

## REVIEW

# Does Reflexology Reduce Labor Pain? A Systematic Review

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### Abstract

**Objective:** In this systematic review, we aim to evaluate the effectiveness of foot reflexology in reducing labor pain intensity.

**Material-Method:** The study was done in the second half of 2019. PubMed (MEDLINE), CINAHL (EBSCO), Scopus, Science Citation Index, Science Direct, ULAKBIM (Turkish National Databases) databases were searched using terms and keywords including ‘labor pain’ ‘vaginal delivery’ ‘normal delivery’ ‘pregnancy and delivery’ ‘reflexology’ ‘foot massage’ ‘pain and reflexology’ in three languages. 3292 articles (English, Turkish and Persian languages) reached by using keywords and scanning electronic databases (between 2009 and 2019). Nine descriptive cross-sectional studies were evaluated that involving provide only quantitative results and descriptive designs quantitative elements of mixed (qualitative and quantitative) method studies.

**Results:** Out of the 3292 articles found in the databases, only 9 met the inclusion criteria and were included in the study. Studies have shown that foot reflexology during labor reduces the severity of labor pain.

**Conclusion:** Performing foot reflexology can be an effective and low-cost method of pain relief, reducing both pain and the duration of labor. It is recommended that further studies with sufficient statistical power be conducted in this field.

**Keywords:** Labor Pain, Foot Massage, Complementary Therapy, Reflexology

### INTRODUCTION

Labor pain is considered one of the most intense pains in the world, equivalent to the pain experienced during childbirth. Over the years, various methods have been developed to alleviate this pain. During delivery, some women experience pain which can lead to panic and anxiety.<sup>1</sup> Pain also causes many physiological changes. Accordingly, the sympathetic nervous system is motivated to enhance catecholamine discharge, which in turn can lead to increased hormone levels, including epinephrine.<sup>2</sup> These will aggravate the pain and prolong the stages of labor. All these processes can lead to deterioration of the psychological state of the mother. It can also negatively affect mother-infant bonding.<sup>3</sup> As a result, it makes an unpleasant experience of childbirth. Additionally, the fear of pain of delivery leads to irregular increase in the use of the cesarean method.<sup>4</sup> Managing labor pain is a significant health challenge, as previously discussed. Pharmacological and non-pharmacological interventions should be used to relieve labor pain because pain can affect the physiological and psychological situation.<sup>5</sup> During pregnancy, the use of anaesthetic drugs is less preferred due to their passage via the placenta. Fear

of medication side-effects and the tendency for symptom relief are possible reasons for the increasing usage of non-pharmacological pain relief by patients.<sup>6</sup>

There are three fundamental ways to manage labor pain: Maintaining fetal homeostasis, safety and simplicity. Non-pharmacological methods can be used to reduce labor pain.<sup>7</sup> There are several non-pharmacological methods to lessen labor pain, including massage, reflexology, touch-therapy, water-therapy, transcutaneous nerve stimulation, aromatherapy, and acupressure.<sup>8</sup> Reflexology has been a helpful method of nursing care for several hundred years in China, Egypt, and India.<sup>9</sup> Foot massage pictures found in Egyptian tombs offer that reflexology has been used as a therapy for almost 5000 years.<sup>10</sup>

Eunice Ingham<sup>11</sup>, the founder of the reflexology known as Zone Therapy, believed that all organs and endocrine organs are linked with reflexes in the legs, hands, and ears.<sup>12</sup> The evidences have shown that reflexology is useful in many conditions such as prenatal-postnatal pain, chronic obstructive pulmonary disease, and migraine.<sup>13</sup> Therapeutic

effects have also been claimed such as strengthening the immune system, improving sleep quality and wound healing.<sup>14</sup> The Reflexology Association of Canada<sup>15</sup> defines reflexology as “a natural healing art based on the principle that there are reflexes in the feet, hands and ears and their referral areas within the related zone, which correspond to every part, gland, and organ of the body”.

Reflexology is based on a system of reflex zones on the feet.<sup>16</sup> The pressure which is applying to reflex zones, blocks calcium crystals, and uric acid. In this way, opens blocked nerve pathways, and improve blood flow in the entire body. This process is called detoxification.<sup>2</sup> With this method, the body's self-healing process is activated, body's physiological relaxation is provided, the body's blood flow is improved, homeostasis is achieved, and tension is reduced, and physiological and psychological health and wellbeing are restituted and maintained.<sup>17</sup>

The mechanism of action for reflexology is not yet known. The most popular hypotheses are the gate control theory of pain, neural impulse theory, which increase the secretion of endorphins and enkephalins. Reflexology is assist relief from pain, boost lymphatic and blood flow and thereby increase toxin excretion from the body.<sup>18</sup> Another theory about foot reflexology is that stress is responsible for 75% of health problems in humans. Nerves in each foot can be stimulated by foot massage, which can reduce stress and promote relaxation, leading to a sense of body equilibrium.<sup>19</sup>

Reflexology is used to treat various physiological conditions during pregnancy, childbirth, and puerperium like nausea and vomiting, constipation, headache, back pain, carpal tunnel syndrome, breastfeeding, edema, fatigue, premenstrual symptoms, increasing quality of life, providing quality sleep in the postpartum period and menopausal, reducing labor pain, shortening the first, second and third phases of labor, *muscle relaxation in patients with multiple sclerosis reduction in systolic blood pressure and the reduction of cortisol and anxiety.*<sup>10,20-26</sup> The studies which have been conducted on the effect of reflexology on outcomes of labor are limited. Therefore, the current study aims to assess the use of foot reflexology in reducing labor pain.

## MATERIALS AND METHODS

### Materials

The purpose of this systematic review is to collect and to synthesize the best evidence of the impact of reflexology on labor pain. Specific research question:

Does reflexology reduce labor pain?

The study was designed according to ‘*the Guidance on Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA, Annex)*’ to systematically review quantitative studies of pain perception in pregnant women who underwent reflexology before and during labor. The study was conducted as a cross-sectional descriptive study.

### Methods

As the first step the conducted study done in the second half of 2019 PubMed (MEDLINE), CINAHL (EBSCO), Scopus, Science Citation Index, Science Direct, ULAKBIM (Turkish National Databases) databases were searched using terms and keywords. Gray literature was not included in the study. In the second step of the study, each of the researchers initially focused on the abstract sections of the identified literature. Preliminary evaluation was performed according to the exclusion criteria of the study. In the third step, we studied the full texts of the identified research papers and evaluated those that met the inclusion criteria. Afterwards, the final evaluation was made by comparing the findings of the researchers the decision was made on which articles should be evaluated.

Inclusion and exclusion criteria will be added with justifications. All clinical studies of reflexology for labor pain were included. We excluded uncontrolled trials, case studies, case series, qualitative studies, review articles, systematic reviews, out of area articles, trails with a different alternative method and recurring articles. Therefore, this review includes descriptive cross-sectional studies that provide only quantitative results and descriptive designs involving quantitative elements of mixed (qualitative and quantitative) method studies. Between 2009 and 2019, we included studies published in English, Turkish and Persian (languages in which authors are fluent enough for screening).

The search results are summarized in the PRISMA flow chart. 3292 articles reached by using keywords and scanning electronic databases. The articles were primarily evaluated in terms of title, abstract and full text. A preliminary assessment was made according to the inclusion and exclusion criteria. Preliminary evaluation was carried out separately by each researcher and consensus was reached on the articles to be included in the research.

### Statistical analysis

Between January 02 and June 1, 2019, Istanbul University - Cerrahpaşa databases were searched by adding criteria determined by using a collective search link. From 3296 articles, 8 review articles and

2846 articles which had nothing to do with labor pain were excluded from evaluation (Figure 1.)

9 articles included in the research were evaluated in terms of the first author, year, study design, sample size, and participants, method, using tools, primary outcomes, and complications manually. The second author also evaluated 9 articles, taking the same parameters into account. The authors reached a consensus that they compared both evaluations.

## RESULTS AND DISCUSSION

A review of the articles on the study shows that they were all clinical trials. Two articles were excluded from the study due to their semi-experimental method.<sup>27,28</sup> In six studies, ‘*Visual Analog Scale (VAS)*’, in one study ‘*Numerical Pain Rating Scale*

(*NPRS*)’ and in two other studies, ‘*the McGill Pain Questionnaire*’ was used to measure severity of labor pain.<sup>15,25,29-35</sup> Six articles were published in English and three in Persian (Table 1).

Although there are no articles published in Turkish, a doctoral dissertation was found among the thesis studies defined as gray literature but was not taken into consideration because it did not meet the inclusion criteria. In the investigated studies, most of the participants were housewives (59-98%) and in terms of literacy, diploma or high school level (53-97%). A randomized clinical trial with two / three groups method was used in all of the articles included in the study and the sample groups consisted of pregnant women (Table 1).

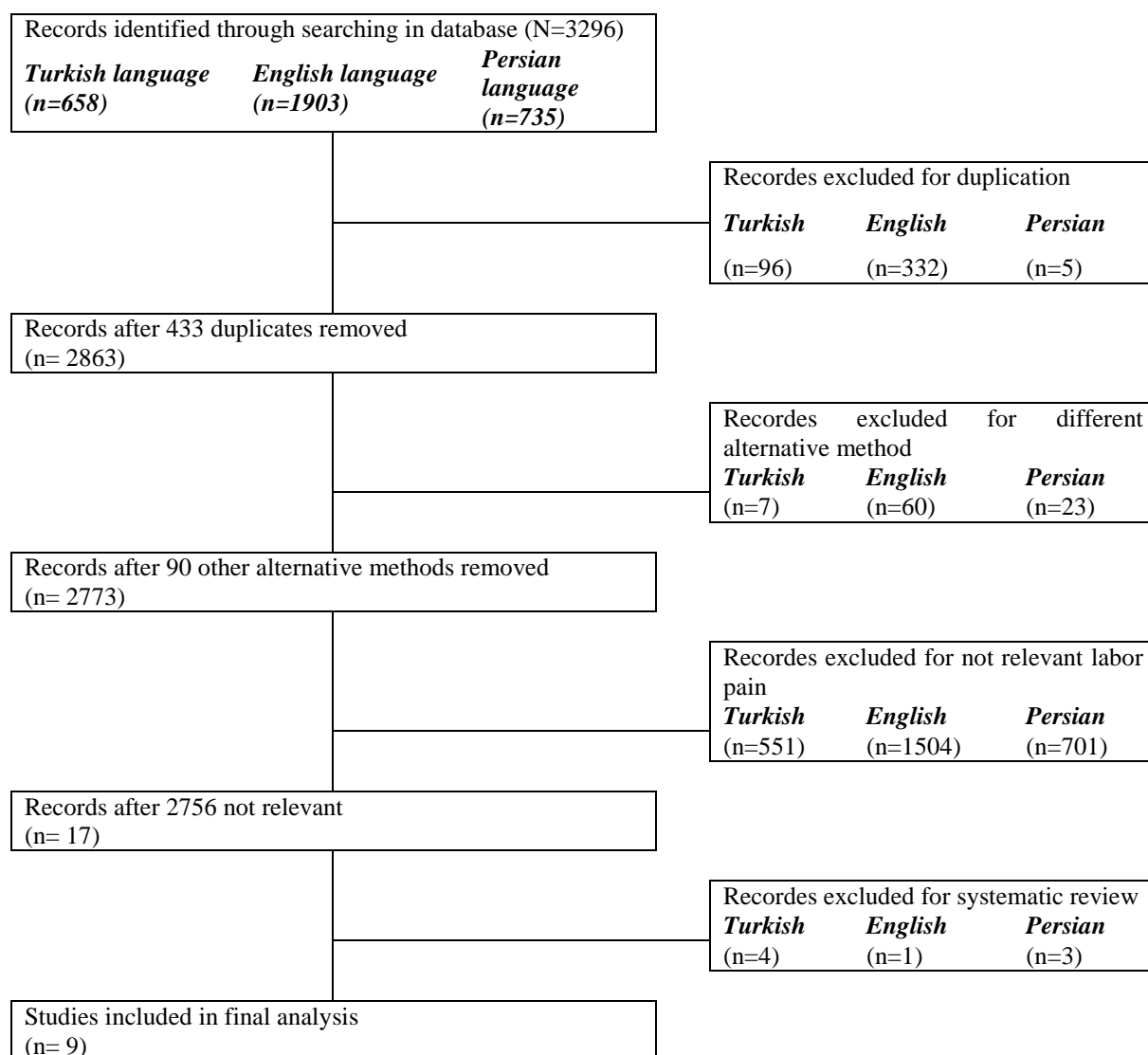


Figure 1. Search strategy

**Table 1.** Features of articles entered into the study

Author (year) (Language)	Study approach	Sample size and Participants	Method	Using tool	Primary outcomes	Complications
Moghimi-Hanjani S, Mehdizadeh-Tourzani Z, Shoghi M 2014 <sup>25</sup> English	A randomized clinical trial with two groups	80 pregnant women attending Alborz and Bahonar hospitals of Karaj (Iran)  Primigravida singleton pregnancies cephalic presentation being in the active phase of labor (dilatation 3-4 cm)	40 participants in the intervention group received 40 minutes of reflexology and 40 participants in the control group received routine cares + massage in other parts of the foot.  Evaluating labor pain intensity, duration of labor, anxiety, the frequency distribution of natural delivery and Apgar scores	1.McGill Questionnaire for Pain Rating Index (PRI)  2.Spielberger State-Trait Anxiety Inventory	The mean pain score in half, one and two hours after reflexology significantly decreased. (p<0.001)	Not mentioned
<u>Dolatian M</u> 2011 <sup>30</sup> English	A randomized clinical trial with three groups	120 pregnant women attending Shahid Akbarabadi Hospital of Tehran (Iran)  Primigravida singleton pregnancies 18-35 years old, gestational age between 37-42 weeks	The first group received 40 minutes foot reflexology in 4-5 cm cervical dilatation. The second group received emotional support and the third group received only routine care  Evaluating severity of pain and duration of labor	1.visual analog scale (pain ruler 0 to 10 cm).  2.Digital Clock	In cervical dilation 4-5 cm, the mean pain intensity is 4.5±1.06, 6.25±0.84 and 7.23±0.83 (reflexology group, support group and routine care group respectively)  In the reflexology group the pain intensity was considerably lower in 6-7 cm and 8-10 cm compared to the other two groups (p<0.001).	Maternal or fetal complications were not observed.
<u>Valiani M</u> 2010 <sup>29</sup> English	A randomized clinical trial with two groups	88 pregnant women attending hospitals of Isfahan (Iran)  Primiparous mothers, Singleton pregnancies originality Iranian-born, 18-35 years old, Gestational age between 37-41 weeks, dilatation 3-5 cm, Cephalic presentation	44 people in the intervention group received 60 minutes foot reflexology once in the active phase of labor and again in 9-10 cm just on specific points 44 people received routine care.  Evaluating Pain intensity, duration of labor and rate of hemorrhage	1.Short-Form of McGill Questionnaire 2.An Analog Clock  3.Counting The Number of Pads	Mean pain intensity in both scales was varying significantly after the intervention (p< 0.001).	Maternal or fetal complications were not observed.
EiFattah A, Metwaly S, Khedr N 2015 <sup>15</sup> English	A randomized clinical trial with two groups	120 pregnant women attending to Ain Shams University Maternity Hospital (Egypt)  Primiparous women the age range of 20- 35, gestational age of 37 to 42 weeks Normal pregnancies Cervical dilation from 4cm	40 women in the active phase of labor in the experimental group received 40 minutes foot reflexology 40 women in the control group received routine care.  Evaluating Pain intensity, duration of labor and labor outcomes	1.Structured Interviewing Questionnaire 2.Women Assessment Sheet (Partograph) 3.Numerical Pain Rating Scale (NPRS): 0 (no pain) to 10 (worst pain) 4.Satisfaction Rating Scale Grading Score	After Intervention in 6-8 cm of dilatation Mean labor pain was 3.5± 0.8 vs 4.7 ± 0.8 in the control group (p<0.05) that illustrates a meaningful decrease in pain intensity after performing reflexology.	Maternal or fetal complications were not observed.

(Highly Satisfied 15-20, Satisfied 7-14, Unsatisfied 0-6).

Mirzaei F, Kaviani M 2009 <sup>31</sup> Persian	A clinical trial with simple sampling with two groups	70 pregnant women attending Afzalipour Hospital in Kerman (Iran)  Primiparous mothers gestational age >37 cervical dilatation 3-4 cm mean age range 25 ±3.6	39 women for experimental group received 20-minute Effleurage in just uterus points in the active phase of labor  31 women in the control group received routine care. Evaluating Pain intensity	Visual Analog Scale	In comparison with the control group (7.43± 1.3), Reflexology caused a significant decrease in pain intensity in the experimental group (5.38± 1.4) (p<0.001)	Not mentioned
Jenabi E, Hajiloo, Mohajeran M, Torkamani M 2011 <sup>32</sup> Persian	A clinical trial with two groups	80 pregnant women attending to Hamedan Social Security Hospital (Iran)  Primiparous mothers Term pregnancy singleton pregnant women cephalic presentation cervical dilatation 3-4 cm	35 women for intervention group received 30-minute massage on reflex points between Heels and ankles in the first stage of labor  35 women in the control group received 30-minute massage in ankle muscles  Evaluating Pain intensity	Visual Analog Scale	In the intervention group, a significant reduction in pain intensity has seen. (p = 0.001) However, there was no significant relationship between uterine reflex points massage and delivery duration. (p=0.59)	Not mentioned
Kamjoo A 2018 <sup>33</sup> English	A randomized clinical trial with two groups	240 pregnant women attending Shariati hospital of Bandar Abbas (Iran)  18 to 35 years, Iranian nationality, 37th to 42nd week of pregnancy, cephalic presentation, having no history of infertility and caesarian indications, their pregnancy being intended, applying no other anesthetic or painkilling method during delivery	120 women for intervention group received 20-minute massage on reflex points between Heels and ankles in the first stage of labor  120 women in the control group received 20-minute massage in a spot other than the uterine spot.  Evaluating Pain intensity	Visual Analog Scale	significant difference was found between the intensity of pain in the 5-7 and 8-10 cm dilatations of the two groups (p=0.01). The length of labor in the active phase was found to be shorter in the reflexology group (p<0.001).	Not mentioned
Hajjghasemali S 2015 <sup>34</sup> Persian	A clinical trial with three groups	92 pregnant women attending Shahid Akbar Abadi Hospital in Tehran  First or second pregnancy, Iranian nationality, 18 to 35 years, 37th to 42nd week of pregnancy, singleton pregnant women, cephalic presentation, having no history of infertility and caesarian indications, being in the active phase of labor, non-rupture amniotic sac over 12 hours, low risk pregnancy.	28 women in SP6 acupressure group received 60 minute pressure four fingers above the apex of the medial ankle and posterior part of the tibia bone,  30 women for reflexology group received 20-minute massage on solar plexus and uterine point,  34 women in the control group received routine care.  Evaluating Pain intensity	Visual Analog Scale	The score of the intensity of pain did not significantly increase after the intervention. however, in the routine care group, the intensity of pain had increased (p=0.001).	Not mentioned
Abdulziz K 2017 <sup>35</sup> English	A randomized clinical trial with two groups	40 pregnant women attending El Sahel Teaching Hospital Inclusion criteria: Primiparous women,	20 women in the experimental group received 20 minutes foot reflexology when cervix is at 3-5 cm dilatation,	Visual Analog Scale	1. There was a significant difference in pain severity in the reflexology	Not mentioned

the age range of 20-35, gestational age of 37 to 41 weeks.	20 women in the control group received routine care.	team before and after the operation (p< 0.001).
Exclusion criteria: Multiparous women, twins, Infectious disease and fever, psychological disorders, epilepsy or seizures, Poly-hydramnios or oligohydramnios, history of any problem during this labor (placenta previa, abortion risk), Fetal distress, Hemorrhage , Incidence of any non-diagnosed dystocia.	Evaluating Pain intensity and Apgar score	2. There were significant differences in Apgar score at first and fifth minute after birth between intervention groups (8.65 and 9.8) and control (7.6 and 9.15) with p<0.001.

In all studies, it was stated that reflexology was applied in the active phase of labor (Table 1). According to the findings of this study, the duration and frequency of reflexology applications vary during these periods. It was determined that a minimum of 20 minutes and a maximum of 60 minutes were applied (Table 2). In all studies, reflexology was applied only once to the experimental group (Table 2). When the studies were examined in terms of body parts that were applied reflexology, it was determined that massage was mostly applied to the uterine reflex point.

According to our findings, it was determined that the Visual Analog Scale was the most widely used measurement instrument for assessing the effect of reflexology on pain perception and the second place was 'the McGill Questionnaire for the Pain Rating Index (PRI)'. It was determined that the Spielberger State-Trait Anxiety Inventory was used for the factors affecting pain perception. By the results of the studies which are included in this study, it was realized that reflexology significantly reduced pain score and increased cervical dilatation. Only one study reported that massaging the uterine point did not affect the delivery process. The findings of the study were consistent with the measured outcomes presented in Table 1. A total of two outcomes were evaluated in the reviewed studies, and the effect size and power analysis was not calculated in any of the studies. Nine articles showed positive results on foot reflexology for the level of pain, duration, mother satisfaction uterine contractions, maternal complications and Apgar scores. None of the studies mention adverse events.

**Table 2.** Specifications of reflexology type in articles entered into the study

Researchers	Reflexology points	Duration	The material used during massage	Times of application
Moghimi-Hanjani S, Mehdizadeh-Tourzani Z, Shoghi M <sup>25</sup>	Pituitary gland, Solar plexus and uterine point	40 minutes (20 minutes for each foot)	Sunflower oil	Not mentioned
Dolatian M <sup>20</sup>	Pituitary gland, Solar plexus, Lumbar, and sacral spine and Genital area	40 minutes (20 minutes for each foot)	Not mentioned	Once at 4-5 cm cervical dilatation
Valiani M <sup>29</sup>	Solar plexus, Areas related to the digestive viscera, Pelvic area, Pituitary, Sinuses, upper and lower extremities, Spinal cord, Lungs, Shallow chest area, The sides on the feet, Ovaries, Uterus and fallopian tubes; and the specific reflexology including the areas related to labor pain such as liver, spleen, kidney, pituitary, solar plexus and uterus.”	60 minutes (30 minutes for each foot)	Not mentioned	Once at 3-5 cm cervical dilatation
ElFattah A, Metwaly S, Khedr N <sup>15</sup>	Solar plexus, the area related to the digestive viscera, pelvic area, pituitary, sinuses, upper and lower extremities, spinal cord, lungs, the shallow chest area, the sides on the feet, ovaries, uterus and fallopian tubes; and the specific reflexology including the areas related to labor pain	40 minutes (20 minutes for each foot)	Not mentioned	Reflexology was conducted during the first stage of cervical dilatation (3-5 cm, 6-8 cm, 9-10 cm) and again during the second

	such as liver, spleen kidney, pituitary, solar plexus and uterus.”			stage of labor, with a concentration of at least five minutes on specific points
Mirzaei F, Kaviani M <sup>31</sup>	Uterine point (the region between the inner ankle and sole)	20 minutes (10 minutes for each foot)	Not mentioned	Once at 3-4 cm cervical dilatation
Jenabi E, Hajiloo Mohajeran M, Torkamani M <sup>32</sup>	Uterine point (the region between the inner ankle and sole)	30 minutes (15 minutes for each foot)	Not mentioned	Once at 4-5 cm cervical dilatation
Kamjoo A <sup>33</sup>	Uterine spot (a curving area between the ankle and the heel )	20 minutes (10 minutes for each foot)	Not mentioned	Once contractions began, the massage would also begin, and once the contractions were over, the message was over too
Hajjghasemali S <sup>34</sup>	SP6 acupressure point (four fingers above the apex of the medial ankle and posterior part of the tibia bone), reflexology on solar plexus and uterin point between the ankle and the heel	60 minute for SP6 point and 20 minute for solar plexus and uterin point.	Not mentioned	Every two minutes without paying attention to Uterine contractions
Abdulziz K <sup>35</sup>	Reflexology on pituitary gland, Solar plexus, lumbar and sacral spine and genital points and also ovaries, uterine, pelvic region, fallopian tubes and sciatica points.	40 minutes (20 minutes for each foot)	Not mentioned	Once at 3-5 cm cervical dilatation

## DISCUSSION

This study evaluates the effects of reflexology on the relief of labor pain in pregnant women. Touch therapy has always been a part of care and now, reflexology has become another part of it.<sup>36</sup> According to reflexology, which is defined as an old-fashioned holistic healing technique, all organs and glands are associated with reflex points in the feet, hands, and ears.<sup>37</sup> Studies have shown that reflexology is an effective method, particularly as a support in pain control treatment.<sup>38</sup>

It has been used to treat a variety of diseases such as migraine headaches, respiratory problems, pain and stress reduction, anxiety, hypertension and insomnia, reducing low back pain, reducing stress while working, increasing pain tolerance, promoting homeostasis, cancer pain and side effects of treatment, menopausal symptoms, dysmenorrhea, postpartum period discomfort and improving lactation, reduce nausea, vomiting, back pain, headache, help lactation and delivery.<sup>39-44</sup>

There are some mechanisms to explain why reflexology might reduce labor pain. Although the exact mechanism of action for reflexology has not been established yet, the first mechanism is gate control theory. Reflexology makes systematic and local physiological changes, looseness of muscles, better blood circulation in the body. And other hand, a deep feeling of comfort and mind balance is created, and than, symptoms of stress are reduced.<sup>45</sup> Fear and anxiety increase adrenaline and noradrenaline acting. This can disturb uterine contractions and decrease the duration of labor.<sup>46</sup> Fear and pain affect the body's circulatory system, respiratory system, endocrines and other tasks. That

would result in increase cesarean and instrumental labor rate and reduce the Apgar score.<sup>47</sup>

However, reflexology results in the secretion of natural painkillers (enkephalins and endorphins) in the body, while adrenaline and noradrenaline levels decrease.<sup>48</sup> Thus, the neuronal transmission of the pain message to the brain is stopped and the level of anxiety and pain is reduced, so it can be used to reduce labor pain.<sup>47</sup> It also appears that reflexology during labor promotes relaxation, which can build a woman's confidence to dealing with pain. It is a non-invasive treatment that may assist mother when certain medications and interventions are contraindicated due to advancing gestation.<sup>49</sup> In recent years, reflexology in midwifery has become increasingly important. It can reduce the use of pain relievers during labor. It can reduce the rate of the elective cesarean section which is due to the fear of vaginal delivery.<sup>50</sup> Reflexology is a simple and convenient technique that requires no hardware tools at reducing the feeling of labor pain.<sup>15</sup> Majority of the mothers (89.71%) believed that reflexology was an effective technique in labor pain<sup>51</sup>. The intervention resulted in a significant reduction of pain after the intervention<sup>52</sup>, using less Entonox gas<sup>53</sup>, labor duration was averagely reduced 6-7 hours.<sup>54</sup> Reflexology may facilitate labor by increasing uterine contractions, reducing pain and the need for intervention.<sup>48</sup> Pregnant women who applied foot reflexology during labor perceived painless than the control group.<sup>55</sup>

The application started at the beginning of the active phase of labor and it was applied in the durations of 10 to 60 minutes. Ideally, in the first stage of labor with 3-4 cm dilatation, uninterrupted and accurate

reflexology techniques, starting from the right foot and being applied for a total of 15-30 minutes for each foot. Only uterus reflex point was used in 44% of the investigated studies<sup>31-34</sup> and general reflexology points combined with uterus point was used in remaining 56%.<sup>15,25,29,30,35</sup> All applications to the right foot are repeated in the left foot. Massage was recommended to be done once a week in the first trimester and 2-3 times a week in the third trimester for 10-60 minutes.<sup>56</sup>

In the literature, there are different one-dimensional and multi-dimensional assessment tools for determining the severity of pain.<sup>57</sup> One-dimensional scales used in pain assessment are the Verbal Category Scale, Numerical Scales, Visual Analogue Scale (VAS), Burford Pain Thermometer (BAT). Multidimensional scales are The McGill Pain Questionnaire (MPQ), Dartmouth Pain Questionnaire, Behavioral Models, Pain Perception Profile, Wisconsin Short Pain Chart, Reminder Pain Evaluation Card, West Haven-Yale Multidimensional Pain Chart. VAS scale is commonly used for the assessment of labor pain because of high sensitivity in pain assessment, easy to apply for patients over five years old, a successful method in evaluating pain relief and sufficient sensitivity to assess the effects of treatment.<sup>58</sup> In investigated studies, it was found that VAS is frequently used as a tool for assessing pain severity. Based on literature search, there is one systematic review and one review researching the effect of reflexology on the severity of labor pain.<sup>59,60</sup> Sharifi et al.<sup>59</sup> reviewed seven clinical trials that examined the effect of reflexology on labor pain. The positive effect of reflexology on labor pain is in agreement with the results of the present study. In a review of Hakim et al.<sup>60</sup>, who analyzed the effects of foot reflexology for women and fetal wellbeing in labor, they found that foot reflexology can reduce labor pain intensity. It was also decreased anxiety, duration, blood pressure, pulse, hemorrhage. On the other hand, there was a significant increase in Apgar scores, uterine contractions, and maternal satisfaction.<sup>60-61</sup> Nasiri et al.<sup>61</sup> conducted a systematic review to investigate the efficacy of reflexology studies in Iran. They found that reflexology is an alternative treatment that promotes relaxation. In a systematic review that is determined of the effect of massage on pain and duration of labor, Ganji and colleagues reported that massage was effective in reducing pain in the first stage of labor.<sup>62</sup>

Ernone et al.<sup>63</sup> performed a qualitative study aimed at examining reflexology experiences in pregnant

women. In this study, participants described a positive and optimistic experience of increasing their sense of self-efficacy, pain and anxiety levels were reduced, which was consistent with the results of the present study.

Nasiri et al.<sup>61</sup> performed a systematic review of 47 clinical trials examining the effects of reflexology on fatigue, pattern of sleep, labor length, post-chemotherapy vomiting, physiological parameters of Pre-Menstrual Syndrome (PMS), low back pain, anxiety and constipation. They found that out of the 20 pain studies published, 18 reported that reflexology reduced pain. However two studies reported this method ineffective. Studies have also reported that reflexology reduces pain after cesarean section and hysterectomy.<sup>64</sup>

One of the most important limitations of this study is the inability to perform meta-analysis due to differences in reflexology methods as well as different control groups. Several issues raised from the RCTs included in this review require further investigation and evaluation. According to the RCTs included in this review, the methods of the studies included in the review was mixed. Most of the studies provided limited information about their methods. Minimising bias in these trials was challenging.

The limitation of the review is that it included a small number of trials with small sample sizes. Further studies with more variables are needed to better determine the effects of using reflexology for labor pain relief. Another limitation of the studies is that reflexology was applied only once in the active phase of labor to the experimental group. However, reflexology might be applied during the latent phase or after the patient enters the labor ward without any prohibition in the first stage of labor. In addition, the effect of reflexology should be examined more frequently (twice or three times).

The next issue is about the reflexology environment which being unclear, due to the extreme effects of the quiet environment on the results of the process.

Much research has focused on the impact of reflexology on the reflex points of the uterus. We suggest that a full reflexology process is performed to achieve better outcomes

## CONCLUSION

One of popular types of complementary and alternative medicine, Reflexology, is recommended in maternity hospitals to promote the wellbeing of pregnant mothers and their fetuses during labor.

Despite the challenges outlined above, this systematic review provides clear evidence that foot reflexology can reduce the duration of labor and the intensity of pain. It is a low-cost, complex equipment-free intervention.



However, to reach a definitive conclusion, it is necessary to conduct Randomized Clinical Trials (RCTs) with sufficient statistical power.

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