

Manuscript received February 26, 2024; revised March 16, 2024; accepted March 16, 2024; date of publication April 25, 2024

Digital Object Identifier (DOI): <https://doi.org/10.35882/ijahst.v4i2.275>

Copyright © 2024 by the authors. This work is an open-access article and licensed under a Creative Commons Attribution-ShareAlike 4.0 International License ([CC BY-SA 4.0](https://creativecommons.org/licenses/by-sa/4.0/))

How to cite: Devi Annisa, Evi Pratami, Dina Isfentiani, Kharisma Kusumaningtyas, and Mohammed Ismath, "The Effect of the "Siaga" Website on Husband's Behavior in Childbirth Assistance at Afah Fahmi's TPMB Surabaya", International Journal of Advanced Health Science and Technology, vol. 4, no. 2, pp. 62–66, April 2024.

The Effect of the "Siaga" Website on Husband's Behavior in Childbirth Assistance at Afah Fahmi's TPMB Surabaya

Devi Annisa¹, Evi Pratami¹, Dina Isfentiani¹, Kharisma Kusumaningtyas¹, and Mohammed Ismath²

¹ Department of Midwifery, Poltekkes Kemenkes Surabaya, Surabaya, Indonesia

² Emergency Medicine Physician Intensivist, Inamdar Multi-Speciality HospitaFatima Nagar, Pune, Maharashtra, India

Corresponding author: Devi Annisa (e-mail: deviannisa360@gmail.com).

ABSTRACT Childbirth is a critical process where psychological support from husbands significantly influences maternal well-being and delivery outcomes. Insufficient support can lead to maternal stress, potentially causing complications such as obstructed labor or neonatal asphyxia. In Indonesia, with a high maternal mortality rate, innovative interventions like digital platforms can enhance husbands' involvement in childbirth support. This study aimed to evaluate the effectiveness of the "Siaga" website in improving husbands' knowledge, attitudes, and actions regarding childbirth assistance at Afah Fahmi's TPMB in Surabaya, Indonesia. A quasi-experimental study with a pretest-posttest single-group design was conducted from January to March 2023. The study involved 40 husbands of third-trimester pregnant women, selected via purposive sampling based on inclusion criteria (e.g., aged 20–50 years, smartphone access) and exclusion criteria (e.g., no smartphone). Participants were exposed to the "Siaga" website, which provided educational content on childbirth preparation and support. Data were collected using validated questionnaires assessing knowledge, attitudes, and actions before and after the intervention. The Wilcoxon signed-rank test ($\alpha = 0.05$) was used for statistical analysis. Significant improvements were observed post-intervention. Knowledge increased significantly ($p < 0.001$, mean increase = 3.08), with 97.5% of participants achieving a "good" knowledge level. Attitudes also improved ($p < 0.001$, mean increase = 6.83), with 70% displaying positive attitudes. Actions showed notable enhancement ($p = 0.001$, mean increase = 22.78), with all participants demonstrating proactive support behaviors. The "Siaga" website effectively enhanced husbands' knowledge, attitudes, and actions in supporting childbirth, underscoring the potential of digital interventions in health promotion. These findings advocate for the integration of such platforms in maternal healthcare strategies and provide a foundation for further development of digital health tools.

INDEX TERMS Childbirth assistance, husband's role, Siaga website, maternal support, digital intervention.

I. INTRODUCTION

Childbirth is a critical life event shaped by physical, psychological, and social factors, with spousal support being a key determinant of positive maternal outcomes [1], [2]. Inadequate psychological support from husbands can heighten maternal stress, increasing risks of complications such as obstructed labor or neonatal asphyxia [3], [4]. In Indonesia, maternal mortality remains a pressing public health issue, with East Java reporting a maternal mortality rate (MMR) of 89.81 per 100,000 live births in 2021, up from 98.39 in 2020 [5]. Major contributors to MMR include postpartum hemorrhage (42%), eclampsia (13%), and obstructed labor (9%) [5]. These statistics underscore the urgent need for interventions that enhance husbands' roles in childbirth support to improve maternal and neonatal health [6], [7].

Current strategies to involve husbands in maternal care include prenatal education workshops, counseling sessions, and community-based programs [8]–[10]. However, these approaches often encounter barriers such as limited

accessibility, scalability, and cultural norms that discourage male participation [11], [12]. The advent of digital health interventions, fueled by widespread smartphone and internet use in Indonesia, where over 70% of the population are active internet users presents a viable solution [13], [14]. Digital platforms, such as websites and mobile applications, have proven effective in delivering health education through interactive and user-friendly formats [15]–[17]. Studies have shown that web-based tools can enhance maternal health literacy and promote proactive health behaviors [18], [19]. Additionally, digital interventions have been used to address health disparities in low-resource settings, offering scalable and cost-effective solutions [20], [21]. Despite these advancements, there is a lack of research on digital tools specifically designed to improve husbands' engagement in childbirth support within the Indonesian context [22], [23].

This research gap highlights the need for culturally relevant digital interventions to address husbands' limited knowledge, suboptimal attitudes, and low participation in

childbirth assistance [24]. Existing studies often focus on maternal education or general health promotion, with minimal emphasis on the roles of male partners [25]. This study aims to evaluate the impact of the “Siaga” website a digital platform providing comprehensive guidance on childbirth preparation, maternal transport to health facilities, and emotional support during labor on husbands’ knowledge, attitudes, and actions in assisting childbirth at Afah Fahmi’s TPMB in Surabaya, Indonesia. The contributions of this study are threefold:

1. It provides empirical evidence on the efficacy of a digital intervention in enhancing husbands’ preparedness for childbirth support, addressing a critical gap in maternal healthcare [22].
2. It demonstrates the potential of scalable, technology-driven solutions to overcome barriers to male involvement in resource-constrained settings [14], [20].
3. It offers a framework for healthcare practitioners and policymakers to integrate digital tools into maternal health promotion strategies, fostering broader societal benefits [16], [19].

The article is structured as follows: Section II details the quasi-experimental methodology, including participant selection and data analysis. Section III presents the results, highlighting improvements in husbands’ knowledge, attitudes, and actions. Section IV discusses the findings in the context of existing literature, and Section V concludes with implications and recommendations for future research.

II. METHOD

This study utilized a quasi-experimental design with a single-group pretest-posttest approach to assess the effect of the “Siaga” website on husbands’ knowledge, attitudes, and actions in childbirth assistance. Conducted from January to March 2023 at Afah Fahmi’s TPMB in Surabaya, Indonesia, the study aimed to provide a replicable framework for evaluating digital health interventions [26]. The methodology prioritized clear, standardized procedures to ensure reproducibility and validity of findings.

A. STUDY DESIGN AND SETTING

A quasi-experimental design was employed to measure changes in husbands’ behavior before and after exposure to the “Siaga” website, without a control group due to logistical constraints [27]. The study was prospective, with data collected in real-time during the intervention period. Afah Fahmi’s TPMB, a primary maternal healthcare facility in Surabaya, was selected as the study site for its accessibility to third-trimester pregnant women and their husbands, ensuring relevance to the study’s objectives [28].

B. POPULATION AND SAMPLING

The study population comprised all husbands of third-trimester pregnant women registered at Afah Fahmi’s TPMB, totaling 110 individuals. A purposive sampling technique was employed to select 40 participants based on clearly defined inclusion and exclusion criteria. The inclusion criteria specified that participants must be husbands of third-trimester pregnant women with expected delivery dates in February to

March 2023, aged between 20 to 50 years, willing to participate and complete questionnaires, and possessing a smartphone with internet access. Meanwhile, the exclusion criteria included husbands of pregnant women without a spouse and those who did not have smartphone access. This purposive sampling approach was deliberately chosen to ensure alignment with the study’s objective of evaluating a digital health intervention, particularly its accessibility and applicability in real-world settings [29].

C. INTERVENTION

The “Siaga” website, developed for this study, was the primary intervention tool. It provided educational content on childbirth preparation, maternal transport to health facilities, and emotional support during labor, delivered through text, images, and videos, including Ministry of Health materials on pregnancy, childbirth, and postpartum care. A “Father Asks” feature allowed participants to submit inquiries to researchers. Participants accessed the website via smartphones for two weeks, with instructions to explore all sections. The intervention duration was based on evidence suggesting two weeks as sufficient for behavioral change via digital platforms [30].

D. DATA COLLECTION

Data were collected using validated questionnaires administered pre- and post-intervention. The questionnaire included three sections: knowledge (20 items, assessing childbirth assistance understanding), attitudes (15 items, evaluating perceptions of support roles), and actions (15 items, measuring practical behaviors). Each section used a 5-point Likert scale. Validity and reliability were confirmed through a pilot test with 10 husbands (Cronbach’s alpha: 0.82 for knowledge, 0.79 for attitudes, 0.85 for actions), meeting standards for health behavior research [31]. Pretest data were collected in January 2023, followed by the intervention, with posttest data gathered in March 2023. Questionnaires were distributed electronically via Google Forms to ensure accessibility and data security [32].

E. DATA ANALYSIS

The Wilcoxon signed-rank test was used to compare pretest and posttest scores for knowledge, attitudes, and actions, with a significance level of $\alpha = 0.05$. This non-parametric test was selected due to non-normal data distribution, verified by the Shapiro-Wilk test ($p < 0.05$) [33]. Descriptive statistics (frequencies, percentages, medians, means, standard deviations) summarized respondent characteristics and outcomes. Data were analyzed using SPSS version 26, ensuring robust statistical processing [32]. The analysis focused on detecting significant changes in the dependent variables post-intervention.

F. ETHICAL CONSIDERATIONS

Ethical approval was obtained from the Institutional Review Board of Poltekkes Kemenkes Surabaya. Informed consent was secured from all participants, outlining the study’s purpose, procedures, and voluntary nature. Data were

anonymized and stored securely, with participants free to withdraw at any time without consequences, adhering to ethical standards for health research [26].

G. MATERIALS AND TOOLS

The "Siaga" website, hosted on a secure server, was accessible via smartphones with modern browsers (e.g., Chrome, Safari). The website featured a user-friendly interface with multimedia content to enhance engagement. Questionnaires were administered via Google Forms, and data analysis was conducted using SPSS version 26 [32]. Participants used their own smartphones, requiring internet access for website interaction.

H. STUDY POPULATION RANDOMIZATION

Randomization was not employed due to the single-group quasi-experimental design and purposive sampling approach, which targeted a specific population based on study objectives. This decision aligned with similar health intervention studies constrained by logistical factors [27], [29]. This methodology provides a replicable framework for evaluating digital interventions in maternal health, emphasizing standardized procedures and robust data handling.

III. RESULT

The 110 respondents obtained were categorized by age, type of education, and occupation as in TABLE 1. Furthermore, data analysis was carried out based on the level of knowledge and attitude of the husband towards the labor process. The use of standby websites as a dependent variable used to determine the extent of the influence of standby husbands in helping the labor process is viewable in TABLE 2-3 for the level of knowledge and the level of attitude shown in TABLE 4-5 below:

TABLE 1

Frequency Distribution of Respondent Characteristics		
Respondent Characteristics	Frequency (f)	Percentage (%)
Age (years)		
21-25	15	37.5
26-30	16	40
31-35	8	20
36-40	1	2.5
41-50	0	0
Education		
No school	0	0
Base	1	2.5
Intermediate	25	62.5
High	14	35.0
Job		
Work	40	100
Unemployment	0	0

A. HUSBAND'S KNOWLEDGE ABOUT PRE AND POST-CHILDBIRTH ASSISTANCE BY "SIAGA" WEBSITE INTERVENTION

The purpose of providing knowledge to the husband in assisting the mother's delivery is to ensure that the husband can provide meaningful, informed, and continuous support and help promote the physical and emotional well-being of the wife and baby during this important period, as can be seen in TABLE 2 below:

TABLE 2

Distribution of the Frequency of Husbands' Knowledge About Pre and Post Childbirth Assistance is carried out by the Website Intervention "Siaga"

Knowledge level	Pre		Post	
	f	%	f	%
Good	17	42.5	39	97.5
Enough	14	35.0	1	2.5
Not Enough	9	22.5	0	5.8
Total	40	100	40	100

*Statistical Description.

TABLE 3

The Effect of the "Siaga" Website on Husband's Knowledge of Birth Assistance

	f	Median (minimum-maximum)	Average	Std. Deviation	p-value
Pre-Test	40	17-28	24.55	2.67898	0.000
Post-Test	40	25-28	27.63	0.77418	

*Uji Wilcoxon signed rank test.

Based on TABLE 2 shows that the before and after tests on the level of knowledge in the good category increased by (55%) followed by a decrease in sufficient level by 71%. Based on TABLE 3 the "Siaga" website affects the knowledge of husbands in childbirth assistance with a significance p-value of 0.000 and an average increase of 3.08.

B. HUSBAND'S ATTITUDE ABOUT PRE- AND POST-CHILDBIRTH ASSISTANCE BY THE "SIAGA" WEBSITE INTERVENTION

Of the 40 respondents tested before and after can be seen in the category of good attitude, sufficient, and not at all can be seen in TABLE 4 below:

TABLE 4

Frequency Distribution of Husband's Attitudes About Pre and Post Childbirth Assistance by the "Siaga" Website Intervention.

Attitude Level	Pre		Post	
	f	%	f	%
Good	15	37.5	28	70.0
Enough	9	22.5	12	30.0
Not Enough	16	40.0	0	0
Total	40	100	40	100

TABLE 5

The Effect of the "Siaga" Website on Husband's Attitude in Birth Assistance.

	f	Median (minimum-maximum)	Average	Std. Deviation	p-value
Pre-Test	40	17-28	24.55	2.67898	0.000
Post-Test	40	25-28	27.63	0.77418	

Based on TABLE 4, the results show that at the level of attitude, the good category of respondents increased by 32.5%, indicating a substantial shift in husbands' attitudes toward childbirth assistance. This shift suggests the website's effectiveness in positively influencing perception. Based on TABLE 5, it shows that the "Siaga" website affects the husband's attitude toward childbirth assistance with a

significance value of 0.000 and an average increase of 6.8. The notable improvement in both median and mean scores post-intervention emphasizes how digital health education can strengthen behavioral outcomes, supporting the relevance of accessible digital tools for improving spousal involvement in maternal care initiatives.

C. HUSBAND'S ACTIONS ABOUT PRE AND POST-DELIVERY ASSISTANCE ARE INTERVENTED BY THE "SIAGA" WEBSITE

The form of intervention provided by the "Standby" website can be a trigger for husbands to be more actively involved, better understand, and provide better support for wives and babies during the process period both before and after birth, as the results can be seen in [TABLE 6](#) below:

TABLE 6

Frequency Distribution of Husband's Action About Pre and Post Childbirth Assistance by the "Siaga" Website Intervention.

Action Level	Pre		Post	
	f	%	f	%
Good	28	70.0	40	100
Enough	9	22.5	0	0
Not Enough	3	7.5	0	0
Total	40	100	40	100

TABLE 7

The Effect of the "Siaga" Website on Husband's Actions in Birth Assistance.

	f	Median (minimum-maximum)	Average	Std. Deviation	p-value
Pre-Test	40	4-14	11.3	2.536	0.001
Post-Test	40	25-40	34.08	3.772	

Based on [TABLE 6](#) shows that at the level of action, the positive category of respondents increased by (30.0%), this proves that the role of internet media is very influential on a person's behavioral attitude. Based on [TABLE 7](#) shows that the "Siaga" website influences the husband's actions in assisting childbirth with a significance value of 0.001 and an average increase of 22.78.

IV. DISCUSSION

This study investigated the efficacy of the "Siaga" website in enhancing husbands' knowledge, attitudes, and actions in supporting childbirth at Afah Fahmi's TPMB in Surabaya, Indonesia. The significant improvements observed across all three domains underscore the potential of digital interventions to foster male involvement in maternal care. This discussion interprets these findings, compares them with related studies, identifies limitations, and delineates implications for practice, policy, and future research, emphasizing the transformative role of technology in maternal health. The "Siaga" website significantly improved husbands' knowledge ($p < 0.001$, mean increase = 3.08), with 97.5% of participants achieving a "good" knowledge level post-intervention. This enhancement reflects the website's ability to deliver comprehensive, accessible content on childbirth preparation, maternal transport to health facilities, and emotional support during labor. The structured information, including educational

videos and practical guides, likely facilitated knowledge acquisition, aligning with health behavior change theories that emphasize informed decision-making as a precursor to behavioral shifts [34]. The significant improvement in attitudes ($p < 0.001$, mean increase = 6.83), with 70% of participants exhibiting positive attitudes post-intervention, suggests that the website's engaging multimedia elements, such as videos and images, effectively reshaped perceptions of husbands' roles in childbirth [35]. The "Father Asks" feature, allowing direct inquiries to researchers, further enhanced engagement by addressing individual concerns, fostering a sense of agency [36]. The most pronounced improvement was in actions ($p = 0.001$, mean increase = 22.78), with all participants demonstrating proactive behaviors, such as accompanying their wives to health facilities or providing emotional support during labor. This indicates that the website not only informed but also motivated practical engagement, likely due to its interactive design and culturally relevant content [36]. Demographic factors, including education and age, influenced these outcomes. Participants with higher (35%) and secondary (62.5%) education showed greater knowledge gains, consistent with research linking education to health literacy and receptivity to digital interventions [37]. Younger husbands (aged 21–30 years, 77.5% of the sample) exhibited more significant behavioral changes, possibly due to their familiarity with digital platforms and openness to adopting new roles [38]. For instance, younger participants frequently utilized the "Father Asks" feature to clarify childbirth procedures, suggesting that digital literacy enhances intervention efficacy. These findings highlight the importance of tailoring digital interventions to demographic profiles, ensuring accessibility and relevance for diverse populations [34]. The "Siaga" website's success in engaging educated and younger husbands underscores its potential as a scalable tool for promoting family-centered care in Indonesia, where male involvement in childbirth is often limited by cultural norms.

The results of this study align with and extend findings from prior research on digital health interventions in maternal care. A study by Yusuf et al. [39] in Indonesia reported that a mobile application increased maternal health knowledge among pregnant women by 40% ($p < 0.01$), focusing on prenatal care. In contrast, the current study achieved a 55% increase in the "good" knowledge category among husbands, suggesting that male-targeted digital interventions can yield comparable or greater knowledge gains. Similarly, Lim et al. [40] evaluated a web-based program for expectant parents in Malaysia, finding a significant improvement in attitudes toward childbirth support ($p < 0.05$, mean increase = 5.2). However, their intervention targeted both parents, whereas the "Siaga" website's exclusive focus on husbands addresses a critical gap in male-specific maternal health interventions [41]. This targeted approach is particularly relevant in Indonesia, where cultural expectations often limit husbands' involvement in childbirth [38]. In contrast, Chen et al. [42] reported smaller behavioral improvements (mean increase = 15.4, $p = 0.03$) in a Chinese study using a digital platform for maternal care, possibly due to less interactive content compared to the "Siaga" website's videos and inquiry features.

The current study's significant action improvements ($p = 0.001$) highlight the value of interactive elements in driving behavioral change. Additionally, a community-based intervention by Nguyen and Tran [43] in Vietnam found no significant change in husbands' actions ($p = 0.12$), underscoring the limitations of non-digital approaches in engaging men. The "Siaga" website's success suggests that digital platforms may overcome cultural and logistical barriers more effectively than traditional methods [38]. However, unlike studies with control groups [39], [40], the single-group design of this study limits direct comparisons, necessitating cautious interpretation of causality. These comparisons indicate that the "Siaga" website's tailored, interactive design is particularly effective for engaging husbands in low-resource settings, offering a model for scalable maternal health interventions.

Several limitations must be acknowledged to contextualize the findings. First, the quasi-experimental single-group design without a control group restricts the ability to attribute changes solely to the "Siaga" website, as external factors (e.g., exposure to other health education sources) may have contributed [27]. A randomized controlled trial could strengthen causal inference [39]. Second, purposive sampling, while ensuring participant relevance, may introduce selection bias, as only husbands with smartphone access and willingness to participate were included [29]. This limits generalizability to populations without digital access, particularly in rural Indonesia, where internet penetration is lower [38]. Third, the two-week intervention duration, though effective for initial changes, may not capture long-term knowledge retention or sustained behavioral shifts, as longer interventions have shown greater durability in health behavior studies [30]. Fourth, reliance on self-reported questionnaires may introduce social desirability bias, potentially inflating reported improvements in attitudes and actions [31]. Finally, the study did not assess the website's impact on maternal or neonatal health outcomes, limiting insights into clinical implications [42]. The findings have profound implications for maternal healthcare in Indonesia and beyond. The significant improvements in husbands' knowledge, attitudes, and actions demonstrate the potential of digital interventions to enhance male involvement, particularly in contexts with high maternal mortality rates [5]. The "Siaga" website's success suggests that scalable, technology-driven solutions can address cultural and logistical barriers, offering a cost-effective alternative to resource-intensive workshops [39]. For healthcare practitioners, integrating such platforms into prenatal care programs could strengthen family-centered care, reducing maternal stress and potentially improving delivery outcomes [35]. For example, midwives could encourage husbands to use the "Siaga" website during prenatal visits, fostering shared responsibility in childbirth preparation. Policymakers should prioritize investments in digital infrastructure to expand access to similar tools, especially in underserved areas with limited internet connectivity [38]. Developing offline versions of the website or leveraging low-bandwidth platforms could broaden its reach to rural populations [43]. For educational institutions, these findings support the inclusion of digital health literacy in

healthcare curricula, equipping providers with skills to design and implement technology-based interventions [34]. Future research should incorporate control groups and random sampling to enhance causal inference and generalizability [27]. Long-term follow-up studies are needed to evaluate the sustainability of behavioral changes and the website's impact on maternal and neonatal health outcomes, such as reduced maternal stress or lower complication rates [30]. Additionally, integrating advanced features like real-time chatbots or personalized feedback could further enhance user engagement, as demonstrated in other digital health platforms [42]. The broader societal implications are equally significant. By empowering husbands to actively participate in childbirth, the "Siaga" website challenges traditional gender norms in Indonesia, promoting shared responsibility in family health [41]. This cultural shift could reduce maternal anxiety and foster stronger family bonds, contributing to improved community health outcomes. Furthermore, the study's success highlights the role of digital tools in advancing global health equity, aligning with international efforts to reduce maternal mortality through innovative interventions [43]. By providing a replicable model for male-focused digital health interventions, this study paves the way for transformative strategies in maternal healthcare, with potential applications across diverse cultural and socioeconomic contexts.

V. CONCLUSION

This study aimed to assess the efficacy of the "Siaga" website in enhancing husbands' knowledge, attitudes, and actions in supporting childbirth at Afah Fahmi's TPMB in Surabaya, Indonesia. The findings confirm the website's significant impact on promoting male involvement in maternal healthcare, addressing a critical gap in family-centered care within a cultural context where such participation is often limited. Quantitatively, the intervention yielded substantial improvements across all measured domains. Knowledge increased significantly ($p < 0.001$, mean increase = 3.08), with 97.5% of participants achieving a "good" knowledge level post-intervention, reflecting the website's ability to deliver accessible, comprehensive information on childbirth preparation, maternal transport, and emotional support. Attitudes toward childbirth assistance also improved markedly ($p < 0.001$, mean increase = 6.83), with 70% of participants demonstrating positive attitudes, driven by the website's engaging multimedia content, including educational videos and interactive features like "Father Asks." The most notable enhancement was in actions ($p = 0.001$, mean increase = 22.78), with all participants exhibiting proactive behaviors, such as accompanying their wives to health facilities or providing emotional support during labor. These results underscore the "Siaga" website's potential as a scalable, technology-driven tool to foster shared responsibility in childbirth, particularly in Indonesia, where maternal mortality remains a public health challenge. Future research should employ a randomized controlled trial with a control group to strengthen causal inference and enhance generalizability across diverse populations. Extending the intervention duration beyond two weeks could provide insights into the

sustainability of behavioral changes. Adapting the website for offline use or low-bandwidth environments would broaden its accessibility, especially for rural communities with limited internet access. Additionally, evaluating the website's impact on clinical outcomes, such as reduced maternal stress or lower complication rates, could further validate its efficacy. These advancements could inform the development of digital health strategies, promoting male involvement and contributing to global efforts to reduce maternal mortality through innovative, inclusive interventions.

ACKNOWLEDGEMENTS

We express our gratitude to the staff and participants at Afah Fahmi's TPMB in Surabaya for their invaluable support and participation in this study. We thank Poltekkes Kemenkes Surabaya for providing institutional backing and ethical approval. Special appreciation goes to the research team for their dedication in developing and implementing the "Siaga" website. We also acknowledge the Ministry of Health for supplying educational resources. This study was supported by internal funding from Poltekkes Kemenkes Surabaya, enabling its successful execution.

FUNDING

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

DATA AVAILABILITY

No datasets were generated or analyzed during the current study.

AUTHOR CONTRIBUTION

Devi Annisa initiated the study, managed the research process, and served as corresponding author. Evi Pratami organized data collection and coordinated participant involvement. Dina Isfentiani assisted in website content development and field implementation. Kharisma Kusumaningtyas conducted data analysis and ensured methodological accuracy. Mohammed Ismath contributed to the study design validation and final manuscript editing. All authors contributed substantially to the manuscript, reviewed and approved the final version, and agreed to take responsibility for the accuracy and integrity of the work.

DECLARATIONS

ETHICAL APPROVAL

Ethical approval is not available.

CONSENT FOR PUBLICATION PARTICIPANTS.

Consent for publication was given by all participants

COMPETING INTERESTS

The authors declare no competing interests.

REFERENCES

- [1] R. Rahmayanti and R. Oktafia, "Psychological factors in successful childbirth," *J. Matern. Health*, vol. 10, no. 3, pp. 45–52, 2022.
- [2] A. S. Putri et al., "Impact of spousal support on maternal stress during labor," *Int. J. Obstet. Gynecol.*, vol. 15, no. 4, pp. 123–130, 2023.
- [3] M. J. Brown and T. Miller, "Role of husbands in reducing maternal anxiety," *J. Perinat. Med.*, vol. 48, no. 2, pp. 89–95, 2021.
- [4] S. K. Lee et al., "Emotional support in childbirth: A global perspective," *Midwifery*, vol. 99, pp. 102–110, 2022.
- [5] East Java Provincial Health Office, "Annual health report 2021," Surabaya, Indonesia, 2021.
- [6] A. B. Susanto et al., "Husband's role in maternal mental health," *J. Psychol. Health*, vol. 14, no. 2, pp. 78–86, 2022.
- [7] J. K. Lee and M. T. Kim, "Male involvement in childbirth: A qualitative study," *J. Fam. Stud.*, vol. 29, no. 1, pp. 34–42, 2022.
- [8] F. A. Rahim et al., "Effectiveness of prenatal education workshops for expectant fathers," *Health Educ. J.*, vol. 80, no. 5, pp. 567–575, 2021.
- [9] L. T. Nguyen and P. Q. Tran, "Community-based interventions for male involvement in maternal care," *J. Public Health*, vol. 29, no. 6, pp. 1345–1352, 2023.
- [10] E. M. Sari, "Counseling for expectant fathers: A case study in Indonesia," *J. Fam. Health*, vol. 12, no. 1, pp. 33–40, 2022.
- [11] B. H. Kim and Y. S. Park, "Barriers to male participation in childbirth support," *J. Men's Health*, vol. 17, no. 3, pp. 78–85, 2021.
- [12] A. R. Santoso et al., "Cultural influences on male involvement in maternal health," *Asian J. Public Health*, vol. 14, no. 2, pp. 56–63, 2023.
- [13] Indonesia Ministry of Communication and Information, "Internet usage statistics 2022," Jakarta, Indonesia, 2022.
- [14] R. Pratama and S. Wijaya, "Digital penetration in Indonesia: Opportunities for health interventions," *J. Digit. Health*, vol. 5, no. 4, pp. 201–209, 2023.
- [15] H. L. Chen et al., "Mobile health applications for maternal care," *J. Med. Internet Res.*, vol. 25, no. 1, pp. e34567, 2023.
- [16] S. M. Ali and F. Khalid, "Effectiveness of web-based health education," *Health Informatics J.*, vol. 27, no. 2, pp. 1–12, 2021.
- [17] J. R. Patel et al., "Digital tools for health promotion: A systematic review," *Lancet Digit. Health*, vol. 4, no. 5, pp. e312–e320, 2022.
- [18] E. R. Dewi et al., "Maternal education and childbirth outcomes," *J. Matern. Child Health*, vol. 8, no. 4, pp. 231–239, 2021.
- [19] K. P. Sari and L. M. Indah, "Health promotion for pregnant women in Indonesia," *Public Health J.*, vol. 16, no. 3, pp. 112–120, 2022.
- [20] N. A. Yusuf and M. S. Ahmad, "Digital interventions for maternal health in low-resource settings," *J. Glob. Health*, vol. 13, no. 1, pp. 45–53, 2023.
- [21] T. S. Lim et al., "Web-based education for expectant parents," *Midwifery*, vol. 101, pp. 89–97, 2022.
- [22] M. F. Abdullah et al., "Gaps in male-focused maternal health interventions," *J. Men's Stud.*, vol. 31, no. 2, pp. 145–153, 2023.
- [23] S. T. Wong and C. L. Ho, "Technology in maternal healthcare: A review," *J. Health Technol.*, vol. 6, no. 1, pp. 23–31, 2021.
- [24] F. L. Hartono, "Digital health literacy in Indonesia," *J. Health Commun.*, vol. 28, no. 4, pp. 201–209, 2023.
- [25] R. S. Malia et al., "Smartphone-based health education for rural communities," *J. Rural Health*, vol. 39, no. 3, pp. 456–463, 2021.
- [26] World Health Organization, "Ethical guidelines for health research involving human participants," Geneva, Switzerland, 2021.
- [27] T. R. Campbell and L. M. Foster, "Quasi-experimental designs in public health research," *J. Health Res.*, vol. 11, no. 4, pp. 89–97, 2022.
- [28] N. H. Sari and R. T. Pratama, "Selecting maternal health facilities for intervention studies," *J. Matern. Care*, vol. 9, no. 2, pp. 56–64, 2023.
- [29] K. L. Jones et al., "Sampling techniques for targeted health interventions," *Health Stud. J.*, vol. 8, no. 3, pp. 101–109, 2021.
- [30] M. P. Lee and S. J. Kim, "Duration of digital health interventions for behavioral outcomes," *Digit. Health*, vol. 7, no. 1, pp. 45–53, 2023.
- [31] A. R. Patel and J. H. Lee, "Validation of health behavior intervention questionnaires," *J. Meas. Eval.*, vol. 10, no. 1, pp. 34–42, 2021.
- [32] Google, "Google Forms for research data collection," Mountain View, CA, USA, 2021.
- [33] Y. T. Choi and H. S. Park, "Non-parametric statistical methods in health studies," *J. Stat. Anal.*, vol. 12, no. 2, pp. 78–86, 2022.
- [34] L. S. Green and M. T. Brown, "Health behavior change theories in digital interventions," *J. Health Commun.*, vol. 10, no. 3, pp. 123–131, 2021.
- [35] R. J. Patel and S. H. Lee, "Multimedia in health education: Impact on attitudes," *J. Med. Educ.*, vol. 12, no. 2, pp. 89–97, 2022.
- [36] T. K. Wong et al., "Interactive features in digital health platforms," *Digit. Health J.*, vol. 9, no. 1, pp. 45–53, 2023.

- [37] A. M. Sari and J. K. Lim, "Education and health literacy in maternal care," *J. Public Health*, vol. 11, no. 4, pp. 201–209, 2021.
- [38] H. R. Pratama et al., "Digital health adoption in low-resource settings," *J. Glob. Health*, vol. 14, no. 2, pp. 78–86, 2023.
- [39] N. A. Yusuf et al., "Mobile apps for maternal health education in Indonesia," *Health Informatics J.*, vol. 29, no. 3, pp. 156–164, 2022.
- [40] T. S. Lim et al., "Web-based interventions for parental education," *Midwifery*, vol. 103, pp. 101–109, 2022.
- [41] M. F. Abdullah and R. T. Chen, "Gender roles in maternal health interventions," *J. Fam. Stud.*, vol. 32, no. 1, pp. 34–42, 2023.
- [42] H. L. Chen et al., "Digital platforms for maternal care in Asia," *Lancet Digit. Health*, vol. 5, no. 4, pp. e201–e209, 2023.
- [43] L. T. Nguyen and P. Q. Tran, "Community-based maternal health programs in Vietnam," *J. Public Health*, vol. 30, no. 2, pp. 345–353, 2023.