



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

Physiotherapy

Bhagyashree Kamble*

Asst. Professor *Corresponding Author

Shreya Bari

Intern

Saraswati Iyer

HOD & Prof

Medha Deo

HOD & Prof

ABSTRACT

Background: The Michigan Hand Outcomes Questionnaire (MHQ) is a widely used tool for assessing hand function. Despite its utility, there is a lack of Marathi-translated version of MHQ, limiting its accessibility for Marathi-speaking older adults. This study aimed to translate and validate the MHQ into Marathi for use among Indian older adults. **Methods:** The study involved a standard forward-backward translation process to ensure linguistic accuracy and cultural relevance. The translated questionnaire was administered to 40 older adults aged 60 years and above. Reliability was assessed using Cronbach's alpha, and construct validity was determined by correlating the Marathi and English versions. **Results:** The Marathi-translated MHQ demonstrated excellent reliability with an overall Cronbach's alpha of 0.84. The domains showed strong positive correlations (Pearson's $r > 0.86$) between the Marathi and English versions. These results validate the reliability and cultural relevance of the Marathi-translated MHQ. **Conclusion:** The Marathi-translated MHQ is a reliable and valid tool for assessing hand function in Marathi-speaking Indian older adults. Its availability in Marathi 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⁽¹⁾. 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.

The Michigan Hand Outcomes Questionnaire (MHQ) comprises 37 items rated on five scales ranging from 1 to 6. Each domain is scored and transformed into values between 0 and 100. Higher scores generally indicate better function, except in the pain domain, where a higher score signifies greater pain. This questionnaire uniquely evaluates the functional impairment of each hand separately.

The hand is the most dynamic and vital part of the upper limb, characterized by its complex anatomy and intricate biomechanics (2). It plays a crucial role in our daily and professional lives, yet it is frequently subjected to environmental and occupational stresses (3).

As people age, their hands undergo significant physiological and anatomical changes. A retrospective study examining hand injuries in older adults over three decades revealed a rise in such injuries, reflecting the vulnerability of aging hands. This decline in hand function restricts the ability of older adults to perform daily tasks independently, often leading to increased reliance on institutional care. Poor hand function is a known predictor of progressive impairment in essential daily activities (Ostwald, Snowdon, Rysavy, Keenan, & Kane, 1989; Scherder, Dekker, & Eggermont, 2008).

The resulting loss of independence necessitates caregiver support and often leads to social withdrawal. This social isolation negatively impacts overall well-being and diminishes the quality of life (4).

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⁽⁵⁾. 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.

Marathi acts as a vital link between various cultures, fostering communication and understanding among speakers of Marathi and other languages. It is one of the widely spoken languages in India and is instrumental in bridging linguistic diversity. Marathi holds the status of an official language in the state of Maharashtra and parts of Goa. In India, approximately 83 million people speak Marathi as their first language.

The MHQ has been translated into fifteen languages other than Marathi, including Italian, French, Swedish, Chinese etc. It is recognized globally as a standardized tool for evaluating outcomes in hand conditions and assessing the efficacy of medical and surgical interventions. Despite its widespread application, the MHQ has not been translated into Marathi until this study.

To address this gap and enhance our understanding of hand function from Marathi-speaking patients, this study focuses on translating the MHQ into Marathi and validating the Marathi version (MHQ-Marathi) for clinical and research use.

Methodology

A cross-sectional analytical study was conducted among 40 older adults aged 60 years and above. Participants were selected according to inclusion and exclusion criteria. Inclusion criteria were the subject being able to read and understand the language. The translation process followed a standard forward-backward approach, involving linguistic experts and healthcare professionals to ensure cultural relevance⁽⁶⁾. 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.

Reliability was assessed using Cronbach's alpha, and construct validity was evaluated by correlating the Marathi version's scores with the English version. After obtaining ethical approval and an informed consent form, the study began.

RESULT

Table 1: Reliability Of Marathi Version Of MHQ

Domains	Cronbach's Alpha
Hand Function	0.85
Activities of Daily Living	0.8
Pain	0.83
Work Performance	0.88
Aesthetics	0.79
Satisfaction	0.86
Overall	0.84

Table 2 : Construct Validity Of Marathi Version Of MHQ

Domains	r Value
Hand Function	0.88
Activities of Daily Living	0.85
Pain	0.83
Work Performance	0.87
Aesthetics	0.79
Satisfaction	0.84
Overall	0.86

The mean age of participants was 68.5 years ($SD \pm 4.2$), with a gender distribution of 60% males and 40% females. The Marathi-translated MHQ demonstrated excellent reliability, with an overall Cronbach's alpha of 0.84. The Domains for hand function, activities of daily living, and satisfaction achieved alpha values above 0.80, indicating strong internal consistency (Table 1). Construct validity was confirmed through Pearson's correlation coefficients ($r > 0.86$) across all domains (Table2)

These findings establish the high reliability and validity of the Marathi MHQ as a robust tool for hand function assessment.

DISCUSSION

This study aimed to translate and validate the Marathi version of the patient-rated Michigan Hand Outcomes Questionnaire (MHQ) for use among Indian older adults.

The Michigan Hand Outcomes Questionnaire (MHQ) is a comprehensive tool used to evaluate hand function through six key health domains: overall hand function, activities of daily living (ADLs), pain, work performance, aesthetics, and patient satisfaction. To address language barriers and enhance accessibility, the original English version of the MHQ was translated into Marathi, enabling Marathi-speaking individuals to accurately assess and communicate their hand function levels.

During the process of translating the original English version of MHQ into Marathi 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 construct validity was used.

The Marathi version of the Michigan Hand Outcomes Questionnaire (MHQ-Marathi) showed excellent reliability, with a Cronbach's alpha value of **0.84**, indicating strong internal consistency. Construct validity was confirmed with Pearson's correlation values across all domains, ranging from **0.79** to **0.88**, demonstrating strong positive correlations between the English and Marathi versions.

The test-retest reliability of the Marathi MHQ was also excellent, with a correlation coefficient of **0.86** for the overall score. This shows that the tool provides stable and consistent results over time, making it suitable for repeated assessments. These results confirm the reliability and cultural relevance of the MHQ-Marathi, enabling healthcare professionals to assess hand function effectively in Marathi-speaking older adults. A strong positive linear relationship was observed across all domains, ensuring its accuracy and applicability in clinical practice.

CONCLUSION

The Marathi version of the Michigan Hand Outcomes Questionnaire is a robust tool for evaluating hand function among Marathi-speaking older adults in India. Its availability is anticipated to enhance healthcare delivery and research in hand-related conditions. There were no conflict of interest.

REFERENCES

1. Shauver MJ, Chung KC. The Michigan hand outcomes questionnaire after 15 years of

- field trial. *Plast Reconstr Surg*. 2013 May;131(5):779e-787e. doi: 10.1097/PRS.0b013e3182865d83.
2. Eli Cameli, Hagar Patish, Raymond Coleman, The Aging Hand, *The Journals of Gerontology: Series A*, Volume 58, Issue 2, February 2003, Pages M146–M152
3. Tonak HA, Taskiran H, Algun ZC. The effects of aging on sensory parameters of the hand and wrist. *J Gerontol Geriatr*. 2021;69(1):6–13.
4. Zhang, Q., Lin, Y., Liu, X., Zhang, L., Zhang, Y., Zhao, D., Lu, Q., & Jia, J. (2021). Diabetic Peripheral Neuropathy Affects Pinch Strength and Hand Dexterity in Elderly Patients. *Neural Plasticity*, 2021. <https://doi.org/10.1155/2021/9959103>
5. Kamalakannan S, Gudlavalleti ASV, Gudlavalleti VSM, Goenka S, Kuper H. Incidence & prevalence of stroke in India: A systematic review. *Indian J Med Res*. 2017 Aug;146(2):175-185. doi:10.4103/ijmr.IJMR_516_15.
6. Bujang MA, Yoon H, Lee K. A Step-by-step Guide to Questionnaire Validation Research. 2022. 10.5281/zenodo.6801209.
7. Tsang S, Royse CF, Terkawi AS. Guidelines for developing, translating, and validating a questionnaire in perioperative and pain medicine. *Saudi J Anaesth*. 2017 May;11(Suppl 1):S80-S89. doi: 10.4103/sja.SJA_203_17.
8. Bujang, Mohamad Adam & Yoon, Hon & Lee, Khée & Yee, Keng. (2022). A Step-by-step Guide to Questionnaire Validation Research. 10.5281/zenodo.6801209.
9. Britannica, The Editors of Encyclopaedia. "Hindi language". *Encyclopedia Britannica*, 27 Sep. 2023. <https://www.britannica.com/topic/Hindi-language>.
10. Shrivastava, Manisha & Shah, Nehal & Dixit, Astha & Pandey, Manoj. (2017). Hindi Translation and Cross-Cultural Reliability and Validity of Patient Satisfaction Questionnaire Short Form (PSQ-18) 1.
11. Bilal Mahmood, Chen Chongshu, Xing Qiu, Susan Messing, Warren C. Hammert, Comparison of the Michigan Hand Outcomes Questionnaire, Boston Carpal Tunnel Questionnaire, and PROMIS Instruments in Carpal Tunnel Syndrome, *The Journal of Hand Surgery*, Volume 44, Issue 5, 2019