Pioneering Excellence: A Comprehensive Review Of Data Governance And Health Information Management In Healthcare Administration

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Abstract

Background: The research was carried out to understand the data governance and Health Information Management in Healthcare Administration in Saudi Arabia. Aim: The purpose of the systematic review is to carefully analyze the existing literature on data governance and health information management in healthcare administration. Method: A systematic search of databases including PubMed and Google Scholar was conducted to identify relevant studies published between 2011-2023. The inclusion criteria for this study consisted of selecting articles written in English that specially examined data governance and health information management. Additionally, the chosen articles had to use well-established scales for measurement and provide valuable data on data governance and health information management in the hospital setting. After initial screening and quality assessment, twelve studies were included in the synthesis. Results: It revealed a consistent link between data governance strategies and health information management systems in healthcare administration. Data governance (DG) and Health Information Management (HIM) were identified as advantageous factors in mitigating and fostering a positive impact on healthcare administration. Conclusion: The review underscores the shortcomings and importance of data governance and health information management systems in healthcare administration for healthcare professionals and patients. The research concluded that the importance of data governance (DG) and Healthcare Information Management (HIM) holds potential effective ways to enhance patient services and develop strategies at the national level in forecasting the future of healthcare in Saudi Arabia.

Keywords: Data Governance, Healthcare Information Management, Healthcare Administration.

Introduction

Healthcare organizations are realizing the importance of data and its great impact in improving their performance, increasing data quality, and enhancing competitiveness through data governance and health information systems. The growing of digital data inside and outside the organizations increases possibilities of data availability and accessibility. More and more healthcare organizations have embarked on Information Technology (IT) to improve outcomes, reduce medication errors, increase healthcare efficiency, and eliminate unnecessary costs. Health Information Management (HIM) in healthcare has expanded from primarily administration and financial-oriented to more clinically-oriented systems. (Carroll et al., 2020; Abraham et al., 2019)

In Saudia Arabia Ministry of Health (MoH) provides 58 % of healthcare services, the remaining portion is shared between other governmental bodies (23 %) and the private sector (19 %). Currently, the total number of hospitals in Saudi Arabia is 387. In the Saudi health sector, the utilization of the health information system has increased. Although some health organizations are expanding their health information management (HIM) infrastructure and applications, there are variations among these organizations with respect to the expanding rate and reliance on data governance and IT (Alharbi, 2018). Unfortunately, the majority of Saudi hospitals are in the early stages of adopting a Health information management system, and very few health organizations are in the advanced stages.



Figure 1: Data Governance in healthcare organization

The adoption of healthcare information management is of particular importance in Saudi Arabia for the following reasons(M. A. Alharbi, 2018).

- The majority of hospitals and medical centers in Saudi Arabia still record patient information on paper.
- The amount of health information is increasing. However, different health sectors use disparate systems with little interoperability between these systems, which created nonconnected islands of information.
- Most healthcare information systems have historically organized the delivery of healthcare around institutions and not around patients.

As a result, most of the existing information systems are mostly of an administrative nature rather than a patient-care focus. Therefore, healthcare organizations in Saudi Arabia must be aware of the need for the right use of their data and to protect it from unauthorized access. Therefore, it is important for all organizations either public or private which process data especially personal data to have clear policies and laws to deal with their data in an appropriate way by conducting and adhering to data governance. To design and apply data governance effectively, these five data domains must be considered by the organizations: data principles, data access, data quality, metadata, and data lifecycle. The maturity of data governance for Saudi sectors can be measured through policies and standards of data management, data quality, risk of poor data quality, cost of data correction, and data security. However, the functional areas related with healthcare information management are as follows.



Figure 1: Health Information Management Functional Areas

Methodology

Literature Search

A comprehensive literature search was conducted to identify relevant studies investigating the data governance and healthcare information management in healthcare organizations. The search was performed using articles published and included in databases like Google Scholar and PubMed. An initial search of databases for research on, the 'data governance in healthcare organizations " resulted in 240 results while a search on 'healthcare information management "resulted in 500 while results for 'data governance and healthcare information management" resulted in 230 results.

The search strategy employed the use of keywords to optimize the retrieval of relevant articles. The following search terms and their variations were used: "data governance," "Healthcare information management" "data governance and health information management" and "Healthcare information management." The search was not limited by publication date however only the publications in the English language were accessed. The PRISMA diagram provides complete details for research identified, screened, and included in the systematic review.



Figure 2: PRISMA Flow Diagram for Systematic Review

Inclusion/ exclusion Criteria

Studies were included in the review if they investigated the use of the Healthcare information management (HIM) system and data governance in the healthcare sector.

Included publications with a focus on data governance in the healthcare sector and healthcare information management systems in healthcare administration.

Studies were excluded if they were not relevant to the topic of data governance and healthcare information management and similar; another reason for exclusion was duplicate publications and nonscientific research.

Data Extraction

To gain a better understanding of the similarities and general direction of the research, data related to the author, research design, objective, results, and conclusion used in the study were noted and extracted from original articles.

Sr	Author	Research Topic/Title	Objective	Resear ch Design /Meth odolog Y	Results	Conclusion
1	(Alofay san et al., 2014)	The Significance of Data Governance in Healthcare A Case Study in a Tertiary Care Hospital	The paper investigate s the importance of data governance to healthcare organizatio ns.	Case Study	By applying data governance in healthcare will provide a solid start for data- driven projects such as data quality improvement, data warehousing, healthcare analytics, and business intelligence.	The proposed framework shows effectiveness on resolving patients' data issues within a short period of time. This model helped to proactively control data, reactively resolve data issues, and monitor breaches of data rules and policies.
2	(ALTU WAIJRI, 2011)	Health Information Technology Strategic Planning Alignment in Saudi Hospitals: A Historical Perspective	To closely examine the work of the NGHA in the area of Health informatio n technology that led to its excellence	Action Case Study Approa ch	The research includes ten key lessons in the following areas: IT vision, IT projects risks, IT departments' roles, IT infrastructure, project management, adequate training, systems integration, healthcare analytics, political situation impacts, and the fit	In spite of the potential benefits that health IT offers to the healthcare industry, the failure rate in health IT- related projects are extremely

			award recognition		between international solutions and local requirements	high. The lessons learned in the implementati on of such projects must be shared across all of healthcare, both locally and internationall y, so that success can be replicated and failures avoided.
3	(A. I. Alkraiji et al., 2016)	Factors impacting the adoption decision of health data standards in tertiary healthcare organizations in Saudi Arabia	Recent studies indicated that the level of adoption of health data standards in healthcare organizatio ns remains frustratingl y low worldwide although health data standards have been perceived to be an essential	Multipl e Case study Approa ch, Semi Structu red Intervie ws	The technological factors are complexity and compatibility of health data standards, IT infrastructure, switching costs, market uncertainties, systems integration, and enhancing the use of advanced systems. The main organizational factors are the lack of adequate policies and procedures and information management plan, resistance to change, data analysis and accreditation. The core environmental factors are the lack of national regulator and data	The investigation into the adoption decision of health data standards in tertiary healthcare organizations in Saudi Arabia has led to the development of a technology organization- environment list that contains the critical factors

			tool for interopera bility barriers within health informatio n systems.		exchange plan, national healthcare system and the shortage of professionals.	influencing their adoption
4	(M. A. Alharbi, 2018)	The Status Quo of Health Information Technology and Health Information Management Efficiency in Saudi Arabia: A Narrative Review	The goal of this narrative literature review is to explore the current status of the reality of Health Informatio n Technology (HIT) infrastructu re in Saudi Arabia.	Narrati ve Literatu re Review	The results of this study have indicated that poor HIT infrastructure in Saudi Arabia has exacerbated problems and retarded the adoption of electronic healthcare practices, which have suffered a reduction in technical project resources, primarily due to high costs, which occurs not only in Saudi Arabia, but also regionally and globally	HIT practices in Saudi public hospitals have suffered a reduction of HIT specialists, training and awareness programs, as well as poor management . This study also revealed that the Electronic Health Record System (EHRs) implementati on strategies were unsuccessful, and the National Informational Technology Plan appears too long- term and

						rigid.
5	(Khalifa , 2013)	Barriers to Health Information Systems and Electronic Medical Records Implementati on A Field Study of Saudi Arabian Hospitals	To identify, categorize, and analyze barriers perceived by different healthcare professiona ls to the adoption of EMRs in order to provide suggestions on beneficial actions and options.	Questio nnaire, Rando m Sampli ng, 158 Particip ants	The study identified six main categories of barriers to HIS which are Human, Professional, Technical, organizational, Financial, Technical	Human barriers, as well as financial barriers, are the two major categories of barriers and challenges in the way of successful implementati on of HIMs and EMRs.
6	(Ngesi mani et al., 2022)	Data governance in healthcare information systems: A systematic literature review	The objective of this study was to understand the features of HIS; acquire informatio n about DG success and understand the influence noted on DG	SLR, Mono Metho d	The study revealed that many organizations have realized that the only method to fix the data problem is the implementation of effective DG. With the increased adoption and rise of cloud computing, DG is gaining interest among specialists.	The shift from paper- based systems led organizations to seek organizationa l change through digital transformatio n. The proper collection and utilization of electronic healthcare records is the foundation of digital

						healthcare. Many organizations value DG as a promising method of maintaining data as a valuable asset
7	(A. Alkraiji et al., 2011)	Health data standards and adoption process Preliminary findings of a qualitative study in Saudi Arabia	This paper seeks to carry out a critical study of health data standards and the adoption process with a focus on Saudi Arabia.	Qualita tive Metho d	Through the thematic analysis of the qualitative data, the authors have identified 18 factors which have a direct impact at the decision-making stage on the adoption process of HIT-related standards.	The present study and findings should help inform policy and decision- makers in developing health systems with the potential creation of information and structure that can sustain future and improved systems
8	(A. Alkraiji et al., 2013)	Barriers to the Widespread Adoption of Health Data Standards: An Exploratory Qualitative Study in	Health data standards are perceived to be the essential solution for interopera bility barriers	Explora tory Interpr etative Approa ch, Multipl e Case study metho	The results exposed that few standards were adopted for four broad reasons, managerial, technical, educational and governmental	The health data standards are expected to be the basis for interoperabili ty solutions, the level of adoption of

		Tertiary Healthcare Organizations in Saudi Arabia	within medical IT and HIM system	dology		those standards remains frustratingly low.
9	(El Mahalli , 2015)	Electronic health records: Use and barriers among physicians in Eastern Province of Saudi Arabia	Electronic health record (EHR) application s improved quality and diminished health services cost.	Cross- Section al Researc h Design, EHR- Tool Questio nnaire	There was under- utilization of almost all functionalities. The least one was 'data back-up and disaster recovery' (18.2%) and the highest was 'enter pharmacy orders' (96.2%).	There was under-utilizat ion of almost all EHR functionalitie s. There was no use of any communicati on tool with patients such as e-mails, fax, and SMS.
10	(F. Alharbi et al., 2022)	Towards a Strategic IT GRC Framework for Healthcare Organizations	The emergence of IT GRC as an approach for protecting healthcare organizatio ns from excessive risk and removing growth barriers has been due to numerous factors like governance	Survey Approa ch, Questio nnaire	Although about 48% of participants reported that their organizations implemented IT GRC programs, 16% stated that they are considering implementing IT GRC programs soon. In almost 71% of healthcare organizations, IT governance, risk management, and compliance are integrated	This study shows that healthcare organizations must assess various factors for the effective implementati on of IT GRC activities

						
11	(Al- Dossari & Sumaili , n.d.)	A Data Governance Maturity Assessment: A Case Study Of Saudi Arabia	This study aims to assess the maturity of data governance for Saudi sectors by design a framework and using it to measure whether the data governance have been applied or not.	Hybrid model from CMM and Gartner models to assess the maturit y of Saudi organiz ation in terms of data govern ance	Although approximately 58% of the respondents as illustrated in that either there is no or they are not sure of the existence of a data governance committee in the sectors in which they work, 55% of them indicated that there are legislation and regulations for data governance in the sectors, as well as for making data available , 42% from the respondents stated that their organizations have policies and procedures to enforce data management.	The Saudi public sectors have policies and procedures for data management . They also have good data quality and data correction cost is appropriate and acceptable.
12	(Al- Ruithe & Benkhe lifa, 2020)	Determining the enabling factors for implementin g cloud data governance in the Saudi public sector by structural equation modeling	the aim of this research is to identify the enabling factors in adopting and implementi ng cloud data governance in the Saudi public sector.	the approa ch of critical success factors (CSF) has been adopte d in this researc h to make up the main constru	The results of the study were based on 206 respondents, and structural equation modelling (SEM) was used to evaluate these results.	A good data governance framework can also help organizations to create a clear mission, achieve clarity, increase confidence in using organizationa I data, establish accountabiliti es, maintain scope and

	cts c the	of	focus, and define
	rese	arc	measurable
	h mod	lel.	successes

DISCUSSION

The present systematic review aimed to thoroughly investigate the data governance and healthcare information management system in healthcare administration of Saudi Arabia. The review synthesized findings from a range of studies, including those conducted by (Al-Ruithe & Benkhelifa, 2020), (Al-Dossari & Sumaili, n.d.), (F. Alharbi et al., 2022), (El Mahalli, 2015), (A. Alkraiji et al., 2013), (A. Alkraiji et al., 2011), (Ngesimani et al., 2022), (Khalifa, 2013), (M. A. Alharbi, 2018), (A. I. Alkraiji et al., 2016), (ALTUWAIJRI, 2011), (Alofaysan et al., 2014).

Over the past four decades, Saudi Arabia has spent billions of dollars in developing and improving the quality of healthcare and expanding its coverage in the country. However, this has not been accompanied by advancement of the health IT field, whose applications have become a necessity for hospitals to enhance the quality of healthcare and reduce the time and cost for healthcare delivery. One of the possible reasons for this is the fact that the failure rate for health IT projects is extremely high (ALTUWAIJRI, 2011). NGHA, a leading health organization Saudi Arabia in the field health IT, won the first Middle East excellence award in electronic health record.

The healthcare information management system (HIM) help healthcare organizations to Optimizing the provision of healthcare, unify the electronic medical record kingdom wide, coordinating patient care activities throughout hospitals and clinics by providing a single patient record to be accessed, managing healthcare resources and supporting decision making which are ultimately improving healthcare services at hospitals. A World Health Organization (WHO) report dealing specifically with electronic healthcare record (EHR) implementation in developing countries, listed high cost, lack of clinical terminology standards, and resistance from healthcare professionals based on a lack of technology literacy. An EHRfocused Saudi study indicated that, due to the widespread manual patient record systems still employed in Saudi public hospitals, intensive work would be required for the implementation of EHRs. Hence, the lack development of EHRs in public hospitals is actually the outcome of a lack of thorough planning strategies and a neglect of necessary minimum technical standards. This study also indicated that hospitals in the governmental and private sectors faced several challenges to the successful implementation of EHRs, listing resistance from healthcare professionals to new technologies and managerial attitudes and lack of dedicated budgets as the primary obstacles (Alharbi, 2018). Different researches have evidence of data errors that are related to the absence of data governance. Such data errors resulted from the lack of data privacy and security rules, the lack of data policies, and the absence of accountability on the data entered into the Electronic Medical Record system (Alofaysan et al., 2014).

Implications

The current systematic review on data governance and healthcare information management system is in local context (Saudi Arabia) to improve and implement data governance and healthcare information management system in healthcare administration as an effective educational strategy to enhance healthcare services throughout public and private sector institutions. The data governance (DG) and Healthcare information Management (HIM) in to improve healthcare administration can be achieved by applying data governance and HIM strategies discussed.

Recommendations

The review help to identify the role of change management at healthcare organizations where the great resistance of physicians and other healthcare professionals to accept and use health information systems and electronic medical records is probably one of the major barriers that delayed the adoption and successful implementation of such systems. This is why the process of HIS and EMRs implementation should be treated as a change project, and led by change managers, in medical practices. The quality of change management actually plays an important role in the success of implementation.

Addition in Existing Literature

Apart from systematic review of literature the study help to point out the barriers which are significantly affecting the data governance and healthcare information management system at patient and physician level. The six main categories of barriers, which are consistent with those reported in recent published research. 1) Human Barriers, related to the beliefs, behaviors and attitudes, 2) Professional Barriers, related to the nature of healthcare jobs, 3) Technical Barriers, related to computers and IT, 4) Organizational Barriers, related to the hospital management, 5) Financial Barriers, related to money and funding and 6) Legal and Regulatory Barriers, related to laws, regulations and legislations. The six categories of barriers were validated with the participants of the pilot sample. Human barriers as well as financial barriers are the two major categories of barriers and challenges in the way of successful implementation of electronic medical records (EMRs) which are bad effecting data governance and healthcare information management system in healthcare organizations.

Impact and Contributions

The review will create a tremendous impact on healthcare professionals and policy makers for the implementation of HIMs at hospital settings through a scientific approach by addressing all the relevant barriers which are causing hurdles in the smooth implementation of Data governance and healthcare information management system to support healthcare administration in Saudi Arabia. It led to the development of a technology-organization-environment that contains the critical factors influencing management and physicians for adoption. The research addressed the gap in knowledge of the adoption of health data governance standards in healthcare organizations. It also provides the ministry of health (MoH) with better understanding of the adoption process of those standards to better judge and to develop suitable strategy for data governance and implementation of HIM at healthcare organizations.

Limitations

Despite the auspicious findings, it is important to acknowledge the limitations across the studies. Due to limited studies with similar variables the heterogeneity in this study's design, data governance and healthcare information management strategies proposed and implemented by various researchers is a challenge for direct comparison and generalization of results. This study was limited to data collected from digital databases and web search engines and thus could have missed relevant research in public libraries and university databases.

Conclusion

The systematic review collectively suggests that applying data governance in healthcare will provide a solid start for datadriven projects such as data quality improvement, data warehousing, healthcare analytics, and business intelligence in healthcare organizations. The analytical measures of data alerts, data quality improvement, policy violation provenance, rules monitoring, and authority monitoring will increase the reliability and transparency of data governance for all users and regulatory bodies specifically ministry of health (MoH) at Saudi Arabia. Studying and comparing the outcomes of different data governance frameworks is an essential piece of future work. The research directly impacts many interesting research disciplines pertaining to healthcare data governance such as, strategic decision effectiveness, data error tracking, and assessments of improvements to data quality by overcoming the barriers which are creating hurdles in implementation.

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