

## The effects of nursing interventions on mothers' empowerment regarding improvement of the care of preterm infant in NICU: a Systematic review

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### Abstract

**Introduction:** The birth of a preterm infant can be an overwhelming experience of guilt, fear and helplessness for parents. According to remarkable effect of nursing interventions on parents and infants in NICU (Neonatal Intensive Care Unit), which has been pointed out in different studies, this study has been done to determine the effects of nursing interventions on improving mothers' ability in taking care of the preterm infants.

**Methods:** This study was based on a systematic review, and it has been done in targeted form, by focusing on the study questions. The articles were studied from 2003 to 2013, by using four key words: Nursing interventions, mothers' empowerment, preterm infants and NICU in Science Direct, Medline, PubMed, SID, Irandoc, and Iran medex databases. Relevant articles were selected after several steps of evaluation and full text of these articles were analyzed.

**Results:** In this study, among 35280 articles, we finally selected nine. Results of four major themes including; increase of parent-infant attachment and engagement, increase of parents' confidence in taking care of preterm infants, decrease of psychological problems (depression, fear, anxiety, anger, etc.) and increase of preterm infants' breastfeeding skills were extracted.

**Conclusion:** This study showed that, nursing interventions are effective in both parents and preterm infants for parents' empowerment and partnership in taking care of preterm infant. Therefore, it is recommended to start education and care programs for parents who have had a preterm infant throughout the admission phase of the infant, discharge and after that in the houses and educational-treatment centers.

**Keywords:** Mothers' empowerment • preterm infant, Nursing interventions, NICU

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### Introduction

Parents, who were expecting a healthy infant are going to have psychological problems and tension by birth of a preterm infant and hospitalization in stressful environment of NICU, where is full of equipment noise, bright lights, unpleasant smell of chemical substances and observing the infant that is connected to the equipment via tubes and wires [1].

May be parents are suffering fear about their infant's situation, and they are dubious about their ability in taking care of the infant. Also sometimes parents experience anger, sadness, grief, depression, guilt, blame, disappointment and decrease of confidence [2]. On the other hand, infant's hospitalization in the hospital and mother-infant separation interferes mother-infant - involvement and this process influences infant's emotional and physical development [3]. When mother is taking care of her preterm infant, sense of partnership is improving in her and she feels more confident. Active involvement of parents in taking care of preterm infant improves parents' ability for facilitating their infant's development during hospitalization and after discharge and decreases preterm infants' hospitalization time in NICU, also decrease of economic costs and decrease of the risk of acquiring hospital infections are among the other remarkable benefits [4].

Studies during the recent years indicate different kinds of nursing interventions (kangaroo care, massage therapy, breastfeeding education etc.) influencing parents' partnership and empowerment in taking care of preterm infant [5]. Results of the studies showed that nurses can influence parents remarkably by providing accurate and timely nursing interventions [6]. Since NICUs parents' partnership in taking care of the hospitalized infants are less considered in our country, this study had been done to determine nursing interventions benefits for mothers who have preterm infant in order to increase mothers' partnership in taking care of preterm infant.

### Methods

Systematic review method was used in this study and in targeted form, by focusing on the questions of the study; searching necessary information was retrieved, evaluated and integrated. The main question of this review study was this; what is the effect of performing nursing interventions on empowerment of mothers who have preterm infants?

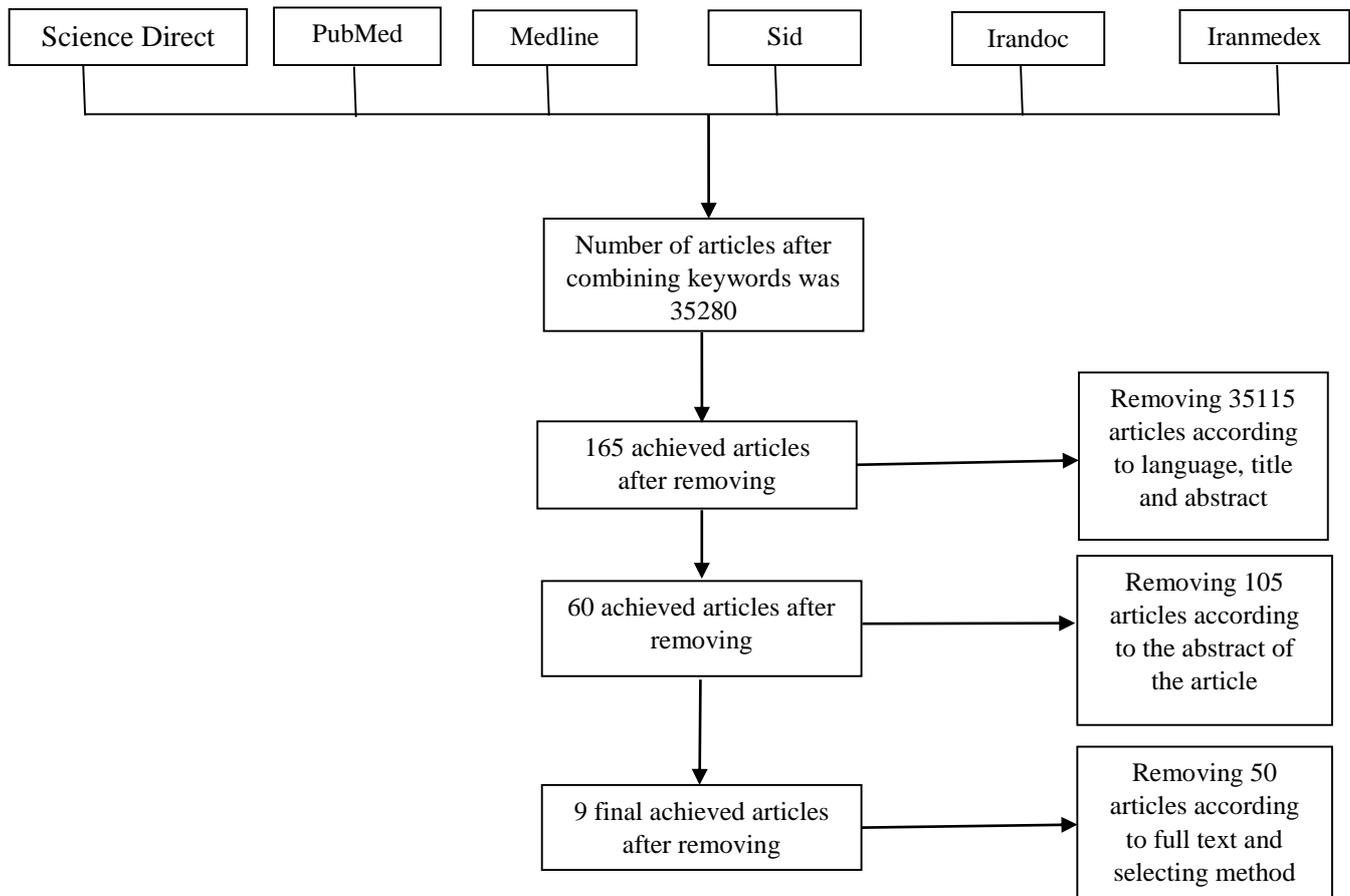
Inclusion criteria included; English and Persian articles from 2003 to 2013, clinical trial, preterm infant with less than 1000 g weight, and gestational age less than 37 weeks gestation.



Searching strategy was as follow: In the first phase, we identified the databases. In this phase, we performed one electronic identifying articles in Medline, PubMed, Science Direct databases and Sid, Irandoc, Iranmedex (Persian language databases). We used the following words separately and then a combination of them had been used for doing free search in databases and electronic journals: for mothers' empowerment, nursing intervention, preterm infant, NICU in the first phase of searching 35280 articles had been found. After studying title and language of these articles, regarding the approach of accordance with inclusion criteria, 35115 articles were removed. In the next phase, after studying abstract of the articles and selecting method of the study, 105 articles were omitted. In the next phase, full text of the selected articles were studied from the approach of relationship with the questions of the research and conformity with inclusion and exclusion criteria of the studies. Fifty articles were omitted in this phase of the study. Finally 7 foreign and 2 Persian articles had inclusion criteria of the study and finally full texts of these articles were reviewed and analyzed several times. (Graph 1) . For analyzing data, these articles were combined in line with questions of the study and they were reported through systematic review.

### Results

Results, achieved from nine selected articles, which are completely related to each other, indicate that ability and partnership of parents, who have preterm infant, are going to be increased as the outcome of implementation of nursing interventions. Achieved results regarding parents include: 1. Increase of mother-infant attachment and engagement 2. Increase of parents' confidence in taking care of the preterm infant 3. Decrease of parents' psychological problems (depression, anxiety, fear, disappointment, anger, etc.). 4. Increase of breastfeeding ability to the preterm infant. The most important findings of these articles were analyzed and they are given in the tables after categorization (tables 1&2). Mother-infant attachment was among the most effective results, which is emphasized in the articles. Actual attachment is a unique relationship between mother and infant, which is started since embryonic period and it is going to be developed after birth. Infant's hospitalization may delay this relationship. Impairment of this relationship can cause adverse consequences such as; failure to thrive (FTT), separation anxiety, personality disorder and school problems of the infants. In this regard, nurses by providing accurate and timely educations to the parents play an effective role in increasing this relationship.



Graph 1. process of selecting articles of the study.

Among interventions, which are in different articles in this regard is; Mother-Infant Transaction Program (MITP), Guided Participation (GP), Skin-to-Skin Contact (SSC), Creating Opportunities for Parent Empowerment program (COPE) [10-7].

Different kinds of early interventions is necessary for decreasing stress, depression and increasing parents' confidence during hospitalization and before discharge [11]. Parents' confidence should be improved frequently during infant's hospitalization. Also evaluating this confidence before infant's discharge is necessary, since parents are going to face some problems at home [12]. Mothers are often happy about their infant's discharge, but when they have the total responsibility of the infant, they suffer from anxiety and depression [13].

Studies have shown that when mothers are in the same room with their infant and they have partnership and responsibility of taking care of their infant before discharge, they have more confidence and they perform more

appropriate regarding satisfying their infant's needs at home and they are more satisfied [14].

Parents' partnership in taking care of preterm infant is effective in decreasing their anxiety. Providing information in the form of training tapes, illustrated books, holding meetings and oral explanations decrease parents' anxiety and stress and increase their partnership in taking care of the infant [15,16].

Decreasing level of mother's anxiety, depression, anger, disappointment and confidence in taking care of the infant is another achieved result of this study. Effective interventions in this regard are programs such as; partnership care program, (COPE), (MITP), (SSC), video interaction guidance (VIG), cues and care trial [8, 9, and 15, 17-21].

Increase of skill in preterm infant's breastfeeding is among other remarkable results, which are achieved through implementation of interventions such as; MITP and GP [22].

Table 1- Epidemiological characteristics of the reviewed studies

Ref.	Author	Country/region	Age group	Age average	Gender of the sample	Sample size
8	Newnham et al.	Australia	Adults	7/29±4/69	Female	68
9	Chiu et.al	Washington/US	Adults	25±6/3	Female	100
15	Jafari Mianayee et.al	Isfahan/Iran	Adults	27/88	Female	90
16	Bastani et.al	Tehran/Iran	Adults	25/93±4/2	Female	100
17	Melnik et.al	New York/US	Adults	27/9±6/57	Female	246
18	Tooten et.al	Netherlands	Adults	25/51±5/65	Female	210
19	Kaarsen et.al	Norway	Adults	35±49	Female	214
22	Pridham, et. al	Wisconsin-Madison/US	Adults	25/50±5/27	Female	42
46	Schroeder & Pridham	Midwestern US.	Adults	31 ± 7	Female	16

## Discussion

According to the presented analysis, in most of the articles of the study in this systematic review, providing interventions, in addition to its effect on improvement of taking care of the infant, had remarkable effects on parents too.

Since, there were many studies in order to introduce varied nursing interventions, identifying accurate interventions such as kangaroo care, massage, breastfeeding, etc., and providing it in-time, play an important role in improvement of taking care of the infant [5]. One of the results of this study was mother-infant attachment, which has been emphasized in many studies [8- 10, 23], connection and interest are two close concepts in emotional relationship between parents and infant. Actually, this process is a unique relationship between mother and infant, which has been started from embryonic period and it is going to be developed after birth [24]. This interest is the basis of the infant's growth in the future. Birth of a preterm infant interferes this process between parents and infant [25]. Conditions, which interfere this relationship and make it harder to create interest include; infant's hospitalization, medical treatments, fear of losing the infant and emergence of some emotions such as; anxiety, depression,

disappointment etc. [26]. Impairment in this relationship can cause adverse consequences such as failure to thrive (FTT), separation anxiety, personality disorder and school problems of the infants. Parents suffer from fear and anxiety when they are encountered with their preterm infant. However, nurses, working in NICU can overcome parents' fear of the initial relationship with the infant by using appropriate methods and increasing parents-infant attachment [27]. One of the common methods in this regard is Kangaroo care. In this method, the infant is on the parents' chest only by wearing a hat and a diaper [28]. This method had been done for the first time in Bogota in Columbia in 1970 in order to decrease infants' death due to shortage of incubator [29]. Results of clinical trial in Columbia showed that Kangaroo care is a safe method, which can be used as a replacement for care in incubator [30]. In addition, result of another clinical trial in Iran showed that Kangaroo care is as effective as care in incubator regarding increase of parents-infant attachment [31]. Benefits of using this method have been repeated in articles many times. For example, this method in parents cause parent- infant attachment , decrease of depression after childbirth, decrease of anxiety, increase of breast milk production and improvement of breastfeeding [32].

**Table 2.** Methodological characteristics of the reviewed studies

Ref.	Methodology	Statistical method	Case group intervention	Results of the study	Intervention time
8	RCT*	t- test	Received a modified Mother–Infant ransaction Program	enhanced mother–infant interactions, less stressed	1 to 1.5 hour
9	RCT	t- test	videotaped during a feeding session	Increase of infant-mother interaction	The remaining 48 dyads first experienced SSC at a mean of 9.9 h (SD: 11.3, range: 0.5–42.1), for an average 11.6 times (SD: 5.2, range: 1–25), and for an average 1.3 h each time (SD: 0.5, range: 0.5–2.5).
15	RCT	t-test, $\chi^2$ test, Mann Whitney test, Spearman correlation and test for repeated measures	Video tape and illustrated booklet	Decrease of stress and anxiety and increase of partnership	15 minutes
16	RCT	t-test, $\chi^2$	Briefing	Decrease of mother's anxiety	30-45 minutes
17	RCT	$\chi^2$ , t- test	Examining the processes through which an educational Y behavioral intervention program	Could decrease post discharge maternal anxiety and depression, which may improve outcomes for both mothers and preterm infants	Time 1 (2 to 4 days after NICU admission) Time 2 (2 to 4 days after Time 1) Time 3 (1 to 2 days after Time 2) Time 4 (1 to 4 days prior to discharge) Time 5 (1 week after discharge) Time 6 (2 months corrected age of child)
18	RCT; multicenter	Regression method	Evaluate the effectiveness of Video Interaction Guidance	Stress symptoms, depression, anxiety and feelings of anger and hostility.the quality of parental bonding and parent-infant interactive behavior.	3 hours
19	RCT	t tests and intraclass correlation coefficients, Cohen's d, ANCOVA	Modified version of the Mother-Infant Transaction Program (MITP),	Reduces parenting stress	1 hour
22	RCT	The Cochran-Armitrage Trend Test Goldstein's (1995) procedure	Four areas of skill were assessed and scored from direct observation as performed or not performed: (a) oral-motor; (b) hand-to-mouth and fine motor; (c) body positioning (head and trunk); and (c) communication social	GP activities to support mothers in assessing and responding to infant readiness to move forward in self-feeding, infant development of these skills may have been affected by overriding maternal concern about the infant's nutrient intake or growth and consequent management of feedings to assure intake. GP may have a moderating effect on the relationship of depressive symptoms and adaptive feeding behavior.	2 hours
46	RCT	Univariate tests of linear and quadratic trends	Briefing	Increase of mother's partnership	45 minutes

\*Randomized controlled trial

In addition to the mentioned benefits, there are some barriers for performing this care, which include concerns related to the infant, clinical concerns, safety, having problem in determining infant's preparation, lack of special guideline, time management and lack of nurses and physicians' support [33].

Decrease in level of anxiety, depression, anger, disappointment and increase of parents' confidence in taking care of the infant is another important result achieved from this study [8, 9, 17, and 18]. Kaaresen (2006) in a clinical trial study considered that early interventions program is effective in decreasing parents' stress [19]. Different types of early interventions are necessary for decreasing stress, depression and increasing parents' confidence during hospitalization and before discharge [11]; because it is necessary to improve parents' confidence during hospitalization frequently. Furthermore, it is important to evaluate this confidence before infant's discharge because parents encounter with problems at home [12]. Results of the studies of Feijo [2006] showed that preterm infant's massage decreases mother's depression [34].

Results indicate various programs and interventions for increasing empowerment of parents, who have preterm infants such as COPE, MITP, SSC, and GP.

COPE program is one of the most important interventions that many studies had been done in this regard. The initial basis for formation of this intervention was the self-regulation theory of Lontal and Johnson (1983). This theory claims that providing objective information and increasing person's knowledge and awareness about the facts enables the person to deal with unexpected and stressful situations through increase of understanding, confidence and anticipation [35].

Dr. Bernadet Melnic et al (2001) developed self-regulation theory for parents of the infants hospitalized in NICU. They presented educational-behavioral intervention according to self-regulation theories [36]. The first component of this intervention, in addition to psychological support of parents, presenting recorded and written information about physical and behavioral features of preterm infant and on how to play mother role in NICU, is about increase of parents' confidence in taking care of preterm infant. Decrease of parents' stress, anxiety and depression and increase of mother-infant interaction were the results of this intervention. The second component of this intervention was increase of motivation for participating in taking care of the infant, which can cause decrease of parents' anxiety and depression, since they have less feeling of helplessness and powerlessness.

Totally, results achieved from two components of COPE intervention include: 1. Increase of parents' confidence 2. Increase of ability to take care of the infant 3. Decrease of stress, anxiety and depression 4. increase of infant-mother interaction (3, 10, 37, 38).

Results of the clinical trial study in Iran were in line with the present study. Also in this study the effect of creating growth opportunity program for parents on the level of anxiety and stress of mothers who have preterm infant has been assessed [15].

MITP is among other effective interventions in this regard. In Newnham et al (2009) clinical trial on 68 preterm infant's mothers with the aim of studying the effect of MITP reported some results such as decrease of stress and anxiety and increase of mother-infant attachment [8]. In contrast, Raven (2011) demonstrated that this program has no effect on decrease of mother's stress after implementation of MITP intervention program.[3].

SSC intervention was common following Kangaroo care. One of the ways of nonverbal communication between mother and infant is skin contact. Touching in infancy period is specifically important [40]. SSC method is a safe and usable method in the first week of preterm infant's life [41].

Affonso et al (1993) presented the first report about the effect of SSC care on mother's emotion towards her preterm infant. Results of their study showed that parents have more feeling of closeness with their infant [42]. Results of the interview with the mother who experienced SSC care method with their infant showed that this method increases parents' confidence in taking care of the infant and provides an opportunity for better understanding of the infant [27]. Results of review study of Moore (2007) also showed that this care is effective in increasing mother-infant attachment [43].

In addition, positive effect of SSC on mother and infant interaction has been proved in many studies. Feldman (2002) showed that this method decreases mother's anxiety and increases her interest to the infant [44]. However, results of some studies indicate ineffectiveness of this method. For example Miles (2006) showed that SSC has no effect on mother's anxiety, depression, stress and breastfeeding performance and preterm infant's behavior [45].

There have been many programs in NICU, which were designed to help mother to understand, support and observe preterm infant. Among these programs is the mother's GP intervention.

Schroeder (2005) by performing GP, which included holding six sessions with subjects such as teaching the way of changing diaper, breastfeeding, temperature measurement and keeping infant, achieved this result that performing this program can be effective in developing mother and infant relationship [46]. Results of the studies of Pridham (2005) after performing mother's GP intervention indicated decrease of depression signs, improvement of mother-infant interaction and increase of mother's breastfeeding skills [22].

In one study, illustrated programs were presented for education and increase of parents' confidence before discharge. This program was according to networks based on recommended educational system designed by Young (1999). Results of this study showed that presenting video programs for mother's education is effective in increase of mother and infant interaction [47]. Video instructions are one of the effective interactions during preterm infants' hospitalization and after their discharge, which is used in order to increase parents' empowerment and information in taking care of these infants. In a research, which (2012), access to video instructions is necessary at home as a

support for parents after infant's discharge. Furthermore, studies showed that these instructions are effective in decreasing parents' stress, depression, anxiety and anger [48].

Tooten et al (2012) also presented a method known as VIG (Video Interaction Guidance) for increase of mother and infant interest that achieved positive results. Result from this research demonstrated decrease of parents' psychological problems such as; stress, depression, anxiety, anger, disappointment and increase of their confidence [18].

## Conclusion

Implementation of nursing interventions for parents' participation and increase of their empowerment in taking care of the preterm infant leads to increase of mother-infant interaction and interest, increase of parents' confidence in taking care of the preterm infant, decrease of psychological problems (depression, fear, anxiety, anger, etc.) and increase of breastfeeding skill. Therefore, it is recommended to start educational programs for parents, who have a preterm infant at the time of hospitalization and to continue it until relative independence of the parents.

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