

# The effect of coping intervention on maternal competency in caring for premature infants at home

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## Abstract

The mother's ability to care for premature infants will affect the success of the interaction between mother and baby as well as the growth and development of the baby. The study aimed to assess the impact of coping interventions on mothers' ability to care for premature infants at home. This quasi-experimental research involved 80 respondents, divided into a treatment group and a control group, with 40 participants in each. The treatment group received a 3-month coping intervention, while the control group did not. The mothers' abilities were evaluated using questionnaires and the Developmental Pre-Screening Questionnaire (KPSP) instrument. The results revealed significant improvements in the treatment group's abilities in providing nutrition, maintaining body temperature, preventing infection, recognizing danger signs, and stimulating development in premature infants. These positive outcomes underscore the effectiveness of coping interventions in enhancing maternal abilities. It is recommended that health workers incorporate coping interventions into their support for mothers of premature infants, aiming to empower them with the skills and knowledge needed for better care and development of their infants at home. This approach can contribute to the overall well-being and growth of premature infants while reducing the burdens on healthcare providers.

## Introduction

The ability of mothers to care for premature infants will affect the success of interactions between mothers and infants and the growth and development of infants.<sup>1</sup> However, the mother's current ability is still an issue, as shown by research indicating that mothers in Indonesia have not provided proper nutrition, and kangaroo care is often stopped in the first week at home.<sup>2</sup> Hospitals in Indonesia have made efforts to prepare mothers with adequate capabilities to carry out care at home through the availability of health education, leaflets, and discharge preparation programs carried out in the perinatology room.<sup>2</sup>

Various problems are encountered in providing adequate capabilities, including health education, which currently only focuses on the physical care of premature infants, with no standard educational media and methods.<sup>2</sup> Additionally, the discharge planning program is not considered optimal. One obstacle is that the mother's contribution is minimal, and follow-up care from the hospital to the community by the health team has not been effectively implemented.<sup>3</sup> Efforts have also not focused on the psychological problems of the mother, even though caring for premature infants at home causes a lot of stress, which can hinder the achievement of the mother's abilities.<sup>4-6</sup> Appropriate coping strategies can help mothers reduce stress, enabling them to demonstrate maternal

behavior effectively.<sup>7</sup> Mothers who are competent in premature baby care are needed, as 25-50% of premature infants experience health problems after discharge from the hospital.<sup>8</sup> The readmission rates for premature infants are also higher than for normal infants, with as many as 32.7% readmitted in their first year of life.<sup>9,10</sup> By 7.4%, premature infants are re-admitted to the hospital in the first two weeks after discharge.<sup>8</sup> The most frequent causes of readmission of premature infants are respiratory tract diseases (55.3%), advanced neonatal infections (25%), malaria (11.8%), and epilepsy (7.9%).<sup>10</sup>

One of the factors affecting the mother's ability is the mother's coping. Coping is an important indicator of maternal response and behavior.<sup>11</sup> Ability is a component of maternal behavior and the achievement of the mother's role.<sup>12</sup> The results have shown that the efficacy of mothers with premature infants increased significantly after being given education while in the hospital.<sup>13</sup> However, there has not been much evaluation of mothers' abilities after being discharged from the hospital. The results of other studies show that parents of premature infants have higher stress than parents of full-term infants, so mothers need to adjust their coping strategies continuously.<sup>14</sup> Mothers of premature infants report experiencing obstacles to becoming mothers and low parenting confidence, thus they need appropriate coping strategies to overcome these issues.<sup>15</sup> Coping can help mothers reduce stress, enabling them to exhibit maternal behavior and fulfill their caregiving role effectively.<sup>7</sup> The use of efficient coping will regulate emotions, reduce the negative effects of stress due to premature births, and improve abilities, interactions with infants, and the mother's physical and mental health.<sup>16</sup>

The achievement of the mother's role is to become a mother throughout her life and develop her maternal identity in the form of ability, confidence, and joy in the role of motherhood.<sup>17</sup> Currently, interventions given to mothers of premature infants do not focus on psychological interventions. The need for psychological intervention is supported by research from Fowler, which emphasizes nurses' focus on meeting the psychological needs of the mother, increasing the mother's welfare, and enabling her to be physically and emotionally present for her premature baby properly.<sup>18</sup> Maternal coping interventions are needed to improve the ability of mothers to provide care for premature infants at home by enhancing maternal coping strategies, knowledge, and skills in caring for premature infants. The purpose of this study was to analyze the effect of coping intervention on the ability of mothers to care for premature infants at home.

**Table 1.** Intervention of coping.

Intervention of coping Implementation through home visits Contents of intervention		
Time of Intervention	Part 1: coping strategy	Part 2: Premature baby care at home
Day 3 post discharge	Providing materials and practicing coping strategies: praying and get closer to the baby	The topic of the discussion and practice session was determined during a meeting between the researcher and the mother and considering the needs and interests of the mother. Mothers express their questions, experiences and problems faced by their infants and then discuss them together.
Day 7 post discharge	Providing materials and practicing coping strategies: accepting the situation and seeking support	
Day 28 post discharge	Discussion and practice: praying, getting closer to the baby, accepting the situation, and seeking support	
Day 90 post discharge	Discussion and practice: praying, getting closer to the baby accepting the situation and seeking support	

## Materials and Methods

### Research design

This research employed a quasi-experimental design with a control group pre-posttest design.

### Setting and samples

The study's population consisted of mothers caring for premature infants at home in Malang Raya, East Java, Indonesia. The sample included mothers of premature infants who met the following inclusion criteria: mothers with premature infants who had been hospitalized for a maximum of three days, both mother and baby were in good health (the infant's temperature, respiratory rate, and pulse were within normal limits, and the baby was active; the mother had no health complaints, had a partner, and lived in the same house with a partner). Exclusion criteria for this study included mothers with premature infants who had congenital diseases and mothers with premature twins. The sample size was calculated using statistical power analysis with a power of 0.95, an alpha of 0.05, and an effect size of 0.80. Based on these conditions, the sample size for each group was determined to be 40 participants, resulting in a total of 80 eligible participants, with an additional 10% dropout rate, resulting in 40 participants per group. The sampling technique used was a non-probability sampling technique, specifically purposive sampling. Data collection took place from February to July 2023.

### Intervention

The intervention was administered individually over 3 months in the mothers' homes, with detail intervention in Table 1. Meetings were scheduled on the 3rd, 7th, 28th day, and 3rd month, with each meeting lasting for 60 minutes. Meanwhile, the control group received interventions in line with those provided by the hospital where they gave birth. These interventions included guidance on breastfeeding, kangaroo mother care, and hand-washing, as well as the distribution of educational leaflets. The interventions were delivered in the form of mentoring, education on coping, education about caring for premature infants at home, and individual coping skills training, conducted by professional nurses.

### Measurement and data collection

The dependent variable in this study is the mother's ability to care for their premature infants, which comprises five indicators: the ability to provide nutrition, maintain body temperature, prevent

infection, recognize danger signs, and stimulate development. These maternal abilities were assessed using a questionnaire derived from Managing Newborn Problems<sup>19</sup> and the Developmental Pre-Screening Questionnaire (KPSP) instrument.<sup>20</sup> Prior to employing the questionnaire, validity and reliability tests were conducted, involving 32 mothers with premature infants. The results confirmed the questionnaire’s validity, with a range of correlation coefficients (r) between 0.373 and 0.965 and a reliability value of 0.934.

### Data analysis

The data analysis included descriptive statistics such as frequency, percentage, mean, standard deviation (SD), and the minimum and maximum values for each variable. Inferential analysis was carried out using the Wilcoxon statistical test to assess differences in pre- and post-scores within each group. Additionally, the Mann-Whitney statistical test was employed to measure the differences in post-test scores between the control and treatment groups. The desired significance level for these tests was set at 95%, with  $\alpha \leq 0.05$ .

## Results

Based on the results presented in Table 2, it is evident that the

respondents in both the control and treatment groups shared several similarities. Most of them lacked prior experience in caring for premature infants, had two children, and were not employed. However, differences emerged in the variables related to education, socio-economic status, and certain characteristics between the control and treatment groups.

In the control group, a majority of the respondents held bachelor’s degrees, reported incomes above the minimum wage, and had infants in good health, as indicated by the absence of nasogastric tube and oxygen usage at home. Conversely, within the treatment group, most mothers had attained middle or high school education, had incomes below the minimum wage, and all infants were in good health, similarly showing no need for nasogastric tubes or oxygen at home.

Based on the descriptive analysis in Table 3, In both groups, pre-intervention nutrition scores averaged 12.30 (treatment) and 11.90 (control). Post-intervention, treatment group scores rose to 21.35, while control group scores reached 14.40. Average pre-intervention temperature maintenance scores were 8.5 (control) and 8.6 (treatment), increasing to 14.7 (treatment) and 11.70 (control) post-intervention. Infection prevention scores averaged 16.65 (treatment) and 16.60 (control) pre-intervention, increasing to 22.30 (treatment) and 18.95 (control) post-intervention. Average pre-intervention scores for recognizing danger signs were 12.2 (treatment) and 12.5 (control), rising to 23.4 (treatment) and 16 (control) post-intervention. Pre-intervention scores for stimulating

**Table 2.** Characteristics and equality test of mothers having premature infants at home, 2023 (n=80).

Variables and Categories:	Intervention		Control		p
	n	%	n	%	
<b>Previous experience</b>					
Experience caring premature					0.762
No	33	82.5	34	85.0	
Yes	7	17.5	6	15.0	
Number of Kids		0.915			
1 child	10	25.0	10	25.0	
2 children	14	35.0	16	40.0	
3 children	13	32.5	11	27.5	
4 children	2	5.0	1	2.5	
5 children	1	2.5	2	5.0	
Factors of mothers					0.570
Education					
Primary school	6	15.0	4	10.0	
Middle school	12	30.0	8	20.0	
High school	12	30.0	12	30.0	
Diploma	1	2.5	3	7.5	
Bachelor	9	22.5	13	32.5	
Job					0.639
Working	13	32.5	15	37.5	
Not working	27	67.5	25	62.5	
Income					0.262
Above minimum wage	19	47.5	24	60.0	
Below minimum wage	21	52.5	16	40.0	
<b>Factors of Infants</b>					
0.314					
Baby characteristic					
Non using device	40	100	39	97.5	
Using device	0	0.0	1	2.5	
Variable:	$\bar{x} \pm SD$	$\bar{x} \pm SD$			
Weight of baby born	1753.75 ± 348.22	1753.87 ± 314.35	0.999		
Length of stay	14.375 ± 14.89	12.62 ± 12.18	0.620		

development averaged 9.3 (treatment) and 8.6 (control), increasing to 14.675 (treatment) and 11.60 (control) post-intervention.

Based on the data presented in Table 4, the results of the statistical analysis using the Wilcoxon test in both the control and treatment groups indicate that all variables yielded significance values lower than alpha (0.05). This implies that both the standard intervention employing leaflets and the coping intervention have a significant impact on all aspects of the mother's ability to care for premature infants at home. Notably, it's worth mentioning that the treatment group exhibited a greater increase in scores across all ability variables compared to the control group.

Table 5 displays Mann Whitney test results indicating that pretest scores in both groups are not significantly different ( $p>0.05$ ), suggesting similar abilities before the intervention. In contrast, posttest values show significant differences between control and treatment groups ( $p<0.05$ ), indicating the effectiveness of coping intervention in improving all variable abilities. Delta values for all variables also exhibit significant differences ( $p<0.05$ ), signifying that the treatment group had a greater increase in ability compared to the control group.

## Discussion

The results of the third stage of the study, as determined

through statistical analysis tests with Mann Whitney, revealed a significant positive effect of coping intervention on the improvement of mothers' ability to care for premature infants at home. This positive impact was observed across all indicators, encompassing the provision of nutrition, maintenance of temperature, prevention of infection, recognition of danger signs, and stimulation of development. Additionally, the analysis indicated that, during the pretest, there was no statistically significant difference in the average scores between the treatment and control groups for all ability indicators. However, following the intervention, the treatment group exhibited a more substantial increase in the average posttest ability scores compared to the control group.

The term "mother's ability" refers to the maternal intelligence that influences the development of infants and children. This includes elements of sensitivity, responsiveness, and synchronization in fulfilling their role as mothers. Maternal abilities are often described in terms of various aspects of infant care. The primary domain of capability pertains to the expression of comfort, satisfaction, and skills in caring for infants. Furthermore, according to Alghamdi (2019), the ability domain can be categorized into four domains, which include knowledge, skills, ability, and responsiveness.<sup>21</sup>

Coping interventions grounded in health promotion have proven to be more effective in enhancing the ability of mothers to care for premature infants at home when compared to standard

**Table 3.** Description of mothers' ability to care for premature infant at home in 2023 (n=80).

Variables	Descriptive	Intervention		Control	
		Pretest	Posttest	Pretest	Posttest
Ability to give nutrition	Minimum	8.00	12.00	8.00	12.00
	Maximum	20.00	24.00	20.00	20.00
	Mean	12.30	21.35	11.90	14.40
	Standard Deviation	3.553	3.118	3.565	2.977
Ability to maintain body's temperature	Minimum	8.00	8.00	8.00	4.00
	Maximum	12.00	16.00	12.00	12.00
	Mean	8.50	14.70	8.60	11.70
	Standard Deviation	1.340	2.103	1.446	2.103
Ability to prevent Infection	Minimum	12.00	20.00	12.00	12.00
	Maximum	20.00	24.00	20.00	28.00
	Mean	16.65	22.30	16.60	18.95
	Standard Deviation	2.497	2.003	2.134	2.970
Ability to recognize Danger Signs	Minimum	8.00	20.00	8.00	12.00
	Maximum	16.00	24.00	20.00	20.00
	Mean	12.20	23.40	12.50	16.00
	Standard Deviation	2.997	1.446	3.289	2.717
Ability to stimulate Kid's Development	Minimum	4.00	12.00	4.00	8.00
	Maximum	12.00	16.00	12.00	16.00
	Mean	9.300	14.675	8.60	11.60
	Standard Deviation	2.919	1.886	3.078	2.18

**Table 4.** Test results of the effect of coping intervention on mother's ability in the control and treatment groups.

Variable	Mean±SD Intervention Group			Mean±SD Control Group		
	Pre	Post	p	Pre	Post	p
Ability to give nutrition	12.30±3.553	21.35±3.118	0.000	11.90±3.565	14.40±2.977	0.000
Ability to maintain body's temperature	8.50±1.340	14.70±2.103	0.000	8.60±1.446	11.70±2.103	0.000
Ability to prevent Infection	16.65±2.497	22.30±2.003	0.000	16.60±2.134	18.95±2.970	0.000
Ability to recognize Danger Signs	12.20±2.997	23.40±1.446	0.000	12.50±3.289	16.00±2.717	0.000
Ability to stimulate Kid's Development	9.30±2.919	14.67±1.886	0.000	8.60±3.078	11.60±2.181	0.000



**Table 5.** Results of testing the effectiveness of providing coping interventions on the ability of mothers to caring for premature infants at home.

Variable	Test	Group	Mean	p
Ability to give nutrition	Pretest	Intervention	41.78	0.604
		Control	39.23	
	Posttest	Intervention	56.75	
		Control	24.25	
Ability to maintain body's temperature	Pretest	Intervention	40.00	0.747
		Control	41.00	
	Posttest	Intervention	53.10	
		Control	27.90	
Ability to prevent Infection	Pretest	Intervention	41.00	0.821
		Control	40.00	
	Posttest	Intervention	52.40	
		Control	28.60	
Ability to recognize Danger Signs	Pretest	Intervention	39.60	0.711
		Control	41.40	
	Posttest	Intervention	59.83	
		Control	21.18	
Ability to stimulate Kid's Development	Pretest	Intervention	42.99	0.301
		Control	38.01	
	Posttest	Intervention	53.25	
		Control	27.75	

interventions. These results align with the findings of other studies, which suggest that standard or routine interventions are less effective in supporting the fulfillment of the mother's role.<sup>22-24</sup> Coping interventions based on health promotion encompass a more comprehensive approach, addressing not only the need for information about premature infants and their physical care but also providing guidance and individual training on the care of premature infants. These comprehensive interventions address both the physical and behavioral aspects of care for premature infants and include exercises aimed at building effective coping strategies. Health promotion-based coping interventions provide mothers with simultaneous and comprehensive support, covering aspects of both the physical and behavioral care of premature infants as well as equipping mothers with effective coping strategies.

The results of this study are corroborated by research that reviewed ten intervention programs implemented in home settings. These programs involved regular visits to parents, offering emotional and practical support. The results of these programs indicated a significant reduction in parental stress levels, leading to positive effects on mothers' behavior and their interactions with their premature infants. Support programs delivered in the home environment on a regular basis resulted in mothers becoming more responsive to their infants and better able to provide appropriate and diverse stimulation for their infants.<sup>25</sup>

Furthermore, the results of this study are supported by previous research on Creating Opportunities for Parent Empowerment (COPE) interventions and parental sensitivity interventions. These interventions have a direct impact on areas such as knowledge, skills, beliefs, confidence, and maternal self-efficacy in the care of premature infants.<sup>26-28</sup> Additionally, other studies have provided evidence of the relationship between high maternal self-efficacy and active maternal care and coping skills. Conversely, low maternal self-efficacy has been found to correlate with depression, issues in child development, and mothers adopting passive coping strategies in their parental roles.<sup>29</sup> Maternal depression is also associated with low maternal self-efficacy and passive coping strate-

gies.<sup>30</sup>

Ineffective coping can hinder mothers in effectively fulfilling their maternal roles. Research has shown that coping dysfunction results in suboptimal caregiving practices due to stress related to the appearance and behavior of premature infants.<sup>11</sup> Health promotion-based coping interventions assist mothers by providing the necessary resources for them to evaluate the stressors they encounter while caring for premature infants at home. Strengthening these resources is a crucial aspect because stress arises when individuals do not adequately assess stressors based on their available abilities (resources). This concept aligns with Lazarus' theory, which emphasizes cognitive aspects of the stress process, where an event must be appraised as stressful before it can influence an individual's emotions and behavior. Moreover, an individual's judgment depends on the resources available.<sup>31</sup>

Stress has a negative relationship with maternal role satisfaction and continues to impact maternal competency and satisfaction. Research results indicate that mothers who face fewer stressors tend to feel more competent and satisfied in their maternal roles during the postpartum period.<sup>32</sup> Stressful life events and the challenges associated with caring for a baby have a negative relationship with maternal satisfaction. Maternal competency and satisfaction are closely interlinked, as it is challenging to achieve competence when a woman is not satisfied with her maternal role.<sup>32</sup> These findings align with previous research, as stress has been shown to affect women's sense of competence and satisfaction in their roles as mothers.<sup>33</sup>

Effective coping strategies play a crucial role in reducing maternal stress. Mothers who employ effective coping strategies can minimize negative emotional issues in their interactions with their infants and in the care they provide. Successful coping strategies are effective in increasing an individual's commitment to expected behaviors in caring for an infant. This aligns with the theory suggesting that positive emotions linked to specific health behaviors can enhance commitment.<sup>34</sup> Effective coping strategies also help mothers minimize the barriers they encounter in their

maternal roles and bolster their self-control.<sup>7,15,35</sup> However, one limitation of our study is that some respondents displayed lower participation in discussion sessions. To address this, we endeavored to motivate mothers and provide them with a deeper understanding of the importance of caring for their premature infants at home. While our study met the minimum required sample size, we recommend the use of a larger sample for future research.

## Conclusions

The implementation of coping interventions demonstrates significant potential in enhancing the abilities of mothers – including their capacity to provide nutrition, maintain the body temperature, prevent infection, recognize danger signs, and stimulate development – in caring for premature infants at home. Community health workers or Puskesmas personnel can effectively employ this intervention to assist mothers in managing their emotions and achieving competent care for their premature infants. Future studies should encompass an examination of the intervention's impact on the infants themselves, incorporating larger and more representative sample sizes, while employing an experimental design with randomization to yield robust and generalizable results. Consequently, the coping intervention developed in this study can be readily applied as a practical guideline for enhancing maternal abilities in a home setting. Relevant agencies must actively implement such programs and interventions to advance public health and improve the well-being of mothers and premature infants.

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