A Case Study on Acceptance of Hospital Information Systems (HIS), among Nurses in a Tertiary Care Hospital

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ABSTRACT

Purpose: *To improve the quality of care, information technology must be implemented in the healthcare field. In any healthcare system, nurses are the primary users of the hospital information system (HIS), making them the Centre of care. Therefore, understanding their views and the way they use these systems will help improve hospital information systems.*

Methodology: *Data were collected from 389 nurses in hospital wards, intensive care units, and emergency departments using a structured questionnaire. There were two sections of questions on the questionnaire. In the first section demographic details were included. In the second session, 15 statements about nurse's acceptability of the hospital information system in the hospital are also included. It was suggested to include one more open-ended question in the study to get feedback from the nurses about ways to increase HIS acceptance.*

Finding/Result: *The study found that the majority were female nurses with a bachelor degree and 3-4 years of computer experience. The majority of nurses accepted that the HIS is integrated into their daily work. As a result of the study, the nursing staff will be more likely to accept the HIS.*

Originality/value: *This study will provide a comprehensive overview of understanding information technology and the acceptance of using these systems, which will reduce the workload of nurses while improving the quality of care and patient satisfaction.*

Paper Type: *Observational case study*.

Keywords: Hospital Information system (HIS), Nurses, Tertiary care hospital, nursing practice, information technology, ABCD analysis.

1. INTRODUCTION :

The Hospital Information System is a sophisticated, coordinated and expertly built information system intended to handle both managerial and medical components of hospitals and medical Institutions. The healthcare industry has benefited significantly from information technology [1]. The significance of these systems stems from their crucial role in the storage of all kinds of patient data or information, including records of all therapeutic services provided to the patient, including examinations, diagnoses, treatments, follow-up reports, and vital medical choices [2]. Through the hospital information system (HIS) every level of management has access to the information they require at the appropriate time, in the correct format, and at the right location through hospital information system {HIS), enabling efficient and effective decision-making. Hospital Information systems (HIS) and hospital information management systems (HIMS) are completely interconnected in current healthcare Institutions. In addition, it is specifically designed to manage the day-to-day operations of a hospital, including administrative, financial, and therapeutic aspects [3]. Today they are necessary for the operation of modern hospitals. Since the 1990s, many large corporate hospitals in India have implemented HIS. The HIS can improve hospital performance, both financially and in terms of patient satisfaction. Despite this, studies on the acceptance of hospital information system (HIS) handlers, particularly in developing countries, have been inconsistent [4]. The use of information technology and the implementation of quality standards for patient satisfaction are other areas in which HIS lags behind

operational and industrial information systems. However, there are few research studies on HIS user acceptance, particularly in developing countries [5]. In healthcare settings, nurses are the most important service providers, along with patients who directly or indirectly benefit from HIS and they are the primary user group for Hospital Information Systems (HIS). However, nurses need skills and knowledge to effectively use HIS, usually acquired through training [6].

Nurse acceptance of HIS use is a new research area that may explain the destiny of HIS development and implementation projects in hospitals. Although managing the ward, nurses are key to using the hospital information system. To our knowledge, very few observational studies have been conducted on them worldwide. However, there is very little support for HIS systems, particularly in developing nations [7]. Therefore, understanding nurse's views and their use of these systems will help improve hospital information systems. For nurses, HIS records take less time than paper records, allowing nurses to focus on patient care at the bedside. Our study's goal was to determine whether nurses at a particular tertiary care hospital would accept a hospital information system based on their perceptions.

2. RELATED WORKS :

The articles of the research from Google Scholar, Research Gate, Academia, and Shodhganga during the last two decades to get an idea about hospital information systems (HIS), nurses, tertiary care hospitals, nursing practice, information technology, and ABCD analysis are the keywords and are presented below. Some papers published in the years 2003–2022 are also referred to for a better understanding of the topic.

Table 1: The table shows studies on keywords conducted on the many different publications by authors

S. No.	Focus /Area	Contributions	References
1	User acceptance of health information technology (HIT) in developing countries	According to a study done in Indonesia, hospitals are not receiving the proper level of acceptance. The study's objective is to evaluate hospital staff members' intentions to use information systems. Three factors were used to quantify and analyze the online survey that was based on the technology acceptance model. The findings indicate that hospital staff members still do not have a firm understanding of the risk (factor) connected to using hospital information systems.	Ahmad, (2014). [8]
2	User acceptance factors of hospital information systems and related technologies	As stated in the study, in order to effectively plan the implementation of HIS, hospital administration and IT developers need have a better awareness of non-technology elements. To ensure that the HIS is simple to use and offers advantages to both users and hospitals, management support is essential for its long-term viability.	Handayani, et al., (2017). [9]
3	Physician acceptance of hospital information system	According to the study, senior administration support had a big influence on perceived effectiveness. The usability of hospital information systems as seen by physicians was significantly influenced by the project team's expertise and the system's quality. Hospital information system acceptability was significantly influenced by physicians' opinions of	Chen & Hsiao, (2012). [10]

		their value and usability, which accounted for 81% of the total explained variance.	
4	Usefulness of newly implemented electronic medical records for pediatricians	According to the study's findings, most physicians received training before the new EHR was implemented; the majority of participants assessed and perceived the new HIS system's usability as the top indicator, and the unavailability of desktop computers as the lowest. The proper implementation of EHR for pediatric healthcare services is hampered by a lack of information technology (IT) support, hardware, and a time-consuming data entry process.	Alsohime, et al., (2019). [11]
5	User acceptance of an anesthesia information management system	In accordance with the study, participants did not want to switch back to keeping paper records because they believed that keeping records electronically improved the quality of their job. There were problems with the arrangement of hardware and software elements, such as coding, diagnostic tools, and mode of operation. Customers' acceptance of the training was significantly influenced by its perceived quality.	Quinzio, et al., (2003). [12]
6	Nurses experience on the evaluation of the quality of the hospital information system	According to the report, the majority of nurses use HIS in order to get more accessible, practical, and simple paperwork and instructions. The system must be reversible and adaptable in the lowest amount of time to allow nurses the chance to rectify errors and incorrect information. Advanced hardware and the right connection line should also be employed to speed up reaction times. Users should always have access to the staff members that manage the HIS to reduce data loss. The idea of including new functions in a system in the future to satisfy changing demands should be considered by system developers.	Sheikhtaheri, (2014). [13]
7	patient acceptance of Health Information Technology in developing countries	The study reviews a few Health information technology systems that are now in use to evaluate their level of availability and the technology employed in their creation. Works pertaining to the acceptance of HIT systems were also examined in order to evaluate the gaps in this area and suggest a solution in order to address the gaps observed. The study's findings revealed a lack of availability of these systems, particularly in developing nations, a low acceptance rate for HIT systems, and a paucity of studies on	Ahlan & Ahmad, (2015). [14]

		patient acceptability of HIT systems. investigating what influences patients' acceptance of HIT systems. A conceptual model of HIT acceptability in developing nations was suggested as a study's conclusion and is based on TAM.	
8	Nursing satisfaction with nursing information system	According to the study, the majority of nurses were satisfied with the systems' user interface and information quality. The study's findings indicate that developing information systems around the requirements of their users enhance usability. Therefore, while choosing such systems, policymakers and healthcare institution decision-makers should prioritize usability.	Khajouei & Abbasi, (2017). [15]
9	The nursing perspective of acceptance of the hospital information system	The study demonstrates that factors such as user self-efficacy, top management support, compatibility, and information quality have a big impact on how usable something is. Support for upper management is also necessary. It was discovered that perceived utility was significantly influenced by compatibility and information quality. It was also discovered that nurses' perceptions of the HIS's usability and usability in general had a considerable impact on system adoption, accounting for 45.1% of the entire explained variance.	Hsiao, et al., (2011). [16]
10	Nurses' Views About the Impact of the Hospital Information System on Nursing Processes	According to the study, most nurses were satisfied with the HIS that had been put into place, and a small percentage of them were delighted. Additionally, comments made by nurses on HIS typically said that it improved the efficiency of related procedures. The nurses claim that HIS has increased procedure speed, accuracy, and precision. But at the same time, other system problems were noted, such as the system's slow speed and lack of vision for some crucial activities, such as e, g, and appropriate forms for documentation.	Mina, et al., (2014). [17]
11	Nursing perspective about confirmation of expectations and satisfaction with hospital information systems	The study found that non-technical factors are equally crucial for a clinical information system's effective implementation in addition to its technical components. In order to ensure that systems are developed to fulfill user expectations, it is important to take into account the nature of clinical duties and corporate culture. The investigation will come to the conclusion that an evaluation study is required to determine the	Ayatollahi, et al., (2016). [18]

		advantages and disadvantages based on user perceptions. This approach can help with development in a way that has clear expectations for the system.	
12	Implementation of Hospital Information Systems in Hospitals	According to this study, doctors, nurses, and other healthcare professionals are also striving to improve information quality and patient care and should be involved in HIS implementation. Human factors, training, planning, and information should also be considered.	Zare, et al., (2011). [19]
13	Information Technology Acceptance in Clinical Settings from Nurses' Perspective	According to the study, the majority of nurses used clinical information in their regular work. However, problems such a lack of computers, poor content design, system capacity concerns, and a nurse's lack of computer proficiency should be thoroughly looked into. Additionally, a number of technical and individual initiatives, such as enhancing nurses' IT abilities, teamwork culture, organizational position, team communication, and updating and improving, should be planned and established.	Mehdi & Hassan, (2013). [20]
14	Acceptance of health information technology among health professionals	The study's findings demonstrate that perceived usability, but not utility, relevance, and subjective norms, directly predicted hospital information technology (HIT) usage intentions. They also suggest that the original TAM approach needs to be modified to better address how health professionals understand and support HIT for the medical and nursing professions, and that social influences should be investigated through information campaigns to improve HIT support in healthcare.	Ketikidis, et al., (2012). [21]

3. RESEARCH GAP :

Hospital information systems (HIS) should be developed to satisfy customers' and hospitals' needs. Therefore, nurses' approach towards using HIS and its design has a significant impact on the successful implementation of HIS. Previous studies have shown that the majority of nurses felt that the HIS functions were not well integrated with their regular work and that the biggest concern was data loss. The hospital information system is being implemented in India as a result of advancements in technology, which have raised the level of service in the healthcare system. This fact is reflected in various published research papers. However, the limitations are also observed while implementing the HIS, which figure out the barrier to implement HIS in the system. To the successful implementation of HIS it must be utilized by the nurses and this remains the greatest challenge. This challenge is not explored in depth, and therefore this gap is identified by the author of the present article that is addressed.

4. RESEARCH AGENDA :

The study comprises the following agenda based on the research gaps:

(1) Whether Hospital Information system will accept by the nurses in a tertiary care teaching hospital?

(2) Whether sociodemographic characteristic can impact on the acceptance of Hospital information systems?
(3) Are there any suggestions given for the Hospital information system?

5. OBJECTIVES OF THE STUDY :

(1) To assess the acceptability of Hospital Information system (HIS) among the nurses in a selected tertiary care hospital setting.
(2) To analyze the study using Bar diagram, SWOT Analysis, and ABCD analysis.

The study will be conducted in a tertiary care hospital with 1250 beds in the Dakshina Kannada district of Mangalore, Karnataka, India. The study tried to analyze the acceptance on Hospital Information system based on the nurse's perceptive in a selected tertiary care teaching hospital.

6. METHODOLOGY :

The study period is one month, where Data were collected from 389 nurses in hospital wards, intensive care units, and emergency departments using a structured questionnaire. The secondary data is collected through records, journals, and other textbooks. There were two sections of questions included in the questionnaire. The first section of the questionnaire inquired about demographic information such gender, age, education level, years of nursing experience, length of computer use, and formal computer training. The second session questioned 15 statements about nurses' acceptance of hospital information systems. The questionnaire sections from yes and no were used. One more open-ended question was added to ask nurses about their thoughts on improving HIS acceptance among nurses.

7. RESULT :

There were two sections of questions included in the survey. Demographic information in the first section contained information on gender, age, education level, years of nursing experience, length of computer use, and formal computer training.

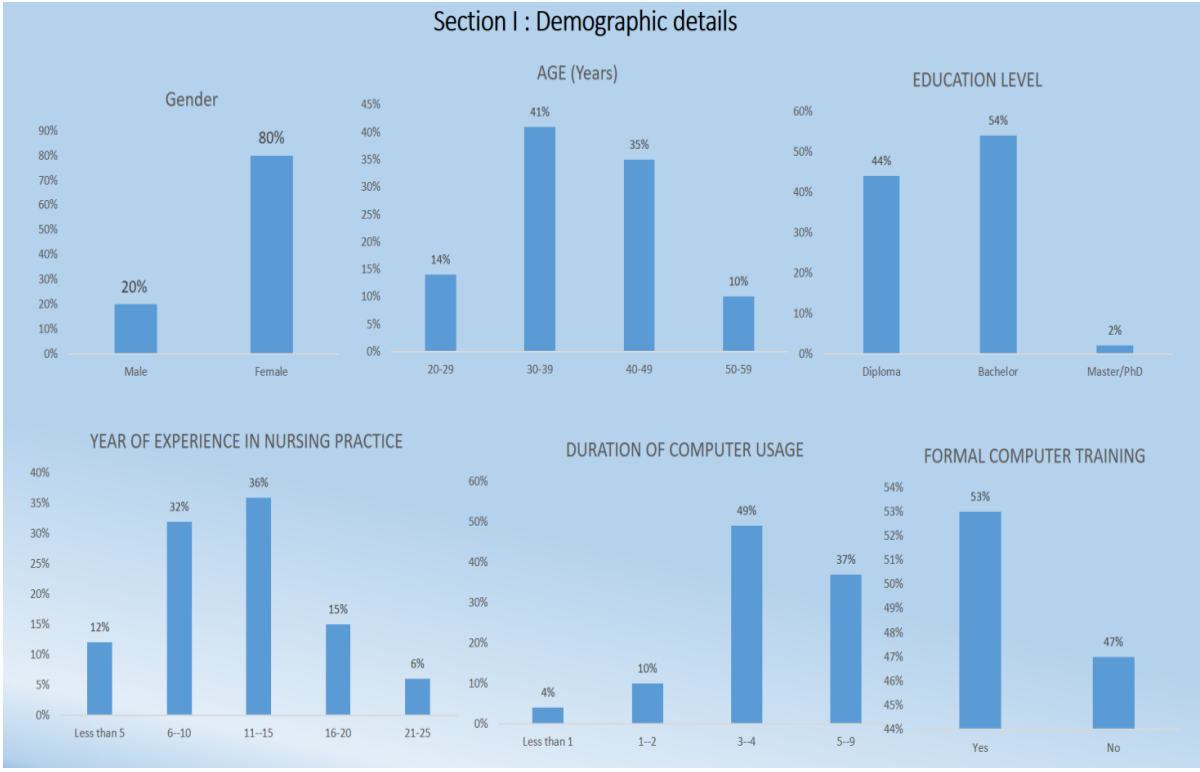

Fig. 1: Demographic Details
(Source: Khalifa, M., & Alswailem, O. (2015). [3]

The Figure 1 depicts that the valid responses from the 389 participant were nurses among the participants, majority were female nurses 311 (80%) and only 78(20%) male. The majority of

participants (43.7%) belonged to the 30-39 age groups. A study of the nurses' educational backgrounds showed that 209 (54%) of nurses had a bachelor's degree and 171 (44%) had a diploma in nursing. The majority of nurses, 140 (36%) had 11 to 15 years of experience, while only 46 (12%) had fewer. The highest percentage of nurses with prior computer experience was 189 (39%), followed by 146 (37%), at 3-4 years. 207 people (53%) said they had formal computer training, while 182 people (47%) stated that they had no training at all.

The second session included 15 statements regarding nurse's acceptance of hospital information system in the hospital. The questionnaire sections from yes and no used.

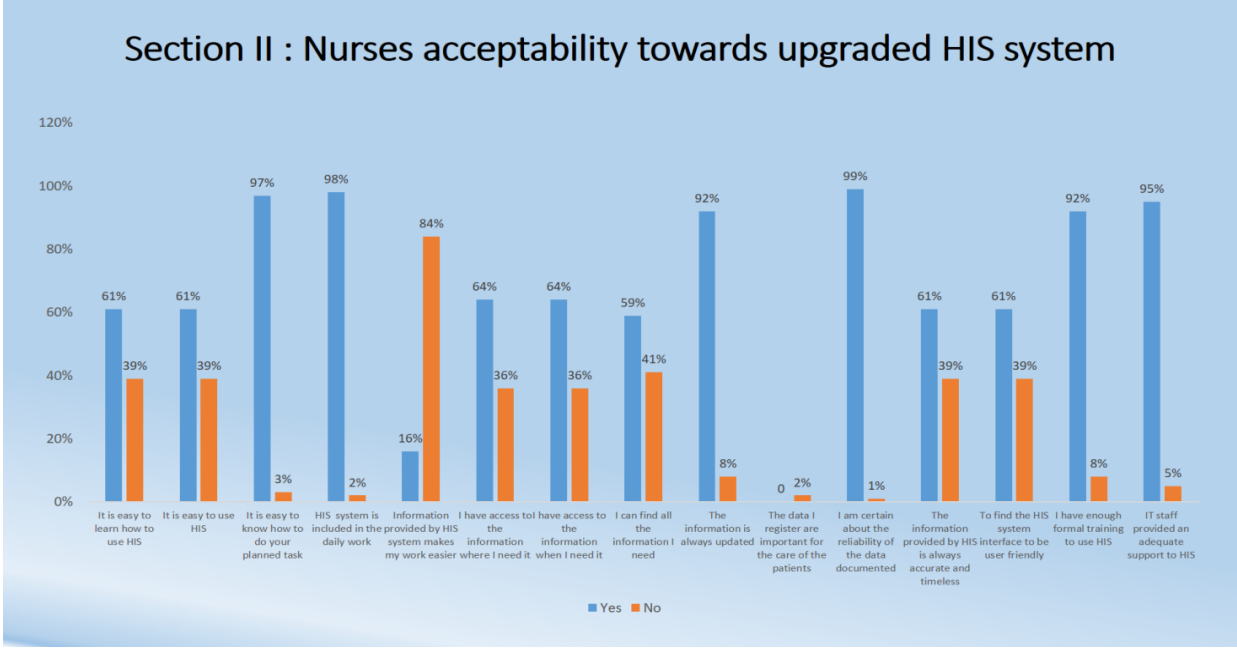

Fig 2: Nurses acceptability towards HIS system
(Source: Khalifa, M., & Alswailem, O. (2015). [3]

The Figure 2 depicts that the majority of the nurses (61%) found that HIS is easy to use, ease to learn, accurate, timeless and user friendly. About 42% of nurses say they can't find all the information in their systems, 35% of nurses even say they can't access information when and where they need it. Although 16% of nurses felt that the HIS system's information made their job easier but suggested that duplication of work in both the HIS and the records were found in their practice area.

7.1 SWOT analysis of the acceptability of Hospital Information system (HIS) among the nurses:

SWOT analysis is a situational analysis or situational evaluation. Identification of the strength, weaknesses, opportunities, and threats of any organization's competitors or project planning is a strategic management technique [22]. This tool helps the investigator in determining the primary business operations that the corporation excels in and in developing a winning long-term plan. SWOT can also reveal business flaws that, if not corrected, might be exploited by competitors. Therefore, a SWOT analysis looks at both internal and external issues that may or may not be under the organization's control.

Table 2: SWOT analysis of the acceptability of hospital Information systems among the nurses

INTERNAL	**Strengths** • Reduced Time • Quick access [23] Accurate data [23] • Files are secured & Strong backup [24] • All patient's data's organized in	**Weakness** • Huge investment [23] • Lack of patient care • Change in the format from one record to another [24] • Different designed format [24] • Lack of skills in documentation will

	one folder • Customization of formats is easy • Viewable anywhere [33] • Minimal Training [36] • Easy to use [33, 34, 37] • End user support [37, 40]	slow down the work [23] • Customization requires software developer [24] • Time consuming [36]
EXTERNAL	**Opportunity** • Adoption to new technology [25] • Enhance the quality of service [25,26] Simple [33] • Reduced system-related health issues [36] • Patients benefits by better coordination • Strong competition • Improved image of the healthcare • Recognition	**Threat** • Reduced patient satisfaction • Technological competitors • Equipment breakdown [25] • Breach of information through internet hackers [26] • During conversation misplacing the data • Poorly designed forms [26] • Different systems [26] • Loss of productivity if misfiled [27] • Financial burden [28]

7.2 ABCD analysis of the acceptability of hospital Information system among the nurses:

ABCD is a tool used in business strategy to identify a business's advantages, benefits, limitations, and disadvantages in a systematic matrix. By recognizing the important restrictions, this style of analysis discusses important concerns by taking into account all factors in crucial domains [29-40].

Table 3: ABCD analysis of the acceptability of Hospital Information system (HIS) among the nurses

Advantages	Benefits	Constraints	Disadvantages
• Easy to use and learn [32, 33] • Quick Access to patient data • Reduces manual work [36, 37] • Faster clinical decisions • Files are secured and back up available • Cost reduction [36] • Reducing medical errors	• Receive high-quality ratings • strengthen data security [37] • improved Organizational revenue management [38] • Identify and track each detail to avoid mistakes [40]	• Lack of backup • Losing the file • High cost • Networks and computers have both maintenance issues. • A lack of guidelines for entering and retrieving data • Technical difficulties when teaching customers how to utilize HIS	• It takes time and costs money • Inconsistency and inefficiency • Increase dependency on technology • Security risk in relation to data and fraud

8. FINDINGS :

The findings made it abundantly evident that there was a considerable correlation between the characteristics of nurses and their acceptance of HIS. The key factors that significantly impacted the acceptability of HIS and, subsequently, the acceptance of HIS users was gender, age, education level, years of experience in nursing practice, duration of computer use, and their level of formal computer training. According to the findings of our study, the majority of nurses were in favour of incorporating HIS into their everyday work. The nurses claimed that because they have access to the information they need when they need it, can find all the continuously updated information they require, and are confident in the accuracy of the recorded data, the information given by HIS makes their jobs easier. They believe that the information they collect is crucial to the treatment of the patients. According to this finding, the system is usually more beneficial to their employment at the hospital. HIS is user-

friendly and simple to learn. The acceptance of HIS by nurses could be increased by taking into account their needs for user-friendly technology and sufficient training. In addition, for nurses to understand the responsibilities associated with their HIS, proper training is required. These variables can be viewed as major influences on the planning and execution of HIS for nurses. Nurses will be more willing to learn and less resistant to change when adequate and supporting training is provided in the healthcare organisation.

9. LIMITATIONS :

Though the above are the findings, the limitations of the study are as follows

(1) The study is limited to hospital wards, intensive care units, and emergency departments
(2) The study excludes new joiners
(3) The study is based on the available resources.
(4) The responses are based on the staff available during the study.
(5) The study is only applicable to one type of healthcare.

10. SUGGESTIONS :

(1) According to the study, nurses could be able to deliver high-quality treatment using the HIS with the help of HIS training.
(2) The study should be done for all nursing staff working in the patient care area of the hospital.
(3) The study could be done with new hires of experienced staff regarding their previous organisations on HIS.
(4) Benefits of using the HIS in hospitals include ease of use and learning, quick access to patient data, less manual work for nurses, and quicker clinical decisions. Patient details are secured, and backup facilities are available. Medical errors are reduced, and there is also a reduction in cost.
(5) The present study recommends that further research could be conducted at a large scale in larger organizations. Study results were concluded using the data of a single organization.

11. CONCLUSION :

This study found that nurses accepted the HIS since it was simple to use and learn. The demographics of nurses were significant in influencing their acceptance of HIS. To facilitate acceptance, thorough instruction in the use of HIS should be given to a nurse who has not received official system training. Overall, our findings highlighted the importance of the demographics of the nurse and the acceptability of HIS in examining the adoption of HIS by the nursing staff.

REFERENCES :

[1] Ismail, A., Jamil, A. T., Rahman, A. F. A., Bakar, J. M. A., Saad, N. M., & Saadi, H. (2010). The implementation of Hospital Information System (HIS) in tertiary hospitals in malaysia: a qualitative study. *Malaysian Journal of Public Health Medicine*, *10*(2), 16-24. Google Scholar

[2] Shortliffe, E. H., & Chiang, M. F. (2021). Biomedical data: Their acquisition, storage, and use. In *Biomedical informatics: Computer applications in health care and biomedicine*, 45-75. Cham: Springer International Publishing. Google Scholar

[3] Khalifa, M., & Alswailem, O. (2015). Hospital information systems (HIS) acceptance and satisfaction: a case study of a tertiary care hospital. *Procedia Computer Science*, *63*(1), 198-204. Google Scholar

[4] Mogli, G. D. (2001). Medical Record Organization and Management, Jaypee Brothers, 1-638. Google Scholar

[5] Mahla, M., Talati, S., Gupta, A. K., Agarwal, R., Tripathi, S., & Bhattacharya, S. (2021). The acceptance level of Hospital Information Management Systems (HIMS) among the nursing officials working in a teaching hospital. *Journal of Education and Health Promotion*, *10*(1), 1-8. Google Scholar

[6] Handayani, P. W., Hidayanto, A. N., Pinem, A. A., Hapsari, I. C., Sandhyaduhita, P. I., & Budi, I. (2017). Acceptance model of a hospital information system. *International journal of medical*

informatics, *99*(1), 11-28. Google Scholar↗

[7] Lu, C. H., Hsiao, J. L., & Chen, R. F. (2012). Factors determining nurse acceptance of hospital information systems. *CIN: Computers, Informatics, Nursing*, *30*(5), 257-264. Google Scholar↗

[8] Ahmad, B. I. E. (2014). User acceptance of health information technology (HIT) in developing countries: a conceptual model. *Procedia Technology*, *16*(1), 1287-1296. Google Scholar↗

[9] Handayani, P. W., Hidayanto, A. N., & Budi, I. (2018). User acceptance factors of hospital information systems and related technologies: Systematic review. *Informatics for Health and Social Care*, *43*(4), 401-426. Google Scholar↗

[10] Chen, R. F., & Hsiao, J. L. (2012). An investigation on physicians' acceptance of hospital information systems: a case study. *International journal of medical informatics*, *81*(12), 810-820. Google Scholar↗

[11] Alsohime, F., Temsah, M. H., Al-Eyadhy, A., Bashiri, F. A., Househ, M., Jamal, A., ...&Amer, Y. S. (2019). Satisfaction and perceived usefulness with newly-implemented Electronic Health Records System among pediatricians at a university hospital. *Computer Methods and Programs in Biomedicine*, *169*(1), 51-57. Google Scholar↗

[12] Quinzio, L., Junger, A., Gottwald, B., Benson, M., Hartmann, B., Jost, A., & Hempelmann, G. (2003). User acceptance of an anaesthesia information management system. *European journal of anaesthesiology*, *20*(12), 967-972.Google Scholar↗

[13] Sheikhtaheri, A., Kimiafar, K., & Sarbaz, M. (2014). Evaluation of system quality of hospital information system: a case study on nurses' experiences. In *e-Health–For Continuity of Care*, 960-964. IOS Press. Google Scholar↗

[14] Ahlan, A., & Ahmad, B. (2015). An overview of patient acceptance of health information technology in developing countries: A review and conceptual model. *International Journal of Information Systems and Project Management*, *3*(1), 29-48. Google Scholar↗

[15] Khajouei, R., &Abbasi, R. (2017). Evaluating nurses' satisfaction with two nursing information systems. *CIN: Computers, Informatics, Nursing*, *35*(6), 307-314. Google Scholar↗

[16] Hsiao, J. L., Chang, H. C., & Chen, R. F. (2011). A study of factors affecting acceptance of hospital information systems: a nursing perspective. *Journal of Nursing Research*, *19*(2), 150-160. Google Scholar↗

[17] Mina, A., Shahram, T., & Ahmad, F. B. (2014). Study of Nurses' Views about the Impact of Hospital Information System on Nursing Processes in Farabi Hospital in Tehran. *Payavard Salamat*, *8*(3), 235-248. Google Scholar↗

[18] Ayatollahi, H., Langarizadeh, M., & Chenani, H. (2016). Confirmation of expectations and satisfaction with hospital information systems: A nursing perspective. *Healthcare informatics research*, *22*(4), 326-332. Google Scholar↗

[19] Zare Fazlollahi, Z., Lotfnezhad Afshar, H., Jabraili, M., & Maleki, M. (2011). An evaluation of hospital information system implementation in Imam Hospital in Urmia. *Health Information Management*, *8*(5), 1-7. Google Scholar↗

[20] Mehdi, K., & Hassan, B. (2013). Factors Affecting Information Technology Acceptance in Clinical Settings from Nurses' Perspective. *Payavard Salamat*, *7*(4), 1-16. Google Scholar↗

[21] Ketikidis, P., Dimitrovski, T., Lazuras, L., & Bath, P. A. (2012). Acceptance of health information technology in health professionals: an application of the revised technology acceptance model. *Health informatics journal*, *18*(2), 124-134. Google Scholar↗

[22] Weihrich, H. (1982). The TOWS matrix—A tool for situational analysis. *Long range planning*, *15*(2), 54-66. https://www.sciencedirect.com/science/article/abs/

pii/0024630182901200

[23] Gyamfi, A., Mensah, K. A., Oduro, G., Donkor, P., & Mock, C. N. (2017). Barriers and facilitators to electronic medical records usage in the emergency centre at Komfo Anokye Teaching Hospital, Kumasi-Ghana. *African Journal of Emergency Medicine*, *7*(4), 177-182. Google Scholar↗

[24] Chen, Y., Ding, S., Xu, Z., Zheng, H., & Yang, S. (2019). Blockchain-based medical records secure storage and medical service framework. *Journal of medical systems*, *43*(1), 1-9. Google Scholar↗

[25] Kumar, S., & Aldrich, K. (2010). Overcoming barriers to electronic medical record (EMR) implementation in the US healthcare system: A comparative study. *Health informatics journal*, *16*(4), 306-318. Google Scholar↗

[26] Hersh, W. R. (1995). The electronic medical record: Promises and problems. *Journal of the American Society for Information Science*, *46*(10), 772-776. Google Scholar↗

[27] Newgard, C. D., Zive, D., Jui, J., Weathers, C., & Daya, M. (2012). Electronic versus manual data processing: evaluating the use of electronic health records in out-of-hospital clinical research. *Academic Emergency Medicine*, *19*(2), 217-227. Google Scholar↗

[28] Choi, J. S., Lee, W. B., & Rhee, P. L. (2013). Cost-benefit analysis of electronic medical record system at a tertiary care hospital. *Healthcare informatics research*, *19*(3), 205-214. Google Scholar↗

[29] Aithal, P. S., Shailashree, V., & Kumar, P. M. (2015). A new ABCD technique to analyze business models & concepts. *International Journal of Management, IT and Engineering*, *5*(4), 409-423. Google Scholar↗

[30] Aithal, P. S. (2016). Study on ABCD analysis technique for business models, business strategies, operating concepts & business systems. *International Journal in Management and Social Science*, *4*(1), 95-115. Google Scholar↗

[31] Frederick, D. P., Sujaya, H., & Salins, M. (2022). Quantitative ABCD Analysis of Online Shopping. *International Journal of Applied Engineering and Management Letters (IJAEML)*, *6*(1), 313-329. Google Scholar↗

[32] McDonald, C. J. (1997). The barriers to electronic medical record systems and how to overcome them. *Journal of the American Medical Informatics Association*, *4*(3), 213-221. Google Scholar↗

[33] Morton, M. E., & Wiedenbeck, S. (2010). EHR acceptance factors in ambulatory care: a survey of physician perceptions. *Perspectives in Health Information Management/AHIMA, American Health Information Management Association*, *7*(Winter), 1-17. Google Scholar↗

[34] Miller, R. H., &Sim, I. (2004). Physicians' use of electronic medical records: barriers and solutions. *Health affairs*, *23*(2), 116-126. Google Scholar↗

[35] Barzegari, S., Ghazisaeedi, M., Askarian, F., Jesmi, A. A., Gandomani, H. S., & Hasani, A. (2020). Hospital information system acceptance among the educational hospitals. *Journal of Nursing and Midwifery Sciences*, *7*(3), 186-193. Google Scholar↗

[36] Barzekar, H., Ebrahimzadeh, F., Luo, J., Karami, M., Robati, Z., & Goodarzi, P. (2019). Adoption of hospital information system among nurses: a technology acceptance model approach. *ActaInformatica Medica*, *27*(5), 305-310. Google Scholar↗

[37] Moghbeli, F., Langarizadeh, M., Kouhestani, A., & Orooji, A. (2018). Modeling the acceptance of hospital information systems among nurses: An extended technology acceptance model. *Frontiers in Health Informatics*, *7*(1), 1-6. Google Scholar↗

[38] Shahzad, K.,Jianqiu, Z., Sardar, T., Hafeez, M., Shaheen, A., & Wang, L. (2019). Hospital information-system (HIS) acceptance: A physician's stance. *Human Systems Management*, *38*(2), 159-168. Google Scholar↗

[39] Rochmah, T. N., Fakhruzzaman, M. N., & Yustiawan, T. (2020). Hospital staff acceptance toward management information systems in Indonesia. *Health Policy and Technology*, *9*(3), 268-270. Google Scholar↗

[40] Chau, P. Y., & Hu, P. J. H. (2001). Information technology acceptance by individual professionals: A model comparison approach. *Decision sciences*, *32*(4), 699-719. Google Scholar↗

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