

Cross Cultural Adaptation and Assessment of Nordic Musculoskeletal Questionnaire Gujarati Version

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Abstract: *Background:* Nordic Musculoskeletal Questionnaire (NMQ) is widely used questionnaire for health survey and recording of musculoskeletal symptoms in general population as well as in various occupational settings. NMQ covers nine anatomical regions along with a body chart of specified areas and questions relating to trouble in last 12 months and last 7 days; and limitation in functional area in last 12 months. NMQ has been translated and adapted in various languages for application in different countries and cultures. *Aim:* To cross culturally adapt NMQ, from English language to Gujarati language and assess NMQ Gujarati version. *Methodology:* Cross cultural adaptation of instrument was made using a standardized tool and NMQ Gujarati version was generated. The questionnaire was tested on randomly selected 90 participants. Data was collected twice with an interval of 2 days. *Result:* Face validity and Content validity was found to be good by the expert committee. For Test Retest Reliability, Kappa measure was used and result between 0.664 to 1.000 obtained. For Internal Consistency, Cronbach's Alfa was performed and result showed 0.790. *Conclusion:* Cross cultural adaptation and assessment of NMQ Gujarati version was found satisfactory. NMQ Gujarati version can be utilized by Physiotherapy fraternity for assessment and management of musculoskeletal symptoms in Gujarati participants.

Keywords: Musculoskeletal disorders (MSDs), cross cultural adaptation, reliability, validity

1. Introduction

Since last two decades musculoskeletal disorder related to job or occupation has drawn quite attention all over the world. Work related Musculoskeletal Disorders (WMSDs) are health problems associated with structure and function of loco-motor systems. It is defined as a health related problems of muscle, tendon, skeletal, ligaments, cartilage, nerves and surrounding tissues. WMSD may range from a mild to most severe disabling condition with varying nature and course.¹ Different researchers across the globe have used various techniques for assessment as well as management of WMSDs.

Among methods of assessment, a tool named Nordic Musculoskeletal Questionnaire (NMQ) is widely used. NMQ was developed by Nordic country researchers and the project was supported by Nordic Council of Ministers. NMQ is used for evaluation of health symptoms encountered in job setting.² Since its development in the year 1987 it is commonly employed by researchers in epidemiological studies and by clinicians in general health examination.

NMQ is a simple, structured questionnaire which consists of a body map depicting nine anatomical site indicating neck, upper back, lower back, shoulder, elbow, wrist/hand, hip/thigh, knee, and ankle/foot of both sides. It includes questions on symptoms experienced in last 12 months and last 7 days along with limitation in activity level in last 12 months. Answers to these questions are recorded in the binary system.^{2,3} It can be administered by an interview

method or self-administration. It takes less than 10 minutes to complete the questionnaire.

Original NMQ English has been translated and validated in different languages like Brazilian Portuguese, Portuguese, Greek, Turkish, Chinese and Hindi^{4,5,6,7,8,9} to increase its usability in different cultural and country settings. Cross cultural adaptation is a process addressing issue of translation and adaption of a questionnaire to be used in a different setting. It is required when a questionnaire is used in divergent setting from its original population, in terms of different country, different culture along with different language of target population.^{10,11}

NMQ is often used while addressing musculoskeletal disorders in India. However, it has not been translated into Gujarati language to best of our knowledge. Hence, efforts have been placed in this study to cross culturally adapt and assess the Nordic Musculoskeletal Questionnaire Gujarati Version.

2. Methodology

Two steps were performed to fulfill aforementioned aim of the study. In step one, NMQ was cross culturally adapted into Gujarati language using WHO guideline of process of translation and adaptation of instruments.¹² In step two, NMQ Gujarati version was assessed for face validity, content validity, test retest reliability and internal consistency.

In step one; forward translation of NMQ into Gujarati was done by an Independent translator with a background of health care profession. Guideline as well as the purpose of translation of questionnaire was explained to the translator. Emphasis was placed on conceptual translation rather than literal linguistic translation. Translated version was then reviewed by an expert committee, which consisted of a bilingual expert, a health care professional, translators, a layman and; first and third author of this paper. Suggested changes by the committee were implemented and Gujarati version was then approved.

Backward translation was conducted by an Independent translator who was unaware about the purpose of study. Again emphasis was placed on conceptual translation rather than linguistic translation. Further it was reviewed by the expert committee for any discrepancy in both original and backward translated version.

After agreement on both translations by the expert committee, questionnaire was out for pre testing. Pre testing was carried out on 10 individuals, 7 male and 3 female. They were interviewed for any difficulty in understanding question, response system, lay out and linguistic translation. Subsequently, final version of Nordic Musculoskeletal Questionnaire Gujarati version was prepared and sanctioned by all committee members.(Refer appendix)

In step two, for assessment of Nordic Musculoskeletal Questionnaire Gujarati version 100 participants were randomly selected from a Physiotherapy and a Nursing College. Among those 100 participants, 5 were excluded as 2 participants' mother tongue was not Gujarati and 3 participants were unable to read and/or write Gujarati language.

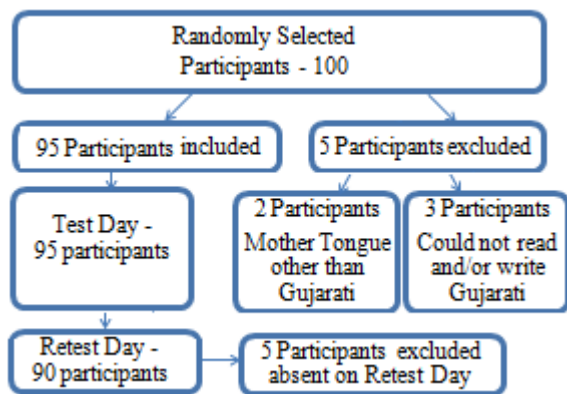


Figure 1: Flow Chart of Methodology Part-2 (Assessment of NMG Gujarati Version)

For assessment of test-retest reliability and internal consistency, data was collected twice with a 2 day interval at same time and same place. Purpose of the study was described to them. The questionnaire was explained and instructions were given to them. They were given 15 minutes to complete the questionnaire. 90 participants filled questionnaire on both days, with 5 drop outs. Hence, 5 participant's initial data was removed because of incompleteness of data. Refer Figure 1- Flow Chart of Methodology Part-2 (Assessment of NMG Gujarati Version)

3. Result

For analysis of data SPSS Inc. version 16.0 was used. Total 90 individuals participated in the present study. Among them 18 participants were male and 72 participants were female. Mean age of participants was 20.80 ± 3.10 years. Mean body mass index was 19.39 ± 3.95 with mean height 1.66 ± 0.09 meters and mean weight 54.21 ± 12.86 kilograms (Table 1).

Validity is multifaceted concept and established by different methods. Face validity of an instrument is what it purports to measure on face. Content validity of an instrument is a degree to which it measures subject of interest. ¹³ Both face validity and content validity were decided by the expert committee and found to be good.

Table 1: Descriptive parameters of participants

Parameter	Minimum	Maximum	Mean	SD
Age(years)	18	32	20.8	3.102
Height(m)	1.45	1.85	1.6639	0.09008
Weight(kg)	32.5	92	54.2156	12.86113
BMI	11.79	31.62	19.493	3.95735

For Reliability testing, data was analyzed to assess Test-Retest Reliability and Internal Consistency.

Kappa is generally employed to check Test-Retest Reliability of scale items which ranges from 0 to 1. Kappa measure was performed and result showed values between 0.664 to 1.000, which indicates substantial to almost good strength of agreement (Table 2).

Table 2: Kappa measure for NMQ Gujarati

Body Regions	Have you at any time during the last 12 months had trouble (such as ache, pain, discomfort, numbness)?	During the last 12 months have you been prevented from carrying out normal activities (e.g. job, housework, hobbies) because of this trouble?	Have you had trouble during the last 7 days (such as ache, pain, discomfort, numbness)?
Neck	0.949	0.668	0.664
Shoulder	0.941	0.883	0.739
Upper back	0.851	0.776	0.675
Elbow	0.904	0.903	1.000
Wrist / Hand	0.907	0.789	0.904
Lower Back	0.689	0.718	0.773
Hip / Thigh	1.000	1.000	1.000
Knee	0.787	0.752	0.731
Ankle / Foot	0.810	1.000	0.848

Cronbach's Alfa is generally employed to check Internal Consistency of scale items which ranges from 0 to 1. Cronbach's Alfa was performed and result showed 0.790 value, which indicates acceptable reliability.

4. Discussion

We made efforts to cross culturally adapt NMQ English version using a standardized tool and to assess NMQ Gujarati version.

For cross cultural translation and adaptation of instrument WHO guideline was employed. This guideline is commonly employed by researchers for cross cultural adaptation of several instruments into different Indian languages.^{9,14}

NMQ Gujarati Version was self-administered to avoid potential examiner's bias. Two days of short interval was kept between test and retest to minimize possibility of change in health status of participants. Face validity and content validity of NMQ Gujarati version are similar to findings of NMQ Turkish and Hindi version.^{7,9}

For analysis of test-retest reliability of nominal and ordinal data Kappa measure is recommended.¹⁵ It is measure of reproducibility of data. Therefore, Kappa measure was employed which showed values between 0.664 to 1.000 i.e. substantial to almost perfect strength of agreement.¹⁶ For analysis of internal consistency Cronbach's Alpha is commonly used. It is a measure of interrelatedness of item of test. Therefore, Cronbach's Alpha was employed which showed value 0.790 i.e. acceptable reliability.¹⁷ Findings of test-retest reliability and internal consistency are in line with Greek, Brazilian Portuguese and Portuguese versions of NMQ.^{4,5,6}

Therefore, Cross cultural adapted and assessed NMQ Gujarati version allows collection and comparison of data with various studies where English or other versions of NMQ have been used. New research can be carried out using NMQ Gujarati version with an interview method as administration technique; and extending sample size, age group as well as occupation.

5. Conclusion

Cross cultural adaptation and assessment of NMQ Gujarati version was found satisfactory. This version reduces interpretive burden of both researchers and participants; and can be regarded as handy and important functional tool. Hence, NMQ Gujarati version can be utilized by Physiotherapy fraternity for assessment and management of musculoskeletal symptoms in Gujarati participants.

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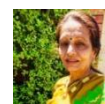
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Author Profile



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Appendix- Nordic Musculoskeletal Questionnaire Gujarati

Nordic Musculoskeletal Questionnaire
નોર્ડિક મસ્ક્યુલોસ્કેલેટલ ક્વેશ્ચનેર

કોલમ 1 અને 3 ના જે પદ્ધતિ જવાબ 'હા' એવા તેને શરીરના અંગોના ચિત્રમાં ડાબી, જમણી કે બંને બાજુ લાઈન - ૦ કરી દર્શાવો.

શરીરના અંગોનું ચિત્ર ડાબી બાજુ જમણી બાજુ	શરીરના અંગોના નામ	તમને છેલ્લા 12 મહિના દરમ્યાન કોઈપણ સમયે તકલીફ થઈ છે: (જેમ કે ડુખાવો, પીડા, બેથેની, નિષ્ક્રિયતા)	તમને છેલ્લા 12 મહિના દરમ્યાન આ તકલીફોને કારણે સેજબલ સીજની સામાન્ય પ્રવૃત્તિ કરવામાં અડચણ થઈ છે: (દા.ત: નોકરી, પરભ્રમ, શોખ)	તમને છેલ્લા 7 દિવસ દરમ્યાન કોઈ તકલીફ થઈ છે: (જેમ કે ડુખાવો, પીડા, બેથેની, નિષ્ક્રિયતા)
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	પગની પૂંદી / પગ	<input type="checkbox"/> હા <input type="checkbox"/> ના	<input type="checkbox"/> હા <input type="checkbox"/> ના	<input type="checkbox"/> હા <input type="checkbox"/> ના