

Participation of Mothers in the Care of Premature Infants and its Associated Factors

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Abstract

Introduction: Parental participation in the care of and support to premature infants is the main factor in accelerating health improvement and growth of infants in the neonatal unit. Many factors are associated with this participation, whose investigation provides appropriate contexts for parental participation.

Objective: The aim of this study was to determine the participation of mothers in the care of premature infants and factors associated with it.

Material and Methods: This is a cross-sectional descriptive–analytical study in which 170 mothers with premature infants, admitted to the neonatal ward of the hospitals chosen by the Guilan University of Medical Sciences, were examined using available sampling method. The information collection tool was a questionnaire of two parts: the questionnaire of the participation of parents with hospitalized infants and the researcher-made questionnaire of the factors associated with mothers' participation in the care of premature infants. After sampling, the data were statistically analyzed using descriptive and inferential statistics (*t*-independent, ANOVA, Pearson and Spearman correlation coefficient, and regression models).

Results: The results suggest that the participation rate of mothers in infant care is 79.03%, and the birth weight ($\beta = -0.001$, $P = 0.017$), gender ($\beta = 0.830$, $P = 0.024$), to become familiar with the physical environment by the nurse ($\beta = 1.506$, $P = 0.001$), to become familiar with the equipment used for infants in the department by the nurse ($\beta = 1.152$, $P = 0.009$), explanation by a nurse for the measurements done for the infant and the reasons ($\beta = 0.818$, $P = 0.023$), and blood sampling or venipuncture or pricking the infant ($\beta = 0.185$, $P = 0.041$), were considered among the predictors of mothers' participation.

Conclusion: Due to the identification of factors associated with the participation of mothers in the care of premature infants, it is recommended that the managers and nurses use the results to improve and strengthen the participation of mothers in the care of hospitalized infants.

Keywords: Mothers, Premature Infant, Infant Care.

Introduction

Premature birth, which is defined as birth in less than 37 weeks, is considered as one of the big problems in today's communities [1]. About 9.61% or 12.9 million births worldwide are preterm births [2]. Results of studies in Iran show that the incidence of preterm births has been increasing, so that in the last three decades, it has gone up from 13% to 30% [3]. The low birth weight and preterm infants are endangered groups and they experience more physical and mental problems than naturally-born infants and, due to the physical features, they need principal care in order to continue life and to attain the natural growth process [4]. One of the best and most efficient ways to prevent damages and injuries associated with hospitalization is the participation of parents in the care of new-borns [1]. Until the mid-20th century, infants were hospitalized without the presence of their parents; but in recent decades, major changes have been established in the role of parents [5]. So active participation of parents in the care of infants has led to weight gain, improved cognition and behaviour status, improved respiratory function, reduced bronchopulmonary dysplasia, increased breastfeeding, increased confidence in parenting skill after discharge, reduced parental stress, reduced length of hospital stay, and reduced cost of care [4, 6, 7].

Based on the studies in this area, many factors are associated with parental participation, some that can be mentioned being: the attitude of the health team, the information and training offered to parents, attitudes and beliefs of mothers, stress and anxiety of mothers, nursing support, encouraging parental participation, clarity of roles, adequate staffing, time required for communication and information transfer, education level, parental age, and

differences in climate, culture, and society [1,8,13].

Unfortunately, despite the passage of more than four decades, some inconsistencies could still be seen in the care of hospitalized infants [5]. In the study by Johnson et al. [14] in Australia, the health caregivers' attitude toward parents' participation in the care of hospitalized infants has been negative; however, this attitude has been positive from the perspective of the American healthcare providers participating in the study by Daneman et al. [15], and the study by Valizadeh et al. [13]. The result of the study by Akbar Begloo and Valizadeh confirmed that giving information to parents with hospitalized infants, creates a sense of control and power in the parents on their position, hence they further contribute in the care of newborns [16]. Giving information to parents about behavioural responses may reduce parental stress about admission to hospital [5]. However, the results of the study by Bastani et al., quoted by McGrath, showed that giving information to the parents leads to confusion and loss of confidence in the healthcare system and, thus, increased parental anxiety [9].

Clarification of the role of parents in the care is also among important and outstanding parental participation cases; in a way that if the parental participation is not clarified, then a major obstacle would be created in the participation. Also, if there is a difference between parents' and nurses' perception of the behaviours that can be considered as care, it will lead to conflict between nurses and parents, decreased quality of care, and further dissatisfaction on both sides. Certainly, clarification of the role of parents is the responsibility of nurses [12]. Studies show that most families tend to be involved in all aspects of care of

hospitalized infants, and they have often described the participation as useful for themselves and their infants [13]. Due to the increased incidence of premature births as endangered groups and the importance of parental participation in the care of the infants, and according to the findings of different studies on the factors related to parental participation, this study was conducted in order to determine the participation of mothers in the care of premature infants and its related factors. With the data obtained from this study, the attention of the authorities would be attracted to the provision of appropriate contexts for parental participation in the clinical setting, and thereby a step, however small, would be taken to reduce costs and remove the problems associated with hospitalization of premature infants.

Materials and Methods

This is a descriptive cross-sectional study whose population are mothers of premature infants hospitalized in the neonatal ward of the chosen Hospitals of the University of Medical Sciences of Gilan in 2014–15. The number of samples were chosen based on the standard deviation of the mean of participation of mothers in the control group in the study by Jafari Mianai (4.85) [8] with 95% confidence level, and considering 15% estimated error of the standard deviation, 180 persons were chosen by the available sampling method.

All mothers over 18, without any physical illness or medical problem disrupting the participation, without previously having an infant admitted to the neonatal ward, and whose infants had the required features, were included in the research. Infant features were: gestational age of 30–36 weeks based on ultrasound and the last menstrual period (LMP), absence of any

obvious abnormalities, not being ill, and hospitalized for at least three days. By not being ill, we mean absence of respiratory distress and Apgar score over seven. The information collection tool was a questionnaire consisting of two parts: the questionnaire of the participation of parents with hospitalized infants (index of participation/hospitalized infant); and the researcher-made questionnaire of the factors associated with mothers' participation in the care of premature infants.

The questionnaire of participation of parents with hospitalized infants had questions with two-choice responses, listing 25 activities that the mother could do for her infant, and she was asked to identify any activity she had done in the last 48 hours. The score range of this question was 0–25, where the higher scores indicated better participation. The second part was the researcher-made questionnaire on factors related to mothers' participation in the care of premature infants. The questions of this part of the questionnaire consisted of three areas: individual–social factors, environmental factors, and stressors factors. In the area of stressor factors, mothers' stress assessment tool derived from the parents' stress assessment tool in the Neonatal Intensive Care Unit Parental Stress (NICUPSS) has been used [17]. The questions of this part of the questionnaire, classified according to the Likert scale, include 12 questions. Earning scores lower than 33.3% of the maximum obtained score (20 points) implies mild stress; earning scores between 33.3%–66.6% (20 to 40 points) implies average stress; and earning scores higher than 66.6% (40 points), implies severe stress.

In the present study, to determine the validity of data collection methods, the CVI (content validity index) method was used.

The questionnaire was given to 10 of the Nursing and Midwifery faculty members and, after reviewing the comments and applying necessary changes, the statements with a rate higher than 0.62 were kept in order to determine the minimum value of the validity ratio according to Lawshe's method; so all the statements were accepted. The CVI for the questionnaire of the parents with hospitalized infants and for the questionnaire of examining mothers' stress was equal to 0.90–1. Also, in order to determine the reliability of the tools, the method of determining internal consistency was used. So the questionnaire was given to 20 mothers with premature infants admitted to the neonatal ward in two hospitals of the city of Rasht, and it was then measured by the Kuder–Richardson 20 test, and Cronbach's alpha. The Kuder–Richardson 20 for the questionnaire on participation of parents with hospitalized infants was obtained equal to 0.89, and the Cronbach's alpha was found equal to 0.85. In this study, after receiving permission for conducting the research from the Vice Chancellor of Research and Technology and Ethics Committee of Gilan University of Medical Sciences (number 2930349911), the researcher attended the educational–medical centre of Rasht, presented the authorization to the relevant units, and obtained permission for attendance in the research environment. To gather the information, the researcher introduced himself to the mothers who met the inclusion criteria and whose infants met the criteria as well and, after offering explanations about the objectives and confidentiality retention of information, and that they are intended to participate, their written informed consent to participate was taken. While the mothers had their questionnaires in front of them, and saw the questions, each question was read out to

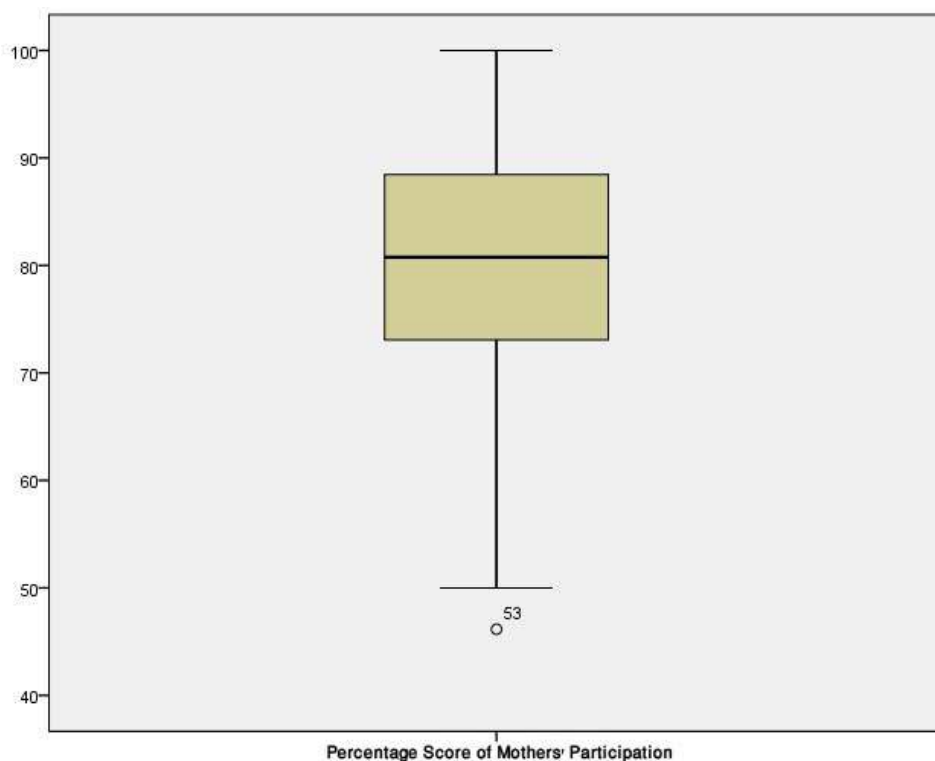
them by the investigator, and the mothers chose their preferred response. For considering the ethical issues, the research units were assured that the obtained information are considered as classified. In the end, the results obtained were analysed using the SPSS Version 21, with descriptive (frequency distribution, mean, standard deviation) and inferential (t–test, ANOVA, Pearson and Spearman correlation coefficient, and model regression) statistics. The significance level was considered as $P < 0.05$.

Results

The results showed that the average age of mothers was 29.21 ± 6.14 (Range, 18 – 50 years). All subjects (100%) lived with their spouses. The average number of children was 1.76 ± 0.84 . Among the subjects, the highest numbers belonged to high school education (34.1%), housewives (91.2%), and with a monthly income below 200\$ (51.2%). The majority of mothers (77.6%) had no history of abortion. The majority of them (62.4%) were not aware of early birth of their infants before the birth. The majority of mothers had spousal support (98.8%), supported by family and friends (92.9%), and nursing support (85.9%). The majority of them (99.4%) were willing to participate in the care of their infants. Most of the subjects felt satisfied with their participation in the care (95.3%). Mothers' satisfaction in participation by nurses for most of the subjects was (91.8%). The average age at birth in preterm infants was 33.05 ± 1.93 weeks and the mean birth weight of these premature infants was 1956.71 ± 406.73 grams (Range, 870 – 2500 gr). Most of the subjects had female infants (50.6%). The least Apgar of the first minute was seven and the most was nine, and the least birth rank was obtained as one, and the most was obtained as five.

Table 1. Mothers' participation in the care of premature infants

| Descriptive Test | | Mothers' Participation | |
|------------------------------|-----------|------------------------|----------|
| | | Score | Per cent |
| Average | | 20.55 | 79.03 |
| 95% Confidence Interval Mean | The least | 20.10 | 77.31 |
| | The most | 20.99 | 80.74 |
| Median | | 21.00 | 80.77 |
| Standard Deviation | | 2.94 | 11.31 |
| Minimum | | 12.00 | 46.15 |
| Maximum | | 26.00 | 100.00 |
| Interquartile Range | | 4.00 | 15.38 |

**Figure 1** PhD Distribution of mothers' participation in the care of premature infants

The most frequent way of feeding was direct milk and formula together (50%).

Results of Table 1 show that the mean score and the standard deviation of mothers participating in the study is equal to 20.55 ± 2.94 points from the 25 obtainable points, and correspondingly, the percentage of mothers' participation is equal to 11.31 ± 79.03 . About the individual-social qualitative variables related to mothers' participation, the results of the ANOVA indicate a statistically significant association

between support by the nurse to stay with the infant ($P = 0.019$) and satisfaction of participation in infant care ($P = 0.023$) with the participation of the mother; while, according to the Pearson correlation, no significant correlation was obtained between mother's age, number of children, number of abortions, number of stillbirths, gestational age at birth, age at admission, birth weight, weight at admission time, ranking of birth and Apgar of infant's first minute with mothers' participation.

Table 2. Regression coefficients for individual-social, environmental, and stressors factors related to mothers' participation in the care of premature infants in NICU

| Factors related to the mothers' participation(individual-social, environmental, stressors) | Regression coefficient | Standard error | Significance level | The relative odds | 95% CI for the relative risk | |
|--|------------------------|----------------|--------------------|-------------------|------------------------------|--------|
| | | | | | Lower | Upper |
| Birth weight | -0.001 | 0.0001 | 0.017 | 0.999 | 0.998 | 1.000 |
| Infant gender | 0.830 | 0.366 | 0.024 | 2.292 | 1.118 | 4.701 |
| Becoming familiar with the physical environment by nurse | 1.506 | 0.449 | 0.001 | 4.511 | 1.872 | 10.870 |
| Becoming familiar with the equipment used for the infant by nurse | 1.152 | 0.439 | 0.009 | 3.165 | 1.338 | 7.490 |
| Explaining the measures taken by the nurse for the infant and the reasons | 0.818 | 0.360 | 0.023 | 2.266 | 1.119 | 4.589 |
| Venipuncture or blood sampling or pricking the infant | 0.185 | 0.091 | 0.041 | 1.204 | 1.007 | 1.438 |
| Constant | 5.135 | 1.374 | 0.0001 | 169.914 | | |

About environmental variables associated with mothers' participation, the results of the independent t-test showed a statistically significant relationship between to become familiar with the physical environment by nurse ($P = 0.0001$), to become familiar with the equipment used for the infant in the ward by nurse ($P = 0.0001$), to determine mother's duties in the care of the infant by nurse ($P = 0.0001$), and to explain by nurse about the measures taken for the infant and the reasons ($P = 0.005$), and the participation of mother.

About the stressors factors related to mothers' participation by Spearman correlation coefficient, there was a positive correlation between any of the questions of the stressors factor area ($P = 0.0001$) and the participation of the mother, so that with decreased mothers' stress, their participation in the care of infant increases.

Results of Table 2 also show that based on the multivariable regression model, among individual-social, environmental, and stressors factors related to the participation of mothers, birth weight ($P = 0.017$), gender ($P = 0.024$), to become familiar with the physical environment by nurse ($P = 0.001$), to become familiar with the equipment used for the infant by nurse ($P = 0.009$), to explain by a nurse about the measures taken for the infant and the reasons ($P = 0.023$), and venipuncture or blood sampling or pricking the infant ($P = 0.041$) are the predictors of mothers' participation, in a way that decreased infant weight leads to decreased mothers' participation. Also mothers with sons had more participation than mothers with daughters. Mothers, who were not familiar with the physical environment and the equipment, had less participation than the mothers who were familiar with the physical environment and the equipment. Also, mothers who did not receive explanations about measures taken for the infants and the reasons by the nurse had

less participation than the mothers who received explanation about the measures taken for the infants and the reasons. Mothers who observed venipuncture or blood sampling or pricking their infants, had a higher chance to obtain the participation score. Also, according to figure No.1, the median of participation percentage is about 81%; accordingly, 75% of the mothers had participation of more than 72%.

Discussion

The findings of this study in determining the participation of mothers and related factors showed that the majority of mothers participated in the care of their infants. In this regard, the results of the study by Jafari Mianaii also showed that with the implementation of the training programme of empowerment in neonatal intensive care unit, the participation of mothers in the test group was significantly higher than the control group [8]. The findings of the study by Ghasemi et al. also suggested a positive attitude of the majority of mothers in the care of premature infants [10].

The results also indicate a statistically significant relationship between the support by the nurse to stay with the infant and the satisfaction of participating in the care of infants with the participation of the mother. About the variable of satisfaction of the participation, the results showed that mothers who felt satisfied with participating in the care of infants had higher odds of participation score. In this regard, Ygge and Arnetz have also addressed the support of staff as a prerequisite for participation [18]. It seems that to strengthen parental participation in infant care, they need continuous guidance and support from nurses so as to recognize their role [19]. According to the surveys it seems that nurses determine the extent and way of parents' participation through the information they give, the support for

parents, and the way they communicate with parents [20]. Also according to other studies, it can be admitted that the nurses know that when they support mothers, they are indirectly supporting the newborn. In this case, the mothers feel confident and are able to take better care of the infant [21]. But in the study by Sepehr Nia et al., the low mean score of mothers' perceptions on the participation showed that nurses do not involve mothers in the care and decisions about their child [22]. The reason for this difference in results may be due to differences in the working conditions of nurses and hospital personnel in the situation studied. Parental participation leads to parental consent and feelings of adequacy in parents [12], which is consistent with the study. In this regard, the results of the study by Aein aimed to determine the impact of nurse–parent participation model on the satisfaction of mothers about the care, also showed that the average satisfaction of mothers in all areas (information, communication, clinical skills, need, and family participation in the care) in the test group was significantly higher than the control group [23].

The findings of this study showed that there was no significant association between maternal age, number of children, number of abortions, number of stillbirths, gestational age at birth, age at admission, birth weight, weight in admission of infant, infant ranking, and first-minute Apgar with the participation of the mother. In this regard, the results of the study by Ghasemi et al. also revealed that there is no statistically significant relationship between the mother's education, mother's occupation, mother's age, and birth weight [10]. No significant difference was also observed between the ranking of infants and number of infants in terms of the levels of mothers' performance in the care of premature infants [24]. The results

of this study were inconsistent with the study by Chapados et al. The results of this study showed that parents with higher education levels, and younger parents, are more inclined to participate, while aged parents are more inclined to leave the care to the staff [25]. Perhaps the reason for this difference in the results is induced by difference in demographic characteristics of studied groups which have unique characteristics and also different sample numbers.

Results of this study showed that in environmental variables related to mothers' participation, there was a statistically significant relationship between familiarity with the physical environment by nurse, familiarity with the equipment used for the infant by nurse, determining the duties of the mother in the care of children by nurse, and explanation by nurse about the measures taken for the infant and the reasons, and the participation of the mother. The results of a study by Jackson et al. in Sweden showed that giving information to parents is of great importance and can give parents the confidence they need to play a parental role [26]. Also Guillaume et al. in their study stated that receiving information, when the infant is admitted in the neonatal intensive care unit, helps to strengthen the bond between mother and infant [27]. The results of the study by Zeynali et al. also showed that meeting the needs of parents of admitted infants about obtaining information, would lead to their further participation [28].

The results of this study also indicate a positive significant correlation between stressors factors and the participation of the mother. In this regard, the results of Zeynali, quoted from the study by Mokhtari, suggests that mothers' participation in the care of paediatric infants, has led to a significant decrease in

anxiety of the mother [5]. In addition, the results of the study by Bastani et al. also confirm that the implementation of the participation programmes in the care of premature infants reduces the anxiety level of mothers [9]. But the results of the study by Burke et al. suggested that although the parents recognized their presence and participation as necessary, it had no impact on the level of their stress; this inconsistency may be due to the difference in the tools used in the study, the kind of participation programme, and the sample size [29].

It is not worth that in our study, the majority of mothers in the study, participated in the care of premature infants, but to promote this extent, the identification of related factors (individual–social, environmental, stressors) seems necessary so as to provide appropriate contexts for further participation of mothers. Also conducting future studies, with the aim of assessing the impact of parental participation in the care of premature infants, on the infant, family, and healthcare workers is recommended.

Among the limitations of this study was the physical–mental condition of the subjects, which could have affected the way they responded to the questionnaire items; however, this was outside the control of the investigator.

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