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Role of Health IT in LTPAC Facilities

Emergent Research Forum (ERF)

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Abstract

Although the impact of Health IT and Electronic Health Records (EHRs) adoption and use has been investigated in acute-care settings, there is a lack of understanding about the application and efficacy of Health IT in the long-term and post-acute care (LTPAC) facilities. How do Health IT adoption and use affect the rapidly evolving LTPAC sector of the U.S. healthcare economy? This study investigates the role of the Health IT on LTPAC facilities by adopting configurational perspective towards organized complexity of LTPAC transitions of care business strategy. We examine data obtained from an organization that operates more than 200 long-term and post-acute care (LTPAC) facilities in multiple states. Our research investigates parsimonious configurations for the high qualitative performance of LTPAC facilities with Health IT characterized by organizational complexity.

Keywords

LTPAC, Health Information Technology, Electronic Health Records, Qualitative Comparative Analysis.

Introduction

By 2016, at least 42% of all Medicare Fee-For-Service (FFS) acute-care hospital inpatient stays were discharged to post-acute care (PAC) setting (MedPAC 2017). Between 2001 and 2017, the Medicare annual expenditure on the long-term and post-acute care (LTPAC) providers has almost doubled to \$60 billion (MedPAC 2017). Despite increase in discharge and spending, hospital readmission rate from the LTPAC setting have been as high as 23% coupled with high mortality risk, mostly due to uncoordinated transition of care or inadequate resources to address patients' care needs (Burke et al. 2016). Health IT, defined as information technology used for recording, storing and exchanging patient health data in a healthcare setting, is a blanket term including Electronic Health Record (EHR) systems, Decision Support Systems (DSS), Computerized Physician Order Entry (CPOE), and more. Health IT has potential to improve care coordination for better patient outcomes (Kruse et al. 2015).

Although prior research has investigated the impacts of evolving Health IT systems in acute-care settings within hospitals and physician offices, there has been very little consideration given to the adoption, use, and efficacy of Health IT in long-term care settings. Certainly, the role of Health IT in the LTPAC setting is not merely limited to interoperability between the healthcare providers. It also includes improved transitional care processes, quality of healthcare service delivery, and reduced costs.

LTPAC facilities differ from acute care hospitals in numerous ways. In contrast to a typical urgent-care or acute-care setting of hospital-based clinical care, LTPAC's routinized work environment lacks complexity

and urgency. The patient population in LTPAC settings comprises of the elderly, typically in fragile health, and in need of assisted daily living activities. With fee-for-service (FFS) payment models resulting in acute-care facilities discharging the patients earlier, LTPAC facilities have been essentially required to adapt by redefining their clinical and operational roles. Consequently, LTPACs have become more technologically intricate with latest clinical advancements. These facilities generally provide care to two different types of patients – patients requiring short-term post-acute care, and those requiring long-term or custodial care due to progressive disease or age (Grabowski 2007). Both acute-care hospitals and post-acute-care facilities face challenges of reducing hospital readmissions as hospital readmissions act as a metric for quality of care in most incentive-based federal and state programs. LTPAC facilities serve a dual role regarding hospital readmissions. On one hand, these facilities provide an alternative to hospital readmission, while on the other they act as the source of these readmissions.

How do the Health IT adoption and use affect the rapidly evolving long-term and post-acute care (LTPAC) sector of the U.S. healthcare economy? Health IT holds promises of better care coordination and improved healthcare outcomes in the LTPAC setting. But still, the rate of Health IT adoption and use by the LTPAC facilities has been particularly low, almost half of the rate for the acute-care hospitals (Wolf et al. 2012). With the use of Health IT, preventable medical errors like adverse drug events can be prevented through more effective medication reconciliation practices. We intend to extend our understanding of the effects of Health IT within the LTPAC setting by adopting configurational perspective towards the organized complexity of LTPAC facilities. The configurational approach regards these organizations as clusters of interconnected components that are best viewed systemically to develop a deeper understanding of complex organizational structure and functions.

Digital technologies are increasingly impacting organizations including healthcare organizations, and thereby transforming the practice of medicine in the digital age (El Sawy et al. 2010). Identifying successful strategies in the rapidly evolving technological landscape requires a shift in focus from causal elements to interactions among them (Bharadwaj et al. 2013). Coupling recent research on the role of technology in healthcare organizations with the theory of complex systems, we argue that information technology capabilities and other key organizational capabilities are key elements of the business strategy of any healthcare organization towards better performance. Alternatively, we need to focus on configurations of capabilities derived from complex systemic interactions (Meyer et al. 1993). Traditional research designs often fail to adequately address the problems of organized complexity and causality in complex systems (Meyer et al. 2005).

Meanwhile, identifying systemic patterns emergent from non-linear interactions among multiple capabilities is not trivial without accommodating these complex non-linear interdependencies within the research design. In our study, we focus on the configurations of capabilities, rather than treating individual capabilities as independent variables, in assessing their impact on performance. Additionally, multiple configurations may lead to the same outcome, the presence of a capability in a high-performance configuration does not indicate its absence would result in low performance.

The data for our study was obtained from an organization that operates more than 200 long-term and post-acute care (LTPAC) facilities in multiple states. Our research investigates parsimonious configurations for the high qualitative performance of LTPAC facilities with Health IT characterized by systematized intricacy of organization. Adopting a configurational viewpoint coupled with a fuzzy-set qualitative comparative analysis (fsQCA) to explain the complex nonlinear relationships among vital technical and non-technical capabilities in the form of speculative, asymmetric, and equifinal causation. With this approach, attention shifts from individual capabilities to configurations of capabilities to develop a better understanding of the complex role of Health IT in the LTPAC sector of healthcare.

Literature Review

Prior research on the impact of Health IT on health outcomes has been inconclusive (Black et al. 2011). While some researchers provide positive support (Hersh et al., 2014), others find these studies unconvincing due to limited sample size or weak methodology. Moreover, some critical gaps in the previous research that examines the impact of Health IT have also been highlighted. With an extensive focus on the

adoption of the technology rather than the value derived from Health IT systems, researchers have faced issues related to improper measurements (Barnett et al., 2016). Certain other groups of researchers have been limited in focus covering only a subsection of the patient population and single hospitals, losing adequate representation and generalizability (Appari et al., 2013). Although the effects of advancing Health IT have been studied in clinical and physician-office settings, there has been not much investigation done into the efficacy and viability of Health IT systems in long-term and post-acute care units. There exists a gap in the current research towards assessing the role of health information systems within the LTPAC industry as prior research has been focused on the systems design approach or qualitative analysis of the effect (Clark et al. 2016).

We bridge the critical gap in determining the role of health IT in transitions of care in the LTPAC industry by adopting configurational perspective of organizational complexity. LTPAC facilities are especially complicated as the blanket term of LTPAC includes components like Long-term acute care hospital (LTACH), Inpatient rehabilitation facility (IRF), Skilled nursing facility (SNF), Home health agency (HHA), Hospice, Home- and community-based services (Medicare) (HCBS)/ long-term services and supports (Medicaid) (LTSS), and Assisted living facilities (ALF)/continuing care retirement communities (CCRC). These components differ in the range and intensity of capabilities that include the complexity of procedures, physician intensity, nursing intensity, therapy services, and support services. As the patients change starting with one consideration setting then onto the next, an absence of coordination, correspondence and opportune, substantial clinical data can prompt unfavorable clinical results and occasions.

Methodology

Facilities data was obtained for operational outcomes described in Table 1. We use a fuzzy set qualitative comparative analysis (fsQCA) of measured characteristics, and later examine the key features of fsQCA that relate to our research agenda. The initial phase in the fsQCA includes the calibration procedure, which distributes the set-participations of each case within high-performance conditions and the result by changing the estimation of each factor for a case into an enlistment or membership score. For organizational abilities, we set 50, 40, and 20 EHR as the stays for full membership, crossover, and full non-participation, correspondingly, for the healthcare facilities. QCA guidelines likewise grant the data distribution statistics for calibration, e.g., the 75th, 50th, and 25th percentiles for full enrolment, crossover, and full non-participation, individually.

Once the membership score has been set, the next step involves utilizing a truth table calculation, which recognizes the configurations of causal conditions (i.e., the six sorts of hierarchical capacities) that adequately produce the result of intrigue – the truth table for the clinical performance of the LTPAC facilities. With the consequences of the configuration, each case is assigned into one of a few potential mixes that relate to one row in the truth table. This process develops configurations that provide insight into the complex relationship or these organizational characteristics.

Data and Variables

Data were obtained from 168 LTPAC facilities for a period of 18 months. With a total of 18,343 beds across these facilities, the range of skilled nursing facility (SNF) bed count varies between 30 to 240, with a median of 120 SNF beds. There are twelve measures used by the company to evaluate the performance of an LTPAC facility, listed along with summary statistics in Table 1.

The level of health IT adoption and use has been recorded for the observation period of 18 months, starting Jan 2016 to Jun 2017, in the LTPAC facilities within our sample. There are three levels of Health IT levels – No EHR usage (level-0), partial EHR or electronic Activities of Daily Living (eADL) use (level-1), and Full Clinical EHR system use (level-2). During the observation period, 124 facilities did not change their Health IT level while 22 switched from level-0 to level-1 and 18 changed to level-2. This switching provides the required Health IT level variation for investigating its effect on the performance indicators of these LTPAC facilities.

Variables	Mean	Standard Deviation
<u>Operational Performance Indicators</u>		
Employee engagement	33.37	12.37
Staff retention rate	0.594	0.118
Staff turnover	0.414	0.109
<u>Financial Performance Indicators</u>		
Staff overtime	6.304	2.886
Bad Debt	0.319	5.935
Revenue performance against budget	439.5	21434
<u>Clinical Performance Indicators</u>		
CMS Five Star Total Score	2.236	1.238
CMS Five Star Quality Measure	3.461	1.334
Complaint Tags Percentage	21.57	25.37
Facility Deficiency Index	1.658	1.082
Failed Survey Re-Visits	0.0671	0.250
Return to Hospital Percentage	16.72	4.585

Table 1 Descriptive Statistics of Performance Parameters and Variables

Results and Conclusion

In our data, 58% of the 168 LTPAC facilities had implemented some level of Health IT within the 18 months observation period. Before calibrating variables of fs-QCA truth-table, we performed preliminary analysis. The found significant effect of Health IT on the clinical performance indicators, which needs further investigation from the configurational perspective. Additionally, a similar effect has been noted in the operational performance indicators.

In general, Health IT with a partial EHR (or eADL) and Full Clinical EHR had wide-ranging effects on performance in all three categories - Operational, Clinical, and Financial, even though not all indicators showed an effect. We performed the preliminary analysis of the MANCOVA of the three types of performance indicators collectively, before the calibration process of fs-QCA, and found a statistically significant difference in the performance measures of LTPAC facilities based on their Health IT level (Hopes, 2017). The one-way MANCOVA presented a statistically significant difference between the facilities based on their Health IT level on the combined dependent variables, even after controlling for skilled percent mix. Financial performance indicators present interesting configurational patterns for further analysis, once we include gross revenue per occupied/licensed bed and bad debt measurements.

The current analysis is preliminary. Given the heterogeneity of some indicators, a qualitative comparative analysis would provide for the exploration of the relationship of Health IT and other predictors on a variety of outcome variables. Some nominal and dichotomous variables, like failed revisit surveys, are more suitable to fuzzy set qualitative analysis (fs-QCA). Our proposed methodology will appropriately be able to identify the differences among the facilities that have some influence on the dependent variables of interest allowing for extending inferences beyond the preliminary indicative analysis.

REFERENCES

- Appari, A., Eric Johnson, M., and Anthony, D. L. 2013. "Meaningful Use of Electronic Health Record Systems and Process Quality of Care: Evidence from a Panel Data Analysis of U.S. Acute-Care Hospitals," *Health Services Research*. (<https://doi.org/10.1111/j.1475-6773.2012.01448.x>).

- Barnett, M. L., Mehrotra, A., and Jena, A. B. 2016. "Adverse Inpatient Outcomes during the Transition to a New Electronic Health Record System: Observational Study.," *BMJ (Clinical Research Ed.)*. (<https://doi.org/10.1136/bmj.i3835>).
- Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., and Venkatraman, N. 2013. "Digital Business Strategy: Toward a next Generation of Insights," *MIS Quarterly: Management Information Systems*. (<https://doi.org/10.25300/MISQ/2013/37:2.3>).
- Black, A. D., Car, J., Pagliari, C., Anandan, C., Cresswell, K., Bokun, T., McKinstry, B., Procter, R., Majeed, A., and Sheikh, A. 2011. "The Impact of Ehealth on the Quality and Safety of Health Care: A Systematic Overview," *PLoS Medicine*. (<https://doi.org/10.1371/journal.pmed.1000387>).
- Burke, R. E., Whitfield, E. A., Hittle, D., Min, S. joon, Levy, C., Prochazka, A. V., Coleman, E. A., Schwartz, R., and Ginde, A. A. 2016. "Hospital Readmission From Post-Acute Care Facilities: Risk Factors, Timing, and Outcomes," *Journal of the American Medical Directors Association*. (<https://doi.org/10.1016/j.jamda.2015.11.005>).
- Clark, S., Elswick, S., Gabriel, M., Gurupur, V., and Wisniewski, P. 2016. "Transitions of Care: A Patient-Centered Perspective of Health Information Systems That Support Post-Acute Care," *Journal of Integrated Design and Process Science*. (<https://doi.org/10.3233/jid-2016-0008>).
- Grabowski, D. C. 2007. "Medicare and Medicaid: Conflicting Incentives for Long-Term Care," *Milbank Quarterly*. (<https://doi.org/10.1111/j.1468-0009.2007.00502.x>).
- Hersh, W. R., Weiner, M. G., Embi, P. J., Logan, J. R., Payne, P. R., Bernstam, E. V, Lehmann, H. P., Hripcsak, G., Hartzog, T. H., Cimino, J. J., and Saltz, J. H. 2014. "Caveats for the Use of Operational Electronic Health Record Data in Comparative Effectiveness Research," *Medical Care*. (<https://doi.org/10.1097/MLR.ob013e31829b1dbd.Caveats>).
- Hopes, Scott L. 2017. "Healthcare IT in Skilled Nursing and Post-Acute Care Facilities: Reducing Hospital Admissions and Re-Admissions, Improving Reimbursement and Improving Clinical Operations". Graduate Theses and Dissertations. (<https://scholarcommons.usf.edu/etd/7409>)
- Kruse, C. S., Mileski, M., Alaytsev, V., Carol, E., and Williams, A. 2015. "Adoption Factors Associated with Electronic Health Record among Longterm Care Facilities: A Systematic Review," *BMJ Open*. (<https://doi.org/10.1136/bmjopen-2014-006615>).
- MedPAC. 2017. "Report to the Congress: Medicare and the Health Care Delivery System," *MedPAC*.
- Meyer, A. D., Gaba, V., and Colwell, K. A. 2005. "Organizing Far from Equilibrium: Nonlinear Change in Organizational Fields," *Organization Science*. (<https://doi.org/10.1287/orsc.1050.0135>).
- Meyer, A. D., Tsui, A. S., and Hinings, C. R. 1993. "Configurational Approaches to Organizational Analysis," *Academy of Management Journal*. (<https://doi.org/10.5465/256809>).
- El Sawy, O. A., Malhotra, A., Park, Y. K., and Pavlou, P. A. 2010. "Seeking the Configurations of Digital Ecodynamics: It Takes Three to Tango," *Information Systems Research*. (<https://doi.org/10.1287/isre.1100.0326>).
- Wolf, L., Harvell, J., and Jha, A. K. 2012. "Hospitals Ineligible for Federal Meaningful-Use Incentives Have Dismally Low Rates of Adoption of Electronic Health Records," *Health Affairs*. (<https://doi.org/10.1377/hlthaff.2011.0351>).