Original Article

Comparing the Effect of Premature Infant Care Training and Performing Auriculotherapy Techniques on Anxiety, General Self-Efficacy and Breastfeeding Self-Efficacy of Mothers with Premature Infants

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Abstract

Background: A preterm birth exposes the mother to many challenges in caring for and supporting the baby. This study aims to use training and auriculotherapy techniques as two simple methods to reduce anxiety and increase the mother's self-efficacy. **Materials and Methods:** This single-blind three-group clinical trial study was conducted in the Bahar Hospital in Shahroud, Iran, in 2019**.** The target group of primiparous mothers was premature infants. For the first group, premature infant care training was provided, and for the second group, auriculotherapy techniques were performed, and the third group (the control group) received routine care. Anxiety, general self-efficacy, and maternal breastfeeding self-efficacy were measured at the beginning of the study and before neonatal discharge. **Results:** Before the intervention, three groups were not significantly different in demographic characteristics, obvious and hidden anxiety scores, and general self-efficacy and lactation ($p > 0.05$). There was a significant difference between the control group and the two intervention groups with ANOVA test for self-efficacy ($F_{2,87} = 6.60$, $p = 0.002$), breastfeeding self-efficacy ($F_{2,87} = 15.20$, $p < 0.001$), obvious anxiety ($F_{2,87} = 56.20$, $p < 0.001$), hidden anxiety ($F_{2,87} = 62.90$, $p < 0.001$), after the intervention. In addition, there was no significant difference in the length of hospital stay in the neonatal intensive care unit ($p = 0.732$). Still, the neonate's infant's mean weight before discharge in the two intervention groups was significantly different from the control group ($p = 0.034$). **Conclusions:** Teaching mothers how to care for premature infants and implement auriculotherapy techniques reduces anxiety and increases mothers' general self-efficacy and breastfeeding.

Keywords: *Anxiety, auriculotherapy, breast feeding, premature birth, self efficacy*

Introduction

The birth before the entire 37th week of pregnancy is called preterm birth. Premature births account for roughly 8% of total births in developed countries and 25% in developing countries.[1] In Iran, about 12% of deliveries are premature.[2] Preterm birth is associated with 75% of perinatal death and accounts for 50% of the cause of long-term morbidity.[3] Dealing with a preterm infant as an emotional crisis can create a stressful situation in mothers' lives and have a long-term impact.[4] Mothers with premature infants have less self-efficacy than those who perform their parental duties. Therefore, the foundation of the capacity and ability to continue the life and interaction of the premature baby with the family and society depends on parents' reactions and positive interaction between mother and premature baby.[4]

Also, for preterm mother–infant dyads Breastfeeding challenges are expected. For example, Barriers to breastfeeding initiation, the development and maintenance of an appropriate milk supply, and the transition from tube feeding to at-breast feeding are all things to consider.[5]

The results of some studies have shown that the implementation of the empowerment program for mothers through the training of premature infant care skills such as teaching the correct breastfeeding positions, sucking exercises, how to give medicine, touch, massage, etc., leads to increasing self-efficacy of mothers in the field taking care of your baby as well as reducing complications and physical injuries to these babies[5,6]

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All medications need to be prescribed by a physician to reduce anxiety, while non-pharmacological methods often have fewer side effects. These methods are inexpensive and usually easy to use, and patients can quickly implement and adapt to these complementary therapies.[6] Auriculotherapy is a health care modality whereby the external surface of the ear or auricle is stimulated to alleviate pathological conditions in order parts of the body.[7] The discovery of this therapy is partially based on the ancient Chinese practice of body acupuncture.[8] It is believed that the outer part of the ear, that is, the auricle, is a view of all anatomical components of the body and different parts of the brain, spinal cord, and central and peripheral nerves and, like acupuncture, is effective in modulating and improving the function of all body organs.[9] This technique has been used to treat obesity, menstrual bleeding, pain relief, and many other types of problems and diseases. The results of a systematic review have shown the positive effects of auriculotherapy techniques on improving breastfeeding status.[10] Another research has pointed to the effectiveness of this method in reducing breastfeeding mothers.[11] This technique has also been used to reduce maternal anxiety during labor pain has also shown that it effectively reduces maternal anxiety and fatigue after the cesarean section.[12]

Since previous studies have not evaluated and compared the effectiveness of care training and performing auriculotherapy techniques on anxiety, general self-efficacy, and breastfeeding self-efficacy of mothers with premature infants, the present study was conducted to perform and compare these methods.

Materials and Methods

This single-blind three-group clinical trial study was conducted in the Bahar Hospital in Shahroud, Iran, in 2019 (IRCT20180108038265N2).The research community included all primiparous mothers with premature infants admitted to the Neonatal Intensive Care Unit (NICU) of Bahar Hospital in Shahroud. To determine the sample size based on the results of Shiouko's study[13] and According to the formula for comparing two averages to measure the anxiety score, with 80% test power and 95% confidence and considering the drop, 30 people were assigned in each group.

Inclusion criteria for infants included the gestational age between 28 and 36 weeks, stable vital signs at the beginning of the intervention without any specific abnormalities or severe respiratory problems that do not remove from incubator care, and not being twins or more. Mothers' inclusion criteria included informed consent, primigravida, speaking Persian, the lowest literacy level, no mental diseases, and no psychiatric medications. In addition, mothers were excluded from the study if they refused to continue attending the meetings, and infants were excluded if, for any reason, the treating physician did not allow the mother to participate in the care of the infant. For sampling, the individuals were entered into the study using pre-determined random allocation sequences under the website and a statistician's supervision in the form of six blocks. Therefore, 90 mothers were recruited for the study; 30 people were in the control group, 30 in the training group, and 30 in the auriculotherapy group [Figure 1].

In the education group (first intervention group), During four 1-hour sessions, the researcher talked to the mother's group for the first possible time after hospitalization of the infant and stabilizing the condition of the mother and infant about the cause of infant's hospitalization, ways to prevent infections, how to change the position of the premature infant, how to breastfeed with breast or gastric tube, how to maintain body temperature, how to bathe and change diapers, how to disinfect hands, etc. At the end of the session, the topics were presented to the mothers in pamphlets. Thus, data were collected in two periods of time, the first time after hospitalization of the infants in NICU and before starting the training sessions and for the second time after completing the training and before the hospital's discharge. The second group included auriculotherapy performed on the mother and began when both baby and mother were stabilized. The name of these points is Shanman which is used to miscle relaxation, reduce tention, and anxiety. Using a pointer pen, the researcher first rotated the pressure on these points in the right ear for 60 seconds at each location (a total of 4 turns for 4 minutes). Then he did the same in the opposite ear. This intervention was performed 12 times (twice a day). Thus, data were collected in two time periods, the first time before the intervention and the second time after the intervention at the time of discharging the baby with the relevant tools. The third group was the control group, with members receiving routine care in the NICU. This group's questionnaires were completed by mothers once at the beginning of the neonatal hospitalization and the second time before their discharge by this group's mothers.

To collect data from demographic information questionnaires (including age, education, place of residence, maternal occupation, and information related to pregnancy and childbirth such as the history of miscarriage or stillbirth, premature rupture of membranes, and also complications such as gestational hypertension, preeclampsia, or gestational diabetes in current pregnancy and fetal distress, placental abruption in the current pregnancy). The State-Trait Anxiety Inventory (STAI) is a widely used measure of trait and state anxiety.[14] It can be used in clinical settings to treat anxiety and measure caregiver distress in studies. This questionnaire has 40 questions, 20 of them evaluate situational anxiety, and the 20 assess personality anxiety. Each of the two scales of situational and personality anxiety is given a score between 20 and 80.[14] Spielberger.[15] state anxiety scale, the stability coefficients range from 0.16-0.62, which are relatively low figures because a valid measure of the State anxiety scale should reflect the influence of unique situational factors that may exist at the time of testing.[15]

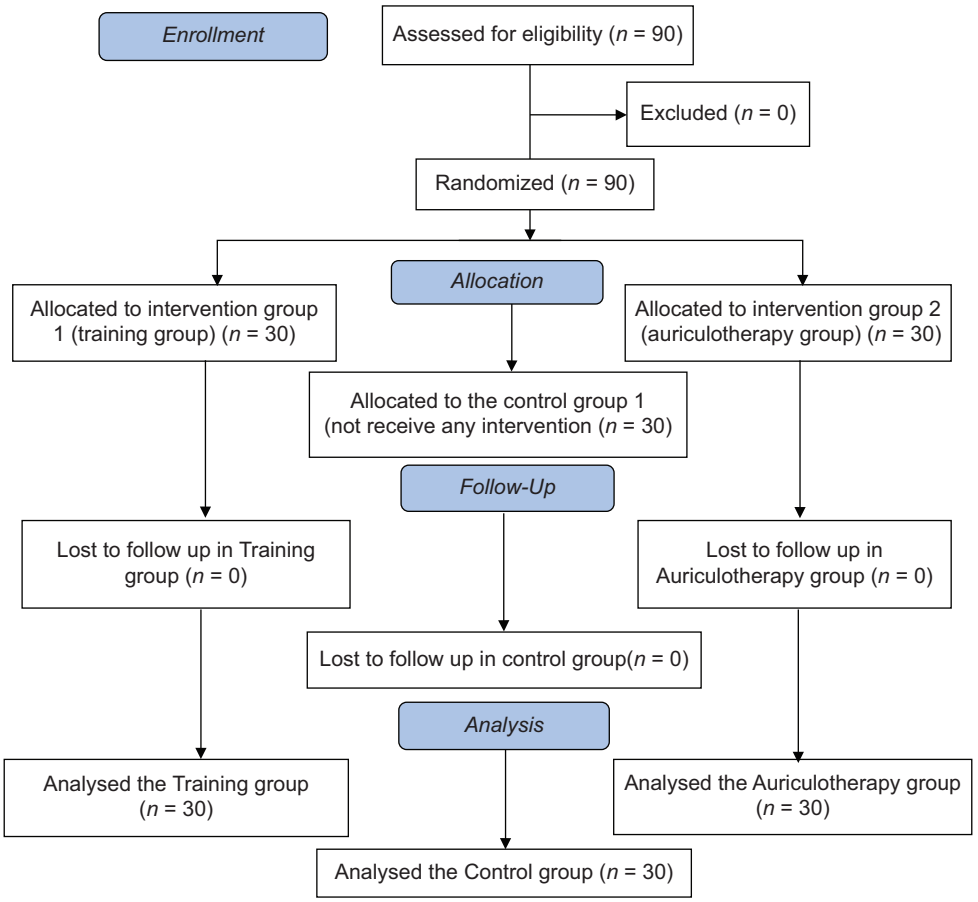

Figure 1: Study flow diagram

The correlation between the inventory and clinical specialist assessment also showed appropriate validity.[16] The reliability of the Iranian form of the inventory was Cronbach's alpha 0.88[17] in the Sahranavard study. In the current study, the reliability of this scale was obtained using Cronbach's alpha coefficient (α = 0.86). Sherer and Madox designed the Generalized Self Efficacy (GSE) scale in 1982. It consisted of 23 items; 17 are related to general self-efficacy, while the remaining six are in a social situation. The present study used the 17-item GSE scale, containing 17 five-point items ranging from totally accepted to absolutely disagree. In this questionnaire, a point from 1 to 5 is allocated to each item. But the scores of the 1, 3, 8, 9, 13, and 15 are increased from left to right, while those of the remaining items are increased from right to left. Overall, the minimum and maximum scores are 17 and 85, respectively.[18] Sherer and Adams[19] reported a Cronbach's alpha of 0.86 for this questionnaire. Also, Beirami conducted a study, and in this research, the questionnaire's reliability was reported at 0.80.[20] In the current study, the reliability of the GSE scale was 0.81. Besides, the concurrent administration of symptom checklist-90 revised was 0.45.[21]

To evaluate mothers breastfeeding self-efficacy levels, a short form of lactation self-efficacy scale was used, and it was designed in 1991 by Dennis based on Bandura's self-efficacy theory.[22] The short form of the Breast Self-Efficacy Scale consists of 14 questions, all of which begin with the prefix "I can always," and the answer to these questions is based on the Likert scale. The range of scores is between 14 and 70, with the highest score indicating the highest breastfeeding self-efficacy level. Therefore, the higher the grade point average is, the higher the breastfeeding self-efficacy would be. Conversely, the lower the grade point average is, the lower the breastfeeding self-efficacy would be. The validity of this scale was assessed using factor analysis. This questionnaire was validated and reliable in Iran by Marzieh Araban *et al*. In 2014, Cronbach's alpha coefficient for the BES was 0.83.[23] In the current study, the reliability of the BES scale was obtained using Cronbach's alpha coefficient (α = 0.86).

Data were analyzed using SPSS software version 24. Values are expressed as Mean) SD (or percentage. The Chi-Square test was used to describe the abundance of data, and the t-pair test was used to compare the data. The mean scores are different in groups; a two-way analysis of variance with repeated measurements was used. A p value of less than 0.05 was considered significant.

Ethical considerations

The aims of the study were explained to the participants. Then, the mothers' informed consent form was presented

after explaining the study's aims and methods to sign and approve it. (IR.SHMU.REC.1397.122).

Results

The statistical test results show no significant statistical differences between the three groups' demographic characteristics, and the studied groups are statistically homogeneous [Tables 1 and 2]. The ANOVA test showed that there was a statistically significant difference between the mean of general self-efficacy score ($F_{2,87}$ = 6.60, p = 0.002), breastfeeding self-efficacy score ($F_{2,87}$ = 15.20, p < 0.001), apparent anxiety score ($F_{2,87}$ = 56.20, p < 0.001), and hidden anxiety score ($F_{2,87}$ = 62.9, p < 0.001), after the intervention in the three groups and

Table 1: Frequency distribution of mothers according to demographic characteristics in three groups, *n*=30

Variables	Groups			*p* (Chi-square)
	Control Group *n* (%)	Training Group *n* (%)	Auriculotherapy Group *n* (%)	
Education				
High school	8 (26.66)	10 (33.33)	7 (23.33)	0.853
Diploma	10 (33.33)	7 (23.36)	12 (40)	
bachelor's degree	10 (33.33)	11 (36.77)	8 (26.66)	
Master of science, MD*.PhD**	2 (6.66)	2 (6.66)	3 (10)	
Habitation				
City	18 (60)	20 (66.66)	14 (46.66)	0.279
Rural area	12 (40)	10 (33.33)	16 (53.33)	
Occupation				
Unemployed	20 (66.66)	20 (66.66)	21 (70)	0.891
Employed	8 (26.66)	7 (23.36)	8 (26.66)	
Student	2 (6.66)	3 (10)	1 (3.33)	
Abortion history				
Yes	6 (20)	7 (23.36)	8 (26.66)	0.830
No	24 (80)	23 (76.66)	22 (73.33)	
Preterm Premature Rupture of the Membranes (PPROM)				
Yes	10 (33.33)	9 (30)	8 (26.66)	0.853
No	20 (66.66)	21 (70)	22 (73.33)	
Preeclampsia				
Yes	4 (13.33)	3 (10)	7 (23.33)	0.333
No	26 (86.66)	23 (90)	23 (76.66)	
Fetal distress				
Yes	5 (16.66)	5 (16.66)	3 (10)	0.698
No	25 (83.33)	25 (83.33)	27 (90)	
placental abruption (decolman)				
Yes	2 (6.66)	3 (10)	0 (0)	0.227
No	28 (93.33)	27 (90)	30 (100)	
Bleeding				
Yes	4 (13.33)	5 (16.66)	5 (16.66)	0.919
No	26 (86.66)	25 (83.33)	25 (83.33)	
gestational diabetes				
Yes	5 (16.66)	5 (16.66)	6 (20)	0.927
No	25 (83.33)	25 (83.33)	24 (80)	
Type of delivery				
NVD***	19 (63.33)	20 (66.66)	21 (70)	0.861
C/S****	11 (36.66)	10 (33.33)	9 (30)	
Neonatal resuscitation (number and stage)				
No need to revive	2 (6.66)	3 (10)	1 (3.33)	0.500
1. Heating and mechanical stimulation	5 (16.66)	5 (16.66)	4 (13.33)	
2. Positive pressure ventilation	7 (23.33)	13 (43.33)	14 (46.66)	
3. NG***** tube and mask	10 (33.33)	6 (20)	8 (26.66)	
4. Heart massage	5 (16.66)	1 (3.33)	3 (10)	
5. Epinephrine injection	1 (3.33)	2 (6.66)	0 (0)	

*Medicine Doctor. ** Philosophiae Doctor. ***Normal Vaginal Delivery. ****Caesarean Section. *****Nasogastric Tube

Table 2: Mean and standard deviation of maternal demographic characteristics in three groups

Variables	Groups			*p* (ANOVA)
	Control G Mean (SD)	Training G Mean (SD)	Auriculotherapy G Mean (SD)	
Age (year)	25.70 (6.66)	25.53 (6.81)	26.70 (6.65)	0.768
Gestational age (w)	31.50 (2.17)	32.20 (2.38)	30.97 (2.06)	0.102
Birth Weight (g)	1380 (343.09)	1552.33 (444.73)	1340.33 (308.81)	0.067
Infant weight when discharged from hospital (g)	1772.67 (216.89)	1945 (315.58)	1858 (209.16)	0.034
length of hospitalization	22.57 (13.78)	20.07 (12.98)	21.83 (10.80)	0.732
The average length of hospital stay in the neonatal ward (day)	10.53 (3.81)	9.70 (2.97)	10.37 (2.61)	0.563

Table 3: Evaluation and comparison of the measured variables' mean before and after the intervention in the three groups of control, training, and auriculotherapy

Variables	Groups			*p* (ANOVA)	*F* (2.87)
	Control Group Mean (SD)	Training Group Mean (SD)	Auriculotherapy Group Mean (SD)		
General self-efficacy					
Before the intervention	54.07 (12.90)	54.00 (13.66)	54.93 (14.50)	0.34	1.06
After the intervention	48.93 (12.98)	59.83 (11.14)	58.57 (13.85)	0.002	6.60
Breastfeeding self-efficacy					
Before the intervention	45.07 (11.04)	46.60 (11.69)	43.00 (9.69)	0.438	0.83
After the intervention	41.47 (10.69)	53.97 (8.35)	48.70 (6.99)	<0.001	15.20
Obvious anxiety					
Before the intervention	56.23 (10.69)	49.70 (15.52)	52.60 (12.91)	0.164	1.84
After the intervention	57.47 (10.86)	30.83 (10.69)	31.17 (11.90)	<0.001	56.20
Hidden Anxiety					
Before the intervention	55.93 (8.10)	51.67 (11.91)	52.60 (11.60)	0.271	1.30
After the intervention	57.65 (9.19)	31.60 (10.32)	34.37 (12.09)	<0.001	62.90

this difference was based on the Toki test done between the control group with training and the control group with auriculotherapy ($p < 0.001$) [Table 3].

Discussion

This study showed that implementing a participatory educational program in premature infants' care and implementing auriculotherapy techniques for mothers reduces their anxiety levels and increases their general self-efficacy and breastfeeding levels compared to the control group.

A study found a positive effect of mothers' empowerment programs on caring for premature infants, reducing anxiety levels, and increasing their willingness to participate in care. Like the present study, it has targeted and valuable educational content.[24] The quality of care for a premature baby depends on the mother's understanding of her ability to do. In addition, mothers of premature infants become self-confident when they can provide proper care for their children.[25] The Ingram study results show that implementing educational programs based on the family-centered educational package with parents' participation increases mothers' self-efficacy scores.[26]

Contrary to the results of the present study, although in the study of Karbandi *et al*.,[27] the implementation of the training program has reduced the average length of hospitalization of these infants, there was no significant difference between the intervention and control group in the rate of subsequent complications and rehospitalization of infants. This difference could be that there was no face-to-face and direct training in their study, and the content was provided to mothers only in the form of a booklet.

A study has confirmed the effect of teaching proper breastfeeding strategies on increasing breastfeeding mothers' self-efficacy and the continuation of successful exclusive breastfeeding in mature and premature infants.[28] However, the results of Niela's study, which has used indirect internet counseling to help to breastfeed premature infants, did not show a significant difference in the level of satisfaction and success of breastfeeding mothers between the two intervention and control groups, which shows the fact that direct and face-to-face training can lead to tremendous success in this area.[29]

In a Cuban study, researchers evaluated the use of auriculotherapy on women's anxiety awaiting an abortion curettage. The sample consisted of 48 women, and the Shenmen, heart, and anxiolytic pressure points were stimulated with thistle seeds.[30] In their studies, Kuo *et al*.[13] also stated that using auriculotherapy techniques

reduces mothers' level of anxiety and fatigue after cesarean section, both of which are consistent with our study.

However, in his study, Blake did not consider the effect of auriculotherapy on patients' anxiety levels with addiction to improve them.[31] This discrepancy between the present study and this study could be due to differences in target groups. Be different because, in Black research, the study group was exposed to severe psychological and physical harm due to psychotropic substances.

The results of a systematic review have shown that the use of auriculotherapy techniques in breastfeeding success is quite effective in increasing breast milk volume and increasing maternal self-efficacy in breastfeeding between the term births.[10] This result can be achieved both directly and following the reduction of stress and anxiety levels of mothers. In the present study, these results have been obtained. However, one of the limitations of this study was the easy and timely access to infants as part of the study sample due to health issues about them. To reduce the effects of this problem, the permission of the treating physician was obtained before any intervention, and the participation of mothers in the care of infants was done under the supervision of nurses.

Conclusion

Teaching premature infant care techniques and using auriculotherapy are two non-invasive and effective ways to reduce mothers' anxiety with premature infants. The educational method reduces anxiety due to interaction with the mother and her needs and questions on caring for the infant. The auriculotherapy method reduces anxiety by releasing endorphins in the body. Following the reduction of anxiety levels, mothers gain more ability to learn and implement the necessary care measures that automatically cause their self-efficacy and self-confidence to increase in this regard as well.

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Conflicts of interest

Nothing to declare.

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