The Role of Information System for Risk Management in Hospital: A Narrative Review

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ARTICLE INFO

A B S T R A C T

The development and progress of information technology is growing rapidly, including information technology in hospital services. Hospitals are labor-intensive, technology-intensive, and risk-taking institutions that require proactive strategies and solutions in risk management. Integrated Risk Management Information System (IRMIS) is defined as an organized and integrated strategy for hospital risk control which consists of identification, assessment, implementation of strategies to reduce or eliminate risks, and monitoring and reviewing risks in hospitals. Management of patient care directly is often associated with risk management. The concept of risk management was developed from clinical and non-clinical services by considering patient safety and security. In this scenario, risk management should be viewed as a proactive activity in maintaining and maintaining the quality of hospital services and the confidentiality of patient data and information and managed in an integrated manner with the hospital management information system (SIMRS) and/or other applications in the hospital as well as business process integration. hospital. This study uses a narrative review approach, with many articles on the same issue. Articles were taken from the Scopus, Science Direct, ProQuest, SpringerLink, Google Scholar, Nature, JSTOR, and Emerald Insight databases with a total of 29 articles used. The purpose of this study was to determine whether the integrated risk management developed in the hospital has a significant influence on decision making with strategic support systems such as human resource development, program selection, marketing, and facility growth by considering clinical and non-clinical risks in the hospital.

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A B S T R A K

Perkembangan dan kemajuan teknologi informasi semakin pesat, termasuk teknologi informasi dalam pelayanan di rumah sakit. Rumah sakit sebagai institusi yang padat karya, padat teknologi, sekaligus padat risiko yang memerlukan strategi dan solusi proaktif dalam pengelolaan risiko. Sistem Informasi Manajemen Risiko Terintegrasi (SMART) didefinisikan sebagai strategi terorganisir dan terintegrasi untuk pengendalian risiko rumah sakit yang terdiri dari identifikasi, penilaian, penerapan strategi untuk mengurangi atau menghilangkan risiko, dan pemantauan dan reviu risiko di rumah sakit. Manajemen pelayanan pasien secara langsung sering dikaitkan dengan manajemen risiko. Konsep manajemen risiko dikembangkan dari pelayanan klinis dan non klinis dengan mempertimbangan keamanan dan keselamatan pasien. Dalam skenario ini, manajemen risiko harus dipandang sebagai aktivitas proaktif dalam menjaga dan mempertahankan kualitas pelayanan rumah sakit dan kerahasiaan data dan informasi pasien serta dikelola secara terintegrasi dengan sistem informasi manajemen rumah sakit (SIMRS) dan/ atau aplikasi lain di rumah sakit serta integrasi proses bisnis rumah sakit. Penelitian ini menggunakan pendekatan naratif review,

dengan banyak artikel tentang masalah yang sama. Artikel diambil dari database Scopus, Science Direct, ProQuest, SpringerLink, Google Scholar, Nature, JSTOR, dan Emerald Insight dengan total 29 artikel yang digunakan. Tujuan penelitian ini adalah untuk mengetahui apakah manajemen risiko terintegrasi yang dikembangkan di rumah sakit memiliki pengaruh signifikan dalam pengambilan keputusan dengan sistem pendukung strategis seperti pengembangan sumber daya manusia, pemilihan program, pemasaran, dan pertumbuhan fasilitas dengan mempertimbangkan risiko klinis dan non klinis di rumah sakit.

INTRODUCTION

An information system may aid an organization in a variety of ways, most notably by assisting with upper-level decision-making. For example, inside hospitals and healthcare systems, a healthcare information system may help increase patient engagement and well-being while also enhancing service quality and cutting costs.(Murphi & Sidauruk, 2021) Along with the general purposes of an information system, its primary benefits within an organization can be summarized as the ability to access a large amount of data, make effective decisions in an automated manner, reduce human errors through the use of complex algorithms, and contribute to the development of new revenue and customer acquisition strategies.(Adibi H, Khalesi N, Ravaghi H, & Jafari M, 2012)

A high-quality information system is a necessary condition for the hospital's successful administration. There are more options, like building it internally or contracting with an external organization to design the new information system. This article discusses how the quality of an information system's implementation affects the administration of a hospital, with a particular emphasis on the risk associated with working with inaccurate data. Another topic covered in this article is the various methods for implementing new information systems in hospitals, as well as their associated benefits and drawbacks.(Mazanec, 2014)

Hospitals are incredibly complicated entities with distinct features such as huge departments and sections that coordinate patient care. They depend heavily on Hospital Information Systems (HIS) to aid in diagnosis, management, and education in order to provide better and more efficient services and procedures. This has the potential to increase service quality.(Sadriani Hade, Abidin Djalla, & Ayu Dwi Putri Rusman, 2019) System quality, information quality, usage, user satisfaction, individual impact, and organizational effect are the six key elements of information system quality Hospital information systems have the potential to significantly reduce healthcare costs while also improving health outcomes. The fast rise of information technology has had a significant impact on the operations of many hospitals.(Aghazadeh, Aliyev, & Ebrahimnezhad, 2012; Awan & Khan, 2016)

Managing a hospital is more complicated than it appears when compared to managing a company. Companies are typically focused on providing a service or a product. The primary areas in which such a firm may be managed are delivery management, finance management, product selling, service provision, public relations, and human resources.(Ismail et al., 2010)

Hospitals have a range of challenges at each level, includingincluding situation complexity, computational complexity, and clinical complexity. The complexity of hospitals is increasing as a result of government legislation and the national health insurance system, which are regularly updated to give the best possible treatment to patients. This increases the complexity of healthcare patient administration systems, with information systems assisting in system integration. It becomes simpler to mitigate the negative impacts of this complexity and improve the quality of optimum treatment for patients to achieve patient satisfaction.(Briner M, Kessler O, Pfeiffer Y, Wehner T, & Manser T, 2010) Uncertainty in the patient care process is a barrier to health services that are related to the hospital's complexity, specifically the relationship among facilities and the ability of hospitals who are unable to fully process details concerning clients' conditions with all services in the hospital due to a lack of integration.(Omole, 2015)

Aside from the many benefits and success aspects that the information system proposes, establishing such a system in an organization may provide many problems that impede its adoption. According to information systems, the following are some challenges: (i) the constant changing of technology, requiring updated users to be in the learning mode; (ii) security issues related to vendors, banking, and distributing the company's essential data, intellectual property, and records; and (iii) the inefficient establishment of an information system due to the high costs and expenses associated with it. These issues, when combined with the lengthy list, might pose significant dangers to an organization's successful performance.(Yulianingtyas, Wigati, & Suparwati, 2016)

Hospital Management Information Systems (HMIS) is an organized, diverse, and automated information system concerned with the process of gathering, storing, and sending applicable data to support an organization's management operations.(Singh, Schiff, Graber, Onakpoya, & Thompson, 2017) An organization's data is divided throughout its numerous divisions. Data is processed in a variety of ways, including graphs, diagrams, charts, and reports, to start generating useful and timely information for management. All company information is stored centrally via Management Information Systems (MIS). Management information systems are employed at all levels of a company.(Harsanto & Hidayat, 2018)

As a result of the many benefits risk management offers, it plays a significant part in the proper operation of various enterprises and organizations. The associated significance stems primarily from the fact that as various organizations move into the information systems area, risk management considerations become increasingly important to eliminate or mitigate the aforementioned risks associated with the incorporation of information systems within an organization.(Adibi H et al., 2012) However, risk management is a large field of study, and knowledge

accumulated through time becomes increasingly complex and multidisciplinary. As a result, a lack of comprehensive knowledge has significantly hampered academics and active practitioners from gaining a comprehensive picture of risk management in information systems. In this work, we want to offer an overview of the function of risk management information systems in providing useful information to both researchers and industry decision-makers.(Farokhzadian J, Nayeri ND, & Borhani F, 2015).

METHOD

This study uses a review method with the type of narrative review. The narrative review aims to identify information systems for the management level to make a decision. Sources of scientific articles are obtained from several databases and there are no standards or protocols in the collection of article narrative reviews.(Huedo-Medina,

Ballester, & Johnson, 2013) Therefore, article screenings as figure 1.

RESULTS AND DISCUSSION

Based on synthesized articles. There are 4 main ideas related to information systems in decision-making. The main idea is the definition of Risk Management Information System (RMIS) in Hospital, Importance of Risk Management in Hospital, The Role of Risk Management Information System in Hospital, and How to Have Effective Risk Management (table 1).

The Risk Management Information System (RMIS) found that RMIS has an importance role in hospital quality. RMIS used to preventing every issue in a company such as hospital. RMIS has a significant influence manager in decision making. decisions in hospitals with strategic support systems such as human resource development, program selection, marketing, and facility growth.
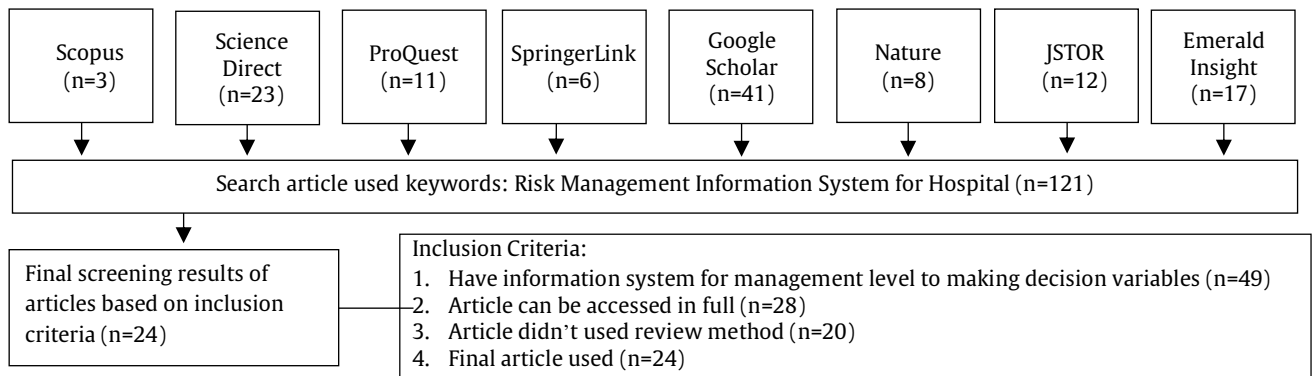

Figure 1. Flow Chart Screening Article

Table 1. Result Synthesis Matrix

No	Main Idea	Similarities of Research Findings
1	Definition of Risk Management Information System in Hospital (Ebnehoseini, Z., Tabesh, H., Deldar, K., Mostafani, S.M. Tara, 2019; Fadilla & Setyonugroho, 2021; Farzandipou M, 2017; Setiawan & Permadani, 2016; W.D., Rokhim, & Febriyanti, 2015)	According to numerous sources of literature that were reviewed and examined, a management information system is a collection or set of procedures that enable data to be processed, analyzed, and presented in such a way that the data becomes valuable for decision-making. This system is an extremely beneficial instrument for assisting and controlling businesses such as hospital activities.
2	Importance of Risk Management Information System in Hospital (Agustina & Susilani, 2018; Kimiafar, Sarbaz, & Sheikhatheri, 2015; Meiryani, Siagian, Damanik, & Djuanda, 2020; Murphi & Sidauruk, 2021; Omole, 2015; Taherdoost, 2021; Zarei & Sadoughi, 2016)	Risk management information system is critical in the healthcare business for a variety of reasons. The following are some of the most significant advantages of a healthcare risk management system and the issues they assist avert. hospital involves the handling of sensitive patient information, such as electronic journals and electronic health records, and quality security management and control quality anticipate significant manipulation of all types of potential security risks to information security in healthcare providers. It is a preventative measure designed to safeguard the system's management against potential dangers.
3	The Role of Risk Management Information System in Hospital (Sadriani Hade et al., 2019)(Setiawan & Permadani, 2016)(Vittal A & Shivraj K, 2008)(Ranisavljevic, 2012)(Awan & Khan, 2016)(Kimiafar et al., 2015)(Murphi & Sidauruk, 2021)(Setyawan, 2016)(Briner M et al., 2010)(Djantika, 2019)(Yulyanti, Rifki, Rudiansyah, & Sugiarto, n.d.)(Ebnehoseini, Z., Tabesh, H., Deldar, K., Mostafani, S.M. Tara, 2019)(El-Kareh, Hasan, & Schiff, 2013)(Dhillon, 2021)	Hospital risk management is a method of preventing significant issues in a company. It is critical to detect and contain hazards to your business or organization as part of appropriate risk management. This may help your company avoid legal challenges, management troubles, accidents, and other problems. Risk management is critical in every sector or kind of organization. This is particularly true in the healthcare field.

| 4 | How to Have Effective Risk Management (Ghaffarzadeh et al., 2016)(Murphi & Sidauruk, 2021)(Sharon Ross & Venkatesh, 2016) | Based on the synthesis, we found that how to have effective risk management have to do identify potential risks in hospital, analyze and classify the risk from the safest threat to the most dangerous, assess and establish security control to make sure every decision made can work, and continuously monitoring risk and compliance or monitoring and evaluating to see the decisions that have been made need to be changed or not |

DISCUSSION

Definition of Risk Management Information System

Risk Management Information System is the act of identifying, assessing, and implementing systems and procedures to safeguard vital assets from a variety of possible threats is known as healthcare risk management.(Setiawan & Permadani, 2016) Because of the sensitive nature of healthcare data, good risk management in the sector may mean the difference between life and death; as a result, healthcare businesses cannot afford to ignore this vital process.(Fadilla & Setyonugroho, 2021)

Risk Management Information system (RMIS) a planned and ongoing process that aims to discover, evaluate, and minimize certain kinds of risks while also reaching adequate acceptance.(Sharon Ross & Venkatesh, 2016) For the following reasons, organizational effectiveness in information security initiatives is critical.(Aghazadeh et al., 2012) First, information security threats do not remain constant over time and fluctuate according to organizational circumstances, information system growth and modifications, new users, and so on. Second, organizations may focus on resources in high-risk areas and manage them in suitable and demonstrable ways while minimizing risks fairly via risk management. Third, a cost–benefit analysis of the adoption of information security measures is one of the features of a good security program. The risk management approach performs this precise analysis.(Ebnehoseini, Z., Tabesh, H., Deldar, K., Mostafani, S.M. Tara, 2019; Farzandipou M, 2017; W.D. et al., 2015)

The Importance of Risk Management in Hospital

Risk is defined as an unpredictable occurrence or circumstance that, if it occurs, may have a positive or negative impact on project success.(Kimiafar et al., 2015) Threats and opportunities are both included in the definition of risk included in the existing system in the hospital. Risk management Information System is a systematic strategy to recognizing, assessing, and reacting to risks, with the goal of increasing the likelihood and implications of good occurrences while limiting the likelihood and consequences of negative events. (Agustina & Susilani, 2018) There is an opportunity in every risk; if handled properly, it may be leveraged to the project customer's benefit. It is good to be aware of a possible issue; put it on the table, debate it, prepare for it, and handle it. Challenges faced by administrators that should be addressed in a risk assessment plan include but are not limited to: (Meiryani et al., 2020)

- Patient safety
- Mandatory federal regulations
- Potential medical error
- Existing and future policy
- Legislation impacting the field of healthcare

A healthcare manager's job includes dealing with present problems as well as planning for future ones. The risks of failing to plan for foreseeable problems may have serious long-term consequences. Failure to implement complete risk management policies may jeopardize patient care, raise liability risks, and result in financial losses. As a result, prospective risks must be assessed and appraised in terms of their possible negative consequences. An organization-specific management strategy should be established, executed, and monitored based on the risk assessment. (Kimiafar et al., 2015; Murphi & Sidauruk, 2021)

In today's technologically sophisticated healthcare system, risk management necessitates proactive rather than reactive solutions. Risk management is described as a structured plan for liability control that includes identifying, analyzing, and evaluating legal hazards, as well as developing ways to minimize or eliminate such risks. Quality control and direct care delivery activities are often related to risk management.(Zarei & Sadoughi, 2016) The risk management idea is being adopted from the real of patient care and used to the security measures surrounding hospital information systems for current objectives. Risk management/liability control is considered in this context as proactive efforts aimed at safeguarding both the hospital information system and the confidentiality of patient data. (Taherdoost, 2021)

RMIS in hospitals facilitates the exchange of data for patient care and administration. This information is mainly about the patient. It must be accurate, relevant, up-to-date, and conveniently accessible to the appropriate personnel at various locations and in a useable format. Data from service transactions is collected, stored, processed, and documented to generate information about the quality of patient care and hospital performance and costs. The hospital's information system must exchange high-quality data throughout its numerous department (Kimiafar et al., 2015; Murphi & Sidauruk, 2021)

The Role of Risk Management Information System in Hospital

Risk Managemeng Information System is crucial as the industry undergoes a rapid transformation as a result of emerging medical technologies and mounting patient data privacy concerns. (Ranisavljevic, Spasic, & Mladenovic, 2012) In the healthcare business, information technology is a relatively recent term. Traditionally, healthcare providers and the health care sector have placed a high value on the practitioner's intellectual abilities, as well as the particular expert's practices.(Sadriani Hade et al., 2019) The collaborative use of information technology and the methodical corporate management of essential health information is somewhat threatening to medical practice traditions. (Vittal A & Shivraj K, 2008)

The interests of Hospital Management Information System (HMIS) are naturally at odds. Healthcare are concerned with the organization's financial sustainability, return on investment, and revenue cycle, which are often the drivers of information technology systems and projects. (Ebnehoseini, Z., Tabesh, H., Deldar, K., Mostafani, S.M. Tara, 2019) Healthcare practitioners, on the other hand, must use these systems, aid in their installation, and contribute to

their optimization. There is a significant danger in failing to appropriately manage organizational friction. The advantages may never be realized unless practitioners embrace and use modern information technology. The provision of visible advantages to the end user is critical to the success of MIS initiatives. (Awan & Khan, 2016)

Hospital workers deal with personal data, the danger of incorrect information processing is substantially larger. When inaccurate information is employed in a process, the end consequence may be a subpar product. A poor performance at a firm implies more expenses, longer wait times, and, in the worst-case scenario, more complaints, and repairs, as well as a decrease in the number of consumers. However, it is more problematic in the hospital since the main dangers are growing death and disability.(Murphi & Sidauruk, 2021; Setyawan, 2016)

The information utilized by workers throughout the process serves more than one function. The processing of information by the information system during organizational processes is critical for management. (Briner M et al., 2010) Because only well-informed managers can make sound decisions, the information system becomes a tool for the organization to remain competitive. The information system gathers all necessary information and delivers it in the proper format to the location where it is required. (Djantika, 2019)

RMIS protects healthcare businesses against a variety of industry-specific threats. They, for example, avoid issues with health records, institutional arrangements, and other systems. These risks may lead to problems with your money, company administration, losses, liabilities, and other concerns. (El-Kareh et al., 2013) Risk management, on the other hand, provides you with a method to follow in order to avoid these risks and deal with them and when they arise. Plans for risk management will aid in damage control and will lower patient health hazards. (Dhillon, 2021; Murphi & Sidauruk, 2021)

How to Have Effective Risk Management Information System

To get optimal performance in running the Risk Management Information System, it is necessary to do the following things; (Ghaffarzadeh, 2015; Murphi & Sidauruk, 2021; Sharon Ross & Venkatesh, 2016) Identify Potential Risk. The first stage in developing a healthcare risk management system is identifying any possible hazards or vulnerabilities in your organization's network. This provides you with a more full picture of your possible attack surface, allowing you to start calculating your organization's risk tolerance and risk appetite.

1. Analyze and Classify the Risk

As previously stated, it is critical to determine your organization's tolerance for risk and risk appetite levels, as they will serve as the foundation of criteria for assessing risks. After your firm has discovered any potential threats or vulnerabilities, the following step is to assess and categorize risks based on the probability of occurrence and the potential effect of a breach on your business operations. Your business will be confronted with several dangers, making it unlikely that you will be able to address them all. As a result, risk prioritization is crucial. Once the relevance of each danger has been assessed, your team can proceed to prioritize risks and decide the best plan of action for resolving the major concerns that would cause the most disruption first.

2. Assess and Establish Security Controls

Following the prioritization of threats by your team, the next step is to analyze your organization's current security measures to identify any holes that need to be filled. Healthcare organizations that have access to sensitive patient information and other key assets must be able to demonstrate that they are taking the required precautions to secure it. Hospital may demonstrate that it is doing the necessary effort to keep personal patient data secure by analyzing current procedures and developing new ones to address weak points. At this stage in the process, it is also critical to start exactly designing the risk management information system.

3. Contiuously Monitor Risk and Compliance

Risk Management Information System is a continuous system and requires regular monitoring and evaluation to see whether the decisions that have been made require input or not.

CONCLUSIONS AND SUGGESTION

Risk Management Information System in hospital it is critical to combine the use of technology and medical practices to speed up clinical procedures, improve well-informed decision making, and protect records without relying just on paper memories. Medical practitioners, administrators, and patients benefit from technological advancements. With the growing need for quick service delivery and high-quality accuracy in treatments, it is already a priority for medical offices, hospitals, and clinics worldwide to be able to meet the expectations of patients and consumers.

Comprehensive risk management strategies in healthcare may help not just with patient safety activities, but also with reducing readmissions. To establish, execute, and monitor an organization's risk management strategy, substantial preparation and competent healthcare administrators are required. Overall patient happiness and other bottom-line goals inside healthcare businesses will benefit as a result of this.

Conflict of Interest Statement
The authors declared that no potential conflicts of interest with respect to the authorship and publication of this article

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