

## The Effect of an Infant Care Educational Program on the Stress Level of Primiparous Women

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### ABSTRACT

**Background & aim:** Women experience various changes in their transition into motherhood and feel stressed while facing new challenges in this period. High levels of stress may prevent mothers from realizing their maternal role. In this study, we aimed to explore the effects of training on the stress of primiparous mothers.

**Methods:** In this quasi-experimental intervention, 100 pregnant women were divided into control (n=50) and intervention (n=50) groups in Tehran, Iran in 2013. The intervention group received routine care, along with planned training in three sessions. The data collection tools included a demographic questionnaire, a childbirth information questionnaire, and a bisectional stress questionnaire. The stress questionnaire was completed before training and six and twelve weeks postpartum. For data analysis, repeated measures ANOVA, Chi-square test, Fisher's exact test, and t-test were performed, using SPSS version 16.0.

**Results:** Based on the findings, no significant difference was observed between the groups in terms of demographic characteristics. However, a meaningful difference was reported in mean stress scores between the two groups at six and twelve weeks postpartum ( $P < 0.001$  and  $P < 0.001$ , respectively).

**Conclusion:** Considering the effects of training on stress relief, design and implementation of educational programs for pregnant women are recommended to reduce their stress and improve their health conditions.

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## Introduction

Although parenthood can be a memorable and pleasant experience, it may be associated with particular challenges including changes required to assume the maternal role (1). Birth of the first child is an important stage in a woman's transition into motherhood, resulting in multiple changes in women and their families. Childbirth is itself an integral part of healthcare policies and has been the subject of considerable debate over the past decades (2).

After delivery, mothers experience physical, psychological, and social changes due to the birth of their newborns (3). A woman's management of such changes can appear as stress responses (4).

Stress is defined as one's dysfunctional interaction with the environment, resulting in his/her need for assistance from others. Overall, transition into motherhood is a stressful challenge and process for women after delivery (5). In other words, when there is an incompatibility between external circumstances and an individual's potential and ability to deal with problems, a state of desperation and despair arises (6).

Liu et al. (2011), citing Ruchella and James (1997), states that during motherhood, not only women are faced with maternal responsibilities, but they also experience physical changes in their bodies. Pregnancy causes physical stress due to

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frequent conditions such as nausea, lethargy, and insomnia. Consequently, we can normally observe stress, depression, and anxiety among pregnant women, referring to prenatal clinics (7). Stressors affecting women during pregnancy usually originate from marital relationships, familial responsibilities, employment status, financial problems, and pregnancy-related issues (4, 8).

Dissatisfaction with the labor phase and unmet expectations of childbirth may cause problems in women's adaptation with the parental phase (9). Primiparous mothers may experience anxiety when judging their own competence and capability in child care after birth (1). According to a previous exploratory research, stress in the postnatal period depends on three factors: focus on assuming the maternal role, noticing unpleasant changes in the body, and lack of support from acquaintances (10).

Parental stress can negatively affect maternal competence and infant-mother relationship, leading to the reduced quality of child growth and development. Parental stress is related to factors such as maternal education, social support from acquaintances, mother's self-confidence or self-sufficiency, child care, and problems related to the child's irritability and mood (5). Also, high stress levels may lead to anxiety and weakened sense of satisfaction in mothers (4). Therefore, understanding the relationship between stress and maternal competence is necessary for improving women's adaptation during transition to motherhood (4).

Research on health promotion has revealed changes in an individual's health during his/her transition into parenthood. According to the literature, some women are not prepared to accept these changes in their identity and role (11). Previous findings indicate that most primiparous mothers are not mentally prepared to assume their maternal role. Consequently, the first months after childbirth are physically and mentally unpleasant for these women (12).

There is a relationship between perinatal events in mothers with different clinical backgrounds (e.g., hypertension, diabetes, and smoking habits) and the consequences reported in newborns (13). In fact, infants of women facing difficulties during motherhood may experience developmental and behavioral dysfunctions, cognitive growth disorders, and attention deficit

disorder (3).

Copeland (2004) claims that by training mothers to care for themselves and their infants, we can alleviate their anxiety and improve their sense of empowerment (14). Extensive studies in recent decades have been conducted on the development of maternal role, although the major focus has been on Western countries rather than Asian countries (5). In Iran, some studies have been performed on the needs of primiparous mothers and several articles have been published on maternal stress (15-17).

Despite the fact that primiparous mothers constitute a significant and vulnerable part of the general population and have no previous experience of infant care, no study has evaluated the needs of this group in Iran; in other words, the importance of such studies on stress relief has been neglected (18). In Iran, educational protocols on pregnancy have been established in hospitals in accordance with the programs of the Ministry of Health and Medical Education. However, the majority of these educational programs are based on training mothers about maternal complications, maternal health, and benefits of breastfeeding, and women do not receive adequate training on proper infant care in the prenatal period.

Moreover, length of hospital stay after birth is short and insufficient for the mothers (maximum of three days) and women do not receive any training on child care before hospital discharge. Also, in Iran, the healthcare system has not obligated midwives to visit mothers after childbirth or address their problems regarding child care. Considering the aforementioned problems and shortcomings, we aimed to perform this study to investigate the effects of education and training in prenatal and postnatal periods on the stress of primiparous mothers in order to improve their infant care abilities.

## Materials and Methods

This quasi-experimental, interventional study was conducted on primiparous mothers, referring to healthcare centers in south of Tehran, Iran. The study setting included the prenatal care units of these centers in southern Tehran. A total of 100 pregnant women participated in this study. At first, all the participants in the intervention (n=50) and control (n=50) groups were asked to complete the demographic and stress questionnaires after

obtaining the informed consent forms. Considering the sample dropout, 45 and 47 subjects were assigned to the experimental and control groups, respectively. Sampling continued from June 2013 to January 2014.

The expectant mothers in the experimental group participated in three training sessions (two sessions before and one session within 10 to 15 days after delivery) and were given two educational booklets and one CD; the training focused on diverse types of information about infant care. The content of training sessions was based on valid scientific books and was prepared under the supervision of faculty members. On the other hand, the control group only received routine care.

Owing to the large number of pregnant women, four out of 32 healthcare centers were selected. Then, two out of the four selected healthcare centers were randomly chosen for recruiting the subjects. The inclusion criteria were as follows: 1) 18 years of age or above; 2) gestational age of 36 weeks or above; 3) primiparous mothers with a singleton and uneventful pregnancy; 4) no prior history or record of psychiatric or mental problems; 5) no addiction to alcohol or narcotics; 6) educational level of at least middle school; 7) Iranian nationality; and 8) absence from infant care sessions.

On the other hand, the exclusion criteria were as follows: 1) use of drugs affecting the mother's nervous system; 2) accidents or loss of a first-degree relative; 3) anomalies in the newborn such as Down's syndrome, 4) fetal or neonatal death; and 5) failure to participate in the second or third session of the training.

In this study, the data collection tools included questionnaires on demographic and childbirth information and a bisectonal stress questionnaire. The demographic questionnaire was completed in the first session before training and the childbirth questionnaire was completed in the third session. The stress questionnaire was completed in three stages: before training, six weeks after delivery, and 12 weeks after delivery. The stress questionnaire consisted of two sections. The first part was the original Social Readjustment Rating Scale (SRRS), which was used as a tool to measure the occurrence of 43 stressors within the past 12 months. The second part of the questionnaire included 12 questions about childbirth and

pregnancy stress.

Overall, SRRS is an international standard tool, which has been validated in numerous studies, and is assessable under any condition for any individual. This questionnaire was first designed by Holmes and Rahe (1967) (19), and its validity and reliability were confirmed by Ngai (2011). In Iran, this questionnaire has been applied in studies by Shahim (2007) (20), Amrayee et al. (2012) (21), Afshar et al. (2010) (22), and Jafarpour et al. (2005) (23), all approving its validity and reliability. Also, in the current study, Cronbach's alpha coefficient of the stress questionnaire was calculated to be 0.79.

Each event was assigned a score from one to five, based on the intensity of the experienced stress; lack of such events within the past year was assigned a score of zero. The questions were graded as follows: completely disagree (score 1) to completely agree (score 5). The total score of the first part of stress questionnaire was within a range of 0-215. Considering the cultural and religious differences, in this questionnaire, "changes in going to church" was replaced by "changes in religious activities" and "Christmas" was changed to "Eyd".

The second section of the stress questionnaire included 12 questions, based on Stora's definition of stress (6). The content validity of the questionnaire was assessed based on the opinions of 10 faculty members, and its reliability was estimated using Kappa statistic (80%). The response to each question of the second section was graded, based on a Likert scale, ranging from completely disagree (score 1) to completely agree (score 5); the total score in the second section ranged between 12 and 60. Finally, the scores of two sections in the stress questionnaire were summed up, with higher scores indicating higher levels of stress; the final stress score ranged between 12 and 275.

In this study, three training sessions (two before and one after delivery) were held for pregnant women in the intervention group. The first and third sessions continued for at least 90 min and the second session took 60 min. The sessions were held using PowerPoint presentations, lecture-based videos, question and answer method, and practical training.

At the end of the first and third sessions, booklets related to these sessions, which

contained further information about the subject under study, were distributed among mothers. These booklets discussed distinct subjects such as postpartum care for mothers and infants (in cases such as fissure and mastitis), consumption of iron and multivitamin supplements, infant vaccination, infant bathing, infant clothing, maternal and neonatal nutrition, prevention of and neonatal care for diaper rash, and care for fever, diarrhea, and flatulence, based on the mother's postpartum stage (from childbirth to the end of the sixth month after delivery).

In the second session, three videos about infant bathing and breastfeeding were presented to the mothers; also, infant bathing was demonstrated in practice. Moreover, a CD and educational PowerPoint presentations were used in the third session. The educational materials related to infants up to the age of six months were provided in the third session (10 to 15 days after delivery). All classes were run by a midwife at the healthcare centers.

Considering the difference in the time of childbirth, a total of 38 classrooms (three to eight members) were held from July to October 2013 in 12 groups. The control group completed the demographic and stress questionnaires in the first

meeting and received the childbirth information questionnaire after delivery; the stress questionnaires were also completed at six and twelve weeks postpartum. In the third educational session, the intervention group completed the childbirth information questionnaire and received the stress questionnaire at six and twelve weeks postpartum. Both groups were asked to deliver the completed questionnaires to the healthcare centers.

Mothers in the intervention group were asked to contact the researcher via phone calls whenever they faced any problems. Additionally, the researcher called the participants every other week to investigate the problems and ambiguities which might occur for the intervention group. This study was conducted with respect to the Declaration of Helsinki and was approved by the ethics committee of Tehran University of Medical Sciences.

For statistical analysis, Chi-square, Fisher's exact test, t-test, and repeated measures ANOVA were performed at a significance level of 0.05. Data were analyzed, using SPSS version 16.0.

## Results

**Table 1.** Demographic characteristics of the participants in the intervention and control groups, based on t-test, Chi-square, and Fisher's exact test

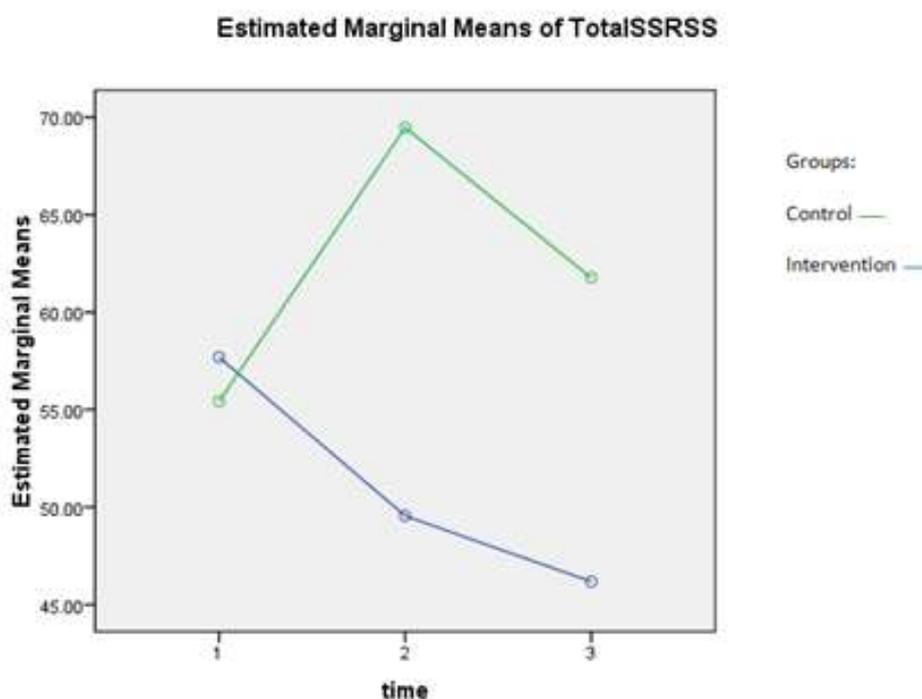
Variables	Intervention	Control	P-value
Mother's age (years) Mean±SD	24.5±4.1	24.2±4.3	0.821
Age of the spouse (years) Mean±SD	28.5±3.4	28.4±4.5	0.670
Age of marriage in mothers Mean±SD	21.9±3.5	21.0±3.9	0.797
<b>Mother's educational level</b>	<b>N (%)</b>	<b>N (%)</b>	<b>P-value</b>
Secondary school	14 (28)	13 (26)	0.972
High school	24 (48)	25 (50)	
University	12 (24)	12 (24)	
<b>Spouse's educational level</b>			
Secondary school	12 (24)	13 (26)	0.789
High school	32 (64)	29 (58)	
University	6 (12)	8 (16)	
<b>Mother's occupational status</b>			
Homemaker	46 (92)	45 (90)	0.756
Employee	2 (4)	1 (2)	
Others	2 (4)	4 (8)	
<b>Spouse's occupational status</b>			
Employee	4 (8)	6 (12)	0.748
Worker	32 (64)	29 (58)	
Others	14 (28)	15 (30)	
<b>Family income status</b>			
Sufficient	13 (26)	15 (30)	0.832
Partially sufficient	30 (60)	27 (54)	
Insufficient	7 (14)	8 (16)	

As presented in Table 1, the two groups were homogenous in terms of demographic and individual characteristics of their spouses. Regarding the intervening individual factors, both groups were homogenous in terms of pregnancy age, number of abortions, type of

pregnancy (intended or unintended), medical record of infertility, number of family members, living with the mother, mother-in-law, or others, social support, mother's feeling about the current pregnancy, and previous experience of infant care ( $P>0.05$ ).

**Table 2.** Comparison of stress scores in the intervention and control groups at various stages of the study

	Before training (Mean±SD)	Six weeks postpartum (Mean±SD)	Twelve weeks postpartum (Mean±SD)
Intervention n=45	58.6±17.0	49.5±12.2	46.1±12.5
Control N=47	55.0±18.8	69.4±16.1	61.7±14.7
P-value	$P>0.001$	( $P=0.000$ )	( $P=0.000$ )



**Figure 1.** Comparison of mean ( $\pm$ SD) stress scores in the intervention and control groups at three stages of the study

In accordance with Figure 1, there was no significant difference between the two groups regarding the stress scores before the intervention. The general linear model (Figure 1) and the results of repeated measures ANOVA showed a significant difference in the stress scores at different time intervals, i.e., before the intervention and six and twelve weeks postpartum ( $P=0.000$ ). Meanwhile, the mean score of maternal stress was significantly

different between the two groups and different measurement stages ( $P=0.000$ ) (Table 2).

## Discussion

The present findings indicated that the mean maternal stress scores in the control and intervention groups were not significantly different before training and both groups were homogenous in this regard. However, the mean stress scores decreased in the intervention

group at six and twelve weeks postpartum, while in the control group, the stress scores increased in the sixth week and decreased in the 12<sup>th</sup> week, compared to the prenatal period.

Based on a longitudinal and correlational study by Emmanuel (2005) (3), entitled "Maternal role development following childbirth among Australian women", 41.8% of the participants had medium to high levels of stress in the 36<sup>th</sup> week of pregnancy, while 19.2% and 15.5% of the subjects had high levels of stress at six and twelve weeks postpartum, respectively. These findings are compatible with the present results reported in the intervention group, i.e., maternal stress decreased after delivery. In consistence with our findings, women in the two groups experienced lower levels of stress in the 12<sup>th</sup> week, compared to the sixth week after delivery. Also, the findings reported by Emmanuel revealed that individual characteristics, social support, and educational factors are significantly associated with the realization of maternal role (3).

A clinical trial by Hayes (2008) (24), entitled, "A randomized controlled trial of a mother-infant or toddler parenting program: Demonstrating effectiveness in practice" on 118 mothers with newborns indicated that the stress level significantly decreased in stressed mothers immediately after training, as well as two and six weeks after training; these results were compatible with the current findings. In the mentioned study, the mean stress scores in the intervention group were 9.05, 4.93, and 4.40 before training, two weeks after training, and six weeks after training, respectively; the corresponding scores in the control group were 10.25, 9.55, and 7.50, respectively. There was a significant difference between the two groups and the results indicated that maternal stress gradually decreases after delivery (24).

In an experimental study by Geranmayeh (2010) (18), entitled, "Effect of an educational program on knowledge, stress, and self-efficacy of primiparous mothers in infant care", there was a significant difference between the control and education groups regarding maternal stress in infant care immediately after education ( $P < 0.04$ ) and two months after delivery ( $P < 0.001$ ). The results

demonstrated lower levels of maternal stress in the intervention group at both stages. In this study, the mean scores of maternal stress were 25.18, 20.91, and 11.14 in the intervention group and 25.07, 25.62, and 18.25 in the control group before training, immediately after training, and two months after delivery, respectively; this study showed reduced maternal stress in both groups after delivery (18).

Moreover, according to a qualitative study by Svensson (2006) (25), entitled "A randomized-controlled trial of two antenatal education programs", primiparous mothers experienced loneliness and anxiety due to lack of parental information. Also, based on a correlational, prospective study by Ngai (2010), entitled, "Stress, maternal role competence, and satisfaction among Chinese women in the perinatal period", the mean stress scores of mothers during pregnancy, six weeks after delivery, and six months after delivery were 9.7, 15.9, and 13.0, respectively. In line with the present study, this finding indicated that maternal stress increases after delivery and then gradually decreases (3). Ngai suggested that women must be empowered with stress relief techniques in the beginning of motherhood so that they can better assume their maternal roles (4).

The findings of this study indicated that education decreases mothers' stress in assuming their maternal role. Therefore, considering the importance of motherhood and maternal stress in infant care, training of pregnant mothers in late pregnancy is essential for maintaining the physical and mental health of mothers and children.

The results of this study can be used in programs implemented by the Ministry of Health and Medical Education, counseling centers, healthcare centers, and clinics with maternity wards. Also, these findings can be applied in midwifery training programs and serve as a basis for further research. Considering the fact that midwives play an important role in providing pregnancy care and guaranteeing the health of mothers and newborns, integrating infant care educational programs in the curriculum of midwifery students could be quite useful.

In the present study, some participants might have been affected by mental illnesses about which neither the participant nor the researcher knew; therefore, random selection of the samples was applied to curb this problem. Also, in the course of the study, stressful accidents in the mother's life were examined. However, routine daily stress was not measurable, which can be considered as a limitation of this study. Overall, the present study can be a basis for further research to extensively investigate the realization of maternal role and assess maternal stress.

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### Conflicts of Interest

The authors declare no conflicts of interest.

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