



## TRANSLATION AND VALIDATION OF HINDI-TRANSLATED PATIENT-RATED MICHIGAN HAND OUTCOMES QUESTIONNAIRE AMONG INDIAN OLDER ADULTS

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**ABSTRACT** **Background:** The Michigan Hand Outcome Questionnaire (MHQ) is a widely used tool for assessing hand function. In India, Hindi is spoken as a first language by nearly 425 million people and as a second language by some 120 million more. However, there is no validated versions in Hindi, limiting its use among Hindi-speaking older adults in India. **Methods:** A standard translation process of forward and backward was done for Hindi version of the MHQ, ensuring cultural relevance and linguistic accuracy. The translated questionnaire was then administered to 40 older adults, aged 60 years and above. The internal consistency was assessed using Cronbach's alpha, and test-retest reliability was evaluated. Construct validation is done by correlating scores between the original English and translated Hindi versions in a bilingual sample. **Results:** The Hindi version of the MHQ demonstrated excellent reliability with a Cronbach's alpha of 0.90. The test-retest reliability was confirmed with a correlation coefficient (R) of 0.9911, indicating consistent results over time. A strong positive correlation between the English and Hindi versions was observed, with a Pearson's correlation coefficient of  $r = 0.957$ . **Conclusion:** The Hindi-translated MHQ is a reliable and valid instrument for evaluating hand function Indian older adults. Its availability in Hindi enables healthcare providers to assess hand function in a large segment of the population, improving patient care and research in hand-related conditions.

### KEYWORDS :

#### INTRODUCTION

The Michigan Hand Outcomes Questionnaire (MHQ) is a tool used to assess patients with hand disorders through the measurement of 6 health domains: overall hand function, activities of daily living (ADLs), pain, work performance, aesthetics, and patient satisfaction<sup>(1)</sup>. Since its development in 1998, the reliability, validity, and responsiveness of the MHQ have been studied and well-documented.

The Michigan Hand Function Questionnaire (MHQ) is a patient rated hand outcome instrument. It is widely used in orthopaedic and neurological conditions of the hands and upper limbs.

It comprises of 37 items with five rating scales from 1 to 6. Each domain is scored and converted to values from 0 to 100. Higher numerical score means better results, except for the pain domain in which a higher score means more pain. It can measure impairment of each side of hand separately.

The hand is the most active and important part of the upper extremity. The anatomy and functional biomechanics of the hand is extremely complex.<sup>(2)</sup> The hand and wrist commonly use in our daily and occupational lives which exposed to the stresses of the environment.<sup>(3)</sup>

Hands undergo many physiological and anatomical changes associated with aging. A retrospective study done in an elderly population to check the prevalence of hand injuries found an increased number of hand injuries over 30 years. The declines limit older adults' ability to live comfortably and independently, as poor hand function is a predictor of progressive impairment in instrumental activities of daily living and increased need for institutional care (Ostwald, Snowdon, Rysavy, Keenan, & Kane, 1989; Scherder, Dekker, & Eggermont, 2008).

Loss of independence requires the support of care-givers and often leads to social withdrawal and negatively effects on wellbeing and quality of life<sup>(4)</sup>

Michigan Hand Outcomes Questionnaire (MHQ) is important for older adults because it provides a comprehensive assessment of hand function, which tends to decline with age due to degenerative conditions such as arthritis and diabetes. It is used in neurological conditions like stroke<sup>(6)</sup>. These conditions, along with the natural aging process, can significantly affect hand strength, dexterity, and sensation, leading to difficulties in performing activities of daily living (ADLs) such as eating, dressing, and personal care.

By evaluating multiple domains—pain, functional ability, work performance, and patient satisfaction—the MHQ offers a well-rounded picture of how hand issues impact independence and quality of life in older adults. Accurate assessment using the MHQ allows healthcare providers to tailor rehabilitation and treatment plans more effectively, addressing the specific needs of this population.

Hindi serves as a bridge between different cultures, enabling communication and understanding between speakers of Hindi and other languages. It is widely spoken and understood, communicating among people from diverse linguistic backgrounds. It is the preferred official language of India, although much national business is also done in English and the other languages recognized in the Indian constitution. In India, Hindi is spoken as a first language by nearly 425 million people and as a second language by some 120 million more.

The MHQ has been translated into fifteen languages other than Hindi i.e Italian, French, Swedish, Chinese, Dutch, German, Japanese, Portuguese, Arabic, Finnish, Malay, Thai, Turkish, Korean, Polish and is used worldwide as a standardized instrument to assess outcomes for hand conditions and to evaluate the effectiveness of medical and surgical intervention. At present, it has not been translated in Hindi. Therefore, to gain more knowledge from Indian patients with hand function, this study is aimed at translating the MHQ into Hindi and investigating the validity of MHQ-Hindi version.

#### METHODOLOGY

A cross-sectional analytical study was conducted on 35 older Indian adults. Participants were selected using inclusion and exclusion criteria. Inclusion criteria were the subject being able to read and understand the language and age 60 and more than 60. The study involved the translation of the Michigan Hand Outcomes Questionnaire (MHQ) from English to Hindi, following a standard forward-backward translation process. After resolving discrepancies between the translated and original versions, the Hindi version was validated by administering both the English and Hindi versions to participants. Demographic data, including age, gender, dominant hand, and occupation, were collected, and participants rated their hand function based on five domains: satisfaction, function, ability, pain, and appearance.

#### RESULT

- Total number of 35 older adults participated in study between the age of 60-90 years out of which 15 were females and 20 were male.

**Table 01:** shows means of domains of MHQ Hindi version between two days

Domains of MHQ	Day 1	Day7
Overall Hand function	98.2	98.5
ADL	97.1	97.5
Work performance	99.3	99.5
Pain	97.4	98
Appearance	99.1	99.5
Satisfaction	98.2	98.5

Test retest reliability shows the value of R is 0.9911 means Excellent test-retest reliability

For internal consistency :

Cronbach's alpha is a measure of internal consistency, that is how closely related a set of items are as a group Cronbach's alpha for total MHQ is 0.965 Suggesting high internal inconsistency

- Construct validity were obtained by Pearson's coefficient of correlation Which showed the value of 'r' is 0.9577 showing strong positive linear correlation proving validity

Language	Mean	SD
English	90.4	2.98
Hindi	89.9	2.75

## DISCUSSION

This study was aimed at translating and Validating the Hindi translated patient rated Michigan Hand outcomes Questionare(MHQ) among Indian older adults.

The Michigan Hand Outcomes Questionnaire (MHQ) is a tool used to assess patients with hand disorders through the measurement of 6 health domains: overall hand function, activities of daily living (ADLs), pain, work performance, aesthetics, and patient satisfaction.

For the Hindi speaking people to interpret their level of hand function without barrier of language, original English version of MHQ was translated into Hindi version..

During the process of translating the original English version of MHQ into Hindi language, the Forward-Backward translation was used and an integrated version was accomplished with retaining the meaning of all the items. All the subjects involved in the pilot testing reported no difficulty in the clarity of language and ease of understanding of all the items. For validating the Translated questionnaire Criterion- concurrent validity was used.

The value for Cronbach's alpha obtained was of 0.9 indicating excellent reliability and internal consistency. In accordance with the values obtained, significant correlations was seen between the English version and the translated Hindi version of Michigan Hand Outcome Questionare. The total scores of English and Hindi MHQ were calculated and were computed for Pearson's correlation co-efficient. The value for Pearson's correlation co-efficient showed to be  $r = 0.957$  presenting strong positive linear correlation Our findings demonstrate that the Hindi MHQ maintains a strong correlation with the original English version, indicating its reliability and cultural relevance The test-retest reliability of the Hindi version of the Michigan Hand Outcomes Questionnaire (MHQ) was found to be excellent, with a correlation coefficient (R) of 0.9911. This high value indicates that the instrument produces consistent results over time, affirming its reliability for repeated assessments. This tool not only addresses the need for a language-specific assessment but also enhances the ability of healthcare professionals to evaluate hand function comprehensively among older adults.

Hence , in the present study, using standard measure the concurrent validation of Hindi translated version of Michigan Hand outcome Questionare was constituted. This study found a positive linear correlation between the domains of the MHQ and also the two versions i.e. English and Hindi of MHQ in Indian older adults.

## CONCLUSION

The Hindi version of the Michigan Hand Function Questionare is a reliable and valid tool to measure satisfaction, ability, function-level, pain-level and appearance of the hand in Indian older adults .

There were no conflict of interest.

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