The Impact of the Fruit and Seed of Date on Childbirth Stages and Pregnancy Complications

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Abstract

The present study aimed to investigate the effects of date fruit products on the childbirth process and pregnancy complications. MeSH keywords systematically were searched in scientific databases. Finally, 16 articles were reviewed. Overall results of studies illustrated that using seven date fruits per day (average of 80 grams per day) for 2 - 4 weeks before their estimated date of delivery leads to a better cervical dilatation at admission or improvement of bishop score, decrease in the need for induction or stimulation of labor and by increasing effective uterine contractions, decrease duration of pregnancy, and duration of the different stages of labor. Also, date fruit products can improve blood pressure parameters in pregnant women at risk of preeclampsia and accelerate episiotomy healing.

Keywords: Pregnancy; Childbirth; Phoenix dactylifera; Date Fruits; Date Palm Fruit.
Introduction

The World Health Organization (WHO) defines natural childbirth as the "spontaneous onset of low-risk labor and its continuation between 37 and 42 weeks of a full pregnancy." If labor is not progressing, several means can stimulate or induce labor. These methods are used alone or in combination, such as stripping the membranes and using prostaglandins and oxytocin.(1) If the cervix is not desirable, the cervix should first be prepared by mechanical methods.(2)

Induction of labor by oxytocin occurs in more than 25% of deliveries.(3) With increasing duration of labor, long-term induction occurs with several adverse effects. These effects include prolonged latent phase, hyperactive uterus, chorioamnionitis, and increased risk of uterine rupture, fetal hypoxia, acidemia, postpartum hemorrhage, and cesarean section.(3, 4) Furthermore, labor induction may lead to maternal discomfort and a significant financial burden.(1, 5, 6) However, these methods accelerate the labor process and reduce the cesarean section rate.(7) Recently, researchers have paid more attention to resolving labor problems using complementary therapies and reducing the rate of cesarean section and maternal and fetal complications.(8)

It seems that the use of complementary and alternative medicine is safer than chemical drugs for the improvement of fertility, childbirth, and postpartum complications.(9) Using herbal medicines throughout pregnancy is 6% to 9% in developed countries such as Canada and the United States, up to 50% in Australia and Eastern Europe, 69% in Russia,(10) and 51% to 63% in Iran.(11) The use of most parts of date products (fresh date fruit, date syrup, "Lagmi") is common in traditional medicine.(12)

Studies indicate that date fruit extract has different properties, and it can be used to prevent and treat pregnancy complications such as cardiovascular disease (preeclampsia and diabetes) and help wound healing and genital injuries.(13, 14) Date fruits seem to be a sensible food choice for pregnant women as part of a balanced diet. Therefore, the present systematic review study investigated the effect of date fruit products on the childbirth process and pregnancy complications.
**Methods**

When reporting the article protocol, the PRISMA (preferential reporting items for systematic review and meta-analysis) guidelines were followed. (15, 16) Also, according to PRISMA guidelines, the following steps were performed: systematic literature review, organizing documents to review, abstracting and evaluating the quality of each experimental study, combining data, and writing a report. (17)

**Search Method**

Relevant articles from 2000 to 2022 were systematically searched on Web of Science, PubMed, Scopus, ProQuest, and Google Scholar. Furthermore, articles were searched according to Medical Subject Headings (MESH) keywords: 1. "Parturitions" OR "Birth" OR "Births" OR "Childbirth" OR "Childbirths"/ 2. "Pregnancy" OR "Pregnancies" OR "Gestation"/ "Phoenix dactylifera" OR "Date Palm Trees" OR "Date Palm Tree" OR "Palm Tree, Date" OR "Palm Trees, Date" OR "Tree, Date Palm" OR "Trees, Date Palm" OR "Date Palms" OR "Date Palm" OR "Palm, Date" OR "Palm, Date" OR "Palms, Date" OR "Dates, Palm" OR "Date, Palm" OR "Palm Date" OR "Date Palm Fruit" OR "Date Palm Fruits" OR "Fruit, Date Palm" OR "Fruits, Date Palm" OR "Palm Fruit, Date" OR "Palm Fruits, Date" OR "Date Fruit" OR "Date Fruits" OR "Fruit, Date" OR "Fruits, Date" OR "Palm Dates"/. 4. 1 AND 2 AND 3.

**Eligible Criteria**

Inclusion criteria: Clinical trial studies that investigated the effect of date fruit products on the stages of labor and pregnancy complications. Besides, there were no language restrictions in article selection. The translator was asked to translate for articles other than Persian or English.

Exclusion Criteria: Studies include case reports, comments, letters, studies with inconsistent data, lack of access to the full text of studies, studies published before 2000, and studies that do not have appropriate quality. The PICO criteria are as follows: **Participants:** Healthy primiparous or multiparous mothers with term birth; Mothers with vaginal childbirth; **Interventions:** Date fruit products (date fruit, date syrup, date-honey syrup, Lagmi) during pregnancy, childbirth, and postpartum period; **Comparison:** Placebo, without intervention or routine care; **Outcome(Measurement):** The rate of cervical dilatation, postpartum hemorrhage, bishop score, the duration of each stage of labor and delivery, and mean blood pressure.
Studies type: Clinical trials related to evaluating the impact of date fruit products on childbirth and its complications in the period 2000 to 2022 were included in this review.

Selecting Articles

Titles and abstracts of all studies reviewed during the electronic and manual search process were evaluated based on inclusion criteria. Subsequently, the two researchers independently reviewed the full text of the articles. They talked to each other to resolve their differences when disagreeing. Afterward, a table was prepared using a review of various articles. This table can best show the information related to the effect of date fruit usage on childbirth stages and pregnancy complications to make a decision.

Quality assessment

Risk of bias (RoB) assessment was performed through the Cochrane RoB 2 tool for included studies, following the Cochrane Handbook for Systematic Reviews of Interventions.(18) The tool has five different areas that are used to determine the overall risk of bias (RoB). The assessment of RoB for the second area, which looks at deviations from the intended interventions, was used to measure the impact of assignment to the intervention. Each area was evaluated using one of three options: "Low RoB," "Some Concerns," or "High RoB." Two authors assessed the RoB for each study, and any disagreements were resolved through negotiation.(Table1)

Data Extraction

The two authors separately reviewed published scientific studies and evaluated their quality. Afterward, they exchanged views and resolved the existing disagreements. The collected information, including reference, region, participants, sample size, intervention group, comparison group, type of product, and outcomes, are summarized in Table 2.

Results

In the present study, 16 articles out of 894 articles were included. Articles were screened in three stages. In the first stage, 31 duplicate articles were excluded. After studying the title and abstract of the articles, 400 articles with irrelevant titles and abstracts were deleted. Subsequently, 432 articles with exclusion criteria were excluded. Furthermore, the full text of 31 articles was reviewed, and 15 studies were omitted. Eventually, 16 qualified studies that
examined the effect of using date fruit products in pregnancy and childbirth (sample size of 1616 pregnant women and 15 rats) were evaluated (Table 2). The flowchart of the study selection process is indicated in Figure 1. Additionally, the imported articles were selected from the published articles from 2000 to 2022. The countries in which the studies were conducted are Iran (n=9), Indonesia (n=2), Pakistan(1), Malaysia(1), Saudi Arabia(1), Tunisia (n=1), and Jordan (n=1), respectively. The intervention in 13 studies, was with date fruits, 1 study was with date syrup, 1 study with "Lagmi", and 1 study was with date honey syrup.

The impact of using date fruits on different stages of labor

Improving bishop score and cervical dilatation at admission:
Pregnant women who consumed 6 or 7 date fruits or 70-76 grams of date fruits daily, 4 weeks before the estimated date of childbirth or from 37th weeks of gestation illustrated that dilatation at admission was significantly higher, and Bishop score were higher than the control group.(19-22)

Spontaneous childbirth and the need for induction and stimulation of labor:
Consumption of 6 date fruits or 70-76 grams date fruits or date honey syrup(132 gr) daily 1-4 weeks before the estimated date of childbirth or from week 37th weeks of gestation reported significantly less need for induction or stimulation of labor in the intervention group, and the rate of spontaneous childbirth was significantly higher.(20, 22, 23) Also consuming 7 date fruits daily for 2 weeks before childbirth causes a higher spontaneous childbirth rate and lower need for induction.(24) In contrast, the results of a study by RAZALI et al. illustrated no statistically significant difference between the intervention and control groups in terms of the need for induction and stimulation of labor and spontaneous childbirth.(25)

Latent phase duration of the first stage of labor
Two studies demonstrated consumption of 6-7 pieces of date fruits, 4 weeks before the estimated date of childbirth cause shorter latent phase length.(19, 25)

Active phase duration of the first stage of labor
Pregnant women who received 7 pieces or 70-76 gr of date fruits, or 132 gr date-honey syrup, or date syrup had significantly shorter active phase.(14, 22, 23, 26)
Duration of the second stage of labor

The duration of the second stage of labor in the participants who received 7 pieces or 70-76 gr date fruits especially 1-4 weeks before childbirth and stopped during labor, was significantly shorter.(14, 22).

Duration of the third stage of labor

Most of the studies that performed the intervention before labor did not have a statistically significant difference in the duration of the third stage of labor(19, 25). However, the results of two studies reported that the duration of the third stage of labor in the intervention group (7 pieces or 70-76 gr date fruits) was significantly shorter(14, 22). However, the duration of the third stage and the mean blood loss were lower with the intervention of 50-100 gr date fruits up to 10 days after childbirth.(27-30)

Using date fruits and blood pressure during pregnancy

The results of a study demonstrated that daily consumption of 7 pieces or 100 gr / daily Ajwa date fruits by pregnant women at risk of preeclampsia and eclampsia for 8 weeks significantly reduced mean arterial blood pressure and roll-over test.(31, 32)

Using date fruit in wound healing (episiotomy)

The presence of phenolic and flavonoid compounds of "Lagmi"(date palm sap) indicated that "lagmi" is an important source of known anti-inflammatory compounds and has a wide range of antioxidants that stimulate wound healing mechanisms, and also have biological activities.(33, 34)

Discussion

The results of included studies showed that using seven date fruits (equivalent to 80 gr per day) during the last 2-4 weeks of pregnancy leads to a reduction in the need for induction or stimulation of labor and duration of pregnancy. Also, consumption of date fruits by pregnant women before labor causes more cervical dilatation or improvement of bishop score at the time of admission, and reduction of the duration of the latent phase of the first stage of labor.

Most studies examined the effect of the consumption of date fruits during labor and illustrated a decrease in the duration of the active phase of the first stage of labor,(14, 22-24, 35) and the
second stage of labor: (22, 23, 36) Besides, studies that performed the intervention with date fruit consumption for several days after childbirth reported a decrease in the third stage of labor. (14, 22, 27, 29) However, the results of the meta-analysis study showed that the date fruit consumption reduces the duration of the active phase and improves the bishop score. However, no significant difference was observed during the first, second, and third stages of labor. (35) 

Several theories may explain these findings. First, in the last weeks of pregnancy (34 - 35 weeks of pregnancy), changes in estrogen and progesterone levels induce eutroton receptors such as oxytocin and prostaglandins in the myometrium. (37) Also, date fruits are rich in saturated and unsaturated fatty acids, which can be converted to icosanoids and eventually to prostaglandins. (21, 38) Second, the abundance of serotonin and calcium in date fruits can contribute to uterine smooth muscle contractions by performing oxytocin mimicry activities. (28, 39) Third, childbirth is a process with high energy consumption, and a pregnant woman needs 50 to 100 kcal/hour or 10 g of glucose/hour during labor. (22, 35) Therefore, date fruits with high nutritional value, especially high content of glucose and fructose can meet pregnant women's energy needs during labor. (39) Additionally, not consuming energy-generating food during labor leads to increased ineffective uterine contractions and increases the duration of the second stage of labor and instrumental vaginal delivery. (40) Other studies demonstrate that resolving food intake limitations during labor, (41) and injecting dextrose solution compared to normal saline reduces the duration of labor, (42) and postpartum hemorrhage. (30) Instead of triglycerides and free fatty acids, glucose is the main metabolite of uterine smooth muscle nutrition during pregnancy. It plays an important role in the formation of adenosine triphosphate and muscle contraction. (43) Following the consumption of date fruits, the extract is digested, absorbed, and used immediately by the cells; afterward, plasma levels of antioxidants are increased for 4 hours. (39) In general, it can be said date fruits have energy, oxytocin-like effects, anti-inflammatory and antioxidant impacts. (14) Accordingly, the results of a clinical trial study revealed that oral consumption of date syrup significantly reduces the labor pain in nulliparous women. (44) 

The important known etiologies of preeclampsia and eclampsia is endothelial damage. (45) Concentrations of antiangiogenic substances such as sFlt-1 in maternal serum increase before the onset of symptoms of preeclampsia. (46) Thus, using Ajwa date fruits by high-risk pregnant women prevents preeclampsia syndrome in the third trimester by reducing the incidence of
antiangiogenic cases.(47) Bragma et al. found that this fruit is a potent inhibitor of angiotensin-converting enzyme, which can effectively control blood pressure.(48) Also in some Arab countries, such as Morocco, date fruits are traditionally used for high blood pressure.(49)

One of the strengths of this study is that systematically reviewing the studies conducted in this field, and helps to make a better decision about the effectiveness of the amount and duration of consumption of date fruit products during pregnancy and childbirth stages. One of the limitations of this study is the small number of studies about the effect of date fruit on pregnancy blood pressure and preeclampsia. However, the effect of using date fruit extract on human wounds and episiotomy wounds has not been studied so far; hence, it is recommended that clinical trials be performed to evaluate it.

**Conclusion**

According to the studies, date fruits can be used to reduce the duration of pregnancy and childbirth time, increase effective uterine contractions, reduce gestational blood pressure, and reduce wound healing time. Thus, healthcare providers can recommend the use of date fruits during pregnancy, childbirth, and the postpartum period.

**Authors’ Contribution**

FA, FAR conceived, designed, and wrote the paper. ZAK, MJB, FR, and FZ reviewed and interpreted the data. All authors approved the final version of the manuscript.

**Conflicts of interest**

Authors state no conflict of interest.

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References


32. Husaidah S, Mappaware NA. Change in Mean Arterial Pressure (MAP), Roll Over Test (ROT), and Soluble Fms Level like Tyrosine Kinase-1 (SFLT-1) as a predictor of preeclampsia in a pregnant woman by giving ajwa date. Enfermeria Clinica. 2020;30:325-30.


43. Steingrímsdóttir T, Ronquist G, Ulmsten U, Waldenström A. Different energy metabolite pattern between uterine smooth muscle and striated rectus muscle in term pregnant


45. LaMarca B. Endothelial dysfunction; an important mediator in the Pathophysiology of Hypertension during Preeclampsia. Minerva ginecologica. 2012;64(4):309.


Table 1. Risk of bias assessment summary: authors’ judgments about each risk of bias domain for each included study

<table>
<thead>
<tr>
<th>Reference</th>
<th>Randomization Process</th>
<th>Deviation from the intended interventions</th>
<th>Missing outcome data</th>
<th>Measurement of the outcome</th>
<th>Selection of the reported results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housaideh (2020)(32)</td>
<td>+</td>
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<td>+</td>
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<tr>
<td>Royani (2019)(31)</td>
<td>+</td>
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<td>+</td>
<td>+</td>
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<tr>
<td>Quershi (2019) (50)</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Fathi (2019)(26)</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Ahmed (2018)(14)</td>
<td>+</td>
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<td>?</td>
<td>+</td>
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<td>Kordi (2017)(22)</td>
<td>+</td>
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<td>Razali (2017)(25)</td>
<td>+</td>
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<tr>
<td>Yadegari (2016)(29)</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>?</td>
<td>+</td>
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<tr>
<td>Abdennabi (2016)(33)</td>
<td>+</td>
<td>+</td>
<td>?</td>
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<tr>
<td>Kariman (2015) (21)</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Yousefi jadidi (2015)(24)</td>
<td>+</td>
<td>+</td>
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<td>+</td>
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<tr>
<td>Kordi (2013)(20)</td>
<td>+</td>
<td>+</td>
<td>?</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Mojahed (2012)(27)</td>
<td>+</td>
<td>+</td>
<td>?</td>
<td>_</td>
<td>+</td>
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<tr>
<td>Al-Kuran 2011(19)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Kordi (2010)(23)</td>
<td>+</td>
<td>+</td>
<td>?</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Khadem (2007)(28)</td>
<td>-</td>
<td>++</td>
<td>+</td>
<td>?</td>
<td>+</td>
</tr>
</tbody>
</table>

+:Low risk; -: high risk; ?:some concerns
### Table 2. Details of included studies

<table>
<thead>
<tr>
<th>Author, Year (Ref)</th>
<th>Region</th>
<th>Participants (N)</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Date product name</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housaideh (2020) (32)</td>
<td>Indonesia</td>
<td>Pregnant women at 8 weeks with a high risk of preeclampsia and eclampsia N:40</td>
<td>N=30 100 gr/daily for 8 weeks</td>
<td>N=10 without intervention</td>
<td>Date fruits (Ajwa Dates)</td>
<td>Significant reduction in: -MAP (98.90–85.03) -ROT (30.13–10.07) -Sflt-1 (4.02–1.72)</td>
</tr>
<tr>
<td>Royani (2019) (31)</td>
<td>Indonesia</td>
<td>Pregnant women having one of the preeclampsia risk factors N:40</td>
<td>N=30 7 pieces /daily for 8 weeks</td>
<td>N=10 without intervention</td>
<td>Date fruits (Ajwa Dates)</td>
<td>Significant reduction in: -MAP (85.03 ± 4.38) -ROT (10.07 ± 8.09)</td>
</tr>
<tr>
<td>Quershi (2019) (50)</td>
<td>Pakistan</td>
<td>At the risk of cardiac diseases N:150</td>
<td>N=100 1: Ajwa Date fruits alone (N=50) 2: Allopathic therapy + Ajwa date fruits (N=50)</td>
<td>N=50 Routine allopathic medicine</td>
<td>Date fruits (Ajwa Dates)</td>
<td>-Significant improvement of Cardiovascular diseases, especially in symptomatic patients.</td>
</tr>
<tr>
<td>Fathi (2019) (26)</td>
<td>Iran</td>
<td>Nulliparous N:80</td>
<td>N=40 6 pieces of date fruits blended in 150 ml water/every 30-60 min/depending on maternal request</td>
<td>N=40 without intervention</td>
<td>Date syrup</td>
<td>-Significant decrease in mean length of active phase of labor.</td>
</tr>
<tr>
<td>Ahmed (2018) (14)</td>
<td>Saudi Arabia</td>
<td>Primipara and multigravida N:89</td>
<td>N=58 1. 7 pieces of date fruits alone (N=26) 2. 7 pieces of date fruits + 250 ml of water (N=32)</td>
<td>N=31 without intervention</td>
<td>Date fruits (Rotana rutab)</td>
<td>Significant decrease in: -Duration of the first stage of labor in the date fruits &amp; date fruits + water consumers (210.14 ± 177.13 Vs. 224.43 ± 157.25 min)</td>
</tr>
<tr>
<td>Study (Year)(Reference)</td>
<td>Country</td>
<td>Gender</td>
<td>Status</td>
<td>N</td>
<td>Daily Intake</td>
<td>Intake Period</td>
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</tbody>
</table>
| Kordi (2017)(22) | Iran | Nulliparous Women | N=182 | N=91 | 70-76 g / daily /from the 37th week of pregnancy | Date fruits (Mazafati dates of Bam) | Significant decrease in: - Duration of the second stage of labor in date fruit + water consumers(20.50 ± 13.94 min). 
- Length of active phase (329.00±249.00 min) 
- Second phase ( 33.60 ±13.70 min) 
- Third phase( 5.10±2.50min) 
- Need of oxytocin for labor acceleration 5.50% | |
| Razali (2017)(25) | Malesia | Nulliparous | N=154 | N=77 | 7 pieces( approximately 80 g)/daily/from 36th weeks of gestation to onset of labor | Date fruits | Significant decrease in: 
- Augmentation of labor 
- Latent phase of the first stage (364±527 min) | |
| Yadegari (2016)(29) | Iran | Nulliparous | N=90 | N=45 | 100gr/daily /From 2 hours to 10 days after delivery | Date fruits (Mazafati dates of Bam) | Significant decrease in the rate of bleeding 2-10 days after birth. | |
| Abdennabi (2016)(33) | Tunisia | Wistar rats | N=15 | N=10 | 1-Lagmi/topically /twice/ daily(N=5) 
2- CICAFLORA/ topically/twice /daily(n=5) | The sap of the date palm "Lagmi" | - Complete healing in the lagmi group on the 12th day of the intervention. | |
<p>| Kariman (2015) (21) | Iran | Nulliparous | N=110 | N=55 | | Date fruits( Bam Mazafati Rutab) | - Significant increase in Bishop score (7.3±2.7) | |</p>
<table>
<thead>
<tr>
<th>Study and Location</th>
<th>Intervention</th>
<th>Randomization</th>
<th>Intervention Group</th>
<th>Significance of Effect</th>
<th>Control Group</th>
<th>Control Group</th>
<th>Control Group</th>
<th>Outcome Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yousefi Jadidi (2015) (24)</td>
<td>Bam Mazafati Rutab</td>
<td>Nulliparous</td>
<td>N=55</td>
<td>7 pieces / daily from 38th week to onset of labor</td>
<td>Date fruits</td>
<td>N=55</td>
<td>7 pieces / daily from 38th week to onset of labor</td>
<td>- Significant decrease in duration of active phase of labor (216.02±16.4 min)</td>
</tr>
<tr>
<td>Kordi (2013) (20)</td>
<td>Bam Mazafati Rutab</td>
<td>Nulliparous</td>
<td>N=105</td>
<td>70-75 gr/daily from the 37th week of pregnancy to onset of labor</td>
<td>Date fruits</td>
<td>N=105</td>
<td>Without intervention</td>
<td>- Significant decrease in the need for induction</td>
</tr>
<tr>
<td>Mojahed (2012) (27)</td>
<td>Bam Mazafati Rutab</td>
<td>Multi and nulliparous</td>
<td>N=44</td>
<td>20 units oxytocin in 1000 ml dextrose + sodium chloride serum + 100 gr date fruits + one glass of warm water immediately after delivery of the placenta</td>
<td>Date fruits</td>
<td>N=51</td>
<td>20 units oxytocin in 1000 ml dextrose sodium chloride serum</td>
<td>- Significant reduction in postpartum hemorrhage (68.5 ml)</td>
</tr>
<tr>
<td>Al-Kuran 2011 (19)</td>
<td>Date fruits</td>
<td>Primi and multigravida</td>
<td>N=69</td>
<td>6 pieces/daily for 4 weeks before the estimated date of delivery</td>
<td>Date fruits</td>
<td>N=45</td>
<td>Without intervention</td>
<td>Significant increase in:</td>
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<td>- Cervical dilatation</td>
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<td></td>
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<td>- Proportion of intact membranes</td>
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<td>- Spontaneous labor in (96%)</td>
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<td>Significant Decrease in:</td>
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<td></td>
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<td>- Use of Prostin/oxytocin (28%)</td>
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<td>- Latent phase of the first stage of labor (510 min)</td>
</tr>
<tr>
<td>Study</td>
<td>Country</td>
<td>Parity</td>
<td>Total N</td>
<td>Intervention</td>
<td>Main Outcomes</td>
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</table>
| Kordi (2010)(23) | Iran    | Nulliparous  | N=90     | 132 gr date honey syrup / from the dilation of the cervix 4 cm to delivery | - Significant increase in spontaneous progression of labor (96.7%).  
- Significant decrease in labor duration (351 min). |
| Khadem (2007)(28) | Iran    | Multi and nulliparous | N=62     | 50 gr immediately after delivery of the placenta    | - Significant decrease in mean blood loss 3 hours after delivery. |

CT: Clinical Trial, MAP: Mean Arterial pressure, ROT: Roll over Test, RCT: Randomized Clinical Trial, APGAR: Appearance, Pulse, Grimace, Activity, and Respiration, min: minute, gr: gram
Figure 1. Flowchart of the study selection process