Psychosocial Determinants of Health Predict Worse PROMIS Scores and Increased Healthcare Utilization in Orthopaedic Trauma Patients

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INTRODUCTION: Social determinants of health have been shown to have a complex relationship with biopsychosocial pathways. Identification of social risk factors in the context of functional outcomes and healthcare utilization could allow for improved quality and lower cost of care. The primary aim of this study is to determine if psychosocial risk factors are associated with patient reported functional outcomes and health care utilization within the orthopedic trauma population.

METHODS: We prospectively obtained data on psychosocial risk factors and healthcare utilization in 73 consecutive patients that presented with an operative orthopaedic injury at a single Level-I trauma center between May 2018 and August 2019. Each patient was asked to complete a social risk factor assessment designed to evaluate change in social settings and healthcare utilization in the aftermath of trauma at both initial hospitalization as well as 1-year follow-up. A novel Psychosocial (PS) score (0–15) was calculated, with a higher score corresponding to a greater psychosocial impact. The primary outcome was Patient-Reported Outcomes Measurement Information System (PROMIS)–physical function scores. The secondary outcome was healthcare utilization defined as return to the emergency department or urgent care since last follow-up because of pain. Regression analyses were utilized to determine the association between PS and PROMIS scores and the association between elevated PS score and healthcare utilization.

RESULTS: The average patient was 49 (±15) years old, overweight (29.6 ± 9.6 kg/m^2), female (53.4%), and Black (76.7%). Patients who reported difficulty affording prescription medicine and very basics like food and housing had significantly lower mean PROMIS scores than those who did not have difficulty ($p<0.001$) (Table 1). A simple linear regression showed a significant relationship between PS and PROMIS scores (R^2=0.25, $p<0.001$). For every 1-point increase in PS score, PROMIS score decreased by 1.70 (Figure 1). Patients that utilized healthcare resources because of pain within one year had significantly higher average PS scores (7.2 vs. 5.2, $p=0.009$). Using a receiver operator characteristic curve to determine the best cutoff, a PS score of ≥5 was defined as elevated. Patients with elevated PS score were almost 6 times as likely to utilize healthcare resources because of pain than those with lower PS scores (odds ratio: 5.9, 95% confidence interval: 1.2–28.2; $p=0.027$).

DISCUSSION AND CONCLUSION: Psychosocial risk factors are significantly associated with worse patient reported outcomes and higher rates of healthcare utilization in operative orthopaedic trauma patients. The results of this study have the potential to drive risk-adjustment models to ensure that hospitals and providers are fairly assessed on quality metrics, and direct inter-disciplinary, comprehensive, and coordinated care of trauma patients.

Figure 1. Simple Linear Regression: Psychosocial Versus PROMIS Score.

R^2 Linear = 0.248

y=52.3–1.7*x
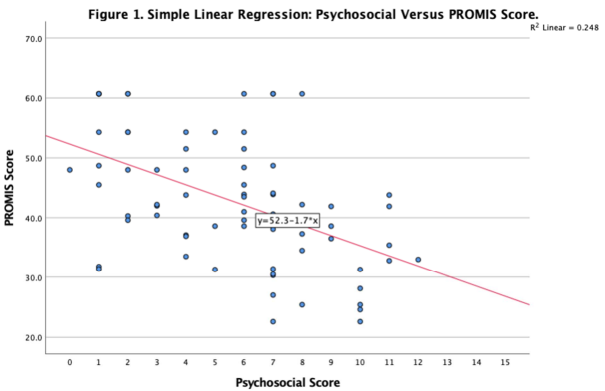
Psychosocial Questionnaire	PROMIS T-Score Mean (SD)	P-Value
Do you have a primary care physician?		0.555
I have (n=51)	42.29 (10.41)	
I don't have (n=22)	43.91 (11.49)	
How hard is it for you to pay for the very basics, like food, housing, medical care, and heating?		<0.001
Not hard at all (n=25)	49.15 (10.51)	
Somewhat hard (n=26)	43.25 (7.39)	
Very hard (n=22)	34.98 (9.41)	
Since your last visit, was there anytime when you could not get a prescription medicine because you could not afford it?		<0.001
No (n=43)	46.48 (9.68)	
Yes (n=30)	37.47 (9.94)	
Since your last visit, has your living situation or housing changed?		0.235
No (n=57)	43.57 (10.73)	
Yes (n=16)	39.96 (10.42)	
Do you live alone?		0.226
No (n=50)	43.81 (11.16)	
Yes (n=23)	40.53 (9.46)	
Are you homeless?		0.161
No (n=72)	42.76 (10.77)	
Yes (n=1)	43.80 (-)	
Since your last visit, has your relationship status changed?		0.161
No (n=59)	43.63 (10.65)	
Yes (n=14)	39.16 (10.48)	
Don't feel accepted by your neighbors or community?		0.306
I feel accepted (n=65)	43.23 (10.51)	
I don't feel accepted (n=8)	39.10 (12.26)	
Have you ever been convicted of a crime? (felony or misdemeanor)		0.575
No (n=55)	43.18 (10.37)	
Yes (n=18)	41.54 (11.85)	
Had nightmares about the event(s) or thought about the event(s) when you did not want to?		0.007
No (n=24)	47.54 (9.63)	
Yes (n=49)	40.45 (10.50)	
Tried hard not to think about the event(s) or went out of your way to avoid situations that reminded you of the event(s)?		0.017
No (n=18)	47.97 (10.39)	
Yes (n=55)	41.08 (10.33)	
Been constantly on guard, watchful, or easily startled?		0.093
No (n=35)	44.97 (10.22)	
Yes (n=38)	40.76 (10.86)	
Felt numb or detached from people, activities, or your surroundings?		<0.001
No (n=38)	47.02 (10.40)	
Yes (n=35)	38.17 (9.09)	
Felt guilty or unable to stop blaming yourself or others for the event(s) or any problems the event(s) may have caused?		0.042
No (n=43)	44.89 (10.71)	
Yes (n=30)	39.75 (10.09)	

Patient Reported Outcomes Information System (PROMIS) Physical Function – Short Form 20a – version 1.0