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Mc Gill Pain Questionnaire: A Cross-Cultural Adaptation Study in Chronic Neck Pain

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ABSTRACT

Introduction: Due to its complex nature, identification, and treatment of both physical and psychological risk factors is essential in patients with neck pain. Multidimensional pain assessment is an essential prerequisite to planning a multi-modal treatment. McGill Pain Questionnaire is a valid and reliable tool that can assist in multidimensional pain assessment. Hence, this study's objective was to determine the clinimetric properties and usability of the Hindi version of the McGill Pain Questionnaire in patients with neck pain.

Methods: After securing permission from the University Ethics board, a cross-culturally adapted Hindi version of the Long Form McGill Pain Questionnaire was administered to evaluate clinimetric properties (validity and reliability) in fifty patients with chronic neck pain.

Results: Hindi version of Long Form McGill Pain Questionnaires demonstrated high levels of internal consistency (Cronbach alpha range 0.76- 0.83) and reliability (intraclass correlation coefficient range 0.74-0.85) in patients with chronic neck pain. The Hindi version of LF-MPQ demonstrated adequate construct and concurrent validity when tested with VAS (Pearson r- 0.80) and NDI (Pearson r- 0.79), respectively.

Conclusion: The Hindi version of the LF-MPQ was a reproducible and valid tool in chronic neck pain assessment.

Keywords: Hindi version, Long form McGill Pain Questionnaire, Chronic Neck Pain, clinimetric properties.

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INTRODUCTION

Neck pain is multifactorial, with physical, psychological and individual risk factors contributing to its development [2,3]. Psychological states such as anxiety, catastrophizing, and depression seem to be primarily associated with neck pain and disability, whereas anxiety is also associated with neck pain intensity [1]. Moreover, anxiety and catastrophizing may significantly predict a patient's self-reported disability [1]. Hence, while assessing neck pain, it is preferable that a tool that incorporates both physical and psychological features of pain would help in appropriate identification, treatment and referral [4].

Long-form McGill pain questionnaire (LF-MPQ), a multidimensional pain assessment tool developed by Melzack and Torgerson, is considered a gold standard for measuring various qualities of pain. The MPQ includes 78 pain descriptors categorized into 20 groups of words divided into three categories (Sensory, motivational-affective, and Cognitive-evaluative)[5]. It is assumed that these three categories interrelate to provide perceptual information on the site, extent, and spatiotemporal properties of the noxious stimuli; motivational inclination toward escape or attack; and cognitive evidence based on experience and possibility of outcome of different response strategies. All three forms of activity could then influence motor mechanisms responsible for the complex pattern of overt responses that characterize pain [6]. Hence Mc Gill's pain questionnaire helps provide comprehensive pain evaluation.

LF-MPQ has been translated and cross-culturally adapted in various languages, allowing the patients to convey their pain experience to clinicians [7] adequately. We have developed a cross-culturally adapted Hindi version of LF-MPQ following the guidelines of Mapi Research Trust. However, it is imperative to test the properties of the newly translated tool in a relevant population to ensure that it is valid and reproducible. Hence, this study aimed to assess the clinimetric properties of translated Hindi version of the questionnaire in chronic neck pain patients, as they are a clinically relevant population with established multifactorial risk factors.

METHODOLOGY

The study was conducted after obtaining permission from the Institutional ethics committee. Patients with a history of non-specific neck pain of more than three months, in the age group of 18 to 60 years, were recruited in the study after obtaining informed consent. To be eligible to participate in the study, the patient had to be able to speak, read and write in Hindi. Exclusion criteria included patients with a history of fracture, trauma, tumors or infection in the cervical spine, evident cervical or thoracic deformity, or post-operative cases of the cervical spine. Patients were also excluded if they presented with a history of cervical nerve root compression, neurological diseases, or depressive symptoms.

The newly developed Hindi version of LF-MPQ was tested on 50 patients (21 Male and 29 female) with chronic neck pain for clinimetric properties. The mean age was 46 +/- 5.1 years.

The patients completed the cross-culturally adapted Hindi LF-MPQ containing 76 pain descriptors, Visual Analog Scale (VAS), and Neck Pain and disability index (NPAD). The Hindi LF-MPQ was re-administered after 48 hours to assess reliability. In addition, validity, reliability, and internal consistency testing were included for the clinimetric assessment of the Hindi version of the LF-MPQ.

Validity refers to a tool accurately measuring what it proposes to test. Construct validity is the degree to which a group of variables signifies the theoretical construct to be measured (in our case construct of pain) [8]. In our study, VAS was utilized to test the validity of Hindi LF-MPQ, as both assess the similar construct of pain. Construct validity is needed because there is usually no direct way of testing the instrument's relationship to the underlying concept [8]. VAS, a unidimensional scale to assess pain intensity, has been widely used in adult populations. The patient rates the intensity of the pain scale on a score between 0 to 10, with a score of 0 meaning no pain and a score of 10 being the worst possible pain [9]. Similarly, high total LF-MPQ scores determine a higher level of pain.

Concurrent validity establishes validity when two measures are taken relatively simultaneously [10]. To test the concurrent validity, we have used the culturally adapted Hindi version of NPAD, originally published in 2006. NPAD was developed as a self-reported questionnaire to evaluate the patient's pain intensity and interference with vocational, recreational, social, and functional aspects of living. NPAD is also used to test the presence and extent of associated emotional factors [11]. The NPAD consists of 20 items/questions. Each question is graded on a scale of 0 (normal function) to 5 (worst possible situation due to pain). The total score is a maximum of 100, with higher scores indicating higher disability [11].

The internal consistency shows if all subparts of an instrument measure the same characteristic, construct, or domain. The idea behind internal consistency procedures is that, if reliable, items or questions measuring the same phenomenon should produce similar results irrespective of their number in an instrument [12]. Internal consistency was calculated for each domain of the Hindi version LF-MPQ separately, i.e., sensory, affective, and miscellaneous, using Cronbach alpha.

Our study assessed reproducibility with a test-retest design using measures of reliability (relative measurement error). Reliability is the ability to reproduce a consistent result in time and space or from different observers, presenting aspects of coherence, stability, equivalence, and homogeneity [13]. For evaluating reliability, the Hindi version of the LF-MPQ scale was re-administered at an interval of 48 hours. Our study evaluated reliability using the interclass correlation coefficient type 2, 1 agreement ($ICC_{2,1}$) with 95% CI.

RESULTS

After following the guidelines of the five-step translation

given by Mapi Research Trust, the final translated Hindi version of LF-MPQ was developed. Finally, the translated Hindi version of LF-MPQ was administered to fifty patients with Chronic Neck Pain.

The original scoring system of LF-MPQ consists of three score types, i.e., Number of words chosen (NWC), Pain Rating Index (PRI) & Present pain intensity (PPI) [5]. In our analysis, we have utilized all three score as mentioned earlier in our study. NWC was obtained by counting the number of words selected by the respondent and ranged from 0 to 76 for our study. The pain rating index (PRI) is determined based on the rank values of the words, such that the word in each subclass inferring the least pain is assigned a value of 1, the next word is assigned a value of 2, and so forth. The rank values of the words chosen by a patient are added to obtain separate scores for the PRI-sensory (subclasses 1-10), PRI- affective (subclasses 11-15), PRI- evaluative (subclass 16), and PRI -miscellaneous (subclasses 17-20) words, in addition to providing a total score, i.e., PRI-Total (subclasses 1-20). Present pain intensity (PPI) score ranges from 1 (mild) to 5 (excruciating) and is obtained by scoring the response to the question, "Which word describes your pain right now?" [5].

The mean scores (+/- standard deviation) of age and duration of neck pain of the participants are shown in Table 1.

Table 1: Demographic data of study participants

Parameter	Baseline	Post 48 hours
Age in years (Mean ±sd)	46±5.1	-
Male patients (number)	21	-
Female patients (number)	29	-
Duration of neck in months (Mean ± sd)	22±6.7	-

Sd = standard deviation

The mean scores (+/- standard deviation) of LF-MPQ (NWC; PRI-T; PPI), NPAD, and VAS of the participants at baseline and after 48 hours are shown in Table 2.

Table 2: Baseline data of study participants

Parameter	Baseline	Post 48 Hours
LF-MPQ NWC Score (Mean ± sd)	23±2.2	23±1.7
LF-MPQ PRI -T score (Mean ± sd)	38±4.3	37±4.8
LF-MPQ PPI score (Mean ± sd)	3±0.7	3±0.8
NPAD (Mean ± sd)	46±8.2	45±6.7
VAS (Mean ± sd)	3.26± 1.3	3.15±1.3

LF-MPQ=Long form Mc Gill Pain Questionnaire; NWC = Number of words choosen;

PRI-T = Pain rating index-total; PPI=Present pain intensity; NPAD=Neck pain and disability index; VAS= Visual analogue scale; sd= Standard deviation.

Positive high correlations are found when scores in one instrument demonstrate a corresponding increase in scores in other tools since increased scores on all tools used in our study, i.e., Hindi MPQ, VAS, and NPAD, imply an increase in suffering.

Pearson correlation analysis indicates high and positive correlation (r-value = 0.80) between the Hindi version of LF-MPQ and VAS scores and the Hindi version of LF-MPQ and NPAD scores (r-value = 0.79), denoting adequate construct validity and concurrent_validity respectively. (Table 3).

Table 3: Pearson correlation among the Hindi version LFMPQ (PRI total & PPI), VAS and NPAD

Instrument	r-value-VAS	p-value-VAS	r-value-NDI	p-value-NDI
Hindi version LF-MPQ (Total)	0.80	0.000	0.79	0.001
Hindi version LF- MPQ (Present Pain Intensity)	0.82	0.000	0.78	0.000

LF-MPQ= Long form Mc Gill Pain Questionnaire.

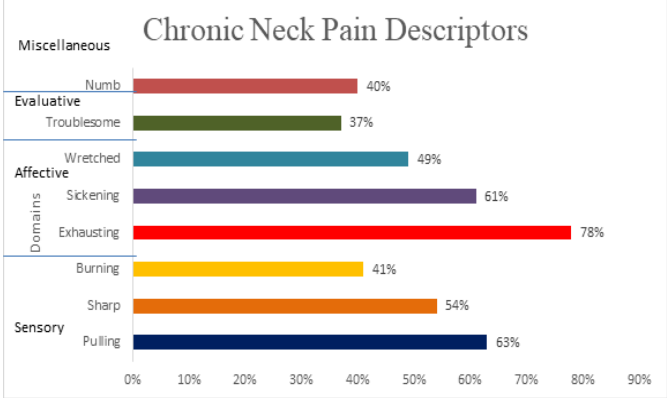
Our study results for internal consistency demonstrated Cronbach alpha for individual domains, i.e., sensory, affective, evaluative, and miscellaneous, ranging from 0.76- 0.83, implying acceptable internal consistency (Table 4). Furthermore, for testing reproducibility, intraclass correlation coefficient (ICC 0.74- 0.85) values indicate significant reproducibility.

Table 4: Internal consistency and reproducibility (reliability) of the Hindi version Long Form Mc Gill Pain Questionnaire

Instrument	Internal Consistency-Cronbach alpha	Intra Tester Reliability- $ICC_{2,1}$ 95% CI
Pain Rating Index- Total		0.82 (0.76, 0.90)
Pain Rating Index- Sensory	0.76	0.78(0.72, 0.86)
Pain Rating Index- Affective	0.83	0.85 (0.78, 0.92)
Pain Rating Index- Evaluative	n/a	0.79(0.72, 0.86)
Pain Rating Index- Miscellaneous	0.75	0.74 (0.67, 0.81)

The most commonly chosen descriptor by our study participants were pulling (खिंचाव), sharp (तेज दर्द), burning (जलानेवाला), from sensory domain; exhausting (बुरी तरह थकना), sickening (बीमार करने वाला) and wretched (उदास करने वाला) from affective domain; troublesome (तकलीफदेह), from evaluative and numb (सुन्न) from miscellaneous domain (Figure 1)

Figure 1: The figure below shows the percentage of patients choosing the common descriptors in various domains.



DISCUSSION

The study results indicate that the Hindi version of the LF-MPQ demonstrates satisfactory validity, internal consistency, and reliability (Tables 3 and 4) when assessed in patients with chronic neck pain.

Previous studies have tested the validity of newly translated tools with other tools that examine similar construct or disease-specific outcomes for construct and concurrent validity respectively [15,16]. Our study has inferred positive and high correlations for construct and concurrent validity of the Hindi version of LF-MPQ with VAS and NPAD respectively (Table 3). Internal consistency of the Hindi version of LFMPQ ranged from 0.76- 0.83 (Table 4) and is considered adequate. Previous studies of translated Brazilian and Japanese LF-MPQ have demonstrated Cronbach's alpha values of 0.55-0.70 and 0.81 respectively [14, 15]. Though our ICC values are comparable with the abovementioned literature, these studies have been done in varied musculoskeletal populations.

The test-retest reliability ($ICC_{2,1}$) of the Hindi version of LF-MPQ ranged from 0.74 to 0.85 and was consistent with the hypothesis of our study. The 2-day interval for reliability assessment was most suitable, as longer duration can alter the results due to treatment effect. Our reliability evaluations of the Hindi version LF-MPQ are comparable to those previously tested for the translated Brazilian version $ICC_{2,1}$ = 0.8 [95% CI: 0.72-0.86] [16].

Pain descriptors used in MPQ are varied and have been identified to help ascertain the pain mechanism, i.e., nociceptive or neuropathic in previous studies [5]. Descriptors chosen by our participants indicate the existence of both nociceptive (sharp, pulling) and affective (exhausting, sickening, wretched) components, with less majority having a neuropathic component (burning, numb) in pain generation. (Figure 1). Thus treatment targeting mechanical features, e.g., manual therapy and stabilization exercises should be administered in this patient as indicated, a finding also supported by a study done on the Brazilian population with chronic neck pain [17].

Chronic neck pain can cause mechanical and behavioral variations resulting in sustained pain due to associated affective difficulties [17]. Also, a preponderance of the affective component indicates due attention to this domain by therapies like cognitive behavioral therapy, etc., to address the same finding supported by clinical practice guidelines for chronic neck pain [18]. Thus, it is noteworthy to recognize the precise pain descriptors in musculoskeletal dysfunctions to guide treatment.

The results of this study provide relevant pain outcome measures for the Hindi-speaking population. Inferring from the context of our study, Hindi LF-MPQ can be a helpful tool to aid multidimensional pain assessment, facilitating the course of treatment in chronic neck pain.

CONCLUSION

Hindi LF-MPQ can be considered a valid and reliable multidimensional pain assessment tool in patients with chronic neck pain.

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