

Original Research Article

Falls efficacy scale international or elderly in Maharashtra: cross cultural adaptation and validation assessment

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ABSTRACT

Background: Aim of the study was to translate falls efficacy scale international (FES-I) in Marathi and to evaluate the translation on the basis of test-retest reliability, internal consistency, concurrent validity for elderly in Maharashtra.

Methods: The study was divided in 2 phases. Phase 1: Translation of FES-I following translation back translation method following ProFane guidelines. Phase 2: Psychometric testing of the new version. In phase 1 translation in to Marathi and back. The 507 participants were included for the study. Activity specific balance scale was used to as a gold standard for criterion validity and Berg balance scale was used for construct validity.

Results: Study had 53.3% of male and 43.7% of female participant. The validity (Cronbach alpha and ICC) and reliability (Spearman coefficient value) of the scale is excellent.

Conclusions: FES-I (M) has excellent reliability and good validity. Hence this scale can be used to assess fear of falls in Maharashtrian elderly.

Keyword: FES-I (M), ProFane, Marathi

INTRODUCTION

Number of elderlies in India (adults above 60 years) is increasing every day. It is currently 10.1% and was expected to rise by 19% by 2020.¹ Falls is one of the common problems faced by elderly.² According to Krishnasawamy et al and Joshi et al prevalence of falls in Indian elderly is 14%-53%.^{3,4}

Falls not only affect physical functioning but also psychological wellbeing of a person. It may lead to a fear of falling. This is a major health issue among elderly living in community.⁵ Fear of fall is defined as "low perceived self-efficacy at avoiding falls during essential, non-hazardous activities of daily living".⁶ Fear of falls can be assessed using self-efficacy when placed in a fall

related situation. It can be done by evaluating a person's perception of own abilities while doing some specific activities safely without falling.

Many scales are available to assess fear of falls in elderly. The FES-I is a widely accepted tool for this purpose. It is developed and validated by the prevention of falls network Europe (ProFaNE). It is found to have excellent reliability and validity among different cultures and languages e.g., Dutch and German.⁷⁻⁹ This scale has been translated and adapted into French-Canadian, Chinese, German, Turkish, British English, and Brazilian Portuguese languages.

Currently, there is no such measure available in Marathi to assess fear of falls in elderly of Maharashtra. This may

force the therapists to self-translate the scale for the patient, which may affect essential construct of the outcome measure. A version of FES in Marathi will help Marathi speaking elderly to report their fear of fall more effectively without getting intimidated by therapist or relative who is translating it for them. It will also make clinical judgment quantification and research to be scientifically sound for a therapist. Thus, the need for such translation was identified and efforts were taken to do the same.

Objectives

Main objective was to translate FES-I in Marathi and to evaluate the translation on the basis of test-retest reliability, internal consistency, and concurrent validity for elderly in Maharashtra.

METHODS

This was a validity assessment study after translation of scale where, 507 participants were recruited to assess the validity and reliability of Marathi version of FES-I (FES-I-M) which was done using Spearman's correlation and ICC value respectively. Patient's relatives coming to physiotherapy OPD, elderly living in vicinity, from community places like garden or clubs, participants willing to participate by word of mouth were included. Elderly with depression, dementia or any other cognitive issues were excluded.

FES-I is a 16-item questionnaire, where individuals are instructed to score their concern of falling during an activity on a 4-point Likert scale with 1 as not concerned at all and 4 as very concerned. The item scores are summed up to obtain a total, with higher the score, higher being the concern for falling. It is useful to the researchers and clinicians interested in fear of falling. The score of FES-I ranging from minimum 16 (no concern about falling) to maximum 64 (severe concern about falling).¹⁰

After permission from ProFane authorities was taken before conceptualizing the study. The institutional ethics committee consent of DES's Brijlal Jindal college of physiotherapy, Pune was taken to conduct the study. Study was completed in 2 years from February 2014 to February 2016.

The study was divided in 2 phases-1) Translation of FES-I following translation back translation method following ProFane guidelines. 2) Psychometric testing for validity and reliability.

Phase 1: Translation of FES

The translation and cross-cultural adaptation process were done according to the guidelines for the process of cross-cultural adaptation of self-reporting measures by ProFane Network. It involved following steps-A) Forward

translation of original scale to Marathi by 2 independent translators who were native speaking and were familiar with the topic, B) First consensus meeting of the translators was held to get a provisional local version, C) Two elderly were selected by each translator to try out the translation. Each elderly filled the questions without discussing with each other or therapist or translators. Later they were asked if items were clear and if any questions needed reformulation, D) Both translators adjusted the wording according to the feedbacks, E) A second consensus meeting was held to create consensus about the preliminary local version of the FES-I, F) Back translation from the local language into English was done by a professional translator whose first language was English, G) A third consensus meeting was held for review of back translation and changes. This was done to check if the translated version adhered to original theme of the FES-I. They discussed various options for items and questions frame and came up with a final version of translated FES-I (M) to be used for pilot testing of this study, H) Pilot testing was done on 10 elderly fitting in above mentioned inclusion criteria to ascertain fluency, clarity and level of understanding of the scale. They reported the scale and instructions to be easy to understand and rate. No one recommended any changes in the final version of FES-I (M).

Phase 2: Analysis of psychometric properties of FES-I (M)

Sample size for the study was decided after pilot testing. It was 506 (α : 0.95 β : 0.05 mean:1.49 SD:1.71=505.269). The 527 elderly (age above 60 years) from both genders who were able to read, speak Marathi were included. Patient's relatives coming to physiotherapy Out patient department of DES's Brijlal Jindal college of physiotherapy-Pune, elderly living in vicinity, from community places like garden or clubs, participants willing to participate by word of mouth were included. Elderly with depression (assessed by geriatric depression scale with score above 9), any other cognitive issues (assessed by Monteria cognitive assessment scale with score less than 26) were excluded. Data of 13 participants had to be discarded due to incomplete forms and drop out. In the end, data of 506 participants was analyzed. Participants were assessed in face-to-face interview for Activity specific balance confidence scale and evaluation for balance using time up and go test and Berg balance scale to establish validity of the FES-I (M). For assessing reliability, participants filled FES (I)-M on their own while investigator was available to provide help/explanation if required. None of the participants required help to fill FES (I)-M as all participants could read and understand Marathi fluently.

This section was subdivided in to following phases

Criterion validity assessment: Activity specific balance confidence scale (it is a 16 item scale, scoring form 0-100 higher the score better the confidence, high internal

consistency ($\alpha=0.94$) in geriatric population, excellent overall test-retest reliability ($r=0.92$, $p=0.0001$) in elderly).¹¹ Association between activity specific balance confidence (ABC) scale and FES(I)-M: Participant's activity specific balance confidence was assessed using ABC scale. Investigator filled the questionnaire for the participant to avoid personal interpretation. Same instructions and questions were asked to all participants.

Criterion validity (or criterion-related validity) measures how well one measure predicts an outcome for another measure. To evaluate criterion validity, calculate the correlation between the results of studying measurement and the results of the criterion measurement. If there is a high correlation, this gives a good indication that studying test is measuring what it intends to measure. ABC is a commonly used scale to assess balance confidence. This scale was chosen as a gold standard to find its association with FES-I (M). Participants were asked to fill the questions on their own. Help was given in case they had any doubts to answer questions. Care was taken to ensure same instructions are given to participants. As the balance confidence improves, fear of falling while performing the activity reduces. Thus, it was assumed that ABC scoring and FES-I-M scoring will show a negative association. Since this was a non-parametric data, this association was found using Spearman's correlation. Participant's activity specific balance confidence was assessed using ABC scale. Investigator filled the questionnaire for the participant to avoid personal interpretation of ABC. Same instructions and questions were asked to all participants.

Construct validity assessment: Construct validity is the extent to which the measure 'behaves' in a way consistent with theoretical hypotheses and represents how well scores on the instrument are indicative of the theoretical construct. It is measured by comparing the test to other tests that measure similar qualities to see how highly correlated the two measures are. Participants were assessed for Berg Balance scale score to rate their balance abilities. Association between BBS and FES(I)-M scores was found using Spearman's coefficient.

Concurrent validity assessment: Concurrent validity refers to the extent to which the results of studying measure correlate with the results of an established measure of the same or a related underlying construct assessed within a similar time frame. Assessing

concurrent validity involves comparing studying test with an existing test (of the same nature) to see if they produce similar results. If both tests produce similar results, then the new test is said to have concurrent validity. Participant's age and FES (I)-M score correlation using Spearman's correlation was found.

Reliability assessment: Subjects were rated their fear of falls using FES-I(M). Out of these, a sub-sample of 253 subjects were randomly selected using chit method for reassessment using FES-I(M) after a weeks' time to establish test-retest reliability. This period was also considered optimal for avoiding the potential occurrence of significant events or changes in their life circumstances that could also impact on their self-perceived balance confidence ratings. No assistance or interpretation was given by the examiner while the participants were filling the FES-I-M form.

RESULTS

Table 1 describes the distribution of the demographic data regarding gender, age and qualification. Table 2 shows the p value for Cronbach alpha and ICC for reliability assessment. Table 3 shows p value for validity assessment when correlated with FES-I(M).

Table 1: Demographic data.

Data	Variables
M:F	270:237 (53.3%:43.7%)
Age (years)	60-70:249 (49.11%)
	71-80:213 (42.01%)
	81-90:45 (8.88%)
Qualification (graduate: post graduate)	340:167 (67.06%:32.93%)

Table 2: Reliability assessment.

Purpose	Test	P value	Reliability-interpretation
Internal consistency	Cronbach's-alpha	0.9243	Excellent
Test-retest reliability	ICC	0.9994	Excellent

Inference: Scale has excellent reliability.

Table 3: Validity assessment.

Validity	FES-I(M) correlation with	Spearman's coefficient value	P value	Interpretation
Criterion validity	ABC	-0.492	<0.0001	Ext. significant
Construct validity	BBS	-0.580	<0.0001	Ext significant
Concurrent validity	Age (Years)	0.878	<0.0001	Ext significant

DISCUSSION

This is the first study to translate and examine reliability and validity of FES-I for Maharashtrian elderly. This

study had 507 participants whereas the original FES-I study had 704 participants. The sample size was determined by considering the original study hence is a good representative of the target population. Current

study has 270 male and 237 female participants. Average age of the participants in this study was 71.6 ± 6.2 years was, younger than samples used in similar studies done in countries: Greek, Brazilian, European, Chinese, Italian; and the original English.^{7,9,12-15} Turkish study had participants with comparable or slightly younger average age (69.7 ± 4.59 (SD) years).¹⁶

Activity specific balance scale was used as a gold standard to find criterion validity. Spearman's coefficient found was 0.492 showing a positive correlation. Balance issues and gait instability can lead to falls or fear of fall.¹⁷⁻¹⁹ Hence to determine validity of this scale, construct of balance was considered. BBS is a highly reliable and valid measure which is used worldwide to assess balance in elderly. Correlation between BBS and FES-I(M) scores was examined for this purpose. Spearman's correlation was found to be -0.580. It showed a negative correlation suggesting that, as the balance worsens, the fear of falls increases. Other studies also show a similar result.^{12,15,16} Association between age and FES-I(M) scores was assessed to find concurrent validity. Spearman's correlation coefficient value was 0.878 showing a positive correlation.

The test-retest reliability was found to be 0.994 which was higher than all the studies done previously i.e., Germany (0.79), Netherlands (0.82), Brazil (0.84), Chinese (0.89), but lower than others: English (0.96), Italy (0.98), Greek (0.95) and Turkish (0.94).

The internal consistency for this was 0.924 which was in range with the Cronbach's alpha value of previous studies. E.g. original English FES-I (0.96), Germany (0.90), the Netherlands (0.96), UK (0.97), Turkish (0.94), Chinese (0.94), Greek (0.92), Italy (0.98), Brazil (0.93), and Norwegian (0.95).^{7,9,12-16,20}

Although, there are several types of validities each serving its own purpose. Due to lack of time and practical issues, only criterion, construct and concurrent validity could be established. Thus, the limitation for the study is it could not establish the discriminative validity, predictive and content validity for this scale. Assessing utility of this scales shortened version would also be helpful for therapists and elderly.

CONCLUSION

Thus, we can conclude that FES-I (M) has excellent reliability and good validity. Hence this scale can be used to assess fear of falls in Maharashtrian elderly. It will help the physical therapist for assessment of elderly with Marathi education.

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

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