Jurnal Bidan Cerdas
e-ISSN: 2654-9352 | p-ISSN: 2715-9965
Volume 7 Issue 2, 2025, page 369-379
DOI: 10.33860/jbc.v7i2.4100
Website: https://ojs.polkespalupress.id/index.php/JBC
Publisher: Poltekkes Kemenkes Palu

# The Role of 'Bundo Kanduang' Women's Group in Early Detection of High-Risk Pregnancy in Tanah Datar

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**ARTICLE INFO**

**Article History:**

Received: 2025-01-31
Accepted: 2025-09-03
Published: 2025-09-30

**Keywords:**

Women's groups;
*Bundo Kanduang*;
Early detection;
Risky pregnancy;
Family;

**ABSTRACT**

**Background:** West Sumatra Province is the only region in Indonesia that adheres to the matrilineal system. An influential community leader in West Sumatra is the women's group 'Bundo Kanduang'. A preliminary study found an increase in problematic pregnancies in Tanah Datar District, West Sumatra. This study aims to determine the role of the 'Bundo Kanduang' women's group in efforts to increase knowledge, attitudes, and family roles in the early detection of high-risk pregnancies **Method:** This study used a quasi experiment pre-post test study design with control group design in Tanah Datar 2024. The population was the husband/family of pregnant women and the total sample was 22 people. Univariate analysis included frequency distribution of knowledge, attitude, and family role. Bivariate analysis used the Mann-Whitney U Test to analyze differences between the control and intervention groups. **Results:** There was an increase in knowledge scores and family roles in early detection of high-risk pregnancies. Statistical test results showed that there were differences in knowledge (0.001) and family roles (0.004) between the control and intervention groups with a p-value <0.05. **Conclusion**: The 'Bundo Kanduang' women's group has successfully improved knowledge and family roles. However, there was no significant difference in attitude, so further research is needed.



## INTRODUCTION

The maternal mortality rate (MMR) remains a significant global health issue, particularly in low- and lower-middle-income countries. In 2020, the global MMR was recorded at 223 per 100,000 live births. This figure is still far from the 2030 SDG target of 70 per 100,000 live births (WHO, 2024). Additionally, in Southeast Asia, Indonesia is among the countries with the highest MMR (Syairaji et al., 2024). This situation is reflected in the results of the 2020 population census, which recorded a MMR in Indonesia of 198 per 100,000 live births. This finding indicates that MMR remains a major challenge in maternal health efforts at the national level (BPS RI, 2023). One of the provinces contributing to this high rate is West Sumatra.

The Indonesian Central Statistics Agency (BPS RI) reports that the maternal mortality rate (MMR) in West Sumatra reached 178 per 100,000 live births in 2020. At the district level, Tanah Datar recorded an MMR of 262 per 100,000 live births, with the main causes being hemorrhage, preeclampsia, circulatory disorders, and metabolic issues (Disdukcapil). Furthermore, an initial survey found that problematic

pregnancies in Tanah Datar increased by 20% in 2023, particularly among mothers who are too young or too old, have severe illnesses, anemia, or have not yet consulted a healthcare provider. Most pregnant women are also still unprepared to handle potential obstetric emergencies.

The high maternal mortality rate may be attributed to delay factors, such as delayed detection of danger signs, delayed decisions to refer, and late arrival at the referral site. This is closely linked to the social environment, particularly the role of family members in decision-making (Suarayasa & Wandira, 2021). Families who lack understanding of pregnancy danger signs tend not to utilize health facilities, which can lead to complications and maternal mortality. Therefore, empowering families is crucial to enhance their ability to detect early pregnancy dangers and provide care for pregnant women (Mardiyanti & Anggasari, 2021).

Previous research indicates that reducing maternal mortality requires the involvement of various parties, including training for community health workers and the active role of families supported by healthcare professionals. Training community health workers in early detection of pregnancy-related risks has proven to enhance their readiness to assist high-risk pregnant women and activate family involvement (Arifin, 2023; Fitriani et al., 2021). Additionally, the knowledge and attitudes of husbands or families also influence the utilization of health services, preparedness to face complications, and emotional support for pregnant women (Ernawati & Askar M, 2024; Julaeha, 2023; Suhartika & Mulyati, 2021).

West Sumatra Province has a unique matrilineal cultural system, namely the Bundo Kanduang Women's Group, which holds an important position as guardians of cultural, spiritual, and family values. In addition, they are also actively involved in government programs, including health. However, empirical evidence evaluating their role in structured maternal health interventions with quasi-experimental designs is still unclear. To address this gap, this study aims to evaluate the role of Bundo Kanduang in the early detection of high-risk pregnancies through community-based health promotion interventions.

## METHODS

This study used a pre-post test quasi-experimental design with a control group and a Participatory Action Research (PAR) approach. The PAR approach was applied to empower individuals and communities, particularly through the active role of women's groups in the early detection of high-risk pregnancies. The study was conducted from October to December 2024 in Sungayang District (intervention) and Pariangan District (control), Tanah Datar Regency. The locations were selected due to the high incidence of high-risk pregnancies and the continued strength of the matrilineal social system.

The sample in this study consisted of 22 pregnant women selected purposively, with 11 each for the intervention and control groups, based on inclusion criteria: pregnant women from the Minangkabau ethnic group, residing in the study area, willing to participate as respondents until the end of the study, and having complete pregnancy care records in their KIA books. Exclusion criteria included pregnant women who experienced miscarriage, died, or moved residence during the study period.

The data collection instrument used a questionnaire to measure three main variables. The measurements consisted of knowledge (true-false questions), attitude (4-point Likert scale), and family role (using the Poedji Rochjati Score and DASS questionnaire). The questionnaire used to assess knowledge, the Likert scale for

attitudes, and the checklist for family roles have been validated.

The study consisted of three implementation stages. The first stage was a pretest for both groups. The second stage involved a three-day training session for women in the intervention area, using lectures, videos, demonstrations, and simulations, followed by two months of mentoring. In the control group, the intervention carried out was educational intervention by the researchers, as well as interventions according to the Puskesmas program for 2 months. Mentoring activities included education on pregnancy risks, preparedness for emergencies, P4K sticker placement, and facilitation of access to health services. Evaluations are conducted every two weeks. In the control group, counseling is only conducted once by the researcher. The third stage is a post-test to assess changes in the three variables.

Data is analyzed using SPSS through editing, coding, and cleaning processes. The Shapiro-Wilk normality test showed that four variables were not normally distributed ($p < 0.05$), namely knowledge and attitude in the intervention group, as well as the role of the family in both groups. Therefore, univariate analysis was performed to see the frequency distribution, and bivariate analysis using the Mann-Whitney U test was performed to see the differences between groups. This study has received ethical approval from the Indonesian Perintis University Health Research Ethich Committee (No. Ref. 920/KEPK.F1/ETIK/2024).

## RESULT

Table 1 shows that the majority of pregnant women are in the low-risk age group (20–35 years), both in the intervention group (54.54%) and the control group (63.64%). Similarly, the parity of mothers in the intervention and control groups is the same, with the majority of mothers having more than three children. Regarding educational level, the majority of respondents had a secondary education, with 63.64% in the intervention group and 72.72% in the control group. Most respondents in both the intervention group (72.72%) and the control group were housewives with monthly incomes mostly above the provincial minimum wage (UMP), at 72.72% in the intervention group and 63.64% in the control group.

**Table 1. Characteristics of Respondents in the Intervention and Control Groups**

| Variables | Sungayang (Intervention) | | Pariangan (Control) | |
|---|---|---|---|---|
| | n | % | | % |
| **Mother's age** | | | | |
| Low risk (20-35 years-old) | 6 | 54.54 | 7 | 63.64 |
| High risk (<20 or >35 years-old) | 5 | 45.46 | 4 | 36.36 |
| **Parity** | | | | |
| > 3 | 8 | 72.72 | 6 | 54.54 |
| ≤ 3 | 3 | 27.28 | 5 | 45.46 |
| **Pregnancy Risk** | | | | |
| Low risk | 0 | 0 | 0 | 0 |
| High risk | 5 | 45.46 | 2 | 18.18 |
| Extremely high risk | 6 | 54.54 | 0 | 0 |
| **Education** | | | | |
| Primary | 2 | 18.18 | 2 | 18.18 |
| Secondary | 7 | 63.64 | 8 | 72.72 |
| Higher | 2 | 18.18 | 1 | 9.1 |
| **Occupation** | | | | |
| Housewife | 8 | 72,72 | 8 | 72,72 |

| Variables | Sungayang (Intervention) | | Pariangan (Control) | |
|---|---|---|---|---|
| | n | % | | % |
| Employee | 2 | 18,18 | 1 | 9,1 |
| Enterpreneur, etc | 1 | 9,1 | 2 | 18,18 |
| **Income (/month)** | | | | |
| < Provincial minimum wage (UMP) | 3 | 27,28 | 4 | 36,36 |
| > Provincial minimum wage (UMP) | 8 | 72,72 | 7 | 63,64 |

**Table 2. Distribution of respondents based on correct answers to questions about knowledge**

| No | Question item | Intervention group | | Control group | |
|---|---|---|---|---|---|
| | | Pre-test n (%) | Post-test n (%) | Pre-test n (%) | Post-test n (%) |
| 1 | Information on high-risk pregnancies | 10 (91) | 10 (91) | 10 (91) | 10 (91) |
| 2 | Types of high-risk pregnancy examinations | 9 (82) | 9 (82) | 10 (91) | 10 (91) |
| 3 | Definition of high-risk pregnancy | 4 (36) | 7 (64) | 6 (55) | 6 (55) |
| 4 | Risk factors for high-risk pregnancies | 9 (82) | 10 (91) | 5 (45) | 7 (64) |
| 5 | The role of the family in early detection of high-risk pregnancies | 3 (27) | 6 (55) | 8 (73) | 6 (55) |
| 6 | The role of the community in early detection of high-risk pregnancies | 7 (64) | 8 (73) | 7 (64) | 8 (73) |
| 7 | The importance of understanding the signs of high-risk pregnancies for families | 5 (45) | 8 (73) | 6 (55) | 7 (64) |
| 8 | The community's contribution to early detection of high-risk pregnancies | 5 (45) | 9 (82) | 5 (45) | 5 (45) |
| 9 | Family knowledge of danger signs during pregnancy | 10 (91) | 11 (100) | 10 (91) | 9 (82) |
| 10 | One of the danger signs in pregnancy | 0 (0) | 9 (82) | 4 (36) | 5 (45) |
| 11 | Family knowledge regarding complications during pregnancy | 9 (82) | 10 (91) | 8 (73) | 9 (82) |
| 12 | Pregnancy complications known to the family | 5 (45) | 8 (73) | 7 (64) | 5 (45) |
| 13 | Family knowledge regarding signs of obstetric emergencies | 10 (91) | 10 (91) | 7 (64) | 7 (64) |
| 14 | Signs of obstetric emergencies that are known | 9 (82) | 9 (82) | 7 (64) | 8 (73) |

Table 2 presents changes in family knowledge regarding high-risk pregnancies before and after the intervention, comparing the intervention and control groups. Overall, the intervention group showed more consistent improvements in knowledge after the intervention, particularly on items such as the definition of high-risk pregnancy (increased from 36% to 64%), danger signs during pregnancy (from 0% to 82%), and community contribution (from 45% to 82%).

**Table 3. Distribution of Respondents Based on Positive Attitudes Toward High-Risk Pregnancy Detection**

| No | Question item | Intervention group | | Control group | |
|---|---|---|---|---|---|
| | | Pre-test (median) | Post-test (median) | Pre-test (median) | Post-test (median) |
| 1 | P4K stickers are very important in raising public awareness about saving pregnant women. | 4 | 4 | 4 | 4 |
| 2 | The use of P4K stickers in the early detection of high-risk pregnancies is not very important. | 3 | 3 | 3 | 3 |
| 3 | One of the roles of the community in supporting the early detection of high-risk pregnancies is to create stigma against pregnant women. | 2 | 3 | 2 | 2 |
| 4 | A high-risk pregnancy is a pregnancy that increases the likelihood of the pregnant woman or fetus experiencing health problems. | 3 | 3 | 3 | 3 |
| 5 | If there are any dangerous factors in the pregnancy, the family needs to immediately go to a health care facility. | 3 | 3 | 3 | 3 |
| 6 | Early recognition of danger signs by families does not have a positive impact. | 3 | 3 | 3 | 3 |
| 7 | One of the danger signs in pregnancy is heartburn. | 3 | 3 | 3 | 3 |
| 8 | Families should immediately contact health workers if they find high-risk factors in pregnancy. | 3 | 3 | 3 | 3 |
| 9 | Improving families' ability to detect high-risk pregnancies early is not necessary because there are more competent health workers. | 3 | 3 | 3 | 3 |
| 10 | Families need to identify the nearest health service in an emergency. | 3 | 3 | 3 | 3 |
| 11 | Early detection of high-risk pregnancies by the community does not help at all | 3 | 3 | 2 | 2 |
| 12 | One contribution the community can make to early detection of high-risk pregnancies is to encourage pregnant women to seek healthcare services in a timely manner | 3 | 3 | 3 | 3 |
| 13 | Families do not need to plan for family management, including children, if the mother needs to be referred or in an emergency | 3 | 3 | 2 | 2 |
| 14 | Families need to obtain information about referring high-risk pregnancy cases from healthcare providers | 3 | 3 | 3 | 3 |
| 15 | Families do not need to have an action plan in case of an emergency during pregnancy | 3 | 3 | 3 | 3 |

Table 3 presents the median scores of family attitudes toward high-risk pregnancies in both intervention and control groups before and after the intervention. Overall, there were minimal changes in attitudes across both groups.

**Table 4. Distribution of Respondents Based on Family Support for Early Detection of High-Risk Pregnancies**

| No | Question item | Intervention group | | Control group | |
|---|---|---|---|---|---|
| | | Pre-test n (%) | Post-test n (%) | Pre-test n (%) | Post-test n (%) |
| 1 | The presence of P4K stickers in front of the house | 9 (82) | 10 (91) | 10 (91) | 9 (82) |
| 2 | What families do when they find signs of high-risk pregnancy | 2 (18) | 10 (91) | 5 (45) | 2 (18) |
| 3 | Family readiness to deal with pregnancy emergencies | 11 (100) | 11 (100) | 9 (82) | 11 (100) |
| 4 | Possession of hospital or midwife contact numbers | 9 (82) | 10 (91) | 10 (91) | 9 (82) |
| 5 | Family knowledge of how to prepare for complications and pregnancy emergencies | 10 (91) | 10 (91) | 9 (82) | 10 (91) |
| 6 | Family action plan in case of pregnancy emergencies | 8 (73) | 9 (82) | 8 (73) | 8 (73) |
| 7 | Type of family action plan to be implemented in case of pregnancy emergenci | 6 (55) | 10 (91) | 7 (64) | 6 (55) |
| 8 | What families do when pregnancy emergencies occur | 6 (55) | 11 (100) | 9 (82) | 6 (55) |
| 9 | Level of family support in handling pregnancy emergencies | 10 (91) | 10 (91) | 7 (64) | 10 (91) |
| 10 | Family history of receiving information on referrals for high-risk pregnancies from health workers | 6 (55) | 10 (91) | 8 (73) | 6 (55) |
| 11 | Information provided by health workers regarding referrals for high-risk pregnancies | 10 (91) | 10 (91) | 7 (64) | 10 (91) |
| 12 | Sufficient access to refer high-risk pregnancy cases | 4 (36) | 9 (82) | 5 (45) | 4 (36) |
| 13 | What the family does if the mother experiences bleeding during pregnancy | 9 (82) | 10 (91) | 9 (82) | 9 (82) |
| 14 | What the family does when the mother has contractions before 37 weeks of pregnancy | 10 (91) | 10 (91) | 4 (36) | 10 (91) |
| 15 | The family's knowledge of what to do when preeclampsia occurs | 9 (82) | 9 (82) | 9 (82) | 9 (82) |
| 16 | How quickly the family knows to contact a doctor or medical personnel if complications arise | 1 (9) | 10 (91) | 3 (27) | 1 (9) |
| 17 | What the family does if the amniotic fluid breaks prematurely | 11 (100) | 11 (100) | 10 (91) | 11 (100) |

Table 4 illustrates changes in family roles related to high-risk pregnancy management before and after the intervention, comparing the intervention and control groups. In the intervention group, there was a significant improvement across almost all indicators. For example, family action when identifying danger signs increased dramatically from 18% to 91%, and knowledge of referral procedures rose from 36% to 82%. The ability to quickly contact medical personnel also improved notably from 9% to 91%.

The results of the study, presented in Table 5, show that the average scores for knowledge, attitude, and family role increased after the intervention in both the intervention and control groups. Meanwhile, a higher increase in the average knowledge score occurred in the intervention group that received two months of assistance from the “Bundo Kanduang” women's group. This mentoring included education on high-risk pregnancies, preparedness for emergencies, the installation of P4K stickers, and support for pregnant women's access to healthcare services. Conversely, the numerical increase in average attitude scores was higher in the control group, with a difference of 7.91 compared to the intervention group, which had a difference of 6.72.

**Tabel 5 Frequency Distribution of Knowledge, Attitude, and Family Role pre-post test in Intervention and Control Groups**

| Variables | Group | Pretest | Posttest | Difference |
|---|---|---|---|---|
| | | Mean (SD) | Mean (SD) | |
| **Knowledge** | Intervention | 12.91(0.944) | 18.27 (3.349) | 3.64 |
| | Control | 12.55 (0.820) | 15.73 (0.905) | 3 |
| **Atittude** | Intervention | 42.55 (1.635) | 49.27 (2.195) | 6.72 |
| | Control | 41.73 (1.489) | 49.64 (2.618) | 7.91 |
| **Family Role** | Intervention | 11.91 (1.044) | 16.27 (0.905) | 4.36 |
| | Control | 11.64 (1.206) | 14.64 (1.748) | 3 |

The statistical test results in Table 6 show that there is a statistically significant difference between the intervention and control groups in terms of knowledge after the intervention and the role of the family after intervention ($p < 0.05$), indicating that group mentoring for women is effective in improving family knowledge and family involvement or role in the early detection of high-risk pregnancies. Conversely, there was no significant difference between the intervention and control groups in terms of attitude ($p > 0.05$), indicating that the intervention had no effect on changing family attitudes.

**Tabel 6 Differences in Knowledge, Attitudes, and Family Roles post test in Intervention and Control Group**

| Variables | Mean Rank | *p- value* |
|---|---|---|
| **Knowledge after intervention** | | |
| Control Group | 7.18 | 0.001 |
| Intervention Group | 15.82 | |
| **Attitude after intervention** | | |
| Control Group | 11.27 | 0.868 |
| Intervention Group | 11.73 | |
| **Family role after intervention** | | |
| Control Group | 7.68 | 0.004 |
| Intervention Group | 15.32 | |

## DISCUSSION

Knowledge plays a crucial role in shaping individual actions. Behavior rooted in knowledge tends to be more sustainable compared to behavior that is not (Minsarnawati, 2023). The findings of this study show that families in the intervention group—who received intensive education from the Bundo Kanduang women's group—had higher knowledge scores than those in the control group. These results are consistent with a study by August et al. (2016), which reported a 27% increase in men's knowledge after receiving interventions from community health workers regarding danger signs in pregnancy, childbirth, and the postpartum period. Additionally, family-centered counseling has been shown to improve the knowledge of pregnant women and their families by up to 91.4%, enabling them to be more prepared and responsive in providing early detection for high-risk pregnancies (Abidah & Anggraini, 2021).

Previous studies have revealed that educational exposure and knowledge of maternal health are key predictors of husbands' involvement in maternal care. Husbands with greater knowledge tend to be more involved in maternal health programs than those with limited understanding (Wai et al., 2015). A lack of knowledge among husbands or families regarding early detection of high-risk pregnancies can result in delays in decision-making. For instance, studies found that maternal waiting homes (MWH) remain underutilized by communities due to limited awareness among pregnant women and their families. In fact, MWHs are one of the interventions that can reduce risks and the severity of pregnancy complications (A. Dewi et al., 2023).

Therefore, improving knowledge plays a significant role in influencing maternal health outcomes. Ongoing health education regarding early detection and pregnancy complications can help reduce maternal mortality by increasing family awareness and understanding (Ernawati & Askar M, 2024). Women's groups have also been shown to be effective in enhancing families' understanding of early detection of high-risk pregnancies. Moreover, by recognizing the danger signs of pregnancy, families are better equipped to make timely decisions to minimize complications (Winancy, 2019).

However, increased knowledge does not automatically translate into changes in attitude or behavior. In this study, although the intervention group demonstrated higher knowledge scores, the increase in attitude frequency was greater in the control group—albeit not statistically significant ($p > 0.05$). This finding is aligned with prior studies which showed that many husbands with a positive attitude (67.40%) still had low knowledge about pregnancy care and danger signs. Furthermore, Dyas et al. (2024) found no significant relationship between attitudes and husbands' participation during childbirth, suggesting that knowledge alone may not be sufficient to shape attitudes. Hence, other factors—such as social influences—may play a more dominant role in attitude formation. Additionally, the small sample size reduced the statistical power and the ability to detect significant differences (Magara & Boury-Jamot, 2024).

The study also demonstrated that the intervention group experienced a greater increase in family role scores compared to the control group. Families who received counseling from Bundo Kanduang were more proactive in identifying danger signs and making timely referrals. This finding is consistent with previous research showing increased competencies in pregnancy emergency prevention, early detection, and management among families who received structured education and training from community leaders and health workers (from 58.0 to 78.9; $p < 0.001$) (Hidayati &

Setyorini, 2020). Similarly, Dewi et al. (2024) found that interactive counseling effectively improved husbands' involvement in supporting their wives during pregnancy.

Family support, especially from husbands, plays a vital role in decision-making related to maternal health, which can affect maternal mortality. Husbands also contribute by facilitating access to preventive health services for pregnant women, particularly through early detection and prevention of pregnancy complications (Syalfina et al., 2020). This study also indicates that involvement of community figures influenced the change in family roles. This could be attributed to the presence of health cadres or community leaders who frequently assist husbands and families in making decisions or seeking emergency care. Health cadres are often perceived as the most accessible and trusted figures within the community, particularly in relation to maternal health (Rasyid et al., 2024).

The limitation of this study is that the number of respondents did not match the initial plan, which was 20 people in the intervention area and 20 people in the control area. After identifying respondents according to the criteria, there were only 11 respondents in the control area, so adjustments had to be made for respondents in the intervention area.

## CONCLUSIONS

The "Bundo Kanduang" Women's Group has shown success in increasing knowledge and the role of families in early detection of high-risk pregnancies. However, there was no significant difference in terms of attitude. Therefore, further research with a larger sample size is needed to determine the influence of the "Bundo Kanduang" Women's Group on attitudes toward early detection of high-risk pregnancies.

**Author's Contribution Statement: Devi Syarief:** Conceptualization, Methodology, Supervision, Reviewing and Editing. **Afrizal**: Writing, Visualization, Investigation. Software, Validation. **Delvi Hamdayani.**: Data curation, Writing-Original draft preparation.

**Conflicts of Interest:** The authors declare that the research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

**Source of Funding:** This study is financially funded by Mercubaktijaya University for the Budget Year 2024 in accordance with the Research Assignment Implementation Agreement Number 63/LPPM-MCB/VI/2024 dated June 13, 2024. Mercubaktijaya University has no influence on the study design, data interpretation, or publication decisions.

**Acknowledgements:** The authors would like to express their hearfelt gratitude to the Bundo Kanduang community and local health cadres in Nagari Sungayang and Nagari Pariangan for their valuable support and participation during the research process. We also thank the Head of Sungayang District, the leader of the Sungayang Heath Center, and the leader of the Pariangan Heath Center for their support in facilitation and coordination. Special appreciation is give to all the pregnant women who generously shared their experiences and time during the data collection. Thanks are also extended to Mercubaktijaya University for their financial support of this research.

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