Linguistic and Cultural Landscape of MHQ Adaptation: A Systematic-Narrative Review of Challenges and Strategies

Dr Ravinder Kaur Marwaha[1], Dr Yagna Shukla[2]

[1]Ph.D. Scholar, Gujarat University, Ahmedabad, Professor, MAEER's Physiotherapy College. Pune
[2] Principal, Govt. College of Physiotherapy, Gujarat University, Ahmedabad, India

Corresponding Author: Dr Ravinder Kaur Marwaha

ABSTRACT

Purpose: While the psychometric properties of cross-cultural adaptations of the Michigan Hand Outcome Questionnaire (MHQ) have been previously examined, this systematic-narrative review aimed to explore the critical linguistic and cultural considerations inherent in the adaptation process for diverse populations.

Methods: A hybrid systematic-narrative review was conducted, searching PubMed, EMBASE, CINAHL, and SCOPUS for studies published between 1999 and 2025 that discussed the linguistic or cultural aspects of MHQ adaptation. Data from 20 included articles, identified through a systematic search strategy, were synthesized using thematic analysis to identify key challenges and strategies in adapting the MHQ.

Results: The thematic analysis revealed five overarching themes: (1) Linguistic Challenges and Adaptation Strategies, highlighting issues with direct translation and the need for culturally sensitive adaptation; (2) Cultural Relevance of Activities of Daily Living (ADLs), emphasizing the necessity of modifying items to reflect culturally specific practices; (3) Cultural Relevance of Demographics and Socioeconomic Factors, underscoring the importance of tailoring data collection; (4) Influence of Gender Roles, revealing potential biases in responses based on cultural norms; and (5) Measurement Equivalence and Validation, highlighting the need for rigorous processes to ensure cross-cultural comparability.

Conclusion: This review underscores the multifaceted linguistic and cultural challenges in adapting the MHQ for diverse populations, offering insights that complement previous findings on psychometric properties. The identified themes emphasize the need for culturally sensitive approaches in translation, item relevance, and data interpretation. Future research should prioritize the development of standardized guidelines that integrate these considerations to enhance the validity and clinical utility of the MHQ across global settings.

Keywords: Michigan Hand Questionnaire, Cultural Adaptation, Hand Conditions, Linguistic, Translation

1. INTRODUCTION

The Michigan Hand Outcome Questionnaire (MHQ) is a widely utilized instrument for assessing hand function across various populations. Its successful application in diverse cultural settings necessitates careful cross-cultural adaptation to ensure the validity and reliability of the collected data.[1,2]

While previous studies provided a systematic review and meta-analysis of the psychometric properties of these adaptations, focused on the quantitative assessment of the psychometric properties of MHQ adaptations, this study presents a complementary investigation focusing on the critical linguistic and cultural considerations inherent in the adaptation process.[3] Cultural factors profoundly influence how individuals perceive and experience health, impacting their understanding of questionnaire items and their response patterns.[4,5]

This systematic-narrative hybrid literature review aims to delve into the specific linguistic and cultural challenges encountered when adapting the MHQ for use in non-Western cultural contexts. By analysing existing literature through both systematic and narrative approaches, we aim to identify and characterize the key linguistic nuances and cultural factors that arise during this adaptation process. Furthermore, we explore and evaluate the effectiveness of various cultural adaptation strategies employed in different settings. This review provides valuable insights and recommendations for researchers and clinicians seeking to optimize the utilization of the MHQ in diverse populations, offering a deeper understanding of the adaptation process that complements the findings of our previous quantitative analysis of psychometric properties.

2. MATERIALS & METHODS
Study Design: Hybrid Systematic-Narrative Approach

This study employed a hybrid systematic-narrative review approach to comprehensively explore the linguistic and cultural considerations in the cross-cultural adaptation of the MHQ. This approach was chosen to provide both a broad overview of the existing literature (systematic component) and a deeper, contextualized understanding of the specific challenges and strategies involved (narrative component). [6]

2.1 Search Strategy:

The systematic component of this review involved a comprehensive literature search conducted in electronic databases, including PubMed, EMBASE, CINAHL, and SCOPUS, from 1999 to 2025. The search strategy utilized the following core search terms: Database-specific search terms are detailed in the appendix (Supplementary 1). The search aimed to identify peer-reviewed journal articles, available in any language, that described the cultural adaptation process of the full version of the Michigan Hand Questionnaire (MHQ) for adults (18+) with hand and wrist conditions.

2.2 Selection Process:

Two independent reviewers screened 426 titles and abstracts against predefined inclusion and exclusion criteria. The inclusion criteria focused on studies that explicitly discussed the linguistic or cultural aspects of adapting the MHQ. Studies that solely focused on psychometric properties without discussing the adaptation process itself, randomized controlled trials (RCTs), studies using the Brief MHQ, editorials, conference proceedings, unpublished data, case reports, or case series were excluded. Twenty full-text articles of potentially relevant studies were retrieved for further evaluation (Fig 1).

2.3 Data Extraction and Synthesis:

Data extraction focused on identifying the guidelines used for adaptation, specific linguistic and cultural challenges encountered, and the strategies employed to address these challenges. The narrative synthesis was conducted using thematic analysis.[7,8]

This involved a four-step process:
(1) Identifying the guidelines used for translation and adaptation,
(2) Categorizing the challenges of translating and adapting outcome measures for different cultures and the effective strategies used,
(3) Summarizing recommendations for overcoming these challenges, and

(4) Exploring the implications of the findings for future cross-cultural adaptations of the MHQ.

This thematic analysis allowed for a comprehensive understanding of the qualitative aspects of the MHQ adaptation process across different cultural contexts.

3. RESULT

This systematic-narrative review aimed to identify and characterize the linguistic and cultural factors encountered during the cross-cultural adaptation of the Michigan Hand Outcome Questionnaire (MHQ). The review synthesized findings from 20 full-text articles that met the inclusion criteria. The thematic analysis revealed several key challenges and strategies in adapting the MHQ for diverse cultural contexts.
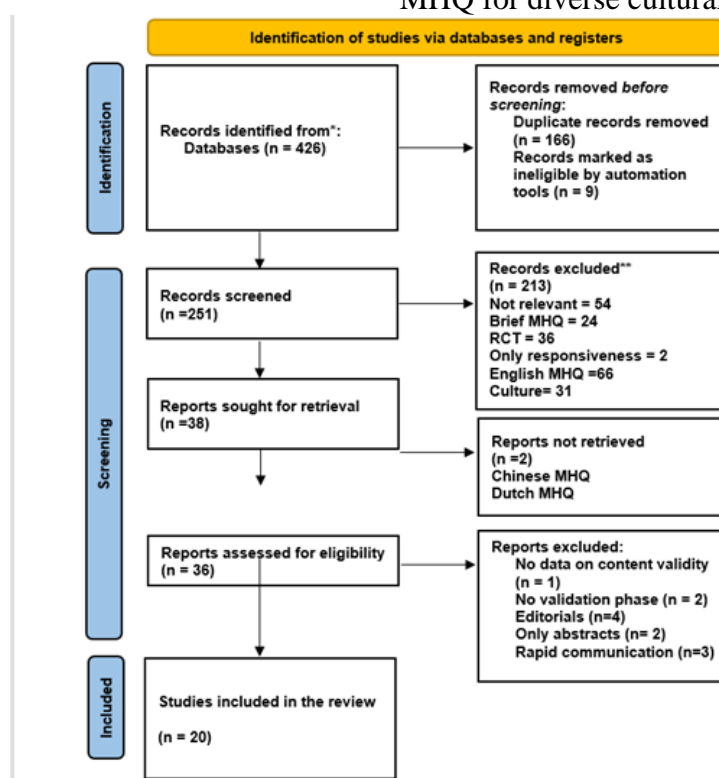

Fig 1: PRISMA flowchart

3.1 Guidelines Used for Cross-Cultural Adaptation: The reviewed studies utilized various guidelines for translating and adapting the MHQ. While the guidelines by Beaton et al. were commonly referenced, specific adaptations in Finnish, Korean, Polish, and Italian contexts followed the American Academy of Orthopaedic Surgeons guidelines.[9] The Arabic adaptation employed Guillemin's Guidelines, emphasizing the need for adaptation beyond mere translation, even within linguistically similar immigrant populations.[10] The number and characteristics of translators involved in the adaptation process varied, but adherence to Beaton's criteria, including forward and back-translation, synthesis by a committee,

and pilot testing, was frequently reported. These rigorous processes highlight the importance placed on achieving semantic, idiomatic, experiential, and conceptual equivalence across languages and cultures, which ultimately aims to ensure the reliability and validity of the adapted MHQ.[11]

3.2 Challenges of Translating and Adapting the MHQ and Effective Strategies:
The thematic analysis identified five overarching themes related to the challenges encountered and the strategies employed in the cross-cultural adaptation of the MHQ:

3.2.1 Linguistic Challenges and Adaptation Strategies:

Direct translation often led to misunderstandings due to idioms, colloquialisms, and nuanced meanings. Examples included the adaptation of the second subscale in the Finnish version and the replacement of "pick up" with a more culturally appropriate verb in the Turkish adaptation. [12,13] The Canadian French adaptation highlighted the lack of direct linguistic equivalents, where "sensation" was misinterpreted as "pain." The overarching strategy to address these challenges was adaptation rather than mere translation, involving bilingual translators and cultural experts to ensure cultural context and nuanced meanings were accurately conveyed. These linguistic nuances, if not carefully addressed, could potentially impact the consistency and interpretation of responses, affecting the overall reliability of the adapted MHQ. [14]

3.2.2 Cultural Relevance of Activities of Daily Living (ADLs):

Several adaptations highlighted the need to modify ADL items to reflect culturally specific activities. For instance, the Koreans and Japanese replaced "Eat with a knife and fork" with "taking a bowl and spoon using both hands when taking a meal, " and "eating with chopsticks," culturally relevant eating practices. [15,16] The Swedish version carrying groceries, usually only involves one hand, so "carrying a grocery bag" was adjusted. [17] The use of culturally inappropriate ADL items can lead to inaccurate assessments of functional status, potentially affecting the content validity of the MHQ in different settings.

3.2.3 Cultural Relevance of Demographics and Socioeconomic Factors:

Adaptations in Thai, Arab, and Malay populations tailored demographic data collection, such as income levels and job/insurance options, to match specific socio-economic and cultural contexts. Insensitive data collection can lead to biased and inaccurate data, hindering the understanding of health disparities within specific populations. Ensuring the relevance of demographic data contributes to a more comprehensive understanding of the factors influencing hand function in diverse cultures. [18–21]

3.2.4 Influence of Gender Roles:

Gender roles were found to influence responses to certain ADL-related questions. Elderly male patients in the Korean adaptation were less likely to answer the "Wash dishes" question, potentially due to traditional Confucian gender roles. Similar issues arose in the Polish adaptation regarding cooking. These findings suggest that cultural norms surrounding gender roles can impact how individuals perceive and report their ability to perform certain activities, which needs to be considered during data interpretation. [15,22]

3.2.5. Measurement Equivalence and Validation:

Ensuring measurement equivalence across cultures involved addressing challenges with response options, as seen in the Turkish adaptation, where "fair" and "poor" conveyed similar meanings. [12] Thorough validation studies were crucial, as exemplified by the Colombian Spanish version requiring modifications to domains and item placement. [23] Resource limitations and the lack of detailed information about expert committees in some studies (Japanese, Swedish, Arabic) were also noted. [24] Ensuring semantic equivalence of response options and conducting rigorous validation studies are essential steps in establishing the reliability and validity of the adapted MHQ in new cultural contexts. [16,17,20]

3.3 Recommendations:

Based on the reviewed literature, several recommendations were identified for future cross-cultural adaptations of the MHQ, including prioritizing culturally sensitive modifications, engaging multidisciplinary teams with cultural experts and linguists,

conducting thorough cognitive interviews, and considering the influence of traditional gender roles on ADL performance.

3.4 Implications for Future Cross-Cultural Adaptations: The findings of this review underscore the importance of a culturally sensitive approach to the adaptation of the MHQ. Integrating narrative synthesis of qualitative data with quantitative analysis, such as examining differential item functioning across cultures, can further enhance our understanding of the MHQ's cross-cultural validity and reliability. Addressing the identified linguistic and cultural challenges is crucial for developing more precise and nuanced measures of hand function across diverse populations.

Table 1: Linguistic and Cultural Adaptations of the Michigan Hand Outcome Questionnaire

Sr No	Language	Author/ year	Age	Journal	Cultural Adaptations	Population
1	Italian[31]	Passiatore M. et al 2021	57±15.7 years	Journal of Hand Surgery	No significant Linguistic/cultural issues identified	Unilateral Hand conditions
2	Polish[22]	Koziej M. et al 2018	56.4±14.9 years	Journal of Hand Surgery	Cultural adaptations done in ADL domain	Hand complaints
3	Swedish[17]	Blomstrand J. et al 2021	61.1±13.5 years	Journal of Orthopaedic Surgery and Research	Cultural adaptations done in ADL domain	Distal end Radius Fracture
4	Persian[32]	Ebrahimzadeh MH. et al 2015	>18 years	Hand Surgery	No significant Linguistic/cultural issues identified	Hand &Wrist Disorders
5	Turkish[12]	Öksüz C. et al 2011	42±11 years	Journal of Hand Surgery	Cultural Adaptation done in ADL domain	Hand Complaints
6	Korean[15]	Roh YH. et al 2011	49 years	Journal of Hand Surgery	Cultural and linguistic adaptations done in ADL domain	Common hand disorders
7	Arabic[20]	Khaja AF. et al 2020	50.65±16.05 years	HSOA Journal of Surgery: Current Trends & Innovations	Cultural Adaptation done in ADL domain	Hand disorders
8	Malay [21]	Lye JX. et al 2021	>18 yrs	Journal of Hand Surgery	No significant Linguistic/cultural issues identified. Demographic details modified	Hand disorders
9	Bahasa Melayu[33]	Kumar A. et al 2022	>18 yrs	Journal of Hand Surgery	No significant Linguistic/cultural issues identified. Demographic details modified	Hand & wrist injuries
10	Finnish[13]	Hulkkonen S. et al 2020	55±15 years	Scandinavian Journal of Surgery	No significant Linguistic/cultural issues identified	Hand Conditions
11	French[34]	Efanov JI. et al 2018	53 years	Hand Surgery and Rehabilitation	No significant Linguistic/cultural issues identified	Hand conditions
12	Brazilian Portuguese[24]	Meireles SM. et al, 2014	49.9 ± 9.3 years	Sao Paulo Med J	Linguistic adaptations done	Hand conditions
13	Thai[19]	Dhippayom	>18 years	Occupational	No significant	Hand

			JP. et al 2018		Therapy International	Linguistic/cultural issues identified	Injuries
14	Thai [18]	Atthakomol P. et al, 2020	47±17 years		Health and Quality of Life Outcomes	No significant Linguistic/cultural issues identified	Hand or Wrist Injuries
15	Columbian Spanish[23]	Miranda D. et al 2008	39 years		Colombian journal of rheumatology	No significant Linguistic/cultural issues identified	Carpal tunnel syndrome
16	Japanese[16]	Oda T. et al 2016	57.7 years		Journal of Hand Surgery	Cultural Adaptation done in ADL domain. Demographic details modified	Hand conditions
17	Spanish[25]	Martínez-Fernández MV et al. 2024	50 ± 11 years		Journal of Orthopaedic Surgery and Research	Cultural and linguistic adaptations done	Hand Conditions
18	Turkish[35]	Ilhanli I. et al, 2015	49.82±9.54 years		Chronic Diseases and Translational Medicine	Cultural Adaptation done in the ADL domain	Carpal Tunnel Syndrome
19	German [26]	Marks M. et al 2014	NA		Arthritis Care Res	Linguistic adaptations done	Dupuytren's
20	Canadian French [14]	Busuioc SA. et al, 2018	52±12.8 years		Journal of Hand Therapy	Linguistic adaptations done	Hand or wrist conditions

NA- not available, ADL- activities of daily living

DISCUSSION

This systematic-narrative review provides a comprehensive overview of the linguistic and cultural considerations encountered during the cross-cultural adaptation of the MHQ. The thematic analysis revealed significant challenges related to linguistic nuances, the cultural relevance of ADLs and demographic data, the influence of gender roles, and the need for rigorous measurement equivalence and validation processes. These findings highlight the multifaceted nature of adapting a Western-developed outcome measure for use in diverse cultural contexts.

Interestingly, our previous systematic review and meta-analysis on the psychometric properties of cross-cultural MHQ adaptations revealed variability in the reported reliability (ICC values) across different cultural contexts. That study employed a systematic search strategy and utilized the COSMIN guidelines to assess the methodological quality of the included studies, focusing on their measurement properties.[3]

The challenges identified in the current review offer potential explanations for the observed variability in reliability reported in our previous work. For instance, the linguistic challenges encountered during translation, such as the lack of direct equivalents or the misinterpretation of terms like "sensation," could introduce measurement error and contribute to lower reliability in certain adaptations.[13–15,24–26] Similarly, the need to adapt ADL items to reflect culturally specific activities suggests that the original MHQ items might not consistently capture the relevant aspects of hand function across all cultures, potentially impacting both the content validity and the reliability of the scores.[12,15,17,20,22,27] The influence of gender roles on responses to specific items could also introduce systematic bias, affecting the consistency of responses within certain cultural groups and thus contributing to the observed variability in reliability.[15,22,28,29]

The use of a hybrid systematic-narrative approach in this review allowed for a broad exploration of the literature while also

providing in-depth insights into the specific challenges and strategies reported in individual studies. The systematic search ensured a comprehensive identification of relevant research focusing on linguistic and cultural adaptation. The narrative synthesis then enabled a nuanced understanding of the complexities involved in the adaptation process. [30]

This approach complements the quantitative focus of our previous meta-analysis, which provided statistical evidence on the reliability and validity of the adapted MHQ versions based on studies assessed for methodological quality using the COSMIN framework.[3] While the meta-analysis offered a quantitative overview of the psychometric properties of adaptations deemed to meet certain quality standards, this review delves into the "why" behind some of those findings, particularly the variability in reliability, by exploring the underlying linguistic and cultural factors identified across the literature through thematic analysis.

However, this review also has limitations. The narrative synthesis, while providing rich contextual information, may be subject to interpretation bias. Furthermore, the included studies varied in their methodological rigor, and we did not apply a formal quality assessment tool like COSMIN in this specific review. Despite these limitations, the findings offer valuable insights for researchers and clinicians involved in the cross-cultural adaptation and use of the MHQ.

Implications for Future Research: Future research should prioritize the development of standardized guidelines for cross-cultural adaptation that explicitly address the linguistic and cultural challenges identified in this review. This includes incorporating best practices for translation and back-translation, conducting thorough cognitive testing to ensure item understandability and cultural relevance, and carefully considering the potential influence of cultural norms and gender roles on responses. Investigating differential item functioning (DIF) across cultures could also help identify specific items that may be biased or function differently across cultural groups, leading to more culturally sensitive and reliable versions of the MHQ.

CONCLUSION

This systematic-narrative review underscores the critical importance of considering linguistic and cultural factors in the cross-cultural adaptation of the MHQ. The identified challenges provide valuable insights into the complexities of ensuring the validity and reliability of this widely used outcome measure in diverse populations. By explicitly linking these qualitative findings to the variability in reliability observed in our previous meta-analysis, which assessed study quality using COSMIN guidelines, this study highlights the complementary nature of different methodological approaches in understanding the nuances of cross-cultural measurement. Future research should build upon these findings to develop more culturally sensitive and psychometrically sound versions of the MHQ, ultimately improving hand function assessment and patient care globally.

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