

## Original Article



# The Effect of Problem-Solving-Approach-Based Counselling on Maternal Role Adaptation in Women with Late Preterm Infant: A Randomized Controlled Trial

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**Abstract****Introduction:** Mothers with preterm infants experience numerous stressful problems which can have negative effects on maternal role adaptation. This study aimed to investigate the effectiveness of consultation using a problem-solving approach on adaptation to the maternal role in women with late preterm infants.**Methods:** This randomized controlled trial (RCT) was carried out on 80 women with spontaneous late preterm infants recruited at Ayatollah Mousavi Hospital of Zanjan. Using convenience sampling method, the participants were assigned into two groups of intervention and control according to block design. Taking a problem-solving approach, counselling was carried out individually in four sessions. The control group received only routine care. The data were collected using adaptation to maternal role questionnaire including 33 items based on a five-point Likert scale ranging in seven areas, in two steps (before counselling and one month after the last counselling session). Data analysis was performed using the SPSS ver. 16.0 software (SPSS, Inc., Chicago, IL).**Results:** The total score of adaptations to maternal role and its areas was significantly higher in the intervention group after the follow-up period.**Conclusion:** A comprehensive counselling including various dimensions of maternity adaptation had a positive effect on improving the adaptation to maternal role in mothers with late preterm infants.**Introduction**

Preterm birth experience is often recognized as a traumatic condition and a source of distress for the parents.<sup>1</sup> Mothers of preterm infants have more worries about their infant's attachment, health, growth, care, and feeding than the mothers of term infants.<sup>2</sup> The severity of psychological distress postpartum may be related to the severity of the infant's illness.<sup>3</sup> Obviously, mothers of early preterm infants' report marked emotional distress than mothers of late preterm infants.<sup>1</sup> The maternal emotional responses may affect the parenting role at least during the first few years of life.<sup>1,4</sup> According to Mercer's theory of maternal role attainment, mothers with full-term infants may spend several weeks to learn and know about their newborns before they feel confident and skilled in the maternal role.<sup>5</sup> The mother with a preterm infant may have difficulty in the parenting role after discharge due to the interruption

of normal pregnancy, loss of the pleasure of parenting a healthy infant, long hospitalization, and limited parenting role in the neonatal intensive care unit (NICU). This feeling delays the attainment of the maternal role.<sup>6</sup> Lack of adequate accountability for infant mental development, nutrition, and physical care are other potential stressors for these parents.<sup>7</sup> Infant health problems, including sucking, jaundice, sleep disturbances, abdominal bloating, ocular infections and cord<sup>8</sup> can be associated with adverse effects on maternal compliance.

However, motherhood is one of the most pleasurable events that a mother may experience during her lifespan.<sup>9</sup> It is understood that transition to motherhood can be a stressful situation for mothers and it requires coping with challenges and changes.<sup>5</sup> Adaptation to the maternal role includes a series of maternal feelings and behaviors through which the maternal responsibilities are achieved

and the mother enjoys interacting with her child.<sup>5,10</sup> A lack of adaptation to the maternal role reduces maternal skills in taking care of the infant and interrupts the duties of motherhood. Moreover, it can result in impaired mother-infant attachments and interactions.<sup>11</sup> The mother's socioeconomic status, her physical and psychological health, the quality of relationship with her partner, various available social supports, the preparations during pregnancy, the experiences of childbirth, and the infant's health are factors that affect the attainment of the maternal role.<sup>10,12-14</sup>

In relation to motherhood, Ozkan & Polat showed that maternal identity development education improved the self-confidence of the primiparas to develop successful motherhood behaviors and interaction with their infants.<sup>9</sup> Halford et al., showed that a maternal parenting educational program could enhance couple communication and mothers' adjustment to parenthood.<sup>13</sup> Some research has focused on mothers with preterm infants. In a review study, it was observed that early behavioral and educational interventions reduced the maternal symptoms of anxiety and parenting stress following a preterm birth.<sup>15</sup> The effectiveness of empowerment programs on self-efficacy of parents with preterm infants was investigated by Liu et al., in Taiwan. They demonstrated that the intervention group had significantly higher scores on self-efficacy than the control group.<sup>16</sup> Korukcu and Kukulcu showed that a mindfulness-based transition to motherhood program could improve the level of maternal attachment and level of competence in the role of motherhood.<sup>17</sup> However, in a contradictory study, Sercekus & Mete in Turkey reported that although prepregnancy education based on Roy's adaptation model improved maternal adaptation during pregnancy, it had no effect on the maternal postpartum adaptation.<sup>18</sup> According to Roy's model, adaptation is realized when an individual continuously changes and interacts with environmental stimuli.<sup>19</sup> In the studies mentioned above, various supportive methods were conducted to evaluate the effect of these on mothers' adaptation to the roles, but most studies focus on a single dimension of maternal roles and there are conflicting results in this regard. For example, self-efficacy, interaction with their infants, parenting stress, and couple communication was considered but emotional-social development was not. Moreover, there is insufficient evidence concerning the applicability of structured postnatal education programs, using specific adaptations to the maternal role in mothers with preterm infants, especially in the Iranian culture.

One of the practical counseling techniques mainly focuses on promoting individuals' adaptation in high-pressure situations is the problem-solving approach. Although the application and effectiveness of this approach are reported in adaptation with postpartum depression,<sup>20</sup> its application in adaptation to the maternal role, particularly in mothers with late preterm infants,

has not been investigated. Problem-solving counseling is one of the cognitive-behavioral approaches that provides a potential response to stressful situations and increases the probability of selecting the most effective strategy among various strategies. This approach mostly focuses on education, perception, and competence of individuals to help them effectively deal with stress, improve the performance of the individuals for adaptation, and thus promote their quality of life.<sup>21</sup>

Adaptation to the maternal role is a multidimensional concept affected by cultural issues.<sup>18</sup> Additionally, there are conflicting results in this regard and no postnatal specialized package is routinely provided for mothers with preterm infants in Iran. Therefore, the current study aimed at investigating the effect of consultation, using a problem-solving approach on adaptation to the maternal role in mothers with preterm infants.

### Materials and Methods

The current randomized controlled trial was conducted on 80 mothers with spontaneous late preterm childbirth (34-36weeks). The study data were collected from June to February 2016. Most preterm childbirths are referred to Ayatollah Mousavi Hospital of Zanjan since it is equipped with advanced facilities of special care for newborns. This study was approved by the Ethics Committee of the Vice Chancellor for Research of Zanjan University of Medical Sciences, Iran, with the approval number ZUMS.REC.1396.22. The study was registered at the Iranian Registry of Clinical Trials under the number IRCT20150731023423N11.

The sample size was calculated 36 women in each group, according to the similar study.<sup>22</sup> In view of an attrition rate of 10%,<sup>23</sup> a minimum of 40 participants were required for each group of the study ( $s_1 = 4.598$ ,  $s_2 = 5.526$ ,  $\mu_1 = 39.26$ ,  $\mu_2 = 35.91$ ,  $\alpha = 0.05$  and Power = 0.8).

The eligible mothers were recruited within 24 hours of delivery and the ones that gave informed consent were included in the study. The inclusion criteria were being healthy, literate, married female cases that had spontaneous late preterm infants (34-36weeks), and lived in Zanjan. Mothers were excluded from the study if: 1) they had a history of medical/obstetric complication before or 24 hours after childbirth; 2) they had a score of more than 13 on Edinburgh Depression Scale; 3) their infants were admitted to the NIUC within 24 hours of birth; 4) they had infants with any congenital abnormalities, multiple pregnancies, fetal distress, and intrauterine growth retardation; 5) they had mother/infant breastfeeding contraindication; 7) they had no access to a telephone to be followed up. By limiting the study sample to mothers with spontaneous preterm labor who were eligible to participate in the study, the primiparous and multiparous mothers were selected for the study.

Convenience sampling method was employed to select 80 eligible mothers who were allocated into two groups

(intervention and control) according to the block design. In this way, 6 possible blocks were assigned to groups A (intervention) and B (control) and assigned to blocks according to the arrangement of individuals. Then, the number of blocks was selected from the random number table until the study sample size was reached. The size of the blocks was four. To ensure the concealment of the sequence of enrolment, we used the sequentially numbered, opaque sealed envelopes (SNOSE).<sup>24</sup>

Counseling was conducted individually in four sessions (45-60 minutes each). The first session was held 24 hours after delivery before discharge from the hospital, and the other sessions were held once a week, (for three weeks) following the discharge at the breastfeeding clinic of Ayatollah Mousavi Hospital in Zanjan, Iran. The consultation sessions were held individually at the breastfeeding clinic of Ayatollah Mousavi Hospital since it had a private counseling room. Additionally, the intervention group received routine care including the control of bleeding, control of vital signs, breastfeeding, and infant clinical examination to determine the need for admission to the NICU during hospitalization. The control group only received routine care in Iran, similar to many other countries, childbirth education programs are taken as physical health issues rather than psychological problems and parenting. No subject in her

routine programs receives education related to adaptation to the maternal role. All participants were followed up for one month after the last session of consultation. The counseling sessions were conducted by one of the researchers who had passed a course on problem-solving counseling at Zanjan University of Medical Sciences. Then, a maternal role adaptation program was developed by the researchers.

The outcome of the study was the maternal role adaptation determined through using a specific maternal adaptation questionnaire<sup>25</sup> in two phases before and one month after the last session of consultation. The details of the administered method are shown in the flow diagram (Figure 1).

The content of the counseling sessions was designed after reviewing the studies and experiences of experts in this field, considering the multidimensional areas of maternal role adaptation and according to a study by Javadifar.<sup>25</sup> In brief, the sessions concerned family support and consolidation, difficulties and dissatisfactions, attachment to the infant, worries and anxieties, performance, effective development, and social adaptation development. The sessions were held according to the five-step problem-solving process including defining the problem, generating alternative solutions, evaluating and selecting an alternative, implementing and following the

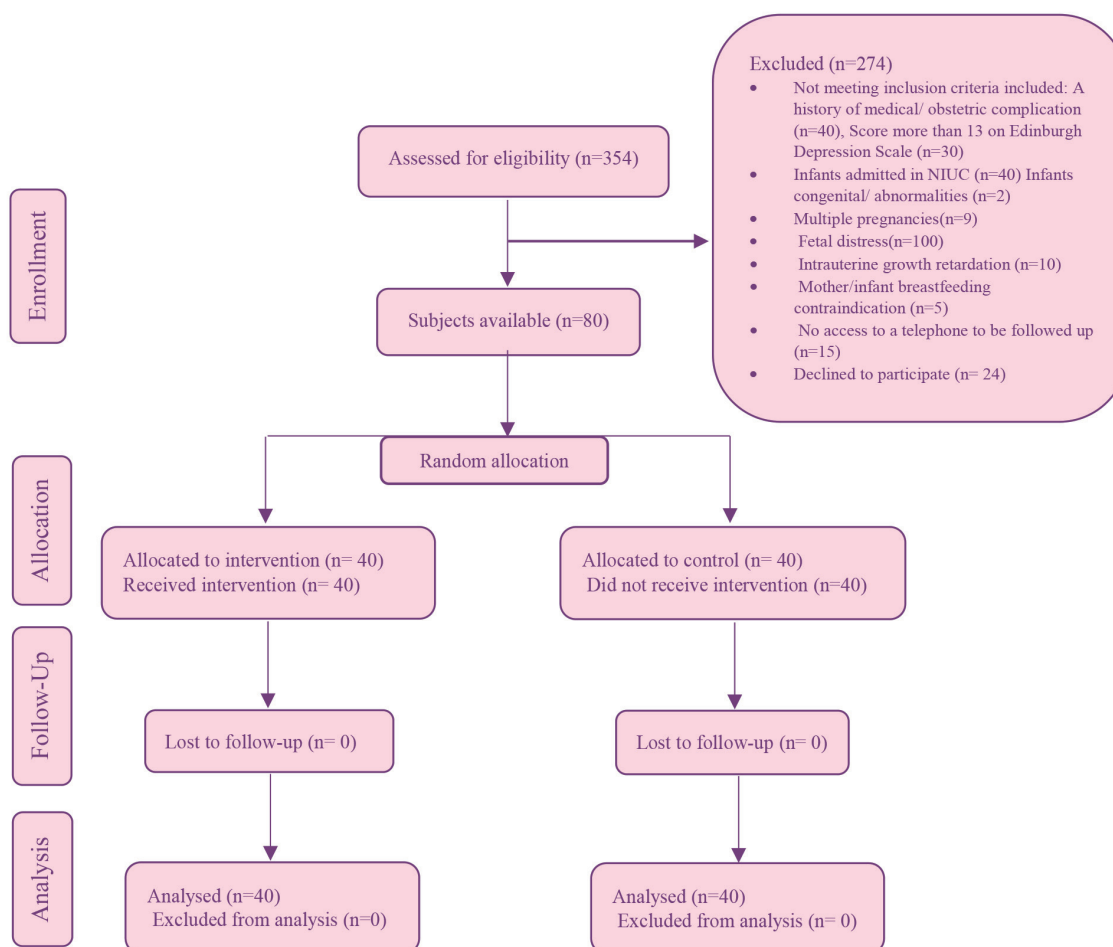


Figure 1. Consort flow diagram

solution, and assessing the results. The goal of problem-solving counseling was to increase the mothers' ability to clearly define their current problems and teach them a specific problem-solving procedure in an attempt to solve their problems in a structured manner. Each counseling session included a progress update, topic discussion, and goal setting. The details related to counselling content were presented as follow.

The first session: a- Improve the performance by enhancing the skills and knowledge of the preterm infant caring (How to hug a baby - hygiene and bathing - taking care of cold or heat - caring for the umbilical cord - vaccination - growth and development - lactation and breast care - sleep and Baby Waking - Hypothyroid, Phenylketonuria Screening Tests - Hearing and Vision test -prescription of Drop Vitamin A,D - Pattern of Neonatal urination and defecation - Causes of Newborn Crying), b- Strengthening attachment to the child (Kangaroo-mother care - baby massage). The second session: a- Reducing concern /anxiety (Stress management - Relaxation exercises- Practicing active listening skills, encouraging women to express the feeling about maternal roles), b- Reducing the hardship and dissatisfaction (Attracting spouses' partnerships in the maintenance of the baby and home work- enhancing the skills and knowledge of the preterm infant caring). The third session: a- Emotional development (Preparing the mother take maternity responsibilities). The fourth session: a- Support -consolidation of the couple's relationship (Enriching married relationships - Promoting marital relationships - Encouraging spouses to express their feelings and expectations - Increase marital satisfaction and intimacy), b- Adaptation and social development (Encouraging the acceptance of the role as a mother or a wife - Encouraging to return to community and occupation).

Data collection tools included a demographic questionnaire, an adaptation to maternal role questionnaire, and the Edinburgh Postpartum Depression Scale (EPDS).

Personal information consisted of age, education level, occupational status, number of pregnancies, delivery method, and breast feeding.

The adaptation to maternal role questionnaire, including 33 items on a five-point Likert scale ranging from strongly agree to strongly disagree in seven areas, was developed and psychometrically evaluated by Javadifar.<sup>25</sup> The seven areas of the questionnaire are support and consolidation of the couple's relationship, hardship and dissatisfaction, attachment to the child, concern and anxiety, emotional development, performance and adaptation, and social development. The two areas of worry-anxiety and difficulty-dissatisfaction were reversely scored. As a result, the minimum and maximum scores were 33 and 165, respectively. An overall score is obtained from the sum of the scores of all items. A high score indicates that maternal role adaptation is high. The content validity

index and reliability of the questionnaires were 0.95 and Cronbach alpha = 0.76, respectively.<sup>25</sup>

In this study, the reliability of the questionnaire was confirmed by calculating the Cronbach's alpha coefficient showing a value of 0.81 for the total scale. The coefficients for each of the areas were as follows: support and consolidation of the couple's relationship 0.77, attachment to the child 0.80, concern and anxiety 0.80, performance 0.76, emotional development 0.79, adaptation and social development 0.77, and hardship and dissatisfaction 0.77. The adaptation to maternal role questionnaire was completed by the participants in two phases (pre-intervention and one month after the last session of consultation).

The scale was developed by Cox et al.<sup>26</sup> The Persian version of the questionnaire was examined by Montazeri et al.<sup>27</sup> The questionnaire consists of 10 items. Each item is scored from 0 to 3 [often yes (3scores) to not at all (0scores)]. The participants with a score of  $\geq 13$  was excluded from the study. The Edinburgh Postpartum Depression Scale was completed by the participants after accepting to participate in the study and the obtained scores were used to determine an exclusion criterion.

The statistical analysis was performed using the SPSS ver. 16.0 software (SPSS, Inc., Chicago, IL). Descriptive statistics were employed to describe the demographic data and the chi-square test was used to compare the demographic characteristics between the two groups. The Kolmogorov-Smirnov test revealed that the scores of the adaptation to maternal role questionnaire and its areas did not have normal distributions. Therefore, the Mann-Whitney test was applied in pre- and post-intervention to compare the scores between the two groups. Moreover, the Wilcoxon test was used to compare the scores within the groups. The level of significance was 0.05 ( $P < 0.05$ ) for the current study.

The confounding variables (education and gravida) were adjusted, using Univariate covariance test. Our data did not have a normal distribution in the uni-variate test; therefore, the most extreme values were checked for being an outlier. The score scale was changed by taking the square root so that the distribution looks like a normal distribution.

## Results

The mean (SD) age of the mothers in the intervention and control groups was 30.62 (5.20) and 30.10 (6.51), respectively. According to Table 1, age, delivery method, and breast-feeding status had no statistically significant differences between the two groups ( $P \geq 0.05$ ). However, occupation status ( $P = 0.01$ ), education ( $P = 0.01$ ), and the number of pregnancies ( $P = 0.01$ ) had statistically significant differences; the majority of the participants in the intervention and control groups had academic and high school education, respectively. With respect to occupation, the highest percentage in the two groups

belonged to housewives; and in terms of the number of pregnancies, the highest percentage was related to multiparous in the two groups (Table 1).

The mean (SD) score of Edinburgh test in the intervention and control groups was 10.82 (1.56) and 10.80 (1.68), respectively the comparison of Edinburgh test scores between the two groups was not statistically significant ( $P=0.09$ ).

The Mann-Whitney test results showed that the total scores of adaptations to maternal role and its areas were significantly higher in the intervention group than in the control group after the follow-up period ( $P<0.001$ ); the intervention caused an increase in the total score of maternal adaptation and its areas; however, there were no significant differences between the two groups in pretest ( $P\geq 0.05$ ). The score of the hardship and dissatisfaction area was significantly higher in the intervention group than in the control group after the follow-up period. Positively, counseling decreased the hardship and dissatisfaction in the intervention group. Obviously, in the control group, the total scores of adaptations to maternal role and the areas of "support and consolidation of the couple's relationships" and "adaptation and social development" worsened. After adjusting the confounding variables (education and gravida), using Univariate covariance test, the differences between two groups were found to be statistically significant (Table 1).

The comparison of pre- and post-intervention scores based on Wilcoxon test results showed that the total scores of adaptations to maternal role and its areas had

statistically significant differences within the intervention group ( $P<0.001$ ). However, the score of the attachment to the infant area had no statistically significant changes ( $P=0.42$ ).

In the control group, based on the Wilcoxon test result, the mean total scores of maternal role adaptation, as well as support and consolidation of the couple's relationship significantly changed; the scores of these two areas worsened ( $P=0.01$ ).

Additionally, in the control group, the comparison of the score of the hardship and dissatisfaction area significantly changed ( $P<0.001$ ); its score decreased and worsened after the follow-up period (Table 2).

## Discussion

The higher level of adaptation to the maternal role in the treatment group in comparison with the control group indicated that problem-solving counseling had a positive impact on adaptation to the maternal role in mothers with late preterm infants. There is limited information regarding the effectiveness of problem-solving counseling in adaptation to the maternal role on mothers with the term or preterm infants. The current study results were consistent with those of the studies that used different procedures to educate mothers; for example, Korukcu et al., showed that the mindfulness-based transition to motherhood program could improve the level of maternal attachment and competence in the role of motherhood in mothers with preterm infants.<sup>17</sup> The current study

**Table 1.** Comparison of participants' characteristics between two groups

Variables	Intervention group (n=40)	Control group (n=40)	Statistical indicators <sup>€</sup>
	N(%)	N(%)	
<b>Mother's Age (year)</b>			
15-24	6 (40)	9 (60)	P = 0.60
25-34	26 (54.2)	22 (45.8)	
35-45	8 (47.1)	9 (52.9)	
<b>Mother's education</b>			
Primary school	2 (18.2)	9 (81.8)	P = 0.01* F = 0.2*
Junior high school	6 (40)	9 (60)	
High school	11 (45.8)	13 (54.2)	
College Graduate	21 (70)	9 (30)	
<b>Mother's occupation</b>			
Housewife	30 (44.1)	38 (55.9)	P = 0.01*
Employed	10 (83.3)	2 (16.7)	
<b>Breastfeeding situation</b>			
Exclusive breastfeeding	35 (48.6)	37 (51.4)	P = 0.59
Powdered milk	3 (75)	1 (25)	
Breastfeeding + powdered milk	2 (50)	2 (50)	
<b>Type of birth</b>			
Vaginal	10 (37)	17 (63)	P = 0.09
Caesarian section	30 (56.6)	23 (43.4)	
<b>Gravida</b>			
Primipara	23 (70.8)	7 (29.2)	P = 0.01* F = 0.5*
Multipara	17 (41.1)	33 (58.9)	

<sup>€</sup>Chi Square Test, <sup>\*</sup>ANCOVA, <sup>\*</sup>Statistically Significant

**Table 2.** The Comparison pretest and posttest scores between two groups

Variable		Control (n=40)	Intervention (n=40)	p <sup>€</sup>
		Median (IQR)	Median (IQR)	
<b>Support and consolidation of the couple's relationship</b>	Pretest	23	23	0.23
	Posttest	21.5	27	<0.001*
	P <sup>¥</sup>	0.01*	<0.001*	
<b>Hardship and dissatisfaction</b>	Pretest	16	25	0.32
	Posttest	19.5	20.5	<0.001*
	P <sup>¥</sup>	0.001*	<0.001*	
<b>Attachment to the child</b>	Pretest	17	17	0.21
	Posttest	17	18	0.01
	P <sup>¥</sup>	0.37	0.42	
<b>Performance</b>	Pretest	12	12.5	0.27
	Posttest	12	16	<0.001*
	P <sup>¥</sup>	0.16	<0.001*	
<b>Emotional development</b>	Pretest	17	17	0.74
	Posttest	17	18	0.001
	P <sup>¥</sup>	0.32	0.009*	
<b>Adaptation and social development</b>	Pretest	15.5	15	0.61
	Posttest	14	18	<0.001*
	P <sup>¥</sup>	0.23	<0.001*	
<b>Concern and anxiety</b>	Pretest	7	7	0.67
	Posttest	7	11.5	<0.001*
	P <sup>¥</sup>	0.62	<0.001*	
<b>Total scores of adaption to maternal role</b>	Pretest	110	113	0.15
	Posttest	102	134	<0.001*
	P <sup>¥</sup>	0.001*	<0.001*	

<sup>€</sup>Mann-whitney test, <sup>¥</sup>Wilcoxon test, <sup>\*</sup>Statistically significant

results emphasized that the problem-solving approach and a mindfulness-based program can improve the adaptation to the maternal role in the postpartum period. In another study, Lui et al., demonstrated that applying an empowerment program could decrease parental depressive symptoms and increase parental self-efficacy.<sup>16</sup> The elements of their empowerment program were similar to those of the current study program; they considered multiple dimensions of adaptation to the maternal role, but they did not consider measuring the relationship with the spouse and social/emotional development of mothers' adaptation roles. In an inconsistent study, Shieh et al., showed that implementing structured discharge education could not significantly increase maternal confidence or the caring knowledge of mothers with preterm infants one month after discharge.<sup>28</sup> The inconsistency could be due to the differences in cultural/social contexts and content of the education programs, because the content of their structured discharge education only focused on one of their multiple roles. However, in the current study, the counseling program was multi-dimensional and designed based on a problem-solving technique that attempted to resolve problems in a structured manner. Moreover, in the current study, based on Iranian culture, the assumed role of close relatives in baby care might have caused maternal confidence and caring knowledge. Self-efficacy is the main effective factor in proper performance and responsibility. There is evidence that maternal confidence of caring for late preterm infants decreases from 3-4 weeks to 6-8 weeks after delivery depending on the demanding features of the late preterm infants, their re-hospitalization, and the mother-health care providers' interactions.<sup>4</sup> It is necessary for health providers to help the mothers meet their personal/infant needs to promote confidence related to the care of their late preterm infants and adapt to the maternal role.

Late preterm newborns are similar in size to term-born infants than to early preterm infants. Therefore, parents and healthcare providers may not recognize these infants as less neurologically and physiologically mature than full-term infants. The mothers of late-preterm infants have greater emotional distress than mothers of term infants for at least one month after the delivery and it can affect the maternal role of adaptation.<sup>6</sup> In the current study, similar to the studies by Afand et al., and Cheng et al., counseling improved the adaptation of mothers to concern and anxiety related to parenting.<sup>29,30</sup> However, it was inconsistent with the findings of the study by Wu et al. They reported that home and clinic visit interventions did not decrease the level of stress in mothers of very low-weight infants.<sup>31</sup> The inconsistency could be due to the difference in infants' gestational age and level of the mother's stress.

Furthermore, in the current study, counseling could improve the score of the hardship and dissatisfaction area in the intervention group compared to the control

group. Rasheed et al., reported similar results. They found that reducing the level of stress in mothers of the preterm infants could help enhance the mother-newborn relationship and decrease mothers' dissatisfaction.<sup>32</sup> Therefore, the problem-solving technique could be an acceptable structure to design postpartum care programs and it could be considered by health providers in this regard.

Attachment to the infant is one of the dimensions of adaptation to maternal role. The current study results showed that counseling could improve the mother-infant attachment in the treatment group compared to the control group. The current study result was in line with that of Korukcu & Kukulcu.<sup>17</sup> On the contrary, Ericson et al., in Sweden revealed that telephone counseling did not have any impact on enhancing the mother-infant attachment.<sup>33</sup> The inconsistency could be due to the differences in procedure, the content of counseling, or personal-social and cultural context. It seems that face-to-face consultation is more effective than telephone consultation to improve the mother-infant attachment. The attachment between mother and infant, as one of the most important areas of maternal adaptation, could influence the neonatal outcome. It is quite essential for health staff to plan for appropriate interventions in this regard, particularly in the postpartum care package.

Social-emotional development is defined as the process of effective application of skills and knowledge to manage emotions, the increased sense of being friendly and less self-centered, the increased sense of responsibility, and the increased ability to adjust to difficult situations and establish positive relationships with the others.<sup>34</sup> In terms of social-emotional development, the current study results revealed that mothers had a better situation after the intervention. There was a lack of evidence from trials in this regard.

The transition to motherhood is a major developmental life event that should be viewed in a specific social context.<sup>5</sup> The sense of responsibility could be related to parenting efficacy, mental health, and couples' relationship satisfaction during pregnancy.<sup>35</sup> Therefore, during pregnancy, health staff should focus on programming and preparing mothers for emotional-social development.

The transition to motherhood needs the reconstruction of goals, behaviors, and responsibilities to attain a new perception of "self." A mother gradually prepares herself for a great new identity; in this way, she needs to be emotionally supported by others, particularly her spouse, more than any other time.<sup>36</sup> In the current study, counseling could enhance the couple's relationship, while this area worsened in the control group. It can be concluded that preterm birth is a threatening factor for the quality of the couple's relationships and thereby, their adaptation to maternal role. Salo et al., found that the quality of postpartum couple's relationships was an essential factor for the parental role adjustment and quality of infant care

service.<sup>37</sup> Therefore, health staff should focus on planning to enhance this aspect of maternal adaptation, especially in mothers of preterm newborns.

The one strength of the current study was that we used an indigenous culture questionnaire for data collecting and theory-based intervention for improving the adaptation of mothers for new roles.

The counseling program was examined in mothers with late preterm infants and the follow-up period was short. Moreover, the participants were selected from a certain hospital in Zanjan city, which limits the generalizability of the results. A more comprehensive design with a larger sample size selected from different hospitals in different areas would help more accurately understand the effect of structured counseling programs on the maternal role adaptation, especially concerning emotion-social development of mothers with late/early preterm infants. In the current study, mothers were consulted in the absence of their spouses. It is suggested that more trials be conducted with both parents. Finally, the gravida as a confounding variable was not stratified thus, it was adjusted using Univariate covariance test.

### Conclusion

The current study results revealed that comprehensive structured counseling had a positive impact on improving the adaptation to maternal roles in mothers with late preterm infants. It can be applied to improve maternal and child health programs and services. In addition, the problem-solving approach can be an acceptable structure to design educational programs in this regard.

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### Ethical Issues

The current study is a part of M.Sc. thesis approved by the ethics committee of the Vice Chancellor for Research of Zanjan University of Medical Sciences, Iran. The objectives of the study were explained to the participating mothers and all participants signed written informed consent forms. The participants could leave the study at any time, and they were also assured about the confidentiality of their data.

### Conflict of Interest

No potential conflict of interest relevant to this article was reported.

### Author's Contributions

AR: the conception, design of the study, data collection process were undertaken; AM: was the supervisor; MD: advisor. They contributed to the design of the study, and reporting of the result. FKT: analysis, interpretation and reporting were supervised. All authors contributed to drafting the article, revising it and

## Research Highlights

### What is the current knowledge?

The mother with a preterm infant may have difficulty in the parenting role due to the interruption of normal pregnancy. The maternal emotional responses may affect the parenting role at least during the first years of life.

### What is new here?

The problem-solving approach can be an acceptable structure to design educational programs regarding adaptation to the maternal role in mothers with late preterm infants.

preparing the final version of the manuscript to be submitted to the journal. They all met the criteria of authorship.

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