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A Rapid Review of Electronic Medical Record (EMR) Implementation in Midwifery Care Services

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ABSTRACT

Background: Electronic Medical Records (EMR) are digital records of patient data used to record all information related to healthcare services provided to patients in a healthcare facility. EMRs provide significant benefits in providing more efficient, high-quality, and coordinated healthcare services. **Purpose:** To analyze the impact of EMR implementation on midwifery services and identify challenges and barriers to implementation. **Methods:** Out of 369 identified articles, 10 met the inclusion criteria. Two primary themes emerged: (1) EMRs contributed to improved documentation accuracy, continuity of care, and communication among providers in midwifery services; and (2) challenges included increased administrative workload, technical limitations, and insufficient training. All included studies underscored the critical need for ongoing support and infrastructure development to ensure effective EMR implementation. **Results:** From the 369 articles found, 10 articles were selected based on inclusion and exclusion criteria. The findings of this review uncovered two themes: the impact of EMR on midwifery care and the challenges in its implementation. **Conclusion:** Implementing an EMR in obstetric practice enhances the quality and efficiency of maternal and child health services by improving access to information and provider communication. However, challenges like increased workload, technical issues, and training needs must be addressed through infrastructure investments and support from government and health institutions.

INTRODUCTION

Advances in information and communication technology in the era of globalization have enabled the rapid exchange of information without being hindered by the limits of space and time. A nation's progress in the era of globalization is highly dependent on its people's ability to utilize knowledge through information and communication technology. Therefore, every country is competing to integrate information and communication technology in all aspects of the nation and state's life, including in efforts to improve the quality of health services (Kemenkes, RI 2022).

The Ministry of Health of the Republic of Indonesia has published a "Blueprint for Health Digital Transformation Strategy" focusing on health data integration, health application development, strengthening the health technology ecosystem, and improving organizational governance. The solutions proposed in the strategy aim to improve the efficiency of healthcare services by integrating various health applications

into a single data aggregator platform, standardizing drug and medical equipment codes, converting manual recording systems to digital, and ensuring connectivity of data from various sources into a unified database. The emphasis is on improving the quality and efficiency of healthcare services through digital transformation, with a particular focus on improving health data collection, biotechnology development, and internal office management (Kemenkes, RI 2022).

Quality health services are health services that can provide satisfaction to service users and are organized by service standards and professional ethics. Information and communication technology are essential in realizing quality health services. One form of utilization of information and communication technology in health services is the Electronic Medical Record (EMR). Medical record documents are an essential component in the management of hospital services (Amin, Setyonugroho, & Hidayah, 2021), This is in line with the Peraturan Menteri Kesehatan No. 24 Tahun 2022, which requires all health services to provide medical records in manual and electronic form. Medical records have a broad meaning and include more than just recording patient data; but also include forms of recording that function to collect all information related to health services provided to patients at a health care facility (BPK RI, 2022). Electronic medical records provide significant benefits in the provision of more efficient, quality, and coordinated health services (Ariani, 2023).

In the context of midwifery, the implementation of EMR facilitates simultaneous access to data, facilitating coordination and integration of maternity care; improved readability of medical records compared to paper records, thereby reducing medical errors due to illegible handwriting; advantages for midwives and postpartum women because all medical records are in one location in a single unit; and rapid access to information through digitization of records, which allows rapid and simultaneous updating of patient information, which is essential for efficiency and safety of services. (Craswell et al., 2021). However, the application of EMR in midwifery still encounters several obstacles and challenges. One of them is that there are still midwives who use manual/conventional medical records. Manual documentation that needs to be integrated causes data access difficulties and is vulnerable to physical damage, security risks, and data duplication.

Despite the growing adoption of Electronic Medical Records (EMRs) in healthcare, there is limited synthesized evidence on how EMR systems specifically impact midwifery care and the unique challenges midwives face during implementation. Existing studies tend to focus broadly on clinical outcomes or general healthcare settings, leaving a gap in understanding their implications for midwifery practice. EMRs have the potential to enhance midwives' autonomy by streamlining documentation, facilitating access to patient information, and supporting more efficient, structured, and coordinated care delivery. To address this gap, this review aims to evaluate the impact of EMR implementation on the quality of midwifery services and to identify the key barriers and challenges that affect EMR adoption in midwifery practice.

METHODS

The research method used in this review is rapid review. This rapid review follows the framework established by Tricco (2017) with the steps as follows and the research was conducted from June to July 2024:

1. Design

This study employed a rapid review methodology to examine the implementation of Electronic Medical Records (EMRs) in midwifery services. A rapid review was

selected over a traditional systematic review to enable timely synthesis of the best available evidence while maintaining methodological rigor. This approach is particularly suitable when decision-makers require prompt yet reliable insights to inform policy or practice. By narrowing the scope of the research question and streamlining the data abstraction process, the rapid review method allows for the efficient identification of relevant findings without compromising quality. This review aims to provide actionable evidence on the benefits of EMRs in midwifery care, evaluate their impact on the quality and efficiency of practice, and explore barriers, facilitators, and midwives' perceptions related to EMR adoption in clinical settings. The findings are intended to support the development and refinement of EMR systems tailored to midwifery needs.

2. Search strategy

The steps begin with setting the review question. The review question in this study is: how is the implementation of EMR in midwifery services? The formulation of this research question uses the PCC model framework described in the following table:

Table 1. Framework PCC

P (population)	C (concept)	C (context)
Midwives, health care professionals	Implementation of Electronic Medical Record (EMR) in midwifery	Midwifery practice, midwifery care

After identifying the review question, the next step was identifying relevant articles. The literature search used four databases: ScienceDirect, PubMed, Scopus, and Cochrane Library. It also used Google Scholar for manual search.

a. Inclusion and exclusion criteria

The inclusion and exclusion criteria of the articles are described in the following table:

Table 2. Inclusion and Exclusion Criteria

Inclusion criteria	1. Research published in English 2. Research that focuses on midwifery practice 3. Research on EMR implementation and use 4. Research that evaluates the impact of EMRs on quality of care, patient outcomes, and midwives' perceptions 5. Articles published in 2019-2024
Exclusion criteria	1. Review Article 2. Meta-analysis of articles 3. Protocol Review

b. Main search term

Articles were searched using keywords including ((Implementation) AND (Electronic Medical Record (EMR) AND (Midwifery Practice OR Midwifery Care).

c. Selection of Source Evidence

The initial search obtained 369 articles from four databases (ScienceDirect, 51 articles; Pubmed, 35 articles; Scopus, 234 articles; Cochrane Library, 34 articles; and two manual searches Google Scholar, 15 articles). After removing duplicate articles, followed by title and abstract screening, nine of the 19 articles obtained were only available in partial text. The remaining ten articles were reviewed based on the research objectives, namely understanding the benefits of EMR in midwifery practice, evaluating the impact of EMR implementation on

the quality and efficiency of midwifery practice, and exploring the barriers and perceptions of facilitators and midwives regarding EMR implementation in hospitals. Figure 1 shows the article selection process.

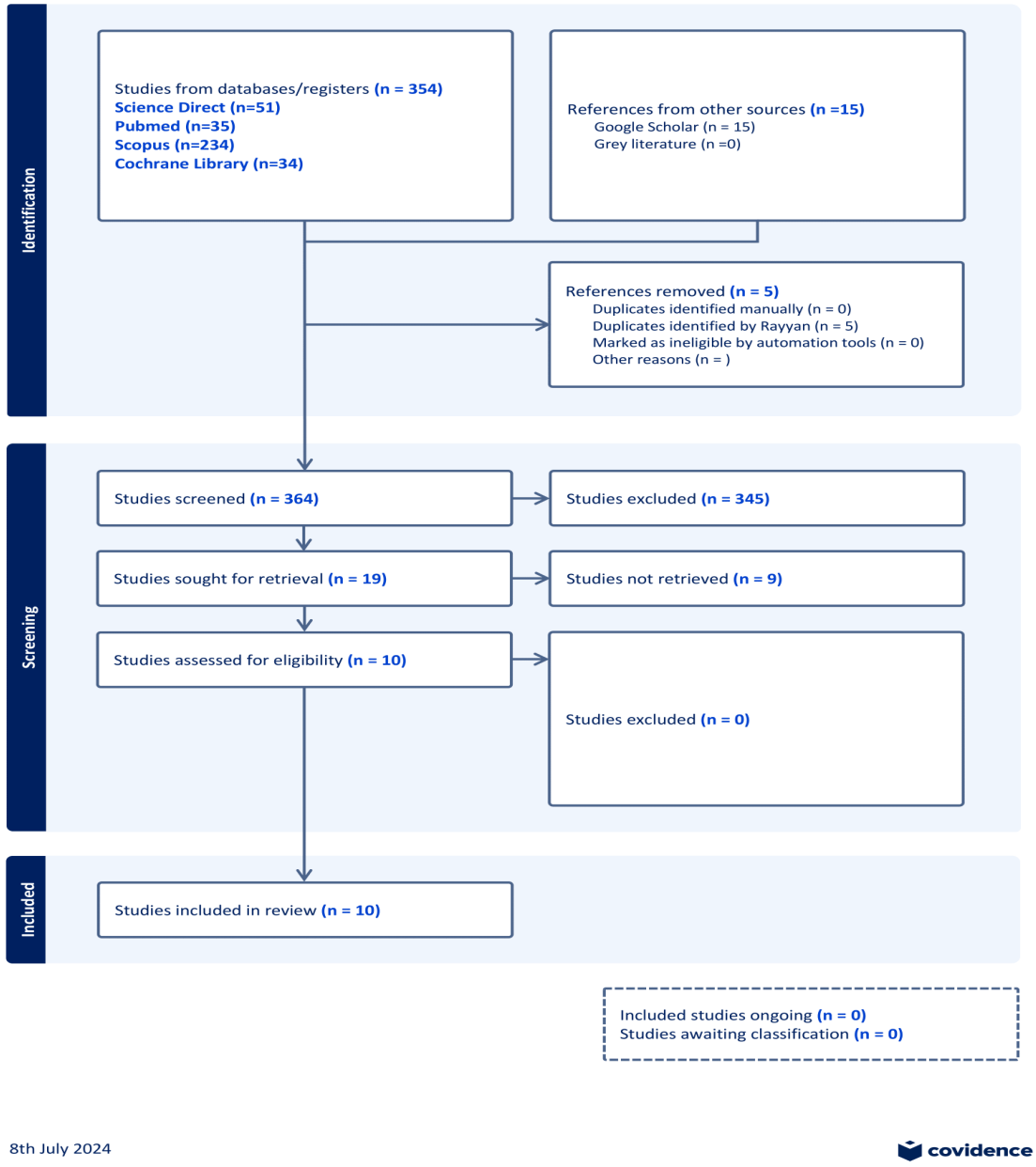

Figure 1. PRISMA-ScR flowchart

d. Data charting

Data synthesis of research articles was carried out using data charting adopted from the Joanna Briggs Institute (JBI), including data on article authors, article titles, years, countries, research objectives, research types and review results.

Table 3. Data Charting

Item Number	Author, Year, Country	Objective	Design	Results	Impect of EMR on Midwifery Practice and Healthcare	Barriers and Challenges
A1	(Craswell et al., 2021) Australia	Inform the use of integrated electronic medical records (ieMR) in the maternity care environment with a focus on the quality, safety and efficiency aspects of this significant change.	Mix methode	Positive feedback: ease of having one record, simultaneous access for multiple doctors, and readability Single location of all records in ieMR considered favorable Observation: midwives spent 23-64% of their time at the computer using ieMR in the delivery room	The positive impact felt by midwives is that EMR facilitates access to information by having one integrated medical record. Convenience of having one medical record, simultaneous access for multiple doctors and readability	Barriers perceived by midwives are reduced face-to-face communication, time-consuming documentation and the risk of errors.
A2	(Abore, Debiso, Birhanu, Bua, & Negeri, 2022) Ethiopia	Assessing health workers' readiness to implement an electronic medical record (EMR) system in public hospitals in Sidama region, Ethiopia	Mix methode	The overall readiness of health workers to use EMR still needs to improve, at only 36.5%. Significant factors affecting readiness include computer skills, EMR knowledge, and attitude toward EMR.	Improve service quality by increasing efficiency and productivity through timely decision-making, saving recurring costs, reducing medical errors, improving patient safety, ensuring data confidentiality, and facilitating the exchange of medical information between authorized personnel.	Barriers: - Healthcare professionals' readiness and attitudes towards EMR systems are often hampered by concerns about the need for an internet connection, electricity, maintenance, and parallel documentation for information security. - Lack of training makes healthcare workers feel unprepared to use

Item Number	Author, Year, Country	Objective	Design	Results	Impect of EMR on Midwifery Practice and Healthcare	Barriers and Challenges
						EMRs. - Uneven knowledge of EMR among healthcare workers affects their readiness. Officers with good knowledge about EMR are more ready to implement this system, with a 3.33 times higher chance of readiness than those who are less knowledgeable.
A3	(Lloyd et al., 2023) Australia	Exploring medical and nursing doctors' perspectives on the usability of electronic medical record (EMR) systems in Australian hospitals.	Qualitative	Clinicians face various challenges in using EMRs, including lack of intuition, complexity, and communication difficulties. Despite this, EMRs also provide benefits such as improved safety and collaboration in care. Recommendations to improve EMR usability include resolving sign-in issues, using templates, and implementing smarter alerts to avoid errors.	Improved safety and risk management.	Electronic medical records (EMR) use in healthcare faces several barriers. Firstly, the usability issues of EMRs can create psychological and time pressure on healthcare workers. Additionally, technical instability affects the usability of EMRs, requiring significant investments in IT and communication infrastructure. Inter-operability challenges also exist in sharing information between

Item Number	Author, Year, Country	Objective	Design	Results	Impect of EMR on Midwifery Practice and Healthcare	Barriers and Challenges
						different healthcare sectors. Furthermore, the complexity and lack of intuitiveness of EMR systems can hinder their utilization, leading to reduced data accuracy and integrity. It is noted that traditional training methods are less effective compared to workflow-based interactive content and hands-on exercises in simulated work environments. To overcome these barriers, there is a need to standardize EMR systems across regions and improve linkages with primary healthcare and other health sectors. These efforts can significantly enhance the overall effectiveness of EMRs in healthcare.
A4	(Venkateswaran et al., 2022)	Improving the quality of antenatal care through the use	*Cluster RCT*	The use of an e-Registry-based clinical decision support system improved adherence to guidelines and	The intervention improved adherence to guidelines for screening and management of anemia, hypertension, and	-

Item Number	Author, Year, Country	Objective	Design	Results	Impect of EMR on Midwifery Practice and Healthcare	Barriers and Challenges
	Palestine	of digital tools and clinical decision support systems		management of conditions such as anemia, gestational diabetes, and hypertension during pregnancy. However, there were no significant differences in adverse health outcomes during delivery or antenatal care attendance between the intervention and control groups.	gestational diabetes, and improved the antenatal care process. The intervention group showed better screening and management outcomes than the control group.	
A5	(Wynter et al., 2022) Australia	Describes the experiences of nurses and midwives after implementing an EMR system in a large community health service in Melbourne, Australia.	Qualitative	Participants reported benefits such as more accessible access to patient data and better communication. However, they also experienced disruptions in workflow, negative impacts on patient care, and personal well-being issues such as frustration and stress. This study emphasizes the importance of ongoing training and support for nurses and midwives after EMR implementation and the need to involve them in designing the EMR system to suit their workflow.	The positive impacts of EMR include: - EMR facilitates straightforward access to patient and referral data, contributing to improved care quality. - Reduced medication errors - EMR allows all healthcare team members to access patient data simultaneously and in real-time, thus improving coordination and service delivery.	Barriers: Disruption of patient communication: EMRs can disrupt communication between healthcare providers and patients. Difficulty in finding patient information: EMR interfaces that are difficult to navigate can make it difficult to find patient information and result in the loss of important information. Prevention of clinical judgment: EMRs

Item Number	Author, Year, Country	Objective	Design	Results	Impect of EMR on Midwifery Practice and Healthcare	Barriers and Challenges
						sometimes hinder healthcare providers from using their clinical judgment.
A6	(Helou et al., 2019) Japan	To understand the preferences of pregnant women in Japan regarding the use of electronic medical record (EMR) systems in antenatal care and identify their experiences and priorities regarding EMR.	Mix methode	Pregnant women in Japan want to see the contents of the EMR and understand their pregnancy through the explanations and summaries enabled by the EMR. They wanted detailed psychosocial information documented in the EMR. Preferences included using EMRs, electronic medical record exchange between providers, and online access to summarized pregnancy data. There exists a complex array of opinions among pregnant women in Japan regarding online access to add information to the EMR, highlighting the multifaceted nature of this issue. Service satisfaction correlated with age, personal income, and household income level.	1. Access to EMR increases patient autonomy and improves communication with healthcare providers. 2. EMRs help improve information communication and management of health conditions, as evidenced by pregnant women's positive experiences with electronic access to pregnancy records. 3. EMRs serve as a comprehensive tool, facilitating information navigation, task documentation, and formal and informal communication.	Challenge: Design an EMR system emphasizing interoperability, psychosocial information, one-way communication, and patient-centered care.
A7	(Lipenguet et al., 2022)	An empirical evaluation of	Quantitative	The study found that 59.6% of respondents intended to	1. EMR facilitates recording action history and prescriptions related to	1. There is a lack of training on information

Item Number	Author, Year, Country	Objective	Design	Results	Impect of EMR on Midwifery Practice and Healthcare	Barriers and Challenges
	Gabon	healthcare professionals' goals for EMR use.		use EMR in their professional practice. Analysis showed that healthcare workers' intention to use EMR had a significant relationship with perceived usefulness and subjective norms. However, there was no significant relationship between socio-demographic characteristics and intention to use EMR, except for age, which influenced perceived usefulness.	patient management. 2. Facilitate the exchange of laboratory test results, radiology examinations, and information between medical personnel for treatment planning and therapy continuity. 3. Provides access to patients to review their medical data. 4. Improve the efficiency of practice and decision-making processes of healthcare workers. 5. EMR ensures that healthcare professionals always have access to up-to-date and synthetic medical history, which includes essential elements for clinical decision-making.	technology (IT) and EMR that needs to be integrated into the initial and continuing education curriculum for health workers. 2. Lack of awareness of the importance of EMR 3. Difficulty operating IT devices that are integrated in EMRs 4. Lack of training. More than half of the respondents in this study had no formal computer usage training, which is an important prerequisite for effectively managing EMR.
A8	(Ramoo, Kamaruddin, Nawawi, Che, & Kavitha, 2023) Malaysia	To assess nurses' perceptions and satisfaction with electronic medical record systems in teaching hospitals.	Qualitative	This study showed that almost all nurses (98%, n = 343) viewed the electronic medical record (EMR) system positively. However, these perceptions varied significantly by work unit, computer or laptop ownership, and daily time spent using the system (all $p < 0.05$). Nurses who had received training reported	1. Reduce medication and other errors, improving the quality of clinical care provided to patients. 2. EMR is designed to proactively avoid errors such as misinterpretation of doctor's handwriting and delayed treatment that often occur in paper-based systems. 3. EMR implementation can improve the overall quality of care. 4. EMR provides a more secure	1. EMR systems involve a complicated documentation process through various tabs or web pages without a clear focus on nursing. 2. The risk of losing patient records due to inadequate data backup systems during power outages

Item Number	Author, Year, Country	Objective	Design	Results	Impect of EMR on Midwifery Practice and Healthcare	Barriers and Challenges
				higher levels of satisfaction with the system. Issues raised by participants included system development and connectivity, emphasizing the importance of nursing personnel involvement in system development to ensure a proper approach to nursing care delivery.	method of protecting patient data and preventing medical errors. Data is thoroughly linked, reducing the risk of data exchange between patients.	underscores the need for robust data security measures. 3. The substantial costs associated with implementing EMR systems, including setup, hardware, and maintenance, pose a significant financial challenge for healthcare institutions. 4. Early implementation of EMR can be a barrier for healthcare workers unfamiliar with the system and needing adequate technical support. 5. Some respondents experienced dissatisfaction with the availability of technological devices (such as computers or laptops) essential for interacting with the EMR. 6. Respondents were dissatisfied with the limited access to computers in ward

Item Number	Author, Year, Country	Objective	Design	Results	Impect of EMR on Midwifery Practice and Healthcare	Barriers and Challenges
						units, the time the system was down, and the short notice of repairs.
A9	(Larasati, Novianto, & Purwadi, 2020) Indonesia	Analyze the creation of antenatal care (ANC) medical records in obstetric services as an effort to reduce maternal and infant mortality.	Qualitative	The results showed that implementing midwifery medical records could have been more satisfactory. A maternal Perinatal Audit has been conducted, but no cleaners to be allowed up exist on how midwives should make medical records. The lack of training programs on the importance of midwifery medical records has caused many midwives to consider medical records only as administrative documents. The Health Office focuses more on maternal and child health programs and their supporting aspects, so medical records are neglected.	1. Hospitals that use EMR show improved service quality compared to conventional paper-based medical records. 2. EMR allows for more accurate services according to patient needs, enabling better decision-making by health workers. 3.EMR plays a crucial role in early detection of danger signs or complications, thereby significantly reducing the risk of maternal and infant mortality, providing a sense of reassurance and security. 4. EMRs are equipped with risk alerts that can predict the likelihood of patient death, enabling healthcare professionals to be proactive and prepared in high-risk procedures such as infusions, surgical transfers, and blood sampling. 5. Improving patient safety through better medical record management and increasing the accuracy of medical decisions. 6. Support future research by providing patient diagnosis data to increase knowledge in the	1. Limited access to adequate internet. 2. Health facilities need to have adequate infrastructure to support EMR operations. 3. Lack of trained administrative staff to manage and operate EMR is also an obstacle to its implementation.

Item Number	Author, Year, Country	Objective	Design	Results	Impect of EMR on Midwifery Practice and Healthcare	Barriers and Challenges
					healthcare field.	
A10	(Abdel-Hafez, Baker, Winning, & Scanlon, 2021) Australia	The purpose of implementing the Clinical Nursing and Midwifery Dashboard (CNMD) is to support Nursing Unit Managers (NUMs) and Midwifery Unit Managers (MUMs) in managing their daily workload and provide continuous visibility into patient risk assessment and nursing safety documentation.	Quantitative	CNMD effectively improves the efficiency and completeness of nursing and midwifery assessments.	1. Increase clinical data utilization to help improve patient healthcare delivery. 2. Provide data analysis and visualization to support better healthcare delivery.	-

e. Source selection of evidence

For articles included in this review, data were extracted using a standardized template, including article title, year, country, research objectives, research type, and review results. Conduct a critical appraisal to assess the quality of the selected articles using the Mix Methode Appraisal Tools (MMAT) checklist 2018 version. The MMAT checklist can assess the quality of research with diverse methodological designs, thus providing a more comprehensive evaluation (Nha et al., 2018). According to (Al-Jundi & Sakka, 2017) The article quality assessment criteria are described in Table 4. The critical appraisal format is attached in tables 4, 5, 6, 7, and 8.

Table 4. Quality Assesment

Scale	Quality
0 = No	A = Very good (10-14)
1 = Unclear	B = Good (5-9)
2 = Yes	C = Poor (0-4)

Table 5. Mix Methods Design Critical Appraisal with MMAT Checklist

No	Question Item	Item number and score		
		1	**2**	**6**
1	Are there clear research questions?	2	2	2
2	Do the collected data allow to address the research questions?	1	2	2
3	Is there an adequate rationale for using a mixed methods design to address the research question?	2	2	2
4	Are the different components of the study effectively integrated to answer the research question?	2	2	2
5	Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	2	2	2
6	Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	1	1	1
7	Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?	2	2	2
	Score	12/A	13/A	13/A

Table 6. Qualitative Design Critical Appraisal with MMAT Checklist

No	Question item	Item number and score			
		3	**5**	**8**	**9**
1	Are there clear research questions?	2	2	2	2
2	Do the collected data allow to address the research questions?	2	2	2	2
3	Is the qualitative approach appropriate to answer the research question?	2	2	2	2
4	Are the qualitative data collection methods adequate to address the research question?	2	2	2	2
5	Are the findings adequately derived from the data?	2	2	2	2
6	Is the interpretation of results sufficiently substantiated by data?	2	2	2	2
7	Is there coherence between qualitative data	2	2	2	2

No	Question item	Item number and score			
		3	5	8	9
	sources, collection, analysis and interpretation?				
	Score	14/A	14/A	14/A	14/A

Table 7. Quantitative RCT Design Critical Appraisal with MMAT Checklist

No	Question Item	Item number and score
		4
1	Are there clear research questions?	2
2	Do the collected data allow to address the research questions?	2
3	Is randomization appropriately performed?	2
4	Are the groups comparable at baseline?	2
5	Are there complete outcome data?	2
6	Are outcome assessors blinded to the intervention provided?	2
7	Did the participants adhere to the assigned intervention?	2
	Score	14/A

Table 8. Quantitative Descriptive Design Critical Appraisal with MMAT Checklist

No	Question Item	Item number and score	
		7	10
1	Are there clear research questions?	2	2
2	Do the collected data allow to address the research questions?	2	2
3	Is the sampling strategy relevant to address the research question?	1	2
4	Is the sample representative of the target population?	1	2
5	Are the measurements appropriate?	2	2
6	Is the risk of nonresponse bias low?	2	1
7	Is the statistical analysis appropriate to answer the research question?	2	2
	Score	12/A	13/A

RESULTS

Based on the 10 selected articles, the following results were obtained:

1. Article characteristics by country

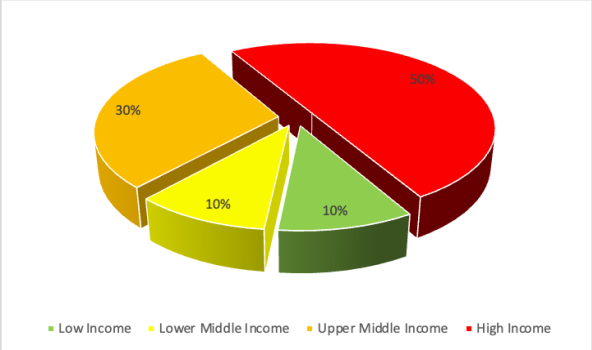

Chart 1. Article Characteristics by Country

Based on the chart, the majority of articles reviewed in this study originated from high-income countries, accounting for 50% of the total sources (as represented in red in the diagram). Additionally, 30% of the articles came from upper-middle-income countries, while 10% each were sourced from lower-middle-income and low-income countries.

2. Characteristics of articles based on the research design used

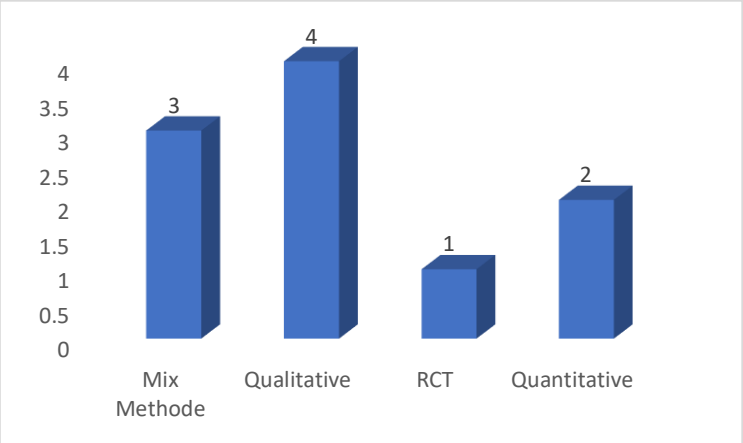

Chart 2: Characteristics of Articles Based on the Research Design Used

Based on the chart, out of a total of 10 reviewed articles, qualitative research design was the most commonly used approach, appearing in four articles. The mixed methods approach, which combines qualitative and quantitative techniques, was employed in three articles. Meanwhile, purely quantitative designs were used in two articles, and only one article applied a Randomized Controlled Trial (RCT) method.

3. Characteristics of Articles Based on Quality

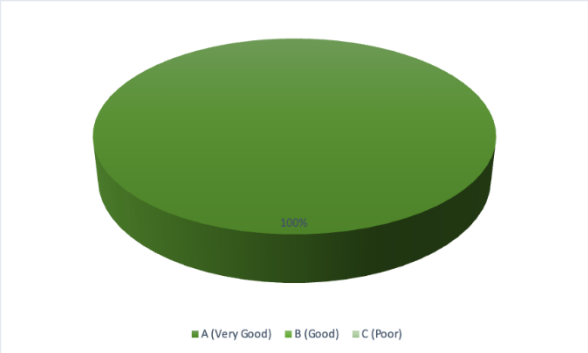

Chart 3: Characteristics of articles based on quality

Based on the chart, all articles included in this review (100%) were rated as Category A (Very Good) in terms of quality, as represented by the dark green section of the pie chart. No articles were classified under Category B (Good) or Category C (Poor).

4. Characteristics of articles by year of publication

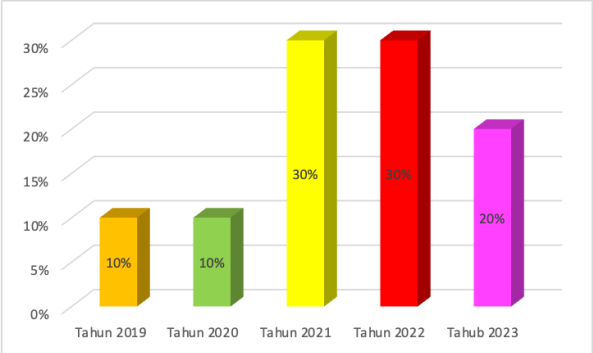

Chart 4. Characteristics of articles by year of publication

Based on the chart, 10% of the articles were published in 2019 and 2020, 30% of the articles were published in 2021 and 2022, while 20% of the articles were published in 2023.

Themes were synthesized through a structured data charting process, where key findings from each included study were extracted, categorized, and compared. Data related to EMR implementation, outcomes, barriers, and facilitators were organized into a matrix to identify patterns and recurring concepts. These patterns were then grouped into overarching themes through thematic analysis, allowing for the integration of both qualitative and quantitative findings. The process was iterative and involved constant comparison to ensure that the synthesized themes accurately reflected the evidence across the studies.

Based on the ten articles used, two themes emerged from the implementation of EMR in midwifery services as follows:

Table 9. Analysis and Mapping of Research Article Themes

No	Theme	Sub Theme	References
1	Impact of EMR on Midwifery Services	Improved Access to Information	A1, A5, A6, A7
		Service Quality Improvement	A2, A3, A4, A5, A6, A8, A9, A10
		Optimizing the Clinical Decision-Making Process	A2, A4, A7, A9
2	Challenges and Barriers to EMR Implementation	Lack of Readiness and Training	A2, A3, A7, A8, A9
		Technical and Infrastructure Disruptions	A2, A3, A5, A8, A9
		Data Management and Security	A1, A8

DISCUSSION

Today's midwifery practice requires high-quality documentation to support providing women-centered care. Those who manage health services and decide to use electronic record-keeping systems must ensure that the new technology will affect clinical services as intended (Kearney et al., 2023). Integration of services through the digitization of paper records is essential. In using EMR, the benefits of handheld and paper records should be transferred and not lost. However, there are concerns that the workload of the EMR may interfere with woman-centered care, especially in the early

postnatal period. Midwives' confidence in their ability to provide good care is affected by the pressure to complete documentation (Craswell et al., 2021).

1. Impact of EMR on Midwifery Services

a. Improved Access to Information

EMR facilitates access to information by having one integrated medical record (Craswell et al., 2021), facilitates straightforward and easy access to patient and referral data (Wynter et al., 2022), helps improve information communication and health condition management (Helou et al., 2019), as well as ensuring that healthcare workers always have access to up-to-date and synthetic medical records that include essential elements for clinical decision-making (Lipenguet et al., 2022). This is by research (Kusumah, 2022), EMRs are better and faster than manual medical records, as they can add or view patient data by computer access.

EMR, unlike manual medical records that necessitate a search in the storage room, allows healthcare providers to access and update patient information in real time. This real-time access not only enhances patient comfort but also significantly reduces waiting time, thereby improving healthcare efficiency (Setyadi & Nadjib, 2023). Furthermore, electronic systems streamline information flow and improve care coordination, enabling healthcare providers to share and access patient information more effectively (Ayaad, Alloubani, & Abu, 2019).

EMR implementation in healthcare settings can significantly change clinical workflows and documentation processes. However, it's important to note that this transition may come with its own set of challenges, such as staff training and potential resistance to change. To support high-quality patient care, a quality improvement program was developed to monitor physician adoption, documentation quality, and adherence to workflows (Jedwab et al., 2022).

b. Service Quality Improvement

EMR improves the quality of care by increasing efficiency and productivity through timely decision-making, reducing recurring expenses, reducing medical errors, improving patient safety, maintaining data confidentiality, and facilitating the exchange of medical information between authorized personnel(Abore et al., 2022), improving safety and risk management (Lloyd et al., 2023), improve adherence to screening and management guidelines for anemia, hypertension, and gestational diabetes, and improve antenatal care processes (Venkateswaran et al., 2022), improve coordination and service delivery (Wynter et al., 2022), improve communication with healthcare providers (Helou et al., 2019), reduce medication and other errors, improve the quality of clinical care provided to patients (Ramoo et al., 2023), improve clinical data utilization, provide data analysis and visualization to support better healthcare delivery (Abdel-Hafez et al., 2021).

Hospitals that use EMR show improved service quality compared to the use of conventional paper-based medical records (Larasati et al., 2020). Using electronic medical records (EMR) in health services in a clear, complete, and precise manner will improve the quality of service and achieve optimal public health. EMR utilization can speed up the completion of administrative work. This speed has an impact on increasing work effectiveness, which affects the improvement of service quality (Eriantika, 2022).

EMRs can reduce errors, improve readability, make results more accessible, provide error alerts, and maintain medication safety. They also make medication documentation and prescribing easier, but they must be checked and updated regularly. EMRs also improve the accessibility of results and imaging (Lloyd et al., 2023).

C. Optimizing the Clinical Decision-Making Process

EMR is helpful as a foundation and guideline in planning and analyzing clinical disease decisions and planning the treatment, care, and medical measures given to patients Optimization of the clinical decision-making process can be in the form of increased efficiency and productivity through timely decision-making (Abore et al., 2022), better management (Venkateswaran et al., 2022), healthcare workers have access to current and synthetic medicines, medical history, which includes elements essential for clinical decision-making, facilitates the recording of history of actions and prescriptions related to patient management, facilitates the exchange of laboratory test results, radiology examinations, and information between medical personnel for continuity of care planning and therapy (Lipenguet et al., 2022).

EMRs integrate Clinical Decision Support (CDS) tools that guide decision-making. These tools can flag drug-drug interactions, suggest screening tests based on risk factors, and recommend evidence-based treatment options. Machine learning algorithms can analyze similar cases to provide predictive analysis, thereby improving real-time decision-making (Alexiuk, Elgubtan, & Tangri, 2024)

2. Challenges and Barriers to EMR Implementation

a. Lack of Readiness and Training

The unpreparedness of EMR implementation in health facilities can cause many obstacles in the implementation process. This can also lead to low healthcare worker adoption of EMR systems (Salleh, Abdullah, & Zakaria, 2021) Therefore, the implementation of EMR should be approved by all EMR users due to its essential role in the health system. Getting adequate training for healthcare workers using EMR is essential to improve their understanding and knowledge of this technology. Training can reduce the deficiencies that health workers have. Training can also enhance and develop the skills and abilities of health workers (Sudirahayu & Harjoko, 2017). Health workers with good knowledge will be more easily and motivated to apply it. Therefore, their tendency to utilize this advantage may contribute to their readiness to implement an EMR system (Rasmi et al., 2020).

Unequal EMR knowledge among healthcare workers (Abore et al., 2022), lack of adequate training can be a barrier to effective use of EMRs (Ariani, 2023), Unreliable and user-friendly human resource issues put psychological and time pressure on healthcare workers. Technical instability affects EMR usability, requiring large investments in IT and communications infrastructure(Lloyd et al., 2023).

Preparation before EMR implementation is part of pre-implementation, a critical requirement to support successful EMR implementation (Singh et al., 2020). Conducting preparatory activities provides an accurate picture of the level of readiness of a healthcare facility and health workers for implementing this new system (Abdulai & Adam, 2020). EMR implementation readiness is the readiness

of healthcare facilities to adapt to changes resulting from technology services for information sharing, quality improvement and healthcare delivery, medical education, research, and e-learning (Kiberu, Scott, & Mars, 2019). In EMR implementation, healthcare workers should be viewed as a critical component in EMR development as they play an essential role in its implementation (Tubaishat 2018;Salleh et al. 2021).

b. Technical and Infrastructure Disruptions

There are various barriers and challenges to EMR implementation, including health workers' readiness and attitude towards the system, the need for reliable internet connection, electricity, and maintenance, the need for parallel documentation to secure information, and a lack of training (Lipenguet et al., 2022), Time-consuming documentation and the risk of errors, complexity, and lack of intuitiveness may hinder its utilization. Significant factors that also influence readiness include computer skills, EMR knowledge, and attitude toward EMR (Craswell et al., 2021).

The EMR system developed involved a complicated documentation process through various tabs or web pages without a clear focus on nursing (Ramoo et al., 2023) and health facilities do not have adequate infrastructure to support operations (Larasati et al., 2020). In addition, technical disruptions such as access to electricity and poor internet coverage are two things that are very crucial in realizing EMR implementation (Aripa Lusyana, 2020). Healthcare facilities still report frequent problems with internet coverage and power outages during service hours, which ultimately hamper the service process because medical records are electronic and require internet and electricity to operate (Tania et al. 2023; Julia Pohan et al. 2022).

The availability of adequate infrastructure, such as computers and supporting devices, system errors, and imperfect system design are obstacles in the EMR implementation process. This is in line with research which states that significant factors affecting readiness include computer skills, EMR knowledge, and attitudes towards EMR (Craswell et al., 2021). This is because electronic medical records must be implemented, and electronic devices such as computers must be used. If electronic equipment is not available, EMR cannot be implemented (Wahyuningsih Nugraheni, 2017).

c. Data Management and Security

The obstacles midwives feel are reduced face-to-face communication, time-consuming documentation, and the risk of errors; there are incidents where patient records or data are lost due to poor data backup during power outages (Craswell et al., 2021). Functionality, resulting in reduced data accuracy and integrity (Lloyd et al., 2023) and EMRs that are difficult to navigate can make it difficult to find patient information and result in the loss of important information (Wynter et al., 2022).

Iterative quality improvement programs, which address adherence and documentation quality issues, should be conducted to improve the usability of EMR software and reduce the time midwives spend on documentation. Provide education and training interventions tailored to doctors' workflows and jobs. This could include face-to-face and online support to help physicians understand EMR documentation requirements and the consequences associated with patient care. The need for electronic medical record (EMR) management or maintenance

includes all activities related to maintaining all system equipment so that it can continue to work as much as possible to improve work quality and extend service life, identify the damage or symptoms of damage, and avoid fatal damage (Delfina Darianti, Vina Ervina Destiana Dewi, & Leni Herfiyanti, 2021).

A multidisciplinary approach with different areas of healthcare in the creation and implementation of EMR systems to ensure that all aspects of care are well supported (Jedwab et al., 2022). EMR's design is needed with a focus on system interoperability, integration of psychosocial information, unidirectional communication, and person-centered care (Helou et al., 2019).

Limitations

The implementation of Electronic Medical Records (EMRs) within midwifery services has shown considerable potential in enhancing the quality of care through improved documentation accuracy, continuity of care, and support for clinical decision-making. Nevertheless, the successful integration of EMRs requires more than technological adoption alone; it necessitates comprehensive strategies that address human resource capacity, technical infrastructure, and organizational readiness.

While this study employed a rapid review methodology to provide timely and relevant evidence, it is important to acknowledge the methodological limitations associated with this approach. The constrained timeframe and abbreviated search strategy may have limited the scope of included studies, potentially excluding relevant evidence—particularly from grey literature and non-English language sources. Moreover, the restriction to studies published between 2019 and 2024, while ensuring recency, may have resulted in the omission of earlier foundational research. Consequently, although the findings offer valuable insights, their generalizability may be limited and should be interpreted with caution.

Implications

The implications of these findings are significant for both health policy and clinical education. From a policy standpoint, the results underscore the urgent need for sustained investment in digital health infrastructure, particularly in low-resource settings. Policymakers should prioritize the development of standardized implementation guidelines that are sensitive to the specific needs and workflows of midwifery care. Moreover, EMR policies must be accompanied by adequate funding for technical support, system maintenance, and user training to ensure long-term sustainability.

In the context of clinical education, the findings highlight the necessity of incorporating digital literacy and EMR competencies into midwifery curricula. Educational institutions should ensure that pre-service and in-service training equips midwives with the skills required to effectively utilize EMR systems. Training programs should not only address technical proficiency but also emphasize the importance of workflow integration, data quality, and patient-centered documentation practices.

Future research should adopt longitudinal and multi-method approaches to evaluate the long-term effects of EMR implementation on maternal and neonatal outcomes, midwives' professional satisfaction, and health system efficiency. Furthermore, participatory system design involving midwives, IT professionals, and healthcare administrators is essential to ensure the development of user-

centered EMR systems that align with the realities of clinical practice. Such collaborative efforts are critical to optimizing the functionality and acceptability of EMRs and advancing the broader agenda of digital health transformation in maternal and child health services.

CONCLUSIONS

This rapid review concludes that the implementation of Electronic Medical Records (EMRs) in midwifery services contributes positively to improving the quality, efficiency, and coordination of maternal and child healthcare. EMRs facilitate timely access to patient data, support clinical decision-making, and enhance communication among healthcare providers. However, challenges persist, including increased documentation burden, limited infrastructure, and insufficient training and readiness among healthcare workers.

RECOMMENDATIONS

To ensure the effective adoption and sustainability of EMRs in midwifery practice, coordinated efforts are required across multiple levels. The following recommendations are proposed: health institutions should invest in reliable digital infrastructure, provide ongoing training for midwives, and establish technical support systems. Educational institutions need to incorporate EMR-related skills into midwifery curricula and offer continuous training on digital health literacy. Policymakers should create context-specific guidelines, allocate funding for digital transformation, and promote collaboration for system interoperability and equitable access. Professional associations should advocate for standardized EMR practices and share best practices for implementation. This study provides valuable insights for improving digital health systems in maternal care, addressing barriers, and guiding future initiatives.

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