

The impact of social deprivation on patient satisfaction in physical medicine and rehabilitation outpatient interventional spine and musculoskeletal medicine using the press Ganey® outpatient medical practice survey

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ABSTRACT

Introduction: Multiple factors (patient age, wait time, depression, etc.) have been associated with lower patient satisfaction as assessed by the Press Ganey® Outpatient Medical Practice Survey (PGOMPS). Social deprivation has been shown to impact multiple aspects of patient care but its impact on patient satisfaction in Physical Medicine and Rehabilitation (PM&R) is limited.

Objective: We hypothesized that increased social deprivation would independently predict lower patient satisfaction, as measured by the PGOMPS.

Design: Retrospective large cohort study.

Setting: Single tertiary academic institution.

Patients: Adult patients seen by PM&R physicians practicing outpatient interventional spine and musculoskeletal medicine who completed PGOMPS between January 1, 2014 and December 31, 2019.

Interventions: Independent variables include: Social deprivation as measured by 2015 Area Deprivation Index (ADI), wait time, patient age, and sex.

Main outcome measure: Patient satisfaction was defined as receiving a perfect PGOMPS Total Score.

Results: A total of 64,875 patients (mean age 52.7 ± 21.8 years, 41.4% male, mean ADI 29.9 ± 18.8) were included. Univariate analysis showed a decreased odds of achieving satisfaction for each decile increase in ADI (odds ratio 0.965; 95% confidence interval 0.957–0.973; $p < 0.001$). The most socially deprived quartile was significantly less likely to report satisfaction on PGOMPS compared to the least deprived quartile (91.1 vs 93.2; $p < 0.001$). Multivariable analysis revealed that the odds of achieving satisfaction was 0.99 (95% confidence interval 0.980 to 0.997; $p = 0.009$) for the Total Score, independent of age, wait time, and patient sex for each decile increase in ADI.

Conclusions: In this cohort, increased social deprivation independently predicted patient dissatisfaction in PM&R.

1. Introduction

Evaluating a patient's satisfaction with his or her healthcare experience has increased in importance over the past several decades. The utilization of patient satisfaction in allocating hospital reimbursement and provider compensation has received scrutiny [61]. Additionally, literature has demonstrated that many non-modifiable factors significantly impact patient satisfaction scores [1,2,18,28,33,44]. Factors

associated with greater patient satisfaction include advanced patient age [1,18,45], greater duration of time with provider [23,40], accessibility of appointment scheduling [13,40], and recommendation of an intervention [57]. Factors correlated with worse patient satisfaction scores include increased length of hospital stay [28], greater wait time [1,8,29], increased time from visit to survey completion [28], burnout of physicians [50], increased pain level [19,71], and higher patient depression and/or anxiety [71]. Factors with mixed evidence in the

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literature include patient sex [9,19,23,45] race [2,5,9,23,44], provider sex [20,59] and race [12,25,44,47], education level and medical understanding of patients [2,33], greater traveled distance to appointments [1,24], and encounter setting [2,6,9,62]. Lower socioeconomic status has likewise been shown to correlate with worse patient satisfaction scores [46]. Socioeconomic status is often described using income level. Social deprivation describes the extent of social seclusion a patient experience based on their access to material and financial resources that would enable them to participate socially. Whereas socioeconomic status is limited to income level, social deprivation incorporates multiple factors to describe a neighborhood's access (or lack thereof) to community and social resources. Previous work has shown that social deprivation is associated with worse patient-reported outcomes (PRO). This correlation has been reported in the Patient-Reported Outcomes Measurement Information System (PROMIS) Anxiety, PROMIS Depression, PROMIS Pain interference (PI), and PROMIS Physical Function (PF) scores [48,73,74]. The effect of social deprivation on patient satisfaction scores in Physical Medicine and Rehabilitation (PM&R) clinics has not been reported previously.

The primary aim of this study was to evaluate the impact of social deprivation on satisfaction scores measured by the Press Ganey Outpatient Medical Practice Survey (PGOMPS) administered after PM&R interventional spine and musculoskeletal medicine (ISMM) outpatient visits. Our hypothesis was that increased social deprivation is associated with worse patient satisfaction scores as measured by PGOMPS.

2. Methods

This study received approval from our institutional review board (IRB #00101230). The electronic medical records of outpatient PM&R ISMM visits between January 2014 and December 2019 at a single tertiary academic medical center were screened. The inclusion criteria were English language PGOMPS surveys completed by adult patients (≥ 18 years of age). Prospectively obtained PGOMPS scores were collected electronically via an emailed survey available for 30 days after a patient's clinic visit. These scores were evaluated retrospectively. Patients lacking a listed address and those with only a listed post office box were excluded.

Electronic data acquisition software identified eligible patients with associated PGOMPS scores and collected the corresponding demographic and visit characteristic data. PGOMPS has six subdomains: access, moving through your visit, nurse or assistant, care provider, and personal issues [57]. Questions are measured on a Likert scale from 1 to 5 and are converted to a 0 to 100-point scale by Press Ganey Corporation proprietary equations. Total wait time was calculated from Press Ganey data as the sum of the waiting room wait time and exam room wait time. Satisfaction was defined *a priori* as receiving a perfect score given a previously identified high ceiling effect of PGOMPS [1,57,58,70].

Social deprivation describes a patient's inability to engage and participate in society and is composed of common socioeconomic measurements. The 2015 Area Deprivation Index (ADI) determined a patient's social deprivation [72]. Individual ADIs coincide with specific 9-digit zip codes and are calculated based on 17 factors influencing socioeconomic status including access to vehicles, telephones, education level, employment, etc. (Supplemental Table 1) [35]. These data were originally based on census records and are updated regularly [34]. The 17 factors are combined into a single composite score for each specific 9-digit zip code from 1 to 100 with higher scores indicating worse social deprivation. In an effort to improve research and public policy the data is publicly available online [35]. Specific ADI scores were obtained for each patient based on a patient's 9-digit zip code. Patient's with a P.O BOX address were excluded. Within the recent years, the ADI has been utilized in several musculoskeletal studies [48,73,74]. A previous study documented the specific factors used to calculate ADI [36].

Categorical variables were summarized as counts and percentages (%). The median and interquartile range were calculated for the ADI.

Continuous variables were summarized as mean \pm standard deviation (SD). Univariate binary logistic regression models evaluated associations between predictor variables and achieving a perfect PGOMPS total score. A separate univariate binary logistic regression was performed to evaluate the odds of satisfaction between top (scores of 76–100) and low (scores of 0–24) quartiles for ADI nationally. Additional predictor variables included were total wait time, patient age, and sex. Multivariable binary logistic regression models were performed to determine the association of the above factors with perfect satisfaction. Statistics were performed using Minitab.

3. Results

A total of 66,494 patients met the inclusion criteria. The mean age was 52.7 ± 21.8 years, and 41.4% were male. The PGOMPS Total Score averaged 92.3 ± 11.5 , and 25,289 gave a perfect score. The mean ADI was 29.9 ± 18.8 (median 27.0; interquartile range 16.0–41.0; range 1–100). Additional patient demographic information and visit data are provided in Table 1.

As estimated by the ADI, patients in the most socially deprived quartile (mean PGOMPS Total Score = 91.1) were significantly less likely to be satisfied, as compared to the least deprived quartile (mean PGOMPS Total Score = 93.2; $p < 0.001$). Univariate analysis demonstrated that each decile increase in ADI (worse deprivation) correlated with a 3.5% decreased likelihood of achieving perfect satisfaction (odds ratio, OR 0.965; 95% CI 0.957 to 0.973; $p < 0.001$; Fig. 1). PGOMPS scores were negatively correlated with increased wait time (OR 0.69, 95% CI 0.68 to 0.70 for each 5-min increase in wait time; $p < 0.001$) and positively correlated with increasing patient age (OR 1.1; 95% CI 1.10 to 1.12 for each 5-year increase in age; $p < 0.001$). Compared to female patients, male patients were significantly more likely to report perfect satisfaction (OR 1.1; 95% CI 1.0, 1.1; $p < 0.001$; Table 2).

Multivariable analysis demonstrated a statistically significant negative correlation between ADI and PGOMPS scores, independent of increasing wait time, advancing patient age and sex (OR 0.99; 95% CI, 0.980 to 0.997; $p = 0.009$; Table 3). Wait time, patient age, and male sex also had a statistically significant positive correlation with patient satisfaction (OR 0.68, 95% CI 0.67 to 0.69; $p < 0.001$; OR 1.01, 95% CI 1.01 to 1.01, $p < 0.001$; and OR 1.08, 95% CI 1.04, 1.12; $p < 0.001$ respectively; Table 3).

4. Discussion

Our primary finding was that increased social deprivation, as estimated by ADI, was an independent predictor of decreased patient satisfaction in the outpatient PM&R ISMM setting. This was independent of several factors previously shown to have a significant impact on patient satisfaction, including wait time and patient age [1,57,58,71].

Our findings are consistent with previous literature associating PGOMPS and social deprivation among orthopedic surgery-trained physicians [26,46,63–66]. Lower socioeconomic status has been shown to correlate with worse patient satisfaction as measured by PGOMPS [46] and functional outcomes such as PROMIS Physical

Table 1
Baseline patient characteristics.

Factor	Value (n = 4881)		
Demographics	Average/ N		Standard Deviation/%
Age (years \pm SD)	52.7	\pm	21.8
Area Deprivation Index (National Percentile)	29.9	\pm	18.8
Females	51,334		58.3%
Visit Characteristics			
Press Ganey Score	92.3	\pm	11.5
Wait Time (Minutes)	13.7	\pm	37.6

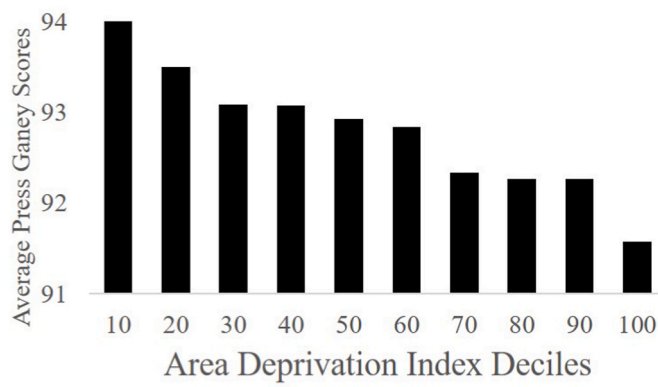


Fig. 1. Average press Ganey scores per area deprivation index decile.

Function scores [48,73,74]. Additional studies have associated social deprivation with an increased risk and incidence of fractures in adults [3,14–17,52] and pediatric patients [42,53,56]. Additionally, several studies support that worse social deprivation negatively impacts the outcomes of various fracture and arthritis treatments [21,22,31,32,49,51,55,69].

Our study is consistent with prior published studies that linked socioeconomic status with patient satisfaction scores using other metrics. Young et al. demonstrated a correlation between lower income levels and lower patient satisfaction scores among elderly patients seen in various specialty clinics utilizing the Veterans Health Administration database [75]. Higher education level, an often used surrogate for socioeconomic status, has been shown to correlate with higher patient satisfaction scores using the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) surveys by McFarland et al. [41]. Our study differs from prior literature that found no significant difference in patient satisfaction scores between males and females [63–66].

Understanding the effect of socioeconomic factors on the healthcare

system is vital to providing high-quality care. A growing body of literature suggests that socioeconomic status strongly influences overall physical and mental health [34,71,73,74]. The association of socioeconomic factors and patient-reported outcomes has also received increasing attention, with evidence that outcomes of medical and surgical interventions may differ based upon patient socioeconomic status [4,7,60]. Specific to rehabilitation, Putman et al. demonstrated functional recovery after stroke was worse for patients with lower socioeconomic status [54]. Similar findings have been found in the spinal cord injury patient population [37–39,67]. Socioeconomic status has also been correlated with worse functional outcomes for patients with back pain who participated in physical therapies [10,43]. Social deprivation is linked with decreased likelihood to participate in cardiac rehabilitation [68], cancer rehabilitation [27] and outpatient physical therapy for musculoskeletal conditions [11,30]. Wright et al. demonstrated that social deprivation is correlated with worse PROMIS Physical Function scores and psychological disability among musculoskeletal patients [73,74]. Though the root cause of these disparities remains elusive, one practical factor may be community limitations to access health care services. Patients with limited social deprivation would be less likely to consistently participate in prescribed therapies.

This study is also insightful in further highlighting non-modifiable factors that impact patient satisfaction. This study, in addition to the previous work described, should be taken into consideration by those involved in health care policy and in health care administration when determining if and how patient satisfaction scores should be linked to physician and hospital reimbursements.

This study has several limitations. The single-center study design of our study may limit the generalization of our findings to healthcare systems that service patient populations with differing demographics. Given that our institution treats patients from a large geographical distribution, some patients travel multiple hours to be evaluated by specialists. This may disproportionately affect patient expectations and satisfaction compared to centers with smaller catchment areas. All studies of this kind are limited by non-response bias inherent to the

Table 2
Univariate analysis for the press Ganey total score.

Factor	Odds Ratio (OR)		Coefficient	Coefficient Standard Error	P-Value
	OR	95% Confidence Interval			
Age ^a	1.010	(1.010–1.011)	–1.037	0.022	<0.001
Area Deprivation Index ^b	0.965	(0.960–0.973)	–0.004	0.0004	< 0.001
Sex	–	–	–	–	–
Female	Reference Category	–	–	–	–
Male	1.102	(1.068–1.138)	–0.529	0.0105	<0.001
Wait Time ^d	0.686	(0.676–0.695)	–0.076	0.001	<0.001

^aPer 5 years of additional age.

^bPer additional 10 percentile points.

^cP-values for the overall univariate binary logistic regression model. Subsequent p-values listed are for pairwise comparisons.

^d Per additional 5 min.

Table 3
Multivariable analysis for the press Ganey total score.

Variable	Odds Ratio (OR)		Coefficient	Coefficient Standard Error	P Value
	OR	95% Confidence Interval			
Age ^a	1.010	(1.010–1.011)	0.013	0.0004	<0.001
Area Deprivation Index ^b	0.988	(0.980–0.997)	0.0103	0.0004	0.009
Gender	–	–	–	–	–
Female	Reference Category	–	–	–	–
Male	1.080	(1.045–1.117)	0.077	0.017	<0.001
Wait Time ^d	0.684	(0.674–0.694)	–0.076	0.001	<0.001

^aPer 5 years of additional age.

^bPer additional 10 percentile points.

^cP-values for the variable category in the multivariable binary logistic regression model. Subsequent p-values listed are for individual comparisons.

^d Per additional 5 min.

PGOMPS survey. A prior study found that patients who complete the PGOMPS differ from non-responders regarding age, sex, and insurance type [70]. A response rate ranging from 8.9 to 16.5% has been reported at our institution for PGOMPS, and it is unclear how this may affect our results [57]. A low response rate is a real-world limitation of the survey. Finally, the present study cannot directly explain *why* patients with worse social deprivation are less likely to be satisfied with their patient encounters. Worse social deprivation appears associated with higher levels of anxiety and depression [73], and similarly, worse PROMIS anxiety and depression scores have been correlated with lower PGOMPS scores [71]. These components may also be significant factors correlating dissatisfaction with social deprivation. Increased efforts are needed to understand why such disparities in patient satisfaction exist amongst those with differing social deprivation statuses and to improve the quality of care delivered to patients with significant social deprivation.

5. Conclusion

As measured by ADI, increased social deprivation is associated with a lower likelihood of obtaining perfect PGOMPS score among patients treated by PM&R physicians practicing interventional spine and musculoskeletal medicine in the outpatient setting. Additional studies are needed to understand why patients with worse social deprivation are more likely to report less satisfaction.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.inpm.2023.100276>.

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