

The Correlation Between a Numerical Rating Scale of Patient Satisfaction With Current Management of an Upper Extremity Disorder and a General Measure of Satisfaction With the Medical Visit

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Abstract

Background: Patient satisfaction is used as an indicator of quality of care, but the measures currently available are lengthy and cumbersome and may not be feasible in orthopedic surgical practices. We set out to assess the relationship between the Medical Interview Satisfaction Scale (MISS-21) and a numerical rating scale (NRS) of patient satisfaction with current management of an orthopedic upper extremity condition. **Methods:** In this cross-sectional study, 86 patients from the practices of 2 hand surgeons were included during an initial or follow-up visit. Questionnaires assessing demographics, upper extremity specific disability, pain during rest and activity, satisfaction with the medical visits (MISS-21), and satisfaction with current management of an orthopedic upper extremity condition (NRS satisfaction) were completed. **Results:** Eighty-six patients completed all questionnaires. A small correlation of .21 ($P = .050$) was found between the MISS-21 and the NRS satisfaction. In bivariate analysis, NRS pain at rest and during activity had small correlations with the MISS-21 ($-.29, P = .05$ and $-.23, P = .034$) and with NRS satisfaction ($-.27, P = .011$ and $-0.27, P = 0.012$). Quick Disability of Arm, Shoulder and Hand (QuickDASH) had a small correlation with NRS satisfaction ($-0.023, P \leq 0.001$), but did not correlate with MISS-21. **Conclusions:** Although there is small overlap about the 2 satisfaction measures, a complex patient satisfaction questionnaire consisting of multiple facets of patient satisfaction like MISS-21 is not replaceable by 1 simple NRS patient satisfaction question.

Keywords: patient satisfaction, Medical Interview Satisfaction Scale, numerical rating scale, QuickDASH, upper extremity disorder

Introduction

Patient satisfaction is an increasingly important dimension of health outcome research. It is currently being used for several distinct purposes including evaluation of quality of care, assessment of health care systems and programs, continuous quality improvement, and health care economics.¹⁸ Patients' satisfaction after a medical visit predicts compliance with the suggested treatment,^{11,19,21} thus impacting both the effectiveness of treatment and health care costs. The level of satisfaction also predicts whether patients adhere to prescribed future medical appointments.^{26,29} Higher patient satisfaction is consistently associated with better overall health.^{5,7,10,16,22,27}

Most patient satisfaction questionnaires such as Consumer Assessment of Healthcare Providers and Systems (CAHPS)¹ and Patient Satisfaction Questionnaire (PSQ)¹⁴ focus on the general evaluation of the health care services of a particular facility.³⁶ Other questionnaires focus on measuring patient satisfaction with specific

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aspects of care including health care services,³⁴ a physician's pain management plan,⁹ satisfaction with anesthesia care,¹² postoperative care,¹³ overall musculoskeletal care,³¹ and specific medical office visits.³⁶ As a group, these questionnaires are lengthy and may be too cumbersome to use in an orthopedic practice. Numerical rating scales (NRSs) such as NRS for pain or NRS for general health are reliable and valid measures of overall pain² and health.⁸ A simple NRS measure of satisfaction may be sufficient to capture satisfaction with current management of an orthopedic condition, and more feasible and accepted for use in busy orthopedic practices.

The purpose of this study is to assess the relationship between an NRS of patient satisfaction with current management of an orthopedic upper extremity condition (NRS satisfaction) with a scale assessing comprehensively satisfaction with an individual medical visit, Medical Interview Satisfaction Scale (MISS-21).²⁵ MISS-21 was originally developed for use in general practice but has been previously used to measure satisfaction in patients with upper extremity concerns.^{6,15} The primary null hypothesis is that the NRS satisfaction does not correlate with the MISS-21. The secondary null hypothesis is that neither satisfaction measures correlate with upper extremity disability as measured by QuickDASH^{3,17} and pain intensity at rest and during activity as measured by NRS pain.

Materials and Methods

In a cross-sectional study conducted between November 2013 and January 2014, 86 patients from the practices of 2 hand surgeons were approached for participation during an initial or follow-up visit. In this Institution Review Board–approved study, consecutive patients were invited based on availability of the researcher and competition with other studies enrolling from the same population. Patients who agreed to participate and provided informed consent completed questionnaires assessing demographics, upper extremity–specific disability (QuickDASH), satisfaction with the medical visits (MISS-21 and an NRS satisfaction), and pain intensity at rest and pain during activity (NRS pain). All questionnaires were completed using the secure online data capture software (REDCap).²⁸ Among the 86 included patients, there were 48 women and 38 men with an average age of 54 years (range, 19–93 years). A quarter of the patients (25%) had previous surgery, about half of the patients (49%) had prior treatment, and approximately a quarter of the patients had another pain condition (24%) (Table 1).

The MISS-21 is a measure of patient satisfaction with a medical visit.²⁵ It consists of 21 items rated on a 7-point Likert scale, where 1 equals “very strongly disagree” and 7 equals “very strongly agree.” Six questions were

Table 1. Patients Demographics (n = 86).

| | Mean | SD | Range |
|----------------------------------|--------|-----|-------|
| Age | 53 | 18 | 19-92 |
| Education | 15 | 2.8 | 6-22 |
| Body mass index | 26 | 4.3 | 17-40 |
| | Number | % | |
| Sex | | | |
| Women | 48 | 56 | |
| Men | 38 | 44 | |
| Work status | | | |
| Working full time | 40 | 47 | |
| Working part time | 11 | 13 | |
| Homemaker | 1 | 1.2 | |
| Retired | 24 | 28 | |
| Unemployed, able to work | 2 | 2.3 | |
| Unemployed, unable to work | 7 | 8.1 | |
| Currently on sick leave | 1 | 1.2 | |
| Marital status (n = 84) | | | |
| Single | 29 | 35 | |
| Living with partner | 4 | 4.8 | |
| Married | 43 | 51 | |
| Separated/divorced | 3 | 3.6 | |
| Widowed | 5 | 6.0 | |
| Other pain conditions (n = 85) | | | |
| Yes | 20 | 24 | |
| No | 65 | 76 | |
| Sought treatment before (n = 85) | | | |
| Yes | 42 | 49 | |
| No | 43 | 51 | |
| Prior surgery (n = 83) | | | |
| Yes | 21 | 25 | |
| No | 62 | 75 | |
| Use of medications | | | |
| Yes | 53 | 62 | |
| No | 33 | 38 | |

reversed coded. The mean item score of the MISS-21 was calculated by summing all 21 individual item scores and dividing the sum by 21. With a range from 1 to 7, a higher mean item score represents a greater patient satisfaction.

The QuickDASH is a shortened version of the Disabilities of Arm, Shoulder and Hand questionnaire.^{3,17} It measures symptoms and disability related to the upper limb.¹⁵ The questionnaire consists of 11 questions about common tasks involving the upper extremities, rated on a 5-point Likert scale, where 1 equals “no difficulty” and 5 equals “unable.” The total score was computed by dividing the total of all items by 11, followed by subtracting 1, and completed by multiplying this number by 25. The total score ranges from 0 (no disability) to 100 (maximum symptoms and disability).

Table 2. Health-Related Outcomes (n = 86).

| | Mean | SD | Range |
|-----------------------|------|-----|---------|
| Miss-21 | 5.8 | 0.8 | 4.0-7.0 |
| QuickDASH | 39 | 22 | 0-91 |
| 11-point satisfaction | 6.6 | 3.2 | 0-10 |
| Pain at rest | 3.1 | 2.7 | 0-10 |
| Pain during activity | 5.1 | 3.1 | 0-10 |

NRS pain is an 11-point ordinal scale assessing pain intensity from 0 (no pain) to 10 (worst pain ever). Participants provided 2 NRS ratings, 1 for pain intensity at rest and 1 for pain during activity. Higher scores depict higher pain intensity at rest and with activity, respectively.

NRS satisfaction is an 11-point ordinal scale assessing satisfaction with the overall management of the upper extremity condition for which they sought help from the orthopedic surgeon, from 0 (completely dissatisfied) to 10 (completely satisfied). Higher scores depict higher satisfaction (Table 2).

Statistical Analysis

An a priori power analysis for the primary null hypothesis indicated that a minimum sample size of 84 patients was needed to detect a .3 (moderate) correlation between the NRS satisfaction and MISS-21 with 80% power ($\alpha = 0.05$). Missing values were imputed. Demographic information was checked against their hospital registration and if needed corrected. There were no missing data of the 11-point ordinal scale, and 11-point measures of pain intensity at rest and pain during activity. We used descriptive statistics to describe demographics and main study variables. We summarized categorical variables as frequencies and percentages, and continuous variables as mean (\pm SD). We assessed the bivariate correlation among the main study measures with Pearson correlations. All factors associated with NRS or MISS-21 ($P < .10$) in bivariate analysis were entered into 2 multivariable analyses for predicting satisfaction as assessed by NRS and MISS-21, respectively.

Results

There was a small correlation of .21 ($P = .050$) between the MISS-21 and NRS satisfaction.

In bivariate analysis, NRS pain at rest and during activity had small correlations with the MISS-21 ($-.29$, $P = .05$ and $-.23$, $P = .034$) and with NRS satisfaction ($-.27$, $P = .011$ and $-.27$, $P = .012$). QuickDASH has a small correlation with NRS satisfaction ($-.023$, $P \leq .001$), but it did not correlate with MISS-21. None of the demographic variables were associated with MISS-21 or NRS satisfaction (Table 3).

Table 3. Bivariate Analysis.

| | Miss-21 | |
|-----------------------|-----------------|--------------|
| | Spearman ρ | P value |
| 11-point satisfaction | .21 | .050 |
| QuickDASH | -.023 | .84 |
| Pain at rest | -.29 | .0078 |
| Pain during activity | -.23 | .034 |

| | 11-point satisfaction | |
|----------------------|-----------------------|-----------------|
| | Spearman ρ | P value |
| QuickDASH | -.39 | <.001 |
| Pain at rest | -.27 | .011 |
| Pain during activity | -.27 | .012 |

Note. Bold P value indicates a statistically significant change.

Discussion

Patient satisfaction is a factor of overall quality of delivered health care.²⁰ It is used as a measure of quality of care for individual providers, health care systems, and programs. Satisfied patients develop longer lasting relationship with their medical provider, leading to improved compliance, continuity of care, and ultimately better health outcomes.^{18,23,24} Research showed that health care satisfaction can improve health, reduce costs, and implement reform.⁴ A variety of satisfaction questionnaires exist,³⁰ and their length can be a burden for patients, particularly in busy orthopedic surgical practices. Our study aimed to see if a simple NRS measure of patient satisfaction with the overall management of an upper extremity conditions correlated with the MISS-21 assessing patient satisfaction with a medical visit.

Our results showed that there is a small correlation of .21 ($P = .050$) between the MISS-21 and NRS satisfaction. This suggests that while the 2 measures share some variance, the MISS-21 items measure additional aspects of satisfaction over and above satisfaction with the overall management of the upper extremity illness. Both MISS-21 and NRS satisfaction significantly and inversely correlated with both NRS pain and with activity, and the magnitude of the correlation coefficient was almost identical. This suggests that the 2 satisfaction measures are equivalent in their relationship to pain intensity at rest and with activity; the higher the pain intensity, the lower the satisfaction with both how the orthopedic illness is managed and overall satisfaction with the medical visit. Only NRS satisfaction was significantly correlated with QuickDASH. This suggests that the 2 measures of satisfaction are not equivalent in their relationship with upper extremity disability; those with higher disability are less satisfied with the overall management of their upper extremity illness, but the disability score does not affect their overall satisfaction with their medical visit.

This study has 2 limitations. First, patients completed all study measures after their meeting with the orthopedic surgeon. As such, the meeting could have impacted not only their patient satisfaction scores but also their ratings of pain and disability. Second, the mean scores for pain and disability were generally low suggesting that the majority of patients had very little pain and disability. The findings might be different with a sample of patients with more severe pain and disability.

The 2 patient satisfaction methods we compared use different specific types of measures, an 11-point Likert scale (NRS) with 1 item versus 7-point Likert scale (MISS-21) with 21 items. Earlier studies already confirmed that substantial variation can be found if different types of measures are used.^{30,32,33,35} Ross et al showed differences from 63% to 82% across the different satisfaction measures.³⁰

Furthermore, the 11-point NRS asked specifically about satisfaction with the management of the upper extremity illness, which implies both patient's ability to manage and the interaction with the surgeon, while the MISS-21 asks more general questions about satisfaction with the medical illness. Because QuickDASH represents the extent of disability, this could explain why we found a small correlation with NRS satisfaction, while no correlation with the MISS-21 was reported.

In conclusion, patient satisfaction is a complex phenomenon, consisting of multiple factors. Although there is some overlap among the 2 satisfaction measures, a patient satisfaction questionnaire like MISS-21, consisting of multiple facets of patient satisfaction is not replaceable by 1 simple NRS patient satisfaction question. Future studies might address with patients with higher levels of pain and disability to determine if the relationships are similar.

Ethical Approval

This study was approved by our institutional review board.

Statement of Human and Animal Rights

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008.

Statement of Informed Consent

Informed consent was obtained from all individual participants included in the study.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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