



ELSEVIER

REVIEW ARTICLE

Clinical rating systems in elbow research—a systematic review exploring trends and distributions of use

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Background: Clinical rating systems are used as outcome measures in clinical trials and attempt to gauge the patient's view of his or her own health. The choice of clinical rating system should be supported by its performance against established quality standards.

Methods: A search strategy was developed to identify all studies that reported the use of clinical rating systems in the elbow literature. The strategy was run from inception in Medline Embase and CINHAL. Data extraction identified the date of publication, country of data collection, pathology assessed, and the outcome measure used.

Results: We identified 980 studies that reported clinical rating system use. Seventy-two separate rating systems were identified. Forty-one percent of studies used ≥ 2 separate measures. Overall, 54% of studies used the Mayo Elbow Performance Score (MEPS). For arthroplasty, 82% used MEPS, 17% used Disabilities of Arm, Shoulder and Hand (DASH), and 7% used QuickDASH. For trauma, 66.7% used MEPS, 32% used DASH, and 23% used the Morrey Score. For tendinopathy, 31% used DASH, 23% used Patient-Rated Tennis Elbow Evaluation (PRTEE), and 13% used MEPS. Over time, there was an increased proportional use of the MEPS, DASH, QuickDASH, PRTEE, and the Oxford Elbow Score.

Conclusions: This study identified a wide choice and usage of clinical rating systems in the elbow literature. Numerous studies reported measures without a history of either a specific pathology or cross-cultural validation. Interpretability and comparison of outcomes is dependent on the unification of outcome measure choice. This was not demonstrated currently.

Level of evidence: Survey Study; Literature Review

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Keywords: Elbow; clinical rating systems; patient-reported outcome measure; outcome assessment; quality of life; validity

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The ultimate measure of success in health care is whether it helps patients as they see it.⁸ In an effort to capture the effect of health interventions on patients, there has been a considerable investment of resources by academics and clinicians to develop systematic, robust, and valid ways of collecting health data from patients.²¹ It is now an agreed standard that treatment evaluations include use of clinical rating systems as an outcome metric.⁴⁸

Currently, clinical rating systems in elbow research use both physician- and patient-completed measures. They aggregate various attributes of interest such as elbow pain, range of motion, and the ability to perform specific tasks.⁴² Although there has been a historical focus on physician-administered tools, recent emphasis has been on the patient-rated outcome measurement (PROM), in which information is gathered pertaining to the patients' perception of their elbow function.⁴⁸

The rise in the use of clinical rating systems has accompanied a fundamental shift in how we measure health. Traditional measurements of treatment effect, such as length of hospital stay, radiographic markers, or range of motion, are increasingly accompanied by or replaced by rating systems, with a particular emphasis on PROMs.²¹ In the United States, the Food and Drug Administration recommends the use of PROMs in clinical trials.⁹ Within the UK, the National Institute for Health and Care Excellence advocates the necessity of PROMs in assessing the effectiveness and cost-effectiveness of healthcare technologies.³⁸

The increasing popularity of patient-focused outcome measurement has accompanied a consequent rise in the production of numerous rating systems. When choosing the appropriate rating system for clinical or research purposes, it is necessary to identify existing instruments that measure the outcome of interest in the target population.⁵³ An appropriate measure should be supported by published evidence that demonstrates that it is acceptable to patients, reliable, valid, and responsive (sensitive to change).¹⁵ Furthermore, these properties should be tested on similar reference groups of patients to those being studied, thereby ensuring the validity of a tool from a language and cultural perspective.² Within the domain of musculoskeletal health, particular emphasis has been placed on the use of clinical rating systems for particular anatomic locations (predominantly joints) rather than generic health measures. Recently, this has evolved to concentrate on condition-specific tools, in which in certain groups or in certain conditions, generic or region-specific tools miss important aspects of health status.²¹ Therefore, for the appropriate interpretation, it is vital that the clinical rating system selected is validated for use in the population of interest and for the specific condition being investigated.

Systematic reviews assessing elbow-specific clinical rating systems have concluded that a paucity of quality measures exist.^{18,28,48,49} The most recent review by The et al⁴⁸ included the assessment of 12 rating systems using the Consensus-Based Standards for the Selection of health Measurement Instruments (COSMIN) checklist; the authors concluded that

the Oxford Elbow Score (OES) was the only system developed using high-quality methodology.

The distribution of use of elbow-specific rating systems across different elbow pathologies is not known. Riedel et al⁴² reviewed 65 articles that used elbow-specific aggregate scores specifically in elbow arthroplasty published between 2004 and 2011. They reported the predominant use of the Mayo Elbow Performance score (MEPS) in 75% of the literature they identified. They criticized the use of this physician-administered score, which was not developed with a formal methodology and is frequently inconsistently applied.

This study aimed to assess the use of clinical rating systems in elbow-related interventional studies. The assessment of the appropriation of rating systems to specific elbow pathologies and across populations has not been undertaken. Furthermore, the change in trends of use over time, with the recent increased emphasis on the use of PROMs, has not been evaluated. Only when armed with the knowledge of either the conformity or heterogeneity of rating systems can compelling arguments be made for the need for standardization.

Methods

A comprehensive systematic review of elbow-specific clinical rating systems in the elbow literature was conducted. This review aimed to identify all articles that reported the use of both physician- and patient-reported rating systems. Both rating systems designed specifically for use in elbow pathology and generic upper limb rating systems with a history of validation and in elbow pathology were included. The present report was written following PRISMA guidelines.³² A search strategy was constructed using MeSH and free-text terms (see Supplementary Data).

The strategy was modeled to each database through the modification of thesaurus terms, wild cards, and truncation. The search was run on May 1, 2017 in Medline (Ovid MEDLINE, 1948-2016 and Ovid MEDLINE In-Process and Non-indexed Citations) accessed through OVIDSP, Embase (Embase 1974-2017) accessed through OVIDSP, and CINHALL (CINHALL 1981-2017) accessed through the EBSCO host.

The search strategy development was guided by previously published search strategies for systematic reviews of interventions in elbow pathology¹⁰ and for the identification of outcome measures,²³ together with terms specifically selected to capture names of relevant instruments published in previous systematic reviews of elbow-specific rating scales.^{18,28,48,49}

The review was conducted in a stepwise manner. Dual review was undertaken at each stage by the lead author and a co-author. In cases of disagreement between reviewers, the article proceeded to the next stage of review to ensure maximum sensitivity. Initial title review was used to exclude duplicates, studies in pediatric populations, non-elbow-based studies, case reports, case studies, surgical technique papers, and conference abstracts. Abstract review used the preceding criteria and also excluded studies that did not report the use of rating systems designed specifically for elbow measurement, or generic rating systems with no history of validation in elbow measurement.

Data extraction was conducted by J.E. and N.F. Publication date, geographic location of the lead author or publishing institution, elbow

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