# Job Satisfaction of Primary Care Team Members and Quality of Care

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## Abstract

In recent years, hospitals and payers have increased their efforts to improve the quality of patient care by encouraging provider adherence to evidence-based practices. Although the individual provider is certainly essential in the delivery of appropriate care, a team perspective is important when examining variation in quality. In the present study, the authors modeled the relationship between a measure of aggregate job satisfaction for members of primary care teams and objective measures of quality based on process indicators and intermediate outcomes. Multilevel analyses indicated that aggregate job satisfaction ratings were associated with higher values on both types of quality measures. Team-level job satisfaction ratings are a potentially important marker for the effectiveness of primary care teams in managing patient care.

During the past 10 years, there has been a surge of research that aims to identify factors underlying variation in the quality of care in the United States. Much of this research seeks to link quality to the actions and characteristics of individual physicians. For example, many studies focused on the extent to which physician-level factors such as experience,[1] practice setting,[2] and financial incentives[3] influence the quality of care. In general, the evidence suggests that physician-level factors offer an important but incomplete understanding of why quality of care can vary.

Although a focus on physician-level factors in relation to quality of care does have an intuitive appeal, the individual provider perspective may have critical limitations given the role that teams play in delivering health care services.[4] Some measures of quality may largely reflect the actions of an individual physician, such as those pertaining to prescribing behavior,[5] but other measures are likely to be influenced by interactions among members of a health care team.[6] Indeed, nonphysician members of a health care team may spend more time with patients than physicians, may have more information or different types of knowledge about a patient's current physiological and psychological status, and may be more informed about family needs and concerns, as observed in studies of inpatient settings.[7,8] Additionally, physician perceptions of patient satisfaction with service

quality have been found to be less congruent with actual levels of patient satisfaction than the perceptions of other health care providers.[9]

Accordingly, although the physician is essential in the health care delivery context, a comprehensive understanding of the factors that influence quality requires a team perspective. In this article, we report the results from a study that investigated quality of care from a team-level perspective. Specifically, we tested the hypothesis that aggregate job satisfaction of individuals comprising primary care teams is positively associated with quality of care. Our study used a multilevel framework that nested patients within teams. We examined both preventive

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measures of quality (eg, screening, immunizations) and biological markers (eg, blood pressure control).

Conceptually, our study is grounded in previous research from the applied psychology literature examining employee satisfaction and performance.[10,11] This literature indicates that more satisfied employees are more engaged and motivated to do well in their jobs.[10,12] Thus, at the level of the individual employee, studies reported a positive association between job satisfaction and job performance,[13] especially for complex jobs.[14] Moreover, employees with more job satisfaction are also more likely to engage in organizational citizenship behaviors or prosocial behaviors.[15] This type of behavior, which is discretionary and not part of formal job duties, is associated with better organizational performance.[16] As such, a workforce of satisfied employees can have a synergistic effect on the performance of a team, unit, or organization. In line with this perspective, some research has found positive associations between aggregate employee job satisfaction and organization-level outcomes.[10,17]

The aggregate job satisfaction of members of a primary care team is likely to be particularly important to patient outcomes. This is because good patient care requires that providers not only perform their own specific jobs well but also work cooperatively with other providers who are involved in the care of the same patient. When members of a health care team are more satisfied with their jobs, they will likely be more motivated to work cooperatively with other members of their team for the purpose of delivering and managing patient care. This may enable teams to perform more effectively in complying with clinical guidelines and other forms of evidence-based practice.

## Methods

### Design

This study entailed analyses of secondary data from the Veterans Health Administration (VA). VA is the largest integrated health care system in the United States. It operates 768 outpatient clinics associated with 153 medical hospitals and has 7.84 million enrollees.[18] We used 2 databases specifically: the patient-level quality-of-care scores from the VA External Peer Review Program (EPRP) database and health care team member ratings of job satisfaction from the 2007 administration of the VA All Employee Survey (AES). The EPRP database consists of quality scores based on guideline adherence and clinical outcomes. Measures in the database are obtained via the review of cross-sectional samples of medical records by trained abstractors and are known to have high interrater reliability.[19] For the present study, we used scores based

on the records of patients seen during the period October 2006 to September 2007. We obtained these data in cooperation with the VA Office of Quality and Performance.

The VA AES database consists of scores for job satisfaction, workgroup climate, and organizational culture. We obtained the scores from a census survey that was administered to all employees of the organization (more than 200 000) in the Spring of 2007. For this study, we defined teams as a group of primary care physicians, mid-level providers, nurses, and support staff who have responsibility for a defined panel of patients. Survey coordinators at each facility could assign codes to teams within each medical facility. For the purpose of this study, we restricted our use of teams to only those units that were clearly identified as primary care.

To create a database suited to the goals of the present study, it was required that we match the quality data with the appropriate primary care team in the employee survey database. This entailed several steps with a VA-assigned provider identification number serving as the link. First, we matched the patient-level records from the quality score database (ie, EPRP) to the identification number of the provider who had seen the patient based on the clinic location, visit date, and patient identification number. Second, using a list of primary care teams with a defined panel of patients, we matched the provider identification number to the specific primary care team within a medical center or outpatient clinic. Third, we matched the formal list of primary care teams to the list of teams identified from the employee survey. We excluded patients who could not be matched to a specific team or were duplicates.

### Measures

*Aggregate team member satisfaction.* The response rate for the 2007 VA AES was 76.2%. The majority of respondents used the Internet to complete the survey. Using the teams defined by the survey coordinator, we identified a subset of 9667 employees in 324 primary care teams. We further restricted the analysis to those teams with a minimum of 10 employees and 10 patients in order to ensure reliable estimates of team performance. The final analytic sample consisted of 7905 employees in 216 primary care workgroups.

To assess aggregate team member job satisfaction, we used the average team response to a single-item measure. The use of a single-item measure of job satisfaction has advantages over the use of multiple items to assess job satisfaction because multiple items may omit important variables that contribute to overall job satisfaction, use more survey space, and have less face validity.[20] The single-item approach to measuring job satisfaction has been

**Table 1.** Indicators Used for Intermediate Outcomes Quality Measure

| Condition | Measure | n, Met | n, Eligible | Percentage |
|---|---|---|---|---|
| Diabetes | HbA1c < 7 | 1002 | 2153 | 46.5 |
|  | HbA1c > 9[a] | 4214 | 4855 | 86.8 |
|  | LDL-C < 100 | 2249 | 3478 | 64.7 |
|  | LDL-C > 120[a] | 4018 | 4853 | 82.8 |
|  | Blood pressure < 140/90 | 3944 | 4855 | 81.2 |
|  | Blood pressure ≥ 160/90[a] | 4634 | 4855 | 95.5 |
| Heart disease (AMI) | ASA at most recent visit | 2280 | 2550 | 89.4 |
|  | β-blocker at most recent visit | 744 | 807 | 92.2 |
|  | LDL-C < 100 | 2431 | 3873 | 62.8 |
|  | LDL-C ≥ 120[a] | 2471 | 2981 | 82.9 |
| Hypertension | Blood pressure ≥ 160/90[a] | 10 098 | 10 637 | 94.9 |
|  | Blood pressure < 140/90 | 8485 | 10 637 | 79.8 |
| Nonhypertension | Blood pressure < 140/90 | 4411 | 4862 | 90.7 |
|  | Blood pressure ≥ 160/90[a] | 4803 | 4862 | 98.8 |
| Nonhyptertension and nondiabetes patients | LDL-C > 120[a] | 6244 | 9707 | 64.3 |
| Nondiabetes, non-AMI patients | LDL-C > 120[a] | 6432 | 9989 | 64.4 |

Abbreviations: LDL-C, low-density lipoprotein cholesterol; AMI, acute myocardial infarction; ASA, aspirin.
[a]Reverse scored, a higher percentage indicates better control.

used in other health care studies.[21] The specific item used in this study made use of a discrepancy approach and asked, "Compared to what you think it should be, what is your current overall level of satisfaction with your job?"[22] The response options were on a 5-point Likert scale ranging from *not at all satisfied* (1) to *very satisfied* (5).

Because we used a team-level measure, we calculated multiple aggregation statistics to justify using data in this manner. The value of the intraclass correlation coefficient, or ICC(1), was 0.05. This statistic compares the variance between units (ie, primary care teams) with the variance within units using the individual ratings of each respondent. The ICC(2), a measure of the relative status of between and within variability using the average rating of respondents within each unit, was 0.70.[23] Taken together, these values provide support for aggregating data to the team level.[24]

*Quality of care.* We examined 2 types of quality indicators: process and intermediate outcomes. The process measure related to the completion of a screen or test that could be conducted within the clinic (eg, lipid panel). For those patients eligible to receive the recommended test, a score of "1" was assigned if the test/screen was in fact performed, and a score of a "0" was assigned if it was not. Intermediate outcome measures consisted of control or biological markers of the patient's physiological functioning (eg, low-density lipoprotein cholesterol < 100).

We computed 2 quality scores for each patient—one for process and one for intermediate outcomes. The process quality measure is the percentage of total tests/screens that the patient received divided by the total number of

tests/screens he or she was eligible to receive. The intermediate outcome quality measure was computed the same way using available biological markers. We report the mean quality score for each indicator in Tables 1 and 2. For the measures comprising the intermediate outcome quality, the percentage of patients who had a good clinical outcome ranged from 46.5% for the HbA1c > 7 marker to 98.8% for blood pressure control. For the measures comprising process quality, the percentage of patients who were eligible and received care ranged from 73.3% for influenza immunizations to 96.9% for receiving an annual HbA1c test. A total of 17 228 patient records were identified for use in the final analysis.

*Other variables.* We added case-mix adjustment variables in the model for selected patient and organization characteristics that prior research has suggested might affect adherence.[25,26] Patient variables included age (5 categorical variables), sex, and disease condition for which they were eligible. For the team level, we used binary variables to indicate hospital teaching affiliation, hospital or community outpatient clinic location, geographic region (4 regions), and an urban or rural variable.

### Statistical Analyses

We first examined the descriptive statistics for variables measured at the patient and team levels. At the team level, we examined Spearman correlations for the quality measures, aggregate team member satisfaction, and other team-level variables. To model the effect of both patient- and team-level variables on outcomes, which were normally

**Table 2.** Indicators Used for Process Quality Measure

| Condition | Measure | n, Met | n, Eligible | Percentage |
|---|---|---|---|---|
| Diabetes | HbA1c annual | 4707 | 4855 | 96.9 |
| | LDL-C measured with 1 year review | 1984 | 2152 | 92.2 |
| | Lipid profile | 1282 | 1327 | 96.6 |
| | Foot pedal pulses | 4356 | 4813 | 90.2 |
| | Foot sensory exam with monofilament | 4226 | 4813 | 87.8 |
| | Renal testing | 2729 | 3005 | 90.8 |
| | Retinal exam | 4086 | 4799 | 85.1 |
| AMI | LDL-C measured | 3609 | 3876 | 93.1 |
| Cancer | Breast cancer screen (all ages) | 1973 | 2253 | 87.6 |
| | Cervical cancer screen | 1441 | 1562 | 92.3 |
| | Prostate education/counsel | 5915 | 6684 | 88.5 |
| | Colorectal cancer screen | 8528 | 10 819 | 78.8 |
| Vaccinations | Influenza immunization | 5264 | 7180 | 73.3 |
| | Pneumococcal immunization (ever) | 10 015 | 10 996 | 91.1 |

Abbreviations: LDL-C, low-density lipoprotein cholesterol; AMI, acute myocardial infarction.

distributed, we ran a hierarchical linear model using Proc Mixed in SAS (SAS Institute Inc, Cary, NC).[27] The hierarchical linear model approach accounted for clustering of patients within health care teams. This method uses both the between- and within-team variation to estimate the slope for the outcomes in a single-stage model. We treated teams as a random effect in the model.

## Results

Table 3 displays the sample characteristics of the patients included in our analyses. The most common condition eligible for test or screen was hypertension (79.7%), followed by cancer (70.2%). The vast majority (84.3%) of the patient sample was male. The quality scores were higher for the process quality measure (86.7%) in comparison to the intermediate outcome quality measure (81.5%).

Table 4 displays the sample characteristics of the primary care teams used in our analyses. Approximately half of the teams were located at a medical center with a teaching affiliation and about a third of the teams were located in community outpatient clinics; the majority of the teams were in urban areas. Teams in the Northeast and Midwest were equally represented, although there was a higher rate of teams represented in the southern region. The aggregate team member satisfaction mean score was 3.75 (standard deviation = 0.35).

### Variation in Quality Measures and Satisfaction

Before estimating our regression models, we first examined correlations among study variables. At the patient level, a modest positive correlation was found between the 2 quality measures ($\rho = 0.13$; $P < .001$). In comparison

**Table 3.** Characteristics of Patients

| | n | Percentage or Mean (SD) |
|---|---|---|
| **Age** | | |
| <45 | 976 | 4.9 |
| 45-54 | 2607 | 13.4 |
| 55-64 | 6211 | 31.8 |
| 65-74 | 4236 | 21.7 |
| >75 | 5501 | 28.2 |
| **Sex** | | |
| Female | 2789 | 15.7 |
| Male | 14 889 | 84.3 |
| **Condition**[a] | | |
| Diabetes | 4876 | 25.0 |
| Cancer | 13 715 | 70.2 |
| AMI | 4912 | 25.2 |
| Hypertension | 15 573 | 79.7 |
| **Quality measure score** | | |
| Process | 17 789 | 86.7 (23.3) |
| Intermediate outcome | 17 460 | 81.5 (23.0) |

Abbreviations: SD, standard deviation; AMI, acute myocardial infarction.
[a]Percentages sum to greater than 100% because some patients could be eligible for tests on all conditions.

to the patient-level finding, the correlation between quality measures was greater at the team level ($\rho = 0.28$; $P = .002$). Aggregate team member satisfaction was also positively correlated with intermediate outcome quality score ($\rho = 0.11$; $P < .09$) and with the process quality score ($\rho = 0.17$; $P = .01$).

Table 5 displays the results of the multilevel regression model for both quality scores controlling for variables. For the intermediate outcome quality model, the aggregate team member satisfaction measure proved to have a significant and positive relationship with the quality measure

**Table 4.** Characteristics of Primary Care Teams

|  | n | Percentage or Mean (SD) |
|---|---|---|
| Teaching hospital | | |
| Yes | 117 | 54.2 |
| No | 99 | 45.8 |
| Community outpatient clinic | | |
| Yes | 79 | 36.6 |
| No | 137 | 63.4 |
| Urban | | |
| Yes | 176 | 81.5 |
| No | 40 | 18.5 |
| Geographic region | | |
| Northeast | 51 | 23.6 |
| Southern | 71 | 32.9 |
| Western | 38 | 17.6 |
| Midwest | 56 | 25.9 |
| Aggregate team member satisfaction | 216 | 3.75 (0.35) |

Abbreviations: SD, standard deviation.

($b = 0.02$; $P < .02$). Patient age was also significantly associated with the process quality measure. Specifically, patients aged 65 to 74 years ($b = .04$; $P < .001$) and 75 years or older ($b = .09$; $P < .001$) had higher scores than patients younger than 45 years of age. At the team level, teaching hospital affiliation ($b = −0.01$; $P = .01$) and outpatient-based setting ($b = −0.01$; $P = .05$) had a significant negative relationship with the intermediate outcome quality measure.

For the process quality measure, aggregate team member satisfaction was again found to be significantly and positively associated with the quality measure ($b = 0.02$; $P = .03$). Patient age was also significant. In comparison to the younger age cohort (younger than 45 years), patients between 45 to 54 years of age ($b = −0.04$; $P < .001$) and patients older than 75 years of age ($b = 0.05$; $P < .001$) had significantly lower adherence scores. Women ($b = 0.03$; $P < .001$) had higher adherence scores than men.

## Discussion

In this study, we found aggregate team member satisfaction ratings to be positively associated with higher scores for process and intermediate outcome quality measures in a primary care setting. Whereas a recent study did not find a significant association between physician-level satisfaction and quality of care,[28] we found a positive association between job satisfaction and quality by using teams as the unit of analysis. There has been increased emphasis on studying teamwork in health care settings.[4,29] To our knowledge, our study represents an initial effort to examine a set of technical quality indicators and their relationship to a measure of aggregate job satisfaction for members of health care teams.

In this study, we observed a similar finding for the objective quality measures at both the patient and team level. Performance on one quality domain did not show a strong association with performance on the other quality domain. Aggregate team member satisfaction, however, was associated with both measures, which suggests that team member satisfaction may be a robust predictor. The positive direction and magnitude of the correlation between aggregate team member satisfaction and performance is consistent with the previously noted research from the applied psychology literature examining employee satisfaction and business performance.[10,11]

The parameter estimate for aggregate team member satisfaction was significant, though modest, when regressed on measures of quality. This is consistent with other studies in health care that also reported relatively modest parameter estimates when modeling technical quality of care.[30] Future research could examine the relationship between aggregate team member satisfaction and performance in other areas in health care, such as those identified in the 6 "aims for improvement" domains (eg, safe, efficient, patient-centered).[31]

In additional analyses not reported, we examined if a larger number of items assessing different facets of job satisfaction would produce stronger estimates. An extended measure of satisfaction (consisting of 6 additional items) yielded similar psychometric properties and associations with outcomes. We decided to retain the single item for the analyses because it would be easier to administer in future independent research and evaluation studies.

In the multilevel regression model, community outpatient clinics were negatively associated with intermediate outcome quality measures. In general, community outpatient clinics may have fewer available services on-site to provide support and care to patients than the parent medical facility. In comparison, the parent medical hospital is more likely to have services on-site and to have support staff who may provide a greater number of services for patient care. For example, some of these services offered at hospitals may include group visits, support group options, on-site pharmacy clinics (eg, to facilitate medication adherence and reconciliation), and more support staff (eg, dietitians) who could provide education and social support for chronic disease management. This may lead to better intermediate outcome scores. Alternatively, patients seen in community clinics may have been at a lower baseline on biological measures, which resulted in lower scores. Our study did not systematically assess for differences, which presents an area for further exploration.

**Table 5.** Multivariable Estimates for Quality Measures

| | Percentage Met for Intermediate Outcome Quality Indicators | | Percentage Met for Process Quality Indicators | |
|---|---|---|---|---|
| | Estimate | Standard Error | Estimate | Standard Error |
| Intercept | 0.70[a] | 0.040 | 0.84[a] | 0.036 |
| Patient level | | | | |
| Age (younger than 45 = reference) | | | | |
| 45-54 | 0.00 | 0.009 | −0.04[a] | 0.014 |
| 55-64 | 0.00 | 0.009 | −0.02 | 0.014 |
| 65-74 | 0.04[a] | 0.009 | 0.01 | 0.014 |
| >75 | 0.09[a] | 0.008 | 0.05[a] | 0.014 |
| Female | 0.00 | 0.009 | 0.03[a] | 0.007 |
| Diabetes | 0.01[b] | 0.004 | 0.04[a] | 0.004 |
| Cancer | 0.02[b] | 0.005 | −0.02[a] | 0.005 |
| AMI | 0.00 | 0.005 | 0.03[a] | 0.005 |
| Hypertension | 0.00 | 0.008 | −0.06[a] | 0.007 |
| Team level | | | | |
| Teaching affiliation (No = reference) | −0.01[b] | 0.005 | −0.01 | 0.007 |
| Community (hospital = reference) | −0.01[b] | 0.005 | 0.00 | 0.007 |
| Urban (rural = reference) | 0.01 | 0.007 | −0.01 | 0.008 |
| Northeast (eastern = reference) | 0.01 | 0.007 | 0.01 | 0.009 |
| Southern | 0.00 | 0.007 | 0.02[b] | 0.008 |
| Western | 0.00 | 0.007 | −0.03[a] | 0.009 |
| Aggregate team member satisfaction | 0.02[b] | 0.007 | 0.02[b] | 0.001 |

Abbreviations: AMI, acute myocardial infarction.
[a]*P* < .01.
[b]*P* < .05.

A strength of this study was the large number of patients included in the analysis and the number of teams used for studying quality of care. By using a large number of patients and teams that are geographically diverse, the results are likely to be generalizable to other primary care settings. Not all patients had an equal number of conditions or tests that they would be eligible to receive; some patients were eligible for only 1 test, whereas others were eligible to have their charts reviewed for multiple tests and outcomes based on their conditions. The goal of the study was not to examine disease-specific care provided by the teams but rather the overall level of provision of care provided by teams who are likely to encounter patients with a variety of disease conditions throughout the normal daily routine of clinical practice.

There may also be specific disease conditions that could respond better to higher team member satisfaction. For example, adherence to more invasive or unpleasant screening procedures (eg, colorectal cancer screening) may be more likely when the patient experience of interacting with team members suggests that employees are satisfied and do not express dissatisfaction with working conditions and resources. Patients may feel more comfortable opting for those types of tests as a result. In fact, patients have been found to be more likely to adhere to prescribed medication if their providers are more satisfied.[32] In contrast, less-invasive procedures, such as obtaining blood samples, may be less affected by perceptions of employee satisfaction. This could lead to better performance on intermediate outcome measures (eg, lower cholesterol levels).

One question that arises from our study is whether the results would generalize to settings other than the one we studied—a large public health care delivery system. Thus, future research should test our findings in private sector delivery settings. The extent to which the findings would be applicable outside of primary care is another area for further research. Although research has examined differences between primary care and specialty care for clinical services,[33,34] less research has examined differences in job satisfaction or teamwork. Existing theory on teamwork would suggest that findings should generalize to those different types of settings, but contextual factors would have an impact.[35] Another limitation is that the study used cross-sectional data. Further research is warranted to investigate the extent to which changes in aggregate team member satisfaction over time lead to changes in quality of care.

## Practice Implications

The study results found a positive association between team-level job satisfaction and quality of care; therefore, a practical question becomes what might be done to improve job satisfaction. We identify 2 models that can provide a starting point. The job characteristics model[36] identifies 5 key characteristics, which include skill variety, task identity, task significance, autonomy, and feedback, that influence employee job satisfaction and motivation.[37] Thus, an attempt to improve the "job itself" may lead to greater satisfaction and other attitudes or behaviors that may influence delivery of care. Additionally, the Job Demands-Resources model examines the influence of working conditions on employee satisfaction and well-being.[38] The model categorizes working conditions into 2 components: job demands and job resources. The job demands elements (eg, workload intensity, time pressures, emotional demands, job role clarity) do not produce negative effects at low levels, but as the demands increase, employees can experience negative effects, such as depression, anxiety, or burnout,[39] leading to a lower level of job performance.[40] The job resources elements (eg, feedback, rewards, decision-making participation, supervisor support) facilitate meeting work goals and stimulate personal growth and development. These factors are associated with positive effects such as employee engagement[39] and organizational citizenship behaviors.[40] Actions that attempt to enhance job resources or job characteristics could focus on providing more job-related training, providing financial rewards, and allowing more participation in decision-making processes. Examples of actions that might be used to reduce job demands can include allowing more time to complete job tasks, ensuring that job roles and tasks are clear, or reducing the workload by making changes or additions to staff.

## Conclusion

This study found that aggregate team member satisfaction was a significant predictor for both process and intermediate outcome quality measures. Findings also support treating measures of process and intermediate outcomes of care as separate and distinct measures of team performance. Findings from this study could support inclusion of aggregate team member satisfaction as an important measure of performance.

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## Authors' Note

## Declaration of Conflicting Interests

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