

Enhancing Patient Care Through AI Integration in Record Keeping: Analyzing Barriers and Strategies for Effective Adoption in Midlands Province's Healthcare Facilities in Zimbabwe.

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Abstract: This study seeks to investigate the incorporation of artificial intelligence (AI) in patient record management within private healthcare institutions in the Midlands Province of Zimbabwe. It examines the obstacles to adoption and techniques for successful implementation to improve patient care. A qualitative study methodology was utilized, incorporating semi-structured interviews with 37 healthcare practitioners from diverse private institutions. The interviews, ranging from 30 to 60 minutes, sought to elicit detailed insights into the problems and attitudes associated with AI integration. Thematic analysis was employed to discern reoccurring themes, with ethical approval and informed permission safeguarding participant confidentiality. The investigation identified significant obstacles to AI adoption, such as technological proficiency, worries around job security, and a preference for conventional record-keeping practices. Prominent topics encompassed insufficient training, significant implementation expenses, and concerns around data protection. In contrast, participants recognized the prospective advantages of AI, including enhanced accuracy, efficiency in recordkeeping, and accelerated access to patient information. These observations underscored the influence of existing practices on the quality of patient treatment. The results reveal substantial obstacles and prospects in the incorporation of AI into healthcare record management. Resolving challenges such as insufficient training, elevated expenses, and privacy issues is essential for fostering an atmosphere favorable to AI adoption. Through the implementation of targeted tactics, such as advanced training programs and partnerships with technology providers, healthcare facilities may fully leverage AI's capabilities, hence enhancing patient outcomes and operating efficiencies.

Key words: Artificial Intelligence, Patient record keeping, Healthcare Integration, Barriers to adoption

I. Introduction

Artificial intelligence (AI) has significantly transformed the healthcare industry, particularly in terms of enhancing patient care in numerous ways. AI, which is computer intelligence that mimics human thinking, has gotten a lot of attention because technology is moving so quickly (Radhakrishnan et al., 2022). Its use in diagnosis, clinical care, and managing health systems shows how it can improve efficiency and patient outcomes (Enahoro et al., 2024). The use of electronic health record (EHR) systems has been crucial in this change, making healthcare delivery and clinical decision-making better around the world (Savoy et al., 2023). Healthcare systems all over the world are starting to see how AI could change how they care for patients. AI makes many things better, from helping doctors make decisions to running hospitals, which makes the overall experience for patients better (Varnosfaderani & Forouzanfar, 2024). Hospitals in the U.S., like Mount Sinai, have successfully added AI tools to their EHR systems, which has greatly improved data management and clinical outcomes (Bard et al., 2021). The UK's National Health Service (NHS) uses AI technology to improve the management of patient records. For example, they use AI for tasks such as managing patient records, matching diagnoses, delivering care, and making purchases (Ntim, 2024). Despite global enthusiasm for digital health projects, Africa's progress is often slower than in first-world countries. Countries like South Africa, Kenya, and Nigeria are at the forefront of using AI because of better internet access and investments in technology (Gikunda, 2024). However, many African countries face significant challenges in implementing AI within the healthcare sector. For instance, Rwanda and Nigeria have progressed with healthcare innovations, but the region as a whole has differences in how quickly new technologies are adopted and how well the infrastructure works (Ibeneme et al., 2021). The Impilo EHR system has been used in more than 1,000 health facilities in Zimbabwe since 2016, which is a big step toward digital transformation in the healthcare sector. This project aims to improve patient management and data collection, especially in rural areas (Mugauri & Chimsimbe, 2025). Despite this, the use of AI technologies is still in its early stages and is facing challenges like healthcare workers' lack of trust and limited digital literacy. AI has a lot of potential to improve patient care in Zimbabwe's Midlands Province, but there are still problems with getting it to work. Some of these problems include insufficient infrastructure, inadequate training, and reluctance among healthcare workers to embrace change. The healthcare sector is very complicated because there are so many people involved, which makes these problems worse. To solve them, there is a need to have a full understanding of the big-picture factors that affect AI adoption. The National Digital Health Strategy (2019–2024) in Zimbabwe also aims to improve health outcomes by using AI, but the actual implementations need to take a systematic approach to finding and removing barriers. Recent observations of private healthcare facilities in the Midlands showed a worrying trend: many are hesitant to fully use AI technologies, which leads to inefficiencies and worse patient care. The goal of this study is to look at how AI is being used and accepted for recording patient data in public hospitals in the Midlands Province. It looked at how well patient data recording

works from 2015 to 2025. It seeks problems with using AI and suggests ways to get more people to use it, which will improve healthcare in the Midlands Province.

II. Review of Literature

This section provides a critical analysis of the deployment of artificial intelligence (AI) in the healthcare sector, which is experiencing substantial global upheavals. In Zimbabwe, especially in private hospitals in Midlands Province, comprehending the factors influencing AI adoption is essential for improving healthcare delivery. This literature review examines current research to identify critical elements affecting AI adoption in this environment, in accordance with the study's aims and importance.

Factors Impeding AI Adoption

Artificial intelligence in healthcare signifies a revolutionary technology that allows practitioners to handle data more effectively by simulating human cognitive abilities (Laï et al., 2020). Notwithstanding its substantial benefits, numerous businesses encounter great challenges in the use of AI technologies (Neumann et al., 2024). These hurdles encompass organizational, financial, technological, and human aspects that obstruct seamless AI integration. Ethical issues, including algorithmic biases and employment displacement, further exacerbate the situation (Sobaih, 2024). Medical professionals frequently articulate concerns about the biases inherent in AI systems, adhering to the notion of "garbage in, garbage out." The efficacy of AI algorithms predominantly relies on the quality of the data they employ. Clinicians may be concerned that AI platforms neglect essential socio-demographic aspects, thereby compromising patient outcomes (Angwin et al., 2020). Deficient health management information systems (HMIS), inadequately qualified staff, and restricted access to vital resources are common challenges in government hospitals (Khan, 2019). Conversely, certain private businesses possess sophisticated technology, underscoring a gap in resources. Artificial intelligence possesses the capacity to mitigate numerous difficulties in the healthcare sector, such as provider weariness, elevated treatment costs, and excessive patient caseloads (Khan et al., 2023). Comprehending healthcare practitioners' viewpoints on AI integration is essential, since they are the principal users and key influencers in the healthcare domain. Healthcare practitioners with inadequate digital literacy frequently oppose the use of mobile health applications, notwithstanding the absence of physical or cognitive impediments. Comprehending the factors contributing to this resistance is crucial for effective AI implementation (Xue et al., 2024). Additionally, low- to middle-income nations often face difficulties in obtaining high-quality data for AI training because of disjointed health information systems and insufficient data management procedures (Mollura et al., 2020).

Patients may cultivate a psychological dependence on technology, resulting in distress when devices malfunction. Concerns regarding duty and accountability in the occurrence of technological breakdowns also hamper adoption (Abdelaziz et al., 2024).

Organizational inertia significantly impedes the adoption of novel technology due to a preference for established procedures (Li et al., 2024). The intricacy of AI systems, frequently termed "black boxes," dissuades stakeholders who value transparency and interpretability (Lambert et al., 2023). The absence of data standards poses significant challenges to the development of robust AI models (Sahni et al., 2023). Addressing these complex issues necessitates a comprehensive strategy that includes technical innovations, educational programs, and strong governance structures.

Perceived Advantages of AI in Patient Data Management

Recent studies underscore the perceived benefits of AI in managing patient data. Healthcare personnel and patients typically see AI favorably, acknowledging its capacity to augment efficiency, enhance diagnostic precision, and optimize patient care (Ferianasari, 2024). AI is perceived as enhancing decision-making, reducing medical errors, and increasing access to healthcare (Chaieb et al., 2023). It facilitates the analysis of extensive health data, perhaps resulting in improved patient outcomes (Pedro et al., 2023). Nonetheless, obstacles persist, especially about data privacy, cyber security, and possible biases in AI systems (Lammons et al., 2023). To mitigate these issues and optimize the advantages of AI, researchers advocate for the establishment of ethical frameworks, the adoption of stringent security protocols, and the inclusion of patients and the public in the formulation and execution of AI initiatives (Ferianasari, 2024). Furthermore, the incorporation of AI education into medical curriculum is recommended to equip healthcare workers for future AI implementation (Chaieb et al., 2023). The implementation of electronic health records (EHR) significantly enhances access to patient information, allowing healthcare providers to make swift, educated decisions, especially in emergencies (Ayaad et al., 2019; Neves et al., 2020). Electronic health records offer a comprehensive summary of a patient's medical history, facilitating timely interventions and improving patient outcomes (Tapuria et al., 2021). The incorporation of AI enhances record-keeping efficiency by streamlining documentation processes and minimizing the probability of errors. Technologies like Natural Language Processing (NLP) can directly transcribe clinical notes into Electronic Health Records (EHRs), significantly reducing the time spent on administrative tasks (Gorrepati, 2024). Real-time data analysis enables the swift identification of changes in patient states, potentially saving lives and decreasing healthcare costs (Lynn, 2019). Moreover, EHRs improve data-sharing capabilities, fostering collaboration among healthcare providers and ensuring continuity of care (Asogwa & Asogwa, 2021). However, inadequate record-keeping practices in some African countries exacerbate healthcare challenges, highlighting the need for improved data management systems (Niyitunga, 2022).

Effects of AI Implementation on Patient Care Quality and Operational Efficiency

Healthcare systems in multiple nations, such as Saudi Arabia and Nigeria, are undergoing swift modernization via digital health efforts (Chowdhury et al., 2021). Nevertheless, numerous institutions continue to be deficient in critical infrastructure necessary for efficient record-keeping management, including dependable energy supply and internet access (Ojo, 2024). Elevated implementation expenses, system incompatibility, and aversion to change among healthcare professionals impede AI adoption (Omole et al., 2024). Concerns about data privacy, algorithmic bias, and the ethical ramifications of AI significantly impact patient care (Guidance, 2021; Osasona et al., 2024). Protecting patient data is essential; patients must be apprised of data management policies and grant consent for data utilization (Brady & Neri, 2020).

Despite the increasing interest in AI technologies, most healthcare institutions in Africa persist in utilizing antiquated manual record-keeping practices, jeopardizing data security and patient confidentiality (Niyitunga, 2022).

Strategies for Effective AI Integration in Patient Data Management

The effective integration of AI technologies in healthcare necessitates a comprehensive strategy. Private hospitals ought to assess the advantages of AI relative to current systems to improve performance and decision-making (Chin et al., 2020). Efficient communication among personnel throughout the implementation phase is essential for enhancing knowledge and acceptability of AI systems (Gonclaves et al., 2020). Encouraging informal connections between healthcare professionals and AI developers can foster trust and enhance comprehension of AI results (Sun, 2020). Training initiatives must concentrate on closing the digital skills gap and improving healthcare practitioners' comprehension of AI (Herman et al., 2021). Public-private partnerships can offer sustainable financing options for the implementation of AI (Romero et al., 2020).

Enhancing data quality via employee training and data management techniques is crucial for efficient AI implementation (Xu et al., 2020). Consistent assessment of clinician support for AI systems can provide insights for improving adoption and integration (Cruz et al., 2019).

In conclusion, although AI presents significant potential for enhancing patient care and operational efficiency in Zimbabwe's healthcare industry, it is imperative to remove the obstacles to its adoption. By cultivating a conducive environment for AI integration via education, collaboration, and effective governance, private hospitals in Harare can utilize AI technologies to improve healthcare delivery.

III. Methods

The application of artificial intelligence (AI) in the recording of patient data in private healthcare facilities in Zimbabwe's Midlands Province was examined in this study using a qualitative research methodology. Qualitative approaches were chosen to clarify healthcare providers' various perspectives on their experiences, difficulties, and perceptions related to AI integration. We did not predetermine the study's target demographic because we were uncertain about the precise characteristics of those working in the healthcare industry in the Midlands Province. A snowball sampling technique was used to choose participants, in which original participants recommended more people, allowing for a wider community reach. 37 people from different private healthcare facilities participated in semi-structured interviews to collect data. The purpose of the interviews was to gather detailed feedback on the factors that influence reluctance to adopt AI, the benefits of AI as perceived by the public, implementation challenges, and operational inefficiencies brought on by a lack of AI integration. Because each interview lasted between thirty and sixty minutes, participants had ample opportunity to freely express their thoughts and experiences.

Respondents repeated similar facts and observations until the interviews reached data saturation. This indicates that the sample size was sufficient for the study's objectives, as no new themes or concepts emerged. We applied thematic analysis to the interview data. To identify reoccurring themes and trends, the interviews were transcribed and examined. This tactic made it easier to fully understand the challenges and solutions associated with the adoption of AI. Before the study started, ethical approval was obtained, and each subject gave their informed consent. To protect participant identities and responses, confidentiality and anonymity were maintained throughout the study. Creswell, J. W., and Poth, C. N. (2016) influenced the methods. *Research Design and Qualitative Inquiry: Choosing from Five Methodologies*. This approach made it easier to include different viewpoints from several industry stakeholders.

IV. Results

Information gathered from participants regarding the use of AI in patient records clarifies key factors influencing their resistance. This qualitative analysis highlights the main attitudes, beliefs, and difficulties that the respondents expressed by grouping the data into thematic areas.

Technological Proficiency

Healthcare professionals' comfort levels with modern computer technologies vary significantly. Many expressed apprehension about implementing new technologies, focusing on concerns about AI systems' complexity and usability. Many expressed their fear of their incompetency in using these technologies, so they chose to stay safe by not using them. An elderly woman stated that she was educated long back when computers were not available, only secretaries were using type writers during those days. She

mentioned that exposing her to computers is giving her lots of problems therefore she prefers to remain away from the use of computers. She said she will try by all means to do things which don't bring her near a computer.

Apprehensions about Employment Stability

Attitudes toward artificial intelligence are strongly influenced by feelings of job stability. One major barrier to adoption was the fear that AI would replace their jobs, which many practitioners voiced. It appears that the majority of people surveyed believed AI existed to replace human workers. Even the groundskeepers believed that their jobs were in danger due to the use of advanced machinery. A young man stated that at their medical center they used to be many people who were cleaners, he mentioned that from the time their boss bought a cleaning machine now they are very few including him who remained because he was able to operate the cleaning machine which was bought. People who were in favor of technology were those in medicine administration. They believed that it is still a long way for them to be replaced by technology. They pointed out that nations like the UK are still seeking workers in the medical field, indicating the necessity of people in this field. Their comfort came from first world countries that were still looking for humans to work in their medical centers.

Preference for Traditional Methods

There was a noticeable hesitancy to abandon traditional record-keeping practices. A sizable portion of respondents indicated a preference for tried-and-tested methods. Although they concluded that some changes are unavoidable and unstoppable, one respondent noted that change is not always welcome. Some people believe that in order to work effectively and effortlessly, one must have experience. As a result, they claimed to have experience with traditional methods of operation. They may experience issues with the new technology, which takes time to get used to. One of the interviewees, who worked in management, mentioned that change is never welcome, even when there is no cause for fear. The employees, particularly the record keepers, appear content with their current work and do not perceive any improvement. One young lady mentioned that she feels good when she uses a pen and paper to record the names and feels that when lots of people are in queue make her boss to see how important she is. One middle aged man stated that they are some areas which needs improvement in using technology such as machine for temperature recording, blood pressure diagnosis and blood testing but other things just need a human being. He mentioned that though machinery is good but the most important thing is for people to get jobs.

Principal Barriers to Adoption

The participants mentioned different factors which hinder the adoption of AI, after identifying different themes, common themes were identified. These themes are presented below.

Inadequate Training: Many interviewees cited a lack of training as the main barrier, highlighting the critical need for educational initiatives to equip healthcare workers with the skills they need to use AI effectively. Since they were well aware of the drawbacks of AI, they also wanted someone who could gently educate them about its advantages. They added that they needed someone to teach them without making fun of them if they didn't pick it up right away. A middle aged woman reiterated that apprentice would be best for them. They needed to learn by doing not to be taught as if they were at school. She mentioned that not everyone was smart at school therefore schooling is not welcome. She even mentioned that the training should be named with words like job training, refresher job training and other names which show that it's something which is related to their current jobs and the aim is for them to improve how they do their jobs.

Exorbitant Implementation Costs: When financial limitations were recognized as a barrier, it frequently sparked conversations about budget allocation and other funding sources for AI initiatives. The management expressed these opinions, stating that because business was slow, they were barely making enough money to invest in machinery and were only surviving in the industry. They went on to explain that though they aim to stay longer in the industry, the money they are making doesn't allow them to invest in their business but gives them money to survive with their families. They also cited high taxes for the health sector and also many licenses which they need to operate. The initial cost needed for the health sector to use modern technology was said to be high and out of reach to many struggling health service providers.

Data privacy concerns: Concern over data privacy was a common theme, underscoring the need for clear laws and strict security measures to promote confidence in AI systems. According to a young man who was interviewed, the purpose of artificial intelligence is to make all of the data accessible to superpowers and tech-savvy individuals. *"You will never have privacy with technology"*, he said. As proof that data privacy has been compromised, an example of how a person can be tracked using their Smartphone was provided. He mentioned that when using ordinary medical cards which are old methods of recording the patients' data, it is difficult for someone to go out of the medical center with details but electronics can be sent through emails and internet which could make the sensitive data to end up in the wrong hands.

Recognized Advantages of AI

Despite the challenges, everyone agrees that AI has potential benefits for patient record management. But the disadvantages outweigh the benefits.

Enhanced Precision and Effectiveness:

Many respondents claim that AI could greatly improve accuracy and efficiency in recordkeeping, which makes the case for its use strong. Fast in retrieving data was mentioned by many respondents. A man stated that the use of modern technology was the way to go though there is resistance. He mentioned that in other countries where technology is being used a patient is no longer asked to sit down and have the temperature recorded but by coming near the machines your data is recorded. He gave an example of a Tanzanian airport at Julius Nyerere, in Dar-e salaam where when one arrives and medical check-up is done by just passing by a screening area. Though he liked the modern technology he agreed that the system eliminates human involvement which could cause loss of jobs. AI's potential to enhance patient care was highlighted, underscoring the importance of quick access to patient data, particularly in emergency situations.

Effect on Patient Care Quality

Most participants agreed that the standard of patient care at their facilities had suffered as a result of the lack of AI implementation. As practitioners recognize AI's potential to improve patient outcomes and operational efficiency, this perspective emphasizes the urgent need to overcome implementation barriers. In the absence of AI, participants acknowledged a number of challenges in maintaining accurate patient records. One medical doctor stated that sometimes patients data are miss placed especially when there is a change of record keepers, there a need to put the data in one machine which can be operated by anyone who is responsible to retrieve the necessary data. He mentioned that some of the patients come to the center alone and not able to give details which enable the retrieving of information therefore making it difficult to help the patient. But in health sectors where finger prints are used one could just use the finger print of the patient even if he is not able to talk. Examples were given for other health facilities which were using modern technology in the same province Midlands and how effective they are to their patients.

The interviews brought up a number of significant concerns and recommendations for incorporating AI in healthcare. Numerous respondents mentioned labor-intensive operations, pointing out that AI could help address the inefficiencies caused by long-standing practices. Participants frequently voiced concerns about human error, and they said AI could significantly lessen these challenges. Issues with information retrieval were also commonly brought up, which points to the importance of improved data management systems for rapid and effective information access. The respondents proposed several strategies for effectively implementing AI. The topic of better budget allocation for technology kept coming up, and many people demanded more money. The improvement in budget was mainly mentioned by those who were not in management. Management expressed concerns about insufficient funds for necessary investments in technology. Participants also emphasized the importance of integrating stakeholders early in the deployment process to foster support and buy-in, along with the necessity of comprehensive staff training programs to improve proficiency with AI technology. Participants also underlined how crucial it is to work more closely with technology vendors to facilitate seamless integration and ongoing support. Lastly, even though strict data privacy laws were desired, many people doubted that strong data privacy would actually be achieved.

Ways to Use AI in Healthcare

The interviews covered a number of important issues and suggestions for using AI in healthcare. Numerous respondents emphasized labor-intensive processes, pointing out that AI could aid in reducing inefficiencies brought on by ingrained procedures. Many participants voiced worries about human error, implying that AI could significantly lessen these difficulties. Information retrieval problems were also frequently brought up, highlighting the necessity of improved data management systems to facilitate efficient and rapid information access. Respondents suggested a number of tactics for the successful application of AI. Better budget allocation for technology was a recurrent theme; many participants, especially those outside of management, demanded more funding. On the other hand, managers were frustrated by the lack of funding for essential technology investments. To encourage support and buy-in, it was underlined how crucial it is to involve stakeholders early in the deployment process. It was also emphasized how important it is to have thorough staff training programs to increase their proficiency with AI technology. To guarantee smooth integration and continuous support, participants also emphasized the significance of working closely with technology vendors. Strict data privacy laws were strongly desired, but many people were skeptical that strong data privacy could actually be achieved in practice.

V. Discussion

Interviews showed that people had different levels of comfort with AI technology, and many said they were uncomfortable with how complicated and challenging to use of the technology. This makes people to have a negative attitude towards the new technology or AI. This outcome aligns with other researches which indicated that a lack of digital literacy significantly contributes to people's reluctance to adapt AI (Aldwean & Tenney, 2024). Despite research indicating that AI generally enhances people's work performance, many individuals expressed concerns about job security and believed that AI would eliminate positions held by non-clinical personnel (Karangutkar, 2023; Ivchik, 2024). This belief is not only a belief but a reality. People have witnessed their jobs being taken away by AI, though this is a great achievement in terms of the quality of work and efficiency. This shows that the adoption of AI will be resisted and needs time to fully adopt. The inclination to traditional ways of storing records showed a clear unwillingness to shift. This was also reiterated by other researchers such as Ramadhani et al., (2024). Some of the key problems that have been brought up are high implementation costs, lack of training, and problems with

data privacy. These findings were not new but were also mentioned by researchers such as Nair et al., 2024. Zitar et al. (2023) say that for workers and AI to work together successfully, both technical and human skills need to be developed, and workers need to keep learning new things and improving their skills. Healthcare personnel realize that AI could be helpful in some ways, such as making things more accurate and efficient and getting to patient's data faster. To successfully integrate AI, healthcare organizations need to work with tech companies, set aside more money for tech, invest in specialist training programs, and make sure that strong data privacy safeguards are in place. To create a hospital culture that encourages new ideas and leverages AI to make patients better and operations run more smoothly, these problems need to be solved. By taking the initiative to deal with these problems, the healthcare industry may fully realize AI's promise and change the way patient care is delivered (Esmaeilzadeh, 2024).

VI. Conclusion

In conclusion, the study on enhancing patient care through AI integration in record-keeping within Midlands Province's healthcare facilities reveals a complex landscape of barriers and opportunities. While healthcare practitioners express significant concerns about technological proficiency, job security, and resistance to change, there is a strong recognition of AI's potential to improve accuracy, efficiency, and access to patient information. Addressing the identified challenges—such as inadequate training, high implementation costs, and data privacy issues—is essential for fostering a supportive environment for AI adoption. By prioritizing strategies that include enhanced training programs, collaboration with technology vendors, and transparent communication about AI's role in improving care, healthcare facilities can overcome these barriers and unlock the full benefits of AI, ultimately leading to better patient outcomes and operational efficiency.

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Data availability

Data is available upon request.

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