

## Research Article

# Mothers' Knowledge and Self-efficacy on Preventing Infections in Low-birth-weight Infants during the COVID-19 Pandemic

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**ORCID**Resti Utami: <https://orcid.org/0000-0001-7445-6121>**Abstract.**

Low birth weight (LBW) infants are at risk for vertical and horizontal transmission of COVID-19. A mother's ability to prevent infection in LBW infants is decided by their knowledge, self-efficacy, and abilities of the mother in carrying out infection-prevention care. This study aimed to analyze the relationship between mothers' knowledge and self-efficacy with their ability to prevent infection in LBW infants during the COVID-19 pandemic. This study used a correlational design. This study included 84 respondents who were selected through purposive sampling in the perinatology room. The statistical test used was the Spearman Rho. The outcomes confirmed a relationship between a mother's knowledge ( $r = 0.249$ ;  $p = 0.022$ ) and self-efficacy ( $r = 0.313$ ;  $p = 0.004$ ) with the mother's ability to prevent infection in LBW infants. The level of strength of the positive relationship between a mother's knowledge and the mother's ability to prevent infection in LBW infants is 0.249, or very vulnerable. The level of the strength of the positive relationship between maternal self-efficacy and the mother's ability to prevent infection in LBW infants is 0.313, or sufficient. Therefore, increased knowledge and self-efficacy of mothers may have an impact on increasing the ability of mothers to prevent infection in LBW.

**Keywords:** knowledge, self-efficacy, ability to prevent infection, low birth weight, COVID-19 pandemic

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## 1. INTRODUCTION

The COVID-19 pandemic has had a major impact on the quality of health services for mothers and low birth weight (LBW) infants (1). COVID-19 is at risk of being transmitted vertically and horizontally. Evidence for vertical transmission suggests that SARS-CoV-2 nucleic acid has been detected in the breast milk and placenta of mothers with COVID-19 (2–7). However, there is currently no evidence of viral transmission through breastfeeding and intrauterine transmission of COVID-19 infection from mother to fetus is rare (8). The study conducted by (9) identified only two infants with possible vertically acquired infection.

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Horizontal transmission of COVID-19 can occur from infected family members or through nosocomial transmission in health facilities (1,10). The cohort study reported 66 cases of COVID-19 receiving inpatient care, 17 (26%) born to mothers infected with COVID-19 (9). Studies show that COVID-19 transmits the virus to others in close contact, through droplets, touching contaminated surfaces, inhalation and entry through the respiratory tract (2,11).

Many factors affect the mother's ability to prevent infection in LBW. Some of them are mother's knowledge and self-efficacy in preventing infection in LBW. Research conducted by (12) found that mothers' knowledge was less related to infection prevention efforts. Mothers with LBW tend to have low confidence in providing the necessary care (13). Thus, researchers are interested in conducting research on the knowledge and self-efficacy of mothers in preventing infections in low birth weight (LBW) infants in the COVID-19 pandemic.

## 2. MATERIALS AND METHODS

This study uses a cross-sectional approach to correlational design. The population in this study were mothers of LBW patients who were treated in the perinatology room of RSD Dr. Soebandi Jember. This study involved 84 respondents obtained by purposive sampling. The inclusion criteria for this study were mothers who gave birth with LBW (weight less than 2,500 grams with infants aged 0-2 months and infants without congenital defects).

The instrument used to collect data was a questionnaire to explore the extent of the respondents' knowledge and self-efficacy in preventing infection in LBW in the COVID-19 pandemic. The questionnaire was tested for validity and reliability (Cronbach alpha 0.60) (14). The instrument of knowledge (Cronbach alpha 0.746) and the ability to prevent infection (Cronbach alpha 0.792) were developed by researchers through a literature study. The self-efficacy instrument is a modified Parental Sense of Competency Scale (PSOC) questionnaire that is adapted to the language and conditions in the research place (Cronbach alpha 0.828) (15,16). The statistical test used is Spearman Rho. The ethical license was granted by the ethics team of the Faculty of Health, University of Muhammadiyah Jember with the number: 0079/KEPK/FIKES/1/2021.

TABLE 1: Characteristics of Respondents.

Age	Frequency	Percentage
< 20	15	17,9 %
20 – 35	56	66,7 %
> 35	13	15,5 %
Total	84	100 %
Education	Frequency	Percentage
Elementary school	29	34,5 %
Junior high school	23	27,4 %
Senior high school	22	26,2 %
College	10	11,9 %
Total	84	100 %

### 3. RESULTS

The characteristics of the respondents are presented in Table 1. The majority of respondents are aged between 20 to 35 years, namely 56 people (66.7%). The most common education obtained by respondents was elementary school (SD), which amounted to 29 respondents (34.5 %).

TABLE 2: Mother’s knowledge on preventing infection in LBW.

Knowledge	Frequency	Percentage
Less	28	33,3 %
Enough	36	42,9 %
Well	20	23,8 %
Total	84	100 %

Based on Table 2. shows that most of the respondents have knowledge in preventing infection in LBW in the sufficient category, namely 36 respondents (42.9%).

TABLE 3: *Mother’s self-efficacy on preventing infection in LB.*

Self-efficacy	Frequency	Percentage
Low	33	39,3 %
High	51	60,7 %
Total	84	100 %

Based on Table 3. shows that most of the respondents have self-efficacy in preventing infection in LBW in the high category, namely 51 respondents (60.7%).

Based on Table 4. shows that most mothers have the ability to prevent infection in LBW in the sufficient category, namely 37 respondents (44.0%).

TABLE 4: Mother's ability to prevent infection in LBW.

Kemampuan ibu dalam mencegah infeksi	Frequency	Percentage
Less	24	28,6 %
Enough	37	44,0 %
Well	23	27,4 %
Total	84	100 %

TABLE 5: Relationship between knowledge and self-efficacy with mother's ability to prevent infection in LBW.

Variable	Correlation Coefficient (r)	P Value
Knowledge – Mother's ability to prevent infection	0,249	0,022
Self-efficacy - Mother's ability to prevent infection	0,313	0,004

Based on Table 5. the test results show that the p value = 0.022; = 0.05; r = 0.249. The results of the analysis of this study indicate that there is a relationship between knowledge and mother's ability to prevent infection in LBW ( $r = 0.249$ ;  $p = 0.022$ ). It is also known that the value of  $r = 0.249$  which indicates the type of positive relationship with a very weak correlation between the independent variable and the dependent variable. The level of strength of the relationship between mother's knowledge and mother's ability to prevent infection in LBW is 0.249 or very weak. Thus, the higher the mother's knowledge, the higher the mother's ability to prevent infection in LBW. Furthermore, the p value = 0.004; = 0.05; r = 0.313. The results of the analysis in this study indicate that there is a relationship between maternal self-efficacy and the mother's ability to prevent infection in LBW ( $r = 0.313$ ;  $p = 0.004$ ). The level of strength of the positive relationship between maternal self-efficacy and mother's ability to prevent infection in LBW is 0.313 or sufficient. Thus, if the mother's self-efficacy increases, it will have an impact on increasing the mother's ability to prevent infection in LBW.

## 4. DISCUSSION

Knowledge of LBW care in preventing infection for mothers is very important so that mothers are able to take good care of LBW in the era of the COVID-19 pandemic. The results showed that the mother had sufficient knowledge in preventing infection in LBW (42.9%). The results of sufficient knowledge from 42.9% of respondents showed that information exposure to mothers with LBW was very good. This is supported by

research conducted by (17) saying that parents with low birth weight need a higher standard of care. This condition provides benefits where health education by the health care team in the form of providing information on matters relating to the health of LBW including preventing infection in LBW becomes a procedure that must be given to mothers to increase knowledge and skills of mothers in providing care to their babies (13). Unexpectedly, this study revealed that although a recent systematic review conducted by (18) showed that maternal education, and sources of information had a very significant relationship with knowledge, however, the results of this study showed that although most of the respondents' education is Elementary School (SD) (34.5%), in fact mothers have sufficient knowledge (42.9%). This can happen because in this study most of the respondents were in the age range of 20-35 years (66.7%) where respondents were in productive age so that mothers actively sought health information and mother's awareness about newborn care increased with age.

Maternal self-efficacy is defined as an individual's perception of the mother's ability to decide and take the necessary actions to produce certain outcomes (19). Although these terms vary, all of them relate to the feeling of parental competence in parenting roles in relation to certain parenting tasks such as LBW care in this case preventing infection in LBW (20). The results showed that most of the respondents had self-efficacy in preventing infection in LBW in the high category (60.7 %). This is supported by Sims (19) saying that higher levels of self-efficacy in parenting are associated with an increase in certain nursing skills. This shows that mothers with high self-efficacy are more likely to make a successful transition to parenthood, are more confident in their baby care decisions, especially in preventing infection in LBW. The results of the analysis of this study indicate that there is a relationship between knowledge and the mother's ability to prevent infection in LBW in the era of the COVID-19 pandemic. This is in line with research conducted by Astuti *et al* (12) which stated that mother's knowledge about preventing infection in LBW had a significant effect ( $p = 0.000$ ) on the mother's ability to prevent infection in relation to caring for her baby. Health promotion activities carried out through socialization, education, and the use of various information media to provide understanding and understanding for all people in the era of the COVID-19 pandemic regarding LBW care have an impact on understanding about COVID-19 which continues to grow. Provisional guidelines have been issued by WHO (21) in controlling infections to reduce the transmission of COVID-19 in the hospital environment, especially the perinatology room. One of them is the limitation on family. This family restriction contradicts psychological and neuroscientific evidence to support unrestricted parental attendance for hospitalized infants (22). Although LBW

is a vulnerable group, it is associated with a relatively immature immune system at birth with a high potential for neonatal complications when exposed to pathogens (23). However, a study conducted by Litmanovitz *et al* (22) showed that the survival of infants born in health care facilities weighing less than 2500 grams was substantially greater than the risk of death from COVID-19. In this regard, so special assistance such as breastfeeding, kangaroo method care, baby hygiene care needs to be carried out by mothers in accordance with COVID-19 infection control procedures as developed by WHO (24) so that mothers are able to care for their babies independently. In particular, when the mother's knowledge in preventing infection in LBW is high, then the mother will have the ability to prevent LBW infection in the COVID-19 pandemic era better than mothers with low knowledge in preventing infection in LBW.

The results of the analysis of this study indicate that there is a relationship between maternal self-efficacy and the mother's ability to prevent infection in low birth weight (LBW) infants in the COVID-19 pandemic era. This is supported by a study conducted by Liyana *et al* (25) which states that first-time parents tend to lack skills and knowledge related to baby care. Lack of skills in their ability to prevent infection in LBW can lead to feelings of being unprepared for a new job related to the roles and responsibilities of providing care to LBW. This will result in lower self-efficacy. Over time, education is needed for mothers to develop skills in preventing infection in LBW, which in turn leads to a greater increase in maternal efficacy. Thus, when the mother's self-efficacy in preventing infection in LBW is high, then the mother will be more competent in carrying out infection prevention care for LBW in the COVID-19 pandemic era than mothers with low self-efficacy in preventing infection in LBW..

## 5. CONCLUSION

The conclusion of this study is that when mother's knowledge and mother's self-efficacy in preventing infection in LBW is high, then the mother will have the ability to prevent LBW infection in the COVID-19 pandemic better than mothers with less knowledge and low self-efficacy. Thus, if the mother's knowledge and self-efficacy increase, it will have an impact on increasing the mother's ability to prevent infection in LBW. Suggestions for hospitals that in providing nursing services to families of LBW patients in the perinatology room are currently more focused on improving regulations or new rules clearly to accommodate efforts to improve LBW care services while still implementing health protocols by all parties. Suggestions for further research to identify nursing interventions that lead to building evidence-based knowledge and self-efficacy of mothers in increasing

the ability of mothers to prevent infection in low birth weight babies in the COVID-19 pandemic, it is hoped that they can be implemented in clinical practice settings in hospitals.

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