

Measures of Knee Osteoarthritis: Condition Specific Outcome Measure Scales and their Availability in Bengali Language



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Abstract

Billions of people around the world are affected from various joint diseases among which osteoarthritis is one of the most common condition. Osteoarthritis (OA) affects a patient's quality of life and have significant impact on individuals and on the society as well. For evaluation of patient's condition with OA, patient reported outcome measures (PROs) are a useful measure which is widely used in clinical settings. This review focuses on the validity, reliability of seven scales that are used for evaluation of knee osteoarthritis and availability of these scales Bengali translated version for using in Bangladeshi population. From the seven English version scales only four scales (WOMAC, KOOS, SF-36 and SF-12) are having Bengali translated version. Among which only three (WOMAC, SF-36 and SF-12) scales are proved to be reliable and valid for general use. But a matter of fact that among the Bengali translated versions only SF-12 Bengali version is easily available in the internet for regular use but it lacks in measuring the pain intensity of patient. So, Bengali translation of other new outcome measures like ICOAP, KOOS-PS should be done and already translated and validated versions should be made available for public use.

Introduction

Osteoarthritis is the most common degenerative and non-inflammatory joint disease and a major cause of disability affecting the elderly patients [1,2]. Involvement of the knee joint is the most common feature of this disease throughout the world and is an important cause of pain [2,3]. The estimated prevalence of knee osteoarthritis in general population of Bangladesh is 7.3% and slightly high among ethnic communities which is 10.4% [4,5]. 30-64 years age group are most commonly affected and female are mostly prone to osteoarthritis [6]. As knee and hip osteoarthritis increases as a result of the aging of the population, the disorder becomes a serious threat to the general health [7]. So, it is essential to optimize treatment and evaluate the interventions that might prevent or delay the progression of the condition [2]. The evaluation of patient's condition suffering from knee osteoarthritis can be done using different outcome measure tools or scales. At present there are several condition specific instruments available for evaluation of specific knee OA. They are Western Ontario and McMaster

Universities Osteoarthritis Index (WOMAC), Intermittent and Constant Osteoarthritis Pain measure (ICOAP), Knee Injury and Osteoarthritis Outcome Score (KOOS), Knee Disability and Osteoarthritis Outcome Score Physical Function Short Form (KOOS-PS), Lysholm Knee Scale, Generic health status questionnaires Short Form-36 (SF-36) and Short form SF 12 [8-11]. In this review the psychometric properties of the knee OA outcome measures were discussed and availability of these scales for using in Bangladeshi population was explored.

Methodology

This review was conducted in two steps. First step was to review the outcome measure scales available for knee osteoarthritis. A literature search on Google Scholar was done during the first week of January 2018. The keyword for search was "(Outcome OR Measure OR Measures OR scale OR scales) AND (of OR for) AND knee AND (osteoarthritis OR OA OR injury OR pain)". The initial total number of selected articles was 25. After removing the similar articles, the count was reduced to 23

articles. Title and abstract and conclusions of each article were read to identify and exclude non-related studies. Articles which were not published in English language were removed. After this selection, the count was reduced to 14 articles. Different library searches and request for the full text of these articles were conducted. The total number of the articles for which the full text was retrieved was 14. After reviewing the selected articles, a list of scale was done on which further review was conducted. Second step of the review was on the selected scales found after the first step. A literature search on Google Scholar was done using the title of the scale to find out the reliability and validity of those English version scales. Then a literature search on Google and Official website of those scales were done to find out the availability of those scales in Bengali language and their psychometric properties. The scales which were found in this step were considered as “easily available” rest of the scales were considered “not easily available”. To get additional information on these “not easily available” scales, mail was sent to the original author.

The WOMAC Index

The WOMAC is a condition specific self-reported questionnaire. The scale includes five questions asking pain at activity or rest, two questions measuring stiffness and 17 questions exploring the degree of difficulty during activities. The original WOMAC is present in both visual analogue scales (VAS) and five Likert boxes format [8]. The scale was developed in 1982 and the latest modified version is available in over hundred languages [12]. The WOMAC 3.1 has been validated and is widely used in the evaluation of knee and hip osteoarthritis. In

several studies disease specific questionnaire WOMAC showed high validity. The questionnaire was also reproducible over time. Responsiveness tended to be higher in women and in knee OA than in men and hip OA [13]. Bengali version of WOMAC 3.1 was developed in 2014 and was found valid for assessing quality of life of patients with knee OA in Bangladeshi population. Reliability testing using Cronbach’s alpha and ICC values was found more than 0.7 in all the domains indicating WOMAC Bangla version is having satisfactory reliability. The Bengali translated version has shown similar construct validity as HAQ (ρ 0.74). Spearman’s rank correlation coefficient between WOMAC pain with Short From-36 bodily pain and physical functioning was found -0.67 and -0.68 respectively indicating good negative correlation between the scales [14].

The Intermittent and Constant Osteoarthritis Pain (ICOAP)

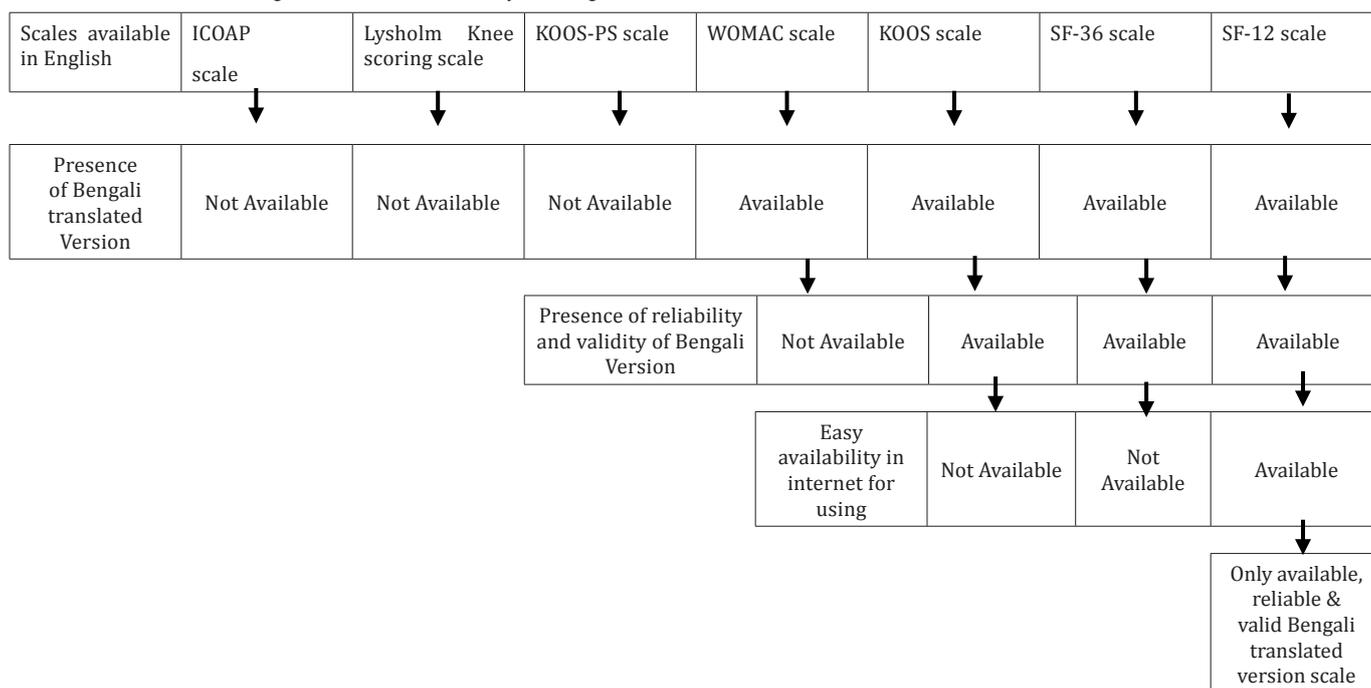
The Intermittent and Constant Osteoarthritis Pain (ICOAP) Score is an eleven item scale specifically made for assessment of hip or knee OA pain. ICOAP scale comprise two subscales considering both pain intensity and the effect of pain on daily life, where five questions scale evaluates patients constant pain and six questions evaluates patients intermittent pain. The latest available version of the ICOAP is version 3, which was developed in 2007. In a hip or knee OA around 40+ year’s age, ICOAP was found to be internally consistent and reliable [15,16]. ICOAP scale is available in several languages which are valid too, but still there is no Bengali version of the ICOAP scales available (Table 1 & 2).

Table 1: Overview of Knee OA pain measuring Scale available in Bengali.

Name of Scale	Version	Author	Year	Area of study	Reliability	Validity	Easily Available in Internet
Bengali version of WOMAC	VA 3.01	Rabbani MG et al. [14]	2014	BSMMU*, Dhaka	Reliable	Valid	Not available
KOOS Bengali version	LK 1.0	Karvannan H et al. [19]	2013	India	No study has been done	No study has been done	Available
Bengali Short Form-36	Ver1	Feroz AH et al. [22]	2012	BSMMU*, Dhaka	Reliable	Valid	Not available
Bengali Short Form SF 12	Ver2	Islam N et al. [9]	2017	BSMMU*, Dhaka	Reliable	Valid	Available

*BSMMU= Bangabandhu Sheikh Mujib Medical University.

Table 2: Flow chart showing the status of availability of Bengali translated Knee OA scales.



Knee Injury and Osteoarthritis Outcome Score

KOOS scale is a condition specific scale to measure patient’s condition in osteoarthritis (OA) which can be primary OA or results of a trauma or injury. KOOS assess total five components including pain, symptoms, daily function, sport or recreational function and quality of life. High reliability, validity and responsiveness of KOOS scale after surgical procedures (like ACL reconstruction, meniscectomy, knee replacement surgery) and physical therapy intervention has been reported in several studies [17,18]. KOOS version LK1.0 is available in the original English and many other languages of the world. KOOS Bengali version LK 1.0 is also available which was developed in November 2013 by H Karvannan et al. [19] In that study the original English version was translated and adapted in Bengali language for measuring patients condition treated with total knee replacement following knee osteoarthritis. However, no validity or reliability study has been done on the Bengali version of KOOS LK1.0.

Knee Disability and Osteoarthritis Outcome Score Physical Function Short Form (KOOS-PS)

The KOOS-PS is a seven questions scale derived from the subscales of the KOOS. It is a recommended tool for measuring physical functional of patients with knee injuries and knee OA to follow the progression of disability and to evaluate treatment responses. Several studies have demonstrated the responsiveness, validity and reliability of KOOS-PS in knee osteoarthritis patents [20]. Although it is available and validated in several languages but Bengali version of KOOS-PS is still not developed.

Short Form-36 (SF-36)

The Medical Outcomes Study 36-Item Short Form or SF-36 is widely accepted and commonly used general health outcomes measure. The SF-36 consists of eight subscales containing total 36 questions and one general overall health status question. The SF-36 is available in several languages which are valid too. The advantage of this health outcomes measure is that it can be used to compare across different diseases and conditions [8]. First version of Short Form 36 was developed in 1992 [21]. The Bengali Short Form-36 was developed on May 2012 by Abu HM Feroz et al. [22] was found to be reliable and valid for using in Bangladeshi patients with RA. Cronbach’s alpha of the Bengali SF -36 version was higher than 0.78 and the test retest reliability was high ($r>0.82$) for all scales. The high correlations of this scale with other disease parameters established the validity of the Bengali translated version of SF-36.

Short Form-12 (SF-12)

The SF-12 is a short version of SF-36 questionnaire made to provide a short and valid substitute to the SF-36. The questions of this scale are divided into two sections to separately assess the physical as well as the mental component of health [23]. The SF-12 was developed in 1996 [24] and it was culturally adapted and validated into Bengali language in 2017 by Islam N et al. [9] Patients acceptancy was high for the Bengali translated version. Internal consistency for both physical and mental component of the scale is satisfactory with a Cronbach’s alpha value of 0.9 and ICC value more than 0.9 indicating reliability of the Bengali version scale. At the same time convergent and discriminant validity of the Bengali SF-12 and Bengali HAQ scale was acceptable.

Lysholm Knee Scoring Scale

Lysholm Knee Score is the scoring systems made specially to use in ACL injuries and chondral defects. It was published in 1982. The current modified and revised version of Lysholm was introduced in 1985 which analyse patient's condition on eight segments: pain, instability, locking, swelling, limp, stair climbing, squatting and need for support. The overall Lysholm score has acceptable test-retest reliability (ICC= 0.91), internal consistency (Cronbach alpha=0.65) and construct validity [25]. Although it is available and validated in several languages but Bengali version of Lysholm Knee Scoring Scale is still not developed.

Discussion

All the scales (WOMAC, ICOAP, KOOS, KOOS-PS, SF-36, SF-12 and Lysholm scale) reviewed in this study are having satisfactory reliability and validity for the original English version [8,13,15,20]. Among which 4 scales (WOMAC, KOOS, SF-36 and SF-12) are having Bengali translated version and all the translated versions except KOOS are found reliable and valid [9,14,20,22]. But a matter of fact that Bengali version of WOMAC and SF-36 are not easily available in the internet for regular use. Only the SF-12 Bengali version is easily available in the internet, but the main weakness of the scale is that this scale only access patient's physical and mental health in spite of the pain intensity [9].

Conclusion

Bengali translation of other new outcome measures like ICOAP, KOOS-PS should be done. Already translated versions should be made available for public use and further evaluated in general population and in patients treated with different interventions.

Limitations

This review was conducted within a limited time period and there was no additional funding to support this review. That's why wide and systemic literature search was not performed and the review was done on the limited articles attainable.

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