

## ORIGINAL ARTICLE

# Analysis of Factors Influencing Needs of Parents with Critically Ill Infants in the Neonatal Intensive Care Unit (NICU)

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## ABSTRACT

**Introduction:** Parents are an integral part of their infant's care. Assessing the needs of parents is an important component to improve family-centered care. Parents have unique and different needs. Various factors can influence these needs. This study aimed to analyze factors influencing parental needs when caring for critically ill infants in the Neonatal Intensive Care Unit (NICU). **Methods:** This study used a correlational quantitative method. The sampling technique used consecutive sampling and obtained 45 mothers. The inclusion criteria: hospitalized infants with minimum of 72 hours of length of stay, and the mother had visited more than once in the time period. The exclusion criteria: mothers who experience pain or are unable to control their emotions. Data were collected using the NICU Family Need Inventory and a questionnaire for characteristics of mothers and infants. Data analysis used the mean value, Rho-Spearman correlation, and linear regression test. **Results:** Parents have priority needs for assurance, information, proximity, support, and comfort. There was a correlation of mother's age, education level, socioeconomic level, previous experience in the NICU, gestational age, birth weight, and length of stay on the needs of parents ( $p < 0.05$ ). The factor of the length of stay is known as the most dominant factor. **Conclusion:** In identifying and meeting the needs of parents, the nurse must pay attention to different characteristics with different priority needs. Identifying the needs of parents leads nurses to integrate these into their infant's care and improve the infant's quality of life.

**Keywords:** Critical Illness, Infants, Needs, Neonatal Intensive Care Unit, Parents

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## INTRODUCTION

Emaliyawati (1) reported that every year it is estimated that around 2-9% of neonates get exceptional care in the NICU, and the most are premature infants and low birth weight. Tooten (2) asserts that prematurity and low birth weight are severe problems in neonates as one of the main risk factors for increasing infant morbidity and mortality. Treatment in the NICU takes a long time, from several weeks to months (3). In addition, infants will be exposed to various environments and stimuli with various painful procedures (4). Several recent studies (1,5) have argued that such treatment can harm the infant and its parents.

Infants undergoing treatment in the NICU often experience secondary infections and distress of hospitalization, which may lead to impaired growth and development. Environmental setting and medical procedures during critical phase may contribute to increased risk of impaired growth and development among infant patients (6). There will also be disturbances in the physical, emotional, cognitive, or social aspects,

which can reduce the quality of life of the neonate (7). Research conducted by Hendrawati (8) stated that infant care in NICU for parents results in anxiety, stress, posttraumatic stress and depression. It happens because, psychologically, the parents are not ready to face their infant's critical illness. Loewenstein (9) reported that parents might be disappointed, and have feelings of guilt, failure, hopelessness, anger, helplessness and loss of self-esteem. Busse (10) asserts that the source of parental stress begins with the critical condition of the infant; separation from their infant; inability to protect the infant from pain; inability to assist, look after, and care for the infant; and lack of knowledge to operate technology assisted tools in the NICU.

To minimize the negative impact of care both for infants or their parents, Mundy (3) proposes developing family-centered care (FCC). Several studies (3,11-13) stated that FCC is a model of infant care in NICU, where nurses involve parents in caring for infants under their guidance and direction. This model was developed based on the philosophy that parents greatly influence children's health (3,14). Several studies (12,13,15) stated that FCC involves mothers having an active role in their child's care.

The first step to applying the FCC model in the NICU is to identify the needs of parents, including needs of

proximity, assurance, information, support and comfort (16). If the needs of parents can be appropriately identified and met by nurses, it can improve the quality of care. On the other hand, inappropriate responses to parental needs can cause parents to be more anxious, stressed, afraid, and confused (3,16).

Several studies (3,17) demonstrate parents with infants cared for in the NICU have unique and different needs. These needs can be influenced by parental age, socioeconomic background, education level, culture, race, religion, care environment, previous parental experience, diagnosis of infant disease, length of stay, gestational age and birth weight (18).

There are significant differences between parents and nurses regarding the perception of the needs of parents in the NICU (19). It may be difficult for nurses to correctly and precisely identify the needs of parents. It is, therefore, crucial to identify needs of parents before applying the FCC model in the NICU (3).

There is a paucity of studies in Indonesia about identifying the needs of parents with critically ill infants and its influencing factors in the NICU. Therefore, this study aimed to analyze the factors influencing parental needs when caring for critically ill infants in the NICU.

## **MATERIALS AND METHODS**

### **Study Design**

This research used quantitative methods.

### **Sampling and Subjects**

The sample in this study was mothers with critically ill infants in the NICU. The inclusion criteria: infants had been in the NICU for 72 hours and their mother had visited more than once. Meanwhile, the exclusion criteria in this study include mothers who are experiencing pain or are unable to control their emotions. The sampling technique used consecutive sampling. The number of samples obtained in this study was 45 respondents. The study was conducted in the NICU of a Government Hospital in West Java in January-February 2015.

### **Data Collection**

Data were collected using the NICU Family Need Inventory (NFNI) and a questionnaire on the characteristics of mothers and infants. The NFNI questionnaire contains 56 statements using a Likert scale ranging from 1-4, with a score of 1 for not important, 2 for slightly important, 3 for important, and 4 for very important. A total of 56 statements in the NFNI represent five dimensions of need: support, comfort, information, proximity, and assurance. To maintain the instrument's validity, the researcher used the back-to-back translation technique and tested the validity and reliability of the instrument with item-total correlations values ranging from 0.43 to 0.60 and Cronbach's alpha value of 0.928.

### **Statistical Analysis**

Data analysis of the needs of parents was done by analyzing the mean and standard deviation of each statement item from the dimensions of need. Then, the data presented were arranged based on the item with the highest mean value. Thus, it is known from the dimensions which needs are the most important to the least important for parents. Meanwhile, the variables influencing the needs of parents, such as mother's characteristics (age, socioeconomic level, education level, and previous experience in the NICU) and infant's characteristics (gestational age, birth weight, and length of stay) were analyzed by using the Rho-Spearman correlation test and linear regression test.

### **Ethical Considerations**

The research was conducted after obtaining ethical approval from the Health Research Ethics Commission, Faculty of Medicine, Universitas Padjadjaran, numbered 716/UN6.C2.1.2/KEPK/PN/2014 and getting permission from the research setting. Researchers also paid attention to the basic principles of research ethics based on Polit (20), including respect for privacy and confidentiality, respect for human dignity, balancing harms and benefits, and respect for justice and inclusiveness.

## **RESULTS**

The characteristics of mothers and infants can be seen in Table I, showing that most of the mothers are aged 31-40 years, as many as 62.2%, and most of the mothers have a high level of education, as many as 55.6%. Based on socioeconomic characteristics, almost half of the mothers have a monthly family income of IDR 1,500,000-2,500,000, namely as many as 46.7%. Meanwhile, almost all mothers stated that their children had never been treated in the NICU previously, as many as 93.3%. Characteristics of infants when viewed from gestational age showed almost half of them were born in gestational age 36 weeks, namely as many as 42.2%. For birth weight, almost half of the infants were born with a weight of 1,500-2,500 grams, namely 40.0%. As for the length of stay in the NICU, most infants had undergone treatment < 14 days, namely 60.0%.

Table II presents the mean value of the needs of parents showing that the needs of parents have the highest mean value for the needs of assurance, which is  $M=3.90$ . Conversely, the dimension of need with the lowest mean value is found in needs of comfort with a mean value of  $M=3.37$ .

A bivariate analysis can be seen in Table III, showing that there was a significant relationship between the mother's age, level of education, socioeconomic level, and previous experience with infants admitted to the NICU with the needs of parents with a  $p$ -value < 0.05. Table III also shows that there was a significant relationship between gestational age, the birth of weight, and length

**Table I: Frequency Distribution of Characteristics Mothers and Critically Ill Infants in the NICU**

Characteristics	Total	
	Frequency (n)	Percentage (%)
<b>Mothers</b>		
<b>Mother's Age</b>		
≤ 20 Years	1	2.2
21 – 30 Years	16	35.6
31 – 40 Years	28	62.2
<b>Level of Education</b>		
Junior high school	17	37.8
Senior High School	25	55.5
University	3	6.7
<b>Level of Socioeconomic</b>		
< IDR 1,500,000	7	15.5
IDR 1,500,000-2,500,000	21	46.7
IDR 2,500,000-3,500,000	12	26.7
> IDR 3,500,000	5	11.1
<b>Previous Experience with Infants Admitted to the NICU</b>		
Never	42	93.3
Ever	3	6.7
<b>Critically Ill Infants</b>		
<b>Gestational Age</b>		
≥ 36 Weeks	19	42.2
32 - 35 Weeks	13	28.9
28 – 31 Weeks	13	28.9
<b>Birth of Weight</b>		
2,600 – 4,000 grams	16	35.5
1,500 – 2,500 grams	18	40.0
< 1,500 grams	8	17.8
< 1,000 grams	3	6.7
<b>Length of Stay in the NICU</b>		
≥ 14 Days	18	40.0
< 14 Days	27	60.0

NICU: Neonatal Intensive Care Unit

**Table II: The Mean Value of the Needs of Parents with Critically Ill Infants in the NICU**

Needs of Parents	Range	Mean Value (M)	Standard Deviation (SD)
Assurance	3.78 – 4.00	3.90	0.12
Information	3.70 – 3.98	3.82	0.15
Proximity	3.11 – 3.96	3.76	0.14
Support	2.98 – 3.88	3.49	0.16
Comfort	2.91 – 3.98	3.37	0.24

NICU: Neonatal Intensive Care Unit

**Table III. Spearman Correlation Test Results on Factors Influencing Parental Needs When Caring for Critically Ill Infants in the NICU**

Factor	Needs of Assurance	Needs of Information	Needs of Proximity	Needs of Support	Needs of Comfort
<b>Mother's Age</b>	r = -0.004 p = 0.490	r = -0.239 p = 0.057	r = 0.009 p = 0.477	r = 0.381 p = 0.005	r = 0.480 p = 0.000
<b>Level of Education</b>	r = 0.162 p = 0.143	r = 0.428 p = 0.002	r = 0.131 p = 0.195	r = -0.052 p = 0.366	r = -0.332 p = 0.013
<b>Level of Socioeconomic</b>	r = 0.175 p = 0.125	r = 0.338 p = 0.012	r = 0.028 p = 0.428	r = 0.134 p = 0.191	r = -0.093 p = 0.273
<b>Previous Experience with Infants Admitted to the NICU</b>	r = -0.397 p = 0.004	r = -0.064 p = 0.338	r = -0.211 p = 0.082	r = -0.319 p = 0.016	r = 0.021 p = 0.446
<b>Gestational Age</b>	r = -0.493 p = 0.000	r = -0.072 p = 0.320	r = 0.088 p = 0.283	r = 0.119 p = 0.219	r = 0.141 p = 0.179
<b>Birth of Weight</b>	r = -0.563 p = 0.000	r = -0.097 p = 0.264	r = 0.029 p = 0.426	r = -0.063 p = 0.341	r = 0.053 p = 0.364
<b>Length of Stay in the NICU</b>	r = 0.105 p = 0.247	r = -0.310 p = 0.019	r = -0.174 p = 0.127	r = -0.201 p = 0.093	r = 0.068 p = 0.328

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of stay with the needs of parents with a p-value < 0.05. The multivariate analysis process can be seen in Table IV. In the final modelling, only the previous NICU care experience and length of stay had p < 0.05. It was concluded that the length of stay in the NICU was the most dominant factor related to the needs of parents with critically ill infants in the NICU (p=0.014).

**DISCUSSION**

Assessing the needs of parents is a main component to improve FCC (12,13), and nurses need to identify and understand these needs (3,21). The results of the study showed that the need of assurance is the most important need for parents, followed by the priority needs for information, proximity, support, and comfort. The results place priority on the need for assurance, information, and proximity over the need for support and comfort. It is consistent with various studies conducted using the NFNI (3,16,17).

In this study, the need for assurance, information, and proximity is the most important need for parents. It is likely when parents of critically ill infants undergoing NICU care experience feelings of shock, stress, and uncertainty about the infant's condition and prognosis (10). Stress can be caused by unclear information, uncertainty about the infant's prognosis, procedures for the actions taken with the infant, separation from the infant, ineffective behavior and communication between health workers and parents, and conditions in the care environment. In his research, Busse (10) asserts that the situation above encourages parents to seek certainty about their infant's condition by gathering the correct information about their infant's condition and always being close to their infant to ensure that he or she gets the best care. Meanwhile, mothers choose the needs of comfort as the need with the lowest priority. This may be because parents prefer to focus on the condition of their infants who are in critical condition so that parents do not pay too much attention to their own

**Table IV: Multivariate Analysis of Linear Regression Factors Influencing Needs of Parents with Critically Ill Infants in the NICU**

Step	Variable	Coefficient (B)	Correlation Coefficient (Beta)	p-Value
Step 1	Mother's Age	-0.001	-0.056	0.745
	Level of Education	-0.011	-0.065	0.758
	Level of Socioeconomic	0.020	0.177	0.387
	Previous Experience with Infants Admitted to the NICU	-0.086	-0.220	0.171
	Gestational Age	0.002	0.060	0.873
	Birth of Weight	-0.005	-0.225	0.516
Step 2	Length of Stay in the NICU	-0.006	-0.421	0.018
	Mother's Age	-0.001	-0.048	0.767
	Level of Education	-0.012	-0.070	0.733
	Level of Socioeconomic	0.020	0.181	0.367
	Previous Experience with Infants Admitted to the NICU	-0.084	-0.214	0.165
	Birth of Weight	-0.005	-0.176	0.259
Step 3	Length of Stay in the NICU	-0.006	-0.432	0.008
	Level of Education	-0.007	-0.041	0.816
	Level of Socioeconomic	0.018	0.157	0.386
	Previous Experience with Infants Admitted to the NICU	-0.088	-0.225	0.128
	Birth of Weight	-0.005	-0.179	0.243
	Length of Stay in the NICU	-0.006	-0.436	0.006
Step 4	Level of Socioeconomic	0.015	0.130	0.342
	Previous Experience with Infants Admitted to the NICU	-0.089	-0.228	0.118
	Birth of Weight	-0.005	-0.180	0.237
	Length of Stay in the NICU	-0.006	-0.433	0.006
	Previous Experience with Infants Admitted to the NICU	-0.095	-0.243	0.094
	Birth of Weight	-0.005	-0.182	0.231
Step 5	Length of Stay in the NICU	-0.006	-0.419	0.007
	Previous Experience with Infants Admitted to the NICU	-0.115	-0.295	0.036
	Length of Stay in the NICU	-0.005	-0.348	0.014

NICU: Neonatal Intensive Care Unit

needs, including comfort. Even if viewed from the mean value, this shows that comfort is still an important need for parents.

Several studies (3,12,13,18,22, 23) have reported that parents with critical infants in the NICU have needs with different priorities. These needs can be influenced by mother and infant characteristics. From the study results of bivariate analysis for factors that influence the needs of parents, it was found that mother's age, level of education, socioeconomic level, previous experience of an infant admitted to the NICU, length of stay in the NICU, gestational age, and the birth of weight have a significant relationship to the needs of parents with critically ill in the NICU with a p-value <0.05.

The study results in Table III show that the older the mother's age, the higher the parent's need for support and comfort. Findings also indicate the higher the education level of parents, the higher need of information and the lower need of comfort. Meanwhile, the higher the family's socioeconomic level, the higher the parents' need for information. Meanwhile, parents with previous experience of care for infants in the NICU had a lower need for assurance and support than parents who had their infants in the NICU for the first time.

Table III also shows that the older the gestational age, the lower the parents' need for assurance and the younger the gestational age, the higher the parents' need for assurance. Meanwhile, the greater the birth weight, the lower the parents' need for assurance and the lower the birth weight, the higher the parents' need for assurance.

Otherwise, the longer the days of caring for infants in the NICU, the lower the parents' need for information and the shorter the days of caring for infants in the NICU, the higher the needs of parents for information.

This finding is in line with the results of previous study (3,18). It was found previous care experiences in the NICU and length of stays as the dominant factors. This result is supported by Chatzaki's study (18) that length of stays in the NICU is considered as the dominant factor affecting the needs of parents. This study also found that a mother's age, level of education, socioeconomic level, gestational age, and birth weight have a significant relationship to the needs of parents with critically ill infants in the NICU, which is different from previous research (9,12).

A strength of the study is that the researcher is a data collector who directly interacts with the respondents. However, the small number of respondents was the main limitation. In addition, data collection was carried out when parents visited their infants, so parents who did not visit often were not included. The research was also conducted by visiting parents at home to collect data for overcoming these limitations. Identifying the needs of parents and factors influencing it can enhance nursing communication and allow nurses to incorporate parents' needs into families' plans of care.

## CONCLUSION

Parents are an integrated part of care process of infants in the NICU and they play major roles during the

recovery phase. Nurses, therefore, must meet the needs of parents and involve them in the nursing care process. In identifying and meeting the needs of parents, the nurse must pay attention to the characteristics of the mother and their infants. Because of different factors, parents have different priority needs.

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