Cross Cultural Adaptation, Reliability and Validity of Gujarati Version of Fear Avoidance Belief Questionnaire in Chronic Low Back Pain

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Abstract: Background: The Fear-Avoidance Beliefs Questionnaire (FABQ) is useful for measuring fear avoidance beliefs in patients with low back pain (LBP); however, no psychometrically validated Gujarati version is available. Study Design: Cultural translation and psychometric testing. Objective: To translate and test the psychometric properties of Gujarati versions of the FABQ. Summary of Background Data: Although commonly used, no previous reports exist on the translation process or the testing of the psychometric properties of the Guajarati version of the FABQ to be used in India. Methods: Translation and cross-cultural adaptation of the original English versions of the FABQ was performed according to published guidelines. A panel of 20 healthcare professionals completed the content validity form. Test-retest reliability for the FABQ-G was examined in 30 CLBP patients. Patients completed the questionnaire twice with an interval of 48 hours. Results: The Content validity and Face validity was found to be excellent. FABQ-G exhibited excellent internal consistency shown by a Cronbach's α value of 0.843 and subscales FABQ-G-W and FABQ-G-PA also showed good internal consistencies (α=0.652 and 0.654 respectively). The test-retest reliability was excellent in chronic low back pain (CLBP) patients (ICC=0.915) and (ICC=0.864 & 0.818 for the FABQ-W and FABQ-PA, respectively). Pain intensity score had high correlation with FABQ-W (r=0.819; p<0.01), and with the FABQ-PA (r=0.852; p<0.01) for subjects with CLBP showing good convergent validity with FABQ-G. Conclusion: The original FABQ was translated into Gujarati and did not pose any problems during data acquisition. The FABQ-G seems to be reliable instruments to measure fear avoidance beliefs in Gujarati patients with CLBP. [Dibyendunarayan B NJIRM 2016; 7(6):1-8]

Keywords: FABQ, Cross-cultural adaptation, Chronic Low back Pain, Reliability, Validity

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Introduction: Chronic low back pain (CLBP) is defined as a condition in which the back pain may last for more than 12 weeks duration[1]. The prevalence of low back pain (LBP) was highest during middle age, which represents some of the most productive years of a person's working life [2].

Among the psychosocial factors, the fear-avoidance beliefs as set out in the Fear-Avoidance Beliefs (FABs) Model developed by Lethem et a[(3 have been hypothesized as one of the most important, specific and powerful cognitive variables may have impact on disability and treatment outcomes in patients with LBP[3-6]. The main basis of this model is the perception that pain is not only influenced by organic pathology but also by induced pain-related fears. Cognitive and affective variables are relevant determinants of pain experience and disability[7]. A prior and major assumption of patients with LBP is that activity will aggravate pain and lead to avoidance of activities which consequently turns out to be major contribution to maintenance of LBP. Several authors focused on the relationship between fear of pain and avoidance. According to cognitive–behavioural theory avoidance leads to a vicious circle characterized by decreased self-efficacy, fear, further avoidance and disability and is maintained by the reduction of anxiety, which is achieved through avoidance of feared activities [3, 8-11]. Appropriate Belief assessment is therefore necessary in research, studies and clinical practice [12] and self-reported outcome measures are most applicable [13].

Waddell et al[11] on the basis of fear avoidance model developed a self-reported fear avoidance beliefs questionnaire (FABQ) with 16-item focusing on patients' beliefs about how physical activity and work affect LBP. The FABQ has got two subscales, the first one assessing the beliefs and attitudes toward work (FABQ-Work, seven items accounting for 43.7% of total variance), and the second one about physical activities (FABQ-Physical activity, four items accounting for 16.5% of total variance) [11]. The beliefs toward work was consistently the stronger predictor of disability and work loss [14]. The psychometric properties of the English version were satisfactory and reliable showing the internal consistency values of FABQ-Work (0.77) and FABQ-Physical activity (0.88);

and the test-retest reliability values were found to be 0.95 and 0.88 respectively[11]. The FABQ has proven its validity by predicting disability in daily activities [11], work loss due to back pain [11], treatment outcome [14] and performance level in behavioural tests [4, 11, 15]. Pfingsten et al[15] felt that the FABs could be considered one of the predictors of return to work after a functional restoration treatment regime [15].

As patient population and health care systems are ethnically different, some authors have recommended the standardized guidelines for cross cultural adaptation of the questionnaire to facilitate the exchange of information within the scientific community[16, 17]. To the best of our knowledge, till now FABQ has been translated and validated in 15 languages namely, German[18], Turkish[19], Persian[20], Italian[21,22], Swiss-German[23], French[24], Brazilian-Portuguese[25], Spanish[26], Norwegian[27], Greek[28], Hausa[29], Japanese[30], Chinese[31], Finnish[32] and Arabic[(33)] languages.

Translating a questionnaire instead of creating a questionnaire allows comparisons of different populations[34], permits researchers to examine functional status across abroad spectrum of people, and permits the exchange of information across cultural and linguistic barriers. It is now widely recognized that questionnaires intended for use across the cultures must be translated perfectly and adapted culturally in order to maintain the content validity of the instrument[35].

It is seen that strong relationship exists between elevated FABs and chronic disability in patients with LBP [11]. There is no questionnaire available for assessment of FABs among CLBP sufferers specific to Gujarati population. We hypothesized that FABQ-G would demonstrate good psychometric properties, as this questionnaire has successfully shown similar psychometric properties in other cross-cultural studies. In the present study, we have described the Gujarati translation of the questionnaire, cultural adaptation, and validation of the FABQ. The methods of translation and validation were performed according to the accepted guidelines for cross-cultural adaptation [16, 36].

The main aims of the present study were to translate FABQ in Gujarati language and check the psychometric properties of the FABQ-G. The objectives of this study were to test the content validity, face validity, internal consistency, test-retest reliability, agreement and minimum detectable change (MDC) of FABQ-G in Gujarati speaking CLBP patients.

Methods: Participants: Native Gujarati patients with CLBP were recruited for the study from five physiotherapy outpatient departments in Surat. Patients were excluded if they had back pain related to vertebral fracture, myelopathy, back surgery, brain surgery, clinically recognizable cognitive impairment, infectious disease, cardiovascular or respiratory problems, neurological deficits, cancer, or other systemic diseases with possible effect on the musculoskeletal system. The Ethical approval of the study was obtained from the Institutional Ethical Committee of Nirmal Hospital, Surat and procedures were in accordance with the declaration of Helsinki. Written informed consent was obtained from each patient before participation.

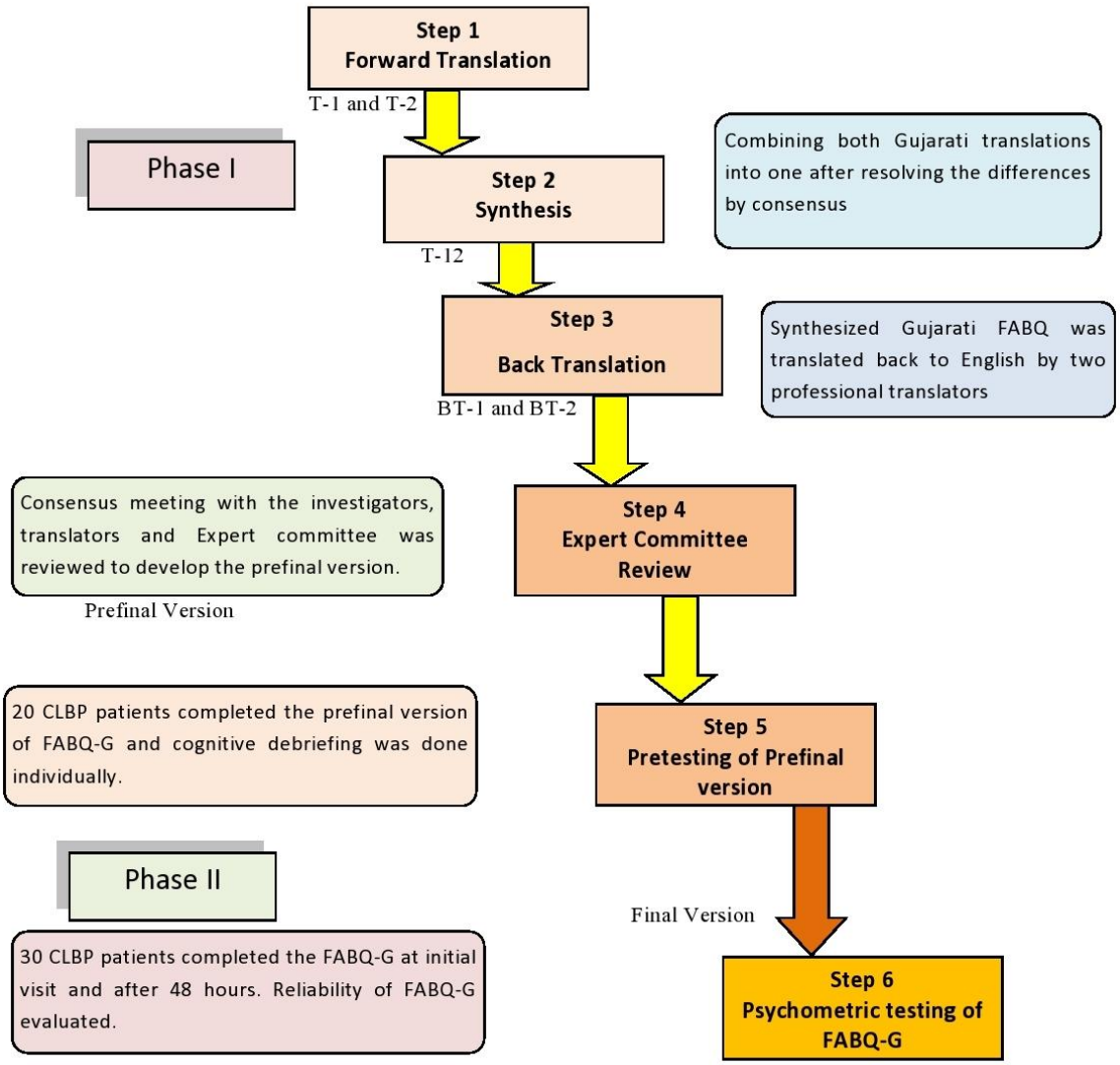
Questionnaire: Fear Avoidance Belief Questionnaire-G: The FABQ-G with two sub scales Fear Avoidance Belief Questionnaire-Work (FABQ-G-W) and Fear Avoidance Belief Questionnaire-Physical activity (FABQ-G-PA) was used for data collection.

Translation: The translation procedures were based on previously published guidelines [16,36]. Figure-1 shows the steps in the process of translation. The committee's considerations were around four areas: semantic equivalence (the meaning of words), idiomatic equivalence (equivalent expression for idioms and colloquialisms), experiential equivalence (the target cultural context), and conceptual equivalence (the validity of the concept). In FABQ-G item number-8 (I have claim for compensation for my pain) is omitted because in India no such compensation exists. Hence FABQ-G is having 15 items as against 16 items in original English version. Penultimate version of the FABQ-G questionnaire was applied on 20 patients with CLBP to determine whether all questions were clear and comprehensible. No modification to the questionnaire was required at this phase and the final FABQ-G was then developed and subjected to further psychometric testing.

Psychometric Testing: Face Validity: Face validity is a subjective assessment of whether the measure appears relevant to the ones to be measured. Face validity was assessed by asking one question to each

of the patients, 'Do you think this scale is relevant to your condition.' The answer was noted as 'yes' or 'no'. Face validity of the FABQ-G was established when all the 30 patients questioned about the relevance of the scale to their condition, all answered 'yes'.

Figure-1: Flow chart of study design of FABQ-G



Content Validity: For the content equivalence assessment on a 7-point Likert scale, answers from a panel of 20 expert members were found to be located between 'mostly agree' to 'strongly agree' for Idiomatic Equivalence (Are the words in the translated Guajarati version presented fluently and correctly as in the original version?) (Average=81.5±10.64), Semantic Equivalence (Do the words and phrase in the translated Gujarati version have the same semantic meaning compared with the original version?) (Average=81.6±10.66) and Content relevance (experiential equivalence) (How the Gujarati statement is relevant to assessing neck pain and disability in chronic neck pain patients?) (Average=80.2±12.9). Similarly, for the Content representativeness (conceptual validity) on a 5-point Likert scale, answers were found to be located between 'Good' to 'very good' ("How well is the content (Item no. 1 to 16 except item no. 8) of FABQ-G scale is representing the entire domain of assessing the fear avoidance beliefs of patients with CLBP?") (Average=4.55±0.51). Additionally, the total scores were normally distributed and the percentage of missing items were <5%, also proves content validity of this questionnaire.

Convergent validity: For the convergent validity of FABQ-G the Spearman's rho correlation coefficients with pain severity scores were used.

Internal Consistency: Internal consistency of the FABQ-G was examined with Cronbach's α coefficient. Cronbach's α values range from 0 to 1, where values above 0.7 indicate adequate internal consistency for a scale [37].

Test-Retest Reliability: Test-retest reliability of the FABQ-G was undertaken by 30 CLBP patients. Patients completed the FABQ-G twice with an interval of 48 hours to minimize any memory of previous answers and any variations in clinical status. Test-retest reliability was determined by Intra-class Correlation Coefficient (ICC).

Agreement: Agreement was determined by the Bland-Altman method in which the individual differences were plotted against the individual mean scores. Significance level was set at 5%[38]. The standard error of measurement (SEM=Average SD x √1-ICC) was used to determine the measurement error. The SEM was then converted into the Minimal Detectable Change (MDC), which expresses the minimal magnitude of change that likely reflects true change rather than measurement error. The $MDC_{95\%}$ was estimated from the SEM and calculated as 1.96 √2 × SEM[39].

Statistical Analyses: Descriptive statistics (percentages, means, and standard deviations) were used to describe demographic characteristics within the study. All analyses of reliability and validity described in the research methods were conducted using SPSS statistical package (version 20.0). As proposed by Waddell et al[11] the score of each FABQ-G subscale was analysed independently. Seven of the 11 items (item: 6, 7, 9–12, and 15) in the FABQ-G-W subscale and 4 of the 5 items (item: 2–5) in the FABQ-G-PA subscale were summed up to reach total scores (42 and 24, respectively). The five remaining questions were used as delusive items[11].

Reliability Analysis: ICCs were calculated for examining the test-retest reliability. A Bland-Altman plot was constructed in which the individual differences were plotted against the individual mean scores. Significance level was set at 5%. The ICC values ranges from 0 to 1; 1 = perfect reliability, 0.90 to 0.99 = very high correlation; 0.70 to 0.89 = high correlation; 0.50 to 0.69 = moderate correlation; 0.26 to 0.49 = low correlation and 0.00 to 0.25 =little, if any, reliability [40].

Result: Internal Consistency: The FABQ-G was filled out twice by 30 CLBP patients. From this sample, 19 subjects were females (63.3%) and 11 subjects were males (36.7%). The mean age was 41.8 (± 11.36) years (range 21-59 years). FABQ-G exhibited excellent internal consistency shown by a Cronbach's α value of 0.843 with scale mean 66.66±5.60 (Table -1).

Table-1: FABQ-G scores at baseline and after 48 hours (n=30)

Score	FABQ-G at Baseline			FABQ-G at Retest		
	Mean (SD)	Range	Cronbach's α	Mean (SD)	Range	Cronbach's α
FABQ-G (Total)	66.66 (5.60)	57-77	0.843 (0.747-0.914)	67.00 (5.9)	55-78	0.846 (0.752-0.916)
FABQ-G-W	32.20 (2.68)	27-37	0.652 (0.422-0.813)	32.00 (2.71)	26-36	0.583 (0.306-0.776)
FABQ-G-PA	20.63 (1.88)	17-23	0.654 (0.355-0.819)	21.10 (1.66)	17-24	0.594 (0.290-0.788)

Reliability: The FABQ-G mean total scores of the first and second assessment were 66.66(±5.6) and 67.00 (±5.9). The ICC in the CLBP patients, based on the total scores of the first and second assessment, was 0.915 (ICC (2,1); 95% CI = 0.823–0.960; p<0.001). The test-retest reliability of the questionnaires was also high with an ICC (2,1) of 0.864 for the FABQ-G-W and of 0.818 for the FABQ-G-PA (Table 2).

An analysis of individual item scores revealed that item numbers 1, 2, 3, 5, 6, 7, 9, 10, 11, 13 and 14 showed an ICC >0.70 indicating high to very high correlation. Item numbers 4, 15 and 16 showed an ICC

= 0.5 to 0.69 indicating moderate correlation; and only item 12 showed an ICC of 0.26 to 0.49 indicating low correlation (Table-3).

Table-2: Reliability data for FABQ-G

Testing Measure	ICC	95%CI	SEM	MDC
FABQ-G (Total)	0.915	0.823-0.960	1.676	4.645
FABQ-G-W	0.864	0.715-0.935	0.993	2.753
FABQ-G-PA	0.818	0.617-0.913	0.755	2.092

Table-3: Item-wise Reliability of FABQ-G

Items	ICC	95% CI
Item 1	0.965	0.925-0.984
Item 2	0.829	0.641-0.918
Item 3	0.893	0.777-0.949
Item 4	0.564	0.085-0.793
Item 5	0.749	0.468-0.881
Item 6	0.740	0.458-0.876
Item 7	0.869	0.724-0.938
Item 8	Deleted	Deleted
Item 9	0.866	0.718-0.936
Item 10	0.758	0.498-0.884
Item 11	0.858	0.700-0.933
Item 12	0.453	0.246-0.739
Item 13	0.808	0.595-0.909
Item 14	0.751	0.485-0.881
Item 15	0.630	0.213-0.825
Item 16	0.644	0.244-0.831
FABQ-G-W	0.864	0.715-0.935
FABQ-G-PA	0.818	0.617-0.913
FABQ-G (Full Scale)	0.915	0.823-0.960

Agreement: The Bland-Altman Plot (Figure-2) shows the difference in total scores against the mean total scores for the CLBP patients. The mean difference approached zero, indicating that no bias had occurred. In CLBP patients, no outlier was seen outside the 95% CI band. The Bland-Altman analysis showed that the mean difference was 0.333±3.262 for the FABQ-G and the limits of agreement was -6.062 to 6.726. The SEM for the FABQ-G was 1.676 and calculations revealed a MDC of 4.645 points. The SEM for the FABQ-G-W was 0.993 and calculations revealed a MDC of 2.753 points. The SEM for the FABQ-G-PA was 0.755 and calculations revealed a MDC of 2.092 points (Table 2).

Pain intensity score had high correlation with FABQ-W (r=0.819; p<0.01), and with the FABQ-PA (r=0.852; p<0.01) for subjects with CLBP showing good convergent validity with FABQ-G.

Figure-2: Bland-Altman Plot showing the limits of agreement of FABQ-G scores

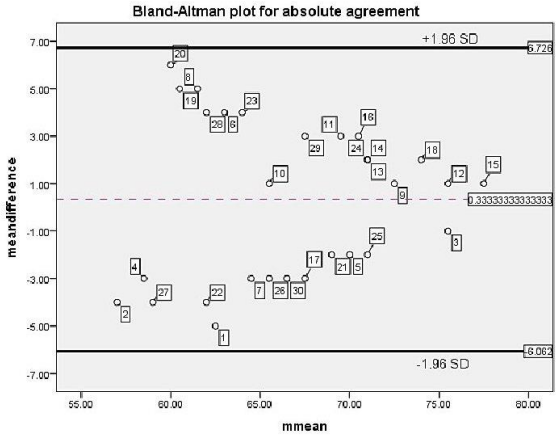


Figure-2: Bland-Altman Plot showing the limits of agreement of FABQ-G scores

Discussion: This study describes for the first time the psychometric properties of a cross-cultural translation of the FABQ into Gujarati. In general, all the patients clearly understood the translated version. As a first step in analysing the psychometric validation of the FABQ-G, the questionnaire was translated from English into Gujarati and finalized in a consensus meeting including Gujarati-speaking researchers from Surat. In our opinion, the translation into Gujarati was appropriate, since the data collection did not reveal any confusion or problems mentioned by the participants. Test-retest reliability was excellent when the FABQ-G was administered twice with a gap of 48-hours in a CLBP sample. The test-retest reliability showed excellent ICC value for CLBP patients (FABQ-G =0.915; FABQ-G-W 0.864 and FABQ-G-PA 0.818), which confirms that the FABQ-G is a psychometrically robust questionnaire. Pain intensity score had high correlation with FABQ-W (r=0.819; p<0.01), and with the FABQ-PA (r=0.852; p<0.01) for subjects with CLBP showing good convergent validity with FABQ-G. Item-8 of FABQ was omitted in Gujarati translation as compensation claims for CLBP is not applicable in India.

The close correlations among the items showed that the FABQ-G-W and FABQ-G-PA subscales were internally consistent and similar to the original. Our findings are similar with the Swiss-German (FABQ-W:0.89 & FABQ-PA:0.82)[23], German (FABQ-Work1:0.89; FABQ-Work2:0.94; & FABQ-PA:0.64)[18], Portuguese (FABQ-W:0.80 and FABQ-PA:0.90)[25], Norwegian (FABQ-W:0.90 & FABQ-PA:0.79)[27], Greek

(FABQ-Work1:0.86; FABQ-Work2:0.90; & FABQ-PA:0.72)[28],Chinese (0.90[31] and Spanish result (0.93)[26].

Test-retest reliability similar to the original scale was indicated by the highly significant correlation between the results obtained on baseline and after 48 hours for the measure as a whole and both subscales. Once again, our findings are similar with the Swiss-German (FABQ-W:0.91 & FABQ-PA:0.83)[23], German (0.87)[18], French (FABQ-W:0.88 & FABQ-PA:0.72)[24], Portuguese (FABQ-W:0.91 & FABQ-PA:0.84)[25], Norwegian (FABQ-W:0.82 and FABQ-PA:0.66)[27], Greek (FABQ-Work1:0.93; FABQ-Work2:0.94; & FABQ-PA:0.85)[28], Chinese (0.81)[31] and Spanish (0.97)[26] results.

The FABQ-G was highly acceptable, easily understood, and was found suitable for self-administration. It required approximately 5-6 minutes filling up. Hence it seems to be appropriate in routine clinical practice. Avoidance behaviour led by FABs in patients with CLBP leads to the development of chronic disability. In reality, fear-avoidance behaviour was shown to be a significant risk factor for chronicity. Hence, encouraging patients to change their beliefs and behaviours has become more crucial in managing CLBP, especially in the early stage. It is important to focus on educating patients regarding pain along with gradual exposure to activities to help reduce pain-related fear; rather than allowing patients believing the imaging reports leading to the development of fear-avoidance behaviour. The FABQ helps clinicians to detect patient's FABs and helps to establish an effective management plan to prevent CLBP.

This study has few limitations that should be pointed out. First, it was a cross-sectional design, and any significant correlations should not be confused with causal effects; it is possible that pain-related fear leads to increased activity avoidance and disability, but the reverse also may be possible. Longitudinal data may be superior because they could provide far better understanding of the impact of baseline characteristics, management issues and expectations on FABs. Second, the associations between self-reported beliefs and physical tests were not taken into consideration. In future studies this may be explored. Third, our study was limited to only CLBP, and it is doubtful whether our result can be generalized to acute or subacute LBP and other complaints of the musculoskeletal system. Hence, this may well be further investigated in future studies. Finally, the present study had the limitation of not considering the divergent and factorial validity of the FABQ-G due to small sample size.

Conclusion: Our results suggest that the FABQ-G has been successfully translated and cross-culturally adapted from English to Gujarati. The preliminary evidence generated by the psychometric testing showed that the FABQ-G shows psychometric properties similar to the English version. This study provides us with the evidence that the FABQ-G is a reliable and valid measure to assess 'fear avoidance beliefs' in Gujarati-speaking CLBP patients and results of FABQ-G can be compared to international studies using other translated versions. Construct validity and Responsiveness of the FABQ-G should be evaluated in further studies.

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