Exploring the efficacy of healthcare quality practices, employee commitment, and employee control

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Abstract

This exploratory study examines healthcare quality program practices, employee commitment and control initiatives, and perceived results by surveying the directors of hospital quality programs. U.S. hospitals are renowned to be among the highest in quality, but recent studies assert that the majority of error-related deaths per year are preventable. In response, healthcare organizations have adopted quality management programs. Employee commitment and control theories propose that employee initiatives are critical to patient safety. However, little research has focused on the efficacy of employee commitment and control initiatives for quality programs at healthcare organizations. This study examines the responses from Quality and Risk Directors of 372 U.S. hospitals. The results of structural equation modeling (SEM) demonstrate that perceived quantitative and qualitative quality program results are more highly related to employee commitment and control initiatives than they are related to quality practices.

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1. Introduction

In the face of national attention paid to rapidly escalating medical errors and patient safety, healthcare organizations have recently expanded different employee initiatives that promise to enhance healthcare

quality management programs. The Institute of Medicine (IOM) reports suggest that 58 percent of the medical error-related U.S. hospital deaths may have been prevented (Institute of Medicine, 2000, 2001). The IOM reports recommend improvements in healthcare quality systems to resolve patient safety errors. Similarly, the insurance company consultant HealthGrades examined comprehensive data from 2000 to 2002 and concluded that about 195,000 deaths in U.S. hospitals can be attributed to medical errors. Furthermore, errors inflate medical costs due to longer and more costly hospital stays (Nordgren et al., 2004). The Juran Institute has estimated the cost of poor quality as nearly a third of our direct medical expenses. By comparison, 14.9 percent of real U.S. Gross Domestic
Product was spent on healthcare in 2002, far beyond the expenditure for Germany, France, Italy, Britain, and Japan (Mehring and Koretz, 2004). Concern about the increasing worldwide number of high profile major errors raises the demand for cultural and structural change in healthcare systems (Walshe and Shortell, 2004). Some research demonstrates the psychological and systemic barriers that prevent learning from healthcare errors (Edmondson, 2003, 2004; Tucker and Edmondson, 2003).

In response to the troubling number of hospital errors, many healthcare organizations have undertaken initiatives targeted toward patient safety (Barry and Smith, 2005). In a longitudinal study of surgeons, the development of a patient safety data system identified several process improvement factors (Shively et al., 2004). Redesigning hospital processes for best practices based on competitive benchmarking has emerged as one of the most common approaches (Dolan, 2003). Indeed, worldwide fervor for patient safety has promoted the successful application of a variety of quality management practices on a global scale (Chan, 2004; Kazandjian, 1997, 2003; van den Heuvel et al., 2005).

There is increasing interest in the implementation of several different types of quality programs in healthcare. In a recent survey, healthcare CEOs expressed a 62% likelihood of launching a new quality initiative in the next year, as compared to 52% for manufacturing CEOs, 31% for education top administrators, and 35% for other service CEOs (Weiler, 2004). For the various quality initiatives, those healthcare CEOs report actual use of each of the quality programs is 79% for Continuous Quality Improvement (CQI) and Total Quality Management (TQM), 8% for the Six Sigma System, and 7% for the Malcolm Baldridge National Quality Award (MBNQA) system. For the first winner of the Baldridge Award in the healthcare category, Sister Mary Jean Ryan, CEO of SSM Health Care, attributes CQI to the success of SSM (Ryan and Thompson, 1998).

For healthcare quality management programs, employee commitment and control initiatives have become a major focus. Comparing U.S. healthcare workforce commitment from 2003 to 2004, there has been an increase from 91 to 97.6 percent, while commitment for the overall U.S. workforce has dropped from 99.7 to 97.6 percent (AON, 2005). Employee commitment is critical to maintain quality program success when 40 percent of healthcare workers reported intentions to leave the field in the last few months (Wilkins, 2004). A study of healthcare employee commitment revealed key predictors are organizational support, job skill enrichment, quality control, and a culture of continuous learning (Kontogiorghes and Bryant, 2004).

This study adopts the perspective of theory-driven empirical research as an approach to the theory-building process (Amundson, 1998; Amundson and Cummings, 1997; Handfield and Melnyk, 1998; Kafer and Bendoly, 2004; Melnyk and Handfield, 1998; Wacker, 2004). It examines the application of behavioral theory of employee commitment and control. Specifically, this exploratory study explores the efficacy of healthcare quality program practices, employee commitment initiatives, and control initiatives, in terms of the effects on perceived quantitative and qualitative results.

2. Healthcare quality program practices

The relevant literature indicates that quality management practices for healthcare organizations include such practices as customer satisfaction evaluation, employee quality teams, statistical quality/process control, competitive benchmarking, and supply chain management. These practices are drawn from CQI, TQM, Six Sigma, and the MBNQA approaches, which have proven successful in manufacturing (Handfield and Ghosh, 2001; Handfield and Melnyk, 1998) and adapted recently to healthcare (Barry and Smith, 2005).

Customer satisfaction evaluation is a quality practice used by many healthcare organizations to measure perceived quality. Quality practices must include a customer focus based on the systems approach (Lighter and Fair, 2000). Quality function deployment has been used as a means of implementing a customer focus for healthcare (Chaplin and Terninko, 2000). Similarly, quality programs in healthcare organizations emphasize customer-driven and data-defined processes (Breyfogle, 2003; Harry and Schroeder, 2000).

Another quality practice involves the use of employee quality teams. Frequently, an integrated patient safety team is used in hospitals for solving patient safety problems (Gandhi et al., 2003). For example, one patient safety team established a voluntary reporting system that resulted in a 20-fold increase in the reporting of adverse events and near misses (Plews-Ogan et al., 2004). In Thailand, several cross-functional quality teams and Quality Circles have been effectively utilized in a nursing department (Siriratanaban and Wanavanichkul, 2004). Quality improvement ideas and implementation often originate from employee teams (Mears, 1994).
Statistical quality and process control is yet another quality practice. The Six Sigma quality program originated from the statistical symbol for the standard deviation and represents achieving only 3.4 defects per million opportunities (Pyzdek, 2001; Revere and Black, 2003) and is therefore highly statistical in nature. Adoption of Six Sigma programs has expanded gradually to healthcare organizations (Barry et al., 2002; Carey, 2003; Chassin, 1998). CQI also includes statistical quality and process control as well as the other quantitative tools such as checksheets, histograms, Pareto charts, cause-and-effect diagrams, and scatter diagrams (Bell and Krivich, 2000). Subsequent applications of statistical quality/process control in CQI and TQM quality programs have achieved considerable success in several case studies (Aguis, 2005; Marszalek-Gaucher and Coffey, 1993; Rungtusanatham, 2001).

A critical component of quality practices includes competitive benchmarking of organizations against those considered "best" in class (Carey, 2003; Carey and Lloyd, 2001; Kelley, 1999). In fact, benchmarking healthcare facilities for best practices has emerged as the most common process improvement approach (Dolan, 2003). Although TQM has attracted less attention than CQI in healthcare, the emergent goals of TQM are more ambitious than CQI in terms of competitive benchmarking (Powell, 1995; Stamatis, 1996). Similarly, the MBNQA program has been validated in terms of the unique contribution of organizational leadership as a driver of quality program results for healthcare (Douglas and Fredendall, 2004). Established in 1988 to recognize excellence in achieving quality management, the Baldrige Award expanded its scope to include Healthcare in 1999. The MBNQA process requires organizations to submit an application documenting their success, which usually includes competitive benchmarking (Blazey, 2005).

Healthcare organizations have recognized the powerful impact of supply breakdowns (Tucker, 2004) and have exploited supply chain management for their quality program, especially in terms of lean operations (Barry and Smith, 2005; Tan et al., 1999). Strategic supply chain management has become a vital element for the success of quality programs (Bendoly et al., 2004; Chen and Paurolaj, 2004; Chen et al., 2004b; Lejeune and Yakova, 2005; Narasimhan, 1997). Similarly, quality programs depend on effective supply chain management (Gowen and Tallon, 2005; Linderman et al., 2003; Pande et al., 2000; Snee, 2000; Snee and Hoerl, 2003). At Charleston Area Medical Center, quality teams were able to improve the management of surgical equipment inventory by focusing on more effective supply chain management practices (Lazarus and Stamps, 2002; Lazarus and Neely, 2003).

2.1. Healthcare quantitative and qualitative results

Research suggests that healthcare quality programs may be highly effective in achieving overall quality improvements (Mannello, 1995). Moreover, they can result in enhanced customer satisfaction and net cost savings (Barry et al., 2002). Specific examples in hospitals include Commonwealth Health Corporation that reported saving $2.5 million due to the implementation of quality programs (Thomerson, 2001, 2002). Heritage Valley Health System invested $123,000 in training to address issues of patient care and customer satisfaction resulting in more than $1 million in savings (Beaver, 2004). Similarly, a quality project implemented at Acadiana Heart Institute in Lafayette lead to major cost savings (LeBlanc et al., 2004). Some hospitals that have implemented quality programs also have reported a reduction in the frequency and severity of medical errors (McFadden et al., 2004).

Beyond quantitative results from implementing quality programs, the literature also suggests that quality programs will lead to qualitative results as well, especially when focused on improving processes to satisfy internal and external customer needs (Goedert, 2004; Kiemele, 2004; Robustelli, 2003; Scalise, 2001, 2003; Swayne and Harder, 2003). Qualitative results include greater understanding and awareness of errors, as well as a reduction in the impact of errors (Kazandjian and Lied, 1999). Hospitals that have developed quality programs that include quality teams, effective reporting of errors, and statistical analysis of error data in solving quality problems tend to report an increase in the understanding and awareness of errors (McFadden et al., 2004). Therefore, based on the existing literature, we expect that implementing quality practices will lead to both quantitative and qualitative program results. Results include quality improvements, an increase in customer satisfaction, net cost savings, reduced error frequency, reduced error severity, increased understanding of errors, heightened awareness of errors, and reduction in the impact of errors. This leads to following research hypotheses:

**H1a.** Quality practices have a positive effect on quality program quantitative results.

**H1b.** Quality practices have a positive effect on quality program qualitative results.
2.2. Employee commitment initiatives

As a theoretical basis for research on healthcare quality management programs, the employee commitment model is a useful behavioral framework. The employee commitment approach can be conceptualized as an individual-level behavioral theory of worker motivation (Allen and Meyer, 1990) as well as an organizational-level behavioral model of employee commitment initiatives influencing the effectiveness of quality management (Bou and Beltran, 2005). Traditionally, individual-level employee commitment has been divided into three areas: affective commitment which refers to employees’ emotional attachment to, identification with, and involvement in the organization; continuance commitment referring to commitment based on the costs that employees associate with leaving the organization; and normative commitment which refers to employees’ feelings of obligation to remain with the organization (Allen and Meyer, 1990, 1993). The three components have proven empirically distinguishable in studies most often conducted with healthcare employees, which were usually nurses (Herscovitch and Meyer, 2002; Meyer et al., 1990; Meyer et al., 1993).

Organizational commitment theory has been implications for employee motivation (Meyer et al., 2004; Steers et al., 2004). Numerous studies have identified commitment antecedents, such as employee pre-employment expectations and opportunity for self-expression (Meyer and Allen, 1988), work values (Glazer et al., 2004; Lee and Mowday, 1987; Meyer et al., 1998), perceived organizational support (Eisenberger et al., 1990; Lee et al., 1992; Lee and Miller, 1999; Rhoades et al., 2001), job quality and decision quality (Meyer et al., 1991); worker education (Chinen and Enomoto, 2004), employee empowerment and goal achievement (Avolio et al., 2004; Lines, 2004; Wu et al., 2004), leadership style (Briscoe, 2005; McColl-Kennedy and Anderson, 2005), and procedural fairness (Siegel et al., 2005). As far as consequences, meta-analyses have demonstrated that commitment has a strong impact on employee turnover intention and actual turnover (Tett and Meyer, 1993; Wasti, 2003). Other organizational commitment studies reveal significant relationships with three measures of job performance (Meyer et al., 1989), organizational citizenship behaviors (Morrison, 1997; Bachrach et al., 2001; Feather and Rauter, 2004; Norris-Watts and Levy, 2004), and organizational climate (McMurray et al., 2004).

The efficacy of employee commitment was espoused in Walton’s (1985) employee commitment model which consists of employee “voice” in decision-making, job redesign, enlarged performance expectations, organic organizational structure, global compensation, and employment assurance. Employee commitment initiatives can be manifested as employee recognition, best-practices sharing, and feedback by results sharing. Arthur’s (1992, 1994) studies of employee initiatives in steel minimills concluded that employee commitment initiatives result in higher productivity, lower scrap rate, and lower employee turnover than employee control initiatives.

In the context of quality management programs, employee commitment has proven critical to organizational success. The critical impact of employee-oriented initiatives on the outcomes of quality management programs has been evidenced in many studies (Bowen and Lawler, 1992; Lawler, 1986, 1992; Lawler et al., 1995, 1991, 1997; Snape et al., 1995; Talaq and Ahmed, 2003). Employee commitment initiatives acted as a moderator of the impact of a quality management program on organizational performance (Bou and Beltran, 2005; Challis et al., 2005; Schonberger, 1994). Furthermore, employee commitment initiatives implemented as a “high-performance work system” proved to be more effective for manufacturing firms than for service organizations (Boxall, 1998, 2003). However, in studies of healthcare quality management programs, employee commitment initiatives have improved organizational success (Caron et al., 2004; Chen et al., 2004a; Manion, 2004).

Therefore, the previous literature review leads to the following research hypotheses:

**H2a.** Employee commitment initiatives have a positive effect on quality program quantitative results.

**H2b.** Employee commitment initiatives have a positive effect on quality program qualitative results.

2.3. Employee control initiatives

In addition to employee commitment initiatives, quality program results can depend on employee control initiatives, as represented in Fig. 1. Employee control initiatives have manifested motivational impacts (Snell, 1992). Furthermore, employee perceived control can ameliorate the adverse consequences of layoffs (Brockner et al., 2004). Employee control initiatives, such as limited training and performance evaluation for specialized skills, promotion opportunity based on specialized ability, and incentive-based financial rewards or pay-for-performance, have been examined in studies of control theory systems (Schonberger, 1994; Snell and Youndt, 1995). Also, employee control initiatives have been associated with the model of
programmed employee tasks requiring behavior-based controls (Eisenhardt, 1985). Arthur's (1992, 1994) studies of steel minimills evidenced higher productivity, lower scrap rate, and lower employee turnover for both employee control initiatives. However, employee control initiatives have received less attention in the face of the historical trend toward organizational decentralization and employee empowerment (Pfeffer, 1998) (Fig. 1).

Quality management programs have been highly effective as a consequence of employee control initiatives, such as incentive pay and general training (Chandler and McEvoy, 2000; Snape et al., 1996). Likewise, employee control initiatives have had a positive impact on healthcare quality management programs (Goldstein and Naor, 2005). However, contingency effects for the success of employee control initiatives have been manifested for the impact of industry type and national culture (Ahmad and Schroeder, 2003), as well as corporate strategy (Youndt et al., 1996).

Therefore, the previous literature review leads to the following research hypotheses:

**H3a.** Employee control initiatives have a positive effect on quality program quantitative results.

**H3b.** Employee control initiatives have a positive effect on quality program qualitative results.

### 3. Methodology

#### 3.1. Sample and measures

A questionnaire about hospital quality program practices, employee commitment and control initiatives, and perceived quantitative and qualitative results was sent to a random sample of 607 U.S. hospitals with a quality program. Our list was initiated from the 6005 hospitals in the [http://Hospitallink.com](http://Hospitallink.com) website list. If a certain hospital website existed, we obtained the address and telephone number. Telephone calls to each hospital revealed the name and phone number of a Quality and Risk Management Director. Several attempts were initiated to contact every hospital on the [http://Hospitallink.com](http://Hospitallink.com) list. We called each of the Quality and Risk Management Directors to describe the survey, determine that a quality program existed for the past few years, ask for their interest to participate, and request their e-mail address. Although we attempted to secure separate responses from the Quality Director and the Risk Director, they often collaborated on a completed questionnaire. When we received multiple responses from a hospital, they were used for inter-rater reliability analysis described later in this section. The multiple responses from each of those hospitals were averaged for a single observation for purposes of data analysis. The survey consisted of sending an electronic-mail message, with the cover letter and the questionnaire an attachment. The questionnaire contained drop-down boxes for ease of response. Approximately 3 weeks after the first mailing, the non-respondents were sent an e-mail reminder with the questionnaire attached. A final reminder was sent a few weeks later. The respondents were guaranteed confidentiality. After we received their response, we sent a report with the overall averaged item results when we had collected about 300 responses.

The 372 fully useable hospital responses signaled a response rate of approximately 61 percent, which is beyond the 50–60 percent required to reasonably assure generalizability (Flynn et al., 1990). In total, 38 states were represented among the respondents. For another test of generalizability, the sample responses and the population of hospitals in the [http://Hospitallink.com](http://Hospitallink.com) list were partitioned into the five categories of East, South, Midwest, Southwest, and West. A goodness-of-fit test for geographic representation gave a chi-square value of 5.16 with 4 degrees of freedom, so the sample is not statistically significantly different from the population at the 0.005 level. The quality programs for the respondents had been implemented an average of 12.5 years. Hospital size had an average of 186 beds, with a range of 6–1300 beds, and most were community hospitals. Respondent hospitals employed an average of 2.8 Quality Department personnel and had an average active staff of 237 physicians.
The questionnaire indicators for each construct were derived from a literature search and pretested to improve content validity (Flynn et al., 1990). Quality practices included customer satisfaction evaluation, employee quality teams, statistical quality/process control, competitive benchmarking, and supply chain management (Agus, 2005; Carey and Lloyd, 2001; Evans and Lindsay, 2005; Ryan and Thompson, 1998). Employee commitment and control initiatives relevant to quality programs were best-practices and information sharing, meetings and literature, employee recognition, and quality project results sharing, agent training, financial rewards, and employee promotion opportunity (Ahmad and Schroeder, 2003; Bou and Beltran, 2005; Bowen and Lawler, 1992; Gowen and Tallon, 2003; Schonberger, 1994). The quality program results consisted of quality improvement, customer satisfaction evaluation, net cost savings, reduced frequency of errors, reduction in the severity of errors, increased understanding of errors, heightened awareness of errors, and reduction in the impact of errors (Barry et al., 2002; Kazandjian and Lied, 1999; Spath, 2000). The hospital quality program variables were assessed by a questionnaire survey. Each of the quality program survey items was defined briefly. The respondent rated their degree of implementation of the quality practices and employee initiatives items, as well as the degree of realization of result items, on a six-point Likert scale. The Likert scale used 0 (zero) as “none,” 1 as “very low,” 2 as “low,” 3 as “moderate,” 4 as “high,” and 5 as “very high.” Content validity was also improved by a pilot survey sent to several hospital quality program directors. Based on their suggestions for improvement, several items in the initial version were reworded and clarified.

The reliability and validity of the data collection process were checked. Although perceptual measures have proven acceptable, especially when objective data is unavailable such as the case of hospital error information for legal reasons, there were some issues to consider (Ketokivi and Schroeder, 2004). To address the potential reliability issue, we examined the data from hospitals with multiple responses. The data exhibited Cronbach alpha inter-rater reliability values of 0.766–0.879, with an average of 0.848, which is beyond the minimum acceptable level of 0.70 in general (Nunnally and Bernstein, 1994) and 0.60 for exploratory research (Flynn et al., 1990). Since we did not know how many single-informants completed our survey, and since using a single respondent may lead to common-method bias, we used Harman’s one-factor test to check whether common method bias was present (Podsakoff and Organ, 1986). Harman’s one-factor test resulted in five factors accounting for 55% of the variance, with the first factor at 15%. Because a single factor did not occur and no factor accounted for most of the variance, the single method of data collection was an acceptable risk (Podsakoff and Organ, 1986; Podsakoff et al., 2003).

3.2. Confirmatory factor analysis

Construct validity for the hospital quality practices, employee commitment and control initiatives, and perceived quantitative and qualitative results was delineated by confirmatory factor analysis (CFA) and scale reliability analysis with Cronbach coefficient alpha, as recommended by Flynn et al. (1990). For CFA, principal components analysis with orthogonal rotation (Varimax rotation with Kaiser normalization as advocated by Hinkin, 1995, as well as Nunnally and Bernstein, 1994) was employed. The means, standard deviations, coefficient alphas, and CFA explained variance ($R^2$) results of all survey items and constructs are represented in Table 1. For all constructs, CFA resulted in a single component. The quality practices construct was composed of customer satisfaction evaluation, employee quality teams, statistical quality/process control, competitive benchmarking, and supply chain management (with overall explained variance of 41% and alpha of 0.64). Employee commitment initiatives were represented by quality program best-practices/information sharing, meetings/literature, employee recognition, and project results sharing (with overall explained variance of 54% and alpha of 0.72). Employee control initiatives were assessed by quality program agent training, financial rewards, and employee promotion opportunity (with overall explained variance of 45% and alpha of 0.67). The quality program quantitative results construct consisted of quality improvement, customer satisfaction evaluation, net cost savings, reduced frequency of errors, reduction in the severity of errors (with overall explained variance of 54% and alpha of 0.79). The quality program qualitative results construct included increased understanding of errors, heightened awareness of errors, and reduction in the impact of errors (with overall explained variance of 67% and alpha of 0.75).

3.3. Model-fitting strategy

We chose structural equation modeling (SEM) to test our proposed model. SEM was chosen for its ability to isolate measurement error through an observed and
latent variable structure, simultaneous calculation of model parameters, and tests of overall fit of the model to the data (Anderson, 1987; Bentler, 1984; Rogosa, 1979).

The first step in analyzing the statistical model was to examine the distribution of data. Skewness and kurtosis values were within acceptable ranges, as Curran et al. (1996) recommend values no greater than 2.0 for skewness and 7.0 for kurtosis. We then employed the two-step SEM analytic strategy: first, the measurement model and then the structural model. The method of estimation used was maximum likelihood (ML). The software utilized was AMOS 4.0 (Arbuckle and Wothke, 1999). As far as measures of goodness-of-fit, the widely used $\chi^2$ statistic was used, yet because it is not interpretable as a standardized value and is sensitive to sample size, other fit indices were employed as well (Bentler, 1990). We used two respective indices of fit—the comparative fit index, or CFI (Bentler, 1990), and the non-normed fit index, or NNFI (Bentler and Bonett, 1980). A predetermined cut-off for overall fit indices was set at 0.9 (Hoyle, 1995).

4. Results

We evaluated a structural model where paths from the exogenous variables (quality practices, employee commitment initiatives, and employee control initiatives) to the endogenous variables (quantitative program results and qualitative program results) were estimated. Results demonstrated this model fit the data well ($\chi^2 = 473$, d.f. = 161, $p < 0.000$). In addition, the fit indices for this model were well above our specified 0.9 cut-off (NNFI = 0.96 and CFI = 0.97).

Fig. 2 shows the path coefficients for our model. The respective paths from quality practices, employee commitment initiatives, and employee control initiatives to quantitative program results and qualitative program results were all significant and the signs on these paths were in the direction anticipated. Taken together, our model suggests that hospitals engaged in quality programs, consisting of quality practices, employee commitment initiatives, and employee control initiatives, realized informants who reported higher quantitative and qualitative results. In sum, our SEM analyses provided

<table>
<thead>
<tr>
<th>Construct</th>
<th>Items</th>
<th>Mean</th>
<th>S.D.</th>
<th>Alpha</th>
<th>$R^2$ (%)</th>
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<tr>
<td>Quality practices</td>
<td>Customer satisfaction evaluation</td>
<td>3.38</td>
<td>0.84</td>
<td>0.64</td>
<td>41</td>
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<td></td>
<td>Employee quality teams</td>
<td>3.81</td>
<td>1.23</td>
<td></td>
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<td></td>
<td>Statistical quality or process control</td>
<td>3.51</td>
<td>1.30</td>
<td></td>
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<td></td>
<td>Competitive benchmarking</td>
<td>3.39</td>
<td>1.40</td>
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<td></td>
<td>Supply chain management</td>
<td>1.74</td>
<td>1.70</td>
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<tr>
<td>Commitment initiatives</td>
<td>Best practices and information sharing</td>
<td>3.47</td>
<td>0.94</td>
<td>0.72</td>
<td>54</td>
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<td></td>
<td>Quality program meetings/literature</td>
<td>3.56</td>
<td>1.25</td>
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<td></td>
<td>Quality program employee recognition</td>
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<td>1.24</td>
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<td></td>
<td>Quality project results sharing</td>
<td>3.53</td>
<td>1.24</td>
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<td>Control initiatives</td>
<td>Quality program agent training</td>
<td>0.86</td>
<td>0.83</td>
<td>0.67</td>
<td>45</td>
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<td></td>
<td>Quality program financial rewards</td>
<td>0.30</td>
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<td></td>
<td>Employee promotion opportunity</td>
<td>0.83</td>
<td>1.28</td>
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<td>Quantitative results</td>
<td>Quality improvement</td>
<td>3.07</td>
<td>0.85</td>
<td>0.79</td>
<td>54</td>
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<td></td>
<td>Customer satisfaction increase</td>
<td>3.68</td>
<td>0.96</td>
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<td></td>
<td>Net cost savings</td>
<td>3.40</td>
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<td></td>
<td>Reduced error frequency</td>
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<td>Reduced error severity</td>
<td>2.84</td>
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<td>Qualitative results</td>
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<td></td>
<td>Heightened awareness of errors</td>
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<td>Reduction in impact of errors</td>
<td>3.50</td>
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Table 1
Properties of quality practices, employee initiatives, and results constructs
5. Discussion and limitations

This study of healthcare quality programs reveals compelling evidence for strong relationships for the impact of quality practices, employee commitment, and control initiatives on perceived results. In general, from the SEM results, the quality practices, employee commitment initiatives, and employee control initiatives are highly related to perceived quantitative and qualitative program results. Overall, the SEM path coefficients in Fig. 2F suggest that employee commitment initiatives have similarly high impact on results as employee control initiatives. Our finding is consistent with previous literature on the synergistic effect of commitment and control (Haynes and Fryer, 2000; Powell and Schultz, 2004; Schultz et al., 1999, 2003), especially for quality management programs (Bowen and Lawler, 1992). However, the SEM path coefficients for employee commitment and control initiatives are more significant than for quality practices. This result is consistent with a study reporting company success depended more on employee commitment initiatives than TQM practices (Challis et al., 2005). Similarly, other studies have evidenced the independent impacts of employee commitment initiatives (Bou and Beltran, 2005; Schonberger, 1994) and employee control initiatives (Chandler and McEvoy, 2000; Snape et al., 1996) as moderators of the effect of quality practices on program results. This study’s novel contribution that both employee commitment and control initiatives command results superior to those of quality practices has not been reported in studies of the independent effects of healthcare commitment (Caron et al., 2004; Chen et al., 2004a; Manion, 2004) or healthcare control (Goldstein and Naor, 2005).

Specifically, hypotheses H1a and H1b about quality practices are supported by the results reported in Fig. 2. This study demonstrates that quality practices are significantly related to quantitative and qualitative program results, confirming the general literature about quality and customer satisfaction, medical errors, and healthcare customer value (Ryan and Thompson, 1998; Thomerson, 2002; Godin et al., 2004). Statistical quality/process control and benchmarking have also been found to result in quality improvement and customer satisfaction, reduced error effects, improved error perception, and greater customer value (Kazandjian, 1997; Lim, 2004). Similarly, supply chain management has been related to cost savings and overall competitive advantage (Barry et al., 2002; Lazarus and Stamps, 2002). However, by comparing the two path coefficients, there seems to be relatively little difference in the impact of quality practices on quantitative versus qualitative results.

Hypotheses 2a and 2b regarding employee commitment initiatives are also supported by this research. The SEM results demonstrate that employee commitment initiatives are highly related to quantitative and qualitative program results, confirming the general literature. Similarly, sharing best practices, information, and project results have been reported as highly effective in motivating organizational performance (Arthur, 1992, 1994; Bou and Beltran, 2005; Gallie et al., 2001; Manion, 2004; Pfeffer, 1998; Walton, 1985). Also employee recognition has been associated with employee commitment (Schonberger, 1994). Finally, by comparing the two path coefficients, employee commitment initiatives appear to have a greater impact on quantitative than qualitative results. The comparison implies employee commitment impacts highly salient program results, such as cost savings, customer satisfaction, and reduced error frequency and severity reported in other studies (Barry and Smith, 2005; Barry et al., 2002; Lazarus and Stamps, 2002; Thomerson, 2001, 2002).

Hypotheses 3a and 3b regarding employee control initiatives are strongly supported by this research. Past studies have also identified employee control initiatives such as limited training that lacks a cross-functional nature (Arthur, 1992; Bou and Beltran, 2005; Pfeffer, 1998; Snell, 1992; Snell and Youndt, 1995). Another employee control initiative is an incentive-based or pay-for-performance financial reward system (Arthur, 1992, 1994; Gallie et al., 2001; Pfeffer, 1998; Schonberger,
The third employee control initiative is employee promotion opportunity described in past literature (Bou and Beltran, 2005; Schonberger, 1994; Snell, 1992; Snell and Youndt, 1995). Employee control initiatives have the greatest path coefficients of the three exogenous variables, which is consistent with a past study (Brockner et al., 2004). Furthermore, employee commitment and control initiatives have a greater impact on quantitative results than on qualitative results.

There are some limitations of our exploratory study worth noting. Potential drawbacks common to survey research include the reliance on perceptual data and the use of a single method of data collection. Relative to the perceptual data issue, research indicates that self-reported evaluations are highly consistent with more objective observations, especially when the respondents are at the appropriate point in the organization to make such evaluations (Dess and Robinson, 1984; Ketokivi and Schroeder, 2004; Robinson and Pearce, 1988). Likewise, Bommer et al. (1995) argue from a meta-analysis of the literature that subjective measures should not serve as proxies but objective measures are no panacea due to their narrow focus. Furthermore, triangulation with more objective data on hospital quality practices and program results was prohibited due to the legal barriers to divulging such information. Similarly, for the potential common method variance issue, the application of Harman’s one-factor test reported before and other methods (Podsakoff and Organ, 1986; Podsakoff et al., 2003) suggests that the single method of data collection is an acceptable risk. Finally, another limitation of this study is one central to SEM in general. SEM can determine that a model represents the given data, yet other equivalent models, which fit the data equally well, are always present. Also, whether the data represents the “reality” of the population is another question entirely. Hence, a limitation of our study is that other, equivalent models may explain our findings as well as our hypothesized model. As Williams et al. (1996) note, researchers who use SEM really fail to disconfirm a model more than they actually confirm the model that they are testing. Replication of our design and analyses would enhance confidence in the results.

In future research, it would be interesting to study the relationship between organization and international culture and implementation of quality management techniques. International considerations affect quality management in manufacturing (Das et al., 2000; Rungtusanatham et al., 2005) and could be critical in the area of patient safety. For example, researchers in Canada have recently become involved in assessing patient safety outcomes (Baker and Norton, 2004). In Singapore, strong political commitment and institutional capacities have helped their country experience a paradigm shift toward the broader concept of quality management (Lim, 2004). Therefore, results obtained in the U.S. could be compared against those observed in countries such as Canada and Singapore. Finally, conducting in-depth analysis of specific hospital quality processes and implementation systems is yet another possible area of future research. These issues would be exciting directions for future research in the area of healthcare quality management.

6. Conclusions and managerial implications

The contribution of this research on hospital quality program results emerges from the relatively similar impacts of employee commitment and control initiatives, which are both greater than the impact of quality practices. The literature has reported that employee control and commitment initiatives can exhibit a synergistic impact on organizational results (Haynes and Fryer, 2000; Powell and Schultz, 2004; Schultz et al., 1999, 2003). A strategic “bundle” of employee initiatives, including training, communication, performance evaluation, job redesign, and empowerment, was more effective than either employee control or commitment initiatives alone (Haynes and Fryer, 2000). Other studies have also supported a complex relationship between control and commitment (Guererro and Barraud-Didier, 2004; Meyer and Smith, 2000). Secondly, the relatively greater effects of employee commitment and control initiatives, compared to the effect of quality practices, has been previously observed only for the independent effects of healthcare commitment (Caron et al., 2004; Chen et al., 2004a; Manion, 2004) or healthcare control (Goldstein and Naor, 2005).

This finding has several important implications for healthcare practitioners charged with achieving superior program results. The strong relationship of employee control initiatives with program results implies that the most successful quality programs are exploiting this opportunity. Our findings suggest that additional utilization of employee control initiatives could vastly improve a mediocre hospital quality program. In addition, greater implementation of employee commitment initiatives has been successful in achieving results. Certainly, healthcare organizations should not abandon employee commitment initiatives.
Our findings also imply that expansion of the application of employee recognition, best practices sharing, meetings and literature, and project results sharing are likely to achieve greater program results. Finally, quality practices command significant qualitative and quantitative program results as well, although the impact may be less than for employee commitment and control initiatives. Importantly, any healthcare quality program is built around quality practices, such as customer satisfaction evaluation, quality teams, statistical process/quality control, benchmarking, and supply chain management. Therefore, enhancement of quality practices is valuable in its own right as well as a foundation for employee initiatives.

The pragmatic contribution of this study for healthcare administrators lies in the opportunities offered by quality management programs for achieving extraordinary quality program results and improvements in patient safety. This study suggests that the expansion of healthcare quality practices offers unique opportunities for reducing errors and creating quantitative program results. At the same time, this study suggests greater urgency for hospitals to exploit employee control and commitment initiatives. These programs have not been consistently adopted by hospitals, although interest and awareness is high (Weiler, 2004). This timely study provides empirical evidence that these initiatives are highly related to quality results and hopefully will provide guidance to healthcare administrators to initiate or enhance hospital quality programs. Therefore, more effective healthcare quality practices, employee control initiatives, and employee commitment initiatives should lead to improvements in healthcare patient safety.

Appendix A. Survey instrument directions and items

A.1. Questionnaire directions

Please evaluate the items by clicking on each drop-down box and select a rating on a 0–5 scale as follows:

<table>
<thead>
<tr>
<th>Rating</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
</tr>
<tr>
<td>1</td>
<td>Very low</td>
</tr>
<tr>
<td>2</td>
<td>Low</td>
</tr>
<tr>
<td>3</td>
<td>Moderate</td>
</tr>
<tr>
<td>4</td>
<td>High</td>
</tr>
<tr>
<td>5</td>
<td>Very high</td>
</tr>
</tbody>
</table>

1. To what extent are these key elements implemented in your program?
   a. Customer satisfaction evaluation by surveys, focus groups, etc.
   b. Quality teams of employees
   c. Statistical quality or process control using control charts, etc.
   d. Competitive benchmarking of best-in-class processes
   e. Supply chain management
2. To what extent are these employee motivation practices implemented in your program?
   a. Best practices sharing and information sharing
   b. Use of quality program meetings and literature
   c. Employee recognition for your quality program
   d. Sharing of results for past projects
   e. Agent training for your quality program
   f. Financial rewards for your quality program
   g. Promotion opportunity for your quality program
3. To what extent have these quality program results been realized?
   a. Quality improvement
   b. Customer satisfaction increase
   c. Net cost savings
   d. Reduced frequency of errors
   e. Reduced severity of errors
   f. Increased understanding of errors
   g. Heightened awareness of errors
   h. Reduction in the impact of errors

References


