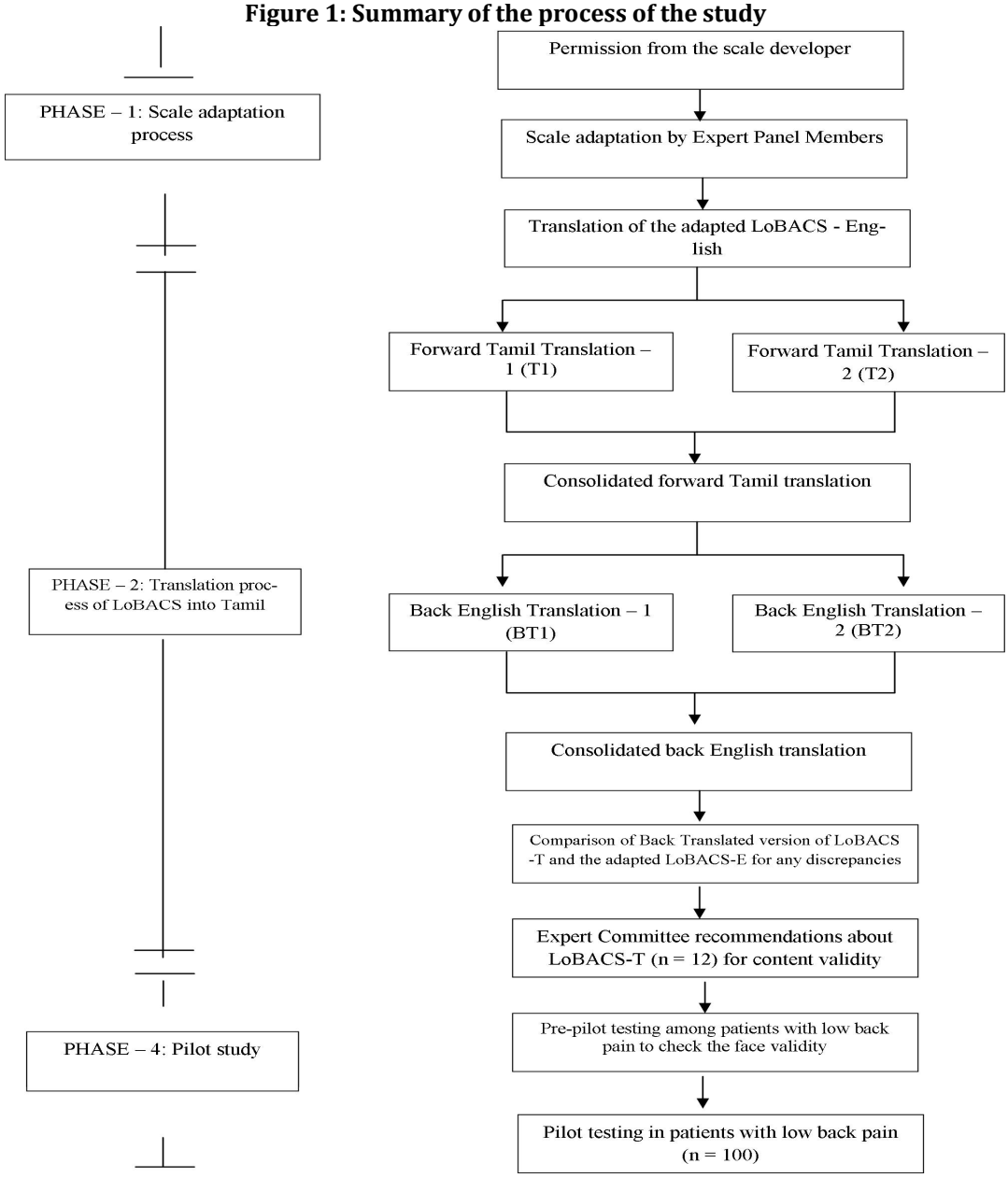
Because it was strongly advised to use the original version of the Low Back Activity Confidence Scale (LoBACS), the original creator granted advance permission to use the scale for the study. The LoBACS was cross-culturally modified and translated into Tamil with the consent of Dr. Kimiko Yamada, PT, DPT,

Procedure:

Stage 1: The Low Back Activity Confidence Scale was cross-culturally adapted in accordance with the American Association of Orthopaedic Surgeons Committee (AAOS) [19]. An Orthopedician, Physiotherapist,, Methodologist, Statistician, Linguistic specialists, Translators, and Consolidators of both forward and back translation procedures, and the Study guide are part of the procedure's expert panel. The guidelines established by Beaton and Guillemin were followed [12]. All of the changes were made with permission from the LoBACS lead developer, Dr. Kimiko Yamada.

Stage 2: Translation process consisted of the 6 steps which are explained in the following:
Step 1: Forward translation (English to Tamil) was completed by an informed translator with a medical background (T1) - Professor and Former Dean of Undergraduate Studies - and another translator who was unfamiliar with the scale - an eminent freelancing translator with a Doctorate in Tamil literature. Both were bilingual translators whose first language was Tamil.
Step 2: A physiotherapist synthesised T1 and T2 to fix any differences, resulting in version T12.
Step 3: Back translation was performed by two separate bilingual translators (BT1 and BT2) who were English Language Professors at prestigious colleges but had no knowledge of the scale. A person with fluent English who was the Vice Principal of a reputable school (BT12) consolidated the two back translated versions. A person with a non-medical background who works at a central university conducted the comparison of the adapted LoBACS-E and Back Translated.
Step 4: A panel of experts of 12 certified professionals was asked to evaluate each item of the scale for content equivalency using the following scale: 1 = irrelevant; 2 = difficult to assess relevance; 3 = relevant but needs small modifications; 4 = incredibly relevant and concise. For the purposes of calculating the Content validity index, each item marked 3 or 4 was recorded as 1 and 1 and 2 as 0. A pre-final version of the LoBACS was developed after an expert panel review to obtain an understanding on the disparities and obscurities.

Figure 1: Summary of the process of the study



Stage 3: Cognitive debriefing or pre-pilot testing of the LoBACS's pre-final Tamil version. This was done to test the wording, arrangement, and comprehension. Stage 4: A pilot research was conducted to assess the study's reliability and validity.

A sample size of 100 was employed according to the Cosmin criterion, with 50 participants receiving the Tamil version and the other 50 obtaining the English version to complete. Participants who finished the Tamil version of the LoBACS received the English version after 24 hours, while patients who completed the English version received the Tamil version. To convey their level of confidence, participants were prompted to mark up the appropriate scores. There was no requirement for an investigator or a supervisor to be there because the LoBACS is a self-administered questionnaire. These data were utilized to assess the trustworthiness of the LoBACS.

STATISTICAL ANALYSIS

SPSS software was used to evaluate the gathered data. On 100 randomly chosen samples, an evaluation of reliability was executed and questions were presented in both Tamil and English in order to determine if the answers matched in both languages. The intraclass correlation coefficient (ICC) was used for each measurement to determine the dependability of the two languages. A two-way mixed effect and absolute agreement were used in the analysis

RESULTS

Analysis of Demographic data

Table 1 - Descriptive Statistics	
Characteristics	**Values**
Subjects (n)	100
Male/Female	39/61
Age in years – mean (SD)	40.27 (13.048)

The Table 1 depicts the descriptive analysis of the demographic data. The sample of 100 consisted of 39 males and 61 females (Graph 1) with the mean value of age of about 40.27 ± 13.048. Only 16 participants out of the 100 received physiotherapy treatment in the past for low back pain.

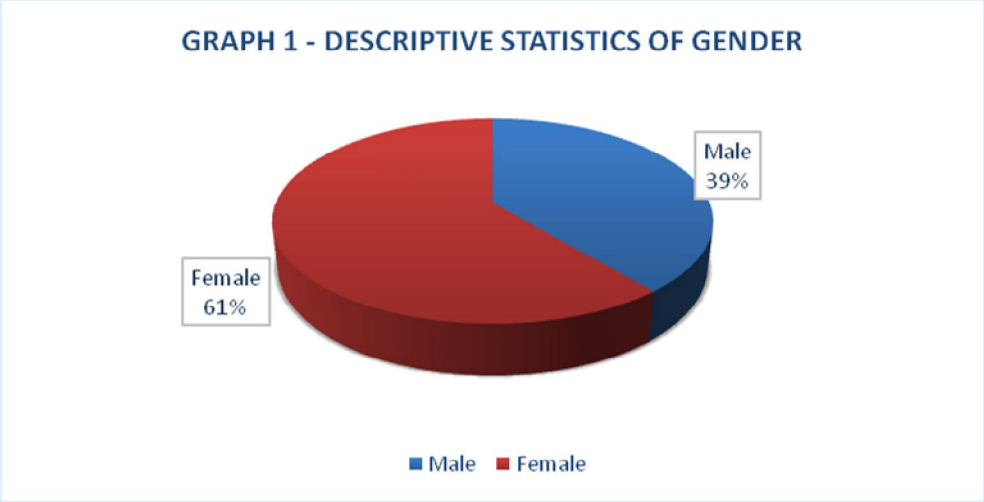


Table 2 – Analysis of Educational status	
High school	28
Pre-college	8
College	64

The descriptive statistics of the educational status of the study participants are shown in Table 2. Individuals with a college degree made up 64% of the total. The participants who attended high school made up approximately 28% of the total, while those who attended pre-college made up approximately 8% (Graph 2).

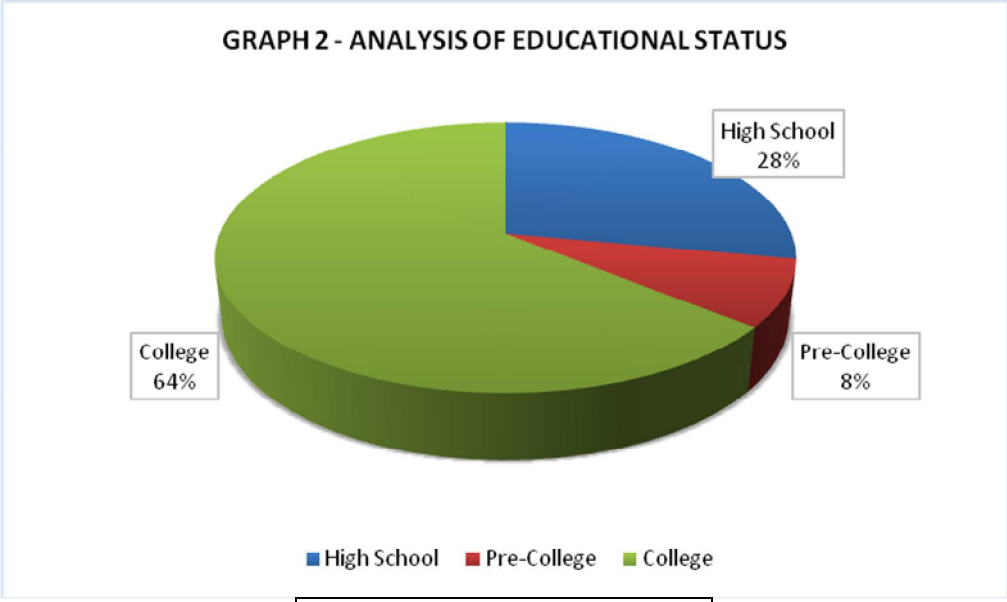
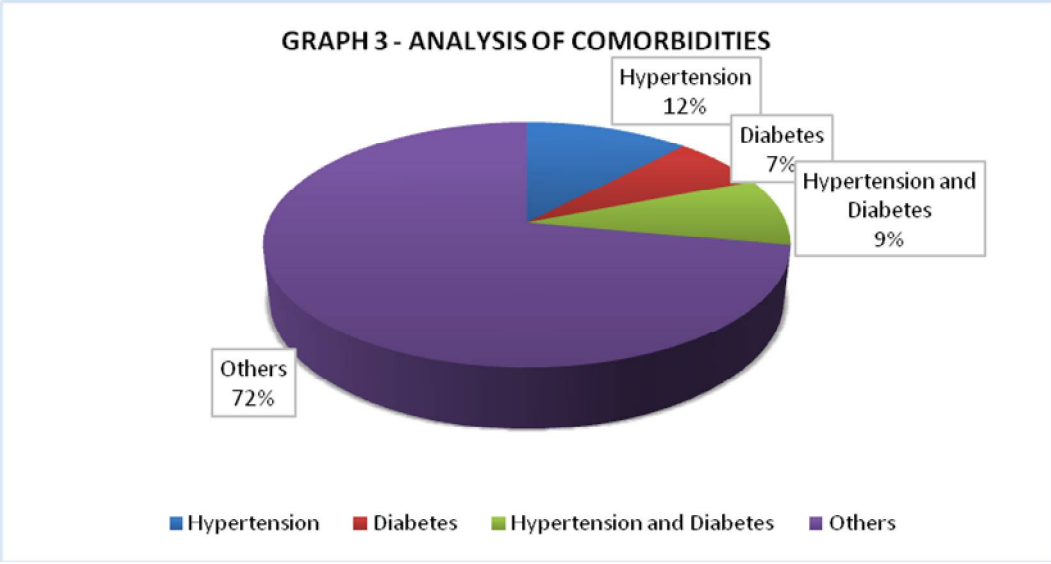
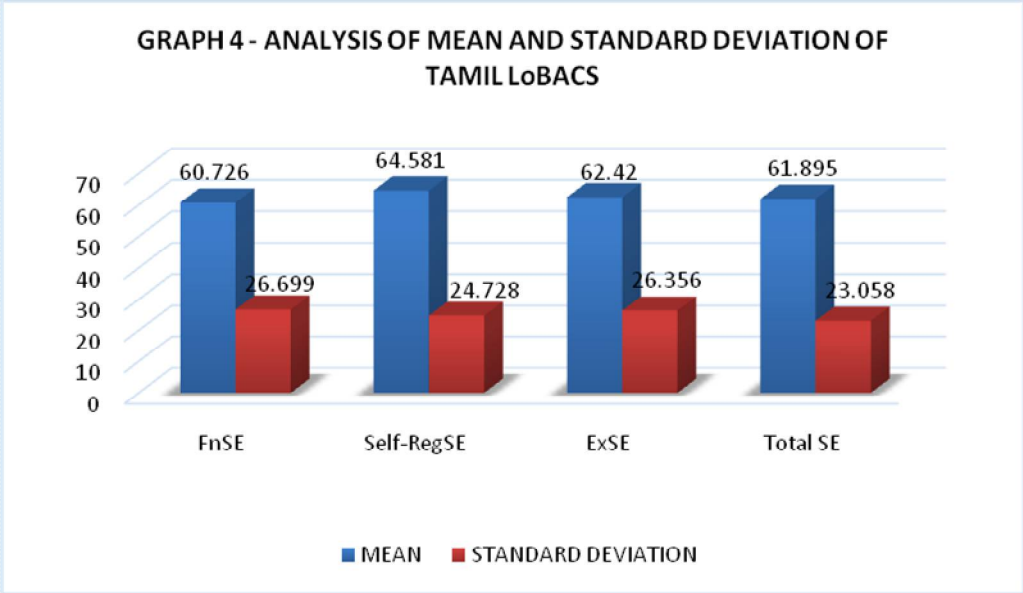


Table 3 – Analysis of Comorbidities	
Hypertension	12
Diabetes	7
Hypertension and diabetes	9
Others	72

Table 3 shows the comorbidities of the study participants, including additional comorbidities such as kidney problems and hormonal disorders such as hypothyroidism accounting for the majority (72%). Subjects with hypertension were approximately 12%, while individuals with diabetes were approximately 7%, placing them in the minority as compared to other comorbidities. Approximately 9% of participants had both hypertension and diabetes (Graph 3).



Reliability



Reliability is a broad concept that refers to the scale's reproducibility (test-retest reliability) and homogeneity (internal consistency) [14]. Table 4 summarises the reliability analysis of the Tamil LoBACS version. The mean and standard deviation for each subscale, as well as the total measure, were calculated. The mean and standard deviation for the answers FnSE, Self-RegSE, ExSE, and Total SE were 60.726 26.699, 64.581 24.728, 62.420 26.356, and 61.895 23.058 (Graph 4).

Table 4 - Analysis of Mean and Standard Deviation of Tamil version of LoBACS

LoBACS	Mean	Standard Deviation
Total	61.895	23.058
FnSE	60.726	26.699
Self-RegSE	64.581	24.728
ExSE	62.42	26.356

Table 5 summarises the reliability analysis of the LoBACS in Tamil.

Table 5 – Analysis of Reliability of Tamil version of LoBACS

LoBACS	ICC	95% CI	Cronbach's alpha
Total	0.990	0.985-0.993	0.995
FnSE	0.971	0.958-0.981	0.986
Self-RegSE	0.933	0.902-0.954	0.965
ExSE	0.970	0.956-0.980	0.985

Cronbach alpha values for Total self-efficacy (average of all items) were 0.995, 0.986 for the Functional self-efficacy subscale, 0.965 for Self-Regulatory self-efficacy, and 0.985 for Exercise self-efficacy (Graph 5). All of the Cronbach alpha values stated above imply that the reliability is excellent.

VALIDITY

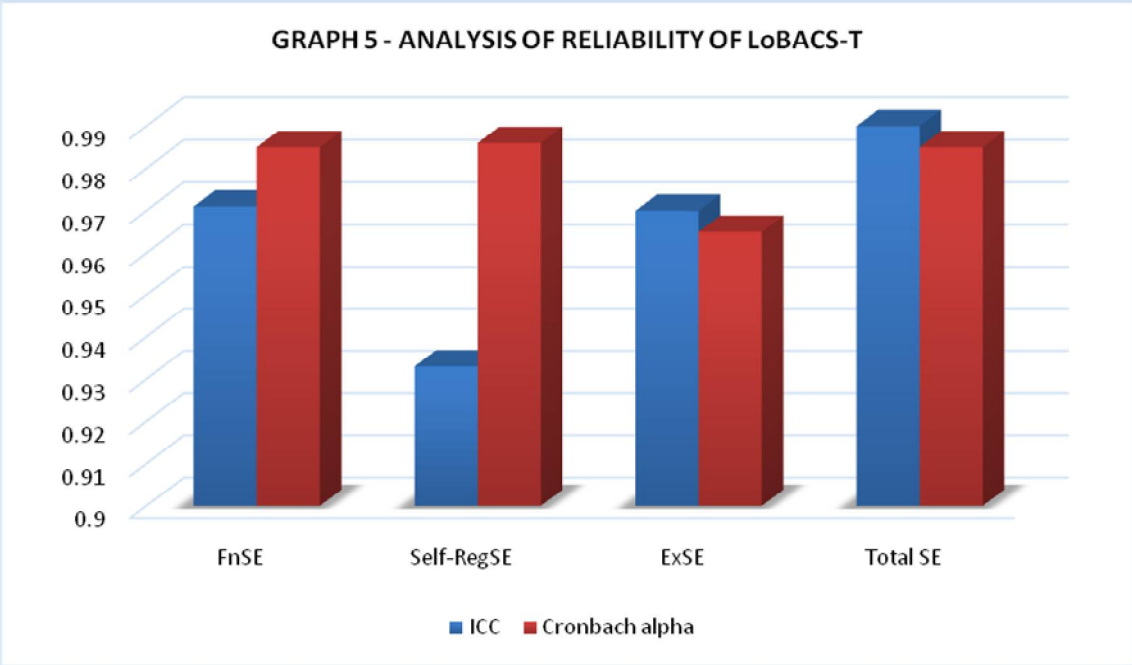


Table 6 describes the content and face validity of the Tamil version of LoBACS. The Expert Committee members assessed the translated items' content validity and found that the Tamil pre-final version of the scale includes all of the original LoBACS scale's characteristics. The content validity index (CVI) was computed, and the result was 96%, which is much higher than the average results [21]. The general audience was tested for face validity, which confirmed that the Tamil LoBACS is intelligible and clear (Graph 6). The complete FVI was calculated, and the result was 100%, which is much higher than the normal readings. [22].

Table 6 – Validation Statistics of Tamil version of LoBACS

Components	Content Validity	Face Validity
Average of proportion relevance	0.96	1
Item-level validity index	0.96	1
Scale-level validity index based on the average method	0.9	1

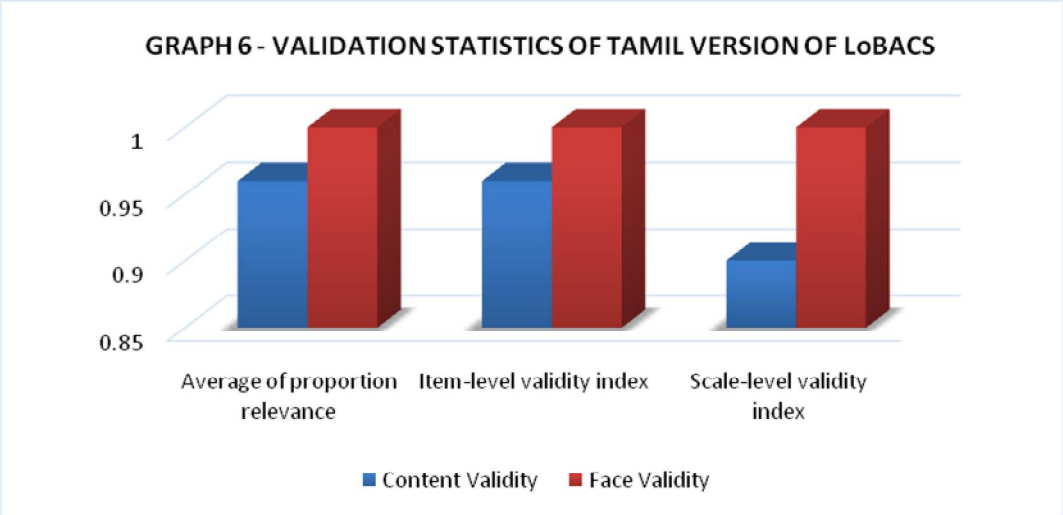


TABLE – 7: CROSS CULTURALLY ADAPTED ITEMS		
Item no.	**Original Item**	**Modified Item**
1	Transport a 25-pound box from a car to my house.	Carry a 10 kilogramme box for a distance of 100 metres.
2	Transfer a bulky telephone book from an above cabinet to a low shelf.	Shift a hefty box from a high to a low shelf.
3	Move a sofa 10 feet through carpet to an alternative position.	Transfer a cylinder 10 feet to a new place.
4	Take a seat for a 6-hour airline ride.	Sit in a waiting room for 6 hours at a time.
6	Nonstop 1 mile (10 city blocks) walk	Walk one and a half kilometres without stopping.

DISCUSSION

The current study's purpose was to cross-culturally adapt the version, translate it to Tamil, and test its reliability and validity. The Oswestry Disability Index is one examination that quantifies low back pain, but only the Low Back Activity Confidence Scale (LoBACS) analyses the patient's confidence in completing functional activities, caring for their back, and exercising.

Ten of the original LoBACS's fifteen elements were not changed, while the other five were determined to be culturally, semantically, or geographically wrong and were amended (Table-3). The Brazilian-Portuguese version's adaptation and translations were mostly focused on the natural and suitable language in Brazilian culture..[10].

The overall scale as well as the item-by-item content validity were calculated. The LoBACS-T total outcome was 96% (Score 0.96). The content validity index (CVI) is 96%, well beyond the standard acceptable value of 78% [21]. The cognitive debriefing method was employed to test the face validity of the LoBACS-T. This is also considered pre-flight testing for the LoBACS-T.

The validity of the LoBACS-T pre-final version was assessed using 25 individuals. The participants in the pre-pilot testing were quizzed about the straightforwardness and ease in which they comprehended the items. On a two-point scale (clear or confusing), every individual is asked to rate the instructions and scale items. Participants who scored puzzled were asked to submit feedback and suggestions for revisions. The total face validity was assessed to be 100%, and all of the items scored 100%. The LoBACS-T's face validity index (FVI) of 100% is significantly higher than the typical acceptable range of 80 - 83%. [22].

LIMITATIONS

The key restriction of this study was that local dialects and slangs, as well as intra-regional variations in Tamil, limit universality across the entire Tamil speaking community. There was only one health centre included in the study. It would have been a lot simpler if the study had been performed in the surrounding area. The concept and criteria validity of the LoBACS-T were not evaluated in this study.

IMPLICATIONS FOR FUTURE RESEARCH:

To test the construct validity of the Tamil version of the Low Back Activity Confidence Scale, as well as assess the efficacy of the scale among Tamil-speaking persons from other locations.

CONCLUSION

The soothing ambience of the coast might help relieve stress-related pain, but pursuits like surfing and paddle boarding may result in strain and damage. As a result, any research focusing on the same challenge is required. The Low Back Activity Confidence Scale has been successfully translated and cross-culturally converted from English to Tamil, according to our findings. The LoBACS Tamil version has the same measurement features as the English version. Such learning changes will likely fill gaps in medical management of chronic low back pain

CONFLICT OF INTEREST: NIL

SOURCE OF FUNDING: NIL

Ethical issues – Addressed.

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