

# The Effectiveness of Prenatal Intervention on Pain and Anxiety during the Process of Childbirth-Northern Iran: Clinical Trial Study

Firouzbakht M<sup>1,2</sup>, Nikpour M<sup>2,3</sup>, Khefri S<sup>4</sup>, Jamali B<sup>1</sup>, Kazeminavaee F<sup>1</sup>, Didehdar M<sup>5</sup>

<sup>1</sup>Department of Midwifery, Islamic Azad university, Babol Branch, Babol, Departments of <sup>2</sup>Social Determinant of Health,

<sup>3</sup>Midwifery and <sup>4</sup>Science, Babol University Medical Science, <sup>5</sup>Department of Psychology, Elicit and Researchers Club, Tehran, Iran

## Address for correspondence:

Dr. Maryam Nikpour,  
Department of Midwifery, Babol  
University Medical Science, Babol, Iran.  
E-mail: maryamnikpour19@yahoo.com

## Abstract

**Background:** Due to the painful nature of childbirth and its maternal and neonatal complications, the woman needs support in this phase of their life. Increased knowledge and skills during pregnancy prepares pregnant mothers for labor and leads to promoted health. **Aim:** This study was designed to evaluate the effectiveness of “prenatal education” on the process of childbirth. **Subjects and Methods:** This clinical trial was conducted on 195 pregnant women, that is, control group ( $N = 132$ ) and case group ( $N = 63$ ) attending health centers in Amol-Iran from 20 weeks of gestation age during 2012. Case group members attended in “prenatal education” class and the control group only received routine care. Data were collected through demographic questionnaire, standard hospital anxiety questionnaire, and a checklist related to childbirth information, and intensity of pain based on visual analogue scale and McGill scales. The data were analyzed by Statistical Package for the Social Sciences software using *t*-test and Chi-square test. **Results:** The result of this study showed that the parent with a high level of education was more interested to participant in prenatal classes. The anxiety level in case group (who received education) was 14.47 (4.69) and in control group it was 16 (4.86), ( $P < 0.001$ ) the pain intensity in case group was 85.68 (1.85) and in control group was 90.99 (14.72) ( $P = 0.03$ ), intervention on labor such episiotomy was 39 %66.1 (39/63) in case group and 80 %72.8 (80/132) in control group ( $P = 0.01$ ) and cesarean section was 13 %17.1 (13/63) in case group and 58 %32.2 (58/132) in control group ( $P = 0.01$ ). **Conclusions:** According to findings of this study, the prenatal education and psychological support are beneficial for mothers during pregnancy and labor. Therefore, it is recommended for educating all the pregnant women.

**Keywords:** Delivery, Obstetric, Pregnancy training classes, Prenatal care, Prenatal education

## Introduction

Childbirth is a life-turning event, in the most basic sense of the word. It means giving birth to a new life but also becoming something new: A parent. The birth of a child alters all aspects of the new parents' lives.<sup>[1]</sup> Both their inner and outer worlds change and these changes last forever. A new personality adapted to the needs of the baby evolves, and for a woman the physiological transformations are profound. In all cultures and

times, women have used rites or strategies and sought support from more experienced women during these deep life changes. This need for support is also associated with awareness of the fact that childbirth is associated with pain<sup>[2]</sup> and risk of infant and maternal morbidity.<sup>[3]</sup> Even these days, despite of very low threats to the infant's and mother's health for women who have access to modern obstetric care, and pain relief, the women and their partners still are worry about the birth.<sup>[4]</sup>

Over 90% of prenatal stress and anxiety is related to the process of childbirth.<sup>[5]</sup> Mother's anxiety in this period mostly is due to the lack of knowledge and prenatal fear of the unknown risks and childbirth. As a result of fear and anxiety, secretion of stress hormones increases and can lead to preterm birth, lack of progress, low birth weight of the child, and fetal hypoxia.<sup>[6]</sup> Women's access to all health services, along with increased awareness through education and counseling during pregnancy

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and childbirth are critically effective factors in the prevention from mortality and complications in this stage. Promotion of prenatal knowledge and skill prepares mothers for delivery and enhance their health. Today, emphasized by United Nations Educational, Scientific and Cultural Organization, learning is devoted part of human life.<sup>[7]</sup>

In many parts of the world, prenatal and delivery trainings that educate pregnant women and their spouses about childbirth and parenthood is routinely provided for women as part of prenatal care.<sup>[8]</sup>

In Iran, prenatal care is limited to regular examinations, tests, and ultrasound. This program is insufficient for mothers and their lack of knowledge and preparation cause anxiety and increased medical interventions, especially cesareans.<sup>[6,9]</sup> Cesarean section (CS) in Iran is performed on 40% of cases, while World Health Organization (WHO) recommends 15%, it is 23% in the U.S., and 10.7% in Sweden.<sup>[6]</sup> Implementation of safe labor policies, mother-friendly hospitals, prenatal education classes, and establishing standard delivery wards together with changes of attitude and behavior of midwives and obstetricians could help reduce cesarean and other emergency interventions.<sup>[10]</sup>

Many studies have shown positive and useful effects of prenatal education classes. In a study by McGrath and Kennell (2008) in Sweden, applying prenatal education the rate of CS and the need for epidural in the trained group had significantly reduced.<sup>[11]</sup> In a study in Spain (2010), trained mothers' anxiety level was lower, but no difference was observed in duration of the first and second stages of delivery, type of delivery, perineal injury, and 5-min Apgar of the baby.<sup>[12]</sup> In a study in Iran by Mehdizadeh *et al.* (2003), back and hip pain and fatigue were less in trained mothers. In addition, the rate of cesarean and duration of delivery stages were significantly lower in trained women.<sup>[6]</sup> In another study done by Bergstrom (2009), use of epidural anesthesia in the trained group compared to the standard group had not reduced; also in experience of delivery and level of parents stress, no improvement observed.<sup>[13]</sup>

This study was conducted to assess the effect of prenatal training classes on the process of delivery at Imam Ali Hospital in Amol/Iran during 2012–2013.

## Subjects and Methods

The proposal of this study approved by the Islamic Azad University of Babol and code and Ethical approval was 51561910717008/2013. 8.23.

### Sampling

This study was a semi-experimental study from June 2012 to April 2013 in health centers of Amol-Iran. Simple random sampling was used, and the sample size was determined through other studies.<sup>[6]</sup> Two hundred and ninety-two women

were selected at the governmental healthcare center of the city of Amol, Iran. The inclusion criteria were as follows: Completion of the 5<sup>th</sup> grade of elementary school, current gestational age of 16–20 weeks, 17–35-year-old, and no contraindication for natural delivery, without any complication during pregnancy. The women who interested in attending prenatal classes were selected as the case group (102 people), and the rest were selected as a control group (190 people).

### Intervention

The case group attended eight training sessions run by four doulas (women having experienced childbirth before and trained in this regard) at two private consultation and healthcare centers of the city of Amol. Each class lasted 90 min into three parts. Part one was about physical and anatomical changes during pregnancy, psychological health, warning symptoms during pregnancy, the pros and cons of vaginal and caesarian delivery, stages of delivery, breastfeeding, and family planning theoretical training, that was presented by means of audio-visual instruments like videos of natural delivery. Part two included consultations of 15 min long in forms of questions and answers. Part three covered mental and muscular exercises, training proper positions during labor and delivery, proper breathing during pregnancy, labor and delivery, and 30 min of practicing for pregnant women. The control group were conducted routine prenatal care.

### Tools

The questionnaires included demographic information, pregnancy information, and labor information. Hospital Anxiety and Depression Scale (HADS) was used to assess anxiety, visual analog scale (VAS) and McGill questionnaire were used to assess pain. The Persian version of HADS is a standardized tool<sup>[14]</sup> whose reliability and validity was confirmed by Montazeri. He has been found to be 0.78 for HADS for anxiety subscale and 0.86 for HADS depression subscale.<sup>[15]</sup> It has seven four-point Likert scale questions; with lower scores showing less anxiety.

Visual Analog Scale is one of the numerical visual scales with scores 0–100. 0 means no pain and one 100 shows the highest amount of pain felt by the patient.<sup>[16]</sup>

The McGill pain questionnaire (MPQ) with three sensory, affective, and evaluative aspects is a strong tool to assess pain,<sup>[17]</sup> and numerous studies have approved its reliability and validity.<sup>[18]</sup> The MPQ reliability and validity was confirmed by Adelmanesh *et al.* (2011), the internal consistency was found by Cronbach's alpha to be 0.951, 0.832, and 0.840 for sensory, affective, and total scores, respectively. Item to subscale score correlations supported the convergent validity of each item to its hypothesized subscale. Correlations were observed to range from  $r^2 = 0.202$  to  $r^2 = 0.739$ .<sup>[19]</sup> In the present study, the affective aspect of pain was assessed, including tiring, sickening, fearful, and punishing that is attributed to labor pain as a punishment because the affective aspect indicates

a wide range of feelings ranging from merely feeling ill to extremely feeling pain. In this questionnaire, lower points indicate less pain. Four observers collected data from samples. The reliability of the observer was 0.72.

**Procedure**

When labor pain began, in case group a doula accompanied the parturient to the labor room in Imam Ali Hospital in Amol/Iran, and during labor performed all the procedures she had learned: Comforting, reassuring, encouraging, talking, and massaging her back, shoulders, and limbs, helping with the best position for different stages of labor, using acupressure to reduce pain, using birth balls, and applying counter-pressure on sacrum, and parturient walking. The midwife completed HADS questionnaire on arrival, VAS at cervical dilatation 3–4, 8–10 cm and the second stage of labor, and McGill scale during the active phase of labor. Information about progress of labor, need for oxytocin and analgesic, type of delivery, and condition of the newborn (weight, Apgar score, breastfeeding) were collected using a questionnaire. The control group received only routine prenatal care by the delivery room personnel.

**Statistics**

Data were analyzed by analysis of covariance, *t*-test and Chi-square test, using Statistical Package for the Social Sciences version 16 analytical software (233, South Wacker Drive, 11<sup>th</sup> Floor, Chicago, USA). The significance level was set at 0.05.

**Results**

Initially, 292 women were selected for the study, of whom 97 (10 due to noncooperation, 4 due to incomplete questionnaires, 12 because of high-risk pregnancies, 71 due to emergency cesareans) were excluded from the study (39 in case group, and 58 in control group). Statistical analysis was performed on 195 women (132 in the control group and 63 in case). The result of this study showed that the parent with a high level of education were more interested to participant in prenatal classes ( $P = 0.07$ ,  $P = 0.03$ ). The anxiety level in case group (who received education) was 14.47 (4.69) and in control group, it was 16 (4.86), ( $P < 0.001$ ), the pain intensity in case group was 85.68 (1.85) and in control group was 90.99 (14.72) ( $P = 0.03$ ). The demographic characteristics include age, mother and spouse occupation, education level, parity, income level, and place of residence, demonstrated in Table 1.

There is a significant effect of intervention after controlling for the effect of education, parity, and age in pain  $F(1, 191) = 8$ ,  $P = 0.02$  and pain anxiety  $F(1, 191) = 72$ ,  $P = 0.01$ . This implies the group who received education experienced lower pain and anxiety during labor in compare to the group who did receive only usual care [Table 2].

Study results indicated that there was no significant difference between groups in duration of the first and second stages of

**Table 1: Demographic characteristics of study groups**

Demographic characteristics	Classes education group	Control group	P
Age (mean±SD)	25.42 (4.9)	25.62 (5.28)	0.99
Weight (kg)	68.2 (11.8)	67.8 (13.4)	0.88
Length (m)	1.62 (0.14)	1.59 (0.17)	0.56
<b>n (%)</b>			
Mother education			
Primary	15 (24.2)	66 (50.0)	0.03
High school	28 (45.2)	40 (30.3)	
University	19 (30.6)	26 (19.7)	
Father education			
Primary	19 (31.7)	71 (53.8)	0.12
High school	20 (33.3)	35 (26.5)	
University	21 (35.5)	26 (19.7)	
Mother occupation			
Housewife	52 (83.9)	116 (87.9)	0.44
At work	10 (16.1)	16 (12.1)	
Father occupation			
Employer	17 (27.4)	18 (13.6)	0.18
Worker	11 (17.7)	30 (22.7)	
Business	34 (54.8)	84 (63.6)	
Residency			
City	36 (63.2)	59 (48.4)	0.06
Village	56 (90.3)	63 (51.6)	
Income level			
Low	6 (9.7)	15 (11.4)	0.72
Average	56 (90.3)	117 (88.6)	

SD: Standard deviation. \*Mothers education and residency are significant

**Table 2: Adjusted results of comparing the education and control group in pain and hospital anxiety**

Variables	Covariates	Sum squares	Df	Mean squares	F
Hospital anxiety	Education	19.883	1	19.883	1.730
	Age	4.226	1	4.226	0.368
	Parity	1884.725	1	1884.725	164.033
	Groups	834.753 <sup>a</sup>	1	834.753	72.651*
	Error	1406.429	191	7.364	
Pain	Education	20.419	1	20.419	0.358
	Age	35.530	1	35.530	0.622
	Parity	1.060	1	1.060	0.019
	Group	480.854 <sup>b</sup>	1	480.854	8.420*
	Error	1259.250	191	6.593	

\*significant. <sup>a</sup> $R^2=0.839$  (adjusted  $R^2=0.824$ ), <sup>b</sup> $R^2=0.201$  (adjusted  $R^2=0.127$ )

labor, use of oxytocin, and need for analgesic. However, in educated mothers CS rate ( $P = 0.01$ ) and episiotomy rate ( $P = 0.02$ ) were significantly reduce. In terms of the infant’s condition, no significant difference was found between the two groups in terms of baby’s weight, head circumference, 5-min Apgar and breastfeeding. In terms of pain intensity using VAS, the results showed the difference between the two groups were insignificant in a latent phase (3–4 cm in cervical dilatation), and in the second stage. However, in a transitional phase (8–10 cm in cervical dilatation), pain intensity was significantly less in the case group. Comparison of McGill

scale score in the two groups during active delivery phase showed significantly lower score in trained mothers [Table 3].

## Discussion

The results of this study showed that the prenatal education reduced level of hospital anxiety and intensity of pain in trained women, as well as the need for episiotomy and emergency cesarean. The results from World Bank and WHO studies on 4000 American women showed that use of breathing techniques and massage caused reduction in fear and pain of delivery, resulting in reduced rate of cesarean and mother and baby complications.<sup>[20]</sup>

Ip *et al.* believed that based on Bandura’s self-efficacy theory the educational intervention is effective in promoting pregnant women’s self-efficacy for childbirth and reducing their perceived pain and anxiety in the first two stages of labor.<sup>[21]</sup>

In 2007, a systematic review by Gagnon and Sandall was conducted evaluating the effect of both individual and group antenatal education for childbirth or parenthood. They concluded that high-quality evidence was lacking and that the effects of antenatal education are largely unknown. However, since 2007, more randomized trials have been conducted, and results from these trials might alter this conclusion. They were included nine

trials, involving 2284 women. No consistent results were found. No data were reported concerning anxiety, breastfeeding success, or general social support. Knowledge acquisition, sense of control, factors related to infant-care competencies, and some labor and birth outcomes were measured. This high-quality study showed similar rates of vaginal birth after CS in “verbal” and “document” groups (relative risk 1.08, 95% confidence interval 0.97–1.21).<sup>[22]</sup>

Another review in 2010 by Bryanton and Beck reported that the benefits of educational programs to participants and their newborns remain unclear. Education on sleep enhancement appears to increase infant sleep and education about infant behavior potentially enhances mothers’ knowledge; however, more and larger, well-designed studies are needed to confirm this.<sup>[23]</sup>

Adequate and correct training increased mothers’ awareness about pregnancy and delivery and enabled them to use of problem-solving strategies.<sup>[3,24]</sup> Furthermore, adaptation of the trained group and use of skills to apply these techniques causes reduction of anxiety, pain, and even postnatal depression.<sup>[25]</sup>

The results of this study showed that the duration of different stages of delivery did not have a significant difference in two groups. While in a study by Gupta and Nikodem,<sup>[26]</sup> and Mehdizade *et al.*<sup>[6]</sup> duration of delivery stages was shorter in trained women. In Bergstrom study (2009), natural childbirth preparation including training in breathing and relaxation did not decrease the use of epidural analgesia during labor, either did it improve the birth experience or affect parental stress in early parenthood in nulliparous women and men, compared with a standard form of antenatal education.<sup>[13]</sup>

In the hospital where this study was conducted, oxytocin is routinely used to induce labor. Furthermore, methods such as changing positions and breathing technique trainings were used for untrained mothers by midwifery students and some delivery ward personnel. These could perhaps be the reason for the lack of difference between groups in duration of delivery. Since this hospital is a child-friendly hospital, breastfeeding begins for all infants without problem within the first ½ h of birth. In this study, no difference was observed in Apgar, weight, and breastfeeding start. In Smith study (2010), no differences were seen in Apgar and weight of the infant, either.<sup>[27]</sup>

There was a significant difference between education level of case and control groups education level. This is explainable with method of administration of two groups because mothers who were interested to participation in classless were more educated. The weeks of this study were that the cases were not selected randomly because we could not deprive a woman of attending training classes if she was interested. The subjects of the two groups were not matched for education; mothers having completed higher levels of education more likely took part in these classes. Then, the effect of the agent on the main variables was adjusted in the analysis.

**Table 3: Obstetrics characteristics of study groups**

Characters	Case group (%)	Control group (%)	P
Parity			
Nulipar	39 (63.9)	66 (50)	0.09
Multipar	22 (36.1)	66 (50)	
Mode of delivery			
Vaginal	63 (82.9)	122 (67.7)	0.02*
Spontaneous delivery	11 (16)	17 (13.9)	0.80
Episiotomy	39 (66.1)	80 (72.8)	<0.001*
Laceration	13 (19.1)	25 (20.5)	0.70
Cesarean section	13 (17.1)	58 (32.2)	0.01*
	<b>Mean (SD)</b>		
Gestational age (week)	38.7 (1.8)	39 (2.3)	0.64
Weight of baby (kg)	3.58 (0.49)	3.36 (0.39)	0.36
Apgar (5 min)	9.3 (0.89)	9.49 (0.62)	0.54
Head circumference (cm)	34.1 (2.8)	34.3 (1.3)	0.32
Length of labor			
1 <sup>st</sup> stage (h)	6.43±3.65	5.92±4.94	0.52
2 <sup>nd</sup> stage (min)	41.04±25.75	41.78±28.6	0.46
3 <sup>rd</sup> stage (min)	4.40±2.57	4.12±2.25	0.89
Pain intensity			
First phase	38.13 (28.007)	40.61 (29.5)	0.58
Latent phase (3-4 cm)	85.68 (18.5)	90.99 (14.72)	0.03*
Transitional phase (8-10 cm) second phase labor	86.08 (18.37)	90.44 (16.64)	0.19
McGill in the second phase labor	8.34 (2.35)	9.16 (2.14)	0.01*

\*significant. SD: Standard deviation



## Conclusion

Prenatal education and psychological support of mothers during labor reduce anxiety, pain intensity, and interventions like episiotomy and CS. Prenatal trainings as part of routine pregnancy care could be used as an effective means of improving mothers' health. This study included some limitations such as lack of randomization and unmatched groups. The authors suggest to future researchers to select sample from several culture with different variables to evaluate the effectiveness of education on delivery.

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