

## Evaluation of Pregnancy, Delivery, and Postpartum Effectiveness of Maternity School Trainings Organized Based on the Guideline of Ministry of Health in Turkey: A Comparative Study

### Abstract

**Background:** There are uncertainties and contradictions in the literature about the effectiveness of maternity schools. The purpose of this study is to determine the effectiveness of prenatal trainings performed in an institutional and disciplined manner. **Methods:** This study was prospectively conducted between 2018 and 2019, and 245 primiparous pregnant women who gave birth in our hospital were examined. On a volunteer basis, a study group ( $n = 108$ ) was created including patients who attended the maternity school trainings and a control group was created including patients who did not attend these trainings ( $n = 137$ ). Both groups were compared in terms of caesarean section rates, active phase periods of birth, visual analogue scale (VAS) during active labor, Edinburgh Postnatal Depression Scale (EPDS) score, time from birth to first skin contact, newborn Apgar scores, and admission rates to the neonatal intensive care unit. **Results:** Caesarean section rates were significantly lower in the maternity school group (21.1% versus 29.19%). In the maternity school group, the active phase period of delivery was shorter ( $p < 0.001$ ), VAS was lower during active labor ( $p < 0.001$ ), and EDPS score was lower ( $p < 0.001$ ). Education level was higher in the maternity school group than in the control group ( $p < 0.001$ ). **Conclusions:** Institutional and disciplined antenatal pregnancy trainings provide significant benefits during pregnancy, delivery, and postpartum period depression by especially reducing the rates of caesarean section and postpartum depression.

**Keywords:** Apgar score, caesarean section, Edinburgh postnatal depression scale, pregnancy, prenatal education

### Introduction

Pregnancy is an important period of physiological, psychological, and social changes in a woman's life and requires adaptation to these changes.<sup>[1]</sup> Lack of knowledge and experience especially in first pregnancies increases the anxiety of pregnant women during pregnancy follow-up and labor and may lead to a bad delivery experience. Pregnancy and delivery are a physiological phenomenon, and pregnant women may face many risks during this period.<sup>[2]</sup> Therefore, pregnant women should be provided with necessary examinations and monitoring at regular intervals during pregnancy and immediately in emergencies, and appropriate care and training should be provided by midwives, nurses, and physicians.<sup>[2,3]</sup> For this purpose, as a result of pregnancy information class trainings performed by health institutions,

expectant mothers go through all these periods without any problems because they have knowledge about pregnancy, birth, and postpartum period.<sup>[4,5]</sup> Providing these trainings in the form of pregnancy information classes and encouraging the participation of pregnant women in prenatal care training may help this practice to be used worldwide.<sup>[6]</sup> Systematic review with previous studies on this subject has shown that evidence is insufficient to determine the effect of antenatal training in small classes on obstetric and psychosocial outcomes.<sup>[7]</sup>

The purpose of this study was to find a solution to the uncertainty in literature by showing the effectiveness of institutional and disciplined antenatal trainings on obstetric and psychosocial results. The purpose of this study is institutional and disciplined prenatal education; to determine the effect on delivery mode, active phase duration at birth, maternal depression rates, and neonatal morbidity rates.

**How to cite this article:** Mutlu S, Ozkaya E. Evaluation of pregnancy, delivery, and postpartum effectiveness of maternity school trainings organized based on the guideline of Ministry of Health in Turkey: A comparative study. *Int J Prev Med* 2021;12:173.

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10.4103/ijpvm.IJPVM\_391\_20

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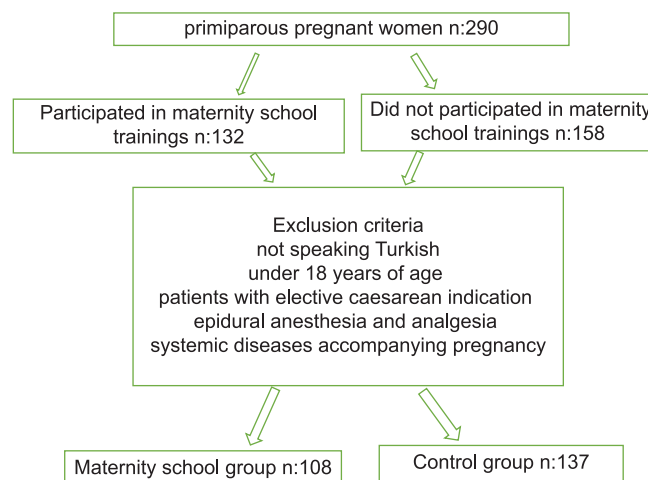


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## Methods

In this prospective cohort study, 290 primiparous pregnant women whose pregnancy was followed and who gave birth in our hospital between 2018 and 2019 were examined. In the first follow-up of pregnant women who presented to the polyclinic for the purpose of pregnancy follow-up, a risk assessment form was used and we planned how to conduct follow-up. At least four quality follow-ups were planned for pregnant women with no risk based on prenatal care protocol as follows: first follow-up during the first 14 weeks, second follow-up between weeks 18 and 24, third follow-up between weeks 30 and 32, and fourth follow-up between weeks 36 and 38. Appropriate tests were requested for weeks in the follow-up program determined by the Ministry of Health.<sup>[4]</sup> In the first follow-up; urine analysis, blood tests (blood type, hemoglobin, thyroid stimulating hormone, glucose) were performed. First trimester screening test was recommended to pregnant women between 11 and 14 weeks of gestation. In the second follow-up, oral glucose tolerance test, urine, and hemogram analysis with fetal anomaly screening was recommended. Nonstress test was performed in addition to urine and hemogram tests at the third and fourth follow-ups. Each patient was provided routine information about physiological and pathological conditions that may occur during pregnancy as well as the maternity school and services in our hospital. All patients were encouraged to participate. The study group included patients participating in the maternity school training on a voluntary basis. In total, 132 patients who participated in maternity school trainings and 158 patients who did not participate were identified. Further, 10 patients who did not participate in all maternity school trainings, 4 patients under 18 years of age, 2 patients who did not speak Turkish and could not communicate, and 8 patients who had indications for elective cesarean section in their follow-up (large infant and abnormalities of placental placement) were excluded from the study. The remaining 108 patients were included in the maternity school group. Five patients who did not attend maternity school trainings and did not come to routine pregnancy controls, two patients under 18 years of age, four patients who did not speak Turkish, and ten patients who developed an indication for elective cesarean section were excluded. In addition, 137 patients were included in the control group. A total of 245 patients were included in the study. In addition to patients aged less than 18 years and not speaking Turkish, patients with elective cesarean indication such as presentation anomalies, placenta previa, and large infants during follow-up in both groups and patients undergoing epidural anesthesia and analgesia as well as patients with systemic diseases accompanying pregnancy (gestational diabetes, preeclampsia, etc.) were excluded from the study.



**Figure 1: Distribution of patients included in the study**

The hospital where this study was conducted received maternity school certificate after meeting the criteria of the Ministry of Health in 2018, and the maternity school training was provided according to the program determined by the Ministry of Health.<sup>[8]</sup> Trainings were conducted in three sessions by educators in five different fields. The educators comprised individuals who attended the training organized by the Ministry of Health and who received certificates. The groups included maximum of ten pregnant women. Each educator provided trainings that lasted 20 min. In pregnant school education; in the first session; reproductive organs, the formation of pregnancy, physiological, and psychological changes during pregnancy. In the second session, daily life during pregnancy (pregnancy and working life, travel, sex life, exercise), signs of emergency situation, and what to do during pregnancy, risky pregnancies, common problems, and solutions during pregnancy, nutrition and nutritional support, pregnancy follow-up, routine tests and immunization, use of medication during pregnancy. In the third session, delivery process, methods to reduce labor pain, and facilitate delivery. In the fourth session, postpartum period and its characteristics, postpartum physiological changes in the mother, psychological changes in the puerperium, puerperal role. Pregnant women were trained under main topics, such as compliance, feeding the newborn, and first care of the newborn in the postpartum period. In childbirth preparation training for fathers, main topics were how to support the pregnant woman about the fear of labor and labor, physiological, and psychological changes of the pregnant woman, methods of coping with the fear of fatherhood, important issues in postpartum sexual life, postpartum sex life, methods of coping with the anxiety about life changes, methods of bonding with mother and baby, pregnancy and the role of the father after pregnancy. Standard prenatal care was provided for the control group. Patients' follow-up in the delivery room was initiated during the active phase of delivery (>4 cm, 60% cervical effacement); therefore, the latent phase duration of the

**Table 1: Indications for cesarean section of patients**

	Study group	Control group	<i>P</i>
Indications for cesarean section			
Fetal distress	11 (%10.11)	10 (%7.29)	<i>P</i> >0.167
Obstructed Action	5 (%3.7)	19 (%13.86)	<i>P</i> <0.001
Cephalopelvic Disproportion (CPD)	9 (%8.33)	11 (%8.02)	<i>P</i> >0.914
TOTAL	25 (23.14)	40 (29.19)	<i>P</i> <0.001

patients was unknown. The follow-up of the patients was performed by a three-member midwife team who worked for 12 h on a watch basis in the delivery room. Management of complications and cesarean deliveries was performed by physicians working in the form of 24-h watches. In the active phase of delivery, analgesia was not performed in any groups. As a method of pain management, applications, such as perineum massage, exercise with Pilates ball, and warm shower were performed. Patients in active labor with 5-cm cervical dilatation were asked to indicate their pain on a 10-point VAS scale, and a VAS score was calculated for each patient. During postpartum week 4 control, the patients were questioned for postpartum depression using the EPDS. Patients who scored over 13 points were considered the risk group in terms of depression.<sup>[9]</sup> Both groups were compared in terms of cesarean section rates, active phase duration of delivery, VAS scores during active labor, time from birth to first skin contact, and EPDS score.

### Statistical methods

Statistical analysis was performed with SPSS 17.0. Normally, distributed data were presented as mean with SD. Categorical outcomes were summarized using frequency distributions. For quantitative data, Student's-t test was used. For categorical data, we calculated *P* value with Chi-square or Fisher exact tests. For time-to-delivery data, we constructed Kaplan–Meier survival curves and calculated log-rank test and *P* value. A *P* value of 0.05 was used as the cut-point for significance.

### Results

Distribution of included patients was shown in Figure 1. Cesarean section rates were significantly lower in the study group (23.1% versus 29.19%) [Table 1]. The first indication for cesarean section was fetal distress in the study group (10.18%), whereas the most frequent cesarean section indication in the control group was obstructed action (13.86%). In the study group, the active phase period of delivery was shorter (*p* < 0.001), VAS was lower during active labor (*p* < 0.001), and EPD score was lower (*p* < 0.001). Time from birth to first skin contact after delivery was 22 min in the study group and 33 min in the control group, which was significantly shorter (*p* < 0.001) [Table 2].

Body mass indexes of the study group were lower than the control group [Table 2]. It was found that education level in the study group was higher than that in the

control group [Table 2]. Admission rates to the neonatal intensive care unit (6.5% versus 9.3%) and neonatal jaundice rates (6.4% versus 7.3%) were similar between the two groups. Apgar scores of newborns for 1 and 5 min were similar in both groups [Table 3]. There was no significant difference between intergroup neonatal weights [Table 4]. There was no difference between the mean age of both groups and the gestational week at birth (*p* > 0.679) [Table 2]. There was no difference between indications for cesarean section of patients [Table 1]. Although there was a significant difference between the groups in terms of active phase duration of birth, survival analysis revealed similar active phase duration between the groups [Figure 2].

In the case group; vaginal repair was performed under general anesthesia due to episiotomy hematoma in two patients, wound infection in one patient, and deep vaginal laceration in one patient among those who had normal vaginal delivery. In the control group, one patient developed episiotomy hematoma and two developed wound infection. In addition, three patients underwent repair under general anesthesia due to deep vaginal laceration. Two patients developed third degree perineal laceration. In the study group of patients who gave birth with cesarean section, two patients developed wound infection. In the control group, one patient developed incision subcutaneous hematoma and two developed wound site infection.

### Discussion

Cesarean delivery rates are increasing over the years in Turkey similar to that worldwide.<sup>[10]</sup> Important reasons for increased rates of cesarean section include pain intolerance, incompatibility with childbirth, and prolongation in the second stage of delivery due to agitation and fear of childbirth.<sup>[11]</sup> Delivery by caesarean section leads to the nonformation of natural flora and increased lung problems in the infant as well as wound infection, embolism, bleeding, caesarean section scarring pregnancy in subsequent pregnancies, placental invasion anomalies, and complications of anesthesia in the mother.<sup>[12,13]</sup> As a result of the trainings provided to pregnant women and relatives in the study, fear of birth, pain management methods, and exercise programs, vaginal birth rates are increased by providing active participation of pregnant women in delivery. In a recently published study from Turkey; it is seen that pregnant schools, regardless of education level,

**Table 2: Comparison summary of some demographic and clinical parameters of groups**

	Groups	n	Mean	Std. deviation	P
Age (years)	Control	137	25.44	10.552	>0.709
	Study	108	24.45	3.354	
EPDS	Control	137	10.37	3.924	<0.001
	Study	108	7.82	3.210	
VAS	Control	137	9.81	0.420	<0.001
	Study	108	7.70	1.070	
Duration of active phase of labor	Control	137	12.13	3.573	<0.001
	Study	108	9.05	3.488	
Gestational age at delivery (weeks)	Control	137	39.13	1.565	>0.05
	Study	108	38.83	1.611	
Time from delivery to first skin contact (min)	Control	137	33.09	24.189	<0.001
	Study	108	22.22	19.696	
Hb change (gr/dl)	Control	137	1.50	0.548	>0.05
	Study	108	1.34	0.675	
Body mass index (BMI)	Control	137	28.9	1.248	<0.05
	Study	108	33.1	1.675	

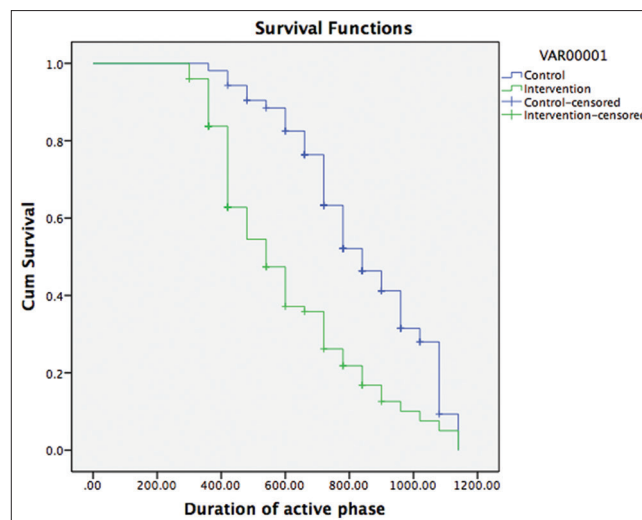
**Table 3: Newborn Apgar scores**

	Study group	Control group	P
Apgar 1.Min	≤6	4 (%3.7)	P=0.154
	>7	104 (%96.3)	
Apgar 5.Min	≤6	4 (%2.9)	P=0.214
	>7	106 (% 98.15)	

**Table 4: Newborn weight**

	Study group	Control group	P
Birth weight	<2500 gr	11 (%8.02)	P=0.955
	2500-3999 gr	118 (%86.10)	
	≥4000 gr	8 (%5.83)	

income level, working status of pregnant women, are effective in all age group pregnant women.<sup>[14]</sup> The World Health Organization in order to achieve the targeted rate of cesarean in Turkey, pregnant schools are very effective tools. (Effect of pregnant schools on birth types) In the maternity school group, as the vaginal birth rates were high and the patients in this group were provided information that skin contact was useful for mother and baby attachment and breast milk during antenatal training, patients were willing to perform vaginal birth; therefore, the time from birth to the first contact was shorter in this group. Additionally, previous report also indicated the systematic antenatal education program, as part of routine antenatal care services, to be an effective project to reduce the rate of interventional labor and promote pregnant women’s conscious participation to the labor process.<sup>[15]</sup> Maternal birth preference is a very important issue, which was reported to be influenced by prenatal educational



**Figure 2: Survival analysis curve of active phase of labor**

classes.<sup>[16]</sup> Birth pain is thought to develop due to tissue hypoxia caused by muscle tension and uterine contractions as a result of fear and stress as well as many psychosocial factors.<sup>[17]</sup> In our study, relaxation and breathing techniques were used during delivery to reduce the fear and tension during delivery as a result of the training provided to pregnant women, and thus, the VAS scores in these patients were lower.<sup>[18]</sup> Depression during pregnancy and especially in the postpartum period negatively affects both the mother and the baby.<sup>[19]</sup> Therefore, prevention, diagnosis, and treatment of depression and anxiety are very important for the health of the mother and baby. In developing countries, deterioration of quality of life and maternal and infant mortalities may occur due to preventable problems in pregnancy, delivery, and postpartum period.<sup>[20]</sup> In our study, it was found that these conditions could be prevented by providing comprehensive training and support to pregnant women including information about pregnancy, childbirth, and postpartum period. Furthermore, in a published Cochrane review, 48 studies that involved 4937 participants and covered three types of program: behavioral, cognitive-behavioral and multimodal were included in the analysis, analysis showed that group-based parenting programs led to statistically significant short-term improvements in depression and satisfaction with the partner relationship. Authors concluded that the use of parenting programs might improve the short-term psychosocial wellbeing of parents.<sup>[21]</sup> Another multicenter randomized trial showed that antenatal psychosomatic programming to decrease of depressive symptoms in women was not conclusive. However, a higher birth weight and lower rate of preterm childbirth was observed in experiment group, authors concluded that “the psychosomatic approach may be more helpful to the target population than the standard antenatal programs.”<sup>[22]</sup> Consistent with our results, in a recently published study from Turkey, authors suggested childbirth education classes to be effective approach to increase the

knowledge of pregnant women and positively contribute in pregnancy, labor, and the postpartum process.<sup>[14]</sup> In our study, it is observed that the pregnancy weight is within physiological limits in terms of weight gained during pregnancy. According to the traditions in Turkey, diets of pregnant women are planned in an uncontrolled manner.<sup>[23]</sup> In the control group, it was clearly observed that the body mass index was too high. It is known that excess weight gain has significant health disadvantages and increases rates of cesarean section.<sup>[24]</sup> It seems that maternity schools are quite useful in this aspect. Our study is a prospective cohort, nonrandomized study. Groups were created in a nonrandomized manner, which is a disadvantage of our study. It was not possible to supervise the practice exercises and the proposed behavior changes in the training provided to patients as a result of their personal lives. However, it was verbally confirmed that patients complied with the proposed behavior changes and exercises that were taught during their training. In addition, because the education levels of the patients attending this school were higher than those of the patients in the control group, further studies are needed to expand the study and create more homogeneous groups in terms of education levels.

Based on current information, our study is the first to assess the impact of the prenatal training program on postpartum depression scores in a single center.

## Conclusions

Our data revealed lower cesarean section rates, shorter active phase of delivery, lower VAS during delivery, shorter time from birth to first skin contact, and lower Edinburgh Depression scores in pregnant women participating in prenatal training. Cesarean delivery and postpartum depression rates will decrease with the institutionalization of these schools worldwide and by providing training in a disciplined manner.

## Acknowledgments

This study was approved by the ethical committee of Karabük University (No. 14/8 No. 77192459-050.99-E637).

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

**Received:** 15 Jul 20 **Accepted:** 27 Nov 20

**Published:** 14 Dec 21

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