

# Midwives Readiness Factors in Maintaining Patient Confidentiality in the Digital Medical Record Era

## *Faktor Kesiapan Bidan dalam Menjaga Kerahasiaan Pasien di Era Rekam Medis Digital*

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### ABSTRACT

**Background:** The digitalization of medical records in healthcare systems created new challenges in maintaining patient information confidentiality, particularly in midwifery practice. The transition from manual to electronic systems required midwives' readiness to understand and implement confidentiality ethics in accordance with digital technology developments.

**Objective:** This research aimed to analyze the factors that influence midwives' readiness in upholding patient confidentiality ethics in the era of medical record digitalization.

**Methods:** The research employed a cross-sectional design with a sample of 150 midwives. Data collection was conducted through structured questionnaires measuring variables of data protection regulation knowledge, digital competence, confidentiality ethics knowledge, and attitudes toward digitalization. Data were analyzed using multiple regression.

**Results:** Regression analysis showed the research model explained 52.9% of variation in midwives' readiness to uphold confidentiality ethics. Three variables had significant influence: knowledge of data protection regulations (coefficient=0.316;  $p=0.001$ ), digital competence (coefficient=0.131;  $p=0.001$ ), and knowledge of confidentiality ethics (coefficient=0.084;  $p=0.027$ ). Attitude toward digitalization did not have a significant effect.

**Conclusion:** Midwives' readiness in upholding patient confidentiality ethics in the digital era was influenced by mastery of data protection regulations, digital competence, and understanding of confidentiality ethics. This research was beneficial for developing strategies to enhance midwives' competencies in facing healthcare system digitalization.

**Keywords:** Midwifery; Confidentiality Ethics; EMR; Digital Competence; Health Data Protection

### ABSTRAK

**Latar Belakang:** Digitalisasi rekam medis dalam sistem pelayanan kesehatan menimbulkan tantangan baru dalam menjaga kerahasiaan informasi pasien, khususnya pada praktik kebidanan. Perubahan dari sistem manual ke elektronik memerlukan kesiapan bidan untuk memahami dan menerapkan etika kerahasiaan sesuai perkembangan teknologi digital.

**Tujuan:** Penelitian ini bertujuan untuk menganalisis faktor-faktor yang mempengaruhi kesiapan bidan dalam menjunjung tinggi etika kerahasiaan pasien di era digitalisasi rekam medis.

**Metode:** Penelitian menggunakan desain cross-sectional dengan sampel 150 bidan. Pengumpulan data dilakukan melalui kuesioner terstruktur untuk mengukur variabel pengetahuan regulasi perlindungan data, kompetensi digital, pengetahuan etika kerahasiaan, dan sikap terhadap digitalisasi. Data dianalisis menggunakan regresi berganda.

**Hasil:** Analisis regresi menunjukkan model penelitian mampu menjelaskan 52,9% variasi kesiapan bidan dalam menjunjung tinggi etika kerahasiaan. Tiga variabel berpengaruh signifikan: pengetahuan regulasi perlindungan data (koefisien=0,316;  $p=0,001$ ), kompetensi digital (koefisien=0,131;  $p=0,001$ ), dan pengetahuan etika kerahasiaan (koefisien=0,084;  $p=0,027$ ). Sikap terhadap digitalisasi tidak berpengaruh signifikan.

**Kesimpulan:** Kesiapan bidan dalam menjunjung tinggi etika kerahasiaan pasien di era digital dipengaruhi oleh penguasaan regulasi perlindungan data, kompetensi digital, dan pemahaman etika kerahasiaan. Penelitian ini bermanfaat untuk pengembangan strategi peningkatan kompetensi bidan menghadapi digitalisasi sistem kesehatan.

**Kata Kunci:** Kebidanan; Etika Kerahasiaan; RME; Kompetensi Digital; Perlindungan

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## INTRODUCTION

The digitalization era fundamentally changed the healthcare service landscape in Indonesia, including midwifery practices which underwent significant transformation from conventional medical recording to electronic systems. The implementation of Electronic Medical Records (EMR) in Indonesia gained momentum following the issuance of the Minister of Health Regulation No. 24 of 2022 concerning the National e-Health Strategy, which made medical record digitalization a priority in national health system reform (Sutha et al., 2025).

Although EMR offered various advantages such as data storage efficiency, ease of access, and improved healthcare coordination, its implementation in Indonesian midwifery service facilities remained uneven with adoption rates varying between urban and rural areas. Ministry of Health data from 2023 showed that only 42% of midwifery service facilities in Indonesia had adopted electronic medical record systems, with significant disparities between the Java-Bali region (63%) and Eastern Indonesia (21%) (Abore et al., 2022).

This digital transition created new challenges related to patient data confidentiality and security that required midwives' readiness in maintaining patient confidentiality ethics. Patient information confidentiality was a fundamental aspect of midwifery services guaranteed by the Indonesian Midwives Code of Ethics and Law No. 36 of 2014 concerning Health Workers. In midwifery practice, midwives had access to sensitive patient information related to reproductive health, pregnancy, and childbirth that needed to be kept confidential (Durmus Iskender & Durmuş, 2022).

Medical record digitalization, despite improving efficiency, also created new vulnerabilities to privacy violations, such as risks of data leakage, unauthorized

access, and cyber security threats that could endanger patient information confidentiality. The complexity of EMR systems without adequate training could cause data management errors and increase the risk of information security breaches (Sudirahayu & Harjoko, 2017).

The National Cyber and Encryption Agency (BSSN) report in 2023 recorded a 47% increase in health data security breach cases in Indonesia compared to the previous year, with 12% involving data in midwifery service facilities (Hailegebreal et al., 2023). This phenomenon emphasized the importance of research on midwives' readiness in maintaining patient information confidentiality in the digital era. There were significant research gaps in the literature regarding Indonesian midwives' readiness to face digital transition.

He et al. (2025) and Indana et al. (2024) explored factors that influenced EMR adoption among health workers, but did not consider Indonesia's unique socio-cultural context and technological infrastructure. Previous studies in Indonesia by Laurenxius et al. (2025) and Mensah (2024) focused more on the technical implementation of EMR in general hospitals, but had not specifically examined the ethical dimensions of EMR use in midwifery practice.

Research gaps were also evident in the limited studies on the interaction between ethical knowledge factors, digital literacy, and attitudes toward technology among Indonesian midwives. Research by Mollart et al. (2023) found that 68% of midwives in Central Java reported a lack of formal training on ethical aspects of digital patient data management (Susanti et al., 2022).

Research on Indonesian midwives' readiness to face medical record digitalization remained limited. International studies had not considered Indonesia's unique context. Previous

research focused more on technical implementation in hospitals, rather than ethical aspects in midwifery practice. Studies on the relationship between ethical knowledge, digital literacy, and attitudes toward technology among midwives were minimal (Setiatin & Agustin, 2019; Sudirahayu & Harjoko, 2017; Yoga et al., 2021).

Indonesia faced specific challenges in transitioning to electronic medical records. The main issues included limited internet access in remote areas, digital gaps between generations, and lack of digital ethics training. Health workers also experienced obstacles due to limited computer skills and poor understanding of EMR benefits (Lakhmudien et al., 2023). Research on the readiness of health workers in hospital facilities remained very limited (Eka Siti Hastuti et al., 2023; Widayanti et al., 2023).

This study aimed to analyze factors that influenced midwives' readiness in maintaining patient confidentiality ethics in the era of medical record digitalization in Indonesia. Specifically, this study aimed to: (1) identify the relationship between knowledge of confidentiality ethics and midwives' readiness; (2) analyze the influence of knowledge about data protection regulations on midwives' readiness; (3) evaluate the impact of digital competence in the use of electronic medical records; and (4) examine the relationship between attitudes toward medical record digitalization and midwives' readiness in maintaining patient confidentiality.

The results of this study were expected to provide empirical foundations for developing national policies on midwifery service digitalization, reorienting educational curricula, and designing continuous training programs focusing on digital ethics in midwifery practice in Indonesia.

## MATERIALS AND METHODS

### A. Research Design

This study used a quantitative design with a cross-sectional approach to analyze factors affecting midwives' readiness in maintaining patient confidentiality ethics in the era of medical record digitalization. The study was conducted during April-June 2024 in 10 primary healthcare centers and 3 hospitals in Bandung City. This research received ethical approval from the Health Research Ethics Committee of Politeknik TEDC Bandung with number 01PKE-010424 and applied research ethics principles including respect for persons, beneficence, non-maleficence, and justice.

### B. Population and Sample

The research sample consisted of 150 midwives who were selected using purposive sampling with criteria of working in healthcare facilities that had implemented electronic medical records for at least one year. The sample size was determined based on G\*Power 3.1 power analysis (effect size  $f^2 = 0.15$ ,  $\alpha = 0.05$ , power = 0.90, predictors = 4) which yielded a minimum of 129 respondents, plus 16% anticipation for non-response rate. The response rate reached 97.4% (150 out of 154 invited midwives).

### C. Research Instruments

The research instrument consisted of structured questionnaires developed through adaptation from the Healthcare Professional's Privacy and Security Readiness Assessment Tool for knowledge and readiness domains, and the Digital Competence Framework for Healthcare Professionals for the digital competence domain. The instrument adaptation process included forward-backward translation, adjustment to the Indonesian midwifery context, language validation, and pilot testing on a small group.

The questionnaire consisted of six sections: demographic characteristics, knowledge of confidentiality ethics (10 items), knowledge of data protection

regulations (10 items), digital competence in electronic medical records usage (10 items), attitudes toward medical record digitalization (10 items), and midwives' readiness (10 items). Variable measurement used a Likert scale with a range of 1-10. Content validity testing was conducted by three experts with a Content Validity Index (CVI) result of 0.87. Reliability testing using Cronbach's alpha showed all instruments had good reliability ( $\alpha > 0.7$ ).

#### D. Data Analysis Technique

Data analysis used descriptive and inferential statistics. Classical assumption tests showed the data met the requirements for regression analysis. Multiple linear regression analysis yielded the equation: Midwives' Readiness =  $3.163 + 0.084$  Ethics Knowledge +  $0.316$  Regulatory Knowledge +  $0.131$  Digital Competence +  $0.065$  Attitude. The F test results showed a significant model ( $p = 0.000 < 0.05$ ) with a determination coefficient of 52.9%. The t-test showed that ethics knowledge ( $p = 0.027$ ), regulatory knowledge ( $p = 0.001$ ), and digital competence ( $p = 0.001$ ) significantly influenced midwives' readiness, while attitudes toward digitalization had no significant effect ( $p = 0.401$ ).

## RESULT AND DISCUSSION

### A. Result

#### 1. Respondent Demographics

Demographic analysis was conducted to provide a profile of research respondents based on specific characteristics such as age, education, and occupation. Table 1 showed that all respondents were female (150 respondents; 100%). Based on age, the majority of

respondents were 35-39 years old (90 respondents; 60%), while the smallest group was 40-45 years old (10 respondents; 6.7%). In terms of education, most respondents were Diploma in Midwifery graduates (90 respondents; 60%), while the remainder were Professional Midwife graduates (60 respondents; 40%). Regarding work experience, the majority of respondents had more than 5 years of experience (85 respondents; 56.7%), while the smallest group had 1-5 years of experience (29 respondents; 19.3%).

**Table 1. Respondent Demographics**

No	Characteristic	Item	Frequency	Percentage
1	Gender	Male	0	0%
		Female	150	100%
2	Age	25-29 years	28	18.7%
		30-34 years	22	14.7%
		35-39 years	90	60%
		40-45 years	10	6.7%
3	Education	Diploma in Midwifery	90	60%
		Professional Midwife	60	40%
4	Experience	< 1 year	36	24%
		1-5 years	29	19.3%
		> 5 years	85	56.7%
5	Midwives' Readiness	Low	7	5%
		Moderate	45	30%
		High	98	65%
Total			150	100%

#### 2. Descriptive Statistics

Table 2 showed that the midwives' readiness variable had the highest mean (7.63), followed by the knowledge of data protection regulations variable (7.61).

**Table 2. Descriptive Statistics**

No	Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
1	Knowledge of Confidentiality Ethics	150	4.00	10.00	70.600	139.139

	Knowledge of Data Protection Regulations					
2		150	5.00	10.00	76.133	122.495
	Digital Competence in Electronic Medical Records Usage					
3		150	3.00	10.00	74.333	148.105
	Attitudes Toward Medical Record Digitalization					
4		150	3.00	10.00	75.800	136.726
5	Midwives' Readiness	150	5.00	10.00	76.333	121.742
Valid N (listwise)		150				

### 3. Classical Assumption Tests

The Kolmogorov-Smirnov normality test yielded a significance value of 0.200 (>0.05), indicating that the residual data were normally distributed. The multicollinearity test showed that all variables had VIF values below 10 (1.539-

1.891) and Tolerance values above 0.1, indicating no significant multicollinearity. The heteroscedasticity test using the Glejser method showed that all variables had significance values above 0.05, meaning there was no heteroscedasticity.

### 4. Multiple Linear Regression Analysis

Table 3. Multiple Regression Analysis Results

No	Model	B	Std. Error	Beta	t	Sig.	F	Sig. F	R <sup>2</sup>
	(Constant)	3.163	.601		5.267	.000	14.964	.000	.529
1	Knowledge of Ethics	.084	.076	.096	2.585	.027			
2	Knowledge of Regulations	.316	.095	.318	3.314	.001			
3	Digital Competence	.131	.078	.159	3.681	.001			
4	Attitude Toward Digitalization	.065	.078	.074	.843	.401			

Regression equation: Midwives' Readiness = 3.163 + 0.084, Knowledge of Ethics + 0.316, Knowledge of Regulations + 0.131, Digital Competence + 0.065, Attitude Toward Digitalization.

## B. Discussion

### 1. Relationship between Knowledge of Confidentiality Ethics and Midwives' Readiness

The study results showed that knowledge of confidentiality ethics had a positive and significant effect on midwives' readiness (p-value = 0.027 < 0.05). The regression coefficient value of 0.084 indicated that each one-unit increase in knowledge of confidentiality ethics increased midwives' readiness by 0.084 units. These findings suggested that midwives with a better understanding of confidentiality ethical principles tended to be more prepared in carrying out their

professional practice in the era of medical record digitalization.

Knowledge of confidentiality ethics constituted an important foundation for professional midwifery practice, especially in the context of increasing use of digital technology. Recent research by [Mollart et al. \(2023\)](#) stated that comprehensive ethical knowledge became a key factor in maintaining patient information confidentiality in an increasingly complex digital health ecosystem. They emphasized that healthcare workers with strong confidentiality ethics understanding were more likely to adopt strict data security protocols in daily practice.



When midwives understood the basic principles of confidentiality ethics, they could identify potential privacy violation risks and develop effective mitigation strategies. Demographic data showed that the majority of respondents (56.7%) had work experience of more than 5 years, which might have contributed to good levels of confidentiality ethics knowledge. Long-term practical experience provided opportunities for midwives to face various ethical situations and deepen their understanding of patient confidentiality through experiential learning.

This aligned with research by [Siswati et al. \(2024\)](#) which showed that healthcare workers with longer working periods had a better understanding of medical record systems and their challenges, including data confidentiality aspects. The study also identified that work experience significantly influenced healthcare workers' readiness in implementing digital systems, showing a positive correlation between length of work experience and level of professional understanding among healthcare workers.

## **2. Influence of Knowledge about Data Protection Regulations on Midwives' Readiness**

Knowledge of data protection regulations had a positive and significant effect on midwives' readiness with a p-value of 0.001 ( $< 0.05$ ) and a regression coefficient of 0.316. These results showed that knowledge of data protection regulations had the strongest influence compared to other independent variables in the research model. Each one-unit increase in knowledge of data protection regulations increased midwives' readiness by 0.316 units.

Regulations such as GDPR in Europe or the PDP Law in Indonesia created standards that must be understood and complied with by healthcare professionals, including midwives. Descriptive statistics

showed an average value of knowledge about data protection regulations of 7.61 with a standard deviation of 1.22, indicating a fairly good level of knowledge among respondents.

[Eka Siti Hastuti et al. \(2023\)](#) identified that education level influenced understanding of regulations in electronic medical record system implementation, which aligned with the finding that 40% of respondents had educational backgrounds in Midwifery Profession that might include more comprehensive training on legal and regulatory aspects compared to D3 Midwifery graduates.

[Widayanti et al. \(2023\)](#) also emphasized that readiness in transitioning from conventional to electronic medical records required comprehensive understanding of regulations and policies, supporting the importance of continuing education on legal aspects in digital transformation of healthcare systems.

## **3. Impact of Digital Competence in Electronic Medical Records Usage on Midwives' Readiness**

The analysis results showed that digital competence in electronic medical records usage had a positive and significant effect on midwives' readiness (p-value = 0.001  $< 0.05$ ) with a regression coefficient of 0.131. This indicated that midwives with better digital skills tended to be more ready in carrying out their professional practice in the era of medical record digitalization. Digital competence had become a fundamental need for healthcare professionals in the era of healthcare service digitalization.

Research showed that information technology skills were a crucial factor in EMR implementation. [Kumar et al. \(2022\)](#) identified that healthcare workers' lack of computer skills and knowledge about EMR benefits became the main barriers to implementation readiness in primary healthcare facilities. This aligned with findings by [Essuman et al. \(2020\)](#) which

emphasized that technological competence affected the level of EMR utilization in Ghana.

Regarding data security aspects, [Ajami & Bagheri-Tadi \(2013\)](#) revealed that concerns about patient data privacy and security became one of the significant barriers in EMR adoption by healthcare workers. Research by [Wubante et al. \(2023\)](#) further showed that healthcare workers' understanding of electronic system security positively correlated with their readiness to implement EMR.

[Dutta & Hwang \(2020\)](#) found that EMR system complexity and lack of adequate training, including data security training, caused low system adoption. They emphasized the importance of comprehensive training that included not only technical skills but also understanding of data security and privacy protocols.

Descriptive statistics showed an average digital competence value of 7.43 with a standard deviation of 1.48 and a minimum value of 3, indicating a digital competence gap among respondents. This became an important concern considering the majority of respondents (60%) were between 35-39 years old, who might have varied levels of technology adaptation.

#### **4. Relationship between Attitudes toward Medical Record Digitalization and Midwives' Readiness**

This study found that attitudes toward medical record digitalization had a positive but non-significant effect on midwives' readiness ( $p\text{-value} = 0.401 > 0.05$ ) with a regression coefficient of 0.065. These results indicated that although positive attitudes toward medical record digitalization contributed to midwives' readiness, their influence was not strong enough to be considered statistically significant.

These findings aligned with [Rasmi et al. \(2020\)](#) who found that positive attitudes toward digital health technology did not

always translate into actual practice if not supported by technical knowledge and supportive organizational environment. In their study on EMR system acceptance in Jordan, they found that although 70% of healthcare workers had positive attitudes, only 48% actually used the system optimally due to lack of technical and organizational support.

Similarly, [Ngusie et al. \(2022\)](#) found that attitudes toward digital technology in healthcare required support from external factors such as infrastructure and institutional policies to significantly impact professional behavior change. They identified that healthcare workers' readiness in the pre-implementation phase was strongly influenced by the availability of technological infrastructure and organizational management support.

Descriptive statistics showed an average value of attitudes toward medical record digitalization of 7.58 with a standard deviation of 1.36, showing generally positive attitudes among respondents. However, this variability in attitudes did not significantly affect midwives' readiness. This might be because other factors such as knowledge of data protection regulations and digital competence had more dominant influences, as confirmed by recent studies.

#### **5. Research Results Synthesis**

Overall, the research model was able to explain 52.9% of variation in midwives' readiness (Adjusted  $R^2 = 0.529$ ), showing that the four independent variables studied were fairly strong predictors for midwives' readiness in maintaining patient confidentiality ethics in the era of medical record digitalization. Knowledge of data protection regulations emerged as the most influential factor, followed by digital competence and knowledge of confidentiality ethics, while attitudes toward medical record digitalization had a non-significant influence.

These findings aligned with the theoretical framework developed by Oo et al. (2021) which emphasized the importance of integrating information and communication technology literacy, knowledge, and system readiness in preparing healthcare workers for the digital health era. Their study in Myanmar found that higher education levels positively correlated with healthcare workers' ability to integrate electronic medical record technology into clinical practice.

Furthermore, these results strengthened the argument from Ngusie et al. (2022) that healthcare professional education needed to develop curricula that included technical and organizational aspects of digital health technology. Their cross-sectional research during the pre-implementation phase showed that healthcare workers' readiness was strongly influenced by infrastructure support and institutional policies.

## 6. Practical Implications

The findings regarding factors affecting midwives' readiness in upholding patient confidentiality ethics in the medical record digitalization era provided several significant practical implications. Knowledge of data protection regulations, which emerged as the most influential factor, indicated a gap in understanding among midwifery professionals regarding the legal aspects of health data management.

This finding suggested that midwifery education institutions needed to reevaluate their emphasis on regulatory content in their curricula. Meanwhile, the significant influence of digital competence reflected the complexity of transitioning from manual to electronic systems in patient information management. This paradigm shift created adaptation challenges for midwives who had long practiced with conventional systems.

Another implication that needed attention was the gap between theory and practice in applying patient confidentiality principles in digital environments. Although the basic concepts of confidentiality were well understood, their application in the context of current technology was often suboptimal. This gap could be explained by the rapid development of health technology that outpaced the speed of educational curriculum updates.

As a result, new midwifery graduates might have had strong theoretical understanding but lacked practical experience in managing ethical dilemmas in digital environments. Additionally, variations in midwives' readiness levels based on demographic characteristics and work experience indicated the need for a more personal and contextual approach in developing digital competencies for midwifery personnel.

Another important implication related to the need for organizational culture transformation in healthcare facilities. The research findings showed that individual midwives' readiness could not be separated from the organizational ecosystem where they worked. Healthcare facilities that had not prioritized data security and privacy protection in their organizational strategies tended to have healthcare workers with lower levels of readiness, regardless of their individual competencies.

This indicated that a systemic approach was needed to support midwives' readiness, not only through individual capacity building but also through organizational culture and infrastructure transformation.

Based on these practical implications, several specific and measurable recommendations could be formulated for midwifery education and clinical practice. In the context of midwifery education, educational institutions needed to conduct



comprehensive curriculum revisions by integrating 40-hour digital ethics learning modules that specifically addressed patient confidentiality in electronic environments.

These modules should have included current regulatory aspects, interactive case studies, and simulations of data confidentiality breach incident handling. Each midwifery education institution needed to organize at least two annual workshops involving cybersecurity and health law experts to ensure learning materials remained relevant to current technological developments and regulations. Educational institutions were also recommended to develop electronic medical record simulation laboratories that allowed midwifery students to practice data protection skills in a controlled environment before entering the workforce.

Evaluation of students' understanding of digital ethics needed to be conducted through comprehensive examinations that not only measured theoretical knowledge but also application abilities in complex clinical scenarios. Formal collaboration between midwifery education institutions and healthcare technology providers was also highly recommended to facilitate knowledge transfer and student exposure to systems used in actual practice.

For clinical practice, healthcare facilities needed to develop specialized orientation programs of at least 16 hours for new midwives that focused on electronic data confidentiality protocols applicable in that institution. Continuous training programs with recertification every two years should have been required for all midwifery personnel to ensure their knowledge remained up-to-date. Healthcare facilities were also recommended to form multidisciplinary data security teams involving representatives from the midwifery division, with monthly regular meetings to

evaluate and improve data security protocols.

At the policy level, midwifery professional organizations needed to develop evidence-based practice guidelines specifically on patient confidentiality management in the digital era, updated every two years according to technological developments. Digital competence certification could be integrated as a mandatory component in the registration and re-registration process for midwifery practice licenses. Structural mentoring programs connecting experienced senior midwives with junior midwives in electronic patient information management could also bridge the generational gap in technology adaptation.

From a professional development perspective, midwives needed to allocate a minimum of 10 hours of annual continuing education credits specifically for data security and patient confidentiality topics. E-learning platforms with interactive modules on digital ethics cases needed to be developed and made accessible to midwives in various geographical areas. Professional organizations could organize annual conferences specifically discussing challenges and innovations in maintaining patient confidentiality in the digitalization era, as well as providing awards for best practices in digital ethics implementation in midwifery.

Implementation of these recommendations required close collaboration between educational institutions, healthcare facilities, professional organizations, and policy stakeholders. Continuous evaluation of intervention effectiveness was also necessary to ensure the relevance and sustainability of efforts to improve midwives' readiness in upholding patient confidentiality ethics in the medical record digitalization era.

With a comprehensive and measurable approach, midwifery

professionals would be better prepared to face ethical challenges in an increasingly digital healthcare environment while maintaining the core values of patient-centered midwifery care.

### 7. Research Limitations

This study had several limitations that should be considered when interpreting the results.

First, this study used a cross-sectional design, which could not definitively establish causal relationships between independent variables and midwives' readiness. Future longitudinal studies were needed to better understand how changes in midwives' knowledge and competencies affected their readiness over time, especially as technology and regulations continued to evolve.

Second, this study relied on self-report instruments to measure research variables, which could have introduced socially desirable response bias. Objective measurements of digital competence, such as performance tests or simulations, could provide more accurate assessments in future research. This limitation was also identified in similar research on digital competence among healthcare workers.

Third, although the sample size was adequate for statistical analysis, the geographical distribution of respondents might not have represented the entire population of midwives in Indonesia, especially those working in remote areas with limited digital infrastructure. Perspectives from midwives working in various geographical and socioeconomic contexts would provide a more

comprehensive understanding of the factors affecting their readiness in the era of medical record digitalization.

Finally, this study did not account for external factors such as managerial support, technological infrastructure, and organizational culture that could affect midwives' readiness. This highlighted the importance of these contextual factors in facilitating the adoption of digitally-based practices among healthcare professionals.

## CONCLUSION

This study successfully identified key factors that influenced midwives' readiness in upholding patient confidentiality ethics in the medical record digitalization era, with knowledge of data protection regulations, digital competence, and understanding of confidentiality ethics as significant determinants. The research objective was achieved by analyzing the contribution of each factor, producing a robust predictive model of priority variables to enhance midwives' readiness in the digital era. These findings contributed to the development of midwifery education policies through recommendations for integrating digital ethics and cybersecurity curricula, providing a foundation for targeted continuing training programs, as well as enriching the literature on health profession adaptation to digital technology and opening opportunities for further research to understand the dynamics of digital transformation in midwifery services.

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