

# The Effect of Pregnancy-Adaptation Training Package on the Anxiety of Pregnant Women with a Prior History of Fetal or Neonatal Death

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## ABSTRACT

**Background & aim:** One of the factors of affecting maternal anxiety is a history of fetal death or neonatal death. This anxiety affects fetal and maternal health. By consideration the impact of anxiety on fetal and maternal health and the lack of protective activities in this field, this study was done to determine the impact of adaptation with pregnancy educational package on anxiety and maternal fetal attachment in pregnant women with a history of baby loss.

**Methods:** 60 pregnant women were selected in two studying group with previous fetal death or neonatal death by convenience sampling and were randomly assigned to control and intervention groups. Educational package includes: teaching session's adaptation with pregnancy in four 60- minutes, training booklet and CD, maternal educating was beginning from 23 week gestation. Maternal anxiety measured before and after the intervention in both groups using the Mann-Whitney and Kruskal-Wallis test and STAI anxiety questionnaire was compared.

**Results:** visible and invisible Anxiety scores had not significant difference between two groups pre-intervention. Immediately after the intervention visible and invisible anxiety scores in the experimental group was better than the control group ( $P \leq 0.05$ ,  $P \leq 0.05$  vice versa).

**Conclusion:** Adaptation with pregnancy educational package reduces anxiety in pregnant women with a history of fetal or neonatal death. So, due to reduce the damaging effects of anxiety on the mother and fetus in pregnancy, holding effective proceeding for reducing anxiety such as: holding training courses are recommended for pregnant women with a history of fetal or neonatal death.

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## Introduction

High levels of anxiety during pregnancy have adverse effects on mothers' physical and mental health and increase the risk of maternal anxiety and depression during the postpartum period. In addition, anxiety during pregnancy leads to the infant's irritability, crying, instability, and even transfer to the intensive care unit.

Some studies including Zolfagari's research (2003) reported that mothers' severe anxiety in late pregnancy can have long-term consequences including reduced mental development of the

child at the age of two years and educational failure at the age of six years (1).

Also, severe anxiety of mothers during pregnancy and after childbirth leads to irreparable damages on the mother-infant relationship and reduces mother's ability to play the maternal role. Moreover, mothers' inappropriate reactions to infants' behaviors might encumber neonatal growth (2). Reduction in milk production and secretion is among the other complications of severe maternal anxiety

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during pregnancy (3).

Pregnancy may cause maternal fear due to physical problems during pregnancy and mothers become concerned about the possible damages to their fetus or newborn. This type of anxiety is more observed in women who have experienced complications such as abortion or neonatal death in previous pregnancies. Moreover, anxiety may give rise to feelings of inadequacy in mothers during their current pregnancy (2, 4, 5).

Pregnancy and motherhood are considered as enjoyable and evolutionary events in a woman's life and include experiences in which the mind, body, and soul undergo significant changes. However, these periods can create emotions and new tensions in the mother or lead to the manifestation of mothers' previous unresolved conflicts (4, 6, 7). For instance, a prior history of fetal or neonatal death may lead to destructive experiences in pregnant women and severe anxiety in future pregnancies. In some cases, it can even cause psychological resistance to pregnancy adaptation (8-11).

Arselant (2003) suggested that some mothers, who have experienced fetal death, are worried and uncertain about the survival of their fetus during future pregnancies (11). These women, especially those who have experienced fetal death after the second trimester of pregnancy, are more prone to lack of confidence, abortion, and complications during future pregnancies. Moreover, infants of these mothers are more susceptible to premature birth, congenital anomalies, and neonatal death (12).

Pounamaky et al. (2006) in their study found that 22% of infants, whose mothers had previously experienced fetal death, might present with developmental disorders. In fact, mothers with such experiences feel great fear and anxiety about pregnancy loss. They assume that clinical measures are insufficient and can jeopardize their lives and their infants (11, 9).

Coping with pregnancy is essential for mother-infant relationship and is a testament to the fact that the mother has successfully fulfilled her maternal responsibilities. Previous research has shown that proper social support of the mother increases maternal adaptation, acceptance, and confidence (13). Since

pregnancy is a stressful event, especially in mothers with a prior history of fetal or neonatal death, providing nursing care and informing parents can increase their adaptation with fetal or neonatal death (11, 14).

Midwives have more opportunities to communicate with mothers during pregnancy. Considering the importance of midwives' consulting and supportive role in providing prenatal and postpartum care, they can well provide the required professional and specialized support (e.g., maternal training, emotional support, problem-solving, and other interventional methods) for pregnant women with a prior history of fetal or neonatal death (15, 16). Therefore, we performed this study with the aim to determine the effect of pregnancy-adaptation training package on pregnant women with a prior history of fetal or neonatal death.

## Materials and Methods

This interventional study was performed on 60 pregnant women with a prior history of fetal or neonatal death, referring to Mashhad health care centers. The subjects were selected via convenience sampling. To determine the sample size, mean difference test (mean anxiety score) and methods of previous studies were applied ( $X_1 = 0.8$ ,  $X_2 = 307$ ,  $x_1 = 7$ ,  $x_2 = 0.4$ ,  $\alpha = 0.005$ , and  $\beta = 0.2$ ). Twenty-five patients were allocated to each group. Considering a 20% dropout rate, 30 patients were enrolled in each group.

The inclusion criteria were as follows: 1) proficiency in Farsi language; 2) minimum literacy (reading and writing); 3) age range of 18-35 years; and 4) gestational age of 14-20 weeks. The exclusion criteria were as follows: 1) a prior history of medical conditions such as diabetes and hypertension; 2) serious family conflicts; 3) narcotic addiction; 4) history of infertility; 5) mental preoccupation caused by events such as divorce and death of relatives; 6) congenital malformations in first-degree relatives; and 7) more than a 5-year interval since the last fetal or neonatal death.

Data collection tools included a demographic form (consisting of demographic data and pregnancy-related information) and Spielberger's State-Trait Anxiety Inventory (STAI), consisting of 40 items. Two forms of anxiety, i.e., trait and state anxiety, are each given 20 separate

questions in this questionnaire.

Convenience sampling method was applied in this study. Two health clinics were selected from health care centers No. 1 and 2, considering the differences in socioeconomic class. Daneshamouz and Sanabad health clinics, affiliated to health care center No. 1, as well as Sahrai and Silo clinics, affiliated health care center No. 2, were selected, considering the high number of clients. Then, the centers were randomly divided into control and intervention groups.

After obtaining the necessary permissions and visiting the selected centers, study subjects were chosen among women with a prior history of fetal or neonatal death at 20 weeks of gestation, based on the inclusion criteria. If the candidates were willing to participate in the study, written informed consents were obtained. The participants were instructed on how to respond to the questions. The questionnaires were distributed among the subjects and completed in an average of 20 minutes.

In both intervention and control groups, routine training classes during pregnancy were held since week 20 of gestation in eight 60-minute sessions during 8 consecutive weeks by the researcher in collaboration with the midwives. In the intervention group, since week 23 of gestation, classes of adaptation with pregnancy, in addition to routine classes, were held (four 60-minute sessions). Also, an educational CD and a training booklet were given to mothers during the sessions.

After the end of educational classes, mothers in both groups were asked to refill the anxiety questionnaire. After collecting the data, the two groups were compared. At the end of the intervention, the educational CD and booklet were given to the control group.

The educational content presented in the first training session included the anatomy and physiology of female genital tract, fertilization, and the process of fetal development and growth. The second session was concerned with physical exercise during pregnancy, body image, and relaxation techniques.

In the third session, group counseling was held by a psychologist at the presence of the researcher, and mothers discussed their fears and concerns. Topics presented in the fourth session included mothers' physical and

psychological changes during pregnancy, compliance with these changes, discussions about their concerns about fetal health, and methods of communication with the spouse and family.

SPSS version 11.5 was used for statistical analysis. Descriptive statistical tests, Wilcoxon, and Mann-Whitney tests were performed for inter- and intra-group comparisons. P-value less than 0.05 was considered statistically significant.

## Results

The mean age of subjects was  $27.19 \pm 4.05$  years in the control group and  $25.86 \pm 3.55$  years in the intervention group. Mann-Whitney test results showed that the two groups were similar in terms of age ( $P=0.607$ ). The majority of mothers in the intervention (35.71%) and control (44%) groups had primary level education. Mann-Whitney test results showed that the two groups were similar in terms of educational level ( $P=0.607$ ).

Most subjects in the intervention and control groups were housewives (89.29% vs. 92.59%). Fisher's exact test showed that the two groups were homogeneous in terms of maternal occupation ( $P=1.000$ ). The mean age of the spouse was  $30.36 \pm 4.60$  years in the intervention group and  $31.89 \pm 5.32$  years in the control group. Mann-Whitney test showed that the two groups were similar in terms of this variable ( $P=0.278$ ).

The majority of subjects in the intervention (53.3%) and control groups (66.67%) were self-employed; Chi-square test showed that the two groups were homogeneous in terms of this variable ( $P=0.988$ ). Additionally, the monthly income of most subjects in the intervention (57.14%) and control groups (62.96%) was sufficient. According to Chi-square test results, the two groups were similar in terms of monthly income.

Mann-Whitney test results showed that the mean anxiety score before the intervention was not significantly different between the intervention and control groups ( $P=0.362$ ). The results showed that the mean score of maternal state anxiety was significantly different between the two groups after the intervention ( $P=0.001$ ). Intra-group comparison by Wilcoxon test showed that the mean score of maternal state anxiety was significantly higher after the experiment in the intervention group, compared to the pre-intervention period ( $P=0.001$ );

however, this difference was not significant in the control group ( $P=0.054$ ) (Table 1).

**Table 1.** Comparison of state anxiety scores in the intervention and control groups before and after the intervention

	Groups		Statistical test b	P-value
	Intervention	Control		
State anxiety				
Before the intervention	64.52±02.7	93.50±37.7	000.324	362.0
After the intervention	04.37±48.8	59.54±80.8	000.53	001.0
Statistical test	567.-4	925.-1		
P-value	001.0	054.0		

Values are presented as mean±SD; a: Wilcoxon test, used for the comparison between the pre- and post-intervention periods; b: Mann-Whitney test, used for the comparison between the intervention and control groups.

**Table 2.** Comparison of trait anxiety in the intervention and control groups before and after the intervention

	Groups		Statistical test b	P-value
	Intervention	Control		
Trait anxiety				
Before the intervention	63.4±5.94	61.04±6.73	324.000	0.362
After the intervention	42.86±8.63	63.26±5.69	18.000	0.001
Statistical test a	-4.626	-1.925		
P-value	0.001	0.054		

Values are presented as mean±SD. a: Wilcoxon test for the comparison between the pre- and post-intervention periods; b: Mann-Whitney test for the comparison between the intervention and control groups

**Table 3.** Comparison of changes in state and trait anxiety before and after the intervention in the intervention and control groups

Variables	Groups		Statistical test	P-value
	Intervention	Control		
State anxiety	-28.92±17.12	8.68±20.93	47.500	000.1
Trait anxiety	-31.77±13.10	4.54±12.32	12.000	0.001

Values are presented as mean±SD. Comparison between the intervention and control groups was performed by Mann-Whitney test

Mann-Whitney test results showed that the mean state anxiety score before the intervention was not significantly different between the intervention and control groups ( $P=0.363$ ). However, the test results showed that the mean score of maternal trait anxiety was significantly different between the two groups after the intervention ( $P=0.001$ ).

The intra-group comparison by Wilcoxon test showed that in the intervention group, the mean score of maternal trait anxiety was significantly higher after the intervention, compared to the pre-intervention period ( $P=0.001$ ); however, this difference was not significant in the control group ( $P=0.054$ ) (Table 2).

Since changes in trait and state anxiety, mother-infant attachment, and pregnancy adjustment after the intervention may be related to the pre-pregnancy period, it was necessary to

perform a closer evaluation of changes in these variables. Therefore, the percentage of changes in each variable was calculated before and after the intervention.

The percentage of changes in the intervention and control groups was compared by Mann-Whitney test. The results are presented in Table 3. Based on the findings, after the intervention, state anxiety was decreased by 28.92% in the intervention group, whereas it increased by 8.68% in the control group; the difference in both groups was significant ( $P=0.001$ ). Moreover, trait anxiety was decreased by 31.71% in the intervention group and by 4.54% in the control group ( $P=0.001$ ).

## Discussion

This study was performed to determine and compare the level of state and trait anxiety in

women before and after providing the training package of adaptation with pregnancy in the intervention and control groups. As the study findings suggested, although the mean anxiety score before the intervention was not significantly different between the two groups, levels of state and trait anxiety were high in both groups at baseline. The mean scores of state anxiety in the intervention and control groups were  $52.4 \pm 7.02$  and  $50.93 \pm 7.37$ , respectively, and the mean score of trait anxiety was  $63.04 \pm 5.94$  in the intervention group and  $61.04 \pm 6.73$  in the control group.

In a study by Bazrafshan et al., state and trait anxiety scores were  $42.26 \pm 13.33$  and  $38.70 \pm 10.75$ , respectively in pregnant women with no history of fetal or neonatal death; women's anxiety was measured by Spielberger questionnaire (8). Furthermore, in a study by Taavoni and colleagues, history of fetal or neonatal death was mentioned as an anxiety-inducing factor during pregnancy (1<sup>V</sup>).

In a study by Ahadi et al., the level of anxiety in pregnant women was  $41.35 \pm 4.34$ . The questionnaire used in their study assessed pregnancy-specific anxiety with a scoring range of 15-60. However, in the present study, Spielberger questionnaire was used for measuring state and trait anxiety; the range of anxiety scores was 20-80.

In our study, for state anxiety, the scoring system was as follows: 20-31 (mild), 32-42 (moderate to low), 43-53 (moderate to high), 54-64 (relatively severe), and  $\geq 76$  (too severe). For trait anxiety, the scoring was as follows: 20-31 (mild), 32-42 (moderate to low), 43-52 (moderate to high), 53-62 (relatively severe), 63-72 (severe), and  $\geq 73$  (too severe). Therefore, the difference in anxiety scores between our study and Ahadi's research is justifiable.

Based on the findings of this study, the level of anxiety in women with a prior history of fetal or neonatal death was upper-moderate. This high level of anxiety and the associated complications during pregnancy can play a significant role in the increasing risk of mental and anxiety disorders, as well as physical and psychological problems (11).

Our findings showed that the package of adaptation with pregnancy decreased state and trait anxiety in mothers with a prior history of

fetal or neonatal death ( $-0.317$  and  $-0.105$  for state and trait anxiety, respectively); this finding was consistent with the results of studies by Toosi et al., Takser et al., and Daivis and Chang et al., i.e., in the mentioned studies, the conducted interventions reduced maternal anxiety (1, 18-19)

One of the limitations of this study was defects in audio and video devices at each center, which interrupted the classes; moreover, these defects sometimes caused difficulties in holding the classes and affected maternal anxiety. Also, considering the time constraints, long-term impact of the training package was not assessed after childbirth.

## Conclusion

The package of adaptation with pregnancy reduced anxiety in pregnant women with a prior history of fetal or neonatal death. Therefore, considering the damaging effects of anxiety on the mother and fetus during pregnancy, use of effective measures such as training courses to reduce the anxiety of pregnant women with a prior history of fetal or neonatal death is recommended.

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## Conflicts of interest

Authors declared no conflicts of interest.

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