EDITOR'S CHOICE

Relative Prevalence of Anxiety and Depression in Patients With Upper Extremity Conditions

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Purpose Prior research regarding the impact of mental health on upper extremity musculoskeletal function and recovery has frequently grouped catastrophizing, anxiety, and depression. This study was designed to define the relative prevalence of heightened anxiety versus depressive symptoms among a patient population seeking upper extremity care and to determine if those prevalences varied according to the symptomatic condition.

Methods All adult patients presenting to a tertiary upper extremity orthopedic center between June 1, 2016 and November 30, 2016 (n = 3,315) completed the Patient-Reported Outcomes Measurement Information System (PROMIS) Anxiety and Depression Computer Adaptive Tests. Descriptive statistics and multivariable linear regression assessed differences in average PROMIS scores between demographic and diagnostic groups. Patients were also analyzed according to crossing thresholds for heightened anxiety and depression scores based on established linkage tables with the Generalized Anxiety Disorder 7 and Patient Health Questionnaire-9 Depression scales, respectively. Pearson chi-square analysis and binary logistic regression were performed to determine if the proportion of patients crossing these thresholds varied according to the primary symptomatic condition while accounting for patient age, sex, and race.

Results African American patients and those with carpal tunnel syndrome, trapeziometacarpal arthritis, or shoulder conditions reported significantly higher PROMIS Anxiety scores. Higher PROMIS Depression scores varied only by diagnosis. Seventeen percent of patients exceeded the Anxiety symptoms score threshold and 10% of patients exceeded the Depression symptom threshold. In logistic regression modeling, the likelihood of exceeding the Anxiety threshold varied by diagnosis and was increased in African American patients and females. African American race was associated with exceeding the Depression threshold while accounting for sex and diagnosis.

Conclusions Patients with upper extremity conditions more frequently report heightened anxiety than heightened depression. Patient race and diagnosis are independent predictors of anxiety among patients seeking care for upper extremity conditions. *(J Hand Surg Am. 2017;■(■):■−■.*

Type of study/level of evidence Diagnostic II.

Key words Anxiety, depression, PROMIS, upper extremity.

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The substantial impact of psychosocial factors on patient outcomes has been well established in the orthopedic literature.[1–6] In patients with upper extremity musculoskeletal conditions, there is a strong correlation between psychological distress and pain intensity with both preoperative and postoperative physical impairment.[7–11] Mental health measures have a stronger association with patient-reported symptoms of hand arthritis than more objective measures, such as radiographic disease progression and range of motion.[12,13] Despite increasing evidence linking the symptoms of psychological distress to patient-reported pain and function, further study is needed to define the incidence of heightened anxiety and depression among patients with upper extremity musculoskeletal conditions.

Twelve percent of 190 patients presenting to 1 of 3 academic hospital–based hand surgeons met criteria for major depression based on the Patient Health Questionnaire (PHQ)-9.[14] Symptoms of anxiety and pain interference correlated with depression in this patient sample, but the prevalence of these psychological disorders was not defined. Gaining further understanding of the epidemiology of mental health conditions among patients seeking upper extremity care will aid our ability to suggest mental health intervention, optimize care, and guide future research.

The National Institutes of Health developed the Patient-Reported Outcomes Measurement Information System (PROMIS) to effectively assess a wide range of health domains, including those of anxiety and depression.[15,16] In its computer adaptive testing (CAT) format, PROMIS assessments selectively draw from large pools of validated questions, providing a sensitive measure of mental health domains including depression and anxiety while requiring a patient to answer only 4 to 12 questions.[17,18]

This study's primary aim was to determine the prevalence of heightened anxiety and depression in patients seeking specialty care for an upper extremity musculoskeletal condition. Second, we aimed to determine if the magnitude of PROMIS scores and prevalence of anxiety and depression symptoms varied among upper extremity musculoskeletal conditions.

METHODS

This cross-sectional study evaluated all new adult patients presenting to 1 of 12 upper extremity surgeons at an orthopedic tertiary-care clinic between June 1, 2016, and November 30, 2016. Our study was exempt from institutional review board approval because it collected deidentified patient data. All clinic patients used a computer tablet (iPad mini; Apple, Cupertino, CA) at check-in that was preloaded with PROMIS Anxiety-v1.0 and PROMIS Depression-v1.0. The PROMIS scores were automatically uploaded into the patients' electronic health record immediately following completion.

The PROMIS modules have been developed to be scored with a T-metric so that a score of 50 represents the normative population mean with an SD of 10.[19] Higher scores represent more of each health domain. For example, a PROMIS Anxiety score of 60 represents anxiety symptoms 1 SD greater than the normative population, and a Depression score of 40 represents less depressive symptoms than the normative population. A minimal clinically important difference of 3.0 to 5.5 points has been suggested, with score changes of 3.0 to 4.5 in mental health domains being clinically relevant in a population of cancer patients.[20,21] However, because a clinically important difference for upper extremity patients has not yet been established, we chose to utilize both the upper and the lower ends of the range (3 to 4.5) as a proxy for a clinically relevant difference between groups.

The PROMIS Anxiety module measures emotional distress caused by fear, anxious misery, hyperarousal, and related somatic symptoms.[17] Using item response theory, a crosswalk linking table exists to convert PROMIS Anxiety scores to the Generalized Anxiety Disorder (GAD)-7, a 7-item instrument established to identify likely cases of GAD. A score of 10 or higher on the GAD-7 maximizes the sensitivity and specificity when judged against a diagnosis of GAD.[22,23] A score of 10 on the GAD-7 corresponds to a PROMIS Anxiety score of 62.3.[24] Thus, a score of 62.3 was chosen as a minimum threshold value indicating a patient being affected by anxiety symptoms for PROMIS Anxiety for this study.

The PROMIS Depression module captures the respondent's negative mood, views of self, affect, and social cognition.[17] A linkage table has been developed to convert between PROMIS Depression scores and the PHQ-9. A score greater than 10 on the PHQ-9, which corresponds to a PROMIS Depression score of 59.9 or greater, indicates moderate depression and allows for the highest sensitivity and specificity when judged against a diagnosis of major depression.[25,26] Therefore, a minimum threshold PROMIS Depression score of 59.9 was chosen indicating a patient being affected by depressive symptoms.

Statistical analysis

Descriptive univariate statistics were used to evaluate the demographic data, average PROMIS scores, and prevalence of patients scoring above the designated