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Agreement between patient-based and clinician-based assessment of the shoulder

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Background: Patient home-based self-assessments after shoulder surgery have the potential to aid clinicians in reducing clinic time and decreasing follow-up requirements. The purpose of this systematic review was to determine the correlation between patient-based and physician-assessed outcome measures for range of motion (ROM), strength, and shoulder function.

Methods: This systematic review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. MEDLINE, Embase, CINAHL, and Cochrane Central Register of Controlled Trials databases were searched. All studies comparing patient-reported and clinician-based assessments of shoulder ROM, strength, and function were eligible for inclusion. Studies that included patient or clinician assessment only, description of shoulder diseases or treatments only, and animal- or cadaveric-based studies were excluded. More than 250 abstracts were searched, and 4 studies were found eligible.

Results: Patients assessed their shoulder ROM, strength, and function with moderate-to-high accuracy compared with clinical assessment. There was less agreement between patients and clinicians regarding the symptomatic shoulder compared with the contralateral shoulder. There was less agreement between patients and clinicians on rotation than forward elevation. Patients who were less satisfied with their shoulder had less agreement with clinicians.

Conclusion: There is moderate-to-high agreement between patients and clinicians in the assessment of the shoulder after surgery. Methods of assessment of rotation could be reviewed to create a more exact self-assessment tool.

Keywords: Patient-derived; patient-reported; clinician-assessed; clinician reported; shoulder assessment; agreement

Level of evidence: Systematic Review; Basic Science Study; Validation of Outcome Instruments

The measurement and reporting of outcomes after shoulder surgery is an essential process to improving the quality of patient care. It requires the periodic follow-up of patients to outpatient clinics, which are resource intensive, and they can be particularly challenging in patients who are doing well after surgical treatment. Therefore, the necessity of these is under review to reduce expenditure.[8]

Virtual or home-based patient self-assessment is becoming increasingly common in medical practice[3] because it offers flexibility to patients and reduces the effort required on their part to present themselves to clinics. It could also reduce the financial burden placed on the system by missed appointments, which are associated with the waste of valuable clinic and personnel time. With validated tools, we are able to gather valuable outcomes data remotely and identify patients

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performing below expectation who may benefit from physician assessment.[33]

In shoulder surgery, there are a variety of questionnaires that can be completed by the patients at home that are used to evaluate outcomes. Questionnaires such as the American Shoulder and Elbow Surgeons Score (ASES), Simple Shoulder Test (SST), and Oxford Shoulder Score (OSS), among others, are able to identify poor outcomes and have been shown to be practical, reproducible, and valid.[27] However, these patient-reported outcome measures might not inform us of the cause underlying poor outcomes. This requires a more objective assessment with the measurement of range of motion (ROM) and strength to differentiate a stiff pain-free shoulder from a painful mobile shoulder replacement where both may score equally on a patient outcome measure.[12]

Assessments of outcome purely based on patient reported outcome measures are also subject to psychological factors[32] and the response shift phenomenon,[25] which refers to the change in the meaning of one's quality of life over time. A home-based patient self-assessed shoulder questionnaire that assesses ROM and strength in addition to a subjective evaluation of function could potentially offer a valuable tool in gathering patient information, without the requirement for a formal clinic follow-up. Before such a tool is developed and validated, it is essential to study the published literature on the correlation between patient- and clinician-completed assessment tools and the known difficulties of designing such tools.

This systematic review aims to critically appraise the evidence on the degree to which the patient self-assessment of shoulder ROM, strength, and function after shoulder surgery compares with a clinician's assessment. The aim is also to understand the difficulties that are likely to be experienced in developing a home-based patient self-assessment questionnaire that combines objective and subjective assessments of shoulder function.

Materials and methods

This systematic literature review was performed in accordance with the Preferred Reporting Items for Systematic review and Meta-Analyses statement for developing study protocols and reporting systematic reviews (Fig. 1). We searched the literature for articles in which a patient-completed questionnaire was compared against a similar assessment by a clinician. Our inclusion criteria were studies that compared between questionnaires completed by the patients and those completed by the clinician. The search terms used were based on patient, clinician, assessment, and shoulder function criteria (Appendix S1). We excluded articles that were solely descriptions of shoulder conditions or treatment options, were studies on cadavers or animals, contained only patient-based questionnaires or only clinician-completed tools, and those that did not compare the 2 forms of assessment. A clinical librarian searched through 4 main databases: CINAHL, Cochrane Central Register of Controlled Trials, MEDLINE, and Embase. We included patients with any previous or current shoulder disorder and those who had had any surgical, conservative, or pharmacologic interventions for their condition. We searched for articles in other languages, and we accepted studies of all types, using patients of any age and sex.

The literature search identified 167 potential studies: 69 from MEDLINE, 59 from Embase, 28 from CINAHL, and 11 from Cochrane Central Register of Controlled Trials. Two independent investigators screened the title and abstracts. Any discrepancies were settled by consultation between the 2 investigators and a third independent reviewer. The reference lists of eligible studies and relevant review articles were assessed for further studies not identified by the search strategy (Fig. 1). The referencing software was used to remove duplicates. We screened 247 abstracts. Initially, 15 full texts were assessed, after we had excluded 152 from the first literature search. From the reference lists, 31 more full texts were assessed. From this total of 46, 42 were excluded, yielding 4 relevant studies that met our selection criteria (Table I). These 37 were excluded because the studies did not explicitly compare the 2 assessments, even though most had forms of patient and clinician assessments. Other reasons for exclusion included clinicians only taking a detailed medical history or interpreting radiographs.

The final articles had at least 1 patient-based questionnaire and a form of clinical assessment that were clearly compared with each other. We looked at the demographics, diagnoses, type of surgery, scoring systems, methods, and statistical techniques used in each study, the results yielded, and limitations the authors identified in using their chosen questionnaire.

Results

The 4 studies eligible for inclusion covered the full range of shoulder diagnoses and operations (Table II). They

Table I Overview of selected studies and the scoring systems used

Number	Name	Authors	Year	Scoring systems
1[28]	Patient and physician-assessed shoulder function after arthroplasty	Smith, Barnes, Sperling, Farrell, Cummings, Cofield	2006	• Newly formed questionnaire
2[6]	Assessment of shoulder ROM: introduction of a novel patient self-assessment tool	Carter, Levine, Kleweno, Bigliani, Ahmad	2008	• Newly formed questionnaire
3[18]	A patient-derived Constant-Murley Score is comparable to a clinician-derived score	Levy, Haddo, Massoud, Mullet, Atoun	2013	• Constant-Murley Shoulder Score
4[33]	Reliability of patient self-assessment of shoulder ROM and strength after shoulder arthroplasty	Yang, Keener, Yamaguchi, Chen, Stobbs-Cucchi, Patton, Galatz	2015	• ASES • Simple Shoulder Test

ROM, range of motion; *ASES*, American Shoulder and Elbow Surgeons score.