

Reliability and Validity of Upper Extremity Patient-Reported Outcome Measures in Assessing Traumatic Finger Amputation Management

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Background: This study investigates the psychometric properties of patient-reported outcome instruments for assessing outcomes in postsurgical traumatic digit amputation patients. The authors hypothesize that the Michigan Hand Outcomes Questionnaire (MHQ) and Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire are the most valid and reliable instruments.

Methods: The authors studied traumatic digit amputation patients as part of the Finger Replantation and Amputation Challenges in Assessing Impairment, Satisfaction, and Effectiveness (FRANCHISE) study initiated by The Plastic Surgery Foundation. The MHQ, DASH questionnaire, Patient-Reported Outcomes Measurement Information System (PROMIS), and 36-Item Short-Form Health Survey were used to assess patients at least 1 year postoperatively. Internal consistency was measured by Cronbach's alpha and criterion validity with Pearson correlation coefficient (r). Construct validity was tested with four predefined hypotheses. Discriminant validity was analyzed by receiver operating characteristic curves.

Results: One hundred sixty-eight replantation and 74 revision amputation patients met the inclusion criteria. All instruments demonstrated fair to good internal consistency in both cohorts ($0.7 < \alpha < 0.9$). The MHQ and DASH questionnaire scores correlated strongly ($r > 0.60$) in both cohorts. The 36-Item Short-Form Health Survey had moderate to weak correlation with the remaining instruments, and its mental component had poor discriminant validity (area under the curve, 0.64 to 0.67). The MHQ, DASH questionnaire, and PROMIS demonstrated good construct validity confirming 75 to 100 percent of predefined hypotheses, whereas the 36-Item Short-Form Health Survey confirmed only 25 percent.

Conclusions: The authors recommend using the Michigan Hand Outcomes Questionnaire or the Disabilities of the Arm, Shoulder and Hand questionnaire when assessing patient-reported outcomes in digit amputation patients based on good internal consistency and validity. The Patient-Reported Outcomes Measurement Information System has fair validity and reliability but should be an adjunct instrument. The 36-Item Short-Form Health Survey should not be used as a primary assessment tool, but as an adjunct to assess overall quality of life. (*Plast. Reconstr. Surg.* 145: 94e, 2020.)

Patient-reported outcomes after surgical intervention have increased in importance in clinical research and health care. Many upper extremity patient-reported outcome instruments have been validated for use after various

hand procedures.¹⁻⁵ Frequently used and validated assessment tools are the Michigan Hand

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