Reliability and Validity of Gujarati Version of Orebro Musculoskeletal Pain Questionnaire (OMPQ-G) - A Cross-Sectional Study

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Abstract

Introduction: Low Back Pain (Lbp) Is Among The Most Commonly Reported Symptoms In Primary Care Facilities Across The Globe. A Significant Concern In The Management Of Lbp Is The Progression From Acute Pain To Chronic Disability.

Materials And Methods: A Cross-Sectional Study Was Conducted In Ahmedabad, Gujarat, From 2023 To 2024, With Permission Obtained Via Email To Translate The Ompq Scale Into Gujarati, Following Beaton Guidelines. Participants Aged 18 To 66, Both Male And Female, Who Understood Gujarati And Had Acute Or Sub-Acute Back Pain (Lasting Less Than Three Months), Were Included. A Total Of 300 Participants Were Selected To Assess Test-Retest Reliability Based On The 25 Items Of The Ompq.

Result: The Internal Consistency Was Assessed by Cronbach's Alpha (A= 0.99) And High Correlation Coefficient (Icc= 0.98) The Ompq-G Showed Excellent Test-Retest Reliability. Cvr Values For 14 Items In Ompq-G Was 1 So It Was Accepted By All The Expert Committee Members (N=10) Except For 11 Items Which Was 0.8 Means It Is Accepted With Modification By 1 Expert.

Conclusion: The Ompq-G Scale Is A Brief, Easy-To Use, Reliable And Valid Scale For Assessing Psychosocial Factor In Gujarati Population With Low Back Pain.

Keywords: Psychosocial Factors, Low Back Pain, Orebro Musculoskeletal Pain Questionnaire (Ompq).

INTRODUCTION

Lower back pain (LBP) is defined as pain or discomfort between the inferior gluteal folds and the costal margins with or without leg pain. It can originate from a single traumatic incident or build gradually over time as a result of micro trauma brought on by repetitive activities. In primary care settings around the world, LBP is one of the most commonly reported complaints. [1]

It is believed that between 42% and 83% of Indians suffer with LBP. According to recent research by Ganesan et al., the prevalence of LBP in young Indian individuals between the ages of 18 and 35 is 42.4% annually and 22.8% weekly. [2]

Work Related Musculoskeletal Disorders (WRMSDs) are injuries to the musculoskeletal system caused or worsened by work activities. [3]The transition from acute back pain to chronic disability is a major

concern, particularly due to its social and economic impacts. Recent research highlights psychosocial factors, known as "yellow flags," that increase the risk of future disability and delay return to work. Self-administered questionnaires have been developed to assess LBP in affected individuals. [4-6]

The Orebro Musculoskeletal Pain Screening Questionnaire (OMPQ), created by Steven J. Linton and KatjaBoersma in 1998, is utilized across various clinical environments. A notable benefit of the OMPQ is its role in the early identification of yellow flags. It serves as a benchmark for screening patients with sub-acute LBP who are at risk of developing disability and experiencing persistent pain. Moreover, existing studies have predominantly focused on return-to-work (sick leave) as the sole outcome variable. While this is an important measure, many healthcare professionals also prioritize other outcomes, such as functional ability and pain levels. [7]

In India, prior to this research, there was no dedicated assessment tool for evaluating psychosocial factors in LBP patients at risk of disability and absenteeism. Consequently, this study aimed to translate and culturally adapt the OMPQ for application in the Gujarati language.

MATERIALS AND METHOD

The original OMPQ in English [7] served as the foundation for cross-cultural adaption in this investigation. This cross-sectional study was carried out in Ahmedabad, Gujarat, from 2023 to 2024. The Institutional Ethical Committee approved permission to perform the study. Written informed consent forms were obtained from participants who agreed to participate in the study. Participants in the current study were recruited from the community. The study comprised participants aged 18 to 66 years old [7], both males and females, who could comprehend Gujarati. The study included participants who experienced acute or sub-acute back pain (lasting less than three months).Participants with psychological disorders, cardiovascular or metabolic diseases, or "red flags" such as caudaequina syndrome, progressive paresis, suspected tumors, local infections, ankylosing spondylitis, rheumatoid arthritis, fractures, or any symptoms requiring urgent medical attention, significant cognitive impairments or visual deficits were excluded from the study.

SAMPLE SIZE CALCULATION

The sample size was determined using a 1:10 ratio and a 20% dropout rate, resulting in a total of 300 participants based on the OMPQ's 25 items.

STUDY PROTOCOL

The author of the Original English version of the OMPQ scale provided consent via email for its translation into Gujarati. Following the Beaton Guidelines [8]and the author's recommendations, the translation process was executed. A cross-cultural adaptation was implemented in Question 4, changing "Were you born in Australia?" to "Were you born in India?" as authorized by the author through email. The translation process included forward translation, reconciliation, backward translation, and a comparison with the original text.

STEP 1:

TRANSLATION was performed by two independent translators who are experienced in bilingual language. The first translator (T1) had expertise in medical care and was familiar with medical terminology, while the second translator (T2) did not have such knowledge. They produced a written report on the translation, noting any uncertainties encountered during the process. Following this, a reconciliation procedure (T12) was carried out between T1 and T2, with written documentation addressing each issue raised and providing resolutions. The next step involved a backward translation of the reconciled text. Two backward translators (B1 and B2) were selected, both of whom were proficient in English and Gujarati, and they were not informed of the concepts discussed, nor did they possess a medical background to mitigate any bias. A reconciliation (B12) was conducted between B1 and B2, leading to the development of a prefinal version.

STEP 2:

COGNITIVE DEBRIEFING From a total of 300 participants, 20 individuals were randomly chosen to evaluate the prefinal version, focusing on terminology, language, nomenclature, clarity of explanations, and the precision of the response options provided. In response to participant feedback, the phrase "There is always a response for your particular situation" was modified from "તમારી પરિસ્થિતિ માટે હંમેશા ચોક્કસ ઉત્તર હોય છે" to "તમારી કોઈ પણ પરિસ્થિતિ માટે હંમેશા કોઈને કોઈ નિરાકરણ હોઈ જ છે" to improve understanding.

STEP 3:

FACE AND CONTENT VALIDITY: A panel of ten experts, averaging 10.5 years of experience in medical and non-medical fields, reviewed the prefinal version. They assessed the Face and Content validity of the translated version through a consensus method, focusing on grading, layout, phrasing, interpretation, and administration. All components of the OMPQ-G received unanimous approval. Content validity was evaluated using the Content Validity Ratio (CVR) for consensus and the Content Validity of Individual items (ICVI) for proportional agreement.

CVR VALUE

In the content validation process, each member of the expert committee was requested to evaluate every item using a rating scale from 1 to 3, where 1 indicates rejection, 2 signifies acceptance with modifications, and 3 represents full acceptance. The Content Validity Ratio (CVR), as introduced by Lawshe[9] in 1975, serves as a linear transformation reflecting the proportion of agreement among experts regarding the acceptance of an item. The CVR is calculated using the following formula:

$$CVR = \{N_e - (N/2)\} / (N/2)$$

In this equation, CVR represents the Content Validity Ratio, N_e denotes the number of experts who rated an item as "accepted," and N refers to the total number of expert committee members. A CVR value of 0.80 was deemed acceptable.

I-CVI VALUE

Experts were requested to evaluate items using a 4-point ordinal scale, where a score of 1 signifies non-relevance, 2 denotes somewhat relevant, 3 indicates quite relevant, and 4 represents highly relevant. The content validity index (I-CVIs) for each item was calculated by dividing the number of experts who rated an item as relevant or clear (scores of 3 or 4) by the total number of content experts. The

acceptability of each item on the scale is determined as follows: I-CVI exceeding 79% indicates that the item is deemed appropriate, while a score between 70% and 79% necessitates revision. Items with an I-CVI below 70% are to be discarded.

STEP 4:
TEST-RETEST RELIABILITY study was carried out after taking a written informed consent of total 300 participants with the interval of two days between the tests.

STATISTICAL ANANLYSIS
Data analysis was performed by using the SPSS version 26.0. The participant's characteristics were evaluated by using descriptive statistics (Table 1). Each item of the scale was calculated with the level of significance set at $p < 0.05$.

	MEAN ± STANDARD DEVIATION
AGE(YEARS)	37.96±11.58
HEIGHT (cm)	160.28±5.48
WEIGHT (kg)	61.48±8.91
BMI ((kg/m^2)	23.84±3.36

TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF THE PARTICIPANTS (N=300)

RESULT:
RELIABILITY: Internal consistency was measured through Cronbach's alpha. The results indicated tht the OMPQ-G possesses excellent test-retest reliability, as reflected by its significant internal consistency ($\alpha = 0.99$) and a high correlation coefficient (ICC = 0.98, with a 95% confidence interval ranging from 0.834 to 0.996).

CONTENT AND FACE VALIDITY: The assessment of content validity revealed that the Content Validity Ratio (CVR) for 14 items in the OMPQ-G was 1, indicating unanimous acceptance by all expert committee members (n=10). In contrast, 11 items received a CVR of 0.8, signifying acceptancewith modifications by one expert. (Table 2)

Acceptability of items of OMPQ-G by Expert Committee Members											No. of experts rated "accepted"	CVR value
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10		
1	3	3	3	3	3	3	3	3	3	3	10	1
2	3	3	3	3	3	3	3	3	3	3	10	1
3	3	3	3	3	3	3	3	3	3	3	10	1
4	3	3	3	2	3	3	3	3	3	3	9	0.8
5	3	3	3	3	3	3	3	3	3	3	10	1
6	3	2	3	3	3	3	3	3	3	3	9	0.8
7	3	3	3	3	3	3	3	3	3	3	10	1
8	3	2	3	3	3	3	3	3	3	3	9	0.8
9	3	3	3	3	3	3	3	3	3	3	10	1
10	3	3	3	3	3	3	3	3	3	3	10	1
11	2	3	3	3	3	3	3	3	3	3	9	0.8
12	3	2	3	3	3	3	3	3	3	3	9	0.8
13	3	2	3	3	3	3	3	3	3	3	9	0.8
14	3	3	3	3	3	3	3	3	3	3	10	1
15	3	3	3	3	3	2	3	3	3	3	9	0.8
16	3	3	3	3	3	3	3	3	3	3	10	1
17	3	3	3	3	3	3	3	3	3	3	9	0.8
18	3	3	3	3	3	3	3	3	3	3	9	0.8
19	3	3	3	3	3	3	3	3	3	3	9	0.8
20	3	3	3	3	3	3	3	3	3	3	10	1
21	3	3	3	3	3	3	3	3	3	3	10	1
22	3	3	3	3	3	3	3	3	3	3	10	1
23	3	3	3	3	3	3	3	3	3	3	10	1
24	3	3	3	3	3	3	3	3	3	3	10	1
25	3	3	3	3	3	3	3	3	3	3	9	0.8
TABLE 2- CVR values for 25 items in OMPQ-G Scale. **M1,M2, M3,M4 etc. denotes the expert members of committee**												

The assessment of Item Content Validity was conducted using ICVI values. All items, with the exception of items 4, 6, 8, 11, 12, 13, 15, 17, 18, 19, and 25, received an I-CVI value of 1, while the aforementioned items were assigned a value of 0.9. Each item within the OMPQ-G demonstrates an ICVI value exceeding 0.79%, indicating the suitability of each item within the scale. (Table-3)

Acceptability of items of OMPQ-G by Expert Committee Members											No. of experts rated 2 or 3	I-CVI Value	UA
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10			
1	1	1	1	1	1	1	1	1	1	1		10	1	1
2	1	1	1	1	1	1	1	1	1	1		10	1	1
3	1	1	1	1	1	1	1	1	1	1		10	1	1
4	1	1	1	0	1	1	1	1	1	1		9	0.9	0
5	1	1	1	1	1	1	1	1	1	1		10	1	1
6	1	0	1	1	1	1	1	1	1	1		9	0.9	0
7	1	1	1	1	1	1	1	1	1	1		10	1	1
8	1	0	1	1	1	1	1	1	1	1		9	0.9	0
9	1	1	1	1	1	1	1	1	1	1		10	1	1
10	1	1	1	1	1	1	1	1	1	1		10	1	1
11	0	1	1	1	1	1	1	1	1	1		9	0.9	0
12	1	0	1	1	1	1	1	1	1	1		9	0.9	0
13	1	0	1	1	1	1	1	1	1	1		9	0.9	0
14	1	1	1	1	1	1	1	1	1	1		10	1	1
15	1	1	1	1	1	0	1	1	1	1		9	0.9	0
16	1	1	1	1	1	1	1	1	1	1		10	1	1
17	1	0	1	1	1	1	1	1	1	1		9	0.9	0
18	1	0	1	1	1	1	1	1	1	1		9	0.9	0
19	1	1	1	1	1	0	1	1	1	1		9	0.9	0
20	1	1	1	1	1	1	1	1	1	1		10	1	1
21	1	1	1	1	1	1	1	1	1	1		10	1	1
22	1	1	1	1	1	1	1	1	1	1		10	1	1
23	1	1	1	1	1	1	1	1	1	1		10	1	1
24	1	1	1	1	1	1	1	1	1	1		10	1	1
25	0	1	1	1	1	1	1	1	1	1		9	0.9	0
												S-CVI/Ave	0.956	
PROPORTION RELEVANCE	0.92	0.76	1	0.96	1	0.92	1	1	1	1				
	AVERAGE PROPORTION OF ITEMS JUDGED AS REVELENCE ACROSS THE TEN EXPERTS									0.956				

TABLE 3- I-CVI values for 25 items in OMPQ-G Scale. M1,M2, M3,M4 etc. denotes the expert members of committee

DISCUSSION:

The aim of this research was to translate and create a Gujarati version of the 25-item Orebro Musculoskeletal Pain Questionnaire (OMPQ) and to evaluate its reliability and validity for the Gujarati population suffering from low back pain. The OMPQ serves as a valuable and efficient assessment tool due to its clear and concise structure. It offers a thorough evaluation from a one-dimensional viewpoint, as it was specifically designed to forecast the probability of returning to work after undergoing physical therapy. Additionally, prior studies have mainly concentrated on return-to-work outcomes (sick leave) as the exclusive variable. While this outcome is significant, numerous healthcare professionals also emphasize other aspects such as functional capacity and pain intensity. Consequently, based on these findings, it can be inferred that the OMPQ-G is a valid and reliable tool that is also straightforward to understand and implement for assessing psychosocial factors. To date, there are eight translated versions of the OMPQ available (refer to Table 4). The original English version of the OMPQ was developed by Steven J. Linton, Ph.D., and KatjaBoersma, M.A., from the Department of Occupational and Environmental Medicine and the Department of Social Sciences–Psychology at Orebro University Hospital and Orebro University, Sweden, in 2003.

TRANSLATIONS OF OMPQ	AUTHORS	PLACE OF STUDY	RELIABILITY	VALIDITY
ENGLISH VERSION (ORIGINAL)(2003) [7]	Steven J. Linton, Ph.D., and KatjaBoersma, M.A et al	Sweden	The test-retest reliability of the questionnaire was assessed with an overall score of 0.80.	The results from correlation and factor analysis confirmed the presence of good convergent and divergent validity.
ARABIC (2023) [10]	FahadAlanazi& Muhammad Alrwaily et al	Saudi Arabia.	The test-retest reliability demonstrated a high level, with an ICC of 0.92 (95% CI: 0.83–0.96).	The Arabic-ÖMPQ exhibited a correlation ranging from moderate ($r \geq 0.3$, < 0.5) to high ($r \geq 0.5$) with the questionnaires assessing pain, disability, fear-avoidance, and catastrophizing.

| Brazilian-Portuguese version (2015) [11] | Felipe Ribeiro Cabral Fagundes, Leonardo Oliveira Pena Costa et al | Cities of Sao Paulo and Taubate, Brazil. | The internal consistency of the OMPSQ was found to be satisfactory, with a Cronbach's alpha of 0.83. The reliability of the measure was considerable, as indicated by an ICC2,1 value of 0.76. | Furthermore, the total score of the OMPSQ demonstrated a strong correlation with the RMDQ (r = 0.73) and the TSK (r = 0.64), while exhibiting a moderate correlation with pain intensity, specifically current pain (r = 0.36), pain over the last two weeks (r = 0.37), and the most recent episode of pain (r = 0.46). |

TRANSLATIONS OF OMPQ	AUTHORS	PLACE OF STUDY	RELIABILITY	VALIDITY
Hong Kong Chinese (2016) [12]	Raymond Tsang Chi Chung et al	Hong Kong	The Cronbach's alphas of the COMPSQ-HK were 0.843 (95% CI 0.816–0.867) and 0.826 (95% CI 0.784–0.863) for back cases and neck cases. ICC1,1 are 0.814 (95% CI 0.627 to 0.913) and 0.922 (95% CI 0.762 to 0.977) in the back pain and neck pain patient group respectively (p < 0.001 in both groups).	Correlation coefficientswere the highest between the COMPSQ-HK and RMDQ-HK (r = 0.525) and NPQ-HK (r = 0.697).
French (2012) [13]	O.	Cliniquesuniversitaires	The sensitivity	A weak correlation

	Nonclercq, A. Berquin et al	Saint-Luc (Brussels, Belgium)	and specificity data exhibited a range from 0.73 to 0.83.	was observed between the ODI relative score and the OMPSQ total score, with correlation coefficients of t = 0.46 and t = 0.49 at time points t0 and t6, respectively, with a significance level of P < 0.0001.
Hausa (2020) [14]	Usman Abba Ahmed et al	Sub-Saharan Africa	The Hausa adaptation of the OMPSQ has shown strong reliability, with an Intraclass Correlation Coefficient (ICC) of 0.82, and satisfactory internal consistency, indicated by a Cronbach's alpha of 0.72.	Furthermore, the retest scores of the OMPSQ-H exhibited a significant correlation with the scores from the global rating of change scale, with a correlation coefficient of r=0.67 and a p-value of 0.01.

TRANSLATIONS OF OMPQ	AUTHORS	PLACE OF STUDY	RELIABILITY	VALIDITY
Persian (2017) [15]	AsrinShafeei et al	Iran.	The Persian OMPQ demonstrated outstanding test-retest reliability, with an intraclass correlation coefficient of 0.89. Additionally, its internal consistency was measured at 0.71.	Convergent validity was established through a strong correlation between the OMPQ and PDQ total scores, yielding a correlation coefficient of $r = 0.72$ ($p < 0.05$).
Spanish(2014) [16]	Antonio Ignacio Cuesta-Vargas et al	Torremolinos (Spain).	The reliability scores range from 0.853, indicating average pain, to 1, which represents duration. However, the "Coping" variable exhibits a notably lower reliability of 0.218.	In terms of concurrent criterion-related validity, several significant correlations were observed, approaching 0.6
Turkish (2016) [17]	JülideÖncü et al	Turkey	The test-retest reliability demonstrated a high level, indicated by intraclass correlation coefficients of 0.93. The internal consistency was measured at 0.96.	The ÖMPQ score exhibited a strong correlation ($r \geq 0.60$) with VAS-pain, ODI, and the number of sick-leave days; a moderate correlation ($0.30 < r < 0.60$) with FABQ; and a weak correlation ($r < 0.30$) with the duration of pain and the Schober test.

CONCLUSION

The OMPQ-G scale is a brief, easy-to use, reliable and valid scale for assessing psychosocial factor in Gujarati population with low back pain. The OMPQ-G scale can be used in researches as a clinical tool to identify psychosocial factors for LBP patients at the risk of disability

REFERENCES

1. Burton, AK, Balagué, F, Cardon, G, Eriksen, HR, Henrotin, Y, Lahad, A, et al. Chapter 2 European guidelines for prevention in low back pain on behalf of the COST B13 working group on guidelines for prevention in low Back pain. *Eur Spine J*. (2006) 15:s136–68. doi: 10.1007/s00586-006-1070-3.

2. Bansal D, Asrar MM, Pharm M, Ghai B, Pushpendra D. Prevalence and impact of low back pain in a community-based population in northern India. Pain Physician. 2020;23(4):E389.

3. Stewart Williams J, Ng N, Peltzer K, Yawson A, Biritwum R, Maximova T, et al. Risk Factors and Disability Associated with Low Back Pain in Older Adults in Low- and Middle-Income Countries. Results from the WHO Study on Global AGEing and Adult Health (SAGE). Marengoni A, editor. PLOS ONE. 2015 Jun 4;10(6):e0127880.

4. Kendall NAS, Linton SJ, Main CJ. Guide to assessing psychosocial yellow flags in acute low back pain: risk factors for long-term disability and work loss. Wellington, NZ: Accident Rehabilitation and Compensation Insurance Corporation of New Zealand and the National Health Committee, 1997.

5. Linton SJ, Halldén K. Can we screen for problematic back pain? A screening questionnaire for predicting outcome in acute and subacute back pain. Clin J Pain 1998; 14:209–15.

6. Linton SJ, Halldén K. Risk factors and the natural course of acute and recurrent musculoskeletal pain: developing a screening instrument.In: Jensen TS, Turner JA, Wiesenfeld-Hallin Z, eds. Proceedings of the eighth world congress on pain: progress in pain research and management, vol 8. Seattle, WA: IASP Press, 1997:527–36.

7. Linton SJ, Boersma K. Early Identification of Patients at Risk of Developing Persistent Back Problem: The Predictive Validity of the Örebro Musculoskeletal Pain Questionnaire. The Clinical Journal of Pain. 2003 Mar; 19(2):80–6.

8. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. Spine. 2000 Dec 15;25(24):3186-91.

9. Lawshe CH. A quantitative approach to content validity. Pers Psychol. 1975;28(4):563-75

10. Alanazi F, Alrwaily M. Cultural adaptation, reliability and validation of the Arabic Örebro Musculoskeletal Pain Questionnaire in patients with low back pain. Journal of Pain Research. 2023 Dec 31:317-25.

11. Fagundes FR, Costa LO, Fuhro FF, Manzoni AC, de Oliveira NT, Cabral CM. Örebro Questionnaire: short and long forms of the Brazilian-Portuguese version. Quality of Life Research. 2015 Nov;24:2777-88.

12. Tsang Chi Chung R, Lau Sau Ying J, Kwong So Fong S, So Ming Loi E, Law Ka Yee R, Wong Fu Yan T, Lee Wai Chi E. Reliability, construct and predictive validity of the Hong Kong Chinese Orebro musculoskeletal pain screening questionnaire. Journal of occupational rehabilitation. 2017 Dec;27:584-92.

13. Nonclercq O, Berquin A. Predicting chronicity in acute back pain: validation of a French translation of the Örebro Musculoskeletal Pain Screening Questionnaire. Annals of physical and rehabilitation medicine. 2012 May 1;55(4):263-78.

14. Ahmed UA, Maharaj SS, Nadasan T, Kaka B. Cross-cultural adaptation and psychometric validation of the Hausa version of Örebro Musculoskeletal Pain Screening Questionnaire in patients with non-specific low back pain. Scandinavian journal of pain. 2021 Jan 27;21(1):103-11.

15. Shafeei A, Mokhtarinia HR, Maleki-Ghahfarokhi A, Piri L. Cross-Cultural Adaptation, Validity, and Reliability of the Persian Version of the Orebro Musculoskeletal Pain Screening Questionnaire. Asian Spine Journal. 2017;11(4):520.

16. Cuesta-Vargas AI, González-Sánchez M. Spanish version of the screening Örebro Musculoskeletal Pain Questionnaire: a cross-cultural adaptation and validation. Health and Quality of Life Outcomes. 2014 Oct 29;12(1).

17. Öncü J, Ilişer R, Kuran B. Cross-cultural adaptation of the Orebro Musculoskeletal Pain Questionnaire among Turkish workers with low back pain. Journal of Back and Musculoskeletal Rehabilitation. 2016 Jan 25;29(1):135–43.