



The Influence of KIA Book-Based Education on Mothers' Attitudes to Danger Signs of Childbirth at Sangowo Community Health Center, Morotai

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Abstract. *The high maternal mortality rate remains a health problem in Indonesia, especially in island areas such as Morotai Island Regency. One contributing factor is the low awareness of mothers regarding danger signs of childbirth. The Maternal and Child Health Book (MCH Book) is an educational medium that can improve mothers' knowledge and attitudes in facing the risks of childbirth. This study aims to determine the effect of MCH Book-based education on mothers' attitudes towards danger signs of childbirth at Sangowo Community Health Center, Morotai Island Regency. The study used a pre-experimental design with a one-group pretest - posttest approach. The study sample consisted of 24 pregnant women in their second and third trimesters who met the inclusion criteria and were willing to participate in education. Data analysis was performed using the Wilcoxon Signed Rank Test to determine differences in attitudes before and after education. The results showed an increase in the median score of mothers' attitudes from 57 in the pretest to 72 in the posttest. The Wilcoxon test showed a significant difference between the pretest and posttest scores ($Z = -4.123$; $p = 0.000$). MCH Book-based education had a significant effect on improving mothers' attitudes towards danger signs of childbirth. Systematic, interactive, and family-involved strengthening of education is crucial for improving maternal safety, particularly in island regions with limited access to health facilities*

Keywords: *Childbirth Preparation; Education; Health Education; KIA Book; Maternal Attitudes.*

1. INTRODUCTION

Maternal health is a key indicator of a country's successful health development because it directly reflects the health system's ability to provide safe, high-quality, and responsive services to maternal needs (Prasetyo & Wahyu, 2025). The WHO asserts that more than 90% of maternal deaths are preventable if obstetric complications are recognized early and treated appropriately. This fact indicates that the high maternal mortality rate is not solely caused by medical factors, but is also related to the health system, community behavior, and social and environmental conditions (Sari et al., 2023). In Indonesia, the maternal mortality rate (MMR) remains above the Sustainable Development Goals (SDGs) target of 70 per 100,000 live births. Although various government programs have been implemented, such as improving the quality of antenatal care (ANC) services, deploying health workers, and providing delivery facilities, Indonesia's geographical challenges as an archipelagic country, disparities in access to services, and low maternal health literacy remain major obstacles to reducing MMR (Kirana & Gani, 2021).

The high maternal mortality rate in Indonesia can be analyzed using the Three Delays Model (Thaddeus & Maine, 1994), which includes delays in recognizing danger signs and deciding to seek help, delays in reaching a health facility, and delays in receiving adequate care. Of these three types of delays, the first delay is often the key to the risk of death because a wrong initial decision will directly impact the next stage (Septiani et al., 2025). Many pregnant women are unaware that bleeding, high fever, seizures, severe headaches, and premature rupture of membranes are danger signs that require immediate action. Several studies have shown that this low understanding arises from insufficient information received by mothers, as well as mothers' lack of awareness of the risks. A mother's lack of readiness to recognize danger signs can be a serious problem, especially when family or husbands also have misperceptions and contribute to delaying decision-making (Ismawati et al., 2024).

From a health behavior perspective, the Health Belief Model (HBM) explains that a person's actions are determined by perceptions of perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and the presence of cues to action (Kustin & Handayani, 2024). In the context of childbirth, many pregnant women do not feel vulnerable to complications and therefore underestimate the importance of certain symptoms, even if they are dangerous. Unrealistic perceptions of severity cause mothers to consider bleeding or abnormal contractions as normal. Perceived barriers such as distance to a health facility, limited transportation, cost, or fear also often exacerbate the tendency to delay seeking help. Good education is crucial as a cue to action that can change perceptions and foster a sense of alertness so that mothers are able to make the right decisions when faced with danger signs (Gusti et al., 2020).

One of the government's strategies to improve the knowledge and attitudes of pregnant women is the use of the Maternal and Child Health Book (MCH Book) as a national educational medium containing comprehensive information on pregnancy, childbirth, postpartum, and infant care. In health education theory, learning media such as the MCH Book can facilitate the internalization of information through clear text and easy-to-understand visual illustrations (Yani et al., 2023). Various studies have shown that MCH Book-based education has a significant impact on improving mothers' knowledge, attitudes, and preparedness in recognizing and responding to danger signs during labor. Mothers who receive education using the MCH Book have a more positive attitude and are quicker to seek help when experiencing danger signs, compared to mothers who do not receive such book-based education (Merben & Hidayanti, 2024).

However, the utilization of the KIA Handbook in the field is still not optimal. Many pregnant women carry the KIA Handbook only as an administrative document without reading or understanding its information, while health workers do not always use the KIA Handbook consistently as a basis for education at each ANC visit (Darajat, 2016) . However, health education theory explains that knowledge will not automatically change behavior if it is not accompanied by the formation of strong attitudes through a systematic, interactive, and continuous educational process. Therefore, the successful utilization of the KIA Handbook depends heavily on the effectiveness of counseling provided by health workers, as well as the willingness of pregnant women and their families to use the handbook as a primary source of information (Pebriani et al., 2024) .

Furthermore, the success of KIA Handbook-based education is also greatly influenced by the role of health workers as the primary facilitators in the information transfer process. Health communication theory emphasizes that an effective relationship between health workers and pregnant women will increase understanding, foster trust, and influence mothers' attitudes in decision-making (Sulhani et al., 2025) . However, in many areas, including Sangowo, the high workload of health workers and limited staff often prevent educational sessions from being conducted optimally. However, various studies have shown that delivering education in a structured, interactive manner and using visual media such as the KIA Handbook can strengthen mothers' risk perceptions in accordance with the principles of the Health Belief Model. When health workers are able to connect the contents of the KIA Handbook to the daily experiences of pregnant women, the process of internalizing the information becomes stronger and has a direct impact on developing a sense of awareness of danger signs in labor (Yatni et al., 2025) .

On the other hand, family support, particularly from the husband, also influences the success of maternal education and the formation of maternal attitudes. Previous research has shown that husbands' involvement in understanding the KIA Handbook contributes to increased rapid decision-making in obstetric emergencies (Ambarita et al., 2021) . In a community context where husbands still play a central role in decision-making, a lack of family understanding can prolong the first phase of the Three Delays Model, namely the delay in recognizing and responding to danger signs. Therefore, KIA Handbook-based education is not only important for pregnant women but also requires family involvement to build collective awareness of the dangers of childbirth complications. Given Morotai's geographical conditions, which require high levels of preparedness, family empowerment through the use of the KIA

Handbook is a crucial strategy in minimizing the risk of delays and increasing the success of maternal safety efforts (Aisyah et al., 2024) .

Geographical conditions exacerbate this problem, particularly in island regions such as Morotai Island Regency, including the Sangowo Community Health Center's work area. Long distances between villages, limited transportation, and unpredictable weather conditions make access to health facilities difficult and risk delays in the second phase. In such situations, mothers' readiness to recognize danger signs and make quick decisions is crucial, as long travel times can worsen a mother's condition if medical attention is not immediately sought. Initial observations at the Sangowo Community Health Center indicate that pregnant women still have a limited understanding of the contents of the KIA Handbook and tend to be less vigilant about danger signs in labor. Many mothers consider certain symptoms to be normal during pregnancy, while others are unaware of the first steps to take when faced with a risky situation.

Based on these issues, systematic efforts are needed to strengthen education based on the KIA Handbook in order to improve mothers' attitudes towards danger signs in childbirth. Strengthening education through the KIA Handbook is expected to increase risk perception, foster appropriate perceptions of severity, reduce perceptual barriers, and provide triggers for action that encourage mothers to immediately seek help when experiencing danger symptoms. By considering the geographical, cultural, and resource challenges available at the Sangowo Community Health Center, the study on "The Effect of KIA Handbook-Based Education on Mothers' Attitudes towards Danger Signs in Childbirth at the Sangowo Community Health Center, Morotai" is very important and relevant as a strategic step in improving maternal safety and achieving national health development targets.

2. RESEARCH METHOD

This study used a pre-experimental design with a one-group pretest–posttest approach. This design was chosen to observe changes in mothers' attitudes before and after receiving KIA Handbook-based education without a comparison group. The study was conducted at the Sangowo Community Health Center, Morotai Island Regency. The entire series of research activities took place from October to November, coinciding with the routine antenatal care (ANC) service schedule. The study population was all pregnant women who visited ANC during the study period. The sample was determined using a purposive sampling technique, based on certain criteria such as mothers being in their second–third trimester, carrying a KIA Handbook, being able to understand the research instructions, and being willing to be

respondents. From the screening results, there were 24 pregnant women who met the criteria and all were included as research samples.

The independent variable in this study was education based on the KIA Handbook, namely counseling activities that referred to the contents of the KIA Handbook regarding danger signs in labor. The dependent variable was mothers' attitudes toward danger signs in labor, which were measured using a Likert-scale questionnaire. The questionnaire contained statements regarding mothers' perceptions of risk, preparedness, and willingness to take action when danger signs occur. Before being used, the questionnaire underwent a validity and reliability testing process. The study began with each respondent completing a pretest questionnaire. Afterward, health workers provided direct education using the KIA Handbook, lasting approximately 20–30 minutes. The material presented covered danger signs in labor. After the educational activity was completed, respondents completed the same questionnaire again as a posttest to assess changes in attitudes.

The collected data were analyzed using univariate analysis to describe the characteristics of the respondents and the distribution of attitude scores. Differences in attitudes between before and after education were analyzed using the Wilcoxon Signed Rank Test because the data came from the same group and compared two measurement times. The significance level of the study was set at $p < 0.05$.

3. RESULTS AND DISCUSSION

Results

Table 1. Respondent Characteristics (n = 24).

Characteristics	Category	Frequency (n)	Percentage (%)
Age (years)	<20	3	12.5
	20–29	12	50.0
	30–39	7	29.2
	≥40	2	8.3
Education	Elementary School/Equivalent	4	16.7
	Junior High School	6	25.0
	Senior High School	10	41.7
	College	4	16.7
Work	Housewife	18	75.0
	Work	6	25.0
Trimester of Pregnancy	II	10	41.7
	III	14	58.3

Characteristics	Category	Frequency (n)	Percentage (%)
Parity	Primipara	9	37.5
	Multipara	15	62.5

Table 1 shows the distribution of characteristics of 24 respondents in the study regarding maternal attitudes towards danger signs of labor at the Sangowo Community Health Center. The majority of respondents were aged 20–29 years (50%), followed by 30–39 years (29.2 %), <20 years (12.5%), and ≥40 years (8.3%). In terms of education, the majority had a high school degree (41.7 %), followed by junior high school (25%), elementary school/equivalent (16.7%), and college (16.7%). Most respondents were housewives (75%), while 25% were employed. Based on trimester of pregnancy, the majority were in the third trimester (58.3 %) and 41.7% in the second trimester. Regarding parity, 62.5 % were multiparous and 37.5% were primiparous.

Table 2. Average Attitude of Mothers to Danger Signs of Childbirth Before and After KIA Book-Based Education.

Variables	N	Mean	Min	Max	Elementary School
Mother's attitude towards danger signs labor (Pretest)	24	56.8	38	60	7.2
Mother's attitude towards danger signs labor (Posttest)	24	71.5	52	75	5.8

Table 2 shows the average attitude scores of 24 mothers towards danger signs of labor before and after receiving KIA Handbook-based education. The pretest results showed an average score of 56.8 with a minimum score of 38 and a maximum score of 60 and a standard deviation of 7.2. After receiving education, the posttest score increased to an average of 71.5 with a minimum score of 52 and a maximum score of 75 and a standard deviation of 5.8. This increase in scores indicates an improvement in mothers' attitudes towards danger signs of labor after receiving KIA Handbook-based education, reflecting the effectiveness of the intervention in improving mothers' perceptions, preparedness, and willingness to take action when facing danger signs of labor.

Table 3. Normality Test.

Variables	N	Shapiro-Wilk Statistics	p-value
Mother's attitude towards danger signs labor (Pretest)	24	0.954	0.180
Mother's attitude towards danger signs labor (Posttest)	24	0.922	0.042

Table 3 shows the results of the normality test of the attitude scores of 24 mothers towards danger signs of labor using the Shapiro-Wilk test. The pretest results showed a statistical value of 0.954 with a p-value of 0.180, which means the pretest data was normally distributed ($p > 0.05$). Meanwhile, the posttest results had a statistical value of 0.922 with a p-value of 0.042, indicating that the posttest data was not normally distributed ($p < 0.05$). Based on these results, the comparison of pretest and posttest scores used the non-parametric Wilcoxon Signed Rank Test because one of the variables did not meet the normality assumption.

Table 4. The Effect of KIA Book-Based Education on Mothers' Attitudes Towards Danger Signs of Childbirth.

Variables	Median Pretest	Median Posttest	Z	p-value
Mother's attitude towards danger signs labor	57	72	-4,123	0,000

Table 4 shows the effect of KIA Handbook-based education on the attitudes of 24 mothers towards danger signs of labor. The median attitude score before education (pretest) was 57, while after education (posttest) it increased to 72. The results of the Wilcoxon Signed Rank Test showed a Z value = -4.123 with a p-value of 0.000, which means there is a significant difference between the pretest and posttest scores ($p < 0.05$). This indicates that KIA Handbook-based education has a significant influence in improving mothers' attitudes towards danger signs of labor, including risk perception, preparedness, and willingness to take immediate action when facing danger signs.

Discussion

The results of the study showed that KIA Handbook-based education had a significant impact on improving mothers' attitudes towards danger signs of childbirth at the Sangowo Community Health Center. The median attitude score increased from 57 in the pretest to 72 in the posttest, and the Wilcoxon test yielded a p-value of 0.000, confirming a significant change before and after the intervention. This finding is in line with research conducted by (Merben &

Hidayanti, 2024) which showed that the use of the KIA Handbook as an educational medium not only increases mothers' knowledge but also fosters a more vigilant attitude and higher preparedness in facing danger signs of childbirth.

Improved maternal attitudes can be explained through the perspective of the Health Belief Model (HBM), which states that a person's health behavior is influenced by perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action. In this context, education based on the KIA Handbook serves as an effective trigger for action, raising maternal awareness of potential labor complications and emphasizing the importance of prompt action when danger signs appear. With better understanding, mothers are better able to make informed decisions, thereby minimizing the risk of delays in the first phase of the Three Delays Model (Kustin & Handayani, 2024) .

Furthermore, the quality of counseling provided by health workers plays a crucial role in the effectiveness of education. Direct, interactive explanations and the use of visual illustrations in the KIA Handbook make the information easier for pregnant women to understand and internalize. This internalization process allows mothers not only to theoretically understand the danger signs of labor but also to relate them to everyday experiences, thereby significantly increasing their awareness of the risks (Yatni et al., 2025) . Therefore, the effectiveness of education depends not only on ownership of the KIA Handbook, but is more determined by the ability of health workers to deliver the material interactively and relevantly (Darajat, 2016) .

Family involvement, particularly the husband's, has also been shown to contribute to successful education. Family support can increase maternal preparedness and expedite decision-making when facing obstetric emergencies. This is crucial, especially in communities where the husband is still the primary decision-maker in the family. Therefore, the husband's involvement in understanding the information in the KIA Handbook can reduce the risk of delays in the first phase of the Three Delays Model. With adequate family support, mothers feel more confident and prepared to face high-risk emergency situations (Ambarita et al., 2021).

The geographical location of Morotai Island Regency as an archipelago adds to the complexity of maternal health issues. Long distances between villages, limited transportation, and unpredictable weather conditions can prolong access to health facilities, increasing the risk of complications requiring immediate treatment (Septiani et al., 2025) . In this context, education that emphasizes recognizing danger signs and being prepared to act quickly is

crucial, as a mother's ability to recognize and respond to early symptoms can be a determining factor in maternal safety in hard-to-reach areas.

Furthermore, this study demonstrated that KIA Handbook-based education improved mothers' risk perception of labor danger signs, reduced perceptual barriers, and encouraged immediate action when danger signs emerged. The resulting attitudinal changes reflect the intervention's success in concretely shaping maternal preparedness, which is particularly relevant for women with high-risk pregnancies. This education not only increases knowledge but also fosters proactive behavior in dealing with situations that endanger the lives of both mother and baby (Gusti et al., 2020).

Furthermore, this study confirms that KIA Handbook-based education cannot be considered merely informational, but must be implemented continuously and systematically to foster strong attitudes. This aligns with health education theory, which states that knowledge without the process of attitude formation and internalization of information will not automatically influence behavior (Pebriani et al., 2024) . Therefore, the success of education depends heavily on effective interactions between health workers and mothers, as well as the consistency of educational materials provided at each ANC visit.

4. CONCLUSION

Based on the research results, it can be concluded that education based on the KIA Handbook significantly improved mothers' attitudes towards danger signs during labor at the Sangowo Community Health Center. The increase in the median attitude score from 57 in the pretest to 72 in the posttest indicates that this educational intervention was effective in improving mothers' risk perception, preparedness, and willingness to take immediate action when facing danger signs during labor. These findings emphasize the importance of educational media, particularly the KIA Handbook, in shaping the proactive attitudes of pregnant women and raising awareness of the importance of safe labor, thereby minimizing the risk of complications.

The success of education is determined not only by the material presented, but also by the role of health workers as primary facilitators, capable of delivering information interactively, systematically, and relevant to mothers' daily experiences. Communicative delivery and the use of visual illustrations in the KIA Handbook make it easier for mothers to understand danger signs in labor and apply them in their daily lives. Therefore, the effectiveness of education depends on a combination of the quality of the material, the health workers' ability to communicate, and the mothers' willingness to take the information seriously.

Family involvement, particularly that of the husband, has been shown to significantly influence maternal preparedness. Family support increases a mother's confidence in dealing with obstetric emergencies and accelerates decision-making when danger signs arise. This is particularly important in areas where decision-making remains centrally centered on the head of the family. The geographical location of Morotai Island Regency, as a remote island region, further enhances the urgency of maternal and family preparedness, as maternal and family preparedness is a key determinant of safe delivery when access to health facilities is limited or delayed.

Overall, this study confirms that education based on the KIA Handbook is an effective strategy for increasing maternal awareness and vigilance regarding danger signs during childbirth, especially in areas with limited access to healthcare. Consistent, systematic strengthening of education, with active family involvement, is expected to improve maternal safety, support rapid and appropriate decision-making, and contribute to achieving the target of reducing maternal mortality as stated in the Sustainable Development Goals (SDGs). Sustainable implementation of this strategy is key to improving the quality of maternal health services and childbirth safety in island regions like Morotai.

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