

The Effect of Dates and Fennel on Breastfeeding Adequacy of Mothers: A Review

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Abstract

Background: No systematic review study was found regarding the comprehensive examination of the effects of dates and fennel on breastfeeding adequacy of mothers. The present study aimed to examine the impact of dates and fennel on breastfeeding adequacy of mothers.

Materials and Methods: All clinical trials evaluating the effect of palm date and fennel on breastfeeding in lactating mothers were searched on the online databases of Scopus, EMBASE, Cochrane, and Web of Science and Medline with no language or time restrictions using the combination related keywords of Mesh.

Results: Five studies were included in this study. The results of the first research suggested the positive relationship between consuming fennel herbal tea and dates in enhancing milk production of mothers within the early days following birth. In the second study, the mother's satisfaction with the adequacy of milk showed the positive effect of dates consumption. The results of the third research showed that 80% of mothers in the intervention group had a smoothness score of breastmilk. The higher smoothness in the intervention group showed the positive impact of consumption of date on breastmilk. In the fourth study, a galactagogue drop containing fennel, Anise, dill, parsley, cumin, and fennel flower did not affect the volume of breastmilk and weight gaining of the infant. The fifth study showed the positive impact of the herbal tea of fenugreek seeds and fennel on improving the breastfeeding adequacy with positive changes in the anthropometric indicators, the number of wet diapers, and increased number of breastmilk drinking.

Conclusion: Considering the availability and inexpensiveness of fennel and dates, their usage by breastfeeding mothers is recommended for increasing breastmilk.

Key Words: Breast-Feeding, Dates, Fennel, Mother.

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1- INTRODUCTION

Infancy is one of the most sensitive stages of development. Breastmilk is a unique solution for supplying the ideal nutrients for infants. Evidence has shown that breastfeeding, for the first six months, is the most desired method (1). Breastmilk is one of the healthiest methods of supplying nutrition for the infant and offers excellent benefits for both the mother and infant. This milk contains nutrients that provide the best nutritional balance for the infant at least up to six months old. Breastfeeding leads to diminished risk of developing infectious diseases, diabetes, cancer, asthma, and obesity in children. Additionally, breastfeeding also has economic advantages (2). Breastmilk within the first six months of life fulfills all nutritional needs of the infant and plays a significant role in preserving the infants' health worldwide (3). Experts believe that exclusive breastfeeding within the first six months has substantial importance in health and reducing mortality among infants (4, 5). In addition to lowering infantile mortality, it can also prevent many infancy diseases (6-8).

World Health Organization emphasizes continuing exclusive nutrition on breastmilk within the first six months old (7, 9, 10). Breastmilk is the most suitable nutritionally for infants due to its proven advantages, whether for the infant or the mother. World Health Organization (WHO), American Association of Pediatrics (AAP), and American College of Obstetricians and Gynecologists (ACOG) recommend breastfeeding for the first six months (11). In various studies, several reasons have been presented for breastfeeding cessation. Some of these reasons include the type of delivery, timeless long labor, mothers' obesity, usage of anesthetic agents during labor, and delay in initiation of breastfeeding. One of the most important reasons for

breastfeeding cessation, especially within the first six months of age for the postnatal period, is the inadequacy of breastmilk volume (12). Meanwhile, socioeconomic, demographic, cultural, midwifery, and infantile factors have also been proposed to be implicated in the early cessation of exclusive breastfeeding. These factors are different among various societies (13, 14). One of the therapeutic approaches for increasing the breastmilk volume is the usage of chemical drugs (metoclopramide, domperidone, sulpiride, and chlorpromazine), which may have adverse effects (12, 16). Today, the usage of herbs, especially in Asian countries, is progressively increasing (17).

Among traditional Iranian medicine, numerous herbs have been proposed for lactogenesis, including dill, fennel, and fenugreek (18-20). Fennel, with the scientific name of *Foeniculum vulgare*, is a plant in the Umbellifers family. The compounds of this plant include 80% of anethol, estragole, camphene, and fenchone. Research has shown that the galactagogue properties of this plant result from phytoestrogen properties present in its anethol (21-25). Naturally occurring products, such as fennel and dates, have been reportedly consumed extensively in the Middle East to increase milk production and have been considered as a superior alternative to synthetic drugs. Palm dates as one of the richest human food sources have been consumed for 6,000 years (26) due to their nutritional and medicinal and economic value. This natural product has been able to control disease and hunger (27) successfully. Several researchers have shown interest on the date due to its antioxidant properties related to rich phytonutrients, thereby providing health factors through reducing lipid oxidation, oxidative stress, and free radical damage (28). Many postpartum mothers try to increase their milk production by using natural galactagogues

and prefer not to use high-risk synthetic galactagogues. The relatively regular consumption of sufficient nutrients by the breastfeeding mother increases milk production with affection in a slick way (15). Extraordinary palm date belongs to the *Arecaceae* family, and the genus *Phoenix* is rich in the useful nutrients to humans, which has been described as the fruit of paradise in the Qur'an, as "In both of them are fruit and palm trees and pomegranates (Al-Rahman; 68).

The most abundant contents of dates are sugar (80%), protein, fat, minerals (magnesium, iron, and copper), and folic acid in order, thereby emphasizing the importance of this product on breastfeeding. Oxytocin, as one of the constituents of dates, can tighten the smooth muscle around the alveoli to direct milk to the milk ducts, indicating oxytocin activity in the milk ejection process.

The review on the literature has shown that no study has been carried out comprehensively on the examination of the effects of dates and fennel on enhancing breastmilk so far. Considering the contradictory results of studies on the impact of dates and fennel on increasing breastmilk, their inexpensiveness, and accessibility of these two plants; moreover, regarding the lack of any comprehensive study on the examination of the effect of these two plants on increasing breastmilk, this review study was conducted to investigate the effect of dates and fennel on increasing breastmilk.

2- MATERIALS AND METHODS

All clinical trials assessed the effectiveness of fennel and palm Date on breastfeeding in lactating mothers were searched on the four English electronic databases of Scopus, EMBASE, Cochrane, Web of Science and Medline (via PubMed). We also applied no language or time restrictions (until Feb. 2019). Combination keywords of (Date palm OR

Date OR *Phoeniceae* OR Fennel OR *Foeniculum*) AND (Breastfeeding OR Breastfeeding OR Breast Milk OR Milk, Human), and their Persian synonyms and all their possible combinations, were searched in the national databases (Magiran, SID, and Iran.Doc). **Figure.1** indicates the process of study selection. Two independent researchers examined, and if there was a discrepancy between reviewers, the third party has come to action.

3- RESULTS

Five clinical trial studies with a sample size of 512 were included in this study. The results are as follows. An interventional study was conducted in Egypt on 75 women who had given birth recently, which compared the effect of consuming herbal tea of fenugreek, dates, and control group on breastmilk production and weight gaining of infants. The mothers' milk volume was measured by a manual breast pump on the third-day of post-delivery. The weight of the infants was measured using the correctly balanced, which was designed for infants' right after the birth, on the third, seventh, and 14th days. The three studied groups had no significant difference before intervention by mothers regarding birth weight, infant gender, pregnancy age, and mother's age.

The results of the third day postnatally showed weight loss of infants in all three groups, which was more significant in the control group compared to the dates and fennel group. On the seventh day, the weight gaining of infants of fennel and control groups was below the average of the birth weight. However, the infants who had consumed dates showed a significant rise compared to the other groups ($p < 0.05$). Nevertheless, on the 14th day, the three groups had no significant difference regarding infant's weight changes ($p = 0.16$). The volume of

breastmilk on the third-day of post-delivery was significantly higher in the dates group ($p < 0.001$) compared to fennel and control groups. Thus, it seems that the consumption of fennel herbal tea and dates could be useful for increasing breastmilk production in the early days of postnatal (30). Another study was conducted in Iraq on the examination of the effect of dates on breastfeeding and uterine involution in the obstetrics ward on 150 women who had recently given birth. Moreover, in the intervention and control groups, uterine involution and satisfaction with breastfeeding questionnaires were completed by mothers. The results of this study showed the average age of women within 19-37 years. The knowledge of women in both intervention and control groups about the benefits of dates consumption was similar, but only 15% of them were aware of the impact of dates on increasing breastmilk.

According to the results, 20% of mothers in the control group were not satisfied with the restricted adequacy, while 53.3% from the control group and 60% from the intervention group had relative satisfaction, and 26.7% from the control group and 40% from the intervention group were delighted with breastfeeding adequacy. Moreover, the pleasure of mothers with breastmilk adequacy showed the positive effect of consumption of date. In this study, although the mothers of both groups had some knowledge about the benefits of dates, none of them was aware of the effect of dates on increasing the breastmilk volume (31).

The different semi-experimental study was carried out in Indonesia to investigate the effect of dates on the smoothness of the post-delivery mother's milk. In this study, every mother and infant were healthy. To carry out the intervention, six dates were given to the breastfeeding mothers daily, and the smoothness of this milk was measured based on its functional definition

using the indicators such as the milk flow from the nipples before initiating breastfeeding, urinary excretion 6-8 times daily by the infant, being calm, 2-3 hour uninterrupted sleep, suitable muscle tone, skin turgor, and monthly weight gain by 500 gr. These indicators were evaluated according to the observations with a questionnaire scoring system to test the milk smoothness. The results of this study indicated that 40% of mothers in the control group and 80% of mothers in the intervention group had a smoothness score of breastmilk. A higher smoothness percentage in the intervention group suggested the positive effect of consumption of dates on breastmilk (17).

To investigate the effect of galactagogue herbal drop on 158 breastfeeding mothers in Mashhad, who were suffered from the milk deficit for the infants' nutrition, a clinical and prospective trial study was conducted on two groups: consuming galactagogue (dill, cumin, parsley, Anise, fennel, fennel flower), and placebo (control). The results of this study were recorded every week four times by measuring the weight, height, head circumference of the infant, and the questionnaire filled by mothers. In this study, the two groups of mothers did not have a significant difference in terms of the level of education, social class, the number of deliveries, and the effect of training on the breastfeeding. Moreover, there was no significant difference in terms of gender ratio, average age, and weight gaining of infants before applying the intervention. In this study, the weight gain of infants in the two groups in each of the four follow-ups was performed within one-week intervals ($p = 0.5$), and other development indicators had no significant difference. The feeling of mothers in both groups regarding changes in the milk volume did not differ significantly. In this investigation, galactagogue drop had no impact on the breastmilk volume and the

infant weight gaining (32). In another clinical trial, which was conducted to investigate the adequacy of breastmilk, 117 mothers with 0-4-month-old infants were classified into three groups receiving fenugreek seed powder herbal tea, fennel powered herbal tea, and placebo. The mothers and infants were homogeneous in terms of demographic variables. No significant difference was reported between the intervention (fennel and fenugreek) and the control groups before the intervention, except for the frequency of breastmilk drinking, which was significantly higher in the control group ($p < 0.001$) compared to other groups. However, after the intervention, a

significant difference was reported between the fennel, fenugreek, and placebo groups regarding infant weight, head circumference, the number of daily wet diapers, the number of fecal defecation, and the frequency of breastmilk drinking ($p < 0.001$). However, the results of the height assessment of the infants had no significant difference between the groups ($p = 0.09$). The results of this study showed the positive impact of fenugreek seed and fennel herbal tea on improving the breastfeeding adequacy with positive changes in anthropometric indicators, the number of wet diapers, the number of fecal defecation, and increased frequency of drinking breastmilk (15).

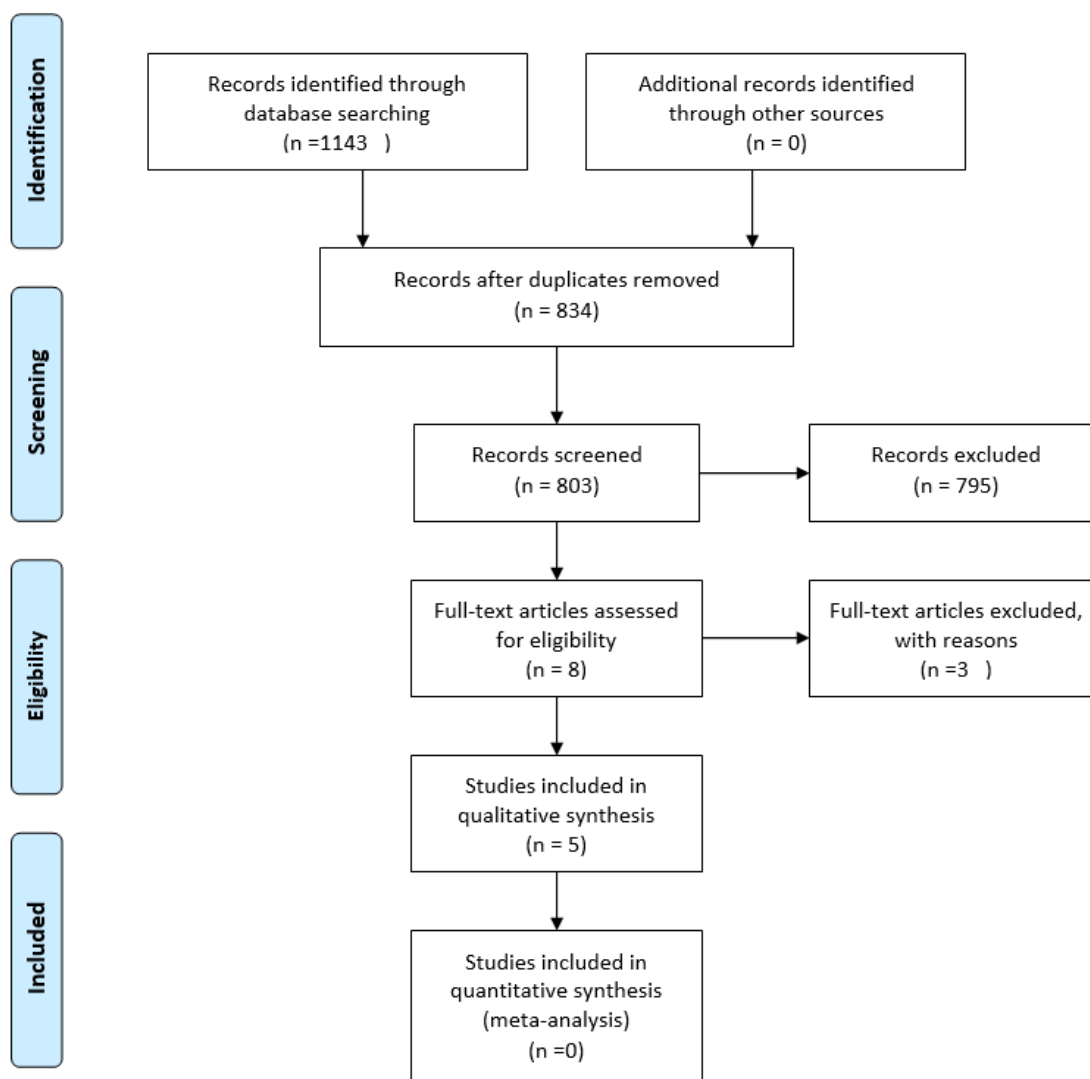


Fig1: Flowchart of Study.

4- DISCUSSION

The present study aimed to examine the effect of dates and fennel on increasing breastmilk among breastfeeding mothers. The results suggested the positive impact of dates on the breastfeeding adequacy of mothers and the weight gaining of infants. Moreover, the positive impact of fenugreek seed and fennel herbal tea was found on improving breastfeeding adequacy of mothers. The future of a society depends on the health of its children. Postnatally, breastmilk is undoubtedly the only food containing the ideal nutritional features. Breastmilk is recommended as the best nutrition for infants due to constant availability, suitable temperature, being fresh, and free from contamination with bacteria, and thus diminished the risk of developing digestive disorders. Additionally, the transfer of immune-boosting factors, the establishment of psychological relationships between infant and mother, the suitability of proteins, and other significant nutrients for the child as well as supplying most essential minerals are other advantages of breastmilk for the child.

Thus, it creates the most suitable growth curve among children (33-36). Meanwhile, breastfeeding is also useful for the mother and causes diminished post-delivery bleeding, reduced risk of ovarian and breast cancer, faster involution of the mother's organs to the initial state, family planning, and reduced osteoporosis in the mother. Among the infants who are fed with breastmilk, diarrhea, intestinal bleeding, milk reflux, colic, and atopic eczema are observed less prevalent. Furthermore, the prevalence of asthma, obesity, and diabetes is also less prevalent among infants feeding on breastmilk (37). Inadequate breastmilk production is the primary cause of breastfeeding cessation. Reduction of breastmilk production may occur in various conditions such as premature birth and disease of mother or

baby, causing detachment of the neonate, anxiety, and stress in mother. All these conditions act as breastfeeding failure. Meanwhile, milk production can be enhanced in different ways, such as psychological support for the breastfeeding mother and training relaxation techniques for mothers. Nevertheless, several mothers seek help from their physicians by requesting medical products and drugs to increase the breastmilk supply (12).

In another study conducted by Ebrahimi (2017) entitled "the effect of dates on prolactin and IGF-1 as well as stress factors in breastfeeding among rats", the researchers addressed dates as a dietary supplement among breastfeeding women for enhancing health, progress, and reduction of stressful conditions post-delivery (38). In the study carried out by El Saka et al. (2014), the effect of dates and fenugreek was examined on increasing breastfeeding. They concluded that dates and fenugreek herbal tea are useful for boosting breastmilk production in the early period of post-delivery (12).

In the study conducted by Suyati et al. (2016), the effect of dates was examined on increasing breastmilk postpartum. They concluded that consumption of dates has a positive impact on increasing the breastmilk for newly delivered mothers at postpartum (17). In another study, Safaa Abd El Raouf Hashim et al. (2012) examined the effect of dates on breastfeeding and uterine involution post-delivery. They found that dates have a positive impact on the uterine involution and breastfeeding adequacy. Since women consumed dates, faster uterine involution was observed. They also had more signs of adequate breastfeeding and complete satisfaction with the nutrition compared to the control group (39). Additionally, one of the chemical elements of dates is oxytocin, which can contract the smooth muscle around alveoli to conduct the milk to the milk ducts. Oxytocin plays a

significant role in milk ejection (17). Palm tree with the scientific name of *Phoenix dactylifera* is one of the essential herbs in southwestern Asia and northern Africa. This plant was used as a drug in the past. In Morocco, this herb has been used for treating diabetes and hypertension. Consumption of palm tree pollen has been typically observed for enhancing sexual desire and fertility among men. In India, dates alongside other herbs are used as a concoction for pregnant and breastfeeding women (38). Today, the use of herbs, especially in Asian countries, is progressively increasing. Fennel, with the scientific name of *Foeniculum vulgare*, belongs to the umbellifers family. The compounds of this plant include 80% anethole, estragole, camphene, and fenchone. Research has shown that the galactagogue properties of this plant arise from phytoestrogen characteristics present in its anethole (21-25).

Studies performed on examining the impact of this plant on increasing the breastmilk volume have shown contradictory results. In the survey conducted by Shariati et al. (2004), a galactagogue drug-containing fennel had no unique impact on increasing breastmilk and, thus, the infant's weight-gaining (32). On the other hand, in the study carried out by Dehkoda et al. (2013), a galactagogue tablet containing fennel led to increased breastmilk and hence the weight gain of the infant (40).

5- CONCLUSION

Therapeutic approaches for the inadequacy of breastmilk through chemical drugs such as metoclopramide, domperidone, sulpiride, and chlorpromazine have various side effects. At the same time, date consumption is associated with increased breast milk and higher frequency of breastfeeding, weight gaining, and the increased height and head circumference of infants. Furthermore, the

herbal tea of fenugreek seeds and fennel tea leads to enhanced adequacy of breastmilk. Considering the extensive use of herbal galactagogues worldwide, as well as the inexpensiveness and availability of these two herbs, usage of dates and fennel herbal tea is recommended for breastfeeding mothers.

6- CONFLICT OF INTEREST: None.

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