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Effect of husband education in childbirth support on women's self-efficacy and labor outcomes: a quasi-experimental study

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Abstract

Background: Labor is an experience that requires confidence but can induce a feeling of fear. Women's readiness and self-efficacy for pregnancy and childbirth are issues in preventing long labor. The husband's support can increase the mother's childbirth self-efficacy.

Objectives: To determine the effect of husband education in childbirth support on women's childbirth self-efficacy and labor outcomes.

Methods: A quasi-experimental study with pretest-posttest design was conducted from June to October 2022 at the Independent Midwifery Practice Centers of Pringsewu Regency, Indonesia. The participants were 138 pregnant women who were randomly allocated into two groups. The data collection instrument included the Childbirth Self-Efficacy Inventory (CBSEI), a questionnaire for assessing the husbands' childbirth support knowledge and skills, and two questionnaires developed by the researchers to record respondents' characteristics and current pregnancy outcomes. Data analysis was performed using the chi-square test, the independent samples *t*-test, and the Multivariate analysis of variance.

Results: There was a significant increase in the husband's knowledge and skills in childbirth support, four domains of childbirth self-efficacy, pain, duration of the first and second stages of labor, and success of initiating breastfeeding (P <0.001). Multivariate analysis showed that of all variables, the variable most influenced by the intervention was first-stage self-efficacy expectancy, which was 0.746 (74.6%), while the variable least influenced was the duration of the first stage of labor, which was 0.199 (19.9%).

Conclusion: Husband education in childbirth support can increase the mother's childbirth self-efficacy and birth outcomes.

Keywords: Spouses, Education, Self efficacy, Doulas, Labor, Obstetric.

Introduction

The global daily Maternal Mortality Rate (MMR) was 810 in 2017, and up to 94% of all maternal deaths occurred in developing countries.[1] MMR in the Southeast Asian Nations (ASEAN region) in 2020 was highest in Cambodia, with 218 per 100,000 live births, and lowest in Singapore, with 7 per 100,000 live births. Indonesia itself ranks third, with 173 per 100,000 live births.[2] The most common cases of birth complications in Indonesia are anxiety or severe pain (53.5%), prolonged labor (40.6%), and inability to bear (10.3%).[3]

During labor, women experience stress and pain.[4] Inappropriate management of labor pain can cause maternal stress and adverse complications, such as prolonged labor, risk of fetal distress, head compression, and low APGAR scores.[5] Prolonged labor can also lead to increased rates of cesarean deliveries and labor inductions, labor complications, bleeding, and even death.[6]

Psychological factors such as beliefs about labor and birth, also known as childbirth self-efficacy (CBSE), can affect labor stress and pain. CBSE is an important indicator of women's coping abilities during labor.[7] A mother with high CBSE can increase her self-confidence in facing childbirth so that the birth process becomes smoother.[8] Low CBSE in mothers results in low self-confidence, which tends to increase pathologically. Therefore, it is important to increase mothers' CBSE to prepare them for labor and increase their self-confidence during childbirth.[9] High CBSE has been shown to be associated with high prenatal fears, improved perinatal outcomes, reduced pain, and

reduced incidence of postpartum depression.[10]

Income, birth experience, and maternal education level all impact women's psychosocial condition and CBSE.[11] A study found that lack of knowledge about childbirth was the main cause of low CBSE. Additionally, low husband support was associated with lower CBSE and higher levels of pain and fear in nulliparous and multiparous women.[8]

Husband support has been shown to reduce labor pain.[12] A study in Indonesia found that women who were fully supported by their partners during labor experienced faster labor, less labor pain, and fewer labor complications.[13] On the other hand, women whose husbands do not fully support them have worse birth outcomes, such as depression and anxiety.[14] Several factors can interfere with partner's support during the birth process. Some of these factors include financial instability, difficulty in transportation to health service facilities, lack of proper knowledge and attitude about the importance of partner's support, and failure to receive necessary information from health care providers regarding support during pregnancy and childbirth.[15,16]

Midwives can serve as educators for both pregnant women and their families.[17] An Indonesian study examining the benefits of educating husbands about supporting mothers during childbirth concluded that education and counseling interventions can increase husbands' knowledge of the benefits of their support during childbirth. A study in Jakarta, Indonesia, also found that teaching pregnant women and their husbands how to use acupressure to relieve labor pain can increase their knowledge in this regard, but they still needed further training to transfer their knowledge to practice.[18,19] However, the effect of the husband education regarding birth outcomes on the mother's psychological condition and birth outcomes has not been clearly explained. In addition, no specific health promotion program in the form of training the husbands of pregnant women in the management of childbirth has been implemented in the Pringsewu Regency, Lampung, Indonesia. Moreover, no study has examined how the husband education in labor support affects CBSE and birth outcomes in Indonesian mothers. Therefore, the question is how the husband training in childbirth support affects the mother's CBSE and birth outcomes.

Objectives

This study examined the effect of a husband education supporting childbirth program on mothers' CBSE and labor outcome.

Methods

Study design and participants

This was a quasi-experimental study with a pretest-posttest design. The population in this study were pregnant women and their husbands who were referred to the Independent Midwifery Practice (IMP) in Pringsewu Regency, Indonesia, and met the inclusion criteria. The inclusion criteria for the couple were residence in the Pringsewu Regency, nulliparity, age of 20-35 years old, gestational age of 20-28 weeks, having a health record in the IMP, a singleton pregnancy, a healthy pregnancy condition, possessing a smartphone, lacking a history of abortion and unplanned pregnancy, and willingness to participate in the study. Exclusion criteria included, lack of access to the couple to complete the study, moving to another city, and occurrence of pregnancy complications.

The sample size was calculated based on the results of a previous study where an antenatal education program increased maternal CBSE, with Control 224.1±37.8 and intervention group 257.6±44.9.[20] Consequently, using the formula for comparing two means, with a two-sided alpha of 0.05 and a power of 0.90, the minimum sample size was 25 people each group. However, given the possible loss to follow-up, we increased the sample size to 74 in each study group. We used a simple randomization technique to assign participants to the study groups. For this purpose, the researchers coded the six available IMPs, put the codes in a container, and asked an unbiased person to randomly pick three codes from the container. Places related to these codes were assigned to the intervention group, and the remaining three places were assigned to the control group.

Data collection instruments

The data collection instrument included four sections. The first section included characteristics of respondents such as age, education level, and occupation. We used data from the pregnant women's files to record respondents' characteristics and current pregnancy conditions. The second section was the questionnaires on the husband knowledge and skills in accompanying his wife during childbirth, drawing from earlier studies in Indonesia.[21] The researchers conducted a reliability test for this questionnaire at the research site, obtaining a Cronbach's alpha of 0.71. The third section was the Lowe's Childbirth Self-Efficacy Inventory (CBSEI). The CBSEI consists of 60 items in four subscales, namely outcome expectancies for active labor (15 items), self-efficacy expectancies for active labor (15 items), outcome expectancies for the second stage of labor (15 items), self-efficacy expectancies for the second stage of labor (15 items).[22] All items are scored on

a numeric rating scale ranging from 1 (not at all sure or not at all helpful) to 10 (completely sure or very helpful). This questionnaire has been translated into Indonesian and psychometrically validated.[9,23] We also conducted a CBSEI reliability test at the research site, obtaining a Cronbach's alpha of 0.82.

The fourth section was the delivery outcomes questionnaire containing items on labor pain, labor duration, APGAR score, and breastfeeding success at the first hour. Labor pain was measured using a numerical rating scale with a score of 0-10 in the active phase of the first stage of labor.[24] Measurement of labor pain in the first stage of the active phase was done after vginal examination. The duration of the first stage of labor was measured in minutes from the mother's entery into the delivery room to the second stage. The results are then compared with the partograph. At stage one, it is seen whether it has crossed the alert line or not. In primiparas, the duration of stage II is measured based on the criterion of two hours. Calculation of the time for the first stage of labor began when the first examination occurred till childbirth. Calculation of the second stage began when the cervix was fully dilated till childbirth. Baby's fitness was measured using the APGAR score in the first minute after the delivery. Early Initiation of Breastfeeding (EIBF) success is measured from the moment the baby is placed on the mother's belly until the baby can suck the mother's nipple. EIBF is successful when the baby can find the nipple within 60 minutes.[25]

Intervention

This study was conducted in April and November 2022. Both the intervention and control groups received health education. The control group received standard health education on healthy pregnancy, nutrition during pregnancy, childbirth preparation, signs of labor, and the birthing process, based on the 2020 edition of the Maternal and Child Health (MCH) book.[26] Education was given in four meetings, each lasting 20-30 minutes.

In addition to the routine health education using the MCH book, the intervention group received a husband education to support childbirth. This program included education about the forms of support during childbirth. We held training sessions during the process using lectures, discussions, and videos on how husbands can provide emotional, informational, financial, and skills support during labor to help mothers feel confident in labor and deliver healthy babies. Skills taught to husbands included helping to regulate breathing during contractions, relieving labor pain with back massages, helping mothers change positions during the first stage of labor, and providing proper nutrition during the first and second stages of labor. The training took place in four sessions, each lasting 20-40 minutes.

Pretest and posttest data on husbands' knowledge and skills in supporting childbirth were obtained immediately before and after the completion of the intervention by filling in a Google form shared on WhatsApp by the research group. Filling in the CBSEI was carried out when the birthing mother entered the delivery room using the Google form on the tablet that we provided. Data on labor outcomes were obtained during the delivery process.

Ethical considerations

This research has received ethical approval from the Faculty of Health, Muhammadiyah University of Pringsewu (No 013/KEPK/FKes/2022). The participants were first informed about the objectives, procedures, benefits, risks and inconveniences, confidentiality of data, and voluntariness. The researchers gave participants the right to decide whether or not they wanted to participate. Subjects willing to participate were asked to sign an informed consent form.

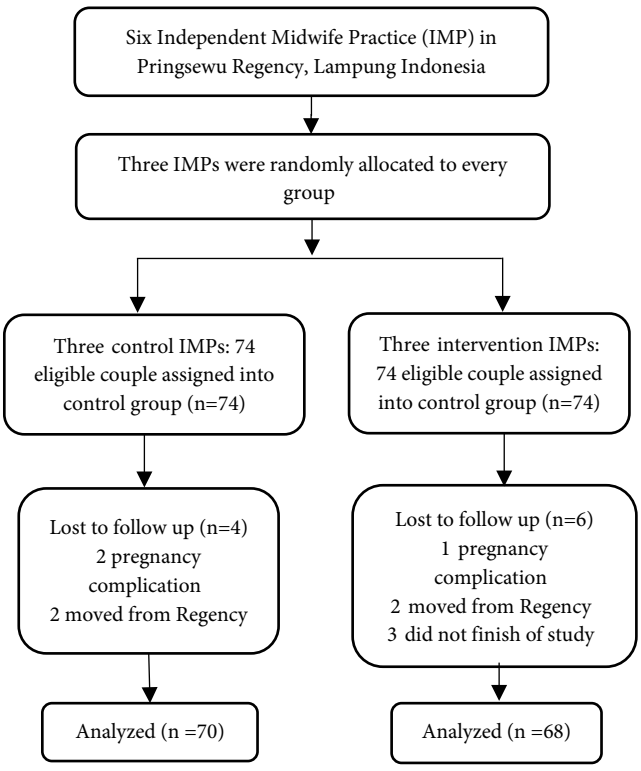

Figure 1. Flow diagram of the study

Data analysis

Data were first entered into the Excel program and then

imported to the IBM SPSS., Armonk, NY, USA. We used the chi-square test to compare the two groups in terms of categorical data. We also used the *t*-test to compare the two groups in terms of categorical data. We also used the t-test to compare the mean of numerical data between the intervention and control groups. A multivariate analysis of variance (MANOVA) was carried out to examine the effects of the intervention on husbands' knowledge and skills, mothers' CBSE, and numerical delivery outcomes simultaneously. This test was set at α of 0.05 and a confidence interval (CI) of 95%.

Results

A total of 70 subjects from the control group and 68 from the intervention group completed the study [Figure 1]. The participants in the control and intervention groups were homogeneous in terms of their age, education, and occupation [Table 1].

Mean baseline scores for knowledge (P=0.278) and skills (P=0.318) in childbirth support did not differ significantly between husbands in the control and intervention groups. Husbands' mean posttest knowledge and skills increased in both groups, but the increase was significantly higher in the intervention group [Table 2].

Table 1. Characteristics of the study subjects

Variables	Group [a]		P-value
	Control (n=70)	**Intervention** (n=68)	
Age, Means±SD	26.6±3.59	26.46±4.51	0.703[b]
Education			0.178[c]
Basic	26 (37.1)	19 (27.9)	
Intermediate	37 (52.9)	35 (51.5)	
High	7 (10)	14 (20.6)	
Work			0.400[c]
Does not work	49 (70)	42 (61.8)	
Work	21 (30)	26 (38.2)	

[a] Data are presented as Means ±SD or n (%), [b] t-test, [c] Chi-square

Table 2. Comparison of the effects of the intervention on husband knowledge and skills in childbirth support

Variables	Group		P-value [a]	CI 95%
	Control (n=70)	**Intervention** (n=68)		
Pretest knowledge				
Mean±SD	53.41±8.14	51.78±9.44	0.278	-1,331 – 4,601
Median	54.50	53.0		
Range	39–57	39–67		
Posttest knowledge				
Mean±SD	63.40±8.03	85.59±4.48	< 0.001	-24,387 – -19,990
Median	63.50	85.0		
Range	51–78	78–93		
Knowledge delta				
Mean±SD	9.99±11.09	33.81±10.52	< 0.001	-27,465 – -20,178
Median	11.09	35.0		
Range	10–35	12–52		
Pretest skills				
Mean±SD	52.34±8.42	53.75±8.04	0.318	-4.181 – 1.365
Median	52.0	54.0		
Range	39–67	39–67		
Posttest skills				
Mean±SD	64.57±8.08	85.24±4.20	< 0.001	-22,826 – -18,514
Median	85.0	85.0		
Range	78–93	78–93		
Delta skills				
Mean±SD	12.23±11.91	31.49±9.97	< 0.001	-22,953 – -15,561
Median	11.0	29.50		
Range	-13–38	13–49		

[a] All p-values are based on t-test

During both the first and second stages of labor, mean mothers' self-efficacy and outcome expectations were significantly higher in the intervention group than in the control group (P<0.001) [Table 3]. No significant differences were found between the two groups in the amount of cervical dilation upon arrival at the delivery room (P=0.703), the proportion of partographs that crossed the alert line at the first stage of labor (P=0.326), and the newborn`s APGAR score (P=0.145). However, labor pain was significantly higher in the control group than in the intervention group (P<0.001). The proportion of partographs crossing the alert line at the second stage of labor was significantly higher in the control group than in the intervention group (P=0.045). However, the duration of the first and second stages of labor was significantly shorter in the intervention group than in the control group (P<0.001). The proportion of unsuccessful EIBF within the first hour was higher in the control group than in the intervention group (P=0.016). The time in which the baby initiated breastfeeding was also significantly faster in the intervention group than in the control group (P<0.001) [Table 3].

Table 4 shows the results of multivariate testing of the influence of husband education in supporting childbirth on childbirth self-efficacy and birth outcomes. The results showed that the husband education in childbirth support had a significant effect on increasing knowledge, increasing skills, childbirth self-efficacy, labor pain, duration of the first stage of labor, duration of the second stage of labor, and successful EIBF time (P<0.001). The partial eta squared was 0.93. Of all variables, the variable most influenced by the intervention was first-stage self-efficacy expectancy, which was 0.746 (74.6%), whereas the variable least influenced was the duration of the first stage of labor, which was 0.199 (19.9%).

Table 3. Comparison of the effects of intervention on mother's childbirth self-efficacy and delivery outcomes

Variables	Group		P-value [a]	CI 95%
	Control (n=70)	**Intervention** (n=68)		
First stage self-efficacy				
Expectancy				
Mean±SD	64.90±6.07	87.99±7.38	<0.001	-25,365 – -20,805
Median	65.0	88.60		
Range	49–80	71–105		
Outcomes				
Mean±SD	66.63±6.63	85.91±6.84	<0.001	-21,554 – -17,013
Median	67.0	86.0		
Range	52–83	71–98		
Second stage self-efficacy				
Expectancy				
Mean±SD	66.36±5.50	85.43±6.61	<0.001	-21,115 – -17,023
Median	67.0	86.0		
Range	50–79	68–101		
Outcomes				
Mean±SD	65.87±5.39	85.54±5.89	<0.001	-21,576 – -17,769
Median	65.0	86.0		
Range	54–81	72–97		
Cervical dilatation on arrival to the delivery room				
Mean±SD	3.33±0.75	3.44±0.81	0.703	-2.612 – -1.607
Median	3.0	3.0		
Range	2–5	2–5		
Labor Pain				
Mean±SD	6.76±1.61	4.65±1.35	<0.001	1,608 – 2,612
Median	7.0	5.0		
Range	4–9	3–7		
Partograph check at the first stage				
Cross the alert line	7 (10.0)	3 (4.4)	0.326	0.226 – 1.546
Normal	63 (90.0)	65 (95.6)		

Partograph check at the second stage				
Prolonged Labor	13 (18.6)	4 (5.9)	0.045	0.186–1.065
Normal	57 (81.4)	64 (94.1)		
Duration of the first stage (minutes)				
Mean±SD	280.09±65.59	218.56±55.85	<0.001	40,991 – 82,063
Median	281.0	207.50		
Range	190–419	107 – 360		
Duration of the second stage (minutes)				
Mean±SD	78.22±17.49	54.37±21.93	<0.001	17,292 – 30,656
Median	78.0	51.50		
Range	46–110	20–90		
APGAR Score				
Asphyxia	9 (12.9)	3 (4.4)	0.145	0.179–1.310
Normal	61 (87.1)	65 (95.6)		
Initiate breastfeeding				
Unsuccessful	21 (30.0)	8 (11.8)	0.016	0.271 – 0.296
Successful	49 (70.0)	60 (88.2)		
Time the baby initiated breastfeeding				
Mean±SD	47.00±10.91	32.44±13.51	<0.001	10,428 – 18,704
Median	44.50	30.0		
Range	23–60	10–60		

[a] P-values are based on t-test or chi-square

Table 4. Multivariate analysis of the effect of the intervention on mother's childbirth self-efficacy and delivery outcomes

Dependent Variable	F	P value	R Squared	Adjudged R Squared	Wilk's Lamba Partial Eta Square
Delta Knowledge	167.091	<0.001	0.551	0.548	0.930
Delta Skills	105.648	<0.001	0.437	0.433	
First stage self-efficacy expectancy	403.530	<0.001	0.748	0.746	
First stage self-efficacy outcome	282.351	<0.001	0.675	0.673	
Second stage self-efficacy expectancy	339.761	<0.001	0.714	0.712	
Second stage self-efficacy outcome	418.826	<0.001	0.755	0.753	
Labor Pain	69.069	<0.001	0.337	0.332	
Duration of first stage	35.103	<0.001	0.205	0.199	
Duration of second stage	50.477	<0.001	0.271	0.265	
Time baby successfully breastfeed	48.586	<0.001	0.263	0.258	

Discussion

Our findings show that the maternal age, education, and employment did not differ significantly between the two groups, therefore, we can conclude that these variables did not significantly affect women's CBSE. However, some studies found that pregnant women with higher education and socioeconomic status had higher self-efficacy.[27] It is important to identify pregnant women with prenatal fears to support them and help them find appropriate coping strategies before delivery.

In this study, we developed an educational intervention for husbands that effectively increased husbands' knowledge and skills in providing good support to the mother during childbirth. A previous study in Iran also found that social, emotional, informational, and financial support provided to pregnant women before giving birth had positive effects on them, helped them adapt better to pregnancy, and improved pregnancy outcomes.[28]

Our findings show that husbands who receive education in childbirth support can affect CBSE in mothers who give birth. The variable most influenced by the intervention was self-efficacy for expectations during the first stage of labor. It seems that Husband education program was able to increase mothers' hope and confidence in their readiness for childbirth. A systematic review showed that maternal self-efficacy is important for overcoming fear of childbirth.[29] Spouses' knowledge and skills about the birth process affect their participation and support during

childbirth and lead to a positive perception of the birth process among pregnant women. Therefore, health care professionals should strive to prepare husbands to be good partners in providing childbirth support.[30] Studies show that teaching communities and families about the importance of social support during pregnancy and childbirth can increase mothers' CBSE and prevent postpartum depression.[31] The literature also suggests that CBSE is associated with mothers' emotions and perceptions of childbirth. Therefore, efforts should be made to increase the emotional stability and self-efficacy of pregnant women by training husbands in the field of childbirth support.[8]

Our findings showed that the intervention could accelerate the first and second stages of labor, however, no significant difference was found in the partograph of the first stage. This finding might be attributed to the fact that the control group also received education about maternal and child health based on the 2020 edition of the MCH book, which can help them in birth management. A previous study also reported that using the new edition of the MCH book can help pregnant women monitor and manage labor outcomes.[32] Furthermore, the duration of labor is not merely influenced by the nature of (psychological) support received during labor. Previous studies have shown that several factors, including the mother's position during labor, nutritional conditions during labor, and the use of some complementary therapies during labor, can influence the duration of labor.[33]

In the present study, labor pain was significantly lower in the intervention group than in the control group. This is because husbands in the intervention group were trained to assist mothers in controlling their breath during labor and provide them back massages to reduce labor pain. Previous studies have also reported that the husband support during childbirth makes the mother feel that her husband is involved, which fulfills her emotional needs, makes her emotionally comfortable, increases her satisfaction, and allows her to manage the anxiety and pain during the birth process.[34] Furthermore, increased self-efficacy may play a role in reducing maternal pain during childbirth, and this can also be achieved by increasing the role of spouses and birth attendants. A study in Australia has also shown that husbands who receive appropriate education can help reduce pain and anxiety when their wives give birth.[35]

In the present study, the two groups did not differ significantly in neonatal APGAR scores. The APGAR score is an indicator of the newborn's health and smooth delivery. Our results indicate that labor support does not directly cause changes in fetal well-being. This finding might be attributed to the fact that we closely monitored fetal and maternal well-being during delivery, and patients who experienced complications were excluded from the study for further treatment. However, lack of antenatal visits, maternal knowledge of risk factors for asphyxia and pregnancy complications, maternal activities during pregnancy, and stress factors during the antenatal and intrapartum periods can affect maternal and fetal well-being and predispose the fetus to asphyxia.[36] Therefore, health care professionals need to pay attention to these factors in birthing mothers.

Our findings showed that babies in the intervention group were more successful in EIBF. Early breastfeeding initiation procedures have become standard care for mothers giving birth to support exclusive breastfeeding in Indonesia. A Studies in Indonesia, have shown that EIBF is highly influenced by partner and health workers support through verbal encouragement, meeting the mothers' needs, and assisting and overcoming difficulties during initial breastfeeding. Making mothers and spouses aware of the importance of breastfeeding, and supporting spouses in this regard will encourage mothers to breastfeed their babies optimally.[37] A study has also found that spousal support not only helps mothers relax while breastfeeding their babies, but also makes it easier for the baby to find the nipple.[38]

The present study found that the training program for husbands significantly improved their knowledge and skills in supporting childbirth. Childbirth support by husbands then could not only increase the birthing mothers' CBSE, but also decrease the duration of the first and second stages of labor, and reduce labor pain and the time of successful EIBF. In this context, the health service system, especially midwives as a basic service in antenatal care and delivery services, should standardize the husband education and provide facilities and opportunities to increase partners' involvement in childbirth support. This can certainly improve the quality of maternal prenatal care and prevent pregnancy complications.

The strength of this research is that it discusses the psychological impact of the husband support on self-efficacy and pregnancy outcomes which have not been studied in previous studies. We used a valid and reliable childbirth self-efficacy questionnaire, and the birth outcome instrument used can predict the extent to which the husband education can contribute to birth outcomes. We also developed an effective program to educate husbands about childbirth support. This model can be

taken into consideration for standard education in pregnancy care services.

One of the limitations of this research is that we only included mothers with uncomplicated pregnancies. It is recommended that similar studies be conducted in pregnant women with special conditions. The knowledge and skills instrument we used are based on the Indonesian context, so the results cannot be generalized to places with different demographics. We also did not analyze the path of the impact of the husband education on his knowledge and skills, and its correlation with self-efficacy and birth outcomes.

Conclusions

Based on the results of this research, educating husbands in childbirth support can increase their knowledge and skills in childbirth support, improve mothers' CBSE, and positively affect birth outcomes. If this program is implemented in all basic antenatal care services and becomes a sustainable intervention, the impact will be on the quality of antenatal care services, husband support, self-efficacy, and positive birth outcomes. It is recommended to look at the long-term impact of the intervention provided on postpartum maternal mental health, complications, and breastfeeding success.

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Competing interests

The authors declare that they have no competing interests.

Abbreviations

Maternal Mortality Rate: MMR; Independent Midwife Practice: IMP; Maternal and Child Health: MCH; Early Initiation of Breastfeeding: EIBF; Childbirth Self-Efficacy Inventory: CBSEI; Confidence Interval: CI.

Authors' contributions

All authors read and approved the final manuscript. All authors take responsibility for the integrity of the data and the accuracy of the data analysis.

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Availability of data and materials

The data used in this study are available from the corresponding author on request.

Ethics approval and consent to participate

Researchers use the principles of respect for people, beneficence and nonmaleficence and justice. This research has received ethical approval form the Faculty of Health, Muhammadiyah University of Pringsewu (No 013/KEPK/FKes/2022). Subjects willing to participate were asked to sign an informed consent form.

Consent for publication

By submitting this document, the authors declare their consent for the final accepted version of the manuscript to be considered for publication.

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