

Comparison of the effects of Date Syrup with Saffron-Honey Syrup on the Progress of Labor in Nulliparous Women: A Single Blind Randomized Clinical Trial

Abstract

Background: Assessing the progress of labor is a primary step in intrapartum care. This study was performed to assess comparison of the effects of date syrup with saffron-honey syrup on the progress of labor in nulliparous women. **Materials and Methods:** A randomized single-blind clinical trial study was conducted on 189 women who were referred to Bea'sat Hospital of Sanandaj from October 2019 to March 2020. Patients were randomly divided into three groups saffron-honey syrup, date syrup, and placebo syrup each including 63 cases. Each participant in the intervention and control groups received a maximum volume of 150 ml of saffron-honey syrup, date syrup, or placebo syrup. The syrups were given at the 4 cm dilation, and every 30–60 min until the end of the active phase of the first stage of labor. Data collection tools included a two-part questionnaire and a partograph form. The results were analyzed by Statistical Package for the Social Sciences (SPSS) 24 using Chi-squared test, analysis of variance, and last significant difference as a post hoc test, the significance level was set at 0.05. **Results:** The duration of the active phases of the first ($F_2 = 92.70$, $p < 0.01$), second ($F_2 = 66.76$, $p < 0.01$), and third ($F_2 = 12.34$, $p < 0.01$) stages of labor was shorter in the date syrup and saffron-honey syrup groups than in the control group ($p < 0.01$). Additionally, both experimental groups exhibited no significant difference in terms of duration between the first ($p = 0.312$), second ($p = 0.724$), and third ($p = 0.911$) stages of labor. **Conclusions:** Date syrup and saffron-honey syrup can be used as one of the safe and available herbal methods to facilitate labor.

Keywords: *Phoenixaceae, honey, labor, obstetric, crocus*

Introduction

Labor is a physiological process in which the fetus, membranes, umbilical cord, and placenta are expelled from the uterus.^[1] Progress in labor is still assessed based on four main signs: cervical dilatation/effacement, station of the presenting part, position of the fetal head, and strength of contractions.^[2] In order to improve mother and child health outcomes, the assessment of labor can identify and forecast problems, such as abnormal labor progression.^[3] Safe labor and delivery practices are vital for the health of mother and baby. The World Health Organization (WHO) emphasizes the importance of limiting medical interventions during childbirth and encourages favoring safe nonpharmacological methods that reduce health complications for the mother and the child.^[4]

Dates contain essential and nonessential fatty acids and can boost the effects of natural oxytocin, which can improve cervical ripening, facilitate normal progress of labor, and increase uterine contractions.^[5] One study revealed that date syrup reduced the duration of active phase of labor.^[6] Also the study showed that oral consumption of dates during labor decreased the duration of the second phase of labor but did not affect the duration of the active phase of labor.^[7] Results of a study by Razali *et al.* (2017)^[5] suggested that eating dates during labor did not alter the duration of the first, second, and third stages of labor. Similarly, honey has been used during labor as a source of energy.^[8] Natural honey contains 200 different compounds, including monoacids, vitamins, minerals, and enzymes; but, it is mainly composed of glucose and fructose satisfying the needs of the body in terms

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of calories.^[9] The consumption of honey syrup has been useful in reducing the duration of the active phase of labor.^[6] Kordi *et al.* (2009)^[8] found that oral consumption of honey–date syrup during labor improved the progress of labor. Moreover, saffron is a valuable plant in Iran. It can lead to abortion or fetal complications through excitatory effects on the uterine smooth muscle in the first 3 months of pregnancy.^[10] In traditional medicine, consumption of 3.5 gr/day of saffron in labor and delivery and 1.5 gr/day in pregnancy is safe.^[11] However, it can facilitate the progress of labor by improving the contraction of uterine muscles. In a clinical trial study conducted in Iran, the consumption of saffron could lead to cervical ripening.^[12]

Most different studies have shown that these products do not produce complications.^[5,6,8,13-15] Dates, saffron, and honey are among the most well-known products of Iran. Due to contradictory results of studies on the progress of labor and the lack of comparison between dates and saffron–honey in the searches, and since in most studies saffron and honey both have an effect on the progress of labor, it was assumed that the combination of saffron with honey may have a greater effect on the progress of labor than dates. So to investigate this possibility, this study was performed to compare the effects of dates syrup with saffron–honey syrup on the progress of labor in nulliparous women.

Material and Methods

A randomized single-blind clinical trial (IRCT20190924044873N1) study was conducted on 189 women who were referred to Bea'sat Hospital of Sanandaj from October 2019 to March 2020. Considering a study power of 80%, confidence level of 95% and α error of 10%, 63 pregnant women were chosen for participation in each group and the total sample size was 189 people. The study sample consisted of pregnant women who had the inclusion criteria. The study inclusion criteria were singleton pregnancy; having no history of pregnancy more than 20 weeks of gestation; cephalic presentation of fetus; 18–35 years of age; gestational age of 37–42 weeks; cervical dilatation of 4 cm at the time of entering the study; no history of infertility; no allergy to date, saffron, and honey; no systemic diseases (diabetes, hypertension, etc.); no maternal pregnancy complications (preeclampsia, bleeding during pregnancy, and infection); no fetal heart rate abnormalities; willingness to participate and physiological labor and delivery conditions. Exclusion criteria include: cesarean indication; vomiting; signs of fetal distress during the research (tachycardia, bradycardia, late or severe variable deceleration of fetal heart rate; meconium repel); disorder during delivery (based on labor partograph which is available in Ministry of Health)^[16]; hypertonic uterus; bleeding more than a sign of labor (show); consumption of dates and saffron during the study in the control group; the use of epidural anesthesia and the need to emergency cesarean.

For sampling, At first, participants were selected by the available or easy method and the randomization method was in the form of triple block (ABC) in which each method was placed in sealed envelopes and participants were randomly divided into three groups, including a group receiving saffron–honey syrup, a group receiving date syrup, and a control group [Figure 1]. To prepare the date syrup, six Bam black dates (Bam black date is one of Iran's export products) (50 gm for all participants) were pitted, blended, sieved, and finally mixed with 150 ml of water.^[6] The appearance of date syrup was clear and dark brown. To prepare the saffron–honey syrup, 250 mg of saffron was mixed with 2.5 tsp of honey (a product of Pars Mino Industrial Company with Iran Standard Logo) and 150 ml of water.^[15] The appearance of saffron–honey syrup was clear and orange. To prepare the placebo syrup, three Saccharin tablets was mixed with 150 ml of water,^[8] and its appearance was clear and colorless. It should be noted that in this study, placebo has no energetic properties. The syrups were provided in opaque glasses and coded. The codes were delivered by researcher. The assistant researcher Fateme Mohamadi (FM) was unaware of the codes. The syrups were well shaken before being given to the participants. The syrups were given by researcher at the 4 cm dilation, and at every 30–60 min based on the patient's desire until the end of the active phase of the first stage of labor. The received amount of syrup was counted by researcher and recorded on the patient's chart sheet. The maximum volume of syrup received for each participant in the study was 150 cc. During the study, lead researcher (HS) recorded the results of demographic questions (includes maternal age, education, job, and place of residence) and clinical questions (includes gestational age, volume of syrup received, Body Mass Index [BMI], number of abortions, taking physiological childbirth classes, doula, presence of a midwife, wanted or unwanted pregnancy, and birth weight of the babies) in the two-part questionnaire form, fetal condition and uterine contractions in the partograph form and also the assistant researcher recorded the results of vaginal examinations. The researcher gave the syrups to the participants and knew the type of intervention but the assistant researcher did not know the type of intervention in the three groups. Thus, the blindness of the study was maintained. Each participant was placed in an individual room during her labor. They were not in contact with each other and did not know the type of intervention in each other. The content validation of the demographic and clinical profile questionnaire was performed by experts within the school of nursing and midwifery at Kurdistan University of Medical Sciences. The partograph form is a standard tool that validity and reliability have been proven worldwide.^[21]

The descriptive statistics were reported as frequency, percentage, and mean (SD). The results were analyzed by the Statistical Package for the Social Sciences (SPSS)

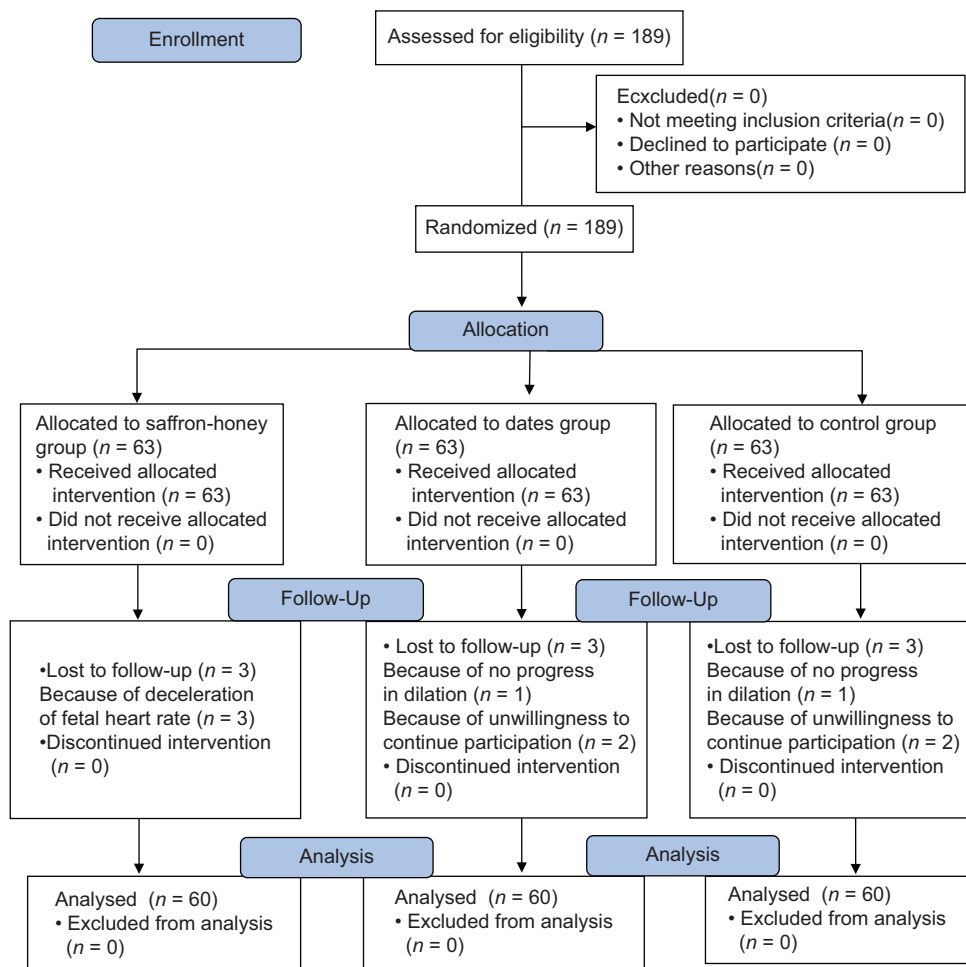


Figure 1: CONSORT flow diagram of the participants

software (version 24; IBM Corp., Armonk, NY, USA), using Chi-squared test, analysis of variance, and last significant difference as a post hoc test, the significance level was set at 0.05.

Ethical considerations

Ethical approval was obtained from the ethics committee Kurdistan University of Medical Sciences (IR.MUK.REC.1398.149). Participants were informed of the objectives of the study and a written informed consent was signed by them. Also, to participate in the study, written informed consent was obtained from the participants. Participants had the right to leave the study if they did not wish to continue cooperating in the study process, and their subsequent care would not be affected.

Results

This study was performed on 180 nulliparous women in three 60-people groups. The results of the present study showed that the participants were similar in demographic (maternal age, education, job and place of residence) and clinical (gestational age, BMI, number of abortions, taking physiological childbirth classes, doula, presence of

a midwife, Wanted or unwanted pregnancy birth weight of the babies) characteristics in three intervention and control groups, except for the volume of syrup received [Table 1].

According to the results, after the intervention, the duration of the active phases of the first stage of labor, second, and third stages of labor was shorter in the dates syrup and saffron–honey syrup groups compared to the control group ($p < 0.01$). There was no significant difference between the dates syrup and saffron–honey syrup groups for the first ($p = 0.312$), second ($p = 0.724$), and third ($p = 0.911$) stages of labor in terms of duration [Tables 2 and 3].

Discussion

The present study aimed comparison of the effect of oral consumption of dates syrup with saffron–honey syrup on the length of the first, second and third stages of labor. Also this study showed that both oral consumption of date syrup and honey–saffron is effective on the labor progress in nulliparous women. Based on the results the date syrup and saffron–honey syrup reduced the mean duration of the

Table 1: Frequency distribution of the study groups based on demographic and clinical variables

Variable	Mean (SD)			F	df	p
	Date syrup group	Saffron-honey group	Control group			
Maternal age (year)	23.82 (5.91)	24.63 (4.85)	25.62 (5.25)	1.69	2	0.186*
Gestational age (day)	275.27 (9.06)	273.55 (13.53)	273.58 (8.54)	0.51	2	0.600*
Volume of syrup received (cc)****	124.42 (32.91)	118.42 (34.10)	126.83 (22.49)	394.49	2	0.029*
Baby weight	3395.60 (463.20)	3385 (457.60)	3335.80 (503.30)	0.27	2	0.763*
Variable	n (%)	n (%)	n (%)	χ ²	df	p
Education						
Illiterate	6 (10.00)	11 (18.33)	10 (16.67)	5.79	6	0.064**
Elementary school and Middle school	28 (46.66)	26 (43.33)	35 (58.33)			
High school and High school diploma	22 (36.67)	19 (31.67)	12 (20.00)			
College education	4 (6.67)	4 (6.67)	3 (5.00)			
Job						
Housewife	57 (95.00)	58 (96.67)	54 (90.00)	2.51	2	0.314**
Working	3 (5.00)	2 (3.33)	6 (10.00)			
Place of residence						
Urban	24 (40.00)	23 (38.33)	25 (41.67)	0.13	2	0.911**
Rural	36 (60.00)	37 (61.67)	35 (58.33)			
BMI***						
Underweight	11 (18.33)	7 (11.66)	7 (11.67)	4.66	6	0.543**
Normal	24 (40.00)	22 (36.66)	29 (48.33)			
Overweight	13 (21.67)	20 (33.34)	16 (26.67)			
Obese	12 (20.00)	11 (18.34)	8 (13.33)			
Number of abortions						
One	43 (71.67)	42 (70.00)	44 (73.33)	1.78	4	0.881**
Two	14 (23.33)	17 (28.33)	13 (21.67)			
Three or more	3 (5.00)	1 (1.67)	3 (5.00)			
Taking physiological childbirth classes						
Yes	6 (10.00)	4 (6.67)	6 (10.00)	0.54	2	0.852**
No	54 (90.00)	56 (93.33)	54 (90.00)			
Having Doula						
Yes	29 (48.33)	28 (46.67)	28 (46.67)	0.04	2	0.978
No	31 (51.67)	32 (53.33)	32 (53.33)			
Presence of a midwife						
Yes	11 (18.33)	8 (13.33)	11 (18.33)	0.72	2	0.721**
No	49 (81.67)	52 (86.67)	49 (81.67)			

*Analysis of variance; **Chi-squared; ***Body Mass Index; ****Cubic centimeter

Table 2: Comparison of the duration of labor stages in the study groups

Duration of labor stage (min)	Date syrup group Mean (SD)	Saffron-honey syrup group Mean (SD)	Control group Mean (SD)	F	df	p
Active phase in first stage	166.75 (34.68)	176.83 (48.29)	289.42 (73.95)	92.70	2	<0.01
Second stage	37.33 (16.30)	35.92 (13.85)	74.92 (29.35)	66.76	2	<0.01
Third stage	12.83 (6.80)	13 (7.26)	18.92 (8.70)	12.34	2	<0.01

active phases of the first stage of labor, second, and third stages of labor. The linoleic and linolenic fatty acids in dates stimulate the production of prostaglandins.^[11,17] With increased prostaglandin secretion in pregnant women during the term can cause uterine contractions and the onset of labor pains.^[18] Studies have also shown that dates also affect

the levels of the hormones estrogen and progesterone.^[19,20] Since one of the factors that initiates childbirth is a change in the level of these hormones,^[18] so dates can be helpful in this regard. Tannin is another substance in dates that affects the smooth muscles of the uterus and can induce uterine contractions.^[21] Dates also contain the hormone oxytocin,

Table 3: Comparison of the duration of labor stages between groups

Time	Groups		p
Active phase in first stage	Control	Date	0.001
		Saffron-honey	0.001
	Date*	Saffron-honey	0.312
Second stage	Control	Date	0.001
		Saffron-honey	0.001
	Date	Saffron-honey	0.724
Third stage	Control	Date	0.001
		Saffron-honey	0.001
	Date	Saffron-honey	0.911

*It is given for comparison between two intervention groups (Date and Saffron-honey). First, the control group is compared with the two intervention groups, and then the two intervention groups are compared in terms of the duration of the labor stages.

which helps the uterus return to its pre-pregnancy state in the postpartum period.^[22] In addition, oxytocin is released into the intervertebral space in the placenta, causing local contraction of the uterine muscle and faster separation of the placenta, thus facilitating placental abruption.^[23]

Likewise, Fathi *et al.*^[24] indicated that the mean (SD) duration of the active phase of the first stage of labor was less in a date syrup group 97.47 (29.39) min compared to the control group 146.32 (35.91) min ($p < 0.001$). Similarly, Izzaddinn *et al.*^[25] demonstrated that consumption of dates during labor reduced the duration of the first, second, and third stages of labor. Kordi *et al.*^[8] found that consumption of dates–honey syrup during labor reduced the duration of the active phase of labor. However, Al-Kuran *et al.*^[26] found consumption of dates during pregnancy did not affect the duration of the first, second, and third stages of labor ($p > 0.05$). Although Razali *et al.*^[5] illustrated that consumption of dates during late pregnancy period and before labor decreased the need to administer oxytocin and prostaglandins during labor and increased the amount of non-induced delivery, it did not affect the duration of the first, second, and third stages of labor.

One difference between our study findings and those of Al-Kuran *et al.* and Razali *et al.* can be caused by the timing of the consumption of dates. Unlike our study that participants consumed dates during labor, consumption of dates started before labor in the previous studies. Rahmani Bilandi *et al.*^[27] examined the effects of receiving three different diets: three dates with water, three dates with tea, and orange juice during the active phase of labor on the progress of labor. They reported that the mean (SD) duration of the second stage of labor was shorter in intervention groups compared to the control group 19.73 (7.28) min.

Saffron exerts its effect by producing prostaglandins and increasing the intensity of uterine contractions, and provides the effective force of uterine contractions.^[12] Sadi *et al.*^[12] reported that taking oral saffron tablets in term

pregnancies enhanced the readiness of the cervix. In line with the results of the present study, Ali Akbari Sichani *et al.*^[28] reported that saffron influenced cervical ripening and reduced the duration of the first and second stages of labor. Mohammadierad *et al.*^[29] found that the consumption of saffron reduced anxiety and labor pain and decreased the duration of the first stage of labor. Ahmadi *et al.*^[14] also concluded that consumption of saffron reduced the duration of the first ($p = 0.002$) and second ($p < 0.001$) stages of labor.

Unlike our study, Sadi *et al.*^[12] reported that saffron did not affect the duration of the labor stages. This is probably due to the differences between doses and types of saffron administration and that the time and duration of intervention were different among the studies. In Sadi *et al.* study, women received 250 mg saffron tablets every 8 h before the labor pain begins. In the present study, participants received saffron syrup at the start of the active phase of labor.

Glucose is an essential source of energy for uterine smooth muscle contractions. Low blood glucose levels lead to an increase in ketone production and ketonuria that can inhibit the uterine smooth muscle contractions. This can be easily prevented by providing glucose to mothers during labor, which can prevent ketone accumulation and enhance uterine muscle contractions.^[30] Several researchers examined the effects of honey or dates on labor progress because of their extensive amount of carbohydrates. In a study that investigated the effects of honey syrup and date syrup on the duration of the active phase of labor in nulliparous women, both syrups reduced the duration of the active phase of labor.^[6] Ghaderi *et al.*^[13] compared the effect of saffron–honey syrup with saffron–sugar syrup on the progress of labor in nulliparous women. The first stage of labor was significantly shorter in the saffron–honey syrup group compared to the saffron–sugar syrup group. However, no significant difference was found between the two groups for the duration of the second and third stages of labor ($p = 1.000$).

Based on the results, no significant difference was found between the date syrup and saffron–honey syrup groups in terms of the duration of the first, second, and third stages of labor. In this study, date syrup and saffron–honey syrup may have contributed to the improved labor progress by continuously supplying natural glucose and having oxytocin and prostaglandin properties that affect myometrial smooth muscle contractions. This study was a randomized clinical trial that demonstrates the strong feature of the study's design.

The strength of our study was the presence of the researcher with the participants during the study, which increased the confidence of mothers and better tolerance of the delivery process. However, the limitation of our study was individual differences, genetic and psychological

state of participants which have effect on their respond to questionnaires that are all out of researcher's full control. But we tried to eliminate these differences by randomization as much as possible. It was not possible to prepare date syrup and honey–saffron syrup with the same shape, color, and taste, so it was not possible to blind the participants. Accordingly, there is a need for further studies in this field to obtain definitive results regarding the effect of saffron, dates, and honey in the maternal, fetal, and neonatal outcomes.

Conclusion

The overall result of this study indicated that the consumption of date and honey and saffron syrups are effective on the progress of labor. Therefore, it seems that the findings of this study can be used in clinical services to prevent abnormal progression of labor and reduce the number of long labors. Therefore, they can be used as one of the safe and available herbal methods to facilitate labor. Also, in mothers who do not have much desire to eat and drink during childbirth, with a small volume of this syrup, provided the calories needed by the mother during childbirth and prevented ketoacidosis.

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Conflicts of interest

Nothing to declare.

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