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REGENSTRIEF CENTER
FOR HEALTHCARE ENGINEERING

Organizational Learning from Voluntary Medication Error Reporting Systems

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PURDUE UNIVERSITY

Discovery Park

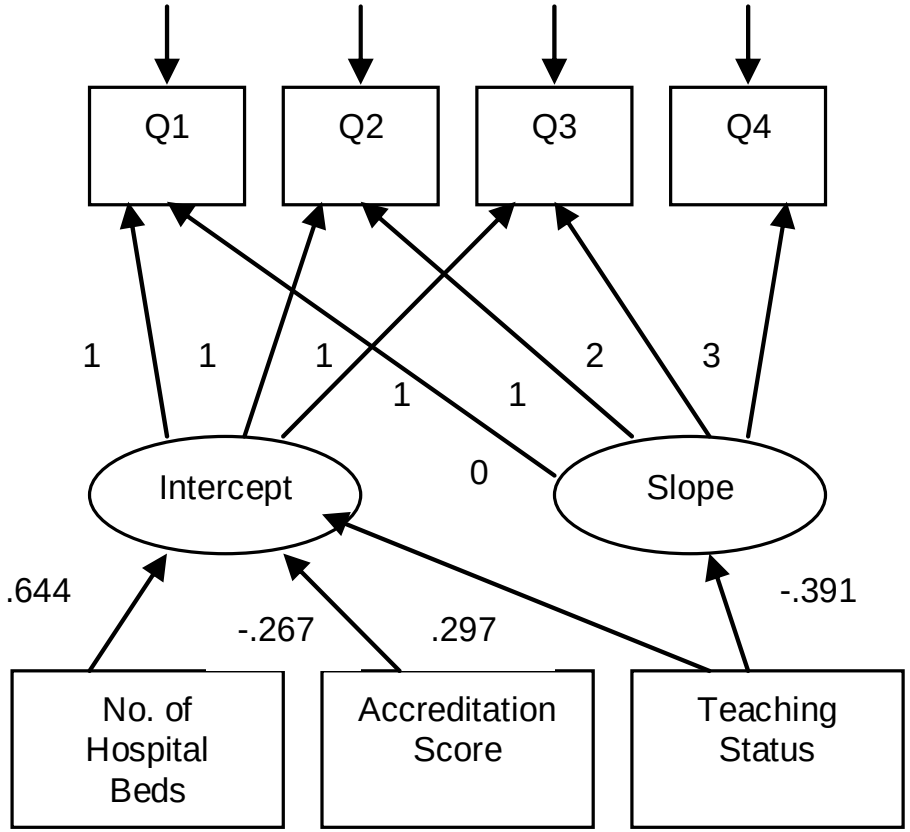
Project Goals and Objectives

- To examine developmental trends in the effectiveness of data sharing regarding medication errors in hospitals.
- To use the results to assist hospitals to improve patient safety by reducing medication errors.

Methods

- Data
  - 17, 000 reports of medication errors from 25 Pennsylvania hospitals
  - Survey of 430 RNs in two Indiana hospitals
  - Data from an EMR implemented in an Indiana hospital emergency room
  - Data from an Indiana hospital incident reporting system
- Analytic Strategy
  - Structural equation modeling.
  - Computer simulation.
  - Hierarchical Linear Modeling

Results To-Date



Latent Growth Curve Model: Error Reporting

Results To-Date

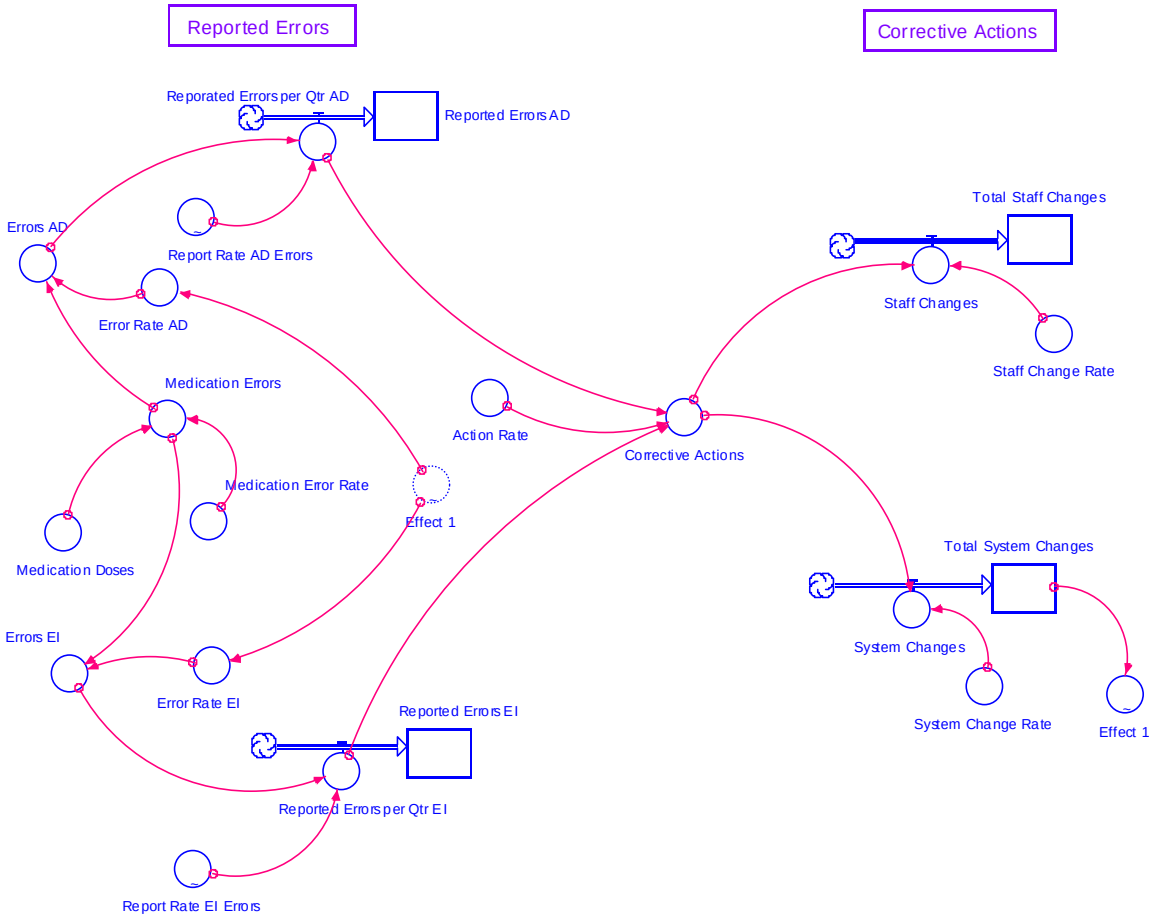


Figure 2. Hospital Medication Error Reporting System

Results To-Date

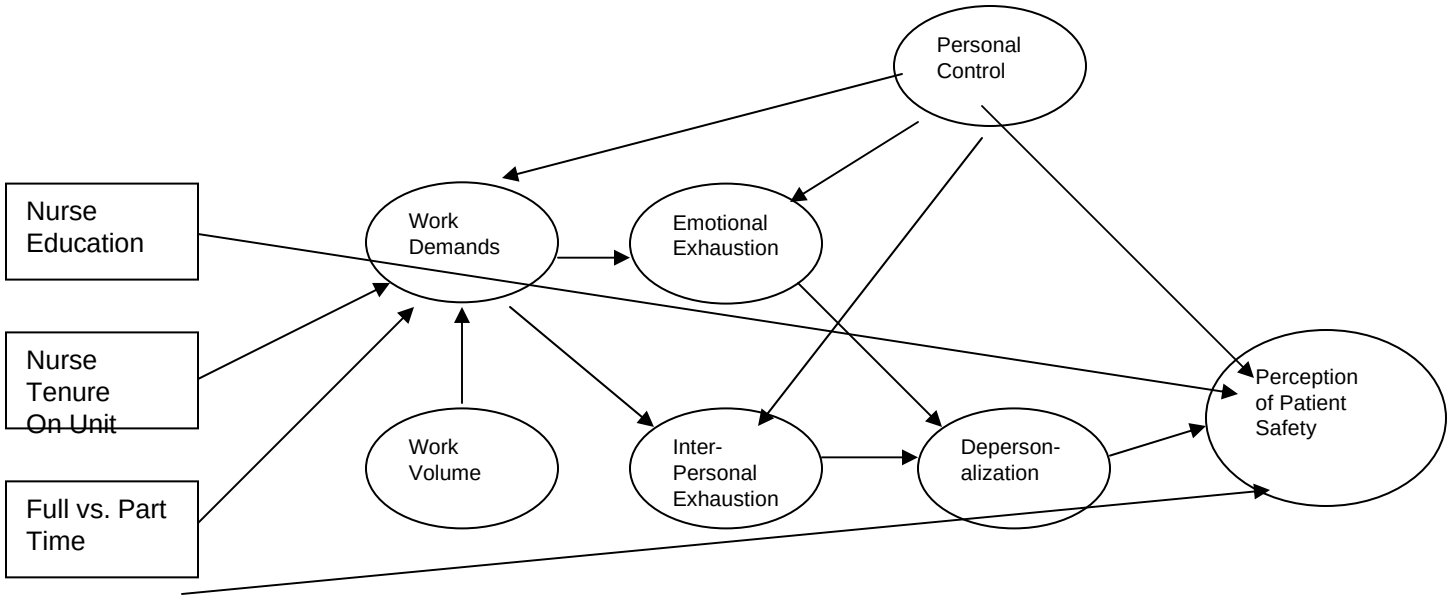


Figure 1. Influences on Nurse Perception of Patient Safety l

Results To-Date

- Despite significant baseline differences between hospitals, error reporting increased at similar rates across hospitals over four quarters.
- By contrast, the reporting of corrective actions remained unchanged.
- Improved patient safety requires more than voluntary reporting of errors. Organizational changes are essential for significant improvement in patient safety.

Results To-Date

- Nurses who report high levels of role demand (i.e., interpersonal exhaustion, depersonalization and lack of personal control over their working conditions) perceive lower levels of patient safety on hospital units
- Nurses who work on hospital units with co-workers who are more experienced perceive higher levels of patient safety.

Connections

- How will research outcomes improve healthcare delivery?
  - If data-sharing systems are intended to promote not just reporting but also root-cause analysis and process improvement, then the design should emphasize data about these processes and corrective actions as well.
  - The nursing staff has the primary responsibility for patient safety. RNs who report high levels of role demand also report little confidence in the safety climate of their hospital units. Proper staffing and support for hospital nurses can significantly improve patient safety.

Opportunities and Challenges

- This project has provided important insights into the design of effective medical error reporting systems. Results also indicate that nurse staffing of hospital units is a critical factor in assuring patient safety. The results and analytic strategy developed could be used by other Indiana hospitals to evaluate and improve their error reporting procedures and to improve patient safety.
- The current project needs additional funding to complete the study of the EMR system and the incident reporting system in two Indiana hospitals.

Research Deliverables

- J.G. Anderson, R. Ramanujam, D. Hensel, M. Anderson, "Voluntary reporting of medical errors and organizational change: A simulation study," in **Health Sciences Simulation 2005**, eds. J.G. Anderson and M. Katzper, San Diego, CA: Society for Modeling and Simulation International, 2005, pp.9-14.
- J.G. Anderson, R. Ramanujam, D. Hensel, M. Anderson, Carl A. Siro, "The need for organizational change in patient safety initiatives," **International Journal of Medical Informatics**, in press.

Research Deliverables

- J.G. Anderson, R. Ramanujam, D. Hensel, M. Anderson, Carl A. Siro, “Reporting Trends in a Regional Medication Error Data-Sharing System,” **Annals of Internal Medicine**, under review.
- R. Ramanujam, K. Abrahamson, J.G. Anderson, , “Influences on Nurse Perception of Patient Safety: Assessing the Effects of Perceived Role Demands,” **Applied Nursing Research**, in preparation.

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