Prevalence of Depression and Impact of Socioeconomic Factors in Ambulatory Orthopaedic Care: Results from Depression Screening of Nearly 60,000 Patients

Mary Hennekes, Anna Christine McGee, Stanley Li, Justin Bennie, Eric C Makhni[1]
[1]Henry Ford Health System

INTRODUCTION: Depression has been shown to have a significant effect on outcomes following orthopaedic procedures. The purpose of this study was to determine 1) the floor and ceiling effects of the Patient-Reported Outcomes Measurement Information System Depression (PROMIS-D) form, 2) the prevalence of positive PROMIS-D screening forms across an orthopaedic service line, and 3) the prevalence of previously diagnosed depression and interventions for those who screened positive on PROMIS-D.

METHODS: This was a retrospective cross-sectional analysis of all patients age 14 years and older who presented to ambulatory orthopaedic clinics across an orthopaedic service line between January 1, 2019 to January 1, 2022. All patients included had completed a self-administered PROMIS-D form as part of the ambulatory orthopaedic encounter. Demographic information and PROMIS-D scores were acquired for all patients from the electronic medical record (EMR). Scores were analyzed with respect to patient characteristics including age, gender, household income, and presenting orthopaedic complaint. Floor and ceiling effects were calculated by the percentage frequency of lowest and highest possible scores achieved on PROMIS-D, respectively. All continuous data was analyzed using Student's independent samples t-tests or ANOVA and reported as means ± standard deviations. A representative sample of 1,000 patients was then analyzed for rates of minor and major depression as well as formal psychiatric diagnosis and prior interventions. Major depression was classified as a PROMIS-D score greater than 60 and minor depression as a PROMIS-D score of 55-60.

RESULTS: A total of 58,227 patients completed a PROMIS-D form during the study period. PROMIS-D displayed a negligible ceiling effect (<0.001%) but a significant floor effect (19.0%) across the orthopaedic service line (Figure 1). The average PROMIS-D score across all divisions was 48.7 + 10.1. Rates of minor and major depression were 15.8% and 14.8%, respectively, across the entire orthopaedic population. Scores indicating major depression on PROMIS-D were highest among patients presenting with spine complaints (42.8%) and lowest among patients presenting to the pediatric clinics (28.64%). Rates of a positive depression screen among women were 33.5%, 1.4 times higher than men. Patients in the lowest quartile mean household income (MHI) also had nearly double the rate of positive depression screens for major depression compared to the highest quartile MHI. Among the representative, random 1,000 patient sample, 31.3% met criteria for minor or major depression on PROMIS-D. Of these, only 39% had previously received some form of mental health treatment, including 33.2% who were prescribed antidepressants.

DISCUSSION AND CONCLUSION: PROMIS-D is a reasonable screening tool for depressive symptoms, but it is limited by its floor effect. Patients who present for spine complaints, are women, and are in the lowest median household income quartile are more likely to screen positive on PROMIS-D. There are a significant number of patients who present to orthopaedic clinics who screen positive for depression but have never taken part in behavioral health interventions. Given the effect depression can have on orthopaedic outcomes, screening for depressive symptoms in the orthopaedic clinic should be considered in order to maximize multidisciplinary care and optimize patient outcomes.

Dept	Patients, n	PROMIS-D, mean (SD)	Major Depression, n (%)	Minor Depression, n (%)	Floor Effect (%)	Ceiling Effect (%)	Floor Effect	Ceiling Effect
							-30% -20% -10% 0% 10% 20% 30%	
Overall	58,227	48.9 (10.1)	7,370 (12.6%)	10,504 (17.9%)	18.6%	0.0%		
Oncology	452	49.1 (10.2)	64 (14.2%)	73 (15.9%)	19.3%	0.22%		
Foot/Ankle	8,844	48.4 (9.9)	977 (11.0%)	1,558 (17.4%)	19.7%	0.03%		
Hand	7,876	48.2 (10.0)	875 (13.9%)	1,381 (15.8%)	20.8%	0.09%		
Joint	15,471	49.3 (10.1)	2,140 (13.8%)	2,881 (18.6%)	17.0%	0.01%		
Peds	220	48.2 (10.3)	44 (15.0%)	55 (13.6%)	5.45%	0.45%		
PM&R	2,395	50.4 (10.2)	389 (16.2%)	464 (19.4%)	15.0%	0.13%		
Spine	2,211	51.8 (10.7)	472 (21.4%)	474 (21.4%)	13.0%	0.05%		
Sports	17,379	48.1 (9.8)	1,810 (10.4%)	2,969 (16.9%)	19.8%	0.05%		
Trauma	2,127	50.6 (10.9)	408 (19.0%)	410 (19.2%)	17.5%	0.09%		

Figure 1: Forest plot of the floor and ceiling effects of the PROMIS-Depression CAT within the ambulatory orthopedic population overall and by presenting department. The width of the bar represents the percentage of floor or ceiling effect