Linking characteristics of high-performing hospitals with patient safety

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Abstract

Purpose: The purpose of my K award was to review the literature focused on high-performance work systems (HPWS) practices, develop and validate a survey to measure HPWS practices, and explore measurement and content issues in the safety culture area.

Scope: We conducted five studies examining HPWS and culture. The goal of the HPWS studies was to demonstrate that HPWS is an organizational construct that predicts safety and quality.

Methods: We created two new surveys – HPWS and error disclosure culture – across these five studies and used two approaches to conduct these studies: narrative reviews and cross-sectional surveys.

Results: We found evidence for the content, construct, and predictive validity of two new measures – one to measure HPWS practices, and the other to measure error disclosure culture. Given our preliminary findings, both measures merit future attention when trying to predict safety and quality outcomes.

Key Words: high-performance work systems (HPWS), error-disclosure culture, measurement equivalence, safety culture, teamwork culture, validity, internal consistency

PURPOSE (Objectives of the study)

Objectives

I addressed each of the specific aims of my project:

> Specific Aim # 1: Develop a content valid survey that can be used to measure high-performance work systems (HPWS) practices in a hospital setting (original aim).

> Specific Aim # 2: Relate HPWS practices to patient safety and quality in the healthcare industry, which will allow for the estimation of internal consistency, construct validity, and criterion validity (original aim).

> Specific Aim # 3: Explore measurement-related issues with respect to safety culture, including measurement equivalence, criterion validity, and development of a new safety culture scale (aim added July 2010).

SCOPE (Background, Context, Settings, Participants, Incidence, Prevalence)

Background: The Institute of Medicine (IOM, 2001) argued that the urgent redesign of the U.S. healthcare system was necessary. Within other industries (e.g., manufacturing, automotive, steel), researchers (Arthur, 1994; Zacharatos, Barling, & Iverson, 2005) have demonstrated that HPWS practices have helped organizations achieve better reliability, safety, and performance. Though not as extensively researched as in non-healthcare settings, the construct of HPWS appears to be promising in healthcare, based on initial studies. From a quality improvement perspective, HPWS practices are similar to Donabedian's (1966) structure dimension of the structure/process/outcome model oftentimes used in healthcare. As such, we defined HPWS as an integrated set of work practices that result in engaged employees and positive individual-, unit-, or organizational-level outcomes.

Context: I conducted three sequential studies to examine HPWS practices in healthcare settings (referred to as studies one, two, and three below). These three studies addressed the first two specific aims of my award. Two other studies (four and five) focused on culture research.

Settings: The first study was a narrative review of the literature. The second study surveyed executives from a large, multi-hospital system in the southern US, and the third study surveyed employees from the same hospital system. The fourth study consisted of nurses and physicians from a healthcare setting, and the fifth study consisted of faculty from six institutions in The University of Texas System.

Participants: There were no participants in the first study (narrative review). Executives (second study) and employees (third study) from a large, multi-hospital system were participants. The fourth study consisted of nurses and physicians from a hospital, and the fifth

study consisted of faculty at all The University of Texas locations. IRB approval was obtained prior to data collection.

Incidence: I did not examine epidemiological issues in my studies.

Prevalence: I did not examine epidemiological issues in my studies.

METHODS (Study Design, Data Sources/Collection, Interventions, Measures, Limitations)

Study Design

In the first study (published in Health Care Management Review in 2011), we reported results from our narrative review of the HPWS literature in healthcare and offered research suggestions for those interested in studying HPWS in healthcare. In our second study, we took the 16 most frequently reported HPWS practices and surveyed executives about the importance of these practices for patient safety and healthcare quality (currently in a revise and resubmit at American Journal of Medical Quality). In our third study, we created and administered a nine-item HPWS survey to employees at a large, multi-hospital system (currently preparing manuscript for journal submission). Cross-sectional surveys were used for the fourth and fifth studies, with the SAQ administered to participants in the fourth study and an error disclosure culture scale created and administered to faculty from six UT institutions.

Data Sources/Collection

For study one, I examined peer-reviewed research articles from library databases (Health Source: Nursing/Academic Edition, PsycINFO, and PubMed) that were focused on the terms high commitment, high involvement, and high performance. Additional articles were identified from reference lists of identified articles and from one anonymous reviewer from Health Care Management Review. Executives, employees, and healthcare providers answered surveys for studies two through five.

Interventions

There were no interventions in these studies.

Measures

The goal of the first study was to review the HPWS literature to examine different definitions and measures used by previous HPWS researchers. The goal of the second study was to have executives determine which of the HPWS practices identified in the first study were most important for safety and quality. Therefore, no measures were used in the first two studies. The third study tested the HPWS measure we created. The fourth study used the job satisfaction dimension of the SAQ as a measure. In the fifth study, I collaborated with my mentor – Dr. Eric Thomas – and two other researchers – Dr.'s Sigall Bell and Tom Gallagher - to create a new survey instrument to measure error disclosure culture.

Limitations

Studies two through five relied on survey responses from participants. Although response rates for studies two, three, and five could have been higher, they were adequate enough for the purpose of each study.

RESULTS (Principal Findings, Outcomes, Discussion, Conclusions, Significance, Implications)

Principal Findings

In study one, the main finding was that there was not a consistent way to measure HPWS in previous research. Furthermore, the number of HPWS practices varied across researchers. In study two, we compared the frequency with which HPWS practices were included in studies vs. executives' ratings of the importance of these HPWS practices. In study three, we created and tested our HPWS practices survey (include in Outcomes, below). We found that the survey was internally consistent ($\alpha = .93$) and a stronger predictor ($r = .62$) of HSOPS's item "Please give this hospital area and overall grade on patient safety)" than safety culture and teamwork culture were, as measured by the SAQ. In the fourth study, we found that nurse and physician responses to the job satisfaction scale of the SAQ displayed measurement equivalence (or invariance). In the fifth study, we demonstrated that our measure of "general" error disclosure culture (1) had an adequate level of Cronbach's alpha, (2) was significantly related to safety culture and teamwork culture as measured by the SAQ, and (3) was a better predictor of the participant's intent to disclose a hypothetical error than either safety culture or teamwork culture.

Outcomes

The nine-item HPWS survey is located below:

Employees in my hospital area/clinical area/unit….

1. are provided opportunities to learn new skills.
2. are given rewards for doing a good job.
3. receive necessary information to do a good job.
4. are asked how workplace processes can be improved.
5. receive performance appraisals that help employees improve performance.
6. receive training on quality improvement methods.
7. have job security.
8. see improvements in this unit based on results of employee surveys.
9. think that best candidate for the job is hired in this hospital area.

Discussion

The first three studies provide evidence that HPWS practices are a potentially important topic for healthcare researchers to examine. Given the steps used in the first three studies, we have gathered initial evidence for the internal consistency as well as content, construct, and predictive validity of our HPWS survey. More research is needed that links HPWS practices with additional outcomes.

Conclusions

Health services researchers should build on our work by continuing to examine HPWS and error disclosure culture to determine what unique outcomes they predict beyond other organizational factors already examined by researchers.

Significance

Surveys to predict healthcare outcomes have traditionally focused on safety and teamwork culture. Other organizational factors merit attention, such as HPWS practices. Given general interest from researchers in examining more contextual factors, HPWS practices and new types of culture – such as error disclosure culture – should be examined to see what role they place in predicting outcomes.

Implications

Given our findings, both HPWS and error disclosure culture add substantial value when predicting outcomes and therefore should be examined by researchers in future studies trying to predict safety and quality outcomes.

LIST OF PUBLICATIONS and PRODUCTS (Bibliography of Outputs from the study).

PUBLICATIONS

Study One - published

Etchegaray, J.M., St. John, C., & Thomas, E.J. (2011). Measures and measurement of high-performance work systems in healthcare settings: Suggestions for improvement. *Health Care Management and Review, 36(1),* 38-46.

Study Two - revise and resubmit at American Journal of Medical Quality

Etchegaray, J.M. & Thomas, E.J. High-performance work systems and healthcare quality and safety: Findings from the literature and a survey of executives.

Study Three - currently being prepared for manuscript submission

Study Four - published

Etchegaray, J.M., Sexton, J.B., Helmreich, R., & Thomas, E.J. (2010). *Job satisfaction ratings: Measurement equiv*alence across nurses and physicians. Western Journal of Nursing Research, 32, 530 – 539.

Study Five - revise and resubmit at BMJ Quality & Safety

Etchegaray, J.M., Gallagher, T.H., Bell, S.K., Dunlap, B., & Thomas, E.J. Error disclosure: A new domain for safety culture assessment.

Additional articles published that were attributed to this K award

Profit, J., Etchegaray, J.M., Petersen, L.A., Sexton, B.J., Hysong, S.J., Mei, M., & Thomas, E.J. (*in press*). The Safety Attitudes Questionnaire as a tool for benchmarking safety culture in the NICU. Archives of Disease in Childhood.

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Etchegaray, J.M. & Fischer, W.G. (2010). Understanding Evidence-Based Research Methods: Reliability and Validity Considerations in Survey Research. Health Environments Research & Design Journal, Fall, 131-135.

Hwang, K.O., Ottenbacher, A.J., Lucke, J.F., Etchegaray, J.M., et al. (2010). Measuring social support for weight loss in an internet weight loss community. *Journal of Health Communication International Perspectives, 16(2),* 198-211.

Etchegaray, J.M., & Fischer, W.G. (*in press*). Understanding Evidence-Based Research Methods: Pilot Testing Surveys. Health Environments Research & Design Journal, Summer 2011.

Etchegaray, J.M. & Thomas E.J. (*in press*). Comparing two safety culture surveys: Safety Attitudes Questionnaire and Hospital Survey on Patient Safety. BMJ Quality & Safety.

McCoy, A.B., Ottenbacher, A.J., Sittig, D.F., & Etchegaray, J.M. (*in press*). Understanding Evidence-Based Research Methods: Challenges and Considerations in Analysis of Survey Data. Health Environments Research & Design Journal.

Etchegaray, J.M. Ottenbacher, A.J., Sittig, D.F., & McCoy, A.B. Understanding Evidence-Based Research Methods: Survey analysis, t tests, and odds ratios. Health Environments Research & Design Journal.

Presentations

Etchegaray, J.M., & Thomas, E. J. (2009). High-performance work systems in healthcare. Academy Health Annual Research Meeting, June 28, 2009. Chicago, IL.

Hwang, K.O., Etchegaray, J.M., Bernstam, E.V., & Thomas, E.J. (2010). Activity in an online weight loss community predicts encouragement support. Poster presented at: Society of Behavioral Medicine 31st Annual Meeting, April 7th, 2010; Seattle, WA.

Hwang, K.O., Etchegaray, J.M., Bernstam, E.V., & Thomas, E.J. (2010). Predictors of intention to share educational health information via online social network ties. Poster presented at: Society of Behavioral Medicine 31st Annual Meeting, April 8th, 2010; Seattle, WA.

Profit, J., Etchegaray J., Petersen, L.A., Sexton, B.J., Minghua, M., & Thomas, E.J. (2010). Safety Attitudes Among Neonatal Intensive Care Units Vary Widely. Pediatric Academies Societies, May 1 – 4, 2010. Vancouver, Canada.

Etchegaray, J.M. & Thomas, E.J. (2010). Examining Executive Ratings of High-Performance Work Systems Dimensions. Presented at 2010 Annual Research Meeting of Academy Health, June 28, 2010, Boston, MA.

Etchegaray, J.M. & Thomas, E.J. (2011, June). Comparison of two patient safety culture surveys: HSOPS and SAQ. Presented at 2011 Annual Research Meeting of Academy Health, June 13, 2011, Seattle, WA.

Etchegaray, J.M. & Thomas, E.J. (2011, June). Converting patient safety climate scores between SAQ and HSOPS. Presented at 2011 Annual Research Meeting of Academy Health, June 13, 2011, Seattle, WA.

Etchegaray, J.M., Gallagher, T.H., Bell, S.K., Dunlap, B., & Thomas, E.J. (2011, September). Error Disclosure: A New Domain for Assessing Safety Culture. Presented at 2011 Agency for Healthcare Research and Quality Annual Conference September 19, 2011. Bethesda, MD.