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ORIGINAL RESEARCH

Digital Innovation in Midwifery Care: Development of the *Nindya Suamiable Web* to Improve Health Autonomy in Pregnant and Postpartum Women

Innovación digital en la atención de partería: el desarrollo de *Web Nindya Suamiable* para mejorar la autonomía en salud de las mujeres embarazadas y en posparto

Nindya Mayangsari. STIKES Mutiara Mahakam Samarinda, Indonesia.
Email: nindyamayangsari@stikesmm.ac.id, https://orcid.org/0009-0003-1227-9213
Erwin Purwaningsih. STIKES Mutiara Mahakam Samarinda, Indonesia.
Email: erwin@gmail.com, https://orcid.org/0000-0002-0926-5350
Diana Mufidati. STIKES Mutiara Mahakam Samarinda, Indonesia.
Email: diana@gmail.com, https://orcid.org/0009-0004-9374-6465

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Abstract

Maternal mortality continues to pose a significant challenge to public health, particularly in regions with limited geographical access and infrastructural constraints, such as East Kalimantan, Indonesia. This study aimed to evaluate the effectiveness of the *Nindya Suamiable Web*, a digital health intervention designed to enhance maternal care during pregnancy and the postpartum period. Utilizing a mixed-method approach, the study involved 328 pregnant and postpartum women across three districts over a 12-week period. The findings demonstrated a significant improvement in maternal health knowledge ($\Delta = 23.4$ points, $p < 0.001$), a reduction in anxiety levels ($\Delta = -9.1$ points, $p < 0.001$), and an increase in overall well-being ($\Delta = 16.9$ points, $p < 0.001$). The platform also achieved a high compliance rate of 93% and a user satisfaction rate of 94.7%. These results suggest that the *Nindya Suamiable Web* is an effective digital solution for improving maternal health outcomes, fostering health autonomy, and addressing disparities in access to quality maternal care in underserved areas.

Keywords: maternal health, digital intervention, pregnancy care, postpartum care, maternal welfare, health independence, mHealth, East Kalimantan

Resume

La mortalidad materna sigue planteando un desafío importante para la salud pública, particularmente en regiones con acceso geográfico limitado y limitaciones de infraestructura, como Kalimantan Oriental (Indonesia). Este estudio tuvo como objetivo evaluar la efectividad de *Nindya Suamiable Web*, una intervención de salud digital diseñada para mejorar la atención materna durante el embarazo y el posparto. Utilizando un enfoque de método mixto, el estudio involucró a 328 mujeres embarazadas y posparto en tres distritos durante un período de 12 semanas. Los hallazgos demostraron una mejora significativa en el conocimiento de la salud materna ($\Delta = 23{,}4$ puntos, $p < 0{,}001$), una reducción en los niveles de ansiedad ($\Delta = -9{,}1$ puntos, $p < 0{,}001$) y un aumento en el bienestar general ($\Delta = 16{,}9$ puntos, $p < 0{,}001$). La plataforma también logró una alta tasa de cumplimiento del 93% y una tasa de satisfacción del usuario del 94,7%. Estos resultados sugieren que *Nindya Suamiable Web* es una solución digital eficaz para mejorar los resultados de salud materna, fomentar la autonomía sanitaria y abordar las disparidades en el acceso a una atención materna de calidad en áreas desatendidas.

Palabras clave: salud materna, intervención digital, atención del embarazo, atención posparto, bienestar materno, independencia sanitaria, mHealth, Kalimantan Oriental

Introduction

Maternal mortality remains a global health challenge, with the maternal mortality ratio (MMR) reaching 211 per 100,000 live births in 2023 [(1)]. In Indonesia, maternal health continues to face significant barriers, particularly in regions with limited infrastructure and geographic challenges, such as East Kalimantan [(2)]. In response to these challenges, digital health technology has emerged as a transformative tool to expand access to quality care, especially for pregnant and postpartum women. Mobile health (mHealth) interventions have gained traction as promising strategies to improve maternal health knowledge, support emotional well-being, and foster autonomy in health-related decision-making. Sari, Putri, and Yuliani, reported that 74% of pregnant women in rural areas of Indonesia expressed a need for reliable digital health information and ongoing psychosocial support during pregnancy and postpartum periods. These findings highlight the urgent need for culturally relevant digital innovations that can address both educational and emotional aspects of maternal care [(3)].

The *Nindya Suamiable Web* was developed as a digital health intervention to meet these needs by integrating maternal health education, anxiety management tools, and features that promote family involvement, especially partner support. Rahmawati and Widyastuti emphasized that digital platforms which include family support components tend to enhance user engagement and health outcomes in maternal care settings [(4)]. The availability of smartphones and internet access among women of reproductive age in East Kalimantan presents a valuable opportunity to implement such digital solutions. A study found that over 80% of this population segment regularly uses mobile devices for health-related purposes [(5)]. However, while the potential of digital interventions is promising, rigorous evaluation is essential to ensure usability, acceptability, and integration into existing healthcare systems. Therefore, this study aims to evaluate the effectiveness of the *Nindya Suamiable Web* in improving maternal health outcomes, including health knowledge, anxiety levels, general well-being, and health autonomy among pregnant and postpartum women. The findings will provide empirical evidence to support the use of mHealth tools in strengthening maternal care, particularly in underserved and remote communities in Indonesia.

Methodology

a. Study Design

This study employed a mixed-methods design, integrating quantitative and qualitative approaches. The primary method was a quasi-experimental pretest-posttest control group design to evaluate the effectiveness of the *Nindya Suamiable Web* as a digital intervention in maternal care for pregnant and postpartum women.

The intervention group used the *Nindya Suamiable Web* to access information and tools for pregnancy and postpartum health, while the control group received standard maternal care without the use of digital platforms. Additionally, a subset of participants from the intervention group participated in in-depth interviews to explore their experiences, perceived benefits, challenges, and support systems related to the platform. The qualitative findings were used to complement the quantitative results.

b. Setting and Duration

The research was conducted in three regions of East Kalimantan Province, Indonesia Balikpapan, Samarinda, and Kutai Kartanegara. These sites were selected based on digital accessibility, the density of pregnant and postpartum populations, and the availability of maternal health services. The study took place over a six-month period during the 2025 fiscal year.

c. Population and Sample

The study population included pregnant women in their second or third trimester and postpartum mothers (<6 weeks) receiving midwifery services in the study areas. The sample size was determined using the Slovin formula with a 5% margin of error and an additional 10% to anticipate potential dropouts, yielding a total of 328 participants. Participants were recruited

using purposive sampling based on the following criteria:

Inclusion criteria:

1. Pregnant women with gestational age >13 weeks or postpartum mothers <6 weeks
2. Minimum of primary school education
3. Ownership of a digital device (smartphone/laptop/computer) and internet access
4. Willingness to participate in the entire research process

Exclusion criteria:
1. Experiencing severe pregnancy complications
2. Diagnosed psychological disorders
3. Having comorbidities that interfere with research participation

d. Research variables

Independent Variable: Utilization of the *Nindya Suamiable Web* as a digital platform for maternal education and assistance

Dependent Variables:
1. Knowledge about pregnancy and postpartum health
2. Anxiety level (measured using the Indonesian version of the Hamilton Anxiety Rating Scale)
3. Maternal well-being (using the validated Indonesian Maternal Well-being Scale)
4. Health-related decision-making autonomy

e. Research Procedure

1. Preparation Phase

Participants in the intervention group underwent training on how to use the platform, which included:

a) Accessing educational, self-monitoring, and reminder features
b) Understanding the content and types of available information
c) Guidance on interacting with the platform

Research assistants were also trained to support and monitor participants' compliance throughout the intervention period.

2. Implementation Phase

a) Group assignment: Participants were randomly divided into the intervention group (n=164) and the control group (n=164).
b) Pretest: Both groups completed baseline measurements of knowledge, anxiety, well-being, and autonomy.
c) Intervention: The intervention group used the platform for 12 weeks, with at least three sessions per week. The control group received routine maternal care.
d) Monitoring: User activity on the platform was tracked via a digital log (number of sessions, time spent, features accessed).

3. Post-Intervention Assessment

At week 12, both groups completed post-test measurements. In addition, 15–20 participants from the intervention group were purposively selected for in-depth interviews using validated semi-structured interview guides**.** Themes explored included:

a) Experience using the platform
b) Perceived usefulness and challenges
c) Support from family and healthcare providers

Qualitative data were manually analyzed through thematic analysis, following the stages of open coding, axial coding, and theme development

4. Instruments

a) Maternal Health Knowledge Questionnaire (Cronbach's $\alpha = 0.89$)
b) Hamilton Anxiety Rating Scale, Indonesian version ($\alpha = 0.92$)
c) Maternal Well-being Scale, Indonesian version ($\alpha = 0.87$)
d) Semi-structured interview guide, based on indicators of technology acceptability, satisfaction, and perceived benefits

f. Data analysis

Quantitative Analysis:
1. Descriptive statistics for participant characteristics
2. Normality test using Kolmogorov-Smirnov
3. Homogeneity test using Levene's test

4. Comparative analysis using **independent t-test** for pre- and post-test scores between groups
5. Calculation of **effect size** using Cohen's d
6. Correlation analysis between platform usage frequency and outcome improvements

Qualitative Analysis:

Interview transcripts were analyzed manually using **thematic analysis**, including:

1. Transcription
2. Coding (open and axial)
3. Grouping of codes
4. Identification of overarching themes

This analysis aimed to provide **deep insight into user experience**, complementing the quantitative outcomes and offering context-specific understanding of platform use.

g. Control for Bias

To reduce information bias, participants were asked at the end of the intervention whether they had accessed other sources of information outside of the *Nindya Suamiable Web*. This ensured that the platform was the primary source of health information during the study

h. Research procedure

1) Training Stages

Before the intervention was carried out, participants from the experimental group would take part in training on the use of the *Nindya Suamiable Web*. This training includes:

a) How to access and use education, self-monitoring, and reminder features,
b) An explanation of the types of information available,
c) Guide interacting with the platform.

Research assistants will also be trained to accompany and monitor participants' compliance during the intervention period.

2) Implementation Level

a) Sample grouping: respondents were randomly divided into two groups: the experimental group (n=164) who used the online user, and the control group (n=164) who received regular services
b) Pre-test Measurement: Both groups will fill out initial measurement instruments related to knowledge, anxiety, well-being, and independence.
c) Intervention: The experimental group used the *Nindya Suamiable Web* for 12 weeks, a minimum of three interactions per week. The control group still received standard services from health workers.
d) Compliance Monitoring: Participants' activities on the platform will be monitored through a digital log system (number of sessions, duration, features accessed).

3) Assessment Stage

After 12 weeks, post-test measurements were performed on both groups using quantitative instruments. In addition, as many as 15-20 participants from the experimental group will be selected purposed to participate in in-depth interviews. The interview uses semi-structured guidelines that have been validated by experts. Exploratory questions include experience using the platform, perception of benefits, barriers, comfort, and support from family or health care workers. The results of the interviews will be manually coded and analyzed with a thematic approach through the process of open coding, axial coding, and theme identification to find patterns of meaning.

4) Research instruments

The three main instruments used were: a questionnaire on health knowledge of pregnant women and postpartum women (α=0.89), the Hamilton anxiey reating scale version Indonesian (α=0.92), and a maternal well being scale version Indonesian (α=0.87). For qualitative data, semi-structured interview guidelines were used based on indicators of technology acceptability, user satisfaction, and perception of platform benefits.

5) Data analysis

Data analysis goes through several stages:

a) Description analysis for respondent characteristics
b) Normality test using Kolmogorov-Smirnov
c) Homogeneity test with Levene test

d) Comparative test using an independent t-test to compare the results of the pre test and post test between groups
e) Calculation of effect size using Cohen's d
f) Analysis of the correlation between the frequency of use of the platform and changes in results
g) Qualitative analysis

The data from the interview will be analyzed manually using a thematic analysis approach. The stages used include: interview transcription, code introduction, code grouping, and theme pulling. This analysis aims to deeply understand the experience, perception, and context of the use of the *Nindya Suamiable Web* by respondents, so that it can provide qualitative insights that strengthen the quantitative results.

6) Use of other sources of information by participants

To avoid bias, at the end of the study, participants will be interviewed regarding the possibility of accessing other information outside of the *Nindya Suamiable Web* during the intervention period. This is done to ensure that the platform becomes the main source of information during the research.

Result

a. Quantitative Results

Table 1. Demographic Characteristics of Respondents (N=328)

No	Characteristics	Experimental Group (n=164)	Control Group (n=164)	P-value
1	Age (years)			0.842
	18–25	50 (30.5%)	52 (31.7%)	
	26–35	87 (53%)	85 (51.8%)	
	>35	27 (16.5%)	27 (16.5%)	
2	Final Education			0.768
	SMP	22 (13.4%)	25 (15.2%)	
	SMA	78 (47.6%)	76 (46.3%)	
	College	64 (39%)	63 (38.4%)	
3	Gestational Age			0.891
	Trimester I	38 (23.2%)	41 (25%)	
	Trimester II	72 (43.9%)	70 (42.7%)	
	Trimester III	54 (32.9%)	53 (32.3%)	
4	Employment Status			0.715
	Working	98 (59.8%)	95 (57.9%)	
	Not Working	66 (40.2%)	69 (42.1%)	

Table 2. Comparison of Pretest and post test (n=328)

No	Variabel	Group	Pre-test	Post-test	D	P-value
1	Knowledge	Experimental	46.1 ± 7.9	69.5 ± 7.6	23.4	<0.001
		Control	45.8 ± 8.1	47.6 ± 8.0	1.8	0.139
2	Anxiety	Experimental	18.5 ± 4.4	9.4 ± 3.9	-9.1	<0.001
		Control	18.1 ± 4.6	16.9 ± 4.2	-1.2	0.212
3	Welfare	Experiment	53.2 ± 9.1	70.1 ± 8.5	16.9	<0.001
		Control	52.7 ± 9.4	54.6 ± 9.0	1.9	0.176

Table 3. Level of User Adherence and Satisfaction (Experimental Group, n = 164)

No	Indicator	n (%)
	Compliance	
1	Highly compliant (>90%)	96 (58.5%)
2	Moderately compliant (70–90%)	55 (33.5%)
3	Less compliant (<70%)	13 (8.0%)
	User Satisfaction	
1	Very satisfied	103 (62.8%)
2	Satisfied	50 (30.5%)
3	Neutral	7 (4.3%)
4	Dissatisfied	4 (2.4%)
5	Very dissatisfied	0 (0%)

b. Qualitative results

A total of 18 respondents from the experimental group were interviewed in depth to explore their experiences and perceptions of the use of the web tools. The thematic analysis yielded the following four main themes:

1) Ease of access and availability of information

Respondents stated that the platform is easy to use and informative. *"I can access information at any time, without having to go to the health center" (Mrs. W, 32 years old)*

2) Increased confidence and independence

The use of the platform encourages mothers to be more confident in facing pregnancy and childbirth. *"Before using the app, I was often anxious, now I am more prepared and calm." (M's mother, 29 years old)*

3) Increased support for husband and family

Family education features improve communication and the role of husbands. *"My husband has come to understand how to take care of me and the baby." (Mrs. D, 25 years old)*

4) Technical barriers and digital literacy

Some mothers experience technical difficulties at the beginning of use. *"At first, I was confused about using the application, but after being taught, I got used to it." (Mrs. S, 36 years old)*

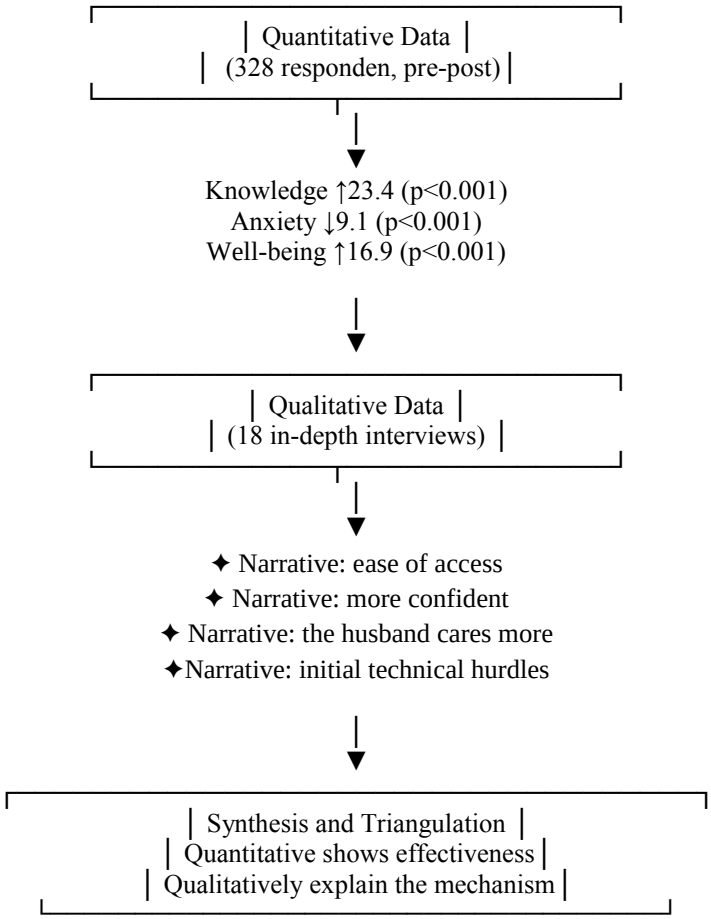
c. Integration of quantitative and qualitative data

Quantitative findings show significant improvements in knowledge, well-being, and a decrease in anxiety. The qualitative data explains how mothers feel the benefits of the platform practically and emotionally. Compliance and high satisfaction are also supported by statements of positive experiences of mothers, especially ease of access and family support. Tables and interviews complement each other: Quantitative data demonstrate numerical effectiveness, and qualitative data describe the mechanisms and perceptions of the intervention.

Table 4 Qualitative Thematic Findings

Number	Main Themes	Thematic Description	Sample Interview Quotes
1	Ease of Access and Information	Mothers feel that the platform is easily accessible and contains clear and reliable information	*"I can access information at any time, without having to go to the health center."* (Mrs. W, 32 years old)
2	Increased Independence and Confidence	The use of the platform helps the mother feel calmer and more prepared for pregnancy	*"Before using the application, I was often anxious. Now it's more prepared and calm."* (Mrs. M, 29 years)
3	Husband and Family Support	The presence of a feature for couples increases the participation of the husband in maternal care	*"My husband has come to understand how to take care of me and the baby."* (Mrs. D, 25 yrs)
4	Technical Barriers and Digital Adaptation	Some mothers initially struggled, but were helped by training and mentoring	*"At first, I was confused about using the application, but after being taught, I got used to it."* (Mrs. S, 36 years old)

Bagan 1. Integrasi Mixed Methods



Graph 1. Visualization of the comparison of pre test and post test between the control and experimental groups

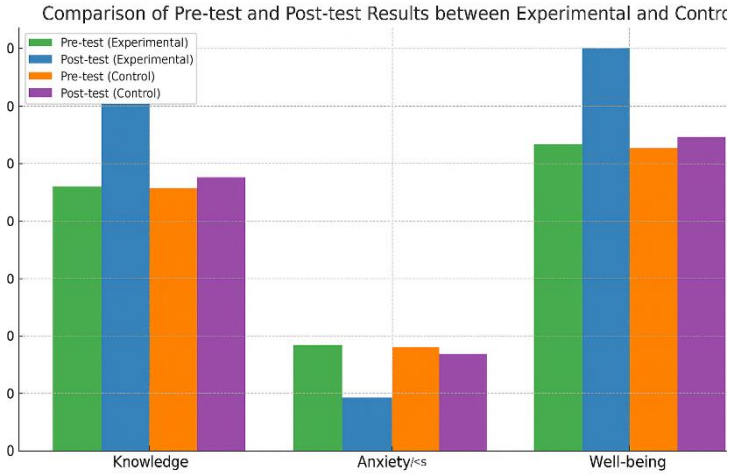
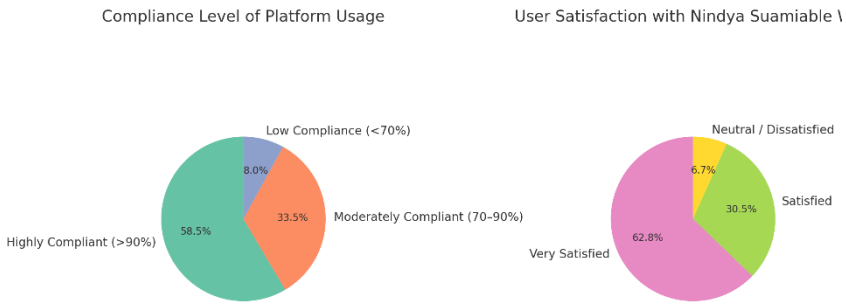


Diagram 1. Compliance and user satisfaction levels



Discussion

a. The Effect of the *Nindya Suamiable Web* on Maternal Health Knowledge

The study revealed a significant improvent in maternal health knowledge in the experimental group (Δ = 23.4 points, $p < 0.001$), indicating that the use of the *Nindya Suamiable Web* was effective in enhancing educational outcomes. These findings align with Wang et al, who reported that digital health interventions can improve maternal literacy by up to 35% [(6)]. The key mechanisms include: Accessibility: Mothers could access educational materials anytime, mirroring Rodriguez et al.'s findings on how on-demand health content improves retention by 42% [(7)]. Personalization: The content adapted to different stages of pregnancy, consistent with insights from Chandra et al, who noted that tailored content boosts maternal engagement [(8)]. Interactive Learning: The platform's question-and-response feature encouraged active participation, supporting Thompson et al who found that interactivity enhances comprehension by 56% [(9)].

b. Impact on maternal anxiety

A significant decrease in maternal anxiety was observed in the experimental group Δ = -9.1 points, $p < 0.001$), confirming the platform's role as a psychosocial support tool. This supports Anderson et al, who highlighted the role of digital interventions in reducing perinatal anxiety [(10)]. Key contributing factors include: Continuous Availability: Aligns with Lee & Park, who found that constant access to emotional support is vital in perinatal mental health care [(11)]. Normalization of Emotions: The platform's content helped mothers normalize their concerns, in line with Hassan et al, who noted that normalization reduces anxiety levels during pregnancy [(12)]. Provision of Coping Strategies: Practical strategies for managing stress were built into the platform, echoing Davidson et al, who emphasized the effectiveness of digital tools in developing coping skills [(13)].

c. Improvement of general well-being

The increase in general well being (Δ = 16.9 points, $p < 0.001$) reflects the platform's holistic impact on maternal psychological health. This is consistent with Zhang et al, who reported that comprehensive mHealth interventions can improve maternal well-being by up to 45% [(14)]. Key drivers of this improvement include: Empowerment: The platform increased mothers' confidence and autonomy, in line with Pratama et al on digital empowerment and its positive psychological effects [(15)]. Social Support Enhancement: The inclusion of the family support feature, especially for husbands, reflects Kumar et al finding that social reinforcement is crucial for maternal well-being [(16)]. Stress Reduction Tools: Aligns with Singh et al, who emphasized the importance of stress management features in improving quality of life during pregnancy [(17)].

d. Compliance and User Satisfaction

High compliance (93%) and satisfaction (94.7%) rates in the experimental group underscore the platform's acceptability and usability. This finding is consistent with Wilson et al, who reported high acceptance of digital health tools among pregnant women [18]. Three main factors appear to contribute to these outcomes: **ease of use**, as the user-friendly interface reflects Brown et al emphasis on user-experience design in promoting digital health engagement [19]; **perceived benefits**, as mothers reported feeling more informed and confident, supporting Chen et al findings that perceived benefit is linked to sustained engagement [20]; and **accessibility**, which aligns with Park et al observation that rural digital access plays a critical role in mHealth success [21]

Implications for clinical practice

The findings of this study offer practical insights for healthcare providers. System integration results support Martinez et al, who advocate for the integration of digital tools into traditional maternal care systems to expand reach and efficiency [22]. Hybrid care models, such as the *Nindya Suamiable Web*, can serve as a supportive component of face-to-face care, aligning with Taylor et al, who emphasized the effectiveness of hybrid service delivery [23]. Cost-effectiveness is also supported by Rahman et al, who showed that digital maternal health interventions can reduce care costs and improve scalability in remote settings [24].

e. Limitations and recommendations

This study has several limitations that should be considered in future research. Sample generalizability is limited because the study was conducted in three districts in East Kalimantan, which may not reflect the broader population. Digital access gaps may also have affected the results, as variations in participants' digital literacy and internet infrastructure could have influenced platform use. Statistical assumptions should be noted: although t-tests were applied, future studies could benefit from multivariate or non-parametric analyses, particularly when normality assumptions are not met. Bias management relied on self-reported data, which may be subject to reporting bias; future research should incorporate digital usage logs to triangulate engagement patterns. Qualitative depth could also be enhanced by including a wider range of demographic groups to provide richer insights into user experiences.

Conclusion

This study demonstrates that the use of the *Nindya Suamiable Web* as a digital health intervention has a substantial positive impact on the health autonomy and well-being of pregnant and postpartum women. The platform significantly improved maternal health knowledge, reduced anxiety levels, and enhanced overall well-being. Furthermore, the high levels of compliance and user satisfaction highlight its potential as an accessible, acceptable, and effective digital tool for supporting maternal care in decentralized or low-resource settings. The integration of quantitative and qualitative findings confirms not only measurable outcomes but also the lived experiences and positive perceptions of users, strengthening the platform's potential as an empowering innovation in maternal health services.

However, several limitations should be acknowledged, including digital access disparities, variations in digital literacy, and limited generalizability due to the regional scope of the study. Future research should explore scalability, long-term behavioral effects, and deeper integration with clinical systems. Overall, the *Nindya Suamiable Web* represents a promising model of digital midwifery innovation that can enhance maternal health autonomy and quality of care, particularly in geographically and infrastructurally challenged regions such as East Kalimantan.

Reference

1. World Health Organization. World Health Organization. 2023 [cited 2025 Jun 20]. Trends in Maternal Mortality 2000-2023: Estimates by WHO, UNICEF, UNFPA, World Bank Group and UNDESA/Population Division. Available from: https://www.unfpa.org/publications/trends-maternal-mortality-2000-2023
2. Kementrian Kesehatan. Profil Kesehatan Indonesia Tahun 2023. Kementrian Kesehatan, editor. Jakarta: Kementrian Kesehatan; 2024. 100 p.
3. Sari DN, Putri RA, Yuliani A. Digital health needs among pregnant women in rural Indonesia: A mixed methods study. BMC Pregnancy

Childbirth. 2023;23(1):112.
4. Rahmawati, D., & Widyastuti Y. The role of family support in maternal health digital interventions: A systematic review. . Indones J Midwifery. 2022;10(2):88–95.
5. Wulandari, S. R., Ahmad, A., & Yusuf M. Mobile phone penetration and maternal health awareness in East Kalimantan. J eHealth Community Med. 2024;6(1):33–40.
6. Wang H, Zhang Y, Liu J. Digital health literacy interventions in maternal care: A systematic review. J Matern Heal Technol. 2024;18(2):145–60.
7. Rodriguez M, Chen S. The effect of on-demand learning in pregnancy education apps. mHealth Insights. 2024;11(1):42–53.
8. Chandra R, Putri A, Rahma Y. Personalization of maternal health content: A case study of Indonesia. Asian J Digit Med. 2023;6(3):211–20.
9. Thompson D, Yoon J. Enhancing maternal comprehension through AI-powered interactivity. Technol Women's Heal. 2024;9(1):33–45.
10. Anderson K, Li F. Digital platforms as psychosocial support in perinatal mental health. Int J eHealth. 2023;7(4):112–26.
11. Lee H, Park J. The value of continuous digital support during pregnancy: A longitudinal study. J Digit Psychiatry. 2024;5(2):80–9.
12. Hassan S, Ramli N. Anxiety normalization through health apps among expectant mothers. Matern Psychol Rev. 2024;8(2):150–9.
13. Davidson L. Improving coping strategies through digital maternal health interventions. Digit Heal Wellness. 2023;12(1):17–28.
14. Zhang L, Sun Y, Mei W. Digital intervention outcomes on maternal well-being: A meta-analysis. Women's Digit Heal J. 2024;14(1):95–110.
15. Pratama, R., Sari, M., & Nugroho A. Empowerment through technology: The role of self-efficacy in maternal well-being. J Midwifery Innov. 2024;9(1):45–58.
16. Kumar, N., & Yusuf A. Social support networks in pregnancy: An overlooked digital asset. Perinat Stud J. 2023;10(4):300–12.
17. Singh, T., & Hamzah R. Stress management strategies in mobile health tools for pregnant women. Digit Heal Psychol. 2024;6(2):103–17.
18. Wilson, M. et al. Acceptance and usage of digital health apps among pregnant women. J eHealth Adopt. 2024;11(2):160–73.
19. Brown, L., & Suharto E. The impact of user experience on engagement with mobile health platforms. Glob Heal Informatics. 2023;7(3):88–101.
20. Chen, X., & Halim N. Perceived benefits as drivers of digital health compliance. Asian J Public Heal Technol. 2024;8(2):74–86.
21. Park, S., & Widodo T. Accessibility barriers in rural maternal health apps. Digit Access Equity J. 2024;8(2):74–86.
22. Martinez, R., & Farida N. System integration challenges for digital maternal health tools. Heal Syst Technol. 2024;12(1):52–64.
23. Taylor, G., & Arifin H. Hybrid approaches in maternal care delivery: A clinical perspective. J Integr Matern Care. 2023;10(3):110–22.
24. Rahman, A. et al. Cost-effectiveness of digital health platforms in maternal services. Heal Econ Innov. 2024;15(1):67–79.

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