Effects of High-Involvement Work Systems on Employee Satisfaction and Service Costs in Veterans Healthcare

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EXECUTIVE SUMMARY

Two strong imperatives for healthcare managers are reducing costs of service and attracting and retaining highly dedicated and competent patient care and support employees. Is there a trade-off or are there organizational practices that can further both objectives at the same time? High-involvement work systems (HIWS) represent a holistic work design that includes interrelated core features such as involvement, empowerment, development, trust, openness, teamwork, and performance-based rewards. HIWS have been linked to higher productivity, quality, employee and customer satisfaction, and market and financial performance in Fortune 1000 firms. Apparently, few prior studies have looked at the impacts of this holistic design within the healthcare sector. This research found that HIWS were associated with both greater employee satisfaction and lower patient service costs in 146 Veterans Health Administration centers, indicating that such practices pay off in both humanistic and financial terms. This suggests that managers implementing appropriate structural support systems will be ineffective. Appropriate training and development activities are also necessary to enable employees to implement these systems.
some key HIWS features and nurses' job satisfaction in a variety of organizational settings. Blegen's (1993) meta-analysis revealed that nurses' job satisfaction and commitment to the organization are positively correlated with autonomy, communication with supervisors, recognition, fairness, peer communication, and routinization of treatment procedures. Cumby and Alexander (1998) reaffirmed the positive effect on RN (registered nurse) job satisfaction of effective supervisory and peer communications, and the authors' formalized treatment protocols. In addition, empirical evidence exists linking staff RN job satisfaction with participative management styles (Moss and Rowles 1997; Nakata and Saylor 1994) and the job satisfaction of healthcare workers to organizational supportiveness (Kangas, Kee, and McKee-Waddle 1999; Morrison, Jones, and Fuller 1997).

Considerably less research evidence exists confirming the relationship between comprehensive deployment of HIWS and organizational performance outcomes in healthcare. Perhaps the closest companion to our research is a study of the effects of a Professional Practice Model (PPM) on nurses' job satisfaction and turnover (Pierce, Hazel, and Mion 1996). That case study found that implementation of a PPM—characterized by participative decision making; control over work practices; organizational supportiveness; collegial relationships; open, multilevel communication; and rewards linked to clinical proficiency—is significantly correlated with increased job satisfaction and lower turnover rates among staff nurses in a rehabilitation hospital. Other related investigations are less holistic in design. Aiken and Sloan (1997) linked increased autonomy and empowerment of nurses to improved clinical outcomes. Kobberg and colleagues (1999) found that hospital workers who felt empowered are more satisfied, less likely to quit, and more productive.

Much evidence also exists demonstrating the organizational costs of unhappy employees. Decades of research has linked employee dissatisfaction with increased stress (Cooper, Dewe, and O'Driscoll 2001) and workplace aggression (Neuman 2004). The American Institute of Stress estimated that job stress costs U.S. industry $300 billion annually, as assessed by absenteeism; diminished productivity; employee turnover; direct medical, legal, and insurance fees; and workplace violence. A report from the Corporate Leadership Council (1998) found that instances of workplace violence and aggression are rising, causing supervisors to spend an estimated 18 percent of their time handling personality clashes and physical and emotional trauma for employees and facing billions of dollars in lost work time and other organizational expenses. A statewide survey on labor and workplace concerns reported higher rates of aggressive behaviors in organizations characterized by low morale, low employee involvement, conflictual team relations, and poor supervision (Keashly and Jagatic 2000). In terms of the healthcare sector, Karasek (1990) found that healthcare workers who feel disempowered and dissatisfied with their
jobs can be costly because of their increased psychological stress, turnover, and absenteeism. Bryan and colleagues (1998) linked improved nurse (clinical staff) satisfaction with decreased length of stay and variable cost per day.

**Study Scope and Objectives**
Our research looked at the effects of HIWS on employee satisfaction and service costs in 146 Veterans Health Administration centers. The adoption of HIWS has indisputable costs. However, as noted above, HIWS has also been associated with improved job satisfaction and employee commitment and superior effectiveness and efficiency. Thus, the adoption of HIWS may be associated with some higher short- and long-term expenses, but the multiple positive effects it generates may be expected to reduce costs overall. Specifically, we hypothesize that HIWS will lead to more satisfied employees and lower service delivery costs. Furthermore, we hypothesize that part of the cost-reducing effects of HIWS will occur through employee satisfaction—that is, satisfaction will partially mediate the relationship between HIWS and cost.

**METHODS**

**Participants and Procedure**
This study is part of an ongoing action-research project with the U.S. Department of Veterans Affairs (VA) that is focused on how changes to the work environment affect quality and cost of service. We culled data for this project from multiple sources, including employee surveys, existing internal quality and cost measures, and other archival data. We used the Veterans Health Administration (VHA)'s 1997 internal performance data for all 146 of its healthcare facilities. In addition, we used the responses of 112,360 VHA employees (55 percent response rate) to the 133 items in a confidential employee survey administered in March 1997. The survey asked for employee observations and opinions on a wide variety of topics surrounding their work experiences. Then, we aggregated these data by averaging the individual responses for each item within each of the 146 VHA facilities.

**Measures and Design**

**Dependent Variables: Employee Satisfaction and Service Costs.** Employee satisfaction was measured by averaging into a single scale the employee responses to two questions in the 1997 survey: (1) “Considering everything, how satisfied are you with your job?” and (2) “Considering everything, how would you rate your satisfaction with the organization at the present time?” A five-point Likert scale (anchored at 1=strongly disagree and 5=strongly agree) was used to classify the responses. Responses to the two items were significantly correlated at the facility level ($r = .81$), and together they produced a highly reliable scale (Cronbach's alpha $r = .86$). Average service delivery cost was assessed using a vigorous measure specifically constructed by the VHA to maximize comparability across different types of facilities in different locations. This was done by dividing the total cost of services produced (excluding uncontrollable shared overhead expenses) by
the total weighted units of work. The numerator is adjusted for geography, educational cost, and research costs. The weighted unit of work (denominator) is effectively a weighted patient or risk-adjusted patient. Patients are classified into one of 94 patient classes that reflect resource intensity regardless of setting (i.e., inpatient or outpatient). The relative value assigned to each class is derived from national VA costs of all patients in all classes. Thus, we have a single facility cost figure that can be compared across the system. For each of the 146 facilities in the study, we simply used their end-of-fiscal-year-1997 average cost per unit of weighted work.

**Independent Variable: HIWS.** Using ten items from the VA employee survey (with responses made on a Likert-type scale, with 1 as strongly disagree and 5 as strongly agree), we measured HIWS. These items asked employees the degree to which they believed that their workplace exhibited the various characteristics that appeared to closely match the content of the HIWS construct—that is, performance-based rewards, alignment, information, involvement, empowerment, teamwork, development, trust, creativity, and performance enablers. The items selected appear in inventories of standard surveys (that of the Mayflower Group, for example) and are generally accepted indicators of the underlying organizational dynamic that each item purports to measure (see analyses of common items found in employee surveys of ten federal agencies, for example—Upsala 1995). Our confirmatory factor analyses indicated that these ten questions represent a single factor construct and are more reliably used together than independently (Cronbach’s alpha \( r = .96 \) at the facility level, compared to an average pair-wise correlation of .73). Table 1 lists these ten items along with their facility means, standard deviations, and HIWS loading; every item loaded at least .75 onto the factor, indicating uniformly strong item-scale correlations (Stevens 1992). Thus, we employed for our analyses a HIWS construct composed of these ten items. We obtained a total scale score by weighing the ten items equally. Consistent with the psychometric literature (Nunnally and Bernstein 1994; Wainer 1976), HIWS effects were identical with equal, versus differential, item weighting.

**Control Variable.** We included patient count as a control variable because one might reasonably expect that patient volume (in terms of number of patients served) through economies of scale can influence the cost efficiency of patient treatment, the extent to which a facility has implemented HIWS, and the extent to which employees are satisfied with their work experiences. Thus, the results of our hypothesis tests will be free of any influence of patient count.

**Analysis**
The aggregated survey-based measures of employee satisfaction and HIWS were matched with each facility’s patient count and service delivery cost. Preliminary data analysis was conducted using the SPSS 10.0 software package, and hypotheses were tested
TABLE 1
High-Involvement Work System Construct Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>S.D.</th>
<th>HIWS Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Employees are rewarded for providing high-quality products and services to customers.</td>
<td>2.62</td>
<td>0.17</td>
<td>0.76</td>
</tr>
<tr>
<td>2. Managers let employees know how their work contributes to the organization’s mission and goals.</td>
<td>2.95</td>
<td>0.16</td>
<td>0.85</td>
</tr>
<tr>
<td>3. Employees are kept informed on issues affecting their jobs.</td>
<td>2.90</td>
<td>0.22</td>
<td>0.82</td>
</tr>
<tr>
<td>4. Sufficient effort is made to get the opinions and thinking of people who work here.</td>
<td>2.83</td>
<td>0.15</td>
<td>0.94</td>
</tr>
<tr>
<td>5. Employees have a feeling of personal empowerment and ownership of work processes.</td>
<td>2.52</td>
<td>0.16</td>
<td>0.91</td>
</tr>
<tr>
<td>6. A spirit of cooperation and teamwork exists.</td>
<td>2.93</td>
<td>0.17</td>
<td>0.85</td>
</tr>
<tr>
<td>7. There is trust between employees and their supervisors/team leaders.</td>
<td>2.66</td>
<td>0.19</td>
<td>0.87</td>
</tr>
<tr>
<td>8. I am given a real opportunity to improve my skills in the organization.</td>
<td>3.10</td>
<td>0.14</td>
<td>0.88</td>
</tr>
<tr>
<td>9. I feel encouraged to come up with new and better ways of doing things.</td>
<td>3.13</td>
<td>0.13</td>
<td>0.90</td>
</tr>
<tr>
<td>10. Conditions in my job allow me to be about as productive as I could be.</td>
<td>3.02</td>
<td>0.14</td>
<td>0.78</td>
</tr>
</tbody>
</table>

using the AMOS 4.0 software package for structural equations modeling (SEM). Using SEM over traditional regression techniques for our analyses has three advantages: (1) SEM allowed us to correct for measurement error, resulting in more accurate statistical tests than could have been performed with traditional regression techniques; (2) SEM allowed us to simultaneously calculate both direct and indirect HIWS effects; and (3) SEM automatically provided us with statistical tests of the adequacy of our hypothesized model compared with alternative “good-fitting” models (see, for example, Byrne 2001 and Schumacker and Lomax 1996).

RESULTS
Table 2 depicts the correlations between the measures used in this study,
TABLE 2
Descriptive Statistics and Correlation Coefficients for Study Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D.</th>
<th>Cost</th>
<th>Satisfaction</th>
<th>HIWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cost</td>
<td>3,960.62</td>
<td>550.66</td>
<td>.32*</td>
<td>.78*</td>
<td>.14</td>
</tr>
<tr>
<td>2. Satisfaction scale</td>
<td>3.24</td>
<td>0.15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. High-Involvement Work System Scale</td>
<td>2.87</td>
<td>0.14</td>
<td>-.17*</td>
<td>.05</td>
<td>.14</td>
</tr>
<tr>
<td>4. Patient count</td>
<td>22,359.57</td>
<td>11,975.94</td>
<td>-.27*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Denotes that the correlation is statistically significant at $p < .05$

Notes: 1. Sample size for all correlations is 146 facilities.
2. For simplicity here, the ten items comprising the HIWS construct were averaged into single scale score.

along with their means and standard deviations. The results of the SEM analyses can be found in Figure 1. As can be seen, the results provide support for our hypotheses that HIWS is associated with lower costs and that part of this relationship is mediated by satisfaction. HIWS was associated with lower cost, with a negative total effect \( \beta = -.13 \); this indicates that a one standard deviation difference in the adoption of HIWS (that is, increasing the average response on the HIWS scale from 2.87 to 3.01) is associated with a .13 standard deviation decrease in cost. This is the equivalent of the 50th percentile facility (with an average patient service cost of $3,851) improving to a 44.83 percentile facility (with an average patient service cost of $3,799.50), yielding a savings of $51.50 per patient. For the average size VA healthcare facility serving 23,360 unique patients a year, such an improvement represents an average annual cost savings of $1,203,040. Generalized throughout the VHA healthcare network, this improvement amounts to an annual savings of over $175.6 million.

In addition, the effect of HIWS on cost is partially mediated by employee satisfaction. The SEM results show that HIWS is associated with higher employee satisfaction (\( \beta = .76 \)) and employee satisfaction is related to decreased costs (\( \beta = -.52 \)). Thus, HIWS affects cost both directly (increasing costs, \( \beta = .28 \)) and indirectly through its effects on employee satisfaction (reducing costs, \( \beta = .76 \times -.52 = -.41 \)). We interpret this finding as showing that real expenses are associated with moving toward HIWS. However, these costs appear to be more than offset by the cost-savings consequences that result from increased worker satisfaction (for a net effect of -.13). The implications of these findings are further discussed below.

As expected, facilities treating more patients were significantly more cost efficient (\( \beta = -.28 \)). However, because patient count was included in the model as a covariate, all of the other variables’ relationships with cost are not influenced by patient volume. Thus, the overall cost-reducing impact of work practices and employee
**FIGURE 1**
Results of the Structural Equations Modeling Analysis

![Diagram showing the relationships between high-involvement work system (HIWS), employee satisfaction, patient count, and standardized cost.]

Total effects of HIWS on Cost = -.13

* Denotes that the path coefficient is statistically significant at $p < .05$

** Variance Accounted For

Notes: 1. Our model used a two-item scale to measure satisfaction and a ten-item factor construct to measure HIWS. For clarity of presentation, Figure 1 only depicts the structural model and does not illustrate error terms and paths between composite indicators and latent constructs. Please contact the authors for information on the measurement model.
2. The predictors in the model account for 20 percent of the variance in cost and 62 percent of the variance in employee satisfaction.
3. The model presented in Figure 1 represents a good fit to the data. Specifically, the following goodness-of-fit statistics are all indicative of good model fit: (a) the chi-square for the model is 3.91 with two degrees of freedom ($p > .05$) (nonsignificance indicates that the model is not statistically different from a perfect-fitting model); (b) the CFI index is .99 (values over .90 indicate good fit); (c) the NNFI (Tucker-Lewis index) is .97 (values over .90 indicate good fit); and (d) the RMSEA is .08 (values at or below .08 indicate good fit).

Satisfaction generalizes to facilities of varying sizes. An explanation for why satisfaction was associated with lower service costs in our study may be that satisfaction reduces organizational conflict and turmoil. Using other data assembled from the VHA, we found that satisfaction is associated with reduced intentions to quit ($r = -.78$), fewer leaves without pay ($r = -.20$), and fewer work-related disability and violence claims ($\beta = -.12$ and $-.16$, respectively). Further, each of these indicators of organization strain is significantly associated with greater cost ($rs = .21$, .20, .22 and .31, respectively; $p < .05$).

It seems understandable that key HIWS-enhancing activities such as involving and developing employees take time away from immediate tasks. However, compensating cost-reducing effects appear possible through greater satisfaction and reduced turmoil. Such complex effects are not always easily recognized by managerial observation and intuitive analysis. Simultaneous-effect modeling allows us to see more
clearly the positive chain reaction caused by HIWS.

**DISCUSSION**

High-involvement work designs often receive little or no executive support because of their difficulty and uncertain payoff. Our results add to growing evidence that such aligned practices enhance financial performance (Huselid 1995; Huselid, Jackson, and Schuler 1997), and our results extend these findings to the healthcare service sector, where relatively little such evidence has previously existed. Further, our results suggest that employee satisfaction and service costs may be simultaneously improved by HIWS. The fact that we looked at 146 separate medical centers operating in widely different geographic settings and circumstances, using a cost measure that incorporated types of budgetary and case mix data available in the private sector, adds some robustness to these findings.

Our findings appear to have important practical implications, suggesting that HIWS may be justified both in humanistic and financial terms. In addition, our results confirm that HIWS is associated with greater employee satisfaction, which, in turn, is associated with a host of cost-sparing consequences such as reduced stress and turnover, fewer leaves of absence, and lower work-related disability and violence claims. When these are combined with shortened lengths of stay and lower variable costs per day, as reported in prior research (Karasek 1990), the cost-dampening potential of elevated employee satisfaction is indeed compelling. Furthermore, although our model leaves unexplained a substantial proportion of variance in cost behavior, the interrelated items subsumed by the HIWS construct represent organization factors that are amenable to direct managerial intervention and control.

Several limitations of our findings should be acknowledged. First, even though considerable diversity existed across the VHA facilities in this study, all the organizations are part of a single, large government organization. To what extent similar results would be obtained in the private sector remains unclear. Second, because employee perception and satisfaction data were drawn from a single source, common method bias might distort findings and blunt conclusions, although this may not be as much of a limitation as is often thought (Judge et al. 1998). Third, employee perceptions were conveniently obtained from existing survey data. Even though the face/content/construct validities of our survey-based measures appeared to be very good, the measurement instrument itself was not specifically constructed with the study's purposes in mind and a separate validation study of the HIWS measure was not performed prior to the analyses. Fourth, HIWS was assessed solely through perceptual measures, which are subject to assessors' distortions, rather than through more objective indicators. Although it can be argued that how employees perceive work practices may be the most valid measure to use for this line of inquiry (Cordes and Dougherty 1993), we are unable to confirm with this study how well these employee perceptions reflect reality.
Finally, the research design advises caution in drawing inferences about causality. There was some time sequencing between employees’ mid-year survey responses and end-of-year financial data, but multiple, time-ordered measures of employee perceptions and facility performance that are necessary to establish causal relationships were not used.

CONCLUSION

Healthcare organizations are immersed in a competitive milieu characterized by continuous and intensifying dynamism. The resource-based view of the firm (Barney 1991, 1995) argues that organizations will be successful only to the extent that they can attract the necessary assets and create the organizational capability to sustain competitive advantage as their environments change. This requires implementing the proper structural and behavioral alignment needed to exploit external opportunities. Human resource is a key asset in this process. HIWS plays an essential role in unleashing and leveraging the human potential that resides with all organizations. We note a convergence of challenges faced by organizations in both the private and public healthcare sectors. Organizations in the private sector are faced with increased restrictions on revenue generation through free-market pricing decisions. Cost reduction is an alternative approach to ensuring adequate operating surpluses (profits) required for future capital replacement and growth. At the same time, public healthcare service organizations are being increasingly subject to privatization influences, including pressure to conform to the quality and cost standards of the private sector and the threat of outsourcing activities proven to be better handled by the private sector.

The results of our research illustrate a set of interacting work practices that contribute to enhanced organizational performance, both in terms of a more satisfied workforce and cost effectiveness—in this case, it amounts to over $1.2 million in cost savings for an average VA facility and almost $176 million for the VA nationwide. Once identified and understood, such information can be used by managers to design satisfying work environments for healthcare employees which will thereby elevate the likelihood of producing positive performance outcomes in the form of high-quality care, efficient delivery of service, and patient satisfaction. Furthermore, our findings reduce the uncertainty around the potential payoff from implementing HIWS. The initial expenditures required to establish HIWS clearly represent expenses, but the net short-term effects and cumulative long-term impact of investing in people-centered practices should have a positive influence on the financial performance of healthcare organizations and enhance overall quality of work life for their employees.

Note

1. A series of exploratory and confirmatory factor analyses revealed that most of the survey items loaded on 14 dimensions. Eight of these dimensions appeared to capture various core HIWS
work practices (e.g., involvement, information sharing, cooperation). However, separate HIWS dimensions were so highly intercorrelated that they were better characterized as indicators of a single common underlying construct rather than as a collection of separate constructs. Subsequently, a single highly reliable construct defined by only ten key items produced virtually identical results to those achieved with more complicated multidimensional models. Therefore, for parsimony, only the analyses using the ten-item HIWS construct are reported in this article.

References


The authors have provided a thought-provoking and informative study, especially as both the public and private sectors of the healthcare industry face turbulent times. The stress and strain of continuous review for cost cutting and efficiency management, reimbursement systems that do not cover full costs, technology advances, an aging population in need of increasing services, and the current economic doldrums do indeed create competing imperatives. The authors describe two such imperatives—the need to reduce cost of services and the need to attract and retain highly dedicated employees. Of course, these are associated with the ultimate imperative in healthcare—providing high-quality care.

The question on organizations' minds is, "Are the costs of keeping employees involved and satisfied with work additive or are they offset by increased productivity?" In attempting to gain insight into this question, the study uses measures of high-involvement work systems (HIWS), employee satisfaction, and costs. The authors relied on measures that are similar in composition to those that many organizations use; they also used survey tools that were already in existence and in use by the VA. The results of the study presented in this article outline a process that, if managed correctly, can allow an organization to complete a self-assessment of their HIWS. In this view, the employee satisfaction survey takes on new importance. If employee satisfaction surveys show low involvement and low satisfaction, productivity is likely less than optimal. This leads the manager to ask if costs associated with actions to increase employee involvement would lead to higher satisfaction and increased productivity, offsetting the initial investment. In this article, the authors provide a basic framework to assist others in contemplating the measurement of HIWS. The decision to evaluate HIWS is important, based on the study results indicating that those healthcare facilities with higher HIWS have lower costs per work unit. The authors have made a clear and compelling argument that the costs of HIWS can be offset by increased productivity. Of course, the next questions are, "How do you achieve a higher level of HIWS?" and "At what level..."