

The Effect of Fatima Ana's Hand (*Anastatica hierochuntica*) on Birth Pain and Duration: A Randomized Controlled Study

Fatma Ana Eli'nin (*Anastatica hierochuntica*)

Doğum Ağrısı ve Süresine Etkisi: Randomize Kontrollü Bir Çalışma

¹Hediye KARAKOÇ^a, ²Jule ERİÇ HORASANLI^b, ³Hatice Kübra AYYACI^c

^aDepartment of Midwifery, KTO Karatay University College of Health Science, Konya, Türkiye

^bDepartment of Gynecology and Obstetrics, Necmettin Erbakan University Meram Medical Faculty, Konya, Türkiye

^cDepartment of Gynecology and Obstetrics, Necmettin Erbakan University Meram Medical Faculty Hospital, Konya, Türkiye

The study is registered at the US National Institutes of Health (ClinicalTrials.gov) NCT05196841. The date of registration: January 18, 2022.

ABSTRACT Objective: This study was conducted to investigate the effects of *Anastatica hierochuntica* on labor pain and duration. **Material and Methods:** This study was planned as a single blind randomized controlled experimental study. The study was conducted with 60 pregnant women who were randomized at a university hospital located in Anatolia, Türkiye. The data were collected using a "Personal Information Form", "Follow-up Form for Labor" and "visual analogue scale (VAS)." The groups show homogeneity in terms of demographic and obstetric variables. **Results:** A significant difference was found between the mean pre- and post-test scores of experimental ($p \leq 0.000$) and the control group ($p \leq 0.000$) regarding labor pain and duration. It was revealed that there was a significant difference between the experimental and control groups concerning VAS scores and duration of 4 cm ($p=0.004$), 8 cm ($p=0.002$). No significant difference was found between the experimental and control groups with regard to VAS score ($p=0.935$) and duration ($p=0.082$) in the second stage of labor and 10 cm vaginal opening. Of the participants in the experimental group, 40% stated that the herb *A. hierochuntica* was effective in relaxing, 66.7% provided visualization of the opening of the cervix, 73.3% thought that the birth progressed as the herb opened, 80% were satisfied with the application. **Conclusion:** It was found out that *A. hierochuntica* used in childbirth was effective in labor pain and duration. Midwives and obstetricians can safely use these cognitive-behavioral techniques with *Anastatica hierochuntica* to reduce labor pain and duration of labor.

ÖZET Amaç: Bu çalışma, *Anastatica hierochuntica*'nın doğum ağrısı ve süresi üzerindeki etkilerini araştırmak amacıyla yapılmıştır. **Gereç ve Yöntemler:** Bu çalışma tek kör, randomize kontrollü deneysel bir çalışma olarak planlandı. Araştırma, Anadolu'da bulunan bir üniversite hastanesine randomize edilen 60 gebe ile yürütülmüştür. Veriler "Tanıtıcı Bilgi Formu", "Doğum Eylemi Takip Formu" ve "vizüel analog skala (VAS)" kullanılarak toplanmıştır. Gruplar, demografik ve obstetrik değişkenler açısından homojenlik göstermektedir. **Bulgular:** Doğum ağrısı ve süre açısından deney ($p \leq 0,000$) ve kontrol grubu ($p \leq 0,000$) ön test ve son test puan ortalamaları arasında anlamlı fark bulundu. Deney ve kontrol grupları arasında 4 cm ($p=0,004$), 8 cm ($p=0,002$) VAS skorları ve süre açısından anlamlı fark olduğu belirlendi. Deney ve kontrol grupları arasında doğum eyleminin 2. evresi ve 10 cm vajinal açıklıkta VAS skoru ($p=0,935$) ve süre ($p=0,082$) açısından anlamlı fark bulunmadı. Deney grubundaki katılımcıların %40'ı *A. hierochuntica* bitkisinin rahatlamada etkili olduğunu, %66,7'si rahim ağzının açılmasında görselleştirme sağladığını, %73,3'ü yabani ot açıldıkça doğumun ilerlediğini düşündüğünü, %80'i uygulamadan memnun olduğunu belirtmiştir. **Sonuç:** Doğumda kullanılan *A. hierochuntica*'nın doğum ağrısı ve süresinde etkili olduğu belirlendi. Ebeler ve doğum uzmanları, doğum sırasında ağrıyı azaltmak için bu teknikleri kullanabilirler. Ebeler ve kadın doğum uzmanları, doğum ağrısını ve doğum süresini azaltmak için bu bilişsel-davranışçı teknikleri *Anastatica hierochuntica* ile güvenle kullanabilirler.

Keywords: Labor pain; midwife; *Anastatica hierochuntica*

Anahtar Kelimeler: Doğum ağrısı; ebe; *Anastatica hierochuntica*

Supportive therapies applied during the birth process are known as complementary treatment methods. These treatments are designed to help with both the physical and psychological requirements of pregnant women, as well as to assist in managing pain during

childbirth and to improve their quality of life.¹ Complementary treatments for labor include mind-body techniques, complementary and alternative medicine, biologically-based therapies, manipulative and body-based techniques, and energy therapy techniques.² The

Correspondence: Hediye KARAKOÇ

Department of Midwifery, Karatay University School of Health Science, Konya, Türkiye

E-mail: hediye.bekmezci@karatay.edu.tr

Peer review under responsibility of Journal of Traditional Medical Complementary Therapies.

Received: 27 Sep 2022

Received in revised form: 09 Nov 2022

Accepted: 26 Dec 2022

Available online: 28 Dec 2022

2630-6425 / Copyright © 2023 by Türkiye Klinikleri. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).



premise underlying the application of mind-body techniques is the identification of mental abilities that enhance physical functions. *Anastatica hierochuntica* is one technique used in this direction.

Among pregnant mothers, *Akar kayu bunga Fatimah* is the most frequently utilized herbal remedy (37.7%). In Arabic, it is referred to as *Kaf Maryam* and in English as *Grass Fatima*. In scientific terms, it is known as *A. hierochuntica*. It is a tiny, grey, winter annual plant that folds inwards when it gets dry. It is seen in the Sahara Arabian deserts.³ Being a herbaceous plant, *A. hierochuntica*, which stores its seeds in dry leaves that resemble a closed fist, has a lifespan of 1000-2000 years. It is also known as “Fatima Ana’s Hand” or “Meryem Ana’s Hand.” In Namibia’s deserts, this plant, which is in the shape of a dried ball, comes to life when it rains and opens its folds to reveal a green tint. After rain, the plant’s leaves that store water to prepare for a new drought season refold and assume a dry appearance. In Namibia’s deserts, the dry plant with a ball-like structure comes to life when it rains, opens its folds, and turns green. After rain, the plant’s leaves that store water to survive an oncoming drought period fold once more and assume a dry appearance.⁴

A. hierochuntica is recognized to have a labor-facilitating effect and is widely utilized during childbirth for this reason. The *A. hierochuntica* plant is placed into a bowl of water in the process of childbirth. According to popular belief, labor will become less difficult as the plant unfolds itself and the baby will deliver like water.⁴

In her study in which she investigates traditional practices regarding pregnancy, childbirth, the postpartum period and baby care, Yalçın revealed that 77.9% of women used the herb *Fatma Ana’s Hand* to facilitate labor.⁵ In spite of its widespread use, no studies regarding *A. hierochuntica*’s impact on birth have been discovered when the literature is reviewed. This study investigates *A. hierochuntica*’s impact on labor pain and duration.

MATERIAL AND METHODS

The Consolidated Standards of Reporting Trials (CONSORT) recommendations were followed in this

study, which complied with the ethical standards specified in the Declaration of Helsinki. This study was approved by KTO Karatay University Faculty of Medicine Non-Pharmaceutical Medical Device Research Ethics Committee (date: May 03, 2018, no: 2018/006), and all trial participants provided their written informed consent. Prior to the enrollment of patients, the trial was registered at the Registry of Clinical Trial, NCT05196841, date of registration: January 18, 2022. This randomized clinical parallel study was carried out at the delivery room of Meram Medical Faculty Hospital, Türkiye.

DESIGN

This study was designed as a single blind randomized controlled experimental study. The study was carried out in a Turkish public hospital’s delivery room. An written informed consent form was signed by each participant.

STUDY POPULATION

The criteria for inclusion were as follows: experiencing singleton pregnancy at 38-42 weeks, experiencing spontaneous labor, having a healthy fetus, being free of complications that might lead to dystocia during labor, not receiving analgesia or anesthesia in the first stage of labor, planned a vaginal delivery, and being willing to participate in the study and able to communicate verbally. However, pregnant women with high-risk pregnancies, those who needed caesarean delivery, and those who had chronic illnesses were excluded.

Using G*Power 3.1 (G*Power, version 3.1.9.7 for Windows 10, Germany), the sample size for this study was determined depending on methods of distraction. The final sample size was determined as 30 (power of 80%, with a 2-sided Type 1 error of 5%), based on the identification of an effect that creates a difference of 1.2 cm/points on VAS pain with 1.1 SD.

RANDOMIZATION&MASKING

Using the permuted block randomization technique, the participants were randomly divided into 2 equal groups according to computer-generated codes. The information regarding the allocation of groups were

hidden in consecutively numbered, opaque envelopes. The envelopes were opened only after the patient gave permission to participate. The entire data collection was the responsibility of one of the authors. The interviewers and participants had information about group assignments. However, the study groups were kept hidden from the statistician.

DATA COLLECTION TOOLS

The data were collected by using a “Personal Information Form”, “Follow-up Form for Labor” and “visual analogue scale (VAS).”

Personal Information Form: There are 8 questions on this form about the sociodemographic and obstetric features of the participants.

Follow-up Form for Birth: This form includes gestational week, medications performed in the first stage of labor, the table regarding the application evaluation (cervical dilatation and wiping, head level and membranes, frequency and severity of contractions, fetal heart rate, mothers’ vital signs and behaviors during labor). In addition, there are questions about the mothers’ participation in the action in the 2nd stage of the birth, the implementation and interventions, the time of delivery, the drugs and applications given after birth, and the duration of delivery.

VAS: On a 10-cm ruler, the participants rated the intensity of their pain, with “no pain” at one end and “worst potential pain” at the other. In comparison to other single-dimensional scales, the VAS has been reported to be more precise and reliable in terms of assessing pain.⁶

The VAS is a 10-cm-long graded ruler and was utilized to gauge how painful labor was. The absence of pain is represented by the number “0,” while the amount of pain that is the most severe is represented by the number “10.” With this approach, the participant is informed that there are 2 endpoints and that she is able to mark any location that best represents her pain level.

PROCEDURES

Throughout the sampling phase, the researcher made inquiries about women who applied for pregnancy

follow-up and got in touch with the mothers who met some of inclusion criteria. The researcher also described the objectives and plan of the study. According to the eligibility requirements and whether or not they were eligible and willing to take part in the study, the participants were evaluated. Pregnant women received thorough information about the objectives, significance, and advantages of participating in the study, as well as the phases of its implementation. In addition, if they so chose, the basic questionnaires, such as the one on sociodemographic features, were completed through interviews and the participants were divided into 2 groups.

Participants in the experimental group were first informed about imagination, focus/distraction techniques in pain management. All counseling sessions were led by the first author. Afterwards, when the actual labor began, *A. hierochuntica* was put into the water and kept with them during the birth. During the birth, the herb *A. hierochuntica* was supported with the use of imagination, focus/distraction techniques. Throughout the active phase, the researcher showed interest to mothers by staying with them.

Under normal circumstances, in experimental studies, the mentioned intervention is applied to the experimental group, while nothing is implemented to the control group, and only the dependent variables are evaluated. However, it is not appropriate and ethical to complete the research without any care, even if it is a control group. As a result, routine care was provided to the control group.

PRIMARY OUTCOMES

The primary outcomes included the intensity of pain experienced during labor that was measured by VAS before the intervention, in the active phase, and the second stage of labor, respectively.

SECONDARY OUTCOMES

Among the secondary outcomes are the duration of the active phase of labor and the 2nd stage of delivery. The duration of delivery stages was monitored and recorded in a partograph chart during labor and childbirth by the researcher.

STATISTICAL ANALYSIS

The data were evaluated using the SPSS Statistics (SPSS for Windows, Version 22.0, IBM, Armonk, NY) software. The statistician who carried out the data analysis was blinded to the groups. The normality of quantitative data was investigated using the Kolmogorov-Smirnov test. The data were assessed using numbers, percentage, chi-square independent t-tests. Repeated measures ANOVA was utilized for comparing the mean scores of pretest-posttest of the groups, and independent t-test was used for comparing the mean intergroup scores. Also, a p-value <0.05 was considered statistically significant.

RESULTS

Among 920 pregnant women who were taken to health care facilities for antenatal checkup, 108 were eligible for participating in the study, 60 of whom agreed to participate in this study (Figure 1).

The groups were determined to be homogenous because they were similar with regard to variables concerning the sociodemographic and obstetric features. Table 1 demonstrates the information about

socio-demographic and obstetric features of the participants involved in the 2 study groups. There was no significant difference between the 2 groups regarding socio-demographic and obstetric information ($p>0.05$, Table 1).

Of the participants in the experimental group, 40% stated that the herb *A. hierochuntica* was effective in relaxing, 66.7% provided visualization of the opening of the cervix, 73.3% thought that the birth progressed as the herb opened, 80% were satisfied with the application, 90% were also satisfied with other pregnant women, and 80% think it speeds up labor.

PRIMARY OUTCOMES

When the experimental and control groups were compared in terms of the mean VAS scores during vaginal opening of 4 cm ($p=0.004$) and 8 cm ($p=0.002$), it was found out that there was a significant difference and the experimental group mean scores were lower. In the 2nd stage of labor, there was no significant difference between the experimental and control groups ($p=0.935$, Table 2).

When both the experimental ($p\leq 0.000$) and the control group ($p\leq 0.000$) were examined in regards to

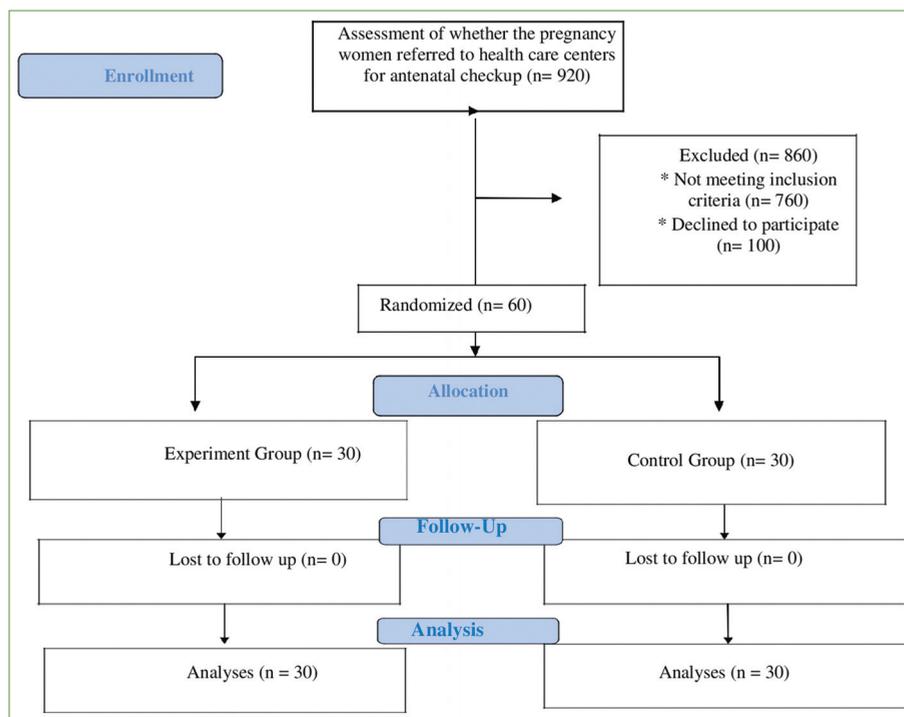


FIGURE 1: The CONSORT flow diagram of the research.

TABLE 1: Sociodemographic and obstetric characteristics of the participants.

Characteristics	Experimental group (n=30)	Control group (n=30)	p value
Age	28.73±4.75*	26.00±4.10*	0.238 ^a
Education			
Primary school	6 (20.0)	12 (40.0)	0.258 ^b
Middle School	6 (20.0)	7 (23.3)	
High school	8 (26.7)	6 (20.0)	
University and above	10 (33.3)	5 (16.7)	
Working status			
I am working	13 (43.3)	8 (26.7)	0.279 ^c
I am not working	17 (56.7)	22 (73.3)	
Duration of marriage	6.23±5.39*	5.23±4.59*	0.442 ^a
Spouse's educational status			
Primary school	4 (13.3)	7 (23.3)	0.129 ^b
Middle School	9 (30.0)	10 (33.3)	
High school	3 (10.0)	7 (23.3)	
University and above	14 (46.7)	6 (20.0)	
Number of pregnancies	2.03±0.96*	1.93±1.08*	0.707 ^a
Birth number	0.87±0.82*	0.77±0.90*	0.654 ^a
Planned pregnancy status			
Planned	27 (90.0)	29 (96.7)	0.612 ^d
Not planned	3 (10.0)	1 (3.3)	

^aIndependent t-test; ^bPearson chi-square; ^cYates Continuity Correction; ^dFisher's exact test; Variables were reported as numbers (%), except for cases; * reported as mean (standard deviation).

TABLE 2: Mean VAS pretest-posttest scores of the groups.

Characteristics	Experimental group (n=30)	Control group (n=30)	Mean difference (95% confidence interval)	p value
4 cm	5.43±1.87	7.23±2.66	-1,80 (-2,98 to -0,611)	0.004 ^a
8 cm	8.00±1.80	9.37±1.35	-1,37 (-2,19 to -0,54)	0.002 ^a
10 cm	6.97±3.45	6.90±2.81	0,07 (-1,56 to 1,69)	0.935 ^a
p value	0.000 ^b	0.000 ^b		
	Partial eta squared: 0.71	Partial eta squared: 0.70		

^aIndependent t test; ^b Repeated measures ANOVA; VAS: Visual analogue scale.

pre- and post-test mean scores, it was revealed that there was a significant difference within the groups (Table 1).

SECONDARY OUTCOMES

When the experimental and control groups were examined with regard to the duration of labor, it was found out that there was a difference between the groups regarding duration between 4-7 cm (p=0.004) and 8-10 cm (p=0.002). In the 2nd stage of labor, it was revealed that there was no significant difference between the groups (p=0.082, Table 3).

DISCUSSION

The results of this study were compared with the studies in the literature to assess the impact of *A. hi-erochuntica* on the perception of pain and duration of labor.

Non-pharmacological methods applied in labor are commonly used in midwifery practices.⁷⁻¹⁰ The nonpharmaceutical method for pain management includes a broad range of strategies that both relieve physical pain and avert mental distress brought on by pain management.¹¹ Mind-body methods are music,

TABLE 3: Comparison of the duration of delivery stages and pain score between two groups.

Characteristics	Experimental group (n=30)	Control group (n=30)	Mean difference (95% confidence interval)	p value
4-7 cm (minute)	5.43±1.87	7.23±2.66	-1.80 (-2.99 to -0.61)	0.004 ^a
8-10 cm (minute)	8.00±1.80	9.37±1.35	-1.37 (-2.19 to -0.54)	0.002 ^a
Second stage (minute)	6.97±3.45	6.90±2.81	0.67 (-1.56 to 1.69)	0.082 ^a
p value	0.000 ^b	0.000 ^b		
	Partial eta squared: 0.8	Partial eta squared: 0.84		

^a Independent t test; ^b Repeated measures ANOVA.

art therapy, hypnosis, yoga, biological feedback, meditation, prayer, mental healing, focusing, imagination techniques based on revealing mental skills to improve bodily functions.¹ A woman's perception about birth, mental health, and level of contentment with birth are all impacted by effective labor pain management.¹² To relieve a woman's suffering, anxiety, and stress during birth and to assist her in having a favorable birth experience, procedures including massage, assistance with breathing and pushing, privacy, positioning, and emotional support can be used.³ One of these practices is *A. hierochuntica*. With 84 mothers using it during pregnancy, *A. hierochuntica* is reportedly one of the most often utilized traditional herbs (37.7%).¹³ *A. hierochuntica* has been shown to be useful in easing pain throughout birth. This outcome validates the hypothesis: "Labor pain of pregnant women alters when using *A. hierochuntica*." Relaxation procedures such as progressive muscle relaxation, breathing, music, mindfulness and other methods, are suggested for healthy pregnant women who seek for the ease of their pain during the course of labor, based on their choices.¹⁴

It was found out that *A. hierochuntica* shortened the duration of labor. This finding validates the hypothesis: "Reducing the duration of labor in pregnant women when using *A. hierochuntica*."

Recent studies on music, yoga and hypnosis, which are among the mind-body methods, indicate that these methods shorten the labor period.¹⁵⁻¹⁹ As far as we know, this is the first randomized controlled trial discussing the effect of *A. hierochuntica* application on women during labour. For this reason, it is recommended to plan randomized controlled studies, especially to study the effect of *A. hierochuntica* on

birth. It was determined that *A. hierochuntica* did not affect the birth pain and duration in the 2nd phase. The straining phase of birth is usually the part that women enjoy the most. The reason why this part is the best part of birth is because women put all their efforts and muscle strength into the work. Women do not have to think about the next process, they just follow the natural flow. The last fears and emotions that a woman will experience as she passes from the first to the 2nd stage of labor are encountered. Then the beloved adrenaline comes and the flow of hormones begins that will make a woman feel that she is the most powerful woman in the world.²⁰ It is believed that there is no difference between the groups, as the focus is concentrated on straining in this phase, when the hormones peak and women experience a feeling of straining.

LIMITATIONS

Our trial's open-label design, which might have influenced medical judgment, and the study's results are limitations of the trial. Second, the trial's single-center design and its limited sample size raise questions about the external generalizability of the results.

CONCLUSION

In this study, it was found out that *A. hierochuntica* used in labor, was effective in the pain and duration of labor. In consideration of the findings of the study, the recommendations that can be made are as follows: To lessen the pain and duration of labor, midwives can safely combine *A. hierochuntica* with these cognitive-behavioral procedures. In addition, it is recommended to plan experimental studies on the effects of *A. hierochuntica* on the postpartum period.

Acknowledgments

We would like to thank pregnant women who agreed to participate in this study.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or mem-

bers of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Hediye Karakoç; **Design:** Hediye Karakoç; **Control/Supervision:** Hediye Karakoç, Jule Eriç Horasanlı; **Data Collection and/or Processing:** Jule Eriç Horasanlı, Hatice Kübra Ayvaci, Hediye Karakoç; **Analysis and/or Interpretation:** Hediye Karakoç; **Literature Review:** Hediye Karakoç, Jule Eriç Horasanlı, Hatice Kübra Ayvaci; **Writing the Article:** Hediye Karakoç, Jule Eriç Horasanlı, Hatice Kübra Ayvaci; **Critical Review:** Hediye Karakoç, Jule Eriç Horasanlı; **References and Fundings:** Hediye Karakoç.

REFERENCES

1. Yılar Erkek Z, Pasinlioğlu T. Doğum ağrısında kullanılan tamamlayıcı tedavi yöntemleri [Complementary treatment methods used for labor pain]. Journal of Anatolia Nursing and Health Sciences. 2016;19(1):71-7. [Crossref]
2. Set T. Ağrı ile baş etmede tamamlayıcı ve alternatif tedaviler [Coping with pain: complementary and alternative treatments]. Türkiye Klinikleri J Fam Med-Special Topics. 2011;2(2):79-82. [Link]
3. Erenoğlu R, Başer M. Effect of expressive touching on labour pain and maternal satisfaction: a randomized controlled trial. Complement Ther Clin Pract. 2019;34:268-74. [Crossref] [PubMed]
4. Gün M, Şahinoğlu S. Tahtakuşlar köyü ve geleneksel olarak kullanılan "Fatma Ana Eli" (Anastatika Hierochuntica) bitkisinin folklorik tıp açısından anlamı [Folkloric medicine understands of "Fatma Ana Eli" (Anastatika Hierochuntica), traditional plant used by Tahtakuşlar Village]. Lokman Hekim Journal. 2011;1(3):18-21. [Link]
5. Yalçın H. Gebelik, doğum, lohusalık ve bebek bakımına ilişkin geleneksel uygulamalar (Karaman örneği) [Traditional practice related to pregnancy, the natal and postnatal period and baby care (Karaman sample)]. Journal of Child Health and Diseases. 2012;55:19-31. [Link]
6. Aslan FE, Onturk ZK. Pain measurement and evaluation. Aslan FE, editör. Ağrı Doğası ve Kontrolü. 1. Baskı. Ankara: Akademisyen Kitabevi; 2014. p.83.
7. Hahm SC, Suh HR, Cho HY. The effect of transcutaneous electrical nerve stimulation on pain, muscle strength, balance, and gait in individuals with dementia: a double blind, pilot randomized controlled trial. European Journal of Integrative Medicine. 2019;29:100932. [Crossref]
8. Genç Koyucu R, Demirci N, Ender Yumru A, Salman S, Ayanoğlu YT, Tosun Y, et al. Effects of intradermal sterile water injections in women with low back pain in labor: a randomized, controlled, clinical trial. Balkan Med J. 2018;35(2):148-54. [Crossref] [PubMed] [PMC]
9. Delgado A, Maia T, Melo RS, Lemos A. Birth ball use for women in labor: a systematic review and meta-analysis. Complement Ther Clin Pract. 2019;35:92-101. [Crossref] [PubMed]
10. Gueguen J, Huas C, Orri M, Falissard B. Hypnosis for labour and childbirth: a meta-integration of qualitative and quantitative studies. Complement Ther Clin Pract. 2021;43:101380. [Crossref] [PubMed]
11. Simkin P, Bolding A. Update on nonpharmacologic approaches to relieve labor pain and prevent suffering. J Midwifery Womens Health. 2004;49(6):489-504. [Crossref] [PubMed]
12. Labor S, Maguire S. The pain of labour. Rev Pain. 2008;2(2):15-9. [Crossref] [PubMed] [PMC]
13. Yusuf J, Mahdy ZA, Noor RM. Use of complementary and alternative medicine in pregnancy and its impact on obstetric outcome. Complement Ther Clin Pract. 2016;25:155-63. [Crossref] [PubMed]
14. World Health Organization. WHO recommendations: intrapartum care for a positive childbirth experience. Geneva: World Health Organization; 2018. [Cited: December 30, 2020]. Available from: [Link]
15. Chuang CH, Chen PC, Lee CS, Chen CH, Tu YK, Wu SC. Music intervention for pain and anxiety management of the primiparous women during labour: a systematic review and meta-analysis. J Adv Nurs. 2019;75(4):723-33. [Crossref] [PubMed]
16. Santivá-ez-Acosta R, Tapia-López ELN, Santero M. Music therapy in pain and anxiety management during labor: a systematic review and meta-analysis. Medicina (Kaunas). 2020;56(10):526. [Crossref] [PubMed] [PMC]
17. Wu Q, Liu Z, Pang X, Cheng L. Efficacy of five-element music interventions in perinatal mental health and labor pain: a meta-analysis. Complement Ther Clin Pract. 2020;40:101217. [Crossref] [PubMed]
18. Rong L, Dai LJ, Ouyang YQ. The effectiveness of prenatal yoga on delivery outcomes: a meta-analysis. Complement Ther Clin Pract. 2020;39:101157. [Crossref] [PubMed]
19. Catsaros S, Wendland J. Hypnosis-based interventions during pregnancy and childbirth and their impact on women's childbirth experience: a systematic review. Midwifery. 2020;84:102666. [Crossref] [PubMed]
20. Rathfisch G. Kadın Bedeni Doğal Doğum İçin Yarattılmıştır. Doğal Doğum Felsefesi. 2. Baskı. Ankara: Nobel Tıp Kitabevi; 2018. p.29-32.