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REVIEW ARTICLE (META-ANALYSIS)

Patient-Reported Upper Extremity Outcome Measures Used in Breast Cancer Survivors: A Systematic Review

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Abstract

Objectives: (1) To identify English-language published patient-reported upper extremity outcome measures used in breast cancer research and (2) to examine construct validity and responsiveness in patient-reported upper extremity outcome measures used in breast cancer research.

Data Sources: PubMed, Cumulative Index to Nursing and Allied Health Literature, and ProQuest MEDLINE databases were searched up to February 5, 2013.

Study Selection: Studies were included if a patient-reported upper extremity outcome measure was administered, the participants were diagnosed with breast cancer, and the study was published in English.

Data Extraction: A total of 865 articles were screened. Fifty-nine full text articles were assessed for eligibility. A total of 46 articles met the initial eligibility criteria for aim 1. Eleven of these articles reported means and SDs for the outcome scores and included a comparison group analysis for aim 2.

Data Synthesis: Construct validity was evaluated by calculating effect sizes for known-group differences in 6 studies using the Disabilities of Arm, Shoulder and Hand (DASH), University of Pennsylvania Shoulder Score, Shoulder Disability Questionnaire-Dutch, and 10 Questions by Wingate. Responsiveness was analyzed comparing a treatment and control group by calculating the coefficient of responsiveness in 5 studies for the DASH and 10 Questions by Wingate.

Conclusions: Eight different patient-reported upper extremity outcome measures have been reported in the peer-review literature for women with breast cancer; some that were specifically developed for breast cancer survivors (n=3) and others that were not (n=5). Based on the current evidence, we recommend administering the DASH to assess patient-reported upper extremity function in breast cancer survivors because the DASH has the most consistently large effects sizes for construct validity and responsiveness. Future large studies are needed for more definitive recommendations.

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Breast cancer is the most common cancer affecting women in the United States, excluding cancers of the skin.[1] It is estimated that in 2013, approximately 232,000 new cases of breast cancer will be diagnosed in American women.[1] Currently, there are approximately 2.9 million American women who are surviving with breast cancer, commonly referred to as breast cancer survivors.[2] Although survival rates continue to improve, the focus on survivorship issues and quality of life has gained more attention.[3] One survivorship issue that is well documented in the literature is upper extremity function in breast cancer survivor quality of life.[4-15]

The ability to use the upper extremity during daily activities in order to participate in desired family, social, and occupational roles[16,17] can be quantified with patient-reported outcome measures.[18] Third-party payers increasingly require health care

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providers to measure clinical outcomes, and patient-reported outcome measures are 1 way to do so. Patient-reported outcome measures can be used to assess the difficulty of a variety of upper extremity activities during participation in daily roles. Rehabilitation professionals can use the information from patient-reported outcomes to assist clinical decision-making and to assess the impact of the effects of rehabilitation treatment on what is ultimately most important to the patient—the daily use of their upper extremity.[18-20]

Understanding the usefulness of patient-reported outcome measures in terms of construct validity and responsiveness is essential to help guide clinical decision-making.[21] The most commonly used patient-reported outcome measures fall into 1 of 2 broad categories: disease/condition specific or region specific.[21] Currently, there are over 30 patient-reported disease- or region-specific upper extremity measures with documented psychometric properties.[21] Some of the most commonly used upper extremity patient-reported outcome measures include the American Shoulder and Elbow Surgeons, Disabilities of Arm, Shoulder and Hand (DASH), Shoulder Disability Questionnaire, and the Shoulder Pain and Disability Index. Many of these questionnaires were created so the outcome score could be interpreted for a variety of individuals, regardless of the upper extremity pathology or diagnosis.[21] The development and validation of these measures occurred in individuals with diagnoses such as humeral fractures, glenohumeral arthritis, rotator cuff tendinitis, impingement syndrome, status postshoulder surgery, glenohumeral instability/dislocation, rotator cuff syndrome, adhesive capsulitis, hemiarthroplasty, shoulder weakness, and soft tissue disorders.[22-24] Because many of the current patient-reported outcome measures were originally designed and measurement properties were characterized for use predominantly in general musculoskeletal disorders of the shoulder or upper limb, it is unclear if the psychometric properties of these outcome tools have been adequately studied for use in the breast cancer population.

We are aware of 3 published breast cancer-specific upper extremity patient-reported outcome measures, Kwan's arm problem scale (KAPS), upper limb disability questionnaire (ULDQ), and 10 Questions by Wingate; however, these all lack reported psychometric properties. Additionally, we are not aware of any studies that have identified which outcome measures have been administered to the breast cancer population and systematically assessed the construct validity and responsiveness of these measures when administered to women with breast cancer. Therefore, the purpose of this systematic review was to (1) identify English-language published patient-reported upper extremity outcome measures used in breast cancer research and (2) examine the construct validity and responsiveness of these patient-reported measures. This information will provide an improved understanding of which patient-reported outcome measures have been administered to breast cancer survivors and reveal select psychometric properties specific to the breast cancer population. Rehabilitation professionals can use this information to guide their decisions when determining which measure is most appropriate to administer when examining upper extremity function in breast cancer survivors, in planning future psychometric studies, and for calculating sample sizes based on data reported for existing measures.

List of abbreviations:

CI	**confidence interval**
DASH	**Disabilities of Arm, Shoulder and Hand**
ES	**effect size**
KAPS	**Kwan's arm problem scale**
ULDQ	**upper limb disability questionnaire**

Methods

The Evaluation Database to Guide Effectiveness Task Force was developed by the research section of the American Physical Therapy Association. The goal of the Evaluation Database to Guide Effectiveness is to establish a framework to facilitate the evaluation of outcome measures. The oncology section of the American Physical Therapy Association developed a task force whose goals are to facilitate identification of valid and reliable tests and measures that reflect clinically important outcomes for standard use across selected patient groups in the area of oncology rehabilitation. Breast cancer was chosen as the initial target practice area, and this systematic review was performed in conjunction with the goals of this task force. Inclusion criteria for article retrieval for both aims in this review included women diagnosed with breast cancer, methodology indicated the use of a patient-reported upper extremity outcome measure, and studies published in English. Studies were excluded for both aims if the patient-reported upper extremity outcome measure was designed for a specific patient condition (ie, rheumatoid arthritis, pulmonary dysfunction), the measure was not standardized, the measure contained clinical-rated or performance-based measures as part of the total score of the measure (ie, Constant Shoulder Scale, 6-minute walk test), the outcome measure was modified from the original format, or the outcome measure was dichotomous yes or no (ie, Simple Shoulder Test). Additionally, for aim 2, studies were excluded if there was no comparison group reported and/or there was no reported outcome total score mean or SD.

Data sources and searches

A primary systematic search using PubMed was performed from its inception until February 5, 2013, and resulted in the retrieval of 716 publications. The search strategy began with the filters *((((“upper extremity” [MeSH terms] OR shoulder)) AND ((disability) or function)) AND (breast neoplasm [MeSH terms])*. A second systematic search strategy using the Cumulative Index to Nursing and Allied Health Literature was performed until February 5, 2013, and yielded 24 publications using the following search terms: MM “Breast Neoplasms” and MM *((shoulder or axilla or upper extremity) AND ((function or disability))*. A third systematic search strategy using ProQuest MEDLINE up to February 5, 2013, yielded 115 publications using the following search terms: *(breast neoplasms) AND (upper extremity OR shoulder) AND (disability OR function)*.

Study selection

Three of the authors (S.H., S.M., T.K.) examined reference lists from all of the selected publications to verify that no pertinent publications were missed during the previously described electronic searches. Retrieved abstracts were reviewed for possible inclusion. When warranted, full articles were obtained for review. Many (n = 684) of the publications did not meet the following inclusion criteria: women diagnosed with breast cancer, methodology indicated the use of a patient-reported upper extremity outcome measure, and published in English. After abstracts were reviewed