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Prevention of Early Jaundice in Babies Through Empowerment: Quasi-Experiments with Pregnant Women

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ABSTRACT

***Background**: Jaundice is a health problem for newborns that occurs in around 60% of term pregnancies and around 80% of premature pregnancies. Babies who experience severe jaundice need to receive proper examination and treatment to prevent morbidity and death. Mothers' role in overcoming the lack of breast milk in newborn babies is important. Hence, they need to be educated and empowered to avoid health problems that can be prevented if mothers and babies receive timely care. **Objectives**: This research aims to analyze the effect of maternal empowerment on preventing early jaundice in babies in Pematangsiantar City. **Method**: The method used was the quasi-experimental design with a non-equivalent control group design model, carried out on 62 pregnant women and jaundice assessment on 62 newborns (31 pregnant women who were given education and monitored for empowerment and 31 mothers who were given education but not monitored). Sampling was taken using consecutive sampling. Data collection used a validated questionnaire and statistical tests with chi-square. **Results**: Statistical tests showed that, after empowering mothers, 90.3% implemented IMD in the intervention group and 83.9% in the control group (p=0.707). The results showed that after empowering mothers there were 93.5% of babies did not experience jaundice, and in the control group 71.0% did not experience jaundice. Statistically, there was a difference between the two groups (p=0.46). **Conclusion**: Maternal empowerment can influence the prevention of jaundice in babies. Implementation of empowerment through providing education about IMD, breastfeeding, and jaundice needs to be carried out by health workers.*

***Keywords**: Baby, Empowerment, Jaundice, Mother, Newborn*

INTRODUCTION

In principle, health development is to improve health status, which is carried out in promotive, preventive, curative, and rehabilitative efforts. The community's ability to realize the importance of health is one form of achieving promotive and preventive measures that have an impact on improving family health as an investment in human resource development (Mujiarto et al., 2019).

Achieving the health status of family members, especially mothers and children, is a priority in assessing the success of the 2005-2025 National Long-Term Development Plan. The health of mothers and children also needs to be considered because they are a vulnerable group with high mortality and morbidity rates (PPN, 2010). The Infant Mortality Rate (IMR) 2017 was 24 per 1,000 live births. Through the SDGs program, the government is targeting a reduction in IMR by 2030 to 12 per 1000 live births (Dopongnuha, 2019; Mariance, 2019). Jaundice is seen as a sign of danger for babies, especially neonates; this can be seen from the results of Basic Health Research (Kemenkes, 2018), where the causes of neonatal death occurring in the first week 0-6 days are respiratory disorders 37%, prematurity 34%, sepsis 12%, hypothermia 7%, jaundice 6%, and congenital abnormalities 1% (Kemenkes, 2014). Jaundice is a health problem among newborns and occurs in around 60% of term pregnancies and around 80% in premature ones. Jaundice is classified into physiological and pathological (Ansong-Assoku et al., 2018; Obeagu & Katya, 2022; Parwata et al., 2019). Babies who

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experience severe jaundice need to receive proper examination and treatment to prevent morbidity and death (Mayunita, 2020; Myle & Al-Khattabi, 2021). Jaundice can occur alone or can be caused by several factors, namely excessive production, for example, excessive breakdown of blood (hemolysis), disturbances in the uptake and conjugation process due to liver function disorders, transport disturbances due to lack of albumin, which binds bilirubin, and disorders excretion that occurs due to blockage in the liver (due to infection) (Nugraheni et al., 2020; Sulistyani et al., 2020; Yuliarty, 2020). Babies who experience jaundice will experience a change in the color of their skin/eye sclera (normally white) to yellow due to increased levels of bilirubin in the blood. Jaundice in newborn babies can be a physiological thing, found in 25% -50% of babies born at term (Fetriyah et al., 2019; Klemming et al., 2021; Revenis & Wong, 2021; Safitri & Haflah, 2022; Sreedha et al., 2023). The World Health Organization (WHO, 2013) provides information that normal newborn babies experience yellowish changes in skin color, mucosa, and face, ranging from 50% to 80% of preterm babies.

Physiological jaundice generally occurs on the second day to around two weeks due to low breast milk production so that the baby experiences a lack of breast milk which results in indirect bilirubin that has reached the intestines and is not bound by food and is not excreted through the anus with food (Nugraheni et al., 2020; Rusnawati, 2022). A study (Yanti Herawati, 2017) stated that there was an influence between early breastfeeding and the incidence of jaundice in newborns 0-7 days old with a P value of 0.02.

Several factors that can reduce the incidence of jaundice include neonatal supervision, avoiding drugs that can increase jaundice in babies, early initiation of breastfeeding, affectionate care for the baby, skin-to-skin contact, and exposing the baby to sunlight in the morning (Simanungkalit, 2021). This factor is based on the mother's behavior regarding the incidence of jaundice in babies 0-6 days old, where behavior is a response or reaction to external stimuli or stimuli. This behavior occurs through a stimulus process to the organism, and then the organism responds. Behavior is divided into three domains, namely, knowledge, attitudes, and practices. Many mothers do not understand how to deal with jaundice in babies aged 0-6 days (in the first week of birth) because of poor behavior and the mother's unresponsiveness to the education provided by local health workers (Simanungkalit, 2021).

Marali (2021) found that there is a significant relationship between early initiation of breastfeeding and the incidence of neonatal jaundice in babies born less than three days old at Aminah Hospital, Tangerang City, in 2021 with a value of r = 0.267. Rahayuningrum et al. (2021) found less than half (49.1%) of the babies experienced jaundice, and most of the mothers (83.0%) had low knowledge. The bivariate test showed that there was a relationship between the level of maternal knowledge and the incidence of jaundice, p-value = 0.024 (p < 0.05) with OR 10.526. Based on research, it can be concluded that mothers who have a low level of knowledge have a 10.526 times risk of developing jaundice in their babies. EIB is a baby who starts breastfeeding as early as possible after birth (Rusli, 2008). Newborn babies who were given the EIB method at 50 minutes after birth were able to breastfeed better than babies who did not use the EIB method at 50 minutes after birth, so it was found that babies were not able to breastfeed well by 50%. At the age of 6 months and 1 year, 59% and 38% of babies who had the opportunity to breastfeed were still breastfed, while 29% and 8% of babies who did not get their turn to breastfeed at the same age were still breastfed (Mashudi, 2014).

One of the recommended primary treatments for jaundice is early initiation of breastfeeding (EIB) or early provision of breast milk. Providing breast milk as early as possible after birth or EIB and exclusive breastfeeding is one of the informal actions taken by the government to improve the health and continuity of life of newborn babies (Apipah & Mariyani, 2022; Yulita et al., 2021). As many as 10 million deaths of children under five in the world per year, and 30,000 infant deaths are found in Indonesia, can be prevented by providing exclusive breastfeeding for six months starting from the date of birth of the baby, without giving additional food and drinks/accompaniments to the baby, as supported by the United Nations Children's Fund (UNICEF) (Aprillia, 2010).

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The role of mothers in overcoming the problem of lack of breast milk in newborn babies is important, so they need to be educated and empowered to avoid health problems that can be prevented if mothers and babies receive timely care. Empowerment is essentially the process of enabling someone to improve their self-development, make the right decisions, and have control over the activities carried out (Nutbeam & Muscat, 2021). Several research results state that empowerment can influence various aspects of health. The Center of Expertise has carried out health promotion efforts by providing educational research to improve health and empower women. Based on this, mothers must be provided with education about lactation and jaundice, which are preventable causes of neonatal morbidity/mortality. Increasing knowledge will help mothers realize the importance of breastfeeding and early detection of jaundice if it occurs. Therefore, this research aims to analyze the effect of maternal empowerment on preventing early jaundice in babies in Pematangsiantar City.

METHODS

Research design & data source

This research uses a quantitative study with a quasi-experimental design using a pre-post model with a control group design. This research was conducted at four independent midwife practices in Pematangsiantar City, namely PMB Yanti, T. Napitu, R. Manurung, and T. Hutapea. The population in this study were third-trimester pregnant women.

Sampling

The population in this study was 293 pregnant women in the third trimester at four independent midwife practices in the city of Pematang Siantar from June to October. The sample for this study was pregnant women of term gestation, maternal age 19-49 years, able to read and understand Indonesian, and had no history of illness based on anamnesis and records. The sample in this research is *non-probability sampling*, namely, *consecutive sampling*. The sample size in this study was 62 (31 samples in the intervention group and 31 in the control group). The sample size was determined based on the sample size calculation formula using two independent populations (Madiyono et al., 2011).

Data analysis

Empowerment carried out by researchers is through providing information about EIB, breastfeeding, and jaundice, then carrying out demonstrations and re-demonstrations that community empowerment can be carried out through activities: program preparation, equipment preparation, program implementation (socialization, implementation of training using lecture methods, demonstrations, and re-demonstrations), and then mentoring, monitoring and evaluation. Data were collected using a checklist for implementing early breastfeeding initiation, assessing the degree of jaundice, and a knowledge questionnaire that had been tested for validity and reliability. To analyze the differences between the two groups, the chi-square test was used. Data processing and analysis used Statistical Package and Service Solution (SPSS) version 25.0 for Windows. Before filling out the questionnaire, participants were explained the research. Prospective participants who were willing to take part in the research were asked to sign informed consent.

Ethical approval

This research has received ethical approval from the Medan Ministry of Health Polytechnic Research Ethics Committee No:01.0186/KEPK/POLTEKKES KEMENKES MEDAN 2022.

RESULTS AND DISCUSSION

The research results are presented in the following table:

Table 1. Characteristics of respondents.

Variable	Intervention Group (n=31)	Control Group (n=31)	*p*
Age (years)			
Mean ± SD	28.94 ± 5.87	28.55 ± 5.53	0.790
Median (min-max)	28 (19 – 40)	28 (20 – 43)	
Gravida			
Mean ± SD	2.35 ± 1.08	2.00 ± 1.03	0.194
Median (min-max)	2 (1 – 5)	2 (1 – 5)	
BBL			
Mean ± SD	3075 ± 243.19	3241 ± 343.29	0.032
Median (min-max)	3050 (2600 – 3500)		

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		3200 (2800 – 4100)	
Education			
- Elementary School	3.2%	0 %	0.701
- Junior High School	6.5%	6.5%	
- Senior High School	77.4%	74.2%	
- PT	12.9%	19.4	
Job-status			
- Work	9.7%	22.6%	0.300
- IRT	90.3%	77.4%	
Baby's gender			
- Man	45.1%	51.6%	1.000
- Woman	54.9%	48.4%	

SD = Standard Deviation;
Housewife = Housewife;
EIB = Early Initiation of Breastfeeding;
BBL = Birth Weight of Baby

The mean age of participants and gravida in the intervention group were higher than those in the control group, respectively 28.94 ± 5.87 years and 28.55 ± 5.53. The mean value of baby weight at birth was higher in the control group at 3241 ± 343.29. The highest level of education in both groups was high school, respectively 77.4% and 74.2%. The occupational status of the largest group is a housewife (90.3% and 77.4%). The majority of participants' ethnicity is Batak, at 87.1% in the control group. Most knowledge about EIB and jaundice (pre-intervention) was sufficient, respectively 74.2% and 54.8%.

Table 2. Effect of Mother's Empowerment on Knowledge of EIB, Breastfeeding, Jaundice, and Implementation of EIB between the Two Groups after Intervention.

Variable	Intervention Group (n=31)	Control Group (n-31)	*p**
Knowledge of EIB (pre-test):			
- Good	12.9%	12.9%	1.000
- Enough	74.2%	74.2%	
- Not enough	12.9%	12.9%	
(post-test)			0.001
- Good	80.6%	32.3%	
- Enough	19.4%	64.5%	
- Not enough	0%	3.2%	
Knowledge about breastfeeding (pre-intervention)			
- Good	61.3%	67.7%	0.861
- Enough	35.5%	29%	
- Not enough	3.2%	3.2%	
(post-intervention)			
- Good			
- Enough	87.1%	71%	0.241
- Not enough	12.9%	25.8%	
	0%	3.2%	
Knowledge about jaundice (Pre-intervention)			
- Good	6.5%	45.2%	0.000
- Enough	74.2%	54.8%	
- Not enough	19.4%	0%	
(Post-intervention)			
- Good	83.9%	61.3%	0.088
- Enough	16.1%	38.7%	
- Not enough	0%	0%	
Implementation of EIB			
- Yes	90.3%	83.9%	0.707
- No	9.7%	16.1%	

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Occurrence of jaundice			
- Yes	6.5%	29.0%	0.046
- No	93.5%	71.0%	

**Chi-Square Test; Mann-Whitney Test*

Table 2 shows that, after empowerment, there were 80.6% of respondents with good knowledge about EIB in the intervention group and 32.3% of respondents in the control group. The results of statistical tests show that there is a difference in knowledge between the two groups (p=0.001). After empowerment, there were 87.1% of respondents with good knowledge about breastfeeding in the intervention group and 71.1% of respondents in the control group. The statistical test results showed that there was no difference in knowledge between the two groups (p=0.241). Based on knowledge about jaundice, after empowerment, there were 83.9% of respondents with good knowledge in the intervention group and 61.3% of respondents in the control group. The statistical test results showed that there was no difference in knowledge between the two groups (p=0.088). After empowering mothers, there were 90.3% who implemented EIB in the intervention group and 83.9% in the control group (p=0.707). These results indicate that statistically there is no difference between the two groups. After empowering mothers, there were 93.5% of babies did not experience jaundice, and 71.0% in the control group. These results show that statistically there is a difference between the two groups (p=0.46).

In this study, we found that, after empowering mothers, the level of knowledge about EIB increased and was higher compared to the control group. Empowerment is the process of enabling someone to improve their progress, make the right decisions, and have control over the activities carried out. Knowledge is a phenomenon that humans encounter and obtain through sensory observation. Knowledge arises when someone uses the senses or cultivated mind to recognize certain objects or events that have never been seen or felt before. Lack of knowledge from parents and medical authorities, as well as reluctance to do so, means that Early Breastfeeding Initiation is still rarely practiced. Many parents feel sorry for and do not believe that a newborn baby can find its own mother's milk. Alternatively, there is the embarrassment of asking the doctor who assisted with the birth to do it (Idris, 2019). This can be seen in knowledge, or cognitive, which is a very important domain for the formation of action; if the behavior is not based on knowledge, then the behavior will not last long (Notoatmodjo, 2007).

Early initiation of breastfeeding is the practice of giving breast milk to babies within the first hour after birth. Good knowledge about the benefits of breast milk and the practice of early initiation of breastfeeding can increase a mother's likelihood of adopting this practice. When pregnant women have adequate knowledge about the benefits of breast milk and early breastfeeding initiation procedures, they tend to have a positive attitude toward this practice. They may be more likely to prepare themselves physically and psychologically to provide breast milk as soon as possible after birth. Conversely, if pregnant women lack knowledge about the benefits of breast milk and early initiation of breastfeeding, they may have a less positive or even skeptical attitude toward this practice. They may not feel more confident or motivated to do it (Limbong et al., 2023).

Several research results state that empowerment can influence various aspects of health. The Center of Expertise has carried out one of the health promotion efforts by providing education, research to improve health, and empowering women, which has beneficial values. Research carried out by Yuniarti (2019) also found that maternal empowerment has a significant influence on developing themselves and being able to make the right decisions to improve their health through antenatal care (ANC).

This is in line with research (Sukmawati et al., 2018) that shows there is a difference between the intervention group and the control group before and after the EIB intervention with p<0.05. There is an effect of education on mothers' knowledge about EIB with p<0.05; the intervention group's knowledge is p=0.000, and the control group's knowledge is p=0.000. There is an increase in pregnant

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women's knowledge about EIB after education (counseling). Research results from Selviyanti et al. (2022) found there were 20 prospective mothers, seven pregnant women, and four breastfeeding mothers with post-test scores higher than the pre-test scores or a total of 88.57%. This shows that there has been an increase in knowledge regarding the importance of early initiation of breastfeeding for the success of providing exclusive breast milk to babies.

After research was carried out, the implementation of EIB on babies showed that it was mostly implemented by mothers who received intervention. Early initiation of breastfeeding is a very important government program to make it easier for babies and mothers to start the lactation process. The principle of good feeding for babies and young children is to carry out Early Breastfeeding Initiation (EIB), give exclusive breast milk for six months, provide appropriate complementary breast milk (MPASI) starting when the baby is six months old, and continue giving breast milk until two years. Early initiation of breastfeeding is a real preventative step in saving newborn babies, will reduce the burden on curative health services, and is the first step in the success of exclusive breastfeeding. If this EIB is not carried out, then it can have an impact on the death of neonates aged 0-28 days. Early initiation of breastfeeding should not be late because the sucking reflex in newborn babies will reach its peak at the age of 20-30 minutes, and then this reflex will decrease and weaken. (Damayanti, 2018).

The results of the study revealed that breastfeeding from an early age is related to the success of exclusive breastfeeding (p = 0.04); sucking from the baby will influence the release of the hormones oxytocin and prolactin, in addition to which the baby also learns to breastfeed so there is a possibility that breastfeeding from an early age affects production and excretion of breast milk (Irawan, 2018). When a baby is placed on the chest to breastfeed, the baby will feel the warmth of the mother's skin, which can reduce the risk of death due to hypothermia. During breastfeeding, the baby will coordinate sucking, swallowing, and breathing. At that time, the mother may have already expressed colostrum. Babies who get colostrum will get antibodies and intestinal cell growth factors; antibodies in breast milk can increase resistance to infection. Various literature states that immediately after birth the baby must be placed on the mother's chest by attaching the baby to the mother's breast; in this case, it is not to provide nutrition but so that the baby can learn to breastfeed and get to know the mother's nipple, also the stimulation of the baby's sucking will stimulate the pituitary gland. The posterior secretes the hormone oxytocin to speed up the release of breast milk. (Irawan, 2018). The results of statistical tests by Periselo (2021) obtained a value of p = .003; this shows that there is a relationship between the EIB variable and the success of exclusive breastfeeding (p<0.05), so the hypothesis is accepted that there is a relationship with EIB. Apart from that, based on the results of research by Amaliyah and Futriani (2023) on the relationship between maternal knowledge about early initiation of breastfeeding (EIB) and the implementation of EIB, it can be concluded that there was an influence on the implementation of EIB with a p-value of 0.000 or p-value < a (0.05).

This study also showed that, after empowering mothers, 93.5% of babies did not experience jaundice, which means that statistically, there was a difference between the two groups p=0.046). Based on this, mothers must be provided with education about lactation and jaundice, which are preventable causes of neonatal morbidity/mortality. Increasing knowledge will help mothers realize the importance of breastfeeding and early detection of jaundice if it occurs. Ilawati and Susanti (2022) showed that there was a relationship between maternal knowledge and the prevention of physiological jaundice in babies aged 0-14 in Hamlet I Sei Mencirim Village in 2022 with the results of analysis from the chi-square statistical test showing p value =0.23 (p<0.05). Likewise, the research results in this study are in line with that research; there is a relationship between maternal knowledge and attitudes and the incidence of jaundice in newborn babies. Mothers with good or sufficient knowledge are more likely to respond to any information given so that, when a situation occurs to the mother, the mother already understands how to deal with it. The knowledge gained directly or from other people's experiences always has

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levels as that knowledge increases and develops. When acquiring knowledge, a person will start their knowledge in the process of just knowing, which then increases to understanding after obtaining sufficient information to develop that knowledge, and along with the ongoing and continuous interaction process, the knowledge gained becomes something that is ultimately integrated with a person and will influence their behavior. A person's behavior is largely determined by his knowledge of developing the knowledge he has so that their future behavior can be even better (Simanungkalit, 2021).

CONCLUSION

Empowerment carried out on mothers can prevent jaundice in babies. Health workers need to implement empowerment through education about EIB, breastfeeding, and jaundice to improve the health of mothers and babies.

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