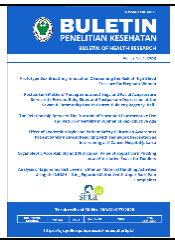

Buletin Penelitian Kesehatan
e-ISSN: 2338-3453 | p-ISSN: 0125-9695
Volume 53 Issue 2, 2025, Page 77-84
DOI: 10.33860/bpk.v53i2.4174
Website: https://ojs.polkespalupress.id/index.php/bpk
Publisher: Poltekkes Kemenkes Palu

The Influence of Education on Increasing Women's Empowerment for Early Detection of Pregnancy Complications in Sigi Regency

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ARTICLE INFO

Article History:
Received: 2025-02-01
Accepted: 2025-05-20
Published: 2025-11-30

Keywords:
Empower women; danger signs; behavior; family support; women autonomy.

ABSTRACT

Background: Women's empowerment plays a critical role in improving maternal and family health, particularly through timely recognition of pregnancy danger signs and informed decision-making. Educational interventions are expected to enhance women's knowledge, attitudes, skills, and empowerment related to the early detection of pregnancy complications. This study examined the effect of education on women's empowerment and behavioral outcomes regarding pregnancy danger signs among third-trimester pregnant women in Sigi Regency, Indonesia.
Methods: A quantitative quasi-experimental study with a pretest–posttest design without a control group was conducted from June to October 2023. Eighty-five pregnant women with gestational age >28 weeks were recruited from four community health centers. Participants received structured education using a pocket book on danger signs during pregnancy, childbirth, and the postpartum period. Data were collected using a validated self-reported questionnaire. Paired t-tests were used for data analysis.
Results: Mean scores for knowledge (8.74 to 9.35), attitudes (19.07 to 21.46), and skills (20.69 to 25.91) regarding pregnancy danger signs increased significantly after the intervention ($p<0.05$). Although the empowerment score increased (14.65 to 16.27), the difference was not statistically significant ($p>0.05$).
Conclusion: Educational intervention effectively improved pregnant women's knowledge, attitudes, and skills related to pregnancy danger signs, but was insufficient to significantly enhance women's empowerment. Comprehensive, family-centered strategies are needed to strengthen women's autonomy in maternal health decision-making.

INTRODUCTION

Women's empowerment is a process of raising awareness and forming capacity (capacity building) for greater participation of women or individuals, groups, communities, in the form of freedom, supervision, and decision-making, as well as transformational actions that lead to the realization of equal rights between men and women or gender equity (Chol *et al.*, 2019; Ha and Ansari, 2020). Previous studies have shown a significant relationship and influence between women's empowerment and autonomy and the quality of family health, especially maternal and child health (Agazhi, 2023; IFAD & ILO, 2017). Women's empowerment refers to efforts to increase women's ability to make decisions regarding their own health and that of their babies

quickly and accurately.

The family is the smallest part of society; on the other hand, it is the main and first shaper of the character of the nation's successors. The role of families in improving health status is important (Herinawati et al., 2021; Hermawati, 2019; Juniarti et al., 2024). There are various benefits or positive impacts related to women's autonomy and empowerment in preventing the late three conditions, which are the causes of maternal and infant mortality in the obstetrics sector apart from bleeding and eclampsia. The three delays referred to include being late in phase 1 or late in recognizing a problem, late in phase 2 is late in getting to a health/referral facility, and late phase 3 is delayed in obtaining treatment at a referral site (Ngo et al., 2020; Nikbakht Nasrabadi et al., 2015; Prata et al., 2017; Rahyani & Suardana, 2019).

Women's empowerment or autonomy is related to their level of education, employment, income, social culture, place of residence and religiosity (Tavananezhad et al., 2022; WHO, UNAIDS, UNFPA, UNICEF, UN WOMEN, 2018; Winters et al., 2023). Women are disadvantaged in recognition of agricultural decision-making and policies because of lack of knowledge, low level of education, social economic disadvantage, and social culture that does not support women (Tavananezhad et al., 2022; World Health Organization, 2018; Wulandari & Laksono, 2020).

Another effect related to the benefits of women's empowerment is that it can reduce the incidence of anemia during pregnancy, improve women's health because they can decide to use contraception according to their condition, and improve the quality of babies born (Agazhi, 2023; Chol et al., 2019; Mardiyanti et al., 2024). Women who have high levels of autonomy or empowerment are associated with the ability to seek health help more quickly and recognize pathology and emergency conditions more quickly because they have the opportunity to contact health workers more frequently (Dangura, 2020; Abreha and Zereyesus, 2021; Abdulai, Salifu and Domanban, 2024; Nath and Das, 2025).

In a report from the Central Sulawesi Provincial Health Office (2020), the Maternal and Child Health Services in Sigi Regency almost exceeded the target on average, such as the achievement of the first visit for pregnant women/K1 (100%), the coverage of visits four times/K4 (92.6%), the percentage of pregnant women who received Fe Tablets (83.8%), gave birth assisted by health workers in health facilities (90.9%), gave birth assisted by trained health workers (91.3%), and postpartum services (85%). Special attention is needed for the lowest coverage of treatment of obstetric complications in Central Sulawesi Province, namely, in Sigi Regency (25.6%). The percentage of babies with low birth weight is 10% (comparison of the percentage of LBW babies in Sigi Regency and Province is 6.2% and the percentage of LBW babies in this case is still below the national target amount 5.4%) (Dinas Kesehatan Provinsi Sulawesi Tengah., 2021).

Data on the underlying factors contributing to the low level of early detection of pregnancy complications and obstetric emergencies in Central Sulawesi Province, particularly in Sigi Regency, remain limited. This gap may contribute to delays in recognizing danger signs and in preparing timely referrals when emergencies occur. Given the potential role of education in strengthening women's knowledge, behavior, and empowerment related to maternal health, this study aimed to examine the effect of educational intervention on women's empowerment and behavioral outcomes regarding pregnancy danger signs among third-trimester pregnant women in Sigi Regency, Indonesia.

METHODS

The type of research was quantitative, with a quasi-experimental design, namely a pretest-posttest without a control group design. The research locations included four community health centers: Marawola, Kaleke, Dolo, and Biromaru Community Health Centers. The research was conducted from June to October 2023. Probability sampling was used as the sampling technique. The total sample included 85 pregnant women with a gestational age of > 28 weeks who visited the Community Health Center in Sigi Regency and met the previously established inclusion and exclusion criteria. Inclusion criteria were as follows: a) complete family (husband, pregnant wife); b) Have a Maternal and Child Health book; c) Have ever visited an Integrated

Services post or Posyandu (in the last 6 months); d) pregnant women do not have a history of chronic disease; e) Willing to be involved in research. Exclusion criteria: a) pregnant women who lived temporarily in the village; b) pregnant women with special needs or mental disorders; and c) not present when the research took place.

The research instrument used was a self-reported questionnaire. Research to analyze the empowerment of pregnant women with question items divided into self-efficacy, self-esteem, future image, support, and decision making. Maternal behavior assessed included: 1) knowledge of danger signs during pregnancy until the postpartum period and attitudes related to empowerment and actions of mothers and families when experiencing emergencies. Behavior and empowerment assessments were conducted in the form of a pre-test and post-test. Pregnant women's classes were held at a health center hall. Researchers assisted by the selected health center midwife coordinator conducted a pretest for 15 min, followed by intervention in the form of counseling on recognizing danger signs during pregnancy until the postpartum period and neonates at home. Counseling was performed in a classical manner for 30 minutes using pocket books. The pocket books were compiled by the researchers and distributed to the sample to be taken home and read whenever the respondents were willing. The posttest was conducted within a maximum of 2 weeks after counseling was given. A 15-minute post-test was conducted at the health center during a return visit. Univariate analysis related to sample characteristics used proportions, while bivariate analysis of differences in pre-test and post-test scores was performed using t-test analysis.

The self-reported questionnaire used was an adaptation of the results of previous studies by Rahyani et al. (2018, 2019) in Bali and West Papua. The validity and reliability of the questionnaire were tested, with valid and reliable results. Ethical approval for this study was obtained from the Ethics Committee of Poltekkes Kemenkes Palu. Participation was voluntary, and all respondents provided informed consent after receiving a full explanation of the study procedures.

RESULTS

A total of 85 respondents were recruited from four selected community health centers in Sigi Regency. The largest proportion of participants was from Marawola Community Health Center (27 participants; 31.8%), while the smallest proportion was from Biromaru Community Health Center (11 participants; 12.9%). Table 1 presents the distribution of respondents across the four community health centers included in the study.

Table 1. Distribution of respondents from four community health centers in Sigi Regency (n=85)

Health Care Center	n	%
Biromaru	11	12.9
Dolo	23	27.1
Kaleke	24	28.2
Marawola	27	31.8

Table 2 presents the sociodemographic and maternal health characteristics of the study participants, showing that most women were unemployed (85.88%), had a monthly income below 1.5 million IDR (67.06%), and all resided in rural areas. More than half were multigravida (50.60%), one-third had a history of pregnancy risk (34.11%), and the majority reported experiencing pregnancy complications (80.00%). Although most participants were aware of pregnancy danger signs (71.76%), midwives and health workers were the main source of information (76.47%), and most women attended antenatal care at least four times (85.89%).

Table 2. Sociodemographic and Maternal Health Characteristics of Study Participants (n = 85)

Variables	n	%
Employment		
Yes	12	14.12
No	73	85.88
Income (in Million IDR)		
<1.5	57	67.06
≥1.5	28	32.94
Gravida		
Primigravida	23	27.05
Multigravida	43	50.60
Grand multigravida	19	22.35
Pregnancy Risk History		
Yes	29	34.11
No	56	65.89
Residence		
Urban	0	0.00
Rural	85	100.00
Complications during pregnancy		
Yes	68	80.00
No	17	20.00
Knowledge of danger signs		
Know	61	71.76
Do not know	24	28.24
Sources of information about danger signs		
Midwives and health workers	65	76.47
Others include social media	20	23.53
Number of ANC visits		
<4 times	12	14.11
≥4 times	73	85.89

Table 3 presents the pretest and posttest mean scores of knowledge, attitudes, psychomotor skills, and women's empowerment among the 85 respondents. Following the educational intervention, mean scores increased for all variables, with knowledge rising from 8.74 ± 1.35 to 9.35 ± 0.88, attitudes from 19.07 ± 4.59 to 21.46 ± 4.18, and psychomotor skills related to emergency management from pregnancy to the postpartum period increasing from 20.69 ± 9.85 to 25.91 ± 9.38. These improvements in knowledge, attitudes, and psychomotor skills were statistically significant (p = 0.001). In contrast, although the women's empowerment score increased from pretest to posttest, the difference was not statistically significant (p = 0.405), indicating a limited impact of the intervention on empowerment within the family context.

Table 3. Analysis of differences in posttest and pretest scores regarding women's empowerment and behavior.

Variables	Score of pretest (mean ± SD)	Score of posttest (mean ± SD)	95% CI	t	p-value
Knowledge	8.74 ± 1.35	9.35 ± 0.88	0.61-0.27	3.58	**0.001**
Attitude	19.07 ± 4.59	21.46 ± 4.18	0.97-3.81	3.35	**0.001**
Psychomotor/skill	20.69 ± 9.85	25.91 ± 9.38	2.88-7.54	4.49	**0.001**
Empowerment	14.65 ± 12.95	16.27 ± 15.17	-2.24-5.48	0.84	0.405

DISCUSSION

Women's empowerment is a multidimensional construct based on various factors, including adequate resources; social or relational support; economic, political, and socio-cultural

aspects; and various psychological factors. Women's empowerment at the household level, perceptions of healthcare provider behavior, and treatment costs were positively associated with the intention to seek treatment. Potential determinants of maternal delays in recognizing and seeking health services in emergency situations are influenced by maternal, family, antenatal, and delivery factors (Abebe et al., 2025; Kebede et al., 2022). By introducing pregnant women and their families early on to various danger signs during pregnancy until the postpartum period, the incidence of death and morbidity can be significantly reduced. Pregnant women and families with positive knowledge, attitudes, and behaviors will seek help from health facilities more quickly and appropriately (Yosef & Tesfaye, 2021).

The empowerment of pregnant women is related to their efforts to seek information from health workers, especially regarding pregnancy care and child health. A previous study by Nasrabad (2015) found that it is very important for women to obtain information related to healthcare and pregnancy from professional staff. This relates to women's rights to seek and obtain comprehensive information about efforts to manage their own and family health (Ngo et al., 2020; Nikbakht Nasrabadi et al., 2015; Prata et al., 2017; Sey-Sawo et al., 2023; Winters et al., 2023; World Health Organization, 2018).

Four main focuses are central to empowering women to seek health information: 1) managing health management through better individual coping, stress management, and controlling situations; 2) collaborative care through a positive interaction approach with health professionals and being actively involved in decision-making regarding their own health; 3) individual development; and 4) self-protection through lifestyle modification strategies, promotion of preventive behavior, increasing self-care efforts, and appropriate treatment-seeking behavior 3. In connection with these results, a study by Ngo et al. (2020) suggests that pregnant women who experience complications during pregnancy require more information from medical personnel. Therefore, efforts have been made to provide information through digital media so that it can be accessed more quickly and easily.

There are several factors that influence the increase in knowledge, attitudes, skills, and women's empowerment scores before and after being educated by health workers; namely, the material provided is important and needed by pregnant women, and the environment of the education place or class for pregnant women that supports comfort and facilities. adequate infrastructure, interesting media, appropriate activity times, and the abilities of the education provider/midwife (Rahyani & Suardana, 2019). Previous studies in Denpasar City and Fakfak Regency (West Papua) showed that the knowledge and skills of midwives in health centers and pregnant women regarding danger signs increased after routine training and mentoring (Rahyani., 2020). Support from policyholders, in this case, the head of the community health center, family/husband, and community, is crucial for the success of educational efforts (Abdulai et al., 2024; Abreha & Zereyesus, 2021; Ang & Lai, 2023; Dangura, 2020).

Limitations and Cautions

The results of this study showed that women's empowerment scores did not differ between the pre-test and post-test scores. This was because of the limited information obtained from the questionnaire used.

Recommendations for Future Research

The researcher recommends that further research be conducted on the various determinants that influence the success of empowerment. It is necessary to conduct a multivariate test of the determinants that most significantly influence the success of women's empowerment by improving maternal and child health more broadly.

CONCLUSION

Increasing the knowledge, attitude, and skill scores of women during pregnancy related to danger signs has a crucial influence on improving maternal and child health. Pregnant women's classes can be used as a source of information and communication between health workers and

pregnant women and their husbands or families in the context of interaction and transformation in the field of health promotion and the prevention of delays in handling pathological conditions or obstetric complications. The competence of midwives in increasing the positive behavior of women and their families needs to be improved. Empowering women in the family, especially those involved in decision-making to seek health care, still requires a special strategy that is more effective and efficient. Evidence-based continuity of care efforts can be a priority for policymakers in the Sigi Regency.

Author's Contribution Statement: Each researcher has their own role and duties, and these roles support the success of research and publication of research manuscripts. The primary and corresponding authors are responsible for conceptualizing, verifying, and compiling the final report. The co-authors are responsible for the data analysis, curation, and visualization. All authors have duties and responsibilities related to research preparation, data collection, and the writing of this article.

Conflicts of Interest: The authors declare no conflicts of interest.

Source of Funding Statements: This research was funded by the 2023 Palu Ministry of Health Polytechnic DIPA Fund.

Acknowledgments: The author would like to express his gratitude to the Director General of Health Personnel, Ministry of Health of the Republic of Indonesia, who provided the opportunity to conduct research on higher education collaboration schemes.

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