

Title of Project: Collaborative Clinical Culture and Quality of Care

Principal Investigator and Team Members

Sheldon Greenfield, Principal Investigator

Sherrie H. Kaplan, Co-Principal Investigator

Douglas Roblin, Co-Principal Investigator

Norma Terrin, Senior Statistician

Organization

University of California, Irvine, School of Medicine

Tufts University School of Medicine

Kaiser Permanente Georgia

Inclusive Dates of Project

9/30/2001 - 9/29/2006

Federal Project Officer

Ronda Hughes, (301) 427-1578, rhughes@ahrq.gov

Acknowledgment of Agency Support

This study was funded by the Agency for Healthcare Research and Quality

Grant Award Number

7R01HS011991-03

STRUCTURED ABSTRACT

Purpose

The study examined the responses of primary care practices to a major quality-oriented system reorganization in terms of practice climate, job satisfaction, and quality of care. Specifically, practitioner and support staff job satisfaction, patient satisfaction with their medical visits, and clinical outcomes of diabetes care were compared between practices developing a strong collaborative clinical culture (CCC; characterized by perceptions of excellent teamwork, good communication, and unambiguous distribution of responsibilities) and practices developing a less collaborative culture.

Scope

The study included the patients, practitioners, and support staff of 16 primary care practices following a major system reorganization. Practice climate and job satisfaction were assessed at Kaiser Permanente Georgia from surveys of 71 practitioners and 115 support staff members 3 and 5 years after the intervention. Patient satisfaction was measured for 22,940 patients, and clinical outcomes were collected for 9,563 patients with diabetes.

Methods

Practice climate and job satisfaction data were collected in two discrete survey administrations in the years 2000 and 2002. Patient satisfaction surveys were collected continuously from years 2000 to 2002. Quality-of-care data were compiled from computerized administrative data in 2000 and 2002.

Results

Practitioners and support staff members reported higher job satisfaction in high-CCC practices than in low-CCC practices. Patients with diabetes treated in high-CCC practices experienced improved clinical outcomes in terms of glycemic and lipid control compared with those treated in low-CCC practices. Patients treated in high-CCC practices were more likely than patients treated in low-CCC practices to be satisfied with their medical visit.

Key Words

Practice climate; Systems change; Primary care; Quality of care; Measurement

Purpose

The project examined the change in the work environment of practitioners and support staff change after the restructuring of primary care practices into multidisciplinary healthcare teams (HCTs) and how that change affected patient outcomes. The hypothesis underlying the study was that a more patient-oriented climate would lead to doctor, patient, and team efforts that would improve chronic disease outcomes. To test this hypothesis, a method to measure the level of collaborative clinical culture (CCC) in an HCT was developed, allowing CCC to be examined as a predictor of job satisfaction among practitioners, patient satisfaction with their medical visit, and quality of chronic disease care.

Four specific aims were proposed:

1. Determine the level and variation in response by practices to the HCT intervention in terms of a collaborative clinical culture, which includes effective delegation, collaboration, efficient team functioning, etc. To meet this objective, we proposed to develop and validate an aggregate measure of collaborative clinical culture that can be used to relate intervention efforts to intermediate- and long-term outcomes.
2. Describe the relationship of collaborative clinical culture to practitioner satisfaction and morale.
3. Describe the relationship of collaborative clinical culture and practitioner morale/satisfaction to outcomes of care.
4. Describe the relationship of work environment characteristics and practitioner characteristics to intervention response, morale/satisfaction, and quality of care.

Scope

Background

Increases during recent decades in the prevalence of chronic disease and the complexity of medical care have widened the gap between the quality of care currently provided in the U.S. and the best care possible with today's resources and technologies. The Institute of Medicine has called for a reorganization of the healthcare system to close this gap by improving (1) processes of care, (2) information technology, and (3) the climate of medical practices. Of these three areas that need improvement, the development of a quality-promoting practice climate is the most difficult to measure but may be an important missing piece in explaining the failure of many process-oriented (including collaborative and other top-down systems changes) or technology-oriented changes to improve patient outcomes.

The organizational psychology literature provides a framework for understanding the climate of a team of healthcare providers. Based on the recommendations of the Institute of Medicine and research on interventions employing the Chronic Care Model, it was hypothesized that clinicians practicing in HCTs that have developed a strong

collaborative clinical culture (CCC) will report higher levels of job satisfaction, and patients treated in high-CCC HCTs will experience better medical outcomes and patient satisfaction than other patients.

Context and Setting

In 1997, Kaiser Permanente Georgia (KPG) launched a comprehensive reorganization of their clinics in the Greater Atlanta area into 16 healthcare teams (HCTs) and collected data on the impact of the change on patients and team members from 1999 through 2002. Strikingly, the perceptions of the work environment reported by HCT members varied significantly between clinics, even though the same intervention with the same resources was made available to all the HCTs. Because many aspects of CCC can be captured in a survey administered to practitioners and support staff, and because KPG carefully documents quality of care for patients with chronic disease, these clinics provided an excellent setting to explore the relationship between practice climate and the effectiveness of the intervention in terms of practitioner job satisfaction, patient satisfaction, and quality of care.

Participants

To establish a connection between practice climate and patient outcomes, the study included practitioners, support staff, and patients.

CCC and job satisfaction were assessed among the practitioners and support staff members of the 16 HCTs. Each HCT consisted of three to five practitioners (medical doctors, physician assistants, or nurse practitioners) and seven to 12 support personnel (nurses, technicians, and administrative personnel). In total, 185 HCT members (71 practitioners and 114 staff members) participated in the study. To protect confidentiality among a relatively small sample, demographic information about these participants is not available.

Visit satisfaction was assessed from post-visit patient satisfaction surveys collected from patients in a sample of 22,940 primary care visits at the 16 adult medicine practices.

Quality of care was assessed from administrative data available in the KPG database. Analyses on quality of care in patients with type 2 diabetes (N=9,563) are complete. Among these patients, 49.0% of participants were women, averaging 53.9 years of age (53.7 years for women, 54.1 years for men), who had been enrolled with KPG for an average of 6.8 years (for both men and women). The median age of onset for diabetes was 52 years.

Methods

Study Design

The study employed a longitudinal observational cohort design to follow the study practices from 1999 to 2002. CCC and practice job satisfaction data were collected in two discrete survey administrations in the years 2000 and 2002. Patient satisfaction surveys were collected continuously from years 2000 to 2002. Quality-of-care data

were compiled from computerized administrative data in 2000 and 2002. This design allowed for longitudinal analysis of outcomes over time and replicable cross-sectional analyses.

Data Sources and Collection

Practice Climate and Job Satisfaction Surveys

As part of the HCT intervention, KPG management sought and obtained informed consent from all members of each of the 16 adult healthcare teams to complete a survey on practice climate and job satisfaction. The practitioner version of this survey was administered to each medical doctor, nurse practitioner, and physician assistant, and the support staff version was distributed to all nurses, technicians, and administrative personnel in 2000 and 2002. The survey took approximately 10 to 12 minutes to complete.

Visit Satisfaction Surveys

KPG conducts post-visit surveys for routine assessment of patient experiences with their care. Random samples of visits were selected weekly, with the goal of obtaining 100 completed surveys per practitioner per year. The survey was administered by telephone (typically within 2 weeks of the visit), included approximately 40 items, and required approximately 15 minutes to complete. The survey response rate averaged 65%.

Measures

Practice Climate Survey (PCS)

To describe the collaborative clinical culture and job satisfaction of each practice, we compiled a Practice Climate Survey (PCS) from various measures used in prior research and several new or modified measures. In total, there are 11 scales—six measuring CCC, and five measuring job satisfaction—in the instrument, with each scale consisting of between one and seven items.

Separate, but similar, versions of the instrument were created for practitioners and support staff. Additionally, small modifications were made to each of the two versions between the first administration of the instruments in 2000 and the second administration in 2002. Table 1 summarizes the content and internal consistency—as measured by Cronbach's alpha (α)—of these scales across the four administrations of the instrument.

Additional items were included in the original PCS but excluded from the 11 scales, either because they were intended only as validation items, not scale items, or because responses were inconsistent with other scale items.

Each scale score is computed as the unweighted average of its constituent items after each is rescaled from 0 to 100, with 100 equaling the most positive rating possible for that item. If an item has missing data, the subscale score can still be computed by taking the unweighted average of the non-missing items.

Table 1 – Content and internal consistency of scales of the Practice Climate Survey

Scale Name	Description	2000 Administration				2002 Administration			
		Practitioners		Support Staff		Practitioners		Support Staff	
		# items	α	# items	α	# items	α	# items	α
Delegation & Collaboration	Confidence in getting help from or delegating tasks to other team members.	4	0.77	2	0.73	4	0.69	2	0.84
Patient Familiarity	Strength of relationships built with patients.	2	0.74	2	0.72	2	0.84	2	0.60
Medical Record Availability	Ease of accessing a patient's chart when needed.	1	N/A	1	N/A	1	N/A	1	N/A
Coordination & Continuity of Care	Sense of providing an ongoing process of care versus "starting over" with patients.	2	0.81	2	0.86	4	0.69	2	0.79
Perceived Quality of Care	Perception of the quality of care delivered by the HCT.	1	N/A	1	N/A	1	N/A	1	N/A
Team Ownership	The degree to which one perceives that his or her coworkers feel the team works together well.	1	N/A	1	N/A	1	N/A	1	N/A
Lifestyle Satisfaction	Satisfaction with income and lifestyle outside the practice.	4	0.78	4	0.81	4	0.82	2	0.83
Time Pressure	Perceived pressure to treat patients quickly.	6	0.72	2	0.46	7	0.82	2	0.47
General Autonomy	One's personal sense of control over patients' care, scheduling, referrals, etc.	5	0.75	3	0.59	5	0.70	3	0.66
Morale	Positive feelings about work.	6	0.66	6	0.74	6	0.84	6	0.79
Burnout	The degree to which one feels affected by stress.	0	N/A	2	0.77	3	0.68	2	0.76

A single score for CCC was computed by taking the unweighted mean of six scales of the PCS—Delegation & Collaboration, Patient Familiarity, Medical Record Availability, Coordination & Continuity of Care, Quality-of-Care Rating, and Team Ownership. A job satisfaction score was computed by taking the unweighted mean of the five affective scales of the PCS—Lifestyle Satisfaction, Time Pressure, General Autonomy, Morale, and Burnout. In the 2000 practitioner survey, however, burnout was excluded from the job enjoyment scale due to poor internal consistency (likely an artifact of confusion with directions). Table 3 summarizes the internal consistency of each aggregate scale across administrations.

Table 2 – Internal consistency of aggregate scales of CCC and job enjoyment of the PCS

	2000 Administration				2002 Administration			
	Practitioners		Support Staff		Practitioners		Support Staff	
	# items	α	# items	α	# items	α	# items	α
Climate for Collaborative Care	6	0.86	6	0.79	6	0.76	6	0.82
• Delegation & Collaboration								
• Patient Familiarity								
• Medical Record Availability								
• Coordination & Continuity								
• Quality-of-Care Rating								
• Team Ownership								
Job Satisfaction	4	0.72	5	0.80	5	0.87	5	0.82
• Lifestyle Satisfaction								
• Time Pressure								
• General Autonomy								
• Morale								
• Burnout								

A CCC score and a job satisfaction score for each HCT were computed by averaging a simple mean of the practitioners’ scores within an HCT with a simple mean of the staff members’ scores to produce a single score for the entire HCT. By giving equal weight to the points of view of each personnel type (practitioner vs. staff), this approach ensures that climate scores are not sensitive to variations in the relative size of the practitioner and staff groups.

Visit Satisfaction

Patients’ visit satisfaction was measured using KPG’s standard survey, consisting of three scales: care access (three items, Cronbach’s alpha=0.65), practitioner interaction (four items, Cronbach’s alpha=0.83), and overall experience (one item). Each scale was dichotomized so that “satisfaction” with an aspect of the visit was defined as a scale score in the upper 80th percentile of responses for that year.

Quality of Care

In addition to visit satisfaction, quality of care was assessed by examining medical outcomes over the study period—specifically, glycemic control (from annual hemoglobin A1c measures) and lipid control (from annual low-density lipoprotein) levels. All laboratory values were extracted from the electronic medical record.

Results

The research resulted in the creation of a valid and reliable measure of CCC. High- versus low-CCC HCTs were then compared in terms of the level of job satisfaction experienced by team members, the visit satisfaction of patients, and the clinical outcomes experienced by patients. Principal findings are discussed in terms of the specific aims of the project.

Principal Findings

Objective #1 - Measure level and variation in response by practices to the HCT intervention in terms of a collaborative clinical culture.

In addition to showing strong internal consistency and discriminant validity from the job satisfaction measure, the CCC measure produced scores that varied considerably across HCTs. On a scale of 0 to 100, CCC scores averaged 66.2 (SD=10.3), ranging from 55.2 to 85.0 at the clinic level. The mean CCC score of HCTs in the highest quartile was significantly greater than the scores in all other quartiles ($t=5.7$, $p<.001$), as summarized in Table 3 below.

Objective #2 - Describe the relationship of collaborative clinical culture to practitioner satisfaction and morale.

Job satisfaction scores were significantly greater in HCTs in the highest CCC quartile than in lower quartiles among practitioners (79.1 vs. 61.8, $p<.001$) and staff members (60.5 vs. 50.1, $p<.05$). At the individual level, CCC and job satisfaction were significantly correlated among practitioners ($r=.56$, $p<.001$) and among support staff members ($r=.39$, $p<.001$).

Objective #3 - Describe the relationship of collaborative clinical culture and practitioner morale/satisfaction to quality of care.

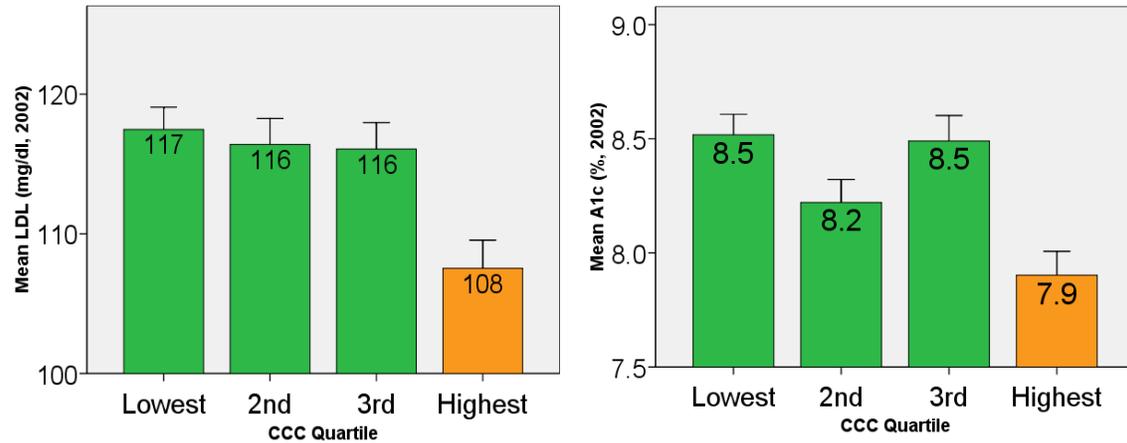
Quality of care was examined in terms of both clinical outcomes and patient satisfaction.

When controlling for age, sex, comorbidities, and baseline values, patients treated by HCTs in the highest CCC quartile had significantly better clinical outcomes at follow-up than did other patients (Figure 1). Among patients with diabetes, hemoglobin A1c levels were significantly lower in high-CCC HCTs than in low-CCC HCTs (7.9% vs. 8.4%, $p<.01$), as were LDL levels (108 mg/dl vs. 116 mg/dl, $p<.01$). When controlling for CCC levels, however, job satisfaction did not predict clinical outcomes.

The likelihood that a patient would report satisfaction with his or her visit was positively associated with the level of CCC of the HCT in which he or she was treated. HCTs that

improved in CCC from 2000 to 2002 showed significant increases in the visit satisfaction rates from 2000 to 2002.

Figure 1 – Clinical outcomes in patients with diabetes by CCC quartile



Objective #4 - Describe the relationship of work environment and practitioner characteristics to intervention response, morale/satisfaction, and quality of care.

No relationship was observed between available measures of work environment (e.g., number of empanelled patients per practitioner) or practitioner characteristics (e.g., physician vs. nurse practitioner, tenure of service), and CCC, job satisfaction, or quality of care.

Conclusions

Variation between healthcare teams in the development of collaborative care processes can be captured in a valid, reliable, and brief measure. This variation was found to predict several aspects of team performance. Specifically, healthcare teams that developed a strong collaborative clinical culture (CCC) performed better after a systems change intervention in the following ways:

- Practitioners and support staff members reported higher job satisfaction in high-CCC practices than in low-CCC practices.
- Patients with diabetes who were treated in high-CCC practices experienced improved clinical outcomes in terms of glycemic and lipid control compared with those treated in low-CCC practices.
- Job satisfaction among practitioners and support staff members in a practice did not predict clinical outcomes in its patients.
- Patients treated in high-CCC practices were more likely to be satisfied with their medical visit compared with patients treated in low-CCC practices.

Significance

Given widespread calls for systems change interventions to improve the quality of chronic disease care in the United States and the highly variable rates of success of such interventions in improving patient outcomes, identifying predictors of successful interventions may help shape future system design efforts. Collaborative clinical culture may be one such predictor linking the introduction of systems change to measurable improvements in patient outcomes, both clinical outcomes and patient satisfaction.

Implications and Products

Even when given identical resources and guidelines, medical practices vary in their response to quality improvement interventions. Methods identifying group dynamics, such as the development of CCC, that predict successful interventions may help match quality improvement strategies and resources to the providers that would benefit most. Efforts to measure and cultivate CCC should be included in interventions to improve staff morale, patient satisfaction, and clinical outcomes of chronic disease care.

The study resulted in two major products: (1) a valid and reliable measure of collaborative clinical culture that was developed for use in future research and (2) a demonstration of a relationship between CCC and patient outcomes, an important contribution to the discussion of the inconsistent effectiveness of quality improvement systems change interventions in healthcare.

List of Publications and Products

Greenfield S, Roblin D, Billimek J, et al. Equipped to adapt: Primary care teams with a collaborative practice climate translate systems change into improved diabetes outcomes. In: *Proceedings of the 134th Annual Meeting and Exposition of the American Public Health Association*; 2006 November 4-8; Boston, MA.

Billimek J, Kaplan S, Roblin D, et al. Translating quality improvement systems change into improved chronic disease outcomes: The importance of practice climate. In: *Proceedings of the 2006 Annual Meeting and Scientific Sessions of the Society of Behavioral Medicine*. 2006 March 22-25; San Francisco, CA.

Roblin D, Kaplan SH, Greenfield S, et al. Collaborative Clinical Culture and Primary Care Outcomes [abstract]. In: *2002 Annual Meeting of the Academy for Health Services Research and Health Policy*; 2002 June 23-25; Washington, DC. Available online at <http://www.academyhealth.org/2002/abstracts/management.pdf>.