

# The Reduction of Anxiety and Improved Maternal Attachment to Fetuses and Neonates by Relaxation Training in Primigravida Women

Monire Toosi<sup>1</sup>; Marzieh Akbarzadeh<sup>2,\*</sup>; Farkhondeh Sharif<sup>3</sup>; Najaf Zare<sup>4</sup>

<sup>1</sup>Department of Midwifery, Shiraz University of Medical Sciences, Shiraz, IR Iran

<sup>2</sup>Community Based Psychiatric Care Research Center, Department of Midwifery, Fatemeh (P.B.U.H) School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, IR Iran

<sup>3</sup>Community Based Psychiatric Care Research Center, Department of Nursing, Shiraz University of Medical Sciences, Shiraz, IR Iran

<sup>4</sup>Department of Biostatistics, infertility research center, Shiraz University of Medical Sciences, Shiraz, Iran

\*Corresponding author: Marzieh Akbarzadeh, Community Based Psychiatric Care Research Center, Department of Midwifery, Fatemeh (P.B.U.H) School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, IR Iran. Tel.: +98-7116474259, Fax: +98-711647425, E-mail: akbarzadehmarzieh@yahoo

**Received:** October 6, 2013; **Revised:** November 25, 2013; **Accepted:** January 11, 2014

**Background:** Anxiety is among the pregnancy complications affecting maternal mental and physical health and attachment to the fetus and newborn. Relaxation training is an effective, simple and available method to address this dismal condition.

**Objectives:** The aim of this study was to evaluate the effect of relaxation training on anxiety and maternal attachment to fetus and neonate in primigravida women.

**Materials and Methods:** This clinical trial comprised 84 primigravida pregnant woman including 42 experimental and 42 controls from a population of pregnant women referred to Shushtari and Hafez hospitals in the summer of 2010. Before the beginning of the study, anxiety and attachment levels of mothers to the fetus were assessed in both groups. In addition to the routine prenatal cares, the experimental group underwent four weekly 90-minutes of relaxation training for one month. The control group received only standard care during pregnancy. At the end of one month intervention, the anxiety and attachment levels of mothers to the fetus were assessed in both groups. The researcher visited mothers, while breastfeeding, on the first day after delivery, and recorded the mothers-neonates attachment behaviors.

**Results:** The two groups were homogeneous in terms of age, sex and attachment and anxiety levels before the intervention. There were no significant differences in mean score of anxiety ( $P = 0.618$ ) and attachment ( $P = 0.897$ ) levels before the intervention in both groups. However, significant differences were observed in the anxiety ( $P = 0.017$ ) and attachment ( $P = 0.005$ ) mean scores after the intervention between both groups. Also, the mean score of maternal attachment after the first breastfeeding in the two groups showed a statistically significant difference ( $P < 0.0001$ ).

**Conclusions:** The results of this study showed that relaxation training reduces anxiety in pregnant women and improves maternal attachment to the newborn.

**Keywords:** Pregnant women; Relaxation training; Anxiety; Attachment

## 1. Background

Women experience dramatic changes during pregnancy and delivery, making them highly sensitive to emotional stimuli and sometimes accompanied by psychological problems. Maternal psychological state affects the intrauterine environment and has a great impact on fetal growth and health (1). Thus, pregnant women are more vulnerable to stress compared with non-pregnant women (2). Anxiety disorders are prevalent during pregnancy, playing a large part in the quality of health. Results of studies suggest an increase of anxiety disorders up to 30% and more in pregnancy that may have an adverse impact on the fetus and neonate (3). Anxiety has harmful impacts on pregnancy and childbirth while long term anxiety by autonomic nervous system stimulation constricts arteries smooth muscles and decreases utero-placental

blood flow oxygen supply to the uterus and as a result abnormal fetal heart rate pattern with increasing possibility of preterm delivery (4). Anxiety during pregnancy can cause miscarriage, prematurity, low birth weight and respiratory disease of the fetus (5). It may also affect special mechanisms in the fetus involving adrenal steroid hormone such as catecholamine and corticotrophin-releasing hormone secretion due to maternal stress if they pass through the placenta and interfere with the development of fetal brain at 22-12 weeks. Also, these hormones cause contractions in the placental arteries and constrain fetal nutrition and oxygen regulation (6) resulting in limited fetal growth and asphyxia which would increase medical interventions such as cesarean section (7). Higher prevalence of respiratory infections and other infections in in-

### Implication for health policy/practice/research/medical education:

The use of relaxation techniques for pregnant mothers could be a simple strategy to reduce anxiety and increase maternal-fetal and neonate attachment. Copyright © 2014, Health Policy Research Center, Shiraz University of Medical Sciences. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

fants born to anxious women is anticipated since these hormones may hamper fetal immune system development (6). Other side effects of psychiatric disorders and maternal anxiety on neonates included low birth weight, decreased lactation and growth, severe malnutrition, diarrhea and loss of compliance with immunization programs (8). Since women and children are more sensitive to psychological tensions, awareness about tension and its consequences is an important aspect of modern medical practice (9). The main cause of increase in medical intervention is unpreparedness of pregnant women for pregnancy. Preparedness is a method of giving knowledge and awareness to pregnant women (10, 11). In different countries, a variety of methods are used to reduce anxiety, for example, psychological counseling, music, and relaxation exercises (12, 13). To learn the methods of coping with stress and anxiety, through daily exercises such as muscle relaxation, can help prevent fetal and maternal complications (14). Neuromuscular training exercises, proper breathing, relaxation training, concentration exercise and proper-position training can help mothers during labor to pass different stages of labor with minimal complications. In addition, increased positive adjustment is significantly associated with general health of pregnant women, contributing to maternal-fetal attachment. On the other hand, postpartum depression is reduced and the desire to breastfeeding increases by the aforementioned trainings (15, 16). Considering the effect of pregnancy education on maternal anxiety and also the importance of preventing anxiety during pregnancy, this study was conducted to evaluate the effect of relaxation training on maternal anxiety and attachment in primiparous women referring to Shiraz Gynecology & Obstetrics centers.

## 2. Objectives

The aim of this study was to evaluate the effect of relaxation training on anxiety and maternal attachment to fetus and neonate in primigravida women.

## 3. Materials and Methods

This was an interventional clinical trial study. The sample size was estimated at 84 participants. This study was conducted during the summer 2010, and included 84 pregnant women referring to Shushtari and Hafez maternity hospitals in Shiraz, and the participants were randomly selected and assigned to relaxation and control groups.

The sampling was purposive, and any woman who did not fulfill the inclusion criteria was excluded from the study and replaced by the next subject. In this context, two participants of the control group and three participants from the experimental group were excluded for

various reasons. The randomization was done in the draw. Sample size according to Equation 1.

$$\text{Equation 1. } n = \frac{(\sigma_1^2 + \sigma_2^2)(z + z_\beta)^2}{d^2}$$

The inclusion criteria were primipara with singleton pregnancy, age between 35-18, the minimum education of guidance school (third year of secondary school), gestational age of 35-32 weeks, lack of obstetrical problem, expected pregnancy and having a low to moderate anxiety score based on Spielberger State-Trait Anxiety Inventory. Exclusion criteria were pregnancy complications such as bleeding, diabetes, hypertension, preterm delivery and internal illnesses, non-attendance at training sessions and no exercise at home, getting into major psychological problems, and stress during the intervention period.

Data gathering instruments in this study were a questionnaire including demographic and gestational information, Spielberger state-trait Anxiety Inventory, Fetal attachment scale Cranley and mothers-infant attachment behavior checklist (Avant). Spielberger state-trait is composed of two parts of state and trait anxiety status. This is a short questionnaire containing 40 questions based on the Likert scale from really low to very high, where the score is 1,2,3,4. Anxiety score ranges from 20 to 80. Spielberger test has been used in many Western studies (17, 18). Another instrument used as standardized fetal attachment was cranely scale questionnaire which was originally used by cranely with confirmed validity and reliability (19). Mother-infant attachment behavior checklist was another tool, originally used by Avant with attested reliability and validity (20).

Having submitted a written informed consent, the participants entered the study if they acquired desired score, so called low and medium anxiety. In order to attend training classes, the mothers were divided into two groups of 21 individuals. Each group received educational program consisting of four 90-minute sessions over four weeks, one session per week on Saturdays in the third trimester of pregnancy. The researcher was in charge of each training session throughout the course of study. The subjects in the experimental group underwent relaxation training at specified times, in addition to receiving the routine prenatal care.

The first session concerned with pregnancy changes in relation to anatomy, physiology, and hormonal aspects alongside their psychological impact on physical and mental status of the pregnant women. The emphasis should be placed on the strategies for compliance with pregnancy changes. These include proper nutrition, personal hygiene, physical and mental health and recogniz-

ing the ways of improving compatibility with pregnancy changes such as relaxation and their impact on pregnancy.

The second session allocated to educating pregnant women on fetal development in different months of pregnancy, the impact of nutrition and health care for mother and fetus, the effect of relaxation on reducing anxiety in pregnancy and its impact on physical and mental health of the mother and fetus.

The third session of the training program was devoted to information on ways of treating threatened signs in pregnancy, the circumstances of forming maternal-fetal attachment, the impact of relaxation on quality of sleep and nutrition of anxious pregnant women, and the effect of relaxation on maternal-fetal attachment.

The fourth session of trainings comprised the impact of relaxation on delivery process and postpartum recovery, lactation and postpartum depression and also familiarization with the process and stages of birth, postpartum care, and breastfeeding.

At the end of all sessions, the Benson Relaxation method was rehearsed. These rehearsals are easy and safe in pregnancy. Its safety in pregnancy has been proved by obstetricians and gynecologists. It was easy to perform for every participant, lasting at least 10-20 minutes and involving the toe to the forehead. In order to ensure that participants practice the relaxation techniques, in addition to relaxation training, they were provided with compact disks (CDs) and were asked to record the daily trainings in a given checklist (21, 22). At the beginning of the next meeting after gathering the checklist, educational materials were reviewed and questions were answered. Practical training, role play, lectures and educational CD were used to teach relaxation. The most important practical training given by Benson method included settling in a quiet environment, mental preparation, passive attitude, and response in a comfortable position, the deep loosening of muscles from foot to the top for 10 to 20 minutes and finally reversing slowly. The control group received only routine prenatal care. At the end of the intervention, mothers in both control and experimental groups completed Spielberger state-trait and Cranley fetal attachment scale questionnaires. After birth, fetal attachment in the first breastfeeding was monitored and recorded without notifying the mothers, alongside monitoring maternal behavior for 15 minutes. To preserve the moral values, all training manuals and training relaxation CDs were delivered to the control group at the end of the study.

The data analysis was performed using SPSS (23). Descriptive statistics included frequency tables, mean and standard deviation. Chi-square test was used to investigate the homogeneity of qualitative variables of the two groups. Independent t-test was performed to compare dif-

ferent stages between the groups, and paired t-test was employed in order to compare the two groups before and after the intervention. In all the tests,  $P < 0.05$  was considered statistically significant.

#### 4. Results

The results showed homogeneity between the two groups, without any significant differences between them in terms of mean maternal age, education level, occupation, partner satisfaction, income level and sex of the fetus at the time of entering the study (Table 1).

Independent t-test results indicated no significant differences between the groups in terms of anxiety score before the intervention. But after the intervention the difference was significant. Paired t-test results showed that in spite of a decrease in anxiety after the intervention in the experimental group, the differences were not significant, but a significant increase in anxiety score was found between the control groups before and after the intervention (Table 2).

The mean of both the state and trait anxiety in the experimental group declined, but increased in the control group after the intervention. Independent t-test results showed no significant differences in the two groups in both the state and trait anxiety prior to the intervention, but after the intervention in the two groups both the state and trait anxiety showed significant differences (Table 3).

Independent t-test scores for attachment were significantly different after, but not before the intervention, between the two groups. In fact, relaxation trainings led to an increase in maternal attachment in the experimental group as compared to the control group. The results of paired t-test after the intervention showed a significantly different increase in attachment in the experimental group, but this difference was not significant in the control group (Table 4).

The mean of maternal-infant attachment behaviors during the first breastfeeding in the experimental group was higher than the control group. In addition, comparison between different aspects of behavior in the two groups showed that sustained intimacy in the both groups was at the highest, whereas the quality of care was at its lowest levels. Independent T-tests demonstrated significant differences in the affectionate behavior (aspect 1), the intimacy behavior (aspect 2), caring behaviors (aspect 3), and mother attention to the baby (aspect 4) between the two groups. Also, statistically significant differences in the mean of all mother-infant attachment behaviors were found between the two groups ( $P < 0.001$ ). Attachment scores were significantly higher in the experimental group than in the control group (Table 4).

**Table 1.** The Demographic and Obstetric Characteristics of the Women under Study

Characteristic *	Case, No. (%)	Control, No. (%)	P value
<b>Employment status</b>			
Employed	5 (11.9)	2 (4.8)	0.248
Unemployed	37 (88.1)	40 (98.2)	0.248
<b>Education</b>			
Junior high-school graduate	6(14.3)	18 (42.9)	0.078
High-school graduate	26 (61.9)	21 (50.0)	0.078
College graduate	10 (23.8)	3 (7.1)	0.078
<b>Marital satisfaction</b>			
Satisfied	37 (88.1)	37 (88.1)	1.000
Dissatisfied	5 (11.9)	5 (11.9)	1.000
<b>Family income, per month</b>			
≥ USD284	18 (42.8)	15 (35.8)	0.372
< USD284	24 (57.2)	27 (64.2)	0.372
<b>Sex of fetus (echography)</b>			
Girl	13 (31.0)	20 (47.6)	0.869
Boy	22 (52.4)	18 (42.9)	0.869
Unknown	7 (16.6)	4 (9.5)	0.869
<b>Age, years</b>			
18-25	24 (57.3)	32 (76.4)	0.097
25-35	18 (42.7)	10 (23.6)	0.097

\* Three million Iranian Rials converted to US dollars on May 29, 2011

**Table 2.** Comparison of Scores for Anxiety in Pregnant Women in the Experimental and Control Groups

	Before Intervention, Mean ± SD	After Intervention, Mean ± SD	Diference between be- fore and after interven- tion, Mean ± SD	P Value (paired T- test)
<b>Case group</b>	44.9 ± 4.7	44.2 ± 5.6	0.8 ± 0.5	0.309, (Not significant)
<b>Control group</b>	45.4 ± 4.0	47.4 ± 4.9	2.0 ± 4.0	0.002, (Significant)
<b>P Value, (Independent T-test)</b>	0.618, Not Significant	0.005, Significant	0.006, Significant	

**Table 3.** Comparison of Scores for Anxiety Trait and Anxiety State between Pregnant Women in the Experimental and Control Groups

	Case Group, Mean ± SD	Control Group, Mean ± SD	P Value, (Independent T-test)
<b>Anxiety trait</b>			
Before Intervention	22.0 ± 2.8	22.0 ± 2.4	0.920
After Intervention	21.8 ± 3.1	23.3 ± 3.2	0.034
<b>Anxiety state</b>			
Before intervention	22.9 ± 2.5	23.5 ± 2.3	0.308
After Intervention	22.3 ± 2.9	24.1 ± 2.9	0.005

**Table 4.** Comparison of scores for Maternal-fetal Attachment in Pregnant Women in the Experimental and Control Groups

	Before intervention, Mean ± SD	After Intervention, Mean ± SD	Diference between Be- fore and After, Mean ± SD	P value, (paired T- test)
Case group	60.1 ± 4.7	63.6 ± 4.3	2.4 ± 3.3-	P < 0.001
Control group	60.2 ± 4.5	61.1 ± 51	0.8 ± 7.0-	P = 0.444
P value, (Independent t-test)	0.897	0.017	0.048	

## 5. Discussion

The findings of this study showed that the anxiety level decreased after relaxation trainings in the experimental group whereas it increased in the control group. Also, the results showed a significant difference in the mean of attachment behaviors of mothers before childbirth and at the first mother-newborn encounter compared to the control group. So, mothers in the experimental group were more caring and attentive to their babies. The overall mean of mother-infant attachment behaviors showed a statistically significant difference between the two groups.

The prenatal education focused on physical fitness, emotional and mental health, health promotion and improving attachment behaviors. These courses can improve childbirth, delivery status and the maternal-fetal attachment (24). Prenatal education is a dynamic process in which parents acquire information about physical and emotional changes in pregnancy, childbirth and parental behaviors. These trainings diminish stress and increase the mothers' knowledge about pregnancy, childbirth, child care and communication, and skills for coping with anxiety and labor pain through physical preparedness such as relaxation and breathing techniques (25).

There are three basic principles in obstetrics for reducing pain and anxiety. These include simplicity, safety and maintaining fetal homeostasis. Among non-pharmacological methods, relaxation is more effective (26). Relaxation training as an educational intervention is cost-effective and safe has been suggested to reduce anxiety, especially during pregnancy. This method is not only effective in the context of comfort or relaxation but also has positive outcomes such as reduction in oxygen consumption and metabolism, decreased breathing and reduced heart rate and systolic and diastolic blood pressure (27). Also, focusing on relaxation techniques including breathing, allows the woman to stay calm during labor and save the energy for childbirth. However, relaxation trainings and midwife's support can decrease labor pain and delivery time and have a positive effect on maternal fetal attachment (28). The study of Price et al., showed that most women demonstrated the need for prenatal education through midwives' support and contact (29). This was shown by the studies of Viens et al., and Morawez who demonstrated that relaxation training reduced anxiety and stress, on the other hand, relaxation improved sleep status and reduced anxiety and physical

and mental stress (30, 31).

The study of Ost and colleague showed that relaxation was effective on various aspects of stress (32). Also, the findings of present study was consistent with those of Deckro et al., who showed the impact of relaxation on reducing anxiety and perceived stress (33). The study also revealed that relaxation caused an increase in maternal-fetal attachment, which is clearly a promising non-pharmacological method in pregnancy. Prenatal care through intervention provides a good opportunity to improve and evaluate maternal-fetal attachment (34). In the current study, attachment level after the intervention was significantly different between the two groups. Also, the mean difference of attachment before and after the intervention was significantly different between the two groups. Similarly, Chang et al., found that prenatal classes can increase maternal-fetal attachment (35). On the other hand, beneficial mental and social effects of group working and supportive, intimate and friendly atmosphere of group training may supplement the educational intervention beside the effects of relaxation exercises (36, 37). In addition, the relaxation exercises practiced at home by the participants involved mental and self-reporting which were uncontrollable and considered as the limitations of the present study. Another limitation of the study, beside others, was the lack of long-term follow-up of the educational impact of this method, which can be resolved by further research. The positive effect of non-pharmacological methods such as relaxation on pain relief and reducing anxiety has been established among people in general and pregnant women in particular. Therefore, the midwives, as the first group from the health team, have an important role in learning and applying these methods in order to combat maternal anxiety.

The results of this study showed that relaxation training, as one of the new midwifery training, can reduce anxiety and increase maternal-fetal attachment. Given that anxiety has harmful effects on pregnancy and is detrimental to physical and mental health of pregnant women and maternal-fetal attachment, the use of relaxation training, without medication, is recommended as an effective method to reduce anxiety in clinical care for pregnant women.

## Acknowledgements

The present article was extracted from the thesis written by Monireh Tousi with grants No: 89- 5099. Hereby

I would like to thank the vice chancellor for research of Shiraz University of Medical Sciences for their financial support. Also, the authors would like to thank Dr Nasrin Shokrpour in the Center for Development of Clinical Studies of Nemazee Hospital for editorial assistance.

### Authors' Contribution

Mrs. Toosi: Design, literature search, definition of intellectual content, data acquisition, experimental studies, manuscript preparation. Mrs. Akbarzadeh: Concepts design, literature search, Definition of intellectual content, Manuscript preparation, review and corresponding. Mrs. Sharif: Design, definition of intellectual content. Mr. Zare: Design, statistical analysis.

### Financial Disclosure

By vice chancellor for research of Shiraz University of Medical Sciences.

### Funding/Support

There is no funding or support for this research.

### References

- Cunningham F G, Leveno K, Bloom S, Hauth J, Rouse D, Spong C. *Williams obstetrics*. 23rd ed New York: McGraw-Hill Publication; 2010.
- McKee MD, Cunningham M, Jankowski KR, Zayas L. Health-related functional status in pregnancy: relationship to depression and social support in a multi-ethnic population. *Obstet Gynecol*. 2001;**97**(6):988-93.
- Bunevicius A, Cesnaite E, Kusminskas L, Mockute I, Bunevicius R. Antenatal mental state and anthropometric characteristics of the neonates: Impact of symptoms of depression and anxiety. *Biol Psychiatry Psychopharmacol*. 2007;**9**(1):7-10.
- Arai YC, Ueda W, Ushida T, Kandatsu N, Ito H, Komatsu T. Increased heart rate variability correlation between mother and child immediately pre-operation. *Acta Anaesthesiol Scand*. 2009;**53**(5):607-10.
- Pillitteri A. *Maternal & child health nursing Care of the childbearing & childrearing family*. 4th ed. Philadelphia: Lippincott Williams & Wilkins; 2003.
- Weinstock M. The long-term behavioural consequences of prenatal stress. *Neurosci Biobehav Rev*. 2008;**32**(6):1073-86.
- Saisto T, Salmela-Aro K, Nurmi JE, Kononen T, Halmesmaki E. A randomized controlled trial of intervention in fear of childbirth. *Obstet Gynecol*. 2001;**98**(5 Pt 1):820-6.
- World Health Organization. *Maternal mental health and child health and development in low and middle income countries*. Geneva: WHO; 2008.
- Davis E. *Heart & hands: A midwife's guide to pregnancy and birth*. 4th ed Berkeley, CA: Celestial Arts; 2004.
- Consonni EB, Calderon IM, Consonni M, De Conti MH, Prevedel T, Rudge MV. A multidisciplinary program of preparation for childbirth and motherhood: maternal anxiety and perinatal outcomes. *Reprod Health*. 2010;**7**:28.
- Bergström M, Kieler H, Waldenström U. Effects of natural childbirth preparation versus standard antenatal education on epidural rates, experience of childbirth and parental stress in mothers and fathers: A randomized controlled multicentre trial. *BJOG*. 2009;**116**(9):1167-76.
- Wang SM, Kulkarni L, Dolev J, Kain ZN. Music and preoperative anxiety: a randomized, controlled study. *Anesth Analg*. 2002;**94**(6):1489-94.
- McEwen A, Moorthy C, Quantock C. The effect of videotaped pre-operative information on parental anxiety during anesthesia induction for elective pediatric procedures. *Paediatr Anaesth*. 2007;**17**(6):534-9.
- Gangi H. *Development psychology*: Baesat Publication; 2003.
- Young G, Jewell D. Interventions for preventing and treating pelvic and back pain in pregnancy. *Cochrane Database Syst Rev*. 2002(1):CD001139.
- Saisto T, Toivanen R, Salmela-Aro K, Halmesmaki E. Therapeutic group psychoeducation and relaxation in treating fear of childbirth. *Acta Obstet Gynecol Scand*. 2006;**85**(11):1315-9.
- Gedney JJ, Glover TL, Fillingim RB. Sensory and affective pain discrimination after inhalation of essential oils. *Psychosom Med*. 2004;**66**(4):599-606.
- Hur MH, Cheong N, Yun H, Lee M, Song Y. [Effects of delivery nursing care using essential oils on delivery stress response, anxiety during labor, and postpartum status anxiety]. *Taehan Kanho Hakhoe Chi*. 2005;**35**(7):1277-84.
- Cranley MS. Development of a tool for the measurement of maternal attachment during pregnancy. *Nurs Res*. 1981;**30**(5):281-4.
- Tilokskulchai F, Phatthanasiriwethin S, Vichitsukon K, Serisathien Y. Attachment behaviors in mothers of premature infants: a descriptive study in Thai mothers. *J Perinat Neonatal Nurs*. 2002;**16**(3):69-83.
- Alder J, Urech C, Fink N, Bitzer J, Hoesli I. Response to induced relaxation during pregnancy: comparison of women with high versus low levels of anxiety. *J Clin Psychol Med Settings*. 2011;**18**(1):13-21.
- Primo CC, Amorim MH. Effects of relaxation on anxiety and salivary IgA levels in puerperae. *Rev Lat Am Enfermagem*. 2008;**16**(1):36-41.
- Gupta JK, Nikodem VC. Commercial hospital discharge packs for breast feeding women. *Birth*. 2001;**28**(1):62.
- Lowdermilk DL, Perry SE. *Maternity and women's health care*. 9th ed St. Louis: Mosby; 2007.
- Nichols FH, Humenick SS. *Childbirth education: practice, research and theory*. 2nd ed Philadelphia: W.B Saunders Company; 2000.
- Roykulcharoen V, Good M. Systematic relaxation to relieve post-operative pain. *J Adv Nurs*. 2004;**48**(2):140-8.
- Tiran D, Mack S. *Complementary therapies for pregnancy and childbirth*. 2nd ed Edinburgh: Baillier & Tindall; 2000.
- Hodnett ED. Pain and women's satisfaction with the experience of childbirth: a systematic review. *Am J Obstet Gynecol*. 2002;**186**(5 Suppl Nature):160-72.
- Price S, Noseworthy J, Thornton J. Women's experience with social presence during childbirth. *MCN Am J Matern Child Nurs*. 2007;**32**(3):184-91.
- Morawetz D. Insomnia and depression: Wiche comes first. *Sleep Res Online*. 2003;**5**(2):77-81.
- Viens M, De Koninck J, Mercier P, St-Onge M, Lorrain D. Trait anxiety and sleep-onset insomnia: evaluation of treatment using anxiety management training. *J Psychosom Res*. 2003;**54**(1):31-7.
- Ost LG, Breitholtz E. Applied relaxation vs. cognitive therapy in the treatment of generalized anxiety disorder. *Behav Res Ther*. 2000;**38**(8):777-90.
- Deckro GR, Ballinger KM, Hoyt M, Wilcher M, Dusek J, Myers P, et al. The evaluation of a mind/body intervention to reduce psychological distress and perceived stress in college students. *J Am Coll Health*. 2002;**50**(6):281-7.
- Ustunsoz A, Guvenc G, Akyuz A, Oflaz F. Comparison of maternal and paternal-fetal attachment in Turkish couples. *Midwifery*; **26**(2):1-9.
- Soon Bok C, Ki Young K, Eun Soon K. Changes of maternal-fetal attachment and self efficacy for delivery after the taekyo-perspective prenatal class. *koren J Women Health Nurs*. 2001;**7**(1):7-17.
- Alexander J, Anderson T, Grant M, Sanghera J, Jackson D. An evaluation of a support group for breast-feeding women in Salisbury, UK. *Midwifery*. 2003;**19**(3):215-20.
- Klier CM, Muzik M, Rosenblum KL, Lenz G. Interpersonal psychotherapy adapted for the group setting in the treatment of postpartum depression. *J Psychother Pract Res*. 2001;**10**(2):124-31.