Hospital IT Sophistication Profiles and Patient Safety Outcomes: A Comparison of Three States

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ABSTRACT

Information technology (IT) sophistication of acute care hospitals in Texas was measured to explore the relationships between IT infrastructure and patient outcomes using Donabedian’s framework. The sample was acute care hospitals (n=175) with an IT profile using HIMSS, demographic and operations data. Three dimensions of hospital IT sophistication were measured and related to patient care outcomes using the AHRQ Patient Safety Indicators (PSI). Significant relationships (p < 0.05) using linear regression were found between hospital IT sophistication and three PSI measures. A review of similar studies during the same time period in Iowa, Georgia, and Florida compares findings from two instruments used to profile hospital IT infrastructure. This study adds to and confirms findings of positive relationships between IT sophistication of hospitals and patient care outcomes using the AHRQ safety indicators. Discussion of the conceptual model and the IT sophistication construct provides a theoretical framework for this line of research.

Keywords: Agency for Health Research and Quality (AHRQ), Health Information Technology, Hospitals, Information Technology, Information Technology Sophistication, Patient Outcomes, Patient Safety, Texas

INTRODUCTION

Health information technology (HIT) has been assigned a major role in improving the quality and safety of our healthcare. The Institute of Medicine’s (IOM) call for IT system improvements a decade ago (IOM, 2001) has been joined by regulatory and government initiatives. This government interest, together with an increasingly competitive marketplace has helped place HIT investment at the top of healthcare management’s priority list (AHA, 2011; Blumenthal, 2009, 2011; Blumenthal, DesRoches, & Foubister, 2008; Brailer, 2011; Jha et al., 2011). Despite all the performance pressures, a recent assessment of patient safety efforts earned only a B- for the key players in healthcare services; HIT earned a C+ primarily because of continuing gaps in HIT adoption (Wachter, 2010). Current policy goals have set

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the bar for improving the quality of our care much higher.

The goals of the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009 and Affordable Care Act of 2010 are not just to improve quality and reduce costs of healthcare. These acts present a transition to healthcare that is incentivized to be high-value, data-driven, patient-centered and effectively managed over an acute to long term care continuum (AHA, 2011; DesRoches, Painter, & Jha, 2012). While healthcare providers continue patient safety efforts and the healthcare industry continues to respond to government policy initiatives that can only be accomplished with technology advancement, questions remain that affect HIT adoption. Despite voluminous research, literature evidence is lacking in HIT effectiveness and cost-benefit, and research methods need improvement. Very little empirical research on HIT effectiveness exists that is theory-based. This lack of evidence has prompted specific requests from national IT leadership to move forward.

Specific suggestions to ensure policy relevance of electronic health records (EHR) research on quality have been made: seek evidence of effectiveness at the institutional level, tie evaluations of HIT to primary outcomes of patient care, and measure IT functionality in aggregate and across multiple health organizations (Blumenthal et al., 2008). A limited number of studies have been conducted at the hospital institutional level reporting patient care or process quality outcomes for HIT. A unique subset of this research, from several states in the U.S., is important for creating profiles of hospital IT infrastructure using two instruments and studying relationships to patient care outcomes.

The instruments measured IT sophistication, defined as a measure of IT capability determined by the availability and use of IT applications, technologies and degree of IT system integration. Hospital IT profiles were surveyed in Georgia and Florida from the same time periods and studied in relationship to the Agency for Health Research and Quality (AHRQ) patient safety indicators (PSI). Theories supporting the relationships between IT infrastructure and outcomes were not presented however. The purpose of this paper is to explore Donabedian’s framework for assessing hospital IT infrastructure and patient care outcomes, to add an IT sophistication profile of Texas hospitals, and to compare results between the three states.

**REVIEW OF THE LITERATURE**

**Health Information Technology**

Information technology leaders cite the “transformative” effect that HIT can have on health information and the health information system (HIS) infrastructure supporting healthcare services. Research on HIT adoption and effectiveness has been largely focused on the EHR in two main areas, the business-case for HIT and the quality role HIT is expected to play. Adoption rates of HIT have been slow overall for the decade, but there have been rapid gains in hospitals since 2008. American Hospital Association (AHA) data on adoption of EHR breaks out the functionality into “basic” and “comprehensive” levels. The basic EHR includes the patient’s problem list, demographics & clinical note information available with diagnostic results (laboratory and imaging) and computerized prescription ordering, implemented in at least one clinical unit. The comprehensive EHR builds on this basic core, adding 14 functions including implementation across all major clinical units (Jha et al., 2009). The adoption trends from 2008 of EHR adoption are impressive.

The basic EHR adoption grew from 7.2% (2008) to 18% in 2011, while adoption of comprehensive EHR increased from 1.5% to 8.7% over the same time period (DesRoches et al., 2012). The 2011 AHA survey collected data on approximately 50% of acute care, medical-surgical hospitals in the United States. The HITECH Act provided for federal incentives to spur EHR adoption, starting in 2011.

To receive the Medicare and Medicaid incentive payments for adoption and use of EHR, a criteria of “meaningful use” (MU) must be met.
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