THE ROLE OF DIGITAL HEALTH USAGE IN MATERNITY NURSING SERVICES IN INDONESIA : LITERATURE REVIEW

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Abstract

Background: The pace of technological developments has become increasingly rapid, particularly since the Covid-19 pandemic era, leading to various innovations in digital health that have been implemented in health services, including maternity nursing. The study aimed to analyze the role, benefits, and challenges associated with the use of digital health in maternity nursing services in Indonesia. **Method:** A literature review was conducted from 2021 to 2025 by searching for articles through national and international databases (SINTA, Pubmed, Sage Publications, and Google Scholar) using spesific inclusion criteria based on PRISMA 2020. A total of six relevant articles were then reviewed. **Results:** The study demonstrated that digital health usage enhances maternity nursing by increasing access to education, and improving the efficiency of nursing services for pregnant and postpartum women, although challenges regarding infrastructure and digital literacy exist. **Conclusion:** Digital health holds significant potential for supporting maternity nursing practices in Indonesia.

Keywords: digital health, mHealth, telehealth, maternity nursing Indonesia

1. INTRODUCTION

Maternal and child health (MCH) is a major indicator of a country's well-being. Pregnancy, childbirth, and postpartum are important periods in a woman's life that require comprehensive monitoring and care. The application of digital health technology offers a variety of innovative solutions that can improve the quality of maternal care, benefits, outcomes of maternity services, and challenges that may be faced, especially in low- and middle-income countries, one of which is Indonesia [1], [2]. Various studies have shown that these technology-based interventions can expand access, increase efficiency, and empower women during pregnancy and postpartum [3], [4].

Digital transformation in the health sector has had a significant impact on various aspects of service, including maternity nursing. Timely access to maternity care is critical to saving lives, and digital health plays a vital role in bridging service gaps and promoting health equity [5]. Since the Covid-19 pandemic, digital health has increasingly become an innovative solution in the transformation of maternity nursing services that allows mothers and babies to receive health services without having to meet face to face.

Health technology services such as electronic medical records (EMR), mobile-based health applications, and remote monitoring systems such as telehealth or telenursing are increasingly being used to improve access and quality of services for pregnant, giving birth, and postpartum women. This digitalization allows nurses to provide more structured education and timely monitoring of patient conditions, especially in areas with limited health facilities [6], [7]

Mobile health applications such as Pregnancy+, MomConnect, and KIA Online have been used to support pregnant women in tracking fetal development, antenatal care (ANC) schedules, and providing information on nutrition and pregnancy danger signs. Maternity nurses use these applications to improve compliance with ANC visits and strengthen the relationship between patients and health workers [8]. The use of telehealth and digital documentation systems such as Electronic Health Records (EHR) in maternity nursing services helps the relationship between nurses and patients in conducting online consultations, prenatal education, remote psychological assistance to pregnant and postpartum mothers, and maternity nurses can access patient medical history quickly, reduce recording errors, and facilitate multidisciplinary collaboration. In addition, integration with Clinical Decision Support Systems (CDSS) helps nurses make more appropriate data-based decisions in handling high-risk cases such as preeclampsia or postpartum hemorrhage [7], [9].

Digitalization of health, in addition to bringing many benefits, still has challenges related to data privacy, digital divide, and training of health workers are still obstacles. Maternity nurses need to receive special training to optimize the use of digital technology while ensuring the protection of patient data. In addition, the role of nurses as educators and technology advocates is very important to bridge the digital divide, especially in remote areas [10].

In Indonesia, various digital interventions have begun to be implemented, such as the KIA Online application, pregnancy teleconsultation, and the use of WhatsApp for pregnant women's education. However, documentation regarding the integration of digital technology into comprehensive maternity nursing practice is still limited. Therefore, this literature review aims to map and analyze in depth the use of digital technology in the context of maternity nursing in Indonesia, with the hope of providing significant contributions to the development of policies, maternity nursing education curricula, and clinical practices that are adaptive to technological advances, in order to realize modern, holistic, and family-centered maternity nursing services in Indonesia.

2. METHODOLOGY

The method applied in this study is descriptive using a literature review using PRISMA 2020 in selecting articles. Article searches through national and international databases (SINTA, Pubmed, Sage Publications, and Google Scholar) with inclusion criteria, namely publication years from 2021-2025, original scientific articles, full text, open access, focus on digital health (mHealth, telehealth or telenursing, health technology), Indonesian regional studies, types of quantitative, qualitative, mixed-methods studies, and digital health program evaluation studies. A total of 6 relevant articles were then reviewed.

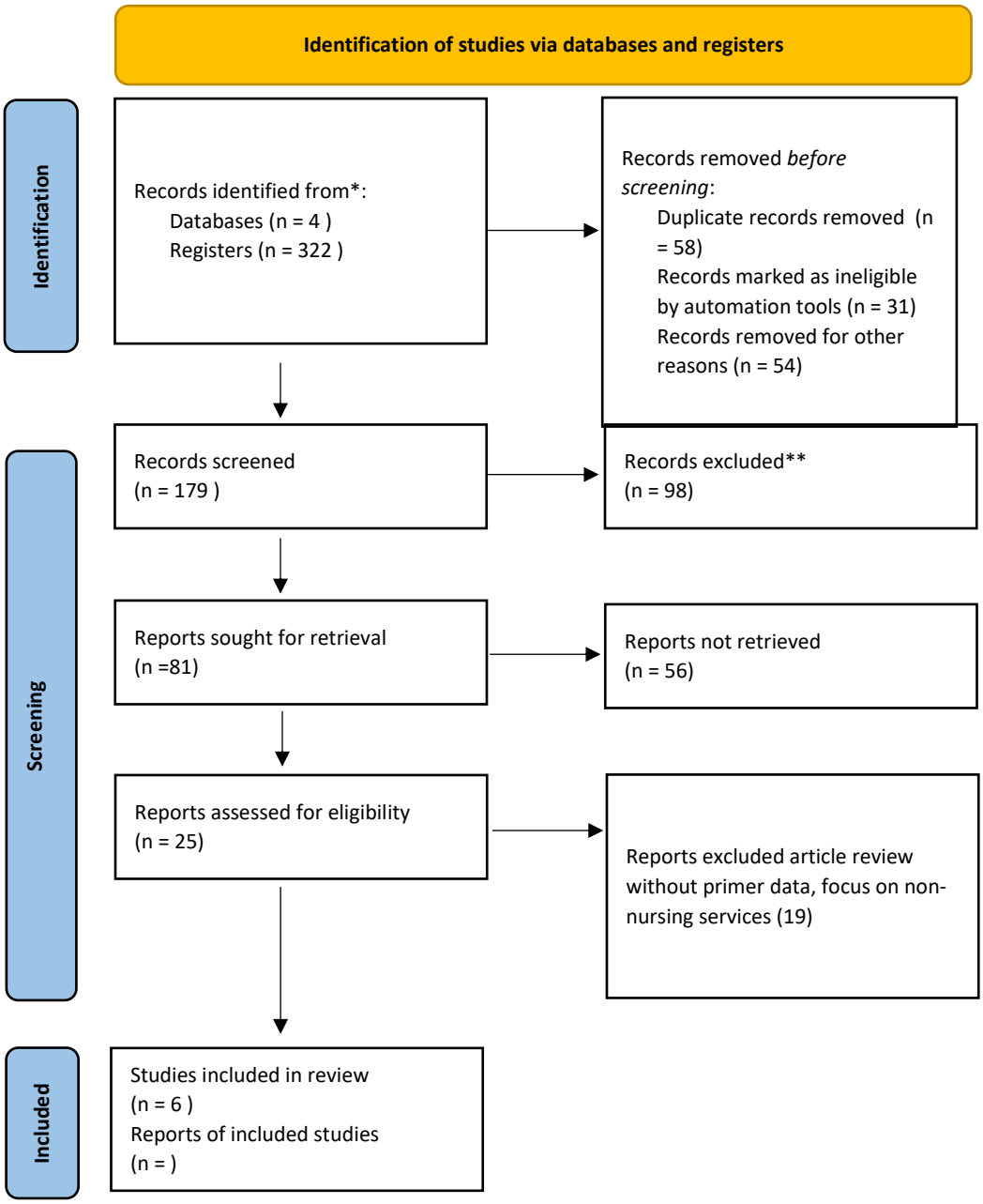

Figure 1. Literature review study selection process adapted from PRISMA (2020).

3. RESULTS

Based on the results of the literature study, 6 references were obtained that were relevant to the research topic to strengthen the validity of this study. The keywords used were "digital health", "maternity

nursing", "health technology" and Table 1 presents a review of several existing studies on digital health in maternity nursing in Indonesia.

Table 1. Use of digital health in maternity nursing services in Indonesia

No	Title	Aim	Methode	Results	Reference & Year
1	The Effect Of Whatsapp-Based Health Education On Pregnant Mothers' Motivation For Antenatal Care Visits: A Preexperimental Study In Buntut Bali Community Health Center[11]	To determine the effect of health education via WhatsApp on maternal motivation during pregnancy visits at the Buntut Bali Health Center.	Design: experiment with one group pre-test post-test design. Population: all pregnant women registered at the Buntut Bali Health Center in 2024 Sample of 30 samples. Instrument: adaptation instrument with product moment correlation validity test that has been declared valid and the statistical analysis used is the Wilcoxon Signed Rank Test.	There is an influence of health counseling via WhatsApp on mothers' motivation during pregnancy visits.	Metri Wiyayun, Meldawati Luthfia Hidayati Rahman (2025)
2	The Effect Of Augmented-Reality Media-Based Health Education On Healthy Lifestyle Knowledge,Attitude, And Healthy Lifestyle Behaviors Among Pregnant Women During Covid-19 Pandemic In Jakarta, Indonesia[12]	To examine the impact of using AR media on the knowledge, attitudes, and healthy living behavior of pregnant women during the COVID-19 pandemic.	Design : cohort-longitudinal Population and Sample: 86 pregnant women aged 18–45 years. The subjects of this study received health education intervention using AR media for 5 months.	The use of AR media in health education significantly increased the subject's score for healthy lifestyle knowledge and behavior. However, the subject's score for attitude did not increase significantly. The results of this study provide evidence of the importance of using AR media in health education for pregnant women during the COVID-19 pandemic.	Erry Y Mulyani, Idrus Jus'at and Sik Sumaedi (2023)
3	Interoperability of Health Digitalization: Case Study on Use of Information	To identify the various maternal and child health information systems used in Indonesia and	Design : descriptive qualitative conducted in Yogyakarta Province from November to December 2020. This	18 maternal and child health information systems have been developed by the government (central and regional), health	Lutfan Lazuardi, Guardian Yoki Sanjaya, Pungkas Bahjuri Ali, Renova Glorya Montesori Siahaan,Lia

	Technology for Maternal and Child Health Services in Indonesia[13]	opportunities for interoperability between systems to support continuity of care services.	study examines MCH applications that have been used in government and private primary health services, hospitals, health offices, and in the community by identifying functions and mapping data elements used by each application to assess the potential for interoperability between systems. Instruments: Online focus group discussions with various application providers were conducted to explore the challenges of interoperability between digital systems.	facilities, and the private sector. Interoperability initiation between systems has not yet occurred, except to support routine reporting at the health office and Ministry of Health levels. Interoperability between information systems requires efforts to improve information technology facilities and infrastructure, develop health data standards, strengthen governance and regulations, and utilize data as an effort to monitor, evaluate, and maintain interoperability between systems to support digitalization of services and routine reporting.	Achmad, Hanifah Wulandari (2021)
4	Postpartum Care Behavior Improvement During Covid-19 Pandemic In Indonesia Using Mobile-Health Interactive Message[14]	To determine the effectiveness of interactive mobile health messages on postpartum care behavior of mothers and husbands.	Design : Quasi-experimental, including treatment group and control group, Population and Sample: purposive sampling technique and each group consists of 46 pairs of pregnant women in the third trimester and their husbands. Instrument: interview and observation.	Mobile-Health interactive messaging effectively improves postpartum care behaviors for mothers and husbands.	Respati Wulandari, Agus Suwandono, Martha Irene Kartasurya, Sri Achadi Nugraheni (2022)

5	Development Of A Chatbot For Pregnant Women On A Posyandu Application In Indonesia: From Qualitative Approach To Decision Tree Method[15]	To obtain information from pregnant women and midwives in developing a decision tree model as material for making a semi-automatic chatbot.	Design: Qualitative exploratory approach, semi-structured interviews conducted through focus group discussions (FGD) Population and sample: Pregnant women (n=10) and midwives (n=12) in March 2022.	The results showed that there were 38 codes, 15 categories, and 7 subthemes that resulted in 3 main themes, namely maternal health education, maternal health service information, and health monitoring. The decision tree method was applied from these themes based on user needs, evidence, and expert sources to ensure quality. The need to use semi-automatic chatbots can be applied to maternal health education and monitoring, where severe cases should be given non-automatic communication with midwives. Applying the decision tree method ensures quality content, supports clinical decisions, and helps early detection. Furthermore, future research needs to measure user evaluations	Puspitasari, I.W.; Rinawan, F.R.; Purnama, W.G.; Susiarno, H.; Susanti, A.I (2022)
6	Health Workers Readiness for Implementation of a Mobile Pregnancy Monitoring System in Primary Health Care: A Cross-Sectional Study[16]	To describe factors related to the readiness of health workers in implementing the Mobile Pregnancy Monitoring System at Primary Health Care Facilities (FKTP) in South Tangerang Regency, Banten Province, Indonesia using	Design: cross-sectional survey used on respondents involved during the antenatal care process. Population and sample: Participants (n=210) Instrument: questionnaire measuring information needs regarding socio-technical aspects of readiness and	The majority of health workers involved in the antenatal care process are ready to implement a mobile pregnancy monitoring system. Having social media and willingness to be involved in IT implementation are related to IT readiness, while there is no significant relationship between demographic factors and health worker readiness. Because there is no	Sandra Hakiem Afrizal, Nashrul Hakiem, Amy Mardhatillah, Dini Oktarina Dwi Handayani (2022),

		a socio-technical approach.	factors influencing readiness. Data were analyzed using logistic regression analysis.	relationship between demographic factors and readiness, supporting factors such as having social media and willingness are related to the level of health worker readiness in implementing a mobile pregnancy monitoring system.	

The use of digital technology in the health sector has become a crucial innovation, especially in improving the quality of maternal and child health services (MCH). Globalization and advances in information and communication technology (ICT) have opened up great opportunities to optimize pregnancy monitoring, health education, and postpartum care, especially in developing countries like Indonesia. Various studies have shown that the implementation of interoperable digital systems can significantly improve the quality of services and facilitate data integration for monitoring and evaluating health service performance.[17].

One form of promising digital technology implementation is the use of mobile-based pregnancy monitoring (mHealth) systems. Readiness of health workers in implementing mobile pregnancy monitoring systems in primary health care facilities in South Tangerang, Banten. The results of this study indicate that the readiness of health workers, which includes socio-technical aspects, is an important factor in the successful adoption of mHealth technology. Alignment between technology, individuals, and organizations is key to ensuring that this system can function effectively and be accepted by its users [16].

In addition to monitoring systems, communication platforms such as WhatsApp have also proven effective in increasing the motivation of pregnant women to make antenatal care (ANC) visits. A pre-experimental study at the Buntut Bali Health Center found that WhatsApp-based health education had a positive impact on the motivation of pregnant women to make scheduled ANC visits [18]. This shows the great potential of social media as a tool for disseminating health information and reminders for examination schedules, which can increase the coverage of K1 and K4, as well as early detection of pregnancy complications [15].

Chatbot development is also an interesting innovation to provide relevant health information to pregnant women. Puspitasari et al. (2022) developed a chatbot for pregnant women on the Posyandu application in Indonesia, using a qualitative approach to the decision tree method. This chatbot can function as a virtual assistant that provides fast and accurate information on various aspects of pregnancy, which is very helpful in overcoming limited access to information and health workers, especially in remote areas [15].

In the context of postpartum care, the use of interactive messages based on mHealth has also shown a positive impact. increasing postpartum care behavior during the COVID-19 pandemic in Indonesia using interactive mHealth messages. The results showed that this intervention was able to increase positive postpartum maternal behavior, underlining the effectiveness of digital communication in supporting optimal health practices during critical times. Furthermore, Augmented Reality (AR) technology has also begun to be explored as a health education medium [12] meneliti efek edukasi kesehatan berbasis media Augmented Reality terhadap pengetahuan, sikap, dan perilaku gaya hidup sehat pada wanita hamil selama pandemi

COVID-19 di Jakarta. Penelitian ini menemukan bahwa media AR dapat secara signifikan meningkatkan pengetahuan dan sikap positif, yang pada gilirannya berkontribusi pada perubahan perilaku sehat. Hal ini menunjukkan bahwa media interaktif dan imersif dapat menjadi alat yang sangat ampuh dalam menyampaikan informasi kesehatan yang kompleks dan memotivasi perubahan perilaku [12]. Examined the effects of Augmented Reality media-based health education on knowledge, attitudes, and healthy lifestyle behaviors in pregnant women during the COVID-19 pandemic in Jakarta. This study found that AR media can significantly increase knowledge and positive attitudes, which in turn contribute to changes in healthy behavior. This suggests that interactive and immersive media can be a very powerful tool in conveying complex health information and motivating behavior change [12]. However, the challenge of interoperability of health information systems remains a major concern. Interoperability is important in health digitalization, especially for KIA services in Indonesia. Fragmented systems can hinder data integration, complicate comprehensive monitoring, and reduce service efficiency. Therefore, the development of interoperability standards such as FHIR (Fast Healthcare Interoperability Resources) is essential to ensure that multiple systems can communicate and share data seamlessly, thereby creating an integrated and efficient digital health ecosystem[13].

Overall, this literature review underscores the integral role of digital technologies in advancing maternal and child health services in Indonesia. From the readiness of health workers, the use of messaging applications, chatbots, to interactive educational media and system interoperability, each aspect contributes to improving the quality and accessibility of maternal and child health services. The sustainability of innovation and implementation of these technologies, supported by strong policies and adequate infrastructure, will be critical to achieving sustainable health goals.

4. CONCLUSIONS

Literature shows that digital health in maternity nursing in Indonesia has positive outcomes in improving access, education, and health decision-making in mothers and children. However, challenges of infrastructure, funding, and digital inequality must be addressed through cross-sectoral policies and evidence-based strategies.

ACKNOWLEDGEMENTS

The researcher would like to thank all innovators in the health sector and previous researchers for their contribution to nursing services, especially maternity nursing.

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