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Review Article

Culturally Sensitive and Environment-Friendly Outcome Measures in Knee and Hip Osteoarthritis

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ABSTRACT

Outcome measures often reflect the culture and environment for which they were originally developed. This study was designed to review research studies on outcome measures that were developed for use in knee and hip osteoarthritis (OA) with cultural considerations at time of development. A systematic review of evidence on culturally sensitive and environment-friendly outcome measures in knee and hip OA was conducted. Literature review of published peer-reviewed empirical research was undertaken. Various databases including Google Scholar, PEDro and PubMed were accessed to search for relevant empirical articles. Search terms were outcome measures, knee osteoarthritis, hip osteoarthritis, culture, and disease-specific. Only articles in English were retrieved. No other search limits were set. Methodologic quality was independently assessed by two reviewers. A self-developed validated checklist was used to review relevant articles. Sixteen free full text articles were identified for inclusion in the review. All of them have evidence of one or more psychometric properties proven. Eight outcome measures were developed and cross-culturally adapted into other languages. Only two outcome measures (Ibadan Knee Hip Osteoarthritis Outcome Measure and Japanese Knee Outcome Measure) were identified to be originally developed for a given population and translated into other indigenous languages with evidence of psychometric properties proven. Outcome measures should be developed for specific environments and cultures. Such measures should be translated into other languages for wide utility with psychometric evidence proven. Physiotherapists are encouraged to develop new outcome measures with considerations for culture of the population and cross-culturally adapt existing ones into indigenous languages.

Key words: *Outcome Measures, Knee Osteoarthritis, Hip Osteoarthritis, Disease-specific, Culture, Psychometrics*

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INTRODUCTION

Measuring health outcomes is central to assessing the quality of care of patients by health care providers. Outcome assessment is the measurement process whereby the consequences of disease and health management interventions are assessed (Bellamy, 2003). The measurement of clinical outcomes in the health care delivery system is one of the most efficacious areas within the area of clinical decision making (Grenvile and Lyne, 1995). The major impetus to the development of standardized outcome measures in the health sector includes the demands of the third party payers of health care services and policy changes which have challenged health workers in developed countries to quantitatively account for the effectiveness of their therapeutic interventions more rigorously than before (Buton et al, 2000, Yeomans, 2000). There is a paradigm shift from health care provider-centered outcomes tools to patient-centred outcomes in the assessment of effectiveness of therapeutic interventions. Outcome measures often reflect the culture and environment for which they were originally developed (Meenan et al, 1980).

Osteoarthritis is among the three most disabling conditions having a remarkable public health impact in developed countries (Drienhofer, 2004), and the most common joint disorder in the world; it occurs in the majority of people over the age of 65 (Bijlsma, 2005). It has a high prevalence in the increasing population of elderly people. and is the single most major cause of disability and activity limitation in elderly people in the UK (Brazier, 1999). Research and clinical management

of patients with osteoarthritis relies heavily on the sound measurement of outcomes. In osteoarthritis research, clinicians and researchers are faced with various challenges in their choice of an appropriate tool for health outcomes measurement (Brazier, 1999). The most frequently affected joints in OA are the large joints which are the knee and hip joints (Pisters et al, 2007).

Outcome measures are developed to assess the effectiveness of therapeutic interventions by health care providers in the clinical care of patients. Outcomes measures have long been used in the assessment of knee and hip osteoarthritis (Sun et al, 1997) and there is a myriad of OMs for knee and hip osteoarthritis currently in use. Many of these measures are generic while some are specific to knee and/or hip OA. These outcome measures include the Arthritis Impact Measurement Scales (AIMS) (Meenan et al, 1980), Knee Osteoarthritis Outcome Score (KOOS) (Roos et al, 1998), Hip Osteoarthritis Outcome Score (HOOS) (Roos et al, 2000), Western Ontario and McMaster University (WOMAC) Osteoarthritis Index (Bellamy et al, 1988), Short Form (SF) 36 Arthritis Specific (SF 36 ASHI) (Convery et al, 1977), Functional Status Index (FSI) (Jette, 1980), Osteoarthritis Severity Indices of Lequesne (LEQUESNE) (Lequense, 1980 and 1987), Health Assessment Questionnaire (Fries et al , 1980), Ibadan Knee/Hip Osteoarthritis Outcome Measure (Akinpelu et. al, 2009) and Japanese Knee Osteoarthritis Measure (Akai, 2005).

Increasing importance has been attached to utilization of disease-specific, patient-centered outcome measures (Wei, 2012) and accepted OMs used in randomized trials in knee and hip OA include specifically include patient-centered measures (Strand & Kelman, 2004). An important consideration in the development of patient-centered outcomes is to ensure that these measures are culturally sensitive and environment friendly. It is however uncertain if these measures are developed with consideration for culture and environment with proven evidence of psychometric properties in those cultures and environment. Existing OMs can be cross-culturally adapted into other cultures different from the culture of original development. The objectives of this study were to assess research studies on OMs that were developed basically for use in knee and hip osteoarthritis (OA) with cultural considerations at time of development and to review these outcome measures for evidence of psychometric properties. This review was specifically aimed at providing an answer to the question: Are outcome measures in knee and hip osteoarthritis culturally sensitive and psychometrically sound?

METHODS

A systematic review of existing outcome measures specific to knee and or hip osteoarthritis was conducted.

Search Strategy

A computerized literature search was conducted using Google Scholar, PEDro and PubMed databases. All published articles from January 2000- December 2013 were accessed in order to search for relevant empirical articles. The computerized search was built on the following components: I) a search strategy for all studies on development of outcome measures in that are disease specific to knee and hip osteoarthritis using the key words and free text words " development," "osteoarthritis," "outcome measures, knee", "disease specific, knee", disease specific, hip", joint specific: 2) a search strategy for all studies on outcome measures in hip osteoarthritis using the key words and free text words "osteoarthritis," "outcome measures, hip; 3) a search strategy for all studies on outcome measures in knee osteoarthritis using the key words and free text words "osteoarthritis," "outcome measures, knee; 4) a search strategy for all studies on environment friendly outcome measures in knee and hip osteoarthritis using the key words and free text words "osteoarthritis," "outcome measures, knee, environment", "outcome measures, hip, environment", 5) a search strategy for all studies on culture friendly outcome measures in knee and hip osteoarthritis using the key words and free text words "osteoarthritis," "outcome measures, knee, culture", outcome measures, hip, environment. Only free English full text articles were accessed.

Inclusion Criteria and Procedure

A study was included in the review if (1) the outcome measure was focused on only pen and paper instruments, scales or questionnaires; (2) the study was on outcome measures that are disease specific to knee and or hip osteoarthritis; (3) the study was on patient-centered outcome measures.

The selection of studies was done in two stages. Firstly, the lead reviewer (ACO) evaluated the titles and abstracts of papers identified by the initial search for appropriateness to the study question and in consideration of the inclusion criteria. The second stage of study selection was performed by two reviewers (ACO and POI) who independently assessed the full text articles. Each review potentially meeting the inclusion criteria was screened by the reviewers for cultural and environment consideration at time of development. Names and contact addresses of developers of identified outcome measures were obtained from the search. Full text article of one of the outcome measures was obtained

from the developer. Full text articles on the development of identified outcome measures were read by the two reviewers (ACO and POI). Information on cultural sensitivity of outcome measures at time of development was obtained. Data on name of outcome measure, author & year, country of development, length of items, psychometric properties and translation of measure into other languages were obtained. Any disagreement between reviewers was resolved by consensus.

Assessment of Methodologic Quality

The methodologic quality of all the included relevant studies was performed by two reviewers who independently used a 10 item self-developed checklist that assessed for content validity (Appendix 1).This checklist was developed because the scope of the review did not fit into existing appraisal tools for quantitative and qualitative analytic studies. All criteria were scored as "yes," "no," or "unclear". Studies were considered of sufficient quality if at least 7 of the 10 criteria were met. Any disagreement between reviewers was resolved by consensus.

Appendix 1:

Checklist for Critical Appraisal of Studies

1. Original research article
2. Article on development of Outcome measure
3. Justification for development
4. Detailed information on the conceptual basis of instrument development
5. Information on any psychometric property of the scale
6. Soundness of methodology in providing evidence of psychometric properties
7. Scope focused on patient-centered outcomes
8. Description of outcome measure (no of items)
9. Utility in knee and or hip osteoarthritis population
10. Information on translation into other languages

Table 1:

Summary of results for evaluation at Initial Stage of Search

Databases	Number of free full text articles	Number of articles for appraisal
Google Scholar	54	12
PubMed	8	4
PEDro	10	0
Total	72	16

RESULTS

Four hundred and seventy-six free full text articles were retrieved from the three databases at the initial stage of the search (Figure 1). Ten articles were retrieved from PubMed, 446 articles from google scholar and 20 articles from Pedro database. Four hundred and four articles were excluded following the screening by titles and abstracts. Seventy-two articles were retrieved for evaluation and different outcome measures were identified. Fifty-six articles were excluded: Repetition (n=18), Generic measures (n=25), not specific to only the knee and hip joints (n=13). Sixteen disease–specific outcome measures on knee/hip osteoarthritis were identified for inclusion in the review (Figure 1). Four outcome measures are specific to the knee, five are specific to the hip and seven are specific to both joints. The full text on the development of these outcome measures revealed that all of them have evidence of one or more psychometric properties proven (Table 2). Fourteen outcome measures were developed and cross-culturally adapted into other languages (Table I). Only two outcome measures (Ibadan Knee Hip Osteoarthritis Outcome Measure and Japanese Knee Outcome Measure) were identified to be originally developed for a given population (Table 2).

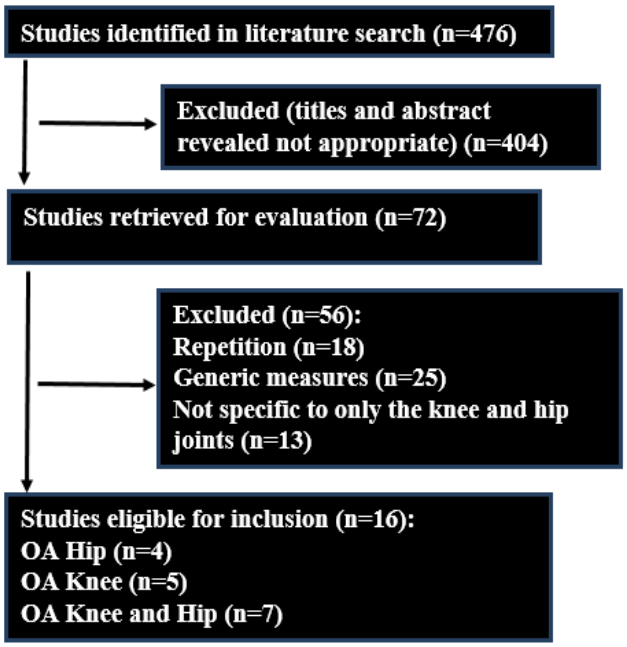

Figure 1:

Flow Diagram of Studies Identified by Literature Search

DISCUSSION

This review was conducted in order to identify whether existing outcome measures in use for the assessment of therapeutic interventions in knee/hip osteoarthritis were conceptually developed with cultural consideration at time of development. This is of particular importance in enhancing patient-centered outcomes in this prevalent musculoskeletal disorder.

Table 2: Summary of Appraised Articles

S/N	OUTCOME MEASURE	JOINTS	AUTHOR (YR)	COUNTRY	LENGTH OF ITEMS	CULTURAL CONSIDERATION	PSYCHOMETRIC PROPERTIES	TRANSLATION INTO OTHER LANGUAGES
1	Arthritis Impact Measurement Scale 2	Knee & Hip	Meenan, 1992	USA	57	No	Validity, Reliability, Responsiveness to change	Yes
2	Short Form-36 Arthritis Specific Health Index	Knee & Hip	Ware et al, 1999	USA	36	No	Validity, Reliability, Responsiveness	Yes
3	Knee Osteoarthritis Outcome Scale	Knee	Roos et al, 1998	Sweden	42	No	Validity, Reliability, Responsiveness to change	Yes
4	Hip Osteoarthritis Outcome Scale	Hip	Klassbo et al, 2003	Sweden	40	No	Validity, Reliability, Responsiveness	Yes
5	Index of severity of the Knee	Knee	Lequesne, 1997	France	11	No	Validity, Reliability, Responsiveness to change	Yes
6	Index of severity of the Hip	Hip	Lequesne, 1997	France	11	No	Validity, Reliability, Responsiveness to change	Yes
7	Harris Hip Score	Hip	Harris, 1969	USA	10	No	Validity, Reliability, Responsiveness	Yes
8	American Association of Orthopaedic Surgeon Hip and Knee Questionnaire	Knee & Hip	Johanson et al, 2004	USA	7	No	Validity, Reliability, Responsiveness	Yes
9	Oxford Hip Score	Hip	Dawson et al, 1996	UK	12	No	Validity, Reliability	Yes
10	Lower Extremity Functional Scale	Knee & Hip	Binkley et al, 1999	USA	20	No	Validity, Reliability, Responsiveness	Yes
11	Harris Index of Severity for Knee Osteoarthritis	Knee	Harris, 2014	USA	19	No	Reliability and Validity	Not stated
12	Ibadan Knee Hip Osteoarthritis Outcome Measure	Knee & Hip	Akinpelu et al (2007)	Nigeria	33	Yes	Validity, Reliability, Responsiveness and MCID	Yes
13	Osteoarthritis of Knee and Hip Quality of life Questionnaire	Knee & Hip	Rat et al, 2005	France	43	No	Reliability and Validity	Yes
14	Japanese Knee Osteoarthritis Measure	Knee	Akai et al (2005)	Japan	25	Yes	Reliability and Validity	None
15	Oxford Knee Score	Knee	Dawson et al, 1998	UK	12	No	Reliability and Validity	Yes
16	Western Ontario MacMaster Universities Knee and Hip Osteoarthritis Indices	Knee & Hip	Bellamy, 1988	USA	24	No	Validity, Reliability, Responsiveness and MCID	Yes

The outcome of this review is to inform appropriate selection of disease-specific outcome measures for use in osteoarthritis of the knee and or hip with cultural consideration of the population for which the measure will be used.

Outcome measure (OM) is a measurement tool (such as an instrument, rating form, and questionnaire) used to document change in one or more client characteristics over time. Outcome measures in the review were limited to only pen and paper instruments. This is in line with the paradigm shift from healthcare provider centeredness to patient centeredness in health outcomes research; there is a growing interest over the past few decades in the development of outcome measures which measure at the disability and handicap level. These measures are hence used to determine if therapeutic interventions satisfy the needs of the patients. In the past, health care providers often assessed outcomes that were least meaningful to the patients. Measuring results of treatment in clinical setting has been an age long practice, and (Keith, 1995). Many standardized outcome measures have been developed for use in the health sector (Akinpelu et al, 2009; Roos et al, Akai et al, 2005; Evans et al, 2002; Gibbon, 1991, Long et al, 1992, Wade, 1992).

Table 2 summarizes the findings of this present review. In this structured review, there are many outcome measures for use in OA knee and or hip populations, out of which only 16 are disease specific to knee and or hip OA (Bellamy, 1982; Dawson et al, 1998; Akai et al 2005; Rat et al, 2005; Akinpelu et al 2007; Harris, 2014; Binkley et al, 1999; Dawson et al, 1996; Johanson et al, 2004; Harris, 1969; Lequesne, 1997; Lequesne, 1987; Klassbo et al, 2003; Roos et al, 1998; Meenan, 1992; Ware et al, 1999). The reason for the limited number of identified disease specific outcome measures could be attributable to the three databases accessed in this study. This obviously is a limitation to the findings from this study. The majority of these disease-specific OA measuring tools considered in this review provided information on the conceptual bases for their development. The conceptual bases of all these outcome measures focused on components of outcomes that are relevant to the patients especially in the adult population which included physical functioning, quality of life, disability, activity limitations, participation restrictions, physical performance, pain, activities of daily living. When developing an outcome measure it is important to consider patient-centered outcomes that are culturally sensitive and environment-friendly. The impetus to providing answers to the research question posed in this study was in conformity to the definition of a standardized outcome measure as provided by McKay – Lyons, 1998. This definition places importance on the purpose, administration, scoring and evidence of psychometric properties of a published measurement tool.

The two reported disease-specific outcome measures that were identified with cultural consideration at time of development in this study were the Japanese Knee Osteoarthritis Outcome Measure and Ibadan Knee/Hip Osteoarthritis Outcome Measure. In Japan, about 7 million people have knee osteoarthritis (OA), and the proportion continues to increase in the ageing population (Kurosawa, 2005). Osteoarthritis of the knees has been reported to limit range of motion at the knee joint, which often impact on activities of daily living involving diminished knee function (Watanabe et al, 2010). The Japanese culture demands that people greet with their knees in full flexion (Watanabe et al, 2010). The Japanese knee outcome measure was designed to incorporate the concepts of the World Health Organization's International Classification of Functioning, Disability and Health 2001, and to reflect the specific Japanese cultural lifestyle, which differs from Western countries (Akai et al, 2005). The Ibadan Knee/Hip Osteoarthritis Outcome Measure was developed specifically to meet the needs of an average Nigerian patient with knee/hip osteoarthritis. It included socio-cultural and religious activities important to patients in the Nigerian environment (Odole et al, 2013) which included manual grass cutting/hoeing, assuming the Islamic praying posture (sitting on the heels), prostrating (by males) and incomplete kneeling (by females) to show courtesy to elders while greeting them, using pit/asiatic toilet, sweeping with a short broom, rising from a mat.

All the identified existing outcome measures have been translated into other languages in order to enhance their utility across different cultures and populations. The development of paper and pen instruments (scales and questionnaires) for outcomes assessment requires a lot of effort, which should be appreciated, no matter how simple the instruments may appear to be (Streiner and Norman, 1989). Beaton et al, 2007 advocated that instruments can be cross-culturally adapted rather than developing new instruments for each culture that exists. The process of cross-cultural adaptation entails translation of the instrument into languages different from the language of development.

Evidence of psychometric properties was proven for all sixteen identified disease-specific outcome measures in knee/hip osteoarthritis. Health measuring instruments with scientific evidence of psychometric properties assist with the register of evidence – based practice (Mckay Lyons, 1998). For a measure to be effectively used in the health sector, it has to be standardized with psychometric properties proven through scientific

enquiry. All the sixteen identified disease-specific outcome measures in this study have scientific evidence of adequate validity and reliability. A standardized measuring instrument must provide scientific evidence of adequate reliability and validity. McDowell and Newell, (1996) noted that validity and reliability are the two important psychometric properties of an outcome measure. This notion was supported by (Roach, (2006) who opined that the starting point for any outcome measure is to understand its reliability and validity. Measures that are not reliable and valid will not provide meaningful information, but rather will provide 'numbers or categories that give a false impression of meaningfulness (Rothstein, 1985). Some of the psychometric properties of the identified disease-specific instruments that were under-reported by researchers based on this review are minimal clinical important difference and sensitivity to change. Portney and Watkins (2000) have documented the importance of these other psychometric properties in health outcomes assessment. It is of importance that the minimal clinical important difference score of an outcome measure be determined if its use must be enhanced to monitor effectiveness of therapeutic interventions (Cook, 2008; Sorensen et al, 2013). Developers of outcome measuring tools must also closely examine the minimal clinical important difference and sensitivity to change of such tools.

Conclusions

All the reviewed outcome measures have scientific evidence of one or more psychometric property though few existing outcome measures in knee and hip osteoarthritis were developed with consideration for patient-centered outcomes that are environment and culture friendly. Physiotherapists are encouraged to develop new outcome measures with considerations for cultural sensitivity of the population and cross-culturally adapt existing ones into indigenous languages so as to encourage individuals who are only literate in their indigenous languages to monitor and track their treatment progress with the use of cross-culturally adapted outcome measures. Evidence of psychometric soundness of such measures should also be proven because it is not certain that the original meanings of items on the adapted versions are retained during the process of cross-cultural adaptations.

Limitations

This systematic review had some limitations. Articles were accessed only in English as we lacked resources for translation. The checklist for appraisal was developed specifically for this study, though well structured, had an element of subjectivity in the review process. Reviewers' ratings appear "subjectively objective because they were based on mental judgment, scores were not allotted based on different response options but categorically on a "yes" or "no" response for each item on the check list. The checklist was not empirically validated and the focus of the review was limited to pen and paper instruments. The findings from this review should be inferred with caution because of the few databases used.

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