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Association Between Patient-Reported Measures of Psychological Distress and Patient Satisfaction Scores in a Spine Surgery Patient Population

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Background: Patient satisfaction has become an important component of the delivery of health care in the United States. Previous studies have shown that patient satisfaction is influenced by patient-specific characteristics. The goal of this study was to determine whether psychological distress influences outpatient satisfaction scores in a spine surgery patient population.

Methods: We retrospectively reviewed the records from all outpatient clinical encounters at a single academic spine surgery center between February 2011 and January 2013. Any patient who completed both a patient satisfaction survey and a Distress and Risk Assessment Method (DRAM) questionnaire for the same clinical encounter was included in the study. Statistical analysis was performed to determine whether patient satisfaction scores were influenced by psychological distress.

Results: During the study period, 103 patients who met the inclusion criteria were identified. On the basis of their responses to the DRAM questionnaire, fifty-six were classified as normal (no evidence of distress), twenty-two as at risk, thirteen as distressed depressive, and twelve as distressed somatic. The mean overall patient satisfaction scores (and standard deviation) were 90.2 ± 10.9 in the normal group, 94.7 ± 8.2 in the at-risk group, 87.5 ± 16.2 in the distressed-depressive group, and 75.7 ± 22.4 in the distressed-somatic group ($p = 0.003$). The mean score for the patients' satisfaction with their provider was 94.2 ± 12.0 in the normal group, 94.2 ± 9.5 in the at-risk group, 90.6 ± 24.0 in the distressed-depressive group, and 74.9 ± 26.2 in the distressed-somatic group ($p = 0.011$).

Conclusions: These results indicate a significant association between patient satisfaction and psychological distress as measured with the DRAM questionnaire. "Distressed" patients gave significantly lower scores for overall satisfaction and satisfaction with their provider compared with patients categorized as "normal." These results suggest that psychological factors may influence patients' perception of the medical care provided to them.

Level of Evidence: Prognostic Level III. See Instructions for Authors for a complete description of levels of evidence.

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Patient satisfaction, and the metrics by which it is measured, have become an increasingly important component of the delivery of medical care in the United States. Patient satisfaction is used as one of several measures of the quality of medical care delivered and is increasingly utilized to evaluate hospital and

physician performance and to determine hospital and provider compensation¹⁻⁶. Despite this increased emphasis, the factors that influence patient satisfaction are incompletely understood. Previously published studies in non-orthopaedic populations have demonstrated that patient satisfaction not only is a function

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TABLE 1 Patient Characteristics in the DRAM Groups

| | Normal | At Risk | Distressed Depressive | Distressed Somatic | P Value |
|---------------------------------|-------------------|-------------------|--------------------------|--------------------|---------|
| Mean age (range) (yr) | 63.05 (15.3-79.6) | 56.72 (15.7-78.5) | 58.58 (31.4-82.0) | 63.31 (40.7-74.2) | 0.3383* |
| Sex (no.) | | | | | 0.4552† |
| Female | 28 | 11 | 7 | 9 | |
| Male | 28 | 11 | 6 | 3 | |
| Diagnosis (no.) | | | | | 0.934‡ |
| Cervical radiculopathy | 7 | 0 | 1 | 2 | |
| Cervical spondylotic myelopathy | 2 | 1 | 0 | 0 | |
| Lumbar radiculopathy | 13 | 3 | 2 | 3 | |
| Lumbar spinal stenosis | 20 | 10 | 6 | 5 | |
| Thoracolumbar deformity | 5 | 3 | 2 | 0 | |
| Trauma | 2 | 1 | 0 | 0 | |
| Back/neck pain | 7 | 3 | 2 | 2 | |
| Other | 0 | 1 | 0 | 0 | |
| Visit type (no.) | | | | | 0.0175§ |
| New | 27 | 13 | 6 | 8 | |
| Return | 6 | 1 | 4 | 4 | |
| Postop. | 23 | 8 | 3 | 0 | |

*Analysis of variance. †Chi-square test. ‡Fisher exact test—simulated. §Fisher exact test.

of the actual quality of the care provided but also is influenced by patient-specific characteristics, including age⁷⁻¹⁸, sex^{8,19}, race^{10,11}, education^{9,12,18}, insurance¹⁵, and employment²⁰. Hekkert et al. evaluated the influence of hospital, department, and patient characteristics on patient satisfaction and found that most of the variation in patient satisfaction was explained by patient characteristics¹⁸. Furthermore, patients with higher functional status and better self-reported health status have been shown to have higher patient-satisfaction scores in several studies^{8-10,13,14,19,21-23}.

A substantial percentage of patients presenting for orthopaedic evaluation have some level of psychological distress²⁴⁻²⁶. Psychological distress has been shown to correlate with lower preoperative patient-reported outcome scores and to adversely affect postoperative clinical outcomes after orthopaedic interventions²⁶⁻³². However, the relationship between psychological distress and patient satisfaction has not been fully established. Vranceanu and Ring found small but significant correlations between self-reported depressive symptoms, pain catastrophizing, and the doctor's impression that the patient was inordinately concerned about his/her symptoms and several aspects of patient satisfaction³³. Our aim in conducting this study was to determine whether psychological distress, as measured with the Distress and Risk Assessment Method (DRAM) questionnaire, influences outpatient satisfaction scores in a spine surgery patient population.

Materials and Methods

Study Design

This study was reviewed and approved by our institutional review board. We retrospectively reviewed all patient records from outpatient clinical

encounters at a single academic spine surgery center between February 2011 and January 2013. Every patient who completed both a patient satisfaction survey and a DRAM questionnaire for the same encounter, before or after the surgery, at any point during the study period was included in this study. If a patient completed both a patient satisfaction survey and a DRAM questionnaire for multiple encounters during the study period, the first encounter was included and all subsequent encounters were excluded. All patient satisfaction surveys and DRAM questionnaire results were linked to the medical record by the encounter number. Variables including age, sex, diagnosis, and visit type were recorded for each patient.

Outcome Questionnaires

The DRAM questionnaire is a validated forty-five-item questionnaire that is commonly used to measure psychological distress in patients presenting for orthopaedic care. It comprises the Modified Somatic Perception Questionnaire (MSPQ) and the modified Zung Depression Scale (ZDS). The scores for these two questionnaires are combined to stratify patients into one of four groups: normal (no evidence of distress or abnormal illness behavior), at risk (higher scores, predominantly for symptoms of depression), distressed depressive (higher scores for all variables but very high for depressive symptoms), and distressed somatic (high scores for all variables, particularly somatic awareness). The scoring algorithm used for the DRAM questionnaire defines normal as a modified ZDS score of <17, at risk as a modified ZDS score of 17 to 33 and an MSPQ score of <12, distressed depressive as a modified ZDS score of >33, and distressed somatic as a modified ZDS score of 17 to 33 and an MSPQ score of >12³⁴. The DRAM has been validated, and worse scores have been shown to correlate with worse psychological distress as measured by the more comprehensive Minnesota Multiphasic Personality Inventory (MMPI)^{34,35}.

The Press Ganey Medical Practice Survey (Press Ganey, South Bend, Indiana) consists of twenty-four questions and comprises six subdomains: access (four questions), moving through your visit (two questions), nurse/assistant (two questions), care provider (ten questions), personal issues (four questions), and overall assessment (two questions). The response to each question is measured on a Likert scale ranging from 1 for "very poor" to 5 for "very good." The response to

TABLE II Satisfaction Scores in the DRAM Groups

| | No. | Score | | P Value* |
|------------------------------------|-----|--------------------|------------------------------|----------|
| | | Mean (Stand. Dev.) | Median (Interquartile Range) | |
| Overall patient satisfaction | | | | 0.0030 |
| Normal DRAM group | 56 | 90.2 (10.9) | 93.8 (81.6~100.0) | |
| At-risk DRAM group | 22 | 94.7 (8.2) | 99.8 (90.2~100.0) | |
| Distressed-depressive DRAM group | 13 | 87.5 (16.2) | 92.2 (84.4~97.9) | |
| Distressed-somatic DRAM group | 12 | 75.7 (22.4) | 82.7 (60.8~92.5) | |
| Patient satisfaction with provider | | | | 0.0110 |
| Normal DRAM group | 56 | 94.2 (12.0) | 100.0 (94.7~100.0) | |
| At-risk DRAM group | 22 | 94.2 (9.5) | 100.0 (90.0~100.0) | |
| Distressed-depressive DRAM group | 13 | 90.6 (24.0) | 100.0 (97.2~100.0) | |
| Distressed-somatic DRAM group | 12 | 74.9 (26.2) | 76.3 (65.3~98.8) | |

*Kruskal-Wallis test.

each question is then converted to a value on a 0 to 100-point scale. The mean score for all answered questions within an individual subdomain is used to calculate the score for that subdomain. The unweighted mean of the six individual subdomain scores is then used to calculate the mean overall satisfaction score³⁶. The mean score for patient satisfaction with his/her provider (provider score) and the mean overall patient satisfaction score were used to quantify patient satisfaction for the purposes of this study.

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Results

During the study period (February 2011 to January 2013), we identified 103 patients who had completed both a patient satisfaction survey and a DRAM questionnaire for the same clinical encounter. Of the 103 patients included in the study, fifty-six were classified as normal, twenty-two as at risk, thirteen as distressed depressive, and twelve as distressed somatic on the basis of their responses to the DRAM questionnaire. A descriptive summary of patient characteristics of each DRAM patient group is reported in Table I.

The mean overall patient satisfaction scores (and standard deviation) were 90.2 ± 10.9 in the normal group, 94.7 ± 8.2 in the at-risk group, 87.5 ± 16.2 in the distressed-depressive group, and 75.7 ± 22.4 in the distressed-somatic group ($p = 0.003$) (Table II). The mean provider score was 94.2 ± 12.0 in the normal group, 94.2 ± 9.5 in the at-risk group, 90.6 ± 24.0 in the distressed-depressive group, and 74.9 ± 26.2 in the distressed-somatic group ($p = 0.011$) (Table II). Post-hoc analysis demonstrated that when the normal and at-risk groups were consolidated into a single "normal" group and the distressed-depressive and distressed-somatic groups were consolidated into a single "distressed" group, there were still significant differences between the groups with respect to the overall scores (91.5 ± 10.4 in the normal group

and 81.8 ± 19.9 in the distressed group; $p = 0.005$) and the provider scores (94.2 ± 11.3 in the normal group and 83.0 ± 25.8 in the distressed group; $p = 0.042$).

Discussion

Patient satisfaction is used commonly as a measure of the quality of medical care delivered and has become an increasingly important component of the delivery of health care. Despite this, previously published studies have indicated that patient satisfaction may depend less on the actual quality of the care provided than on certain patient-specific characteristics⁷⁻²³.

Our study demonstrated significant variation in patient satisfaction scores among groups of patients with different levels of psychological distress as measured with the DRAM questionnaire. "Distressed" patients reported significantly lower scores for overall satisfaction and satisfaction with their provider compared with patients categorized as "normal." Patients categorized as "distressed somatic" had the lowest overall satisfaction and satisfaction-with-provider scores of all groups. Interestingly, the distressed groups also had greater variation in overall satisfaction and satisfaction-with-provider scores compared with the normal and at-risk groups. Our results are in accordance with the work by Vranceanu and Ring, who found small but significant correlations between self-reported depressive symptoms, pain catastrophizing, and the doctor's impression that the patient was inordinately concerned about his/her symptoms and several aspects of patient satisfaction³³.

Our findings, along with the results of previous studies evaluating the relationship between psychological distress and patient-reported outcomes, suggest that psychological factors may influence not only patients' perception of their symptoms as reflected by patient-reported outcome scores, but also their perception of the medical care provided to them as reflected by the patient satisfaction score. Previous research has demonstrated that psychological distress influences patient-reported outcome scores²⁶⁻³², and several studies have shown that patients with higher functional status and self-reported health status tend

to report greater satisfaction^{8-10,13,14,19,21-23}. Other potential explanations for these findings are that patients with greater levels of distress and less effective coping strategies may be more likely to perceive their entire medical care experience in a more negative light or that patient psychological distress negatively impacts provider empathy and the communication quality between doctor and patient. Further research is warranted to better understand the mechanisms by which psychosocial variables influence patient satisfaction. In view of this previous work, we propose that the effect of psychological distress on patient satisfaction is mediated at least in part by patients' experience of their illness and is not completely dependent on the actual quality of the care provided to them.

We found no significant differences in age, sex, or diagnosis among the different DRAM groups, although there were significant differences in visit type among those groups (Table I). Previously published studies of non-orthopaedic populations have demonstrated that patient satisfaction is influenced by certain patient-specific characteristics including age⁷⁻¹⁸, sex^{8,19}, race^{10,11}, education^{9,12,18}, insurance¹⁵, and employment²⁰. However, we are not aware of any studies supporting an association between visit type and patient satisfaction.

This study adds to the body of evidence suggesting that multiple factors, including many outside of the control of health-care providers, may influence patient satisfaction. Psychological distress is probably just one of many factors that play a role in determining patient satisfaction. If patient satisfaction ratings are to be used as a basis for administrative decisions, these factors should be taken into account. This growing body of evidence challenges the assumption that patient satisfaction is an appropriate indicator of the quality of care provided. Patient satisfaction is multifactorial and cannot be fully understood in terms of a single factor. For example, younger age has been demonstrated in several studies to be associated with lower patient satisfaction scores⁷⁻¹⁸. Goulia et al. found that younger patients with medical illnesses had a higher prevalence of severe psychological distress including symptoms of anxiety, depression, hostility, and somatization³⁷. These findings, taken together, suggest that the effect of age on patient satisfaction may be mediated at least in part by psychological factors.

Although a significant percentage of patients presenting for orthopaedic evaluation have some level of psychological distress, the prevalence of psychological distress has been found to vary between different patient populations^{24-32,37,38}. The finding that psychological distress influences patient satisfaction challenges the validity of comparing patient satisfaction scores between populations that may differ with regard to their level of psychological distress.

Our study has several limitations. First, the DRAM score is not a comprehensive measure of a patient's psychological state. The DRAM does not assess anxiety, personality disorders, or substance abuse. It is, however, a good measure of somatization (as measured by the MSPQ) and depressive symptoms (as measured by the modified ZDS), both of which are important components of a patient's psychological state. Another limitation is the retrospective nature of this study. A prospective study may have allowed for the collection of additional data including data on patient outcomes. Other limitations include the fact that this study was limited to a single center and a specific orthopaedic subspecialty. Therefore, it may not be possible to generalize the results of this study to all patient populations. ■

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Update

This article was updated on June 10, 2015, because of previous errors. The title had previously read “Association Between Patient-Reported Measures of Psychological Distress and Patient Satisfaction Scores After Spine Surgery.” It has been changed to “Association Between Patient-Reported Measures of Psychological Distress and Patient Satisfaction Scores *in a Spine Surgery Patient Population*” to reflect the fact that not all patients had undergone surgery when they completed their questionnaires. The last sentence in the Background paragraph of the Abstract had previously read “The goal of this study was to determine whether psychological distress influences outpatient satisfaction scores following spine surgery.” It now reads “The goal of this study was to determine whether psychological distress influences outpatient satisfaction scores *in a spine surgery patient population*.” The last sentence before the Materials and Methods section, which previously read “Our aim in conducting this study was to determine whether psychological distress, as measured with the Distress and Risk Assessment Method (DRAM) questionnaire, influences outpatient satisfaction scores following spine surgery,” now reads: “Our aim in conducting this study was to determine whether psychological distress, as measured with the Distress and Risk Assessment Method (DRAM) questionnaire, influences outpatient satisfaction scores *in a spine surgery patient population*.” Finally, the second sentence in the Materials and Methods section, “Every patient who completed both a patient satisfaction survey and a DRAM questionnaire for the same encounter at any point during the study period was included in this study,” has been changed to “Every patient who completed both a patient satisfaction survey and a DRAM questionnaire for the same encounter, *before or after the surgery*, at any point during the study period was included in this study.”

An erratum has been published: *J Bone Joint Surg Am.* 2015 Jul 15;97(14):e54.