

Translation, Cross-Cultural Adaptation and Validation of the Gujarati Version of the Knee Outcome Survey - Activities of Daily Living Scale

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ABSTRACT

Background: Knee joint disorders limit functions and reduce quality of life. The Knee Outcome Survey-Activities of Daily Living Scale (KOS-ADLS) is a knee-specific, patient-reported scale that assesses symptoms and functional limitations in activities of daily living experienced due to knee disorders. The original English version of the KOS-ADLS has been shown to be reliable and culturally adapted. The aim of this study was to translate the original version of the KOS-ADLS questionnaire into Gujarati and to validate this Gujarati version of the questionnaire.

Methodology: Translation was done of knee outcome survey as per the WHO guidelines using the forward-backward method. Gujarati translation was done by Gujarati translator. An expert panel of 6 professionals determined the face validity. Changes were made according to suggestions to get version KOS-ADLS-1. Backward translation was done by a translator. A pilot study was conducted to determine fluency, ease and understanding. Suggestions were added and version KOS-ADL-2 was made. This version was administered to 20 participants to find out inter-rater reliability, intra-rater reliability, and Cronbach's alpha.

Result: There is a strong positive correlation between Gujarati version and KOS-ADLS with interclass reliability (ICC=0.971), and intra-rater reliability of (ICC=0.99) and the Cronbach's alpha value for test-retest reliability analysis was 0.92.

Conclusion: The Gujarati version of KOS-ADLS was found to be a reliable and valid outcome measure for assessing daily living activities in patients who suffer from knee pathological conditions.

Keywords: Knee outcome survey, knee disorders, reliability, validity

INTRODUCTION

Knee joint disorders limit functions and reduce quality of life and have showed to be a significant public health problem. [1] A number of joint- and disease-specific disability scales have been developed for knee patients. [2] Rehabilitation for knee joint disorders is mainly aimed to improve quality of life (QOL) and physical activity. [3] Because radiographic imaging or clinical examination does not correlate with symptoms of patient, it is important to consider clinical outcomes from the

patient's perspective. [4] For that there are many knee-specific questionnaires in the literature. However, most of these questionnaires, such as Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) [5], Knee injury and Osteoarthritis Outcome Score (KOOS) [6], and International Knee Documentation Committee Subjective Knee Form (IKDC) [7] and many more have been developed for a defined pathological condition.

Knee joint disorders affect the Quality of life. [8] Meanwhile, generic health

questionnaires such as the Short Form Health Survey (SF-36) may be less responsive to knee related physical changes. Thus, it is necessary to have instruments that consider the limitations imposed by knee disorders. The Knee Outcome Survey-Activities of Daily Living Scale (KOS-ADLS) was developed as a knee-specific, patient-reported scale to assess symptoms and functional limitations undergone by individuals with knee disorders during their daily activities. It is easy to understand and quick to complete, It can be used in various knee disorders (surgical and non-surgical) and pathological conditions. [5] The Knee Outcome Survey is a patient self-report survey that includes Activities of Daily Living Scale (ADLS) and Sports Activity Scale (SAS). The ADLS is a 14 item scale that queries patients how their knee symptoms affect their ability to perform daily activities (6 items) and how their knee affects their ability to perform specific functional tasks (8 items). All items are rated 0-5, 5 means “no difficulty” and 0 means “unable to perform” The maximum possible score is 70. The scores for all items are added, divided by 70, and then multiplied by 100 to give an overall ADLS percent rating. Higher percentages indicate higher levels of functional ability. [9]

This scale is translated into many languages Greek, Turkish, French, Arabic, Chinese and many more. The aim of this study was to translate and validate the questionnaire into Gujarati language for use in clinical settings and future studies for Gujarati speaking patients with knee disorders.

MATERIALS & METHODS

A methodological study was conducted in Ahmedabad, where translation was done according to the WHO forward backward method. First forward translation of the English version of KOS-ADLS was done into Gujarati by an independent translator who made the forward translated version.

An expert panel of 6 experts was invited for the study. The expert panel consisted of 3 physiotherapists, 3 orthopedic surgeons. The

suggestions they gave were added into the translated version to make Gujarati version 1, of KOS-ADLS. The experts evaluated the face validity of each item in the translated version. A translator who knew both languages and having good experience with translations and backward translation was done and version 2 was finalized.

To determine fluency, ease and understanding a pilot study was conducted with version 2 of the Gujarati KOS-ADLS scale on patients with knee conditions. Changes were done according to suggestions given by participants and the final version of KOS-ADLS Gujarati was made.

The final version was given to 20 participants selected by convenience sampling to find out test-retest reliability. Two therapists performed the scale on same participant for inter-rater reliability. One therapist performed the scale twice on the same participant for intra-rater reliability. The testing was repeated with a gap of 48 hours. Participants with Gujarati as their mother tongue having knee disorders were included in the study. Those unable to comprehend the questionnaire were excluded.

STATISTICAL ANALYSIS

Data was analyzed using SPSS version 20.0. In this study, psychometric properties of the Gujarati version of knee outcome survey activities of daily living, including test-retest reliability and Face validity, were evaluated.

RESULT

Demographic detail of expert panel is shown in table 1.

Table 1: Demographic of experts in the panel.

Variable	Mean \pm SD (years)
Age	(45.5 \pm 10.06)
Professional experience	(9.5 \pm 7.77)

Mean age of 20 participants was 61.25 \pm 6.39 years. There were 5 males and 15 females. Most of them were housewives or were retired. Nine participants had

hypertension or diabetes or both. 15 had knee osteoarthritis, 2 had meniscus injury, 2 had ACL reconstruction patient, and one had ACL reconstruction with meniscus repair.

There is a strong positive correlation between of Gujarati version of KOS-ADLS with interclass reliability (ICC=0.971), and intra-rater reliability of (ICC=0.99). Cronbach's alpha value for test-retest reliability analysis was 0.92 for the Gujarati version of knee outcome survey activities of daily living.

The expert panel found the translated scale to have reasonable face validity for its use in Gujarati population.

DISCUSSION

The KOS-ADLS Scale is a knee-specific, patient-reported scale that evaluates the symptoms and functional limitations experienced by knee patients in daily activities. [9] Compared to other similar instruments, KOS-ADLS is easy to understand and quick to complete and can be used in various knee disorders (surgical and non-surgical) and pathological conditions such as ligament injuries, or patella femoral pain. [10]

In this study, a two-day retest interval was used for the evaluation of reliability. This was in accordance with Marx et al. They found no differences in the scores of the KOS-ADLS after a retest interval of two days or of two weeks (ICC of 0.93 on both occasions). [11]

An interesting observation in the present study was the difficulty in understanding the phrase "kneeling using the front of the knees". This was also found in the translation into Chinese who encountered similar difficulty. This difficulty was remedied in the final Gujarati version of KOS-ADLS using "ghutan par besvu" instead of "ghutan ni saame besvu".

The translation for "giving way, buckling, or shifting of the knee" was also confusing, in Gujarati translation into "Guthan aagad aavi javu". So it was changed to "guthan achanak vali

javo", "pag dhachkai javo", "pag lachkai javo". Rimnauli Deasy Putryanti Sinaga, et al translated and validated Indonesian version of KOSADL. They found same difficulty in understanding and in translation "kneeling using the front of the knees" and in "giving way, buckling, or shifting of the knee". In the study they established Cronbach's α at 0.911 and ICC was 0.969 (0.950–0.981). [12]

Some smaller changes were done in words like, "sahej" modified to "ekdam thodi". A change was also done in sentence "the symptoms prevent me from all daily activity" which was translated as "lakshan mane badha dainik pravrutti mathi atkave chhe" to "lakshan mane mari badhi dainik pravrutti karta atkave chhe" Zhen-Yu Jia et al made some minor adjustments when they translated the scale into Chinese language to make it easier for Chinese speakers to understand. The word "buckling" sounded too scientific to people and it was difficult for them to understand the question. Therefore, this word was translated as "the symptom that your leg cannot straighten." The phrase "kneel on the front of your knee" directly translated into Chinese was altered due to traditional Chinese custom, so this phrase was translated to an acceptable expression. The SC-KOS-ADLS has been proven to have good reliability, validity, and responsiveness for use in patients with knee disorders in China. [13]

Hooman Minoonejad, et al did translation and psychometric evaluation of the Persian version of KOS ADL. They made some changes while translating, three words in item 4 (giving way, buckling, or shifting of knee) have the same meaning in Persian and the item was changed to 'giving way or instability of knee. Additionally, items kneel on the front of your knee, squat, and sit with your knee bent were accompanied by pictures to resolve the differences between the two translators and they found acceptable level of interclass correlation coefficient (ICC=0.91) and Cronbach's α coefficient ($\alpha=0.91$) for the Persian KOS-ADLS. [10]

CONCLUSION

The Knee outcome Survey activities of daily living Gujarati version, demonstrated good intra-rater and inter-rater reliability and face validity. It can be used for the assessment of symptoms and functional limitation in patients with knee disorders.

Declaration by Authors

Ethical Approval: The study was conducted according to the principles of the Declaration of Helsinki.

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