

# The Effect of Positive Mental Imagery on Labor Pain Tolerance in Primiparous Women Referred to Atieh Teaching-Medical Center of Hamadan, Iran, 2018

**Caroline Yavari**

Hamadan University of Medical Sciences School of Nursing and Midwifery

**Seyedeh Zahra Masoumi** (✉ [zahramid2001@gmail.com](mailto:zahramid2001@gmail.com))

Hamadan University of Medical Sciences School of Nursing and Midwifery <https://orcid.org/0000-0002-2045-3707>

**Farideh Kazemi**

Hamadan University of Medical Sciences School of Nursing and Midwifery

**Mansoureh Refaei**

Hamadan University of Medical Sciences School of Nursing and Midwifery

**Abolghasem Yaghoobi**

Bu Ali Sina University

---

## Research article

**Keywords:** Counseling; Imagery; Labor pain; Primiparous

**Posted Date:** September 20th, 2019

**DOI:** <https://doi.org/10.21203/rs.2.14647/v1>

**License:**  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

---

# Abstract

**Background:** Childbirth is an important experience in the woman's life; and its quality has short- and long-term effects on them. The present study aimed to determine the effect of positive mental imagery on the labor pain tolerance in primiparous women referred to Atieh teaching-medical center in Hamadan.

**Method:** The present clinical trial study was conducted on 90 primiparous mothers referred to Atieh Hospital of Hamadan in interventional (n= 45) and control (n= 45) groups. Data collection tools included demographic information forms, Behavioral pain scale, Visual analogue scale (VAS), and the birth registration checklist that were responded by both groups through interviews and observation during labor. The intervention group participated in 4 weekly counseling sessions in groups of 5 to 7 participants, but the control group received only routine care. Finally, the obtained data from above questionnaires was analyzed using SPSS 21 and analysis of covariance (ANCOVA), Independent t-test and chi-square test and the significance level of tests was considered to be at the level of 5%.

**Results:** The research results indicated that the mean age of control and intervention groups was  $25.98 \pm 4.82$  and  $25.32 \pm 4.85$  respectively. The mean scores of Visual analogue scale (VAS) and the Behavioral Pain Scale significantly decreased compared to the control group ( $P < 0.001$ ). The mean scores of behavioral changes in the intervention group were  $1.77 \pm 0.68$ ,  $2.39 \pm 0.54$  and  $3.09 \pm 0.60$  in 4-5 cm, 6-7 cm and 8-10 cm dilatations respectively. That was statistically significant decrease compared to the control group ( $P = 0.005$ ).

**Conclusion:** Positive mental imagery counseling reduced the visual analogue intensity and behavioral pain intensity in primiparous women. It seems that continuing education and counseling during pregnancy and empowering mothers to control themselves and learn mental imagery techniques and practice during pregnancy and childbirth can help mothers to more relax and alleviate the labor pain intensity.

**Trial registration:** Trial Registration Clinical Trial Registry: IRCT20120215009014N242. Registered on 2017-09-10. <https://en.irct.ir/trial/9621>

Sampling start date: 2018-10-23

## Background

Pregnancy and childbirth are important events in lives of women and their families; and labor pain is an intense pain and unpleasant experience for women. Contrary to the old belief, under which the pain is inevitable and unavoidable during labor and should be tolerated, the pain relief has been considered as a new way of thinking (1, 2).

The labor pain always raises concerns for pregnant women and is sometimes a major concern for women and their families (3). Dick Read (1930) found that fear of unknown phenomena such as

childbirth caused muscle contraction and, consequently, increased the labor pain intensity (4). This in turn has complications for mother and fetus. Therefore, all maternity care units aim to alleviate this pain and make it a pleasant experience with the minimal pain (5).

To reduce these interventions, the anxiety of labor pain should be directed towards pleasant emotions and experiences. The applied methods for alleviating the labor pain are divided into pharmacological and non-pharmacological groups. The use of non-pharmacological approaches has been considered due to adverse effects of medications such as hypoxia, hypotension and maternal cardiac arrhythmia and neonatal respiratory failure. Non-pharmacological practices are superior to pharmacological methods because of their cheapness, simplicity of implementation, non-invasiveness, creation of self-esteem, clients' participation, non-interference with the delivery way, no adverse effects, and being pleasant for mother and fetus (2, 6). Nowadays, taking care of mothers during labor and relieving their pain are major goals of the health system. Studies indicate that the progress of childbirth is facilitated in women who feel more secure and their pain is well controlled (7). The applied techniques for increasing the pain relief and tolerance, such as avoidance of generalization and catastrophizing, positive self-talk and imagery, distraction, use of alternative experience, desensitization and relaxation affect the self-efficacy and increase the ability to cope with labor pain. Studies indicate that relaxation and imagery affect the autonomic nervous system (ANS) and cause relaxation both during pregnancy and labor. Labor support includes ongoing attendance and psychological support such as mother reassurance, encouragement and guidance, physical comfort such as cooperation to perform touch, massage, cold, heat and hydrotherapy techniques, position change and movement, woman and wife information, facilitation of communication to help women to express their needs and demands (1, 2).

Mental imagery or creative visualization is an easy ways to remove stressful thoughts and replace them with relaxing images and it is extremely effective. Mental imagery is the simulation or recreation of a perceptual experience among sensory moderators (8). Since psychological factors play critical roles in the onset, severity, or persistence of pain; and the resulting pain can cause significant discomfort or loss of function, and as the message, which are sent through organs, are perceived by the cerebral cortex after passing through the spinal cord and receiving the brain (9), the stress management and physical relaxation and mental imagery techniques are non-pharmacological methods that are used to control pain. Recent studies indicate that this technique is an effective way to deal stressors. It can eliminate undesirable physiological effects of stress and prevent its symptoms (10, 11). In imagery, people are trained to visualize positive images of vague information; and participants need positive scenarios and images to create positive mental images. In particular, higher levels of optimism are reinforced by the ability to imagine future positive events (12). Midwifery staff provides, maintains and promotes social health through counseling and provision of midwifery services at various stages of life to promote reproductive health and enhance women's health indices. A midwife plays an important role in counseling and reproductive health education not only for women, but also for the family and society. Therefore, all women should have access to midwifery care models. Therefore, the present study investigated the effect of positive mental imagery counseling on labor pain tolerance in primiparous women. Mental imagery may reduce labor pain by reducing fear of childbirth and distraction from labor pain. According to the

World Health Organization, the labor pain relief by non-medicinal methods is a principle that should be included in the mother-friendly hospital protocol.

## Methods

### *Study design, setting:*

A randomized clinical trial was conducted on 90 pregnant mothers in the delivery preparation class at Atieh Hospital of Hamadan in 2017. After obtaining the necessary permission from Hamadan University of Medical Sciences and submitting it to Atieh Hospital, and coordinating with the delivery officer, Subjects were included in this study based on informed consent and having required inclusion criteria.

### *Participants:*

The researcher explained research objectives and methods for them, and provided a list of people who were willing to participate in the study and included in the study at the gestational age of 23–33 weeks. Inclusion criteria were: age 18–35 years; primiparous women; tendency to normal vaginal delivery; gestational age of 32–33 weeks; singleton pregnancy with head view; attending physiological delivery training courses during pregnancy at Atieh Hospital; having low risk pregnancy; and not using specific and invalid medications (alcohol and smoking) during pregnancy; normal placental and fetal status; lack of infertility and chronic diseases; and history of thyroid diseases; lack of familial history of depression; depression in pregnant women; and giving birth at Atieh Hospital, and explained the research goals and methods and prepared a list of people who had a willingness to participate in the study. Exclusion criteria included complications during pregnancy (preterm labor, preterm rupture of membranes, etc.), the absence in at least a counseling session, emergency cesarean section during labor due to fetal or maternal reasons (placental abruption, fetal distress), painless delivery or use of Entonox, and use of analgesics in labor.

### *Sampling Methods:*

According to the data from Bolbol-haghighi et al.(2016), The sample size was 37 peoples based on the information below and following formula:

$$\alpha = 0.05 \text{ Power} = 0.80 \text{ M1} = 2.63 \text{ M2} = 3.55 \text{ Sd1} = \text{Sd2} = 1.4$$

$$n = \frac{\left( Z_{1-\frac{\alpha}{2}} + Z_{1-\beta} \right)^2 (\delta_1^2 + \delta_2^2)}{(\mu_1 - \mu_2)^2}$$

The sample size for each group was 45 persons with 20% loss in sampling (13).

### *Randomization procedure and Randomization allocation concealment:*

Simple randomization method was used in this study with red and blue balls. Women were divided into intervention and control groups (Fig. 1).

*Blinding:*

Due to the content of counseling sessions, there was no possibility of blindness in this study.

*Instrument tools:*

1-demographic questionnaire: Includes questions about age, weight, height, marital status, job, education level, family income level.

2:Behavioral change assessment scale: This scale was completed by researcher. It has 5 degrees. This rating include:

Zero Degree: No pain with normal breathing, no restlessness

Grade one: Increased respiratory rate during contractions

Grade two: compressing surrounding tables such as beds, sheets, and other materials during uterine contractions

Grade Three: Includes symptoms defined in grade two, even between uterine contractions and no relaxation at all

Grade Four: Severe restlessness or perhaps between them, uncontrollable and sudden movements such as jumping

The reliability of this scale in the study by HeidarZadeh (2017) was confirmed by the Cronbach's alpha 0.8 (14).

3- Visual Analogue Scale (VAS): The VAS using a 10-cm line represented the continuum of the pregnant women's opinion of the degree of pain. One extremity of the line represented "too much pain and unbearable pain," and the other extremity represented "absence of pain" The participants were asked to rate the degree of pain by making a mark on the line. The validity and reliability of this tool has been proven in previous studies (15). Demographic information was completed by two groups at the beginning of the study. And the next two scales for both groups were completed during childbirth.

*Intervention:*

Individuals in intervention group were contacted and informed about time and place of class to participate in four weekly counseling sessions in 5 to 7-individual groups at Atieh Hospital. Control group did not receive any intervention. And they participated in routine normal vaginal birth preparation classes. Consultation sessions were designed and conducted as follows.

During the first meeting, the members of the group got to know each other and explained the purpose of their consultative sessions. And their questions were answered. During the second session, people were helped to identify their wrong beliefs and irrational thoughts and hearings about labor pain and the stages of childbirth. The third session began with explanations that misconceptions about the pains of natural childbirth may be the source of exacerbation of these pains, as well as their unbearable and ultimately cesarean delivery. Participants were also briefed on positive mental imagery technique and its stages (Table1). In the fourth session, ways to deal with negative thoughts and perceptions were taught. And people were instructed to use the technique three times a day for 15 minutes each until the end of pregnancy.

After the completion of sessions, follow-up was conducted until the pregnant woman was hospitalized for delivery. In the active phase of labor with the onset of 3–4 cm dilatation, the researcher was present at the mother's bedside and the training, which was presented before the birth, was reviewed. Positive mental imagery technique were again taught to each individual during the labor stages as well as the labor pains. The pain assessment was then performed using the visual analogue scale (VAS) and behavioral pain scale at 4–5 cm, 6–7 cm and 8–10 cm dilatations at the peak of contraction. The same stages without counseling was done in the control group. It should be noted that the researcher as accompanying midwife was present alongside all members of intervention. There was no other accompanying midwife in the mother's bedside in the control group.

#### *Data analyses:*

The obtained data from above questionnaires was analyzed through SPSS 21 and analysis of covariance (ANCONA), independent t-test), and chi-square test. Significance level was considered less than 0.05.

## **Results**

#### *Comparison of demographic characteristics between the two groups:*

The findings of this study revealed no statistical differences between the two groups. Data were normal and the two groups were homogeneous in terms of demographic characteristics ( $P > 0.05$ )

According to the results of Table 2, in the intervention group, the mean age of pregnant women were  $25.32 \pm 4.85$  and in the control group,  $25.98 \pm 4.82$  years. The average duration of Gestational age in the intervention group was  $39.14 \pm 1.15$  years and in the control group,  $39.22 \pm 1.17$  week. 81.8% of intervention group and 80 % of control group were housewives. The majority of pregnant women in intervention (56.8%) and control group (69.5%) had education lower than academic level (Table 2).

Results indicated that there was a significant difference between two groups in mean pain scores at three time points ( $p = 0.02$ ) (Fig. 2). Bonferroni post hoc test indicated that there was a statistical significant difference between pain score in 4–5cm dilatation and pain score of 6–7cm dilatation, and also between pain scores in 4–5cm dilation and pain score in 8–10cm dilatation. ( $p = 0.02$ ,  $F = 5.20$ ) This difference

was also found between pain scores of 6–7cm and 8–10cm dilatations. Mean pain scores of control and intervention groups were compared using the independent t-test and the results indicated that there was no significant difference between two groups in 4–5 cm dilatations ( $P = 0.29$ ), but the differences were significant in 6–7 and 8–10 cm dilatations ( $P = 0.005$  and  $P = 0.01$  respectively) (Table 3).

According to results, the mean scores of pain behavioral changes were significantly different between two groups at three time points ( $p = 0.04$ ) (Fig. 3). Bonferroni post hoc test indicated significant differences between mean scores of behavioral changes in 4–5 cm dilatation and 6–7 cm dilatation, and also between mean scores of behavioral changes in 4–5 cm dilatation and 8–10 cm dilatation ( $p = 0.007$ ). This difference was also observed between mean scores of behavioral changes in 6–7cm and 8–10cm dilatations. Comparison of mean scores of behavioral changes between intervention and control groups was done by independent t-test and the results showed that there was a significant difference between two groups only in 4–5 cm dilatation ( $p = 0.007$ ), while these differences were not significant in 6–7cm and 8–10cm dilatations ( $p = 0.08$  and  $p = 0.53$  respectively) (Table 4).

## Discussion

The present study aimed to investigate the effect of mental imagery on labor pain tolerance in primiparous women. The results indicated that the visual analogue scale and pain behavioral changes by relaxation with positive mental imagery were significantly decreased compared to the control group. In a study by Orch et al. (2015) with the aim at “Comparing immediate effects of two methods, advanced muscle relaxation and mental imagery, on physical and psychological indices in pregnancy”, it was found that mental imagery was significantly effective in increasing level of relaxation compared to relaxation, and it was associated with a significant decrease in maternal heart rate and anxiety and a decrease in the visual intensity of pain; hence, it was consistent with the present study (16). Stressful life events, such as fear of labor pain, are associated with an increase in pain, but psychological support and a constant presence of midwife besides mother partially overcome fear and reduce stress and subsequently reduce pain. Hess and Maddi (1992) found that among people, who were faced with important anxiety issues, those who had high levels of psychological hardiness, were less likely to become ill than those with less hardiness and higher loathing or those who were mentally and physically damaged after changes or accidents (17). The above cases are also true for delivery and its pain. In our study, the severity of labor pain was reduced by applying a positive mental imagery. In general, the research results indicated that positive mental imagery counseling decreased the labor pain in the active phase. Unlike other pains, labor pain has no constant intensity and it gradually increases to promote birth. And with the mental imaging consultations, women’s perceptions of pain have been affected. And the pain tolerance is increased. In our research the imaging counseling had the highest effect on labor pain in 4–5 cm and 6–7 cm dilatations. The results were consistent with findings of similar studies that used non-pharmacological methods to reduce labor pain (18, 19).

The results of our study showed that the mean score of pain behavioral changes decreased with progression of labor in the intervention group. It can be attributed to the effect of counseling and training

of pregnant women at all stages of childbirth. This enables mothers to adapt with the labor pains. Results of a research by Rafiei et al. (2012) indicated that cognitive behavioral therapy was effective in reducing pain intensity and improving pain coping strategies (20). Given that pregnancy is a major and stressful period of women's life, the women's psychological status and stress during pregnancy can directly or indirectly affect the health of mother and fetus. The positive effect on psychological pain control is an effective non-pharmacological method in this regard (21). In a study by Chesli et al. (2006) the results indicated that mean pain tolerance score of the imaging group was significantly higher than the control group, and even higher than other evaluated methods. Furthermore, they considered the use of distraction or imaging in increasing pain tolerance as the most effective strategy that was consistent with the present study<sup>19</sup> (22).

In fact, more relaxation in intervention group resulted in more pain control. Pain has been the most common clinical complaint of pregnant women in labor; and its reduction or elimination has always been the demand of most patients and medical staff (22). Goliyan Tehrani study results (2006) indicated a decreased duration of active phase of labor and pain intensity after application of transcendental meditation effects. Pain intensity was higher in the control group and the results were consistent with the present study (23). In general, it is stated that due to the continuous support of mother during childbirth and her relaxation, she can have greater pain tolerance. Our findings also indicated that having a support person like midwife at delivery had a positive effect on behavioral changes and labor pain. This result was consistent with findings of studies by Houshmandi et al., Kamali et al., Ahmadi, Bahri Binabaj et al., Hodnett et al., Kimber and Chang et al., Kayne et al. and Foroud et al. (24- 26). Based on a research by Hodnett et al.(2013) the continuous supportive behavior reduced analgesics use, surgical interventions, and increased satisfaction with the delivery experience<sup>24</sup> (27). The positive mental imagery can be used to reduce the increasing rate of cesarean section(28). The reason for tendency to cesarean section is mainly due to the fear of vaginal delivery pain. This method can thus help to relieve pain and reduce rate of cesarean section because midwives are in direct contact with pregnant mothers and can well reduce the mothers' anxiety in this period. Learning and implementing non-pharmacological pain methods is an effective step in reducing number of elective cesarean sections.

#### *Limitation of the study:*

One of the limitations of this study was the exclusion of women during labor due to the use of other non-pharmacological methods to control their labor pain. There are few number of similar papers. Further studies on the use of positive mental imagery or other psychological approaches, with long-term evaluation of the psycho prophylaxis method, and with more samples, are needed.

## **Conclusion**

The overall results indicated that positive mental imagery counseling reduced the pain intensity and pain behavioral changes in primiparous women during labor. It seems that continuous education and counseling during pregnancy and childbirth and empowering mothers to control themselves and training

mental imagery techniques to women and midwives can be effective in enduring labor pains. And encouraging mothers to practice this method during pregnancy and childbirth can help mothers to be more relaxed and have lower labor pain intensity.

## Abbreviations

VAS: Visual analogue scale

## Declarations

### *Acknowledgments*

This article was extracted from a student research proposal. Hereby, the authors would like to thank the research and treatment vice-chancellors of Hamadan University of Medical Sciences, the authorities of the healthcare centers under study, and the personnel who cooperated in the research. This study was financially supported by Hamadan University of Medical Sciences, Hamadan, Iran.

### *Authors' contributions:*

SZM and CY conceived the study, developed the study protocol, and conducted the study. FK analyzed the data and drafted the manuscript. SZM and CY guided the protocol development, clinical trial implementation and reviewed the manuscript. MR,AY guided the conceptualization of the study, the development of the protocol. All authors read and approved the final manuscript

*Funding:* This study was supported for the data collection and analysis by Hamadan university of Medical sciences (Grant Number IR.UMSHA.REC.1397.400).

### *Availability of data and materials:*

The data set was produced and created during this research. And because of the confidentiality of the information of the participants is not publicly available, however is available from the corresponding author.

### *Ethics approval and consent to participate:*

The Research Ethics Review Board Hamadan University of Medical Sciences, School of nursing and midwifery, approved the study procedures (IR.UMSHA.REC.1397.400) and was registered at the Iranian Registration Clinical Trials (IRCT20120215009014N242) by I IRCT. The aims of the study were explained to participants. Women volunteered to participate in this study and written consent was obtained from study participants. Information from women was confidential and stored.

### *Consent for publication:*

Hamadan University of Medical Sciences and Head of Maternity ward of Atieh Hospital of Hamadan were allowed to publish and print the article.

*Competing interests:*

The authors declare that they have no competing interests.

*Author details:*

<sup>1</sup> Consultation in Midwifery, Department of Midwifery, Hamadan University of Medical Sciences, Hamadan, Iran. <sup>2,3,4</sup> Department of Midwifery, Mother and Child Care Research Center, School of Nursing and Midwifery, Hamadan, Iran. <sup>5</sup>Department of Psychology, School of Economics and Social Sciences Buali sina Universiy, Hamadan, Iran

## References

1. Keshavarz M, Shariati M, Jahdi F. Effects of complementary therapies on pain and labor outcomes in nuliparous women referred to delivery unit in Fatemiyeh Hospital in Shahrood city (2003-2005). *Medical Science Journal of Islamic Azad Univesity-Tehran Medical Branch*. 2008;18(4):245-50.
2. Simkin P, Bolding A. Update on nonpharmacologic approaches to relieve labor pain and prevent suffering. *Journal of midwifery & women's health*. 2004;49(6):489-504.
3. Perry S, Hockenberry M, Lowdermilk D, Wilson D. *Study Guide for Maternal Child Nursing Care sixth edition* ed: Mosby; 2018.
4. Geranmayeh M, Rezaeipour A, Haghani H, Akhoondzadeh E. The impact of training on the application of palliative methods for labor pain reduction %J *Hayat*. 2006;12(2):13-21.
5. Abushaikha L, Oweis A. Labour pain experience and intensity: a Jordanian perspective. *International Journal of nursing practice*. 2005;11(1):33-8.
6. Tournaire M, Theau-Yonneau A. Complementary and alternative approaches to pain relief during labor. *Evidence-based complementary and alternative medicine*. 2007;4(4):409-17.
7. Simkin P, Ancheta R. *The labor progress handbook: early interventions to prevent and treat dystocia*: John Wiley and Sons; 2011.
8. Menzies V1 TA, Bourguignon C. Effects of guided imagery on outcomes of pain, functional status, and self-efficacy in persons diagnosed with fibromyalgia. *J Altern Complement Med*. 2006;12(1):23-30.
9. Yeh VM, Schnur JB, Montgomery GH. Disseminating hypnosis to health care settings: Applying the RE-AIM framework. *Psychology of Consciousness: Theory, Research, and Practice*. 2014 Jun;1(2):213.
10. Leeners B, Neumaier-Wagner P, Kuse S, Stiller R, Rath WJHiP. Emotional stress and the risk to develop hypertensive diseases in pregnancy. 2007;26(2):211-26.

11. Chaillet N, Belaid L, Crochetière C, Roy L, Gagné GP, Moutquin JM, Rossignol M, Dugas M, Wassef M, Bonapace J. Nonpharmacologic approaches for pain management during labor compared with usual care: a meta-analysis. *Birth*. 2014 Jun;41(2):122-37.
12. Murphy SE, O'Donoghue MC, Drazich EH, Blackwell SE, Nobre AC, Holmes EA. Imagining a brighter future: the effect of positive imagery training on mood, prospective mental imagery and emotional bias in older adults. *Psychiatry research*. 2015;230(1):36-43.
13. Bolbol-haghighi N, Masoumi SZ, Kazemi F. Effect of continued support of midwifery students in labour on the childbirth and labour consequences: a randomized controlled clinical trial. *Journal of clinical and diagnostic research: JCDR*. 2016 Sep;10(9):QC14- –QC17.
14. Heidarzadeh M, Jabrailzadeh S, Chookalayi H, Kohi F. Translation and psychometrics of the "behavioral pain scale" in mechanically ventilated patients in medical and surgical intensive care units. *The J Urmia Nurs Midwifery Fac*. 2017;15(3):176-86.
15. Larroy C. Comparing visual-analog and numeric scales for assessing menstrual pain. *Behav Med*. 2002;27:179–81.
16. Urech C, Fink NS, Hoesli I, Wilhelm FH, Bitzer J, Alder JJP. Effects of relaxation on psychobiological wellbeing during pregnancy: a randomized controlled trial. 2010;35(9):1348-55.
17. Maddi, S. R., & Hess, M. J. (1992). Personality hardiness and success in basketball. *International Journal of Sport Psychology*, 23(4), 360-368.
18. Hosseini S, Asadi N, Zareei F. Investigating the effect of massage therapy on labor in the active stage of first labor. *ZJRMS* 2013; 15(9): 35-38
19. Ezzo JJTjoa, medicine c. What can be learned from Cochrane systematic reviews of massage that can guide future research? *The journal of alternative and complementary medicine* 2007;13(2):291-6.
20. Rafiee S, Sohrabi F, Shams J, Forough AJJoJUoMS. The efficacy of Cognitive Behavioral Therapy in patients with chronic musculoskeletal pain. *Journal of Jahrom University of Medical Sciences*. 2012;10(2):62.
21. Waters BL, Raisler JJTJoM, Health Ws. Ice massage for the reduction of labor pain. *Journal of midwifery & women's Health*. 2003;48(5):317-21.
22. Roshan Chesli R, Sanjabi B, Rasoolzadeh Tabatabaee K, Moghaddam A, Atrifard M. Effects of attention deviation strategies on increasing of the experimental pain tolerance. *Journal of hayat*. 2006 Jul 15;12(3):27-34.
23. Golyan Tehrani S, Vasegh Rahimparvar F, Mehran AB, Nickhah E. The investigation of transcendental meditation effects on pain and length of active phase of labor in primiparous women. *Journal of hayat*. 2006 Jul 15;12(3):51-61.
24. Kamali S, Ahmari-Tehran H, Mohammad-Alizadeh S, Jafari E. Supportive behaviors impact on the process of labor in nulliparous women. *Journal of Qom University of Medical Sciences*. 2010;4(2):14-8.
25. Hushmandi S, Dolatian M, Kamalifard M, Ghochazadeh M. The severity of pain and understand the factors affecting it in nulliparous and multiparous women in public and private hospitals. *Journal of*

Tabriz University of Medical Sciences. 2012;34(3):117-21.

26. Foroud A, Foroud A, Mehdipour S. The effects of breathing patterns and massage on the pain and perception of labor in primiparous women. J Shahrekord Univ Med Sci. 2006; 7 (4) :70-77
27. Hodnett ED, Gates S, Hofmeyr GJ, Sakala C. Continuous support for women during childbirth. Cochrane database of systematic reviews. 2013(7): CD003766. doi: 10.1002/14651858.CD003766.pub5.
28. Khalili A, Shayan A, Khodaveisi M, Masoumi SZ, Soltani F, Havasian MR, Horiat FE. Construction of Professional Ethics Questionnaire in Midwifery. Indian Journal of Forensic Medicine & Toxicology. 2017 Jul 1;11(2):237-240.

## Tables

Due to technical limitations, all Tables are only available as a download in the supplemental files section.

## Figures

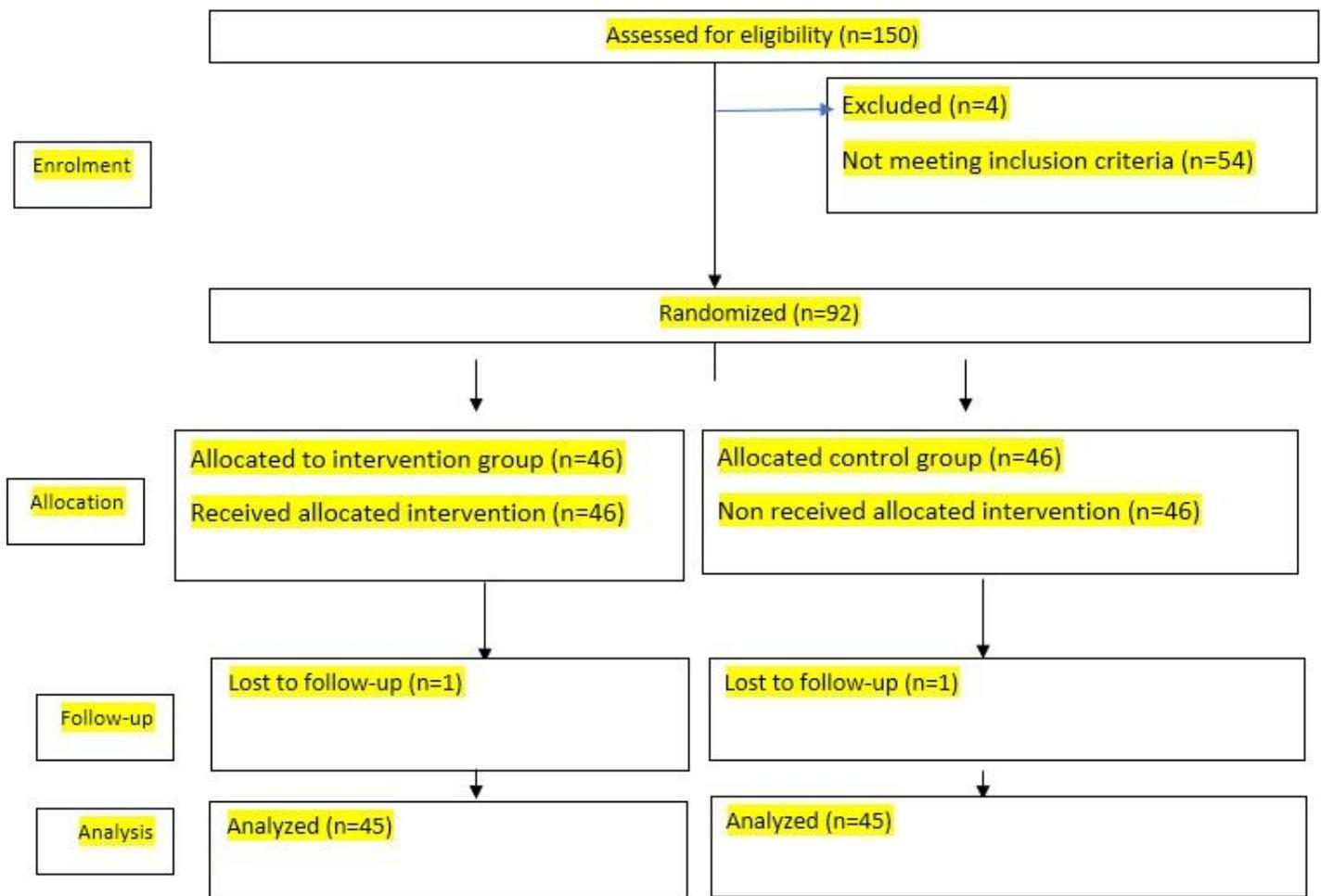


Figure 1

Flow diagram of the participants

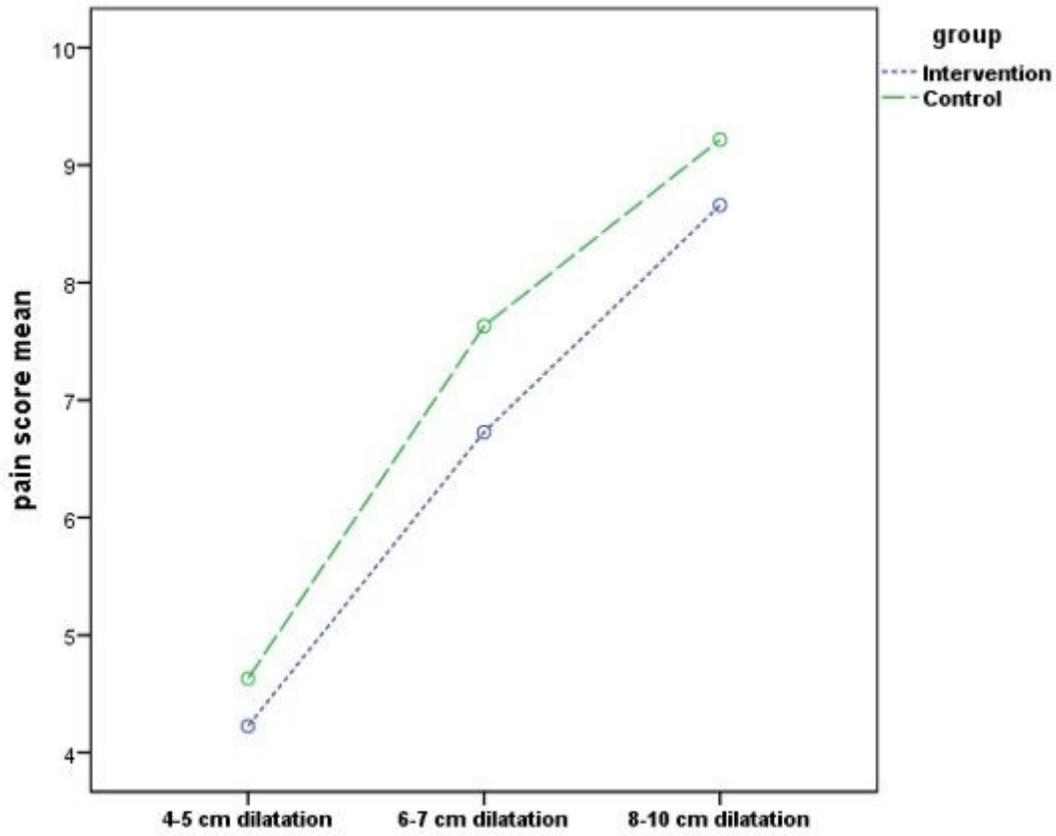


Figure 2

Changes in mean pain score in different dilatations

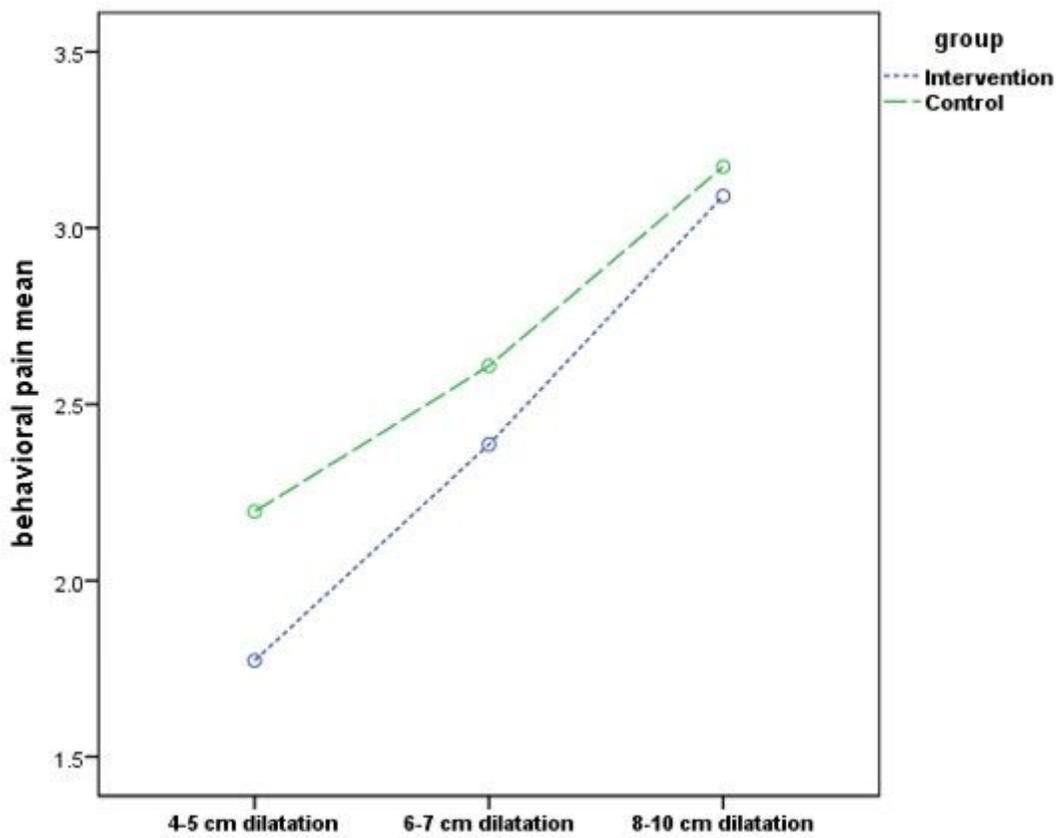


Figure 3

Changes in mean score of pain behavioral changes in different dilatations

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Table.docx](#)