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Research Article

Reliability and Validity of Hindi Version of Nordic Musculoskeletal Questionnaire

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Abstract

Background: Self-administered questionnaires are essential for clinical assessment and research. Researchers and clinicians must have access to reliable and valid measures of concepts of interest in their own cultures and languages to conduct cross-cultural research and/or provide quality patient care. The majority of the peoples who speak Hindi lives in India hence it will be a useful for practitioners to have a Hindi questionnaire while treating Hindi speaking individuals with musculoskeletal discomforts. Aims and objective of the present study is to culturally adapt, translate and establish the psychometric properties of the Hindi version of the Nordic Musculo-skeletal questionnaire.

Method: The study was conducted in 2 phases. 1st phase consisted of translation and cultural adaptation and in the 2nd phase we conducted a study on 100 Hindi reading populations for establishing the psychometric properties of Hindi version of NMQ.

Results: Expert panel review suggested that the Hindi version of NMQ has good face validity. Interclass correlation and Cronbach's Alpha values of data reveled that Hindi NMQ has good test- retest reliability and internal consistency.

Conclusion: Hindi version of the Standardized Nordic Musculoskeletal Questionnaire is functional and easily understood. It has both good validity and reliability.

Keywords: *Validity; Reliability; Hindi; Musculoskeletal; Questionnaire*

Background

Self-administered questionnaires are essential for clinical assessment and research. Most of the standard questionnaires have been developed for English speaking patients [1,2]. The diversity of the population worldwide suggests a great need for cross-culturally validated research instruments or scales. Researchers and clinicians must have access to reliable and valid measures of concepts of interest in their own cultures and languages to conduct cross-cultural research and/or provide quality patient care. The availability and consistent use of established questionnaires in different languages will facilitate the collection of reliable data [1,3]. Translations of existing English language questionnaires must be reliable and validated to deliver the same meaning as well as to ensure comparability of data [1,4,5]. There are various questionnaires which measures musculoskeletal disorders. One of the most frequently used symptom based questionnaire is standardized Nordic musculo-skeletal questionnaire (NMQ). The Nordic questionnaire was developed in the framework of a project supported by the Nordic Council of Ministers. It consists of structured, forced, multiple choice questions and can be used as a self-administered questionnaire or as an interview [1,6,7]. The questionnaire is designed to answer the following question: "Do musculoskeletal troubles occur in a given population, and if so, in what parts of the body are they localized?" With this consideration in mind, the

NMQ consists of 27 binary choice questions (yes or no).The questionnaire has three questions applied to nine regions (neck, shoulders, elbow, wrists/hands, upper back, low back, hips/thighs, knees, ankles/feet).The first is ''had some troubles (ache, pain, discomfort) in the last 12 months", the second is ''in the last 12 months felt some limitation caused by work in the daily activities", and the third is ''had some troubles or pain in the last 7 days" [1,8]. The reliability of the questionnaires has been shown to be acceptable. NMQ is largely used in United States showing easy administration among the subjects. Since this instrument was originally written in English language, a Hindi translation cultural adaption and establishment of its psychometric properties is necessary. Hindi is the official language of the government of the India, and one the most common language spoken worldwide. The majority of the peoples who speak Hindi lives in India; however, a number of people who have migrated to North America, Europe, parts of Australia consider Hindi as their native languages. In the recent time, several measures have been translated for Hindi speaking population [8-10]. However, No Hindi version exists for the standardized NMQ. Translation and cultural adaption of this questionnaire to the Hindi speaking population would allow wide spread use of this questionnaire by Hindi speaking population. It will be a useful measure for practitioners across the world treating Hindi speaking individuals with musculoskeletal discomforts but also facilitate outcome measurement across research trials involving such participants [11-13].

Aims and Objective

Aims and objective of the present study is to culturally adapt and translate Nordic musculoskeletal questionnaire into Hindi and to investigate psychometric properties of the Hindi version of the Nordic Musculo-skeletal questionnaire.

Method

The first phase of the study consisted of Hindi translation and cultural adaptation of English version of NMQ. In the second phases reliability and validity of the Hindi version of the scale was assesses.

First phase: (translation and cultural adaptation): The process of the conceptual and linguistic equivalences began with the translation using the internationally recommended methodology: forward translation; back-translation; committee review; and pretesting. First, the questionnaire was independently translated into Hindi by one Hindi expert and one physician, and a consensus version was generated. Second, two other bilingual experts performed a back-translation independently from one another. Consented version was then submitted to a committee, consisting of six specialists in the area of knowledge of the instrument, to evaluate its equivalence to the original instrument. Once the committee approved the pre-final version of the NMQ, preliminary analysis of its psychometric properties was conducted [14].

Second phase (reliability and validity assessment): For establishing the psychometric properties of Hindi version of NMQ "door to door survey" study was conducted (from 12th February 2018 to 28th February 2018). In this study, using quota sampling technique the people (Male and Female) of the Kanpur Nagar aged between 20 to 49 years who were able to read and comprehend Hindi participated. The subjects were recruited from Chaubepur, Brahmnagar, Shivpuri areas of Kanpur, Uttar Pradesh, India. People who were able to read and understand Hindi and aged between 20 - 49 years were included in the study [1]. People who gave history of any recent injury or diagnosed medical illness which may contribute to MSD were excluded.

We approached 107 people out of which 4 did not give consent, 1 was not able to read Hindi and 2 were excluded due to age criteria. Hence total sample of 100 people was collected. After explaining the aim of the study duly signed consent form was obtained from each participant. The subjects who fulfill the inclusion and exclusion criteria were asked for demographic details, any present or past medical history, family history, surgical history, for each subject. People were given clear instruction for responding to the Hindi Nordic musculoskeletal questionnaire. Retesting was done at an interval of 7 days from same set of people. The questionnaire was individually self-administered in order to avoid any risks of contamination. Statistical analysis was performed using SPSS 14.0 (Chicago, IL). Reliability analysis was done by calculating Cronbach's alpha value. For all statistical tests the level of signification was as $P < 0.01$.

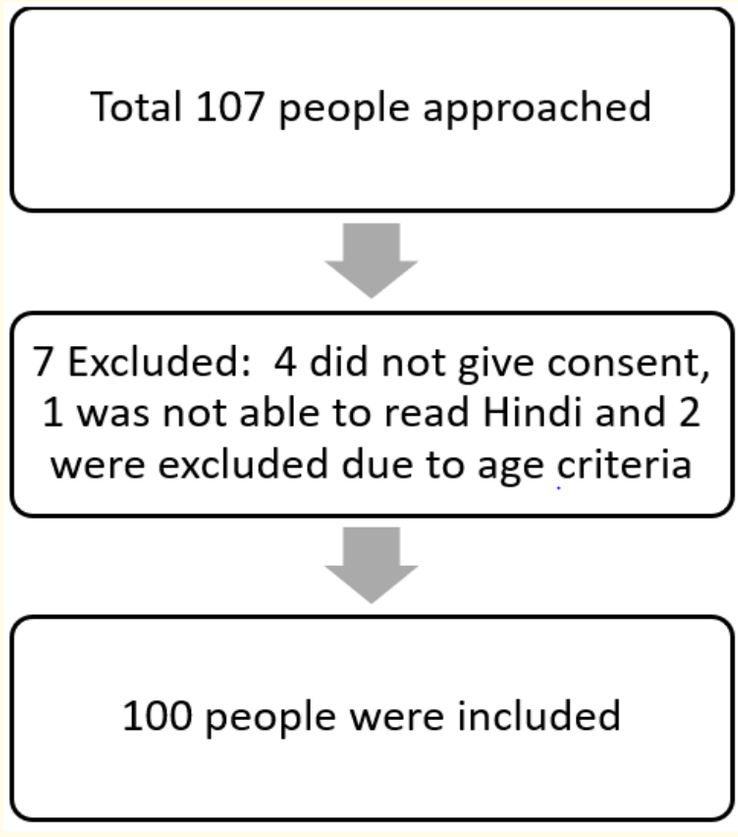

Figure 1: *Subject distribution flow chart.*

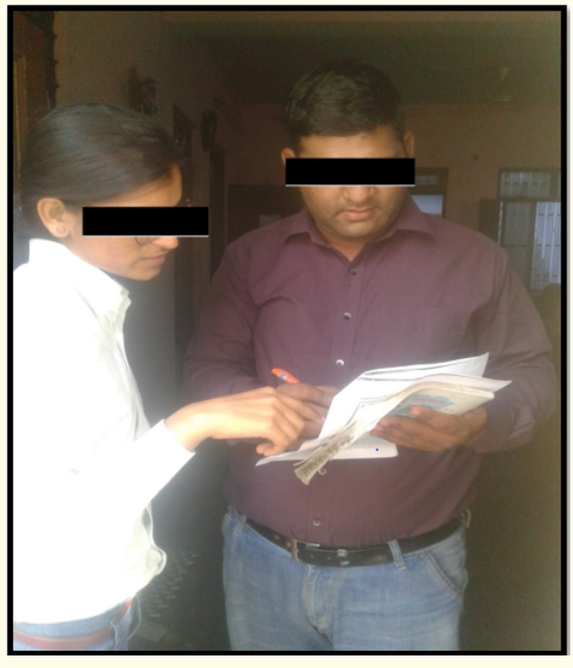

Figure 2: *Subject responding to the Hindi Nordic Musculoskeletal Questionnaire.*

Results

The study was conducted to translate and find out the psychometric properties of the Hindi version of the Nordic musculoskeletal questionnaire. The descriptive statistical analysis of data (N = 100) showed that mean age of respondents were 31.35 ± 8.47, weight in kilograms was 58.28 ± 10.98 and height in centimeters was 156.76 ± 7.88 (Table 1 and 2).

	N	Minimum	Maximum	Mean	Std. Deviation
Age	100	20.00	49.00	31.35	8.47
Height	100	138.00	178.00	156.76	7.88
Weight	100	35.00	106.00	58.28	10.98

Table 1: *Descriptive details about age, height and weight.*

Gender	Frequency
Male	51
Female	49

Table 2: *Gender wise details.*

The cultural and linguistic adaptations of the Standardized Nordic Musculoskeletal Questionnaire (NMQ) to the Hindi involve the translation from the original language to Hindi and the psychometric properties analysis (validity and reliability).

Content validity depends on the extent to which an empirical measure reflects a specific domain of content. The content validity was obtained during the translation and retranslation process referring to a panel of judges constituted by a multidisciplinary panel (ordinary people, bilingual Official translator and physiotherapists). The panel found that the content validity of the Hindi version of NMQ is good.

The Hindi NMQ demonstrated both good test-retest reliability and internal consistency. Test-retest reliability is the ability of an instrument to produce similar results on repeated administration when, no real change in health status has occurred within this period. The internal consistency has been verified by Cronbach's Alpha coefficient of reliability, which showed a correlation coefficient of 0.834 (Table 3). The ICC values obtained were higher than 0.7 for Hindi speaking population a value that denotes good reliability (Table 4).

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.812	0.818	27

Table 3: *Reliability Statistics.*

	Intraclass Correlation(a)	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	0.157(b)	0.119	0.210	6.302	99.0	2574	.000
Average Measures	0.834(c)	0.784	0.878	6.302	99.0	2574	.000

Table 4: *Intra-class Correlation Coefficient.*

Two-way mixed effects model where people effects are random and measures effects are fixed.

a: Type A intraclass correlation coefficients using an absolute agreement definition.

b: The estimator is the same, whether the interaction effect is present or not.

c: This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

Adding to all the information previously described we think this measuring instrument should be applied to subjects with different characteristics from those that participated in this study with the purpose of achieving a bigger and better representation of the Hindi speaking population.

Discussion

The cultural and linguistic adaptations of the Standardized Nordic Musculoskeletal Questionnaire (NMQ) to the Hindi population involve the translation from the original English language to Hindi and the psychometric properties analysis (validity and reliability). Those processes have been in accordance with the WHO guidelines [14]. The content validity was obtained during the translation and retranslation process recurring to a panel of judges constituted by a multidisciplinary panel (ordinary people bilingual official translator and physiotherapists). This panel checked the clearness the inclusion of all concepts and the redundancy of the instrument's items.

Translation of the English NMQ to Hindi addresses clinical gap and provides an additional tool for researchers and clinicians to utilize. The study results were limited by the small sample recruited. Moreover, the psychometric properties are context-specific and therefore the results are limited to the people of rural population of north India.

Conclusion

Translation and cultural adaptations to the English version of Nordic Musculoskeletal Questionnaire did not diminish its validity or reliability for obtaining information about the severity of musculoskeletal symptoms in Hindi reading and understanding population. Hence we believe that the Hindi version of the Standardized Nordic Musculoskeletal Questionnaire is functional and easily understood.

Relevance to Clinical Practice

Musculoskeletal disorders are an issue for everyone's. This questionnaire can be used to monitor the musculoskeletal health, and in musculoskeletal disorder prevention studies.

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Authors' Contributions

Garima Gupta has made substantial contribution in concept, design and data analysis. Bhavana and Rishikesh helped in review of literature, data collection and result interpretation. All the authors worked together in drafting the manuscript as well as revising it critically to ensure the best results. All authors read and approved the final manuscript.

Conflict of Interest

All the authors read and declare that we have no competing interests.

Bibliography

1. Cristino Carvalho Mesquita., *et al*. "Portuguese version of the standardized Nordic musculoskeletal questionnaire: cross cultural and reliability". *Journal of Public Health* 18.5 (2010): 461-466.

2. Barros ENC and Alexander NMC. "Cross-cultural adaptation of the Nordic musculoskeletal questionnaire". *International Nursing Review* 50.2 (2003): 101-108.

3. Kyoung-Sim Jung., *et al*. "Reliability and validity of the Korean version of the Short Musculoskeletal Functional Assessment Questionnaire for patients with musculoskeletal disorder". *The Journal of Physical Therapy Science* 28.9 (2016): 2568-2571.

4. Wang Y., *et al*. "Reliability and validity of the Chinese version of the short musculoskeletal function assessment questionnaire in patients with skeletal muscle injury of the upper or lower extremities*". BMC Musculoskeletal Disorders* 16 (2015): 161.

5. Reininga IH., *et al*. "Cross-cultural adaptation of the Dutch short musculoskeletal function assessment questionnaire (SMFA-NL): internal consistency, validity, repeatability and responsiveness". *Injury* 43.6 (2012): 726-733.

6. Veehof MM., *et al*. "Psychometric qualities of the Dutch language version of the disabilities of the arm, shoulder, and hand questionnaire (DASH-DLV)". *Journal of Hand Therapy* 15.4 (2002): 347-354.

7. de Groot IB., *et al*. "The Dutch version of the knee injury and osteoarthritis outcome score: a validation study". *Health and Quality of Life Outcomes* 6 (2008): 16.

8. Saurabh P Mehta., *et al*. "Psychometric Properties of the Hindi Version of the Disabilities of Arm, Shoulder and Hand: A Pilot Study". *Rehabilitation Research and Practice* (2015): 482378.

9. SP Mehta, *et al*. "Crosscultural adaptation and psychometric testing of the Hindi version of the patient-rated wrist evaluation". *Journal of Hand Therapy* 25.1 (2012): 65-78.

10. M Dhyani., *et al*. "Hindi translation and validation of dysfunctional beliefs and attitudes about sleep (DBAS-16)". *Industrial Psychiatry Journal* 22.1 (2013): 80-85.

11. Alexis Descatha., *et al*. "Validity of Nordic-style questionnaires in the surveillance of the upper-limb work-related musculoskeletal disorders". *Scandinavian Journal of Work, Environment and Health* 33.1 (2007): 58-65.

12. Marina Zambon Orpinelli and Neusa Maria Costa Alexander II. "Cross-cultural adaptation of an instrument to measure work-related activities that may contribute to osteomuscular symptoms". *Acta Paulista de Enfermagem* 22.2 (2009).

13. Carmines EG and Zeller RA. "Reliability and Validity Assessment". Sage University Papers on Quantitative Applications in the Social Sciences. 07-001. Beverly Hills and London: Sage Publications (1991).

14. Process of translation and adaptation of instruments: http://www.who.int/substance_abuse/research_tools/translation/en/

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