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Mentored Research: Randomized Controlled Trial

Effects of acupressure on the childbirth satisfaction and experience of birth: A randomized controlled trial

Fatemeh Mahmoudikohani ^a, Shahnaz Torkzahrani ^{b,*}, Kiarash Saatchi ^c, Maliheh Nasiri ^d^a School of Nursing and Midwifery, Bam University of Medical Sciences, Bam, Iran^b Department of Midwifery, Faculty of Nursing and Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran^c Acupuncture Medicine Association, Tehran, Iran^d Department of Biostatistics, Faculty of Paramedic, Shahid Beheshti University of Medical Sciences, Tehran, Iran

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ABSTRACT

Background: Complementary and alternative medicines have been used to increase comfort and relaxation in mothers during labor. Comforting and preparing the mother in labor can create a positive birth experience. The aim of this study was to evaluate the effect of acupressure on childbirth satisfaction and the experience of giving birth in women with full-term pregnancy, before the onset of labor.

Methods: In 2016, a randomized clinical trial study was conducted in Shahid Akbar Abadi Hospital, Tehran, Iran, enrolling 120 pregnant women at 39–40 gestational weeks with no signs of the onset of labor. They were divided randomly into acupressure, sham acupressure, and control groups. Acupressure points including SP6, BL 60, and BL 32 were pressured bilaterally. Interventions were performed by the researcher, the mother and her relative (husband). Childbirth satisfaction was measured 24 h after delivery. The collected data were analyzed by SPSS software and comparing tests were Chi-squared, Kruskal-Wallis, ANOVA tests ($P \leq 0.05$).

Results: The total childbirth satisfaction did not differ significantly among the three groups ($P = 0.460$), but the acupressure group had a higher level of satisfaction than the other two groups. Moreover, statistical tests regarding the expectations of the childbirth experience showed a significant difference among the groups ($P = 0.033$). The actual birth was closest to the expectations of subjects in the acupressure group.

Conclusion: This study demonstrated that acupressure may be used as a method in order to attempt to provide a good birth experience and satisfaction of childbirth.

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1. Introduction

The satisfaction of the mother is one of the most important indicators of quality of care during childbirth (Matsubara et al., 2013; Mohammad et al., 2014). It affects the health of mother and infant as well as the maternal-neonatal relationship (Matsubara et al., 2013; Mohammad et al., 2014). Childbirth satisfaction refers to the woman's satisfaction with childbirth experiences during birth and the postpartum period (Fair and Morrison, 2012). Women's experiences from childbirth influence their lives and various communication levels, including communication with their family, and with previous and newborn children (Ford and Ayers,

2009). A woman's dissatisfaction with childbirth may lead to her making the decision to have a cesarean delivery for subsequent births (Waldenström et al., 2004). In addition, there are risks for the mother and infant imposing high costs on both individuals, and insurance organizations. Dissatisfaction with childbirth contributes to an increase in medical interventions such as caesarean section rates (Waldenström et al., 2004). The mother's satisfaction with the birth experience increases self-confidence and positive expectations in the mother for subsequent births (Waldenström et al., 2004). Dissatisfaction with the childbirth experience is associated with postpartum depression, post-traumatic stress disorder (PTSD), and anxiety in mothers which can influence women's lives (Guittier et al., 2014). Among the important aspects to consider when evaluating birth satisfaction in the postpartum period is the association between experiencing labor pains and physical discomfort, negative emotions, happiness, emotional compatibility, and perinatal

* Corresponding author. Shahid Beheshti University of Medical Sciences, Tehran, 7661771967, Iran.

E-mail address: mahmodi2020@yahoo.com (S. Torkzahrani).

care (Gungor and Beji, 2012). The outcome of the childbirth experience is multi-dimensional and interdependent upon other factors (Gungor and Beji, 2012), including healthcare providers, previous childbirth experiences, mothers' participation in the treatment process and delivery, and the type of delivery (Spaich et al., 2013). The support provided by caregivers and involvement of the patient in the decision-making process have been identified as key factors related to childbirth satisfaction (Spaich et al., 2013).

Acupuncture and acupressure were introduced about 3 decades ago in Iran, but acupressure has not been widely practiced and is rarely used in pregnancy and labor in Iran (Bai, 2015). Acupressure is a technique that creates a balance of energy, known as qi in TCM, in the body (Mollart et al., 2015). Stimulation of acupuncture and acupressure points can stimulate and improve blood circulation and vital energy, harmony between yin and yang, and the secretion of neurotransmitters, thus maintaining normal body functions and causing comfort in the body (Mollart et al., 2015). In addition, performing acupressure before the beginning of labor induces relaxation and comfort for the mother during labor; therefore, it prepares the mother for the birth (Vernharðsdóttir, 2008; Torkzahrani et al., 2016). Comforting and preparing the mother before labor can create a positive birth experience for her (Mohammad et al., 2014).

A study conducted by Hamidzadeh et al. in 2011, showed that performing acupressure at the LI4 point during labor has a positive effect on childbirth satisfaction. Another study showed that mothers in the stimulated acupuncture points group were more willing to use this method for their next birth than women in the placebo group who received a very low stimulation (Chao et al., 2007).

A few studies have evaluated the effects of acupressure applied during labor on maternal birth satisfaction (Mortazavi et al., 2012), but there have been no studies on the effects of applying acupressure prior to the onset of labor on women's satisfaction with childbirth in various aspects so far. Since the efficacy of applying this method to these acupressure points on childbirth satisfaction has not been evaluated, this research studied the effect of acupressure on childbirth satisfaction in women with full-term pregnancy at 39–40 weeks.

2. Methods

2.1. Design and sample

This study was a clinical trial conducted with three study groups on pregnant women referred to the maternity ward in Shahid Akbar Abadi Hospital, Tehran, Iran, between March 2016 and May 2016. The protocol for this study was approved by the Ethics and Research Committee of Shahid Beheshti University of Medical Sciences (No. IR.SBMU.RAM.REC.1394.635, Date 7/03/2016). The trial is registered at the Iranian Registry of Clinical Trials, number IRCT2016030821904N2.

After obtaining written and verbal informed consent, pregnant women were divided into acupressure ($n = 40$), sham acupressure ($n = 40$), and routine care ($n = 40$) groups by the researcher using a computer-randomization system (see Fig. 1). The randomization code was only revealed after completing the clinical study. Mothers were randomized into the 'no-treatment' control group. The researcher alone was aware of the intervention group (single blind). Routine care was performed by the two research assistants (with 10 years of work experience) who were unaware of the research groups. Data was kept confidential, and data entry was done using password protected computers. The questionnaires included only identity codes. Participants were allowed to withdraw from the study at any time.

In this single-blind clinical trial, 120 pregnant women who were referred to the Shahid Akbar Abadi Hospital in Tehran were enrolled in the study by the researcher. Finally, 109 mothers completed the study. Inclusion criteria were: age 18–35 years old; nulliparous; low risk pregnancy; gestational age 39–40 weeks as estimated by ultrasound before 12th week; singleton cephalic presentation; normal BMI; Bishop score ≤ 4 ; had vaginally delivered a healthy infant; not taking drugs 36 h before and up to the end of the study; and not having sexual intercourse 24 h before and up to the end of study. Exclusion criteria included: taking chemical or herbal drugs; having sexual intercourse; not doing acupressure on schedule; caesarean birth; and severe health problems (of either mother or newborn) during childbirth or immediately after childbirth.

2.2. Intervention

Subjects were allocated to one of the three groups including acupressure, sham acupressure and routine care. The intervention groups were asked by the researcher to refer to the hospital between half an hour and one hour after breakfast at 9 and 11 a.m. for administration of acupressure and sham acupressure. Acupressure and sham acupressure were performed by the researcher every other day between 9 a.m. and 11 a.m. Acupressure and sham acupressure were performed by the mother and her husband after training by the researcher. Subjects were corrected and asked to relocate points as needed. A written instruction manual was used during the training and was given to the participant for reference. This manual consisted of instructions for locating and stimulating each point along with picture diagrams. These methods were carried out between the hours of 3 and 5 p.m. and on the following day of the intervention in the morning and afternoon. In the acupressure group, points including bladder 32, spleen 6, and bladder 60 spots were stimulated. Bladder 32 is located on the bladder meridian and in the region of the sacrum, medial and inferior to the posterior superior iliac spine, in the second sacral foramen (Yu et al., 2015; Lee & Lee, 2011). Spleen 6 is located on the spleen meridian and 5 cm above the inside of the ankle on the Tibia (Yu et al., 2015; Mucuk and Baser, 2014). Bladder 60 is located on the bladder meridian and at the midpoint between the prominence of the lateral malleolus and the Achilles tendon (Yu et al., 2015; Chen and Wang, 2014).

In the acupressure and sham acupressure groups, pressure was applied on the points for 1 min and then a 1 min interval as rest time, so that each point would be pressed 5 times. Acupressure and sham acupressure points were subjected to pressure respectively, and after the completion of acupressure and sham acupressure at each point, the next point was pressed. The total intervention time was 30 min. In the sham acupressure group, three ineffective acupressure points, 5 cm above the midpoint upper edge of the patella on the quadriceps, the midpoint of the patella, and the top of the prominence of lateral malleolus were pressed. The routine care group also received routine healthcare services.

The bilateral method of pressure was applied on the points with appropriate force (half of the fingernails turned white) and this method was continued to create stimulation reactions such as hotness, drowsiness, soreness, numbness, pinching, and pressing. The average force ranged from 3.53 to 3.82 kg for each finger. The pressure was measured by a digital force gauge until creation of stimulation reactions.

The administration of acupressure and sham acupressure was begun at 39–40 weeks gestational age. The administration of intervention and routine care on subjects were continued for as long as the mother had not shown childbirth symptoms until the end of 41 weeks in accordance with country guidelines. Depending

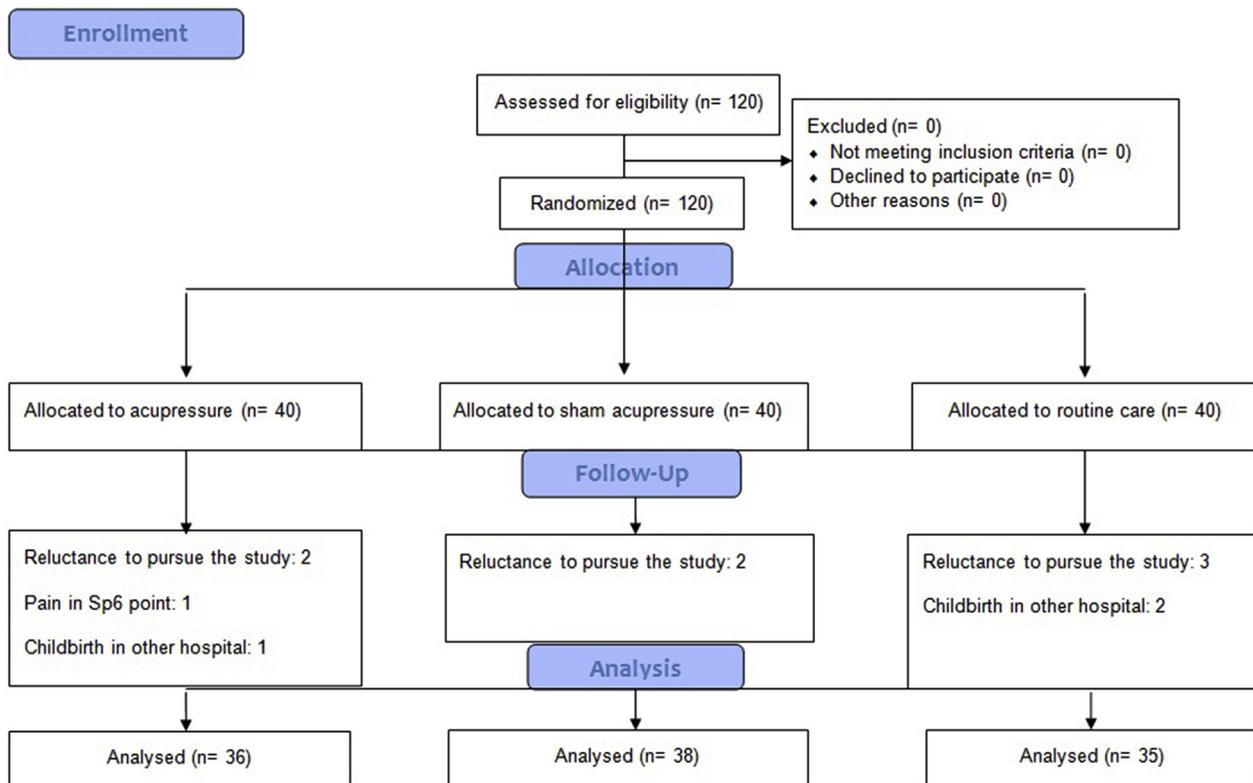


Fig. 1. The flow of participants through the study. Legend: SP6 - Spleen 6 spot.

on the initiation of childbirth symptoms, the number of acupressure sessions varied from one to five for each of the mothers. Also, mothers allocated to the control group received routine medical care.

During the study, subjects were asked to refer to the hospital and call the researcher if they had any bleeding, rupture of membrane, decreased fetal movement, onset of labor pain, or any other problems. In each group, routine care during labor, fetal non-stress test and recording of information related to the labor process were performed by two research assistants (with 10 years of work experience) who were unaware of the research groups.

2.3. Data collection

The tools used for collecting information were demographic and obstetric data questionnaires and a daily record form. The validity of questionnaires was assessed through the content validity. The daily record form was confirmed through test-retest reliability by Cronbach's Coefficient Alpha 0.81. In this regard, after passing a training course with an acupuncture specialist, the reliability of the researcher's work was confirmed by the acupuncturist through observing the administration of the process in ten individuals at the same time and completing the relevant form ($\kappa = 0.81$).

Satisfaction was measured by the Mackey Childbirth Satisfaction Rating Scale 24 h after birth, which in this study was consisted of 4 sub-dimensions: satisfaction with self (6 items), baby (3 items), midwife (8 items) and partner (1 item). Subjects indicated their degree of satisfaction with each item on a 5-point Likert scale ranging from (0) very dissatisfied to (4) very satisfied. The scale was designed by M. Mackey and P. Goodman. The scale has been found to have good validity and reliability in healthy populations (Dolatian et al., 2008; Moudi and Tavousi, 2016; Christiaens and Bracke, 2007).

2.4. Data analysis

Statistical analysis was performed using the SPSS 22.0. Means and standard deviation (SD) were computed. ANOVA was used to compare groups if the data were normally distributed and for unpaired groups with non-parametric data, Kruskal-Wallis test was used. Data were analyzed by Analysis of Chi-squared, Kruskal-Wallis, and analysis of variance (ANOVA) tests ($P \leq 0.05$).

3. Results

Initially, 120 pregnant women were enrolled in this study. Subsequently, 11 patients were excluded due to the lack of desire to continue the study (2 patients in the acupressure group, 2 patients in the sham acupressure group and 3 patients in the routine care group) and birth in another hospital (1 patient in the acupressure group and 2 patient in the routine care group). One patient was excluded due to experiencing pain at the acupressure point. Finally, 109 patients completed the study (see Fig. 1).

The demographic and obstetric characteristics among the groups, including age, BMI, gestational age and Bishop score before entering the trial showed no statistically significant differences (see Table 1, Table 2). In this study, the mean maternal age was 23.45 years (SD 3.64 years) and the mean gestational age at time of enrollment was 39.71 weeks (SD 0.3 days).

In terms of childbirth satisfaction dimensions (including the satisfaction with self) statistical tests showed a significant difference among the groups ($P = 0.033$). Satisfaction with self was higher in the acupressure group than in other groups (see Table 3). The statistical tests showed no significant difference among the three groups in terms of satisfaction with partner and baby, satisfaction with midwife and total satisfaction of childbirth.

No statistically significant differences were found among the

Table 1
Demographic characteristics of participants.

Variables ^a	Acupressure	Sham acupressure	Routine care	P-Value
Maternal age (years)	23.58 ± 3.7	23.63 ± 3.86	23.14 ± 3.34	0.825
BMI	24.62 ± 2.39	25.20 ± 2.35	24.71 ± 2.45	0.531
Highest frequency mother education (high school)	14 (38/9%)	19 (50%)	19 (54/3%)	0.425
Highest frequency husband's education (high school)	14 (38.9%)	20 (52.6%)	22 (62.9%)	0.121
Highest frequency mother's profession (housewife)	34 (94/4%)	37 (97/4%)	34 (97/1%)	0.729
Highest frequency husband's profession (free work)	27 (75%)	30 (78/9%)	29 (82/9%)	0.757

^a Values are given as mean ± standard deviation (SD) and number (%).

Table 2
Obstetrics characteristics of participants.

Variables ^a	Acupressure	Sham acupressure	Routine care	P-Value
Gestational age (week)	39.71 ± 0.27	39.67 ± 0.34	39.76 ± 0.27	0.485
Participation in childbirth preparation classes	4 (11/1%)	2 (5/3%)	1 (2/9%)	0.343
Prenatal care (>5 times)	34 (94/4%)	36 (94/7%)	33 (94/3%)	0.996
Bishop score before trial entry	2.17 ± 1.08	2.11 ± 1.27	2.17 ± 1.07	0.991
Apgar score, 1st min	8.31 ± 0.47	8.32 ± 0.47	8.34 ± 0.48	0.942
Apgar score, 5th min	9.06 ± 0.23	9.05 ± 0.23	9.09 ± 0.28	0.821
Fetal weight (gr)	3309.72 ± 178.01	3305.26 ± 195.83	3391.43 ± 227.68	0.131

^a Values are given as mean ± standard deviation (SD) and number (%).

Table 3
Childbirth satisfaction.

Variables ^a	Acupressure	Sham acupressure	Routine care	P-Value
Satisfaction with self	11.46 ± 2.47	10.39 ± 2.96	9.86 ± 3.23	0.033
Satisfaction with partner	1.11 ± 0.62	1.05 ± 0.52	1.03 ± 0.45	0.768
Satisfaction with baby	7.58 ± 1.13	7.50 ± 1.27	7.66 ± 1.62	0.963
Satisfaction with midwife	17.69 ± 4.61	17.95 ± 4.51	17.77 ± 3.99	0.968
Total childbirth satisfaction	78.78 ± 9.38	76.58 ± 6.65	77.66 ± 6.29	0.460
Expectations of the labor pain experience	2.08 ± 0.65	1.97 ± 0.79	1.69 ± 0.72	0.052
Expectations of the childbirth experience	2.22 ± 0.64	1.95 ± 0.57	1.86 ± 0.60	0.033
Individual assessment of the labor pain experience	2.14 ± 0.64	1.84 ± 0.72	1.80 ± 0.68	0.073
Individual assessment of the childbirth experience	2.22 ± 0.54	2.03 ± 0.75	1.86 ± 0.60	0.052

^a Values are given as mean ± standard deviation (SD) and number (%).

three groups regarding the expectations of the labor pain experience, childbirth experience, and individual assessments of labor pain, although the acupressure group had a better assessment in terms of the experience of labor pain than the other groups. However, statistical tests showed significant differences among the acupressure, sham acupressure and control groups in terms of expectations of the childbirth experience ($P = 0.033$); and the actual birth was more like the expectations of subjects in the acupressure group.

4. Discussion

In this study, demographic characteristics including age, profession, and level of education of mother and husband, BMI, and obstetric characteristics including gestational age and neonatal outcomes showed no significant differences among the three study groups. Furthermore, no significant differences were found in terms of childbirth satisfaction among the study groups. A significant difference was observed among the groups in terms of satisfaction with self; and satisfaction with self was significantly higher among subjects of the acupressure group than those in the other two groups. In a study conducted by Hamidzadeh et al. the effects of LI4 acupressure during labor have been evaluated. The results showed that the satisfaction rate was significantly higher in the acupressure group than the control group (Hamidzadeh et al., 2011). In the present study, acupressure performed before childbirth seemed to better prepare mothers psychologically for

delivery. Several other studies have shown that women who have been prepared for birth before the onset of labor are usually more satisfied with their labor and birth experience (Elvander et al., 2013).

According to the findings of the current study, the acupressure, sham acupressure and control groups did not significantly differ in terms of satisfaction with partner. Low satisfaction in the three groups can be attributed to the ban on husbands entering the delivery room during the birth. The acupressure group and sham acupressure group had higher rates of satisfaction of partner than the control group, although the difference was not statistically significant. The reason for this difference may be related to the husband's participation before the onset of labor in the acupressure and sham acupressure groups. The acupressure and sham acupressure were carried out between the hours of 3 and 5 p.m. and on the following day of the intervention in the morning and afternoon by the mother and her husband.

No significant difference was observed among the three groups regarding the satisfaction with baby, satisfaction with midwife, and total childbirth satisfaction. The results of this study showed no significant differences among the study groups in terms of expectations of the labor pain experience and individual assessment of the labor pain and childbirth experience, but the acupressure group had a higher rate of satisfaction of labor pain and childbirth and a significantly higher rate of satisfaction in terms of expectations of the childbirth experience than the other groups. In a study conducted by Chao et al., the effects of electrical nerve stimulation at

acupuncture points on labor pain were evaluated, and they found a significant difference between the acupuncture and control groups in terms of satisfaction with the use of this method (Chao et al., 2007). Stimulation of acupuncture and acupressure points can stimulate and improve blood circulation and energy, or qi, and the secretion of neurotransmitters, thus maintaining normal body functions and causing comfort in the body (Lee & Lee 2011; Torkzahrani et al., 2017). Acupressure can be used to relieve symptoms, support the healing process, promote relaxation, and improve overall health (Wagner, 2015, Yoopat et al 2015).

Many women may feel some degree of pain, but globally, they are satisfied with the childbirth experience (Goodman et al., 2004; Elvander et al., 2013). Thus, negative feelings can coexist with positive feelings through the use of effective interventions during or after labor. Although childbirth satisfaction is a multidimensional concept that influences the birth experience (Goodman et al., 2004; Elvander et al., 2013), in this study acupressure has a positive effect on childbirth satisfaction in the dimension of satisfaction with self by creating comfortable and positive emotions in the mother and preparing her for the best birth experience. Perhaps if the acupressure was continued during labor, the mothers would be satisfied in terms of all dimensions of childbirth satisfaction. Satisfaction with self and having expectations of labor and childbirth were the most significant predictors of all aspects of satisfaction. Therefore, supportive interventions before or during labor can increase a woman's ability to maintain personal control during labor and can encourage positive expectations of childbirth. In this study, depending on the initiation of childbirth symptoms, the number of acupressure sessions varied from one to five for each of the mothers. If the mothers did not have any symptoms of the childbirth initiation, the intervention was performed for five sessions. We did not compare these results with the number of acupressure sessions.

In conclusion, in this study stimulating acupressure points had positive effects on participant's self-reported perception of childbirth satisfaction and experience of delivery.

Conflicts of interest

The authors declare no conflict of interest.

Ethics approval

This study has been approved by the Ethics and Research Committee of Shahid Beheshti University of Medical Sciences (No. IR.SBMU.RAM.REC.1394.635, Date 7/03/2016).

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jbmt.2019.04.002>.

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