

Psychological Distress is a Stronger Driver of Shoulder Pain and Function than Tear Severity in Patients Undergoing Rotator Cuff Repair

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INTRODUCTION:

Psychological distress has been associated with declining shoulder function and quality of life for patients with rotator cuff tears. Despite this, there are few published studies that have examined the impact of rotator cuff tear severity and preoperative psychological distress on shoulder pain and function in patients undergoing operative management for rotator cuff tear. Thus, the aim of this study was to evaluate the association between psychological distress and shoulder pain and function in patients undergoing arthroscopic rotator cuff repair. Furthermore, we aim to identify the specific dimensions of psychological distress most strongly associated with greater shoulder pain and diminished function.

METHODS:

Consecutive patients that underwent arthroscopic rotator cuff repair and completed preoperative Optimal Screening for Prediction of Referral and Outcome (OSPRO) from 2019 to 2021 at a single academic institution were included. The OSPRO is a validated tool used to measure psychological distress. Sociodemographic, primary indication, and patient-reported outcome scores were collected. Preoperative patient-reported outcomes were collected; these included Visual Analog Scale (VAS) shoulder pain, Single Assessment Numeric Evaluation (SANE), and American Shoulder and Elbow Surgeon (ASES) scores. Patients were stratified based on severity of rotator cuff tendon tears into three groups: 1) partial-thickness tears, 2) small to medium full-thickness tears, and 3) large to massive full-thickness tears. Linear regression analysis was used to further evaluate the association between OSPRO scores measuring psychological distress and patient-reported shoulder function and pain scores.

RESULTS:

Eighty-four total patients were included. Preoperatively, the study cohort had a mean VAS shoulder pain score of 5.8 ± 2.5 , ASES score of 44.2 ± 18.5 , and SANE score of 48.9 ± 21 . Thirty-three (39%) patients had a partial-thickness RCT, 17 (20%) patients had a small to medium full-thickness RCT, and 34 (41%) patients had large to massive RCT. Regarding PRO scores, there were no significant differences amongst the three cohorts of severity of rotator cuff tear. Within the OSPRO negative mood domain, the specific dimension of anxiety ($p < 0.033$) was significantly associated with lower ASES scores (Table 1). Within the negative coping domain, fear-avoidance behavior for physical activity ($p < 0.001$) and work ($p < 0.001$) demonstrated strong association to all shoulder metrics obtained (VAS pain, SANE, ASES score). The dimensions of pain catastrophizing ($p < 0.026$, $p < 0.003$), kinesiophobia ($p < 0.007$, $p < 0.001$), and pain anxiety ($p < 0.006$, $p < 0.000428$) all strongly correlated with both VAS pain and ASES scores, respectively. Similarly, within the positive affect and coping domain, all 3 dimensions of pain self-efficacy ($p < 0.008$, $p < 0.007$), self-efficacy for rehabilitation ($p < 0.003$, $p < 0.001$), and chronic pain acceptance ($p < 0.022$, $p < 0.033$) were shown to strongly associate with VAS pain and ASES clinical outcome scores (Table 1). These findings emphasize strong correlations between specific dimensions of preoperative psychological distress and preoperative pain and function.

DISCUSSION AND CONCLUSION:

These findings suggest that preoperative psychological distress is a stronger predictor of poor shoulder function and pain than rotator cuff tear severity in patients undergoing arthroscopic rotator cuff repairs. This emphasizes the importance of screening for multiple dimensions of pain-associated psychological distress in RCT populations to identify patients who may benefit from multimodal therapeutic intervention.

Table 1 – Linear regression analysis results demonstrating the association between psychological distress and shoulder pain and function, adjusted for rotator cuff tendon tear severity.

	VAS Pain*	SANE Score	ASES Score
	Adjusted B (95% CI)	Adjusted B (95% CI)	Adjusted B (95% CI)
OSPRO Negative Mood			
Depression	-0.079 (-0.048 to 0.207)	-0.486 (-1.563 to 0.591) p=0.372	-0.874 (-1.824 to 0.077) p=0.071
Trait Anxiety	0.055 (-0.019 to 0.129) p=0.144	-0.333 (-0.962 to 0.297) p=0.296	-0.599 (-1.148 to -0.050) p=0.033
Trait Anger	0.115 (-0.077 to 0.308) p=0.237	-1.181 (-2.825 to 0.462)	-0.567 (-2.022 to 0.889) p=0.441
OSPRO Negative Coping			
Fear-avoidance beliefs for physical activity	0.270 (0.130 to 0.410) p=0.000241	-2.008 (-3.185 to -0.831) p=0.001	-2.932 (-3.804 to -2.060) p=0.001, p=0.00099
Fear-avoidance beliefs for work	0.057 (0.005 to 0.109) p=0.032	-0.539 (-0.975 to -0.103) p=0.016	-0.743 (-1.103 to -0.382) p=0.001, p=0.00099
Pain Catastrophizing	0.056 (0.007 to 0.105) , p=0.026	-0.135 (-0.564 to 0.295) p=0.535	-0.538 (-0.891 to -0.186) p=0.003
Kinesiophobia	0.134 (0.039 to 0.230) p=0.007	-0.627 (-1.462 to 0.208), p=0.139	-1.259 (-1.942 to -0.576) p=0.001, p=0.00438
Pain Anxiety	0.049 (0.015 to 0.083) p=0.006	-0.195 (-0.495 to 0.106) p=0.201	-0.451 (-0.696 to -0.207) , p=0.001, p=0.000428
OSPRO Positive Affect and Coping			
Pain Self-efficacy	-0.062 (-0.107 to -0.017) p=0.008	0.289 (-0.110 to 0.687), p=0.153	0.474 (0.134 to 0.815) p=0.007
Self-efficacy for Rehabilitation	-0.036 (-0.059 to -0.013) p=0.003	0.198 (-0.005 to 0.403) p=0.056	0.289 (0.119 to 0.459) p=0.001
Chronic Pain Acceptance	-0.037 (-0.069 to -0.005) p=0.022	0.148 (-0.130 to 0.427) p=0.292	0.262 (0.022 to 0.503) p=0.033

OSPRO Optimal Screening for Prediction of Referral and Outcome Assessment Tool
 *In addition to adjusting for rotator cuff tendon tear severity, ethnicity was
 †p values <0.05, Holm-Bonferroni correction has been made in order to account for multiple comparisons