

# Effect of Pelvic Movements using Birth Ball and Listening to Nature sounds and Honey Syrup Consumption on Labor Pain in Nulliparous Women: A Randomized Clinical Trial

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## Abstract

**Background & Aim:** Childbirth is a stressful event in women's lives. Therefore, the management of labour pain is an important goal of perinatal care. The aim of this study was to investigate the effect of pelvic special movements using a birth ball, listening to nature sounds and honey syrup consumption on labour pain in nulliparous women.

**Material and Methods:** In this randomized clinical trial, 66 nulliparous pregnant women admitted to a teaching hospital were recruited. Samples were divided randomly into intervention and control groups. The intervention group, on starting labour contractions, performed pelvic tilt movements such as tilting forward and backward, left and right using a birth ball, listened to nature sounds and consumed honey syrup. It was continued during the active phase from cervical dilation 4-5 cm to the transitional phase (cervical dilatation 8 cm). The control group received routine care. Pain was measured using the visual analog pain score scale every 30 minutes. Data was analyzed using statistical software SPSS v.16.

**Results:** The mean score of pain showed a significant difference between the groups at the end of the intervention ( $p < 0/001$ ).

**Conclusion:** The results of this study showed that pelvic movements using a birth ball could reduce labour pain in nulliparous women. Therefore, the use of this method during labour is suggested. Also, healthcare providers need to get familiar with this method in degree education and on the job training.

**Key words:** Honey syrup, pain management, active phase of labour, birth ball.

## Introduction

Pregnancy, childbirth and parenting are crucial events in women's life. They influence aspects of mothers' lives (1). In most cases, women have many concerns about pregnancy conditions and labour pain (2). Therefore, the management of labor for pregnant mothers has a special importance (3), and needs the recognition and offering (?) of methods that can manage different phases of labor to achieve the ultimate goals of midwifery and health promotion (4). Therefore, many non-pharmacological approaches are used to reduce pain in labor and childbirth (5, 6). Pharmaceutical methods of pain management including opioids or epidural anesthesia are used, and may produce negative consequences for the mother and child. In developed countries the use of non-pharmacological methods for pain relief have increased. Non-pharmacologic methods reduce pain, prevent suffering during labor and childbirth and facilitate childbirth. They include relaxation, acupuncture, hydrotherapy, cryotherapy, herbal medicine (7), heat therapy (8), music therapy (9), aromatherapy (10), electrical nerve stimulation (11, 12), massage therapy and reflexology (11, 13), birth ball (14, 15) and hypnosis (16, 17). Some of these methods are more acceptable to mothers including pelvis movements using birth ball (14, 15), nature sounds (18), music therapy (9), use of oral liquid (19) including honey and palm syrups (20), and heat therapy (8). According to the results of research conducted in 2003-2007, the use a combination of methods in labor and childbirth is suggested (21, 22). It is suggested that the use of certain methods in combination with other pain relief methods can help with managing pain in labor and childbirth (23). The results of a meta-analysis on the use of complementary medicine methods to reduce pain, and suffering in labor and childbirth indicated that during pain management, complementary medicine in combination

with other methods helped achieve greater effectiveness and increased mothers' compliance during labor and childbirth (7). On the other hand, a very limited combination of non-pharmacologic methods to manage pain in labor and childbirth is available. Also, most methods of complementary medicine on pain during the active phase of labor cannot be used in the first 30 minutes (10, 18, 22). Since a goal of healthcare is to reduce mothers' suffering during labor and childbirth (24), a combination of several methods to provide more favorable conditions for pregnant women is required. The effectiveness of pain relief after the first 30 minutes is related to creating psychological favorable conditions, reducing pain of labor, improving and creating a sense of confidence during labour. There are the guidelines recommended by the Ministry of Health and Medical Education (7) for the combination of interventions. Accordingly, a combination of low-cost and safe interventions such as listening to nature sounds, honey syrup for taking energy and exercise that helps improve childbirth was used in this study. Also, pelvic movements with or without the use of birth ball along with other methods was used to achieve maximum pain management. The aim of this study was to investigate the effect of pelvic special movements using a birth ball, listening to nature sounds and honey syrup consumption on labour pain in nulliparous women.

## Methods

After the approval of the Ethics Committee affiliated with Iran University of Medical Sciences, 66 pregnant women were selected using a convenient sampling method from a teaching hospital in an urban area of Iran. Given confidence interval 95%, power 80% and taking into account the possibility of a 10% dropout in samples, the sample size was determined at 33 patients in each group using the following sampling formula:

$$\frac{1}{1-f} \times \frac{2(Z_{1-\alpha/2} + Z_{1-\beta})^2 S^2}{(\mu_1 - \mu_2)^2}$$

$$\mu_1 - \mu_2 = d = 2$$

$$Z - \beta = 0.84$$

$$Z - \frac{\alpha}{2} = 1.96 \quad \longrightarrow \quad \% 95 \text{ Given the level of confidence}$$

$$N = \frac{2(Z_{1-\alpha/2} + Z_{1-\beta})^2 \times S^2}{(\mu_1 - \mu_2)^2} \quad N = \frac{2(1.96 + 0.84)^2 \times (2.7)^2}{(2.0)^2} = 28.57 \approx 30$$

Inclusion criteria for sampling were age 35-20 years, gestational age 38-42 weeks, cephalic presentation, physical and mental health, no history of infertility, vaginal childbirth, cervix opening at a rate of 5 inches length for less than six hours, no history of allergy to honey, no fear of listening to nature sounds such as sea waves etc. Exclusion criteria included lack of desire to continue with the study, leaving the natural course of labor due to maternal factors, administration of oxytocin during labor, honey syrup consumption for less than 150 cc and performing the intervention for less than 30 minutes.

In this study, all women admitted to the labor and childbirth center were randomly assigned to intervention and control groups. The data collection tool consisted of questions about demographic factors (age, place of birth, occupation, education, abortion etc), registration controls in labor (during and between contractions of the uterus) and vaginal examinations (dilation, effacement ...) using the pain intensity score scale from 0-10 (0 = no pain, 3-1 = mild pain, 6-4 = moderate pain, 7-10 = severe pain). Vaginal examinations were carried out according to the protocols suggested by the Ministry of Health (8-25).

All participants were assessed in terms of the inclusion criteria on arrival. Also, the heartbeat of the fetus, severity of the mother's pain, contractions of uterus and pelvic examination by researchers were performed. The heartbeat of the fetus, intervals and duration of uterine contractions and pain were assessed and recorded every 30 minutes. The amount of dilation, effacement and fetal station after the vaginal examination according to the protocol of the Ministry of Health were recorded every 2 hours. All efforts to reach the dilatation of 8 inches were continued. The control group received only routine care throughout the study by the researcher. To prevent bias, a research assistant assessed and recorded pain. Also, to maintain ethical standards, the mental stress due to leaving the mother prior to the birth was reduced through provision of support. For the intervention group, the researcher had required knowledge and skills, provided necessary education to the women, helped with pelvic movements in terms of tilting and rotation of the front and back, left and right movements on birth ball. Also, 2.5 teaspoons of honey syrup and 150 cc water each 60-30 minutes were given to supply energy. Nature sounds were also listened to by the women. Nature sounds including sea waves, rain, soothing birds were presented through a headphone to prevent environmental sounds. The women could adjust the sounds based on their desire. The women in the control group received care in the same environment. Also, they were free to take water or other liquids if they were willing. Data was analyzed using descriptive and inferential statistics via the SPSS software v.16. The chi-square test, analysis of variance, Scheffe post hoc test, covariance analysis, nonparametric Kruskal-Wallis test and descriptive statistics were used for presenting findings.

## Results

The demographic descriptions of the women are presented in Table 1 (next page). The majority of the women in the intervention and control groups, were aged between 30-20 years old, had higher than high school education and 64% were housewives.

The severity of pain at the beginning of the study indicated that the two groups had a statistically significant difference in the mean score of pain ( $p = 0.001$ ). The pain intensity before and after the intervention was compared (Table 2). The severity of pain in the intervention group was less than the control group at the first 30 minutes to 120 minutes after the intervention. The analysis of variance showed that the intensity of pain was significantly different in intervention and control groups every 30 minutes. The pain severity in the control group had an increasing trend (Table 3). The mean of the pain intensity in the intervention group was  $7.61 \pm 1.17$  and in the control group was  $9 \pm 0.0$  (Table 4).

## Discussion

According to the recent policies of the Ministry of Health aimed at increasing the number of natural childbirths, this study aimed to determine the impact of pelvic movements using birth ball and nature sounds and the honey syrup on the severity of pain in nulliparous pregnant women. The use of special pelvic movements using birth ball and nature sounds and oral administration honey syrup reduces perception of labor pain in nulliparous women. According to the results of a study by Leung et al. (2012) on the effect of exercise using birth ball on labor pain on 203 nulliparous and multiparous women with gestational age 41-37 weeks in China, birth ball reduced labor pain, anxiety and promoted relaxation (10). The study Najmi (2015) to assess the effect of natural sounds on the first stage of labour pain and anxiety in nulliparous women revealed that 3.3% had mild pain, 12.2 moderate pain, and 2.62% severe pain. Statistically significant difference in pain between the groups was reported ( $p=0.01$ ), which was similar to the results the current study indicating the effect of nature sounds on labour pain.

In this study the collective effect of birth ball, nature sounds and honey syrup was assessed on labour pain. However, in another study by Taavoni et al. (2013), the effect of thermotherapy 60 minutes after the intervention was assessed. The study by Taavoni et al. (2015) assessed the effect of nature sounds in the active phase of labour. Converse to the present study, pain in the first 30 minutes after nature sounds was assessed, had statistically significant differences with the control group. Argvi et al. (2007) in Turkey investigated the effect of oral administration of liquid nutrients on the length of labor and pain in 110 nulliparous women with low-risk pregnancy. They showed that pain in the group receiving grape juice with the control group had no significant difference (20). Since the labor environment in terms of noises may have different effects on the process of managing labor pain, the same environment was used in one hospital for both groups.

## CONSORT 2010 FLOW DIAGRAM

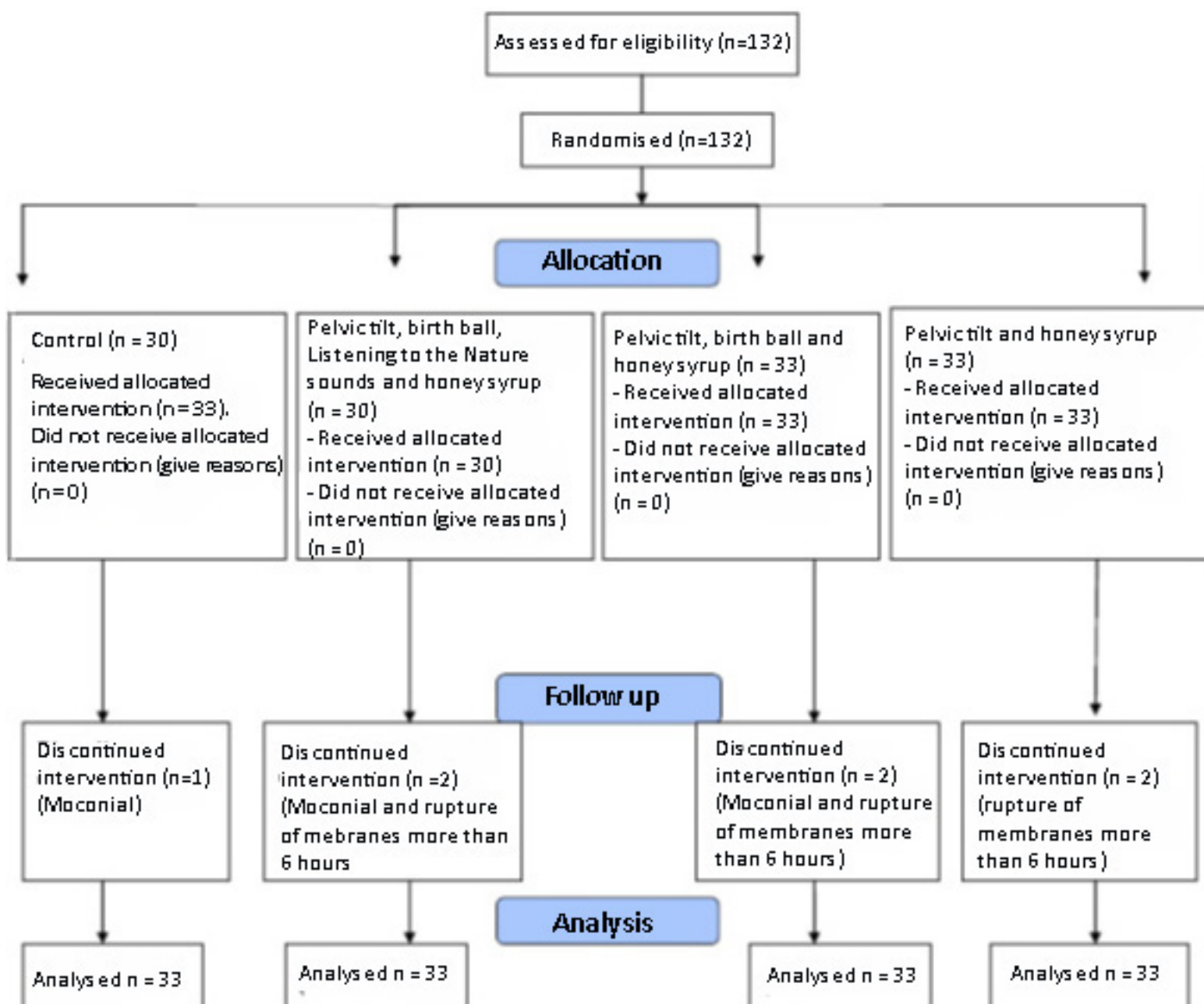


Table 1. The demographic characteristics of the women in the groups

Demographic characteristics	Control	Intervention
Age	20-30 years (51.5%)	20-30 years (33.3%)
Education level	Diploma (39.4%)	Diploma (51.5%)
Employment status	Housewife (72.7%)	Housewife (72.7%)
Pregnancy tendency	Agree (87.9%)	Agree (87.9%)
Gestational age	39.1±24.06	38.91±0.84
Abortion history	(75.8%) Absence	(66.7%) Absence

Table 2: The pain intensity in the groups

Group	After the intervention		Before the intervention	
	Control group	Intervention group	Control group	Intervention group
Pain intensity	Mean± Standard deviation	Mean± Standard deviation	Mean± Standard deviation	Mean ± Standard deviation
Mean± Standard deviation	9±0.0	7.61±1.17	7.76±0.75	7.91±0.94
The analysis of variance	$F = 44.243$ $P < 0.001$		$T = 0.720$ $df=64$ $P=0.474$	

Table 3. The comparison of changes in the pain intensity (every 30 minutes) in the groups

Group	Analysis of variance	Control groups	Intervention group
Pain intensity		Mean± Standard deviation I	Mean ± Standard deviation
30 minutes	$P < 0.001$	7.85±0.75	6.03±1.01
60 minutes	$P < 0.001$	8/12 ± 0/69 8.12±0.69	5.55±0.9
90 minutes	$P < 0.001$	8.42±0.66	5.63±0.92
120 minutes	$P < 0.001$	8.68±0.47	6.15±1.28
150 minutes	$P < 0.001$	8.92±0.27	6.40±0.94
180 minutes	$P < 0.001$	9±0.0	7.05±1.27
210 minutes	$P < 0.001$	9±0.0	7.25±1.12

Table 4: The comparison of the pain severity in the groups before and after the intervention

Group	Control group	Intervention group
	Mean ± Standard deviation	Mean ± Standard deviation
Pain intensity changes	1.24±0.75	-0.30±0.92
Analysis of variance	$P < 0.001$	

## Conclusion

The results of this study showed that pelvic movements on a birth ball and nature sounds and honey syrup reduced labor pain in nulliparous women. Therefore, it is recommended to be used along with other complementary methods of pain relief in labor centers across the country. This study only assessed pain in the dilatation of 8-5 cm in the active phase of labor. Therefore, more studies on the effectiveness of these interventions in combination with other methods of labor pain reduction are needed.

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