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Physician leadership and health information exchange: literature review

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ABSTRACT

Background Notwithstanding two decades of health information exchange (HIE) failures across the country, the US government has incorporated HIE into Meaningful Use Stage 2, which, in turn, has sparked renewed physicians' interest in HIE.

Objective The purpose of this paper was to conduct a literature review to understand how physician leadership might have assisted in supporting organisations in achieving HIE collaboration.

Method The authors conducted a review of the literature about HIE and physician challenges from 2009 to present to identify peer-reviewed publications which might apply. Reviewers abstracted each publication for predetermined issues related to physician leadership. Themes were identified based on the literature findings.

Results The literature review demonstrated four important themes (physician leader characteristics) that can assist in bridging the gap and creating collaboration in an HIE. The themes found in this study were: trust among physicians, promote involvement and buy-in, infuse value proposition and competition.

Conclusion This paper contributes to the healthcare literature by conducting a literature review of the existing literature of surrounding HIE implementation and physician leaders. Specifically, we sought to gain insight into the change process and how physician leaders have demonstrated an impact on the process. This research is the first of its kind to synthesise leadership issues related to HIE and specifically explore the role of physician leader impact on HIE.

Summary box

What is already known?

- Health information exchanges (HIE) serve as bridges to connect disparate electronic health record systems and move healthcare organisations towards interconnected patient-centred care.
- HIEs offer great potential for the healthcare community and can be a significant factor in improving the quality, accessibility and cost-effectiveness of healthcare.
- Previous research has demonstrated that having a physician champion as part of an organisational change has been beneficial for technology implementation.

What does this paper add?

- Currently, most HIE systems are without borders, which means there are a multitude of issues related to trust, loss of revenue and competition.
- The research demonstrated the impact of competition between physicians and healthcare facilities.
- The review demonstrated that trust is a crucial issue in HIE collaboration.
- The review also demonstrated a lack of physician buy-in can be a major barrier to the development and sustainability of HIE change initiatives.

How might it impact on clinical practice in the foreseeable future?

- HIEs are becoming more prevalent in the healthcare landscape. It is important for healthcare leaders to understand how best to implement such change. It has been suggested that physician leaders might play a key role in a hospital change initiative. Physician leaders can make a decisive contribution to the change by actively and enthusiastically promoting the change, building support, overcoming resistance and ensuring that the change is implemented and sustained.

INTRODUCTION

The healthcare industry has undergone tremendous change in recent years with the passing of the Health Information Technology for Economic and Clinical Health Act (HITECH). This act was enacted as part of the American Recovery and Reinvestment Act of 2009, and was signed into law on 17 February 2009.[1] The central focus of HITECH Act was to promote and encourage the adoption and meaningful use of health information technology (IT). HITECH Act includes several important initiatives surrounding IT and the process changes needed towards compliance.[2] The mandated rules have further compounded the ever-changing healthcare context and brought an unprecedented level of confusion primarily because of the introduction of health information exchanges (HIE).

HIE is defined as the use of IT to support the electronic transfer of clinical information across healthcare organisations.[1] HIE can be broken into two primary components: IT and information processing. The technology component refers to the software aspects of HIE and these vary.[1] The process component involves bringing together healthcare

stakeholders within a defined geographic area, and governing the electronic sharing of health information among them for the purpose of improving patient care in that community.[2] However, this is often not a seamless process, and therefore the process component proves to often pose a challenge for physicians. Ideally, the HIE process should encourage and support collaboration; however, this is not always the case.

Hospitals and physicians spend millions of dollars not only to participate in an HIE. Under HITECH Act, the US Department of Health and Human Services is spending $25.9 billion to promote and expand the adoption of health IT (hhs.gov). With an HIE a patient record is no longer private and is accessible within the HIE to any participating physician. Therefore, this literature review is important to the healthcare literature to assist hospital leadership and physicians in the HIE decision-making process and to allow them the opportunity to make needed adjustments before valuable dollars are squandered. This particular literature review demonstrates physician leaders should play a larger role in the HIE governance process from start to finish. It is important for physicians to be integral in the decision-making aspects of HIE because they are ultimately key to whether HIE integration is successful or unsuccessful.

Previous research has demonstrated the true key to HIE success is the creation of a collaborative environment which is driven by physicians.[3] Such a collaborative environment can be used to effectively disseminate information, educate physicians on key issues, facilitate effective decision-making and ultimately aid in the development of trust between physicians.[3] Physicians are the key stakeholders in the HIE implementation process as they act as the primary data providers and data users.[2] Therefore, physician buy-in is essential to the success of such a change initiative. Previous research has also demonstrated a number of factors which are important for HIE implementation success and these include the early involvement of physicians in the change, demonstration of the value of HIE to their practice and the importance of physicians having a voice throughout the process.[4]

This study defines physician leadership as a physician who holds a high level or management position within a hospital (AAPL.org). This study is also pre-empted by previous research that demonstrated physician leadership as the key to success for electronic health record (EHR) implementation and use.[1] Previous literature has shown that EHR physicians who had positive, 'can-do' attitudes towards electronic medical records (EMR) are defined as electronic patient records. 5 EMR problems were vital to getting other physicians to also embrace EHRs.[5] Without exhortation from physician leaders, these other physicians tended to refrain from fully embracing EHR.[6]

Therefore, based on the previous research surrounding EHRs this research sought to understand how physician leadership assisted in supporting organisations in achieving HIE collaboration. To do so, we examined the barriers and successes in the HIE change process and sought to understand how physician leaders might have impacted the process. No previous research has looked to synthesise the current literature surrounding this topic to date. Previous research has demonstrated the importance of collaboration in the HIE implementation process and we are seeking to understand if the literature demonstrates that a physician leader is the key to a more collaborative environment.[1]

METHODOLOGY

The methodology section outlines the process for article search and categorisation. The study contained 105 research papers derived from our search. The general methodology of this research is straightforward and essentially follows the procedures outlined in Mingers.[7] The first step in the process involved conducting a search. The study used a *Web of Science* research database which included: Web of Science with Conference Proceedings, Derwent Innovations Index, BIOSIS previews, MEDLINE and Journal Citation Reports. Each journal was searched using the words specified: 'health information exchange and leadership', 'health information exchange and leader', 'health information exchange collaboration', 'health information exchange success', 'health information exchange and success' and 'health information exchange failure'. These search terms were chosen to ensure the study included captured any leadership issues in the formation of HIE. We began the search with the year 2009 because that is the year the HITECH Act was signed. The HITECH Act was the groundwork for establishing EHR meaningful use which includes mandates on establishing an HIE for any hospital participating in the programme.

The research papers were reviewed through a rigorous process outlined in this section. First, the abstracts of all chosen articles were reviewed to determine the scope of the study and to capture the purpose of the article. The keywords identified by the author(s) were also reviewed. Next, the introduction section was reviewed to determine if physician leadership was a key factor in the study. The authors found in most cases that the physician leader was either briefly mentioned or extensively mentioned as a part of an HIE. In all cases where there was uncertainty about the extent to where a research paper mentioned leadership, but was not articulated as a collaboration factor, a second reviewer was involved in the analysis. We also looked for any leadership terminology noted in the research papers. Any difficulties or ambiguities were noted. While conducting the analysis, the reviewer also gathered keywords associated with each category. Next the researchers conducted an internal audit to enhance the validity of the data. The audit examined both the process and the product of the research for consistency. The authors agreed on the data to strengthen internal consistency. This process involved the analysis of 15 randomly chosen research papers for validation from another coder. Agreement was achieved by searching for

convergence among the various research papers identified to form themes or categories in the study.

RESULTS

Summary description of the publication

The central focus of this paper was to conduct a review of the literature surrounding HIE implementation and how physician leaders impacted the HIE change process. This study noted the first HIE failed in the USA, the Santa Barbara County Hospital met the inclusion criteria. A notable increase in the publication of studies focused on HITECH Act (2010) and the meaningful use of programme has had a significant impact on the direction that HIEs have taken. After careful analysis of the articles, the following themes were chosen: physician trust, promote involvement and buy-in, infuse value proposition and competition. The papers which met the inclusion criteria are presented in table 1.

Physician leadership in HIE

Most of the literature on HIE describes the benefits and challenges related to HIE participation. Physician leadership has been suggested as a way to potentially mediate the implementation process.[8] Physician leaders have been shown to make a decisive contribution to the innovation process (ie, HIE) by actively and enthusiastically promoting the innovation, building support, overcoming resistance and ensuring that the innovation is implemented effectively.[9] Physician leaders can assist other physicians to mentally process the change, deal with potentially perceived negative consequences and build a

Table 1 Example of physician leadership and health information exchange literature

Author/year	Type of study	Summary from literature	How could a physician leader achieve collaboration?
Miller and Miller, 2007[19]	Conceptual	► Santa Barbara project cited the lack of compelling value propositions to key stakeholders such as physicians.	► Infuse value proposition.
Tripathi, *et al*, 2009[21]	Conceptual	► Blue Cross Blue Shield of Massachusetts used physician leadership and support to demonstrate the costs and benefits of EHR and HIE and also to evaluate options for extending implementation state-wide.	► Gain buy-in from other physicians.
Goroll, *et al*, 2009[33]	Conceptual	► Massachusetts eHealth Collaborative (MAeHC) initiative elected a physician to show support and commitment to the healthcare professionals.	► Gain buy-in from other physicians.
Gold, *et al*, 2012[34]	Literature review	► Study cited that senior administrative leadership, including hospital management and boards, as well as physician clinical leadership, promoted clinical involvement.	► Promote involvement and buy-in.
Fontaine, *et al*, 2010[31]	Case study	► Study cited that trust is essential to create HIE collaboration. HIE networks should include leaders who are clinically experienced, IT savvy and well respected within the healthcare community.	► Address trust issues.
Mostashari, *et al*, 2009[35]	Case study	► Study cited that the MAeHC was founded based on the physician leadership of the Massachusetts chapter of the American College of Physicians and the Massachusetts Medical Society, and a $50 million financial commitment from Blue Cross Blue Shield of Massachusetts.	► Promote involvement and buy-in.
Heath, *et al*, 2017[1]	Conceptual	► Study cited physician champion as an important role to build internal trust among the HIE participants. The physician champion is responsible for making a decisive contribution to the process by actively and enthusiastically promoting the HIE, building support and overcoming resistance.	► Internal trust, promoting and building support.
Frisse, 2010[22]	Conceptual	► The exchange successful transformation required the engagement of leadership at the healthcare delivery level to ensure issues related to trust and competition among providers were addressed.	► Address competition and trust issues.
Akhlaq, *et al*, 2016[36]	Literature review	► Study cited lack of leadership and coordination to ensure collection and exchange of information between community and national levels make decision-making difficult, especially in times of disasters and emergency (Seyedin and Jamali 2011; WHO 2011a; Cohn and Xiong 2012; Razzak *et al* 2012).	► Promoting and building support.

EHR, electronic health record; HIE, health information exchange; IT, information technology.

collaborative environment around the change initiative. This is the case because physicians are more inclined to talk and share their experiences with another physician as they are more understanding of their professional challenges and demands.

The literature review of the literature demonstrated four important themes (characteristics) of a physician leader which can assist in bridging any gaps and creating collaboration around an HIE. The four themes are: trust between physicians, promote involvement and buy-in, the cultivation of value proposition into the physician community and competition. In recent years, organisations have come to recognise the importance of having physicians as partners in the daily delivery of care beyond the traditional parameters of their medical practice.[10] The literature surrounding physician leadership demonstrates the numerous benefits within many organisational contexts.[10]

The literature established the importance of the physician leader to the encouragement of a collaborative environment surrounding HIE implementation.[10] Physicians were shown to promote involvement and buy-in and strengthen value proposition into the physician community. In order to gain physician acceptance of HIE and bring such process into healthcare as a permanent change it is important for hospitals to choose a physician to lead other physicians.[10] Such an individual has been shown to develop collaborative relationships, facilitate positive communication and aid in the decision-making processes.[10 11] By leveraging these relationships, the physician leader is able to gain greater levels of buy-in towards a large change initiative.

Physician trust

The literature review demonstrated that trust is a crucial issue in HIE collaboration. Trust refers to an expectation held by one stakeholder about another that the other will act in a mutually acceptable manner.[12] The culture of physicians is very much based on professional autonomy.[13] Professional autonomy is defined as professionals having control over the conditions, processes, procedures or content of their work,[14] which will not be possessed or evaluated by others. Professional autonomy plays a very important role in the working practices of physicians.[14] Studies found that physicians resist change initiatives when the new process or system has a negative impact on their autonomy.[14] Friedman *et al*[15] highlight the need for cultural and organisational changes, emphasising that communities of users and healthcare professionals must be established, and that trust is required if communication and exchange are to be achieved. Rudin *et al*,[16] who studied three HIEs in Massachusetts, identified trust as a key issue due to strategic interests of the stakeholders (ie, physicians, nurse practitioners and physician assistants). The bonds of trust must be formed once a physician decides to participate in the HIE.[16] Physician leaders can create different mechanisms to ensure that trust is formed.

Promote involvement and buy-in

The literature review demonstrated a lack of physician buy-in to be a major barrier to the development and sustainability of HIE change initiatives.[3] The literature noted several concerns surrounding HIE change and stated a lack of understanding on how the HIE might fit in the hospital mission and physician practice.[3] A physician leader was shown to be best able to understand and respond to the differing perspectives and needs of the physicians. This is important as trust and cooperation between clinicians is the key to success and has been shown also to be the primary reason for failure.[3] Physicians need to be willing to share data, use data provided by others and see how change is necessary to the healthcare industry.[17] Physician leaders would be able to provide a combination of control and flexibility to create the highest likelihood of change implementation success.[18]

Infuse value proposition

The literature review demonstrated several examples where the strategic infusion of value propositions for the physicians proved to be of great importance.[19 20] For example, the Santa Barbara County Care Data Exchange was initially considered to be one of the most ambitious HIE projects in the country, but within 8 years the facility shut down operations.[19 21] The reasons for this sudden decline demonstrated a lack of compelling value for the key stakeholders of the HIE.[19] Patients in Santa Barbara County tend to visit the same hospital, laboratory and physician providers where the data were easily available. Therefore, the data were easily available. These findings demonstrate an important consideration for other urban-based environments which might have similar structures in place. Within such environments HIE leadership needed to assess the current methods in place for data sharing in order to properly offer additional value propositions to the stakeholders. In each of the examples found in the literature review a lack of planning and clear demonstration of the value propositions of HIE for key stakeholders was clearly missing from the beginning.[19 20]

Competition

The final area of importance demonstrated through the literature review was the impact of competition between physicians and healthcare facilities.[22 23] By definition, the very nature of such a tremendous organisational change offers areas where competition might be an issue. Frisse[22 23] argued that the dynamics and desired outcomes associated with the planning efforts for an HIE are riddled with challenges. An HIE system involves participants from across competing organisations (eg, hospitals in the same regions) and these planning efforts tend to differ dramatically in terms of tone and substance as compared with planning efforts within a single individual organisation.[1] IT initiatives within a single hospital system have the benefit of an established power structure which can dictate the specifics of the initiative.[22 24] Dealing with the power structures of multiple healthcare

Table 2 Citation exemplars of physician leadership and health information exchange literature

Theme	Citation	Reference
Infuse value proposition.	'Although there are several proximate causes for the project's slow progress—HCF grant money, lack of community leadership, vendor limitations, and the duration of the process—the main underlying cause was lack of a compelling value proposition for Santa Barbara organizations.' (p 573)	Miller and Miller, 2007[19]
Infuse value proposition	'With a $50 million financial contribution from Blue Cross Blue Shield of Massachusetts and physician leadership and support from the Massachusetts chapter of the American College of Physicians and the Massachusetts Medical Society, MAeHC launched pilot projects in three Massachusetts communities in May 2005 to demonstrate the costs and benefits of EHR and HIE and also to evaluate options for extending implementation statewide.' (p 436)	Tripathi, *et al*, 2009[21]
Gain buy-in from other physicians.	'In recognition of the importance of physician leadership to the initiative, a physician was elected chair of the MAeHC, followed by the hiring of a nonphysician chief executive officer with experience in clinical data exchange and a chief operating officer physician executive on loan from BCBSMA.' (p 133)	Goroll, *et al*, 2009[33]
Promote involvement and buy-in.	'Rudimentary forms of exchange can support some of HITECH's goals, but it will take considerably more to conceptualize, gain buy-in, and implement the robust system of exchange that the legislation seeks.' (p 518)	Gold, *et al*, 2012[34]
Address trust issues.	'Solidarity and trust were common themes in practice interviews, and social networks appeared to play a strong role as facilitators of adoption.' (p 127)	Ross, *et al*, 2010[31]
Promote involvement and buy-in.	'These three organizations built a coalition of thirty-four nonprofit organizations, which represent the entire healthcare delivery chain in Massachusetts—from healthcare purchasers to insurers to providers to patients—that now constitutes the collaborative's board of directors.' (p 346)	Mostashari, *et al*, 2009[35]
Internal trust, promoting and building support.	'Regular face-to-face meetings with stakeholders working in other participating organizations is key to building trust.' (p 148)	Heath, *et al*, 2017[1]
Address competition and trust issues.	'To gain trust, leaders decided not to try to achieve an end-state with their initial investments but instead to focus on a small and highly restrictive set of tasks that would prove the concept in more general terms.' (p 53) 'As was the case 10 years earlier during the failed CHIN effort, competition among providers was high and there were significant degrees of distrust among the members—with one another, with the state, and with Vanderbilt.' (p 53)	Frisse, 2010[22]
Promoting and building support.	'The lack of importance given to data in decision making, corruption and insecurity, lack of training and poor infrastructure were considered to be major challenges to implementing HIE, but strong leadership and clear policy direction coupled with the financial support to acquire essential technology, improve the communication network, and provide training for staff all helped to promote implementation.' (p 1310)	Akhlaq, *et al*, 2016[36]

EHR, electronic health record; HIE, health information exchange; HITECH, Health Information Technology for Economic and Clinical Health Act; MAeHC, Massachusetts eHealth Collaborative.

organisations which had traditionally competed against each other proved to be difficult. Previous research has demonstrated undertones of distrust and the impact of past disagreements, particularly at the senior leadership levels.[22 24] Table 2 presents exemplars from the cited literature.

DISCUSSION

The US healthcare system continues to undergo an immense transformation in the way healthcare providers and hospitals document, monitor and share information about patients.[14] The move towards HIE has had an unprecedented impact on the healthcare industry and organisational leaders have tried carefully on how best to approach such initiatives. The implementation of any large change initiative such as HIE is a tremendous undertaking for any organisation and it is time to consider approaches which are unique. Previous research has demonstrated the importance of physicians learning from a physician leader.[25] Such an individual has been shown to develop collaborative relationships, facilitate positive communication and aid in the decision-making processes.[10 11]

The current trend in healthcare is for physicians to move into senior leadership roles within hospitals.[26] Towards this goal medical schools are increasingly adding

leadership development to their curriculum and there is growing interest among practising physicians to move into leadership roles.[27] Hospitals are starting in-house leadership development to foster the idea of physician leadership. Physicians are in a rare position to lead healthcare organisations because they are thought to understand the central focus of healthcare (eg, patient treatment) better than those who are non-clinical.[28] A physician leader's clinical background gives them credibility with the medical staff, while their administrative skills allow them to respond to healthcare reform, changes in reimbursement and newly created integrated delivery systems such as accountable care organisations, medical homes and bundled payment models.[27]

While changes are evolving in the healthcare industry, physicians are challenged to take on more active roles in creating changes. Physicians are able to provide a higher quality of care when all members of a patient's care team are sharing information.[29] While medical professionals may see the advantages of HIE such as comprehensive records, many still have concerns.[30] Some professionals also worry about sharing vital information because they might feel competitively threatened. Failure to collaborate with other healthcare professionals in the digital age, however, may put doctors at a competitive disadvantage, so it is important to think about HIE from every angle.[31] Currently, most HIE systems are without borders, which means physicians are with a multitude of issues related to trust, loss of revenue and competition.[15] Researchers have discussed various perspectives on HIEs including the advantages and disadvantages.[32] We recognise that stakeholder needs and goals can be conflicting based on their interests.

Future research

The implication of this literature suggests that there are many areas for future research and specifically empirical studies. For example, future research might assess the value proposition of successful HIEs to determine what value physicians and hospital envision from their participation. Future research might also survey physicians to determine what factors would lead to their buy-in and participation in HIEs. Another avenue for future research could examine different HIE governance models and stakeholder roles and responsibilities. Finally, physician internal trust might be a valuable area of HIE implementation to understand. Physicians are sharing important information via the HIE with other physicians that they may not know personally. Therefore, research analysing their level of trust while using an HIE would be beneficial.

CONCLUSION

The literature review in this study provides a compelling case for a physician leader to play a significant role in HIE collaboration. Most physicians acknowledge that HIE will transform the practice of medicine.[16] HIE is becoming more prevalent in the healthcare landscape and there is greater government involvement. It is important for healthcare leaders to understand how best to implement such change. Physicians are inclined to talk and share their experiences with one another. Physician leaders have been a suggested role for a hospital change initiative.[10] Physician leaders can make a decisive contribution to the change by actively and enthusiastically promoting the change, building support, overcoming resistance and ensuring that the change is implemented and sustained. It is also important to understand where research currently lies and therefore what questions remain unanswered.

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