




# Management of Breast Milk Oversupply in Traditional Persian Medicine

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## Abstract

Comprehensive explanation about milk oversupply is not available in the current literature because few studies have been done on this topic. In traditional Persian medicine, milk oversupply and its management have been described. The aim of this study was to investigate milk oversupply from the perspective of medieval Persian practitioners. In this study, some main medical resources of traditional Persian medicine such as *Al-Havi* and the *Canon of Medicine* were studied to extract valuable information about milk oversupply. Etiology of milk overproduction according to traditional Persian medicine is based on humors theory and cannot be easily compared with current medical concepts. Diet modifications and natural remedies have been applied for managing this condition but the majority of traditional Persian medicine interventions for reducing milk oversupply have not been scientifically investigated in modern medicine. The knowledge of milk oversupply in traditional Persian medicine may be helpful to conduct further related studies.

## Keywords

milk oversupply, breastfeeding, traditional medicine

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Milk oversupply in nursing mothers is a situation that can lead to symptoms of discomfort and medical complications in both the mother and her baby. Its prevalence is unknown and comprehensive explanation about this problem is not available in the current literature because few studies have been done on the topic. Different terms are used for milk oversupply such as hypergalactia, hyperlactation, and increased lactation.<sup>1,2</sup> Symptoms and complications in mothers with breast milk oversupply include feeling of breast fullness, breast pain, leaking breast, engorgement, plugged duct, sore nipples, and mastitis. Another significant problem is early weaning. Infants may suffer from gastrointestinal problems such as colic, gastroesophageal reflux, and intestinal gas. Crying, fussiness, and excessive weight gain or poor weight gain may be seen in them. Breastfeeding mismanagement, use of herbal supplements, hypo- or hyperthyroidism, and hyperprolactinemia should be evaluated and ruled out in nursing mothers.<sup>1,3</sup> Treatment usually starts with behavioral intervention in feeding such as block feeding and full drainage.<sup>2,4</sup> Other ways proposed to reduce the milk oversupply are complementary medicine and pharmacotherapy. A limited number of herbs such as cabbage leaf, sage, jasmine flowers, peppermint, and

parsley have been introduced to reduce milk production. Studies on the efficacy of these herbal products for inhibiting milk oversupply and their side effects in the nursing woman and her infant are not enough and their results should be used with caution.<sup>2,5-7</sup> Pseudoephedrine and estrogen are medicines that reduce the production of milk but these medications can cause side effects such as irritability, insomnia, and thromboembolism. Bromocriptine and cabergoline are used in the final step of treatment and more research on using them in nursing mothers is required.<sup>2,3</sup>

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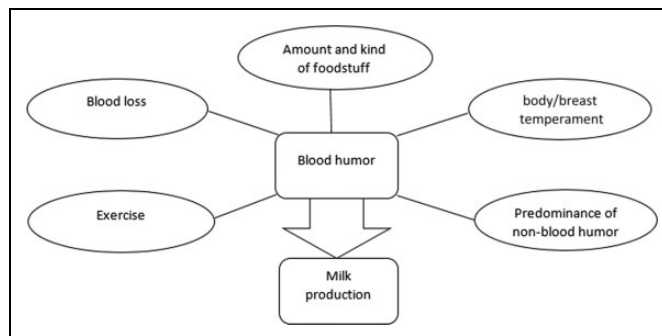
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Complementary and alternative medicine includes medical systems, practices, applications, treatment approaches, and theories that are not currently part of the conventional medicine.<sup>8</sup> Studies have shown that the use of complementary and alternative medicine among the general public particularly women compared with men increased worldwide.<sup>9,10</sup> Traditional Persian medicine as a part of complementary and alternative medicine is one of the oldest and richest ones.<sup>11,12</sup> Medieval Persian physicians played an important role in the progress of medical science by their own intelligence, observations, and experimentation in their era.<sup>13,14</sup> Some of the most popular and influential Persian practitioners were *Razi* or Rhazes (865-925 AD), *al-Abbas al-Majusi* or Haly Abbas (949-982 AD), *Ibn Sina* or Avicenna (980-1037 AD), and Esmail Jorjani or Sorsanus (1042-1137 AD).<sup>15-17</sup> The books of great Persian physicians such as *Continens Liber (Kitab-al-Havi)* by Rhazes and *Canon of Medicine (Al-Qanun-fi-al-Tibb)* by Avicenna were the main references of medical education in Western medical centers from the 13th century until the 18th century.<sup>13,14</sup> Recently, evaluation of medieval Persian medicine that had been forgotten for a long time suggests that many ideas and methods of medieval scientists of Persia are acceptable and usable.<sup>14,18</sup> In traditional Persian medicine, breastfeeding and its related problems are considered as important issues. Milk oversupply and its management during lactation have been described in medieval times by Persian practitioners, so it is not a new condition.<sup>19</sup> Our main goal of this study was to investigate the etiology, effective factors, complications, and management of milk oversupply in lactating women based on prominent medieval practitioners' viewpoints of traditional Persian medicine and comparing them with the viewpoint of recent and modern medicine.

## Methods

This article is a review of some valid traditional Persian medical and pharmaceutical manuscripts, including *Al-Havi* (The Liber Continens) by Rhazes who was a Persian physician, polymath, alchemist, philosopher, and important figure in the history of medicine in the 10th century AD, *Kamel al-Sanaah al-Tibbiyah* (The Perfect Art of the Medicine) circa 970 AD by Haly Abbas an influential Persian physician, *Al-Qanun-fi al-Tibb* (The Canon of Medicine) by Avicenna an illustrious Persian physician and philosopher in 1025 AD, and *Zakhireye Kharazmshahi* (Treasure of the Khwarazm Shah) by Esamail Jorjani, a prominent Persian physician in the 11th century AD. These books are determined as medical resources for Persian traditional medicine, as well references for the Persian PhD schedule in traditional medicine.<sup>20</sup> Books mentioned above were studied and data about milk oversupply and spontaneous leakage from the breast in lactating women were collected. Furthermore, we searched Google Scholar and PubMed for the terms "milk oversupply," "hypergalactia," "hyperlactation," "increased lactation," and "overabundant milk supply" to get available data on this topic. Finally, in order to find relationships between traditional medicine data and modern medical findings, a search was performed using the Google Scholar and PubMed databases. The scientific names of the reported plants were checked by an expert botanist (M. Kamalinejad), and using some text such as *Popular Medicinal Plants of Iran*<sup>21</sup> and *Medicinal Plants*.<sup>22</sup>



**Figure 1.** Factors that affect blood humor and hence milk production in traditional Persian medicine.<sup>19,23</sup>

## Findings

### Definition and Etiology

According to traditional Persian medicine, the cause of milk oversupply is based on the humoral theory. In traditional Persian medicine perspective, "humors" play an important role in health and disease of individuals, because growth, repair, and composition of the human body is dependent on humors. Humors are produced in the process of digesting foodstuffs. Each humor has consistency, quality, and a duty of its own. The balance between these humors is necessary for correct function of the human body.<sup>19</sup> Four types of humors, including blood or *dam*, phlegm or *balgam*, yellow bile or *safra*, and black bile or *sauda*, are produced in the liver and circulate in the vessels.<sup>11,19</sup> Blood humor with warm and wet qualities, red color, sweet taste and medium consistency is the highest humor in the body and its duty is feeding the tissues. On the other hand, "temperament" is a qualitative (hot, cold, moist, and dry) condition. Each person and each organ of the body has its own special temperament. The body and organ functions can be impaired if their special temperaments change. According to traditional Persian scientists' opinion, foodstuffs are different from each other in production of humors and every healthy person should eat foods that would be suitable for his or her body's temperament.<sup>19,23</sup>

Based on traditional Persian medicine, blood humor is the substance and origin of milk. Blood humor is converted into milk in the mother's breast and increased milk production is associated with increased blood humor in the body, therefore milk oversupply is due to increase in blood humor. Both *Ibn Sina* and Esmail Jorjani believed that quantity and quality of blood humor is dependent on some factors such as: the amount of food intake, type of foodstuff, blood loss, exercise depending on its intensity and duration, body and/or breast temperament, and predominance of nonblood humor. These factors can also control milk production (Figure 1).<sup>19,23</sup> *Ibn Sina* has also mentioned that any substances that can increase semen can also increase milk production, such as opium poppy (*Papaver somniferum* L), and goat or sheep breast.<sup>19</sup>

Based on modern medicine, the process of breast milk production is a complex interaction of hormonal endocrine system and autocrine (or local) system. Mammary glands are

responsible for synthesis and secretion of milk. Local regulation of milk secretion within each breast is allowed via autocrine negative feedback when the breast is full. Prolactin and oxytocin are 2 essential hormones that affect lactation. Other hormones like glucocorticoids, thyroid hormone, growth hormone, and insulin are also involved in lactation.<sup>24,25</sup> It has been suggested that serotonin has an inhibitory feedback on lactation that reduces milk production.<sup>24,26</sup> Increasing evidence supports the effect of maternal factors such as genetics, diet, and environmental exposures in moderating quantity, and quality of breast milk, and lactation performance.<sup>24,27</sup> The size and anatomical structure of breast, previous breast surgery or radiation to the chest, and other local problems of the breast like engorgement are other maternal factors that affect milk production.<sup>24,25,28</sup> In current medicine, it seems that the cause of breast milk oversupply is usually idiopathic, and this problem can occur by a congenital talent, breastfeeding mismanagement, hyperprolactinemia, and thyroid dysfunctions.<sup>1,2,4</sup> A case report revealed that breast milk oversupply may be related to retained placental fragment.<sup>29</sup> Moreover, overuse of galactagogues may result in milk overproduction.<sup>1</sup>

### Diagnosis: Detection of Blood Humor Increase

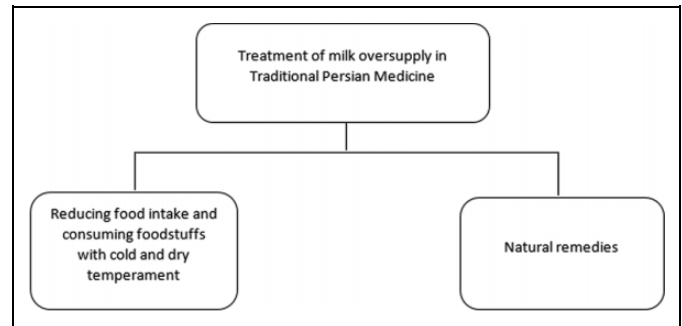
According to the traditional Persian medicine, diet, personal characteristics, and case history of the lactating mother apart from physical examination are helpful in the diagnosis of increase blood humor. History of overeating, using foodstuffs that produce more blood humor such as high consumption of meat products, and sweets, youth, hot and moist temperament of the mother and the spring season are considered as factors that could affect the overproduction of blood humor and hence milk production.<sup>19,23</sup>

The diagnosis of milk oversupply in modern medicine is based on clinician's suspicion after taking history, and physical and biochemical examination, because there is no operational definition with a diagnostic protocol for this predicament.<sup>2,3,30</sup>

### Symptoms and Complications

*Ibn Sina* believed that milk oversupply can lead to excessive milk leakage, breast pain, breast swelling, and other disorders in nursing woman. He points out that when there is an excessive increase in blood humor, controversially milk decreases. Moreover, he stated that high intake of milk in one meal can lead to digestive disorders such as stomach stretching, flatulence, and whiteness of urine in baby.<sup>19</sup>

Based on studies in modern medicine, mothers with milk oversupply may suffer from leaking, engorged, and painful breasts. If excess milk volume and residual milk are not completely drained, complications like plugged duct, mastitis, and breast abscess may occur. Other significant problems are sore nipples, the perception of insufficient breast milk supply, and early weaning. Nursing mothers with oversupply may have uncomfortable infants because they may



**Figure 2.** Treatment of milk oversupply in traditional Persian medicine.<sup>19,23,32</sup>

be fussy at the breast, colicky, and gassy.<sup>2,30,31</sup> These infants may have a shallow latch due to the overactive let-down reflex. In addition, problems such as gastroesophageal reflux, flatulence, and failure to thrive may occur in infants of mothers with milk oversupply.<sup>1,2,31</sup>

### Treatment

In Persian traditional medicine, treatment is based on finding out the cause of disease. Food, diet, and pharmaceutical interventions are recommended by prominent doctors of traditional Persian medicine in the management of milk oversupply (Figure 2).<sup>19,23,32</sup>

**Diet Therapy.** Leading practitioners of traditional Persian medicine have utilized the various properties of food to maintain well-being, prevention, and treatment of diseases. The regimen that is useful in decreasing milk production included reducing food intake especially if the maternal has a history of overeating, consuming foodstuffs with cold and dry temperament such as lentil (*Lens culinaris* Medikus) or *tfshyl* (lentil cooked with vinegar) and avoiding foodstuffs such as lamb, chicken, fresh small fish, soft-boiled eggs, whole wheat bread, milk, particularly milk with honey or sugar, lettuce, grapes, bananas, figs, hazelnuts, and almonds, especially almonds with sugar.<sup>19,23,32,33</sup>

**Pharmaceutical Interventions.** Many natural remedies for treating milk oversupply have been recommended in traditional Persian medicine. In management of this problem in traditional Persian medicine, some drugs are derived from plants, some from animals and some from minerals (Table 1). Medications are administered orally or topically as single or in combination with other substances.<sup>19,23,32</sup> Both *Razi* and *Jorjani* advise drainage of the milk, before using the topical drug on the breast.<sup>23,32</sup> Medication plan is individualized in nursing mothers, according to their background conditions.<sup>19,23,32</sup> *Avicenna* suggests oral administration of lettuce (*Lactuca sativa* L.) seeds and leaf, and seeds of rue (*Ruta graveolens* L.), fruit of chaste tree or chasteberry (*Vitex agnus-castus* L.) and its seeds up to 7 g daily, and caraway (*Carum carvi* L.) for reducing milk and leakage of breast. He states that chaste tree in low doses can

**Table 1.** Natural Remedies for Managing Breast Milk Oversupply in Medieval Persian Medicine.<sup>19,23,32</sup>

Source	Common Name	Scientific Name	Administration	Nature
Herbal	Ammoniacum	<i>Dorema ammoniacum</i>	Topical	Warm
	Basil	<i>Ocimum basilicum</i>	Oral, topical	Warm
	Broad bean	<i>Vicia faba</i>	Topical	Cold
	Cabbage	<i>Brassica oleracea</i>	Topical	Warm
	Caraway	<i>Carum carvi</i>	Oral, topical	Warm
	Chasteberry	<i>Vitex agnus-castus</i>	Oral	Warm
	Fenugreek	<i>Trigonella foenum-graecum</i>	Topical	Warm
	Psyllium	<i>Plantago ovate</i>	Topical	Cold
	Lac	<i>Kerria lacca</i> (created by)	Topical	Warm
	Lentil	<i>Lens culinaris</i>	Oral, topical	Cold
	Lettuce	<i>Lactuca sativa</i>	Oral, topical	Cold
	Rue	<i>Ruta graveolens</i>	Oral, topical	Warm
	Animal	Crab	<i>Brachyura</i>	Topical
Mineral	Litharge	PbO (main component)	Topical	Warm

increase milk production. He believes that applying medications on the breast such as lettuce, mucilage of psyllium (*Plantago ovate* Forssk) and its leaf, broad bean (*Vicia faba* L.) flour combined with rose (*Rosa × damascene* Mill.) oil and vinegar, ammoniacum (*Dorema ammoniacum* D. Don.), fenugreek (*Trigonella foenum-graecum*) seeds, caraway mixed with vinegar, lac (scarlet resinous secretion of a number of species of lac insects) and litharge with rose oil, and mashed cabbage (*Brassica oleracea* L.) root are useful. According to him, basil (*Ocimum basilicum* L.) reduces milk. He also recommends the use of crushed crab (*Brachyura*) topically as a very effective treatment.<sup>19</sup> Furthermore, Jorjani<sup>23</sup> advises topical treatments such as wheat flour and broad bean flour mixed with water and rose oil. His other prescription is litharge pulverized in rose oil and rubbed on the breast. He believes that eating lamb muscle cooked with lentils and a small amount of caraway can stop milk production. He emphasizes on breast milk drainage before using topical medications. Avicenna states that any herbal products that can reduce semen, such as the hemp seeds (*Papaver somniferum* L.) can reduce milk production as well. If milk oversupply created breast congestion and putrefaction of milk, he advises decreasing milk by reducing food intake, eating substances that produce less blood humor, a poultice of breast and chest with cumin and vinegar or clay mixed with vinegar or lentils cooked in vinegar and drinking salty water.<sup>19</sup> Razi recommends an effective topical poultice for stopping milk production that is composed of broad bean flour and basil seeds mixed with basil juice. He suggests topical use of caraway crushed with honey.<sup>32</sup> Traditional Persian scholars have believed that substances that induce menstrual bleeding can also reduce milk production.<sup>19,32</sup>

In modern medicine, treatments that are commonly used to reduce the milk supply are behavioral techniques, herbal supplements, homeopathy, and pharmaceuticals.<sup>2</sup> Behavioral techniques are early interventions that are recommended to nursing mothers. Block feeding is recommended as a common

behavioral technique for milk oversupply. In this, the mother nurses from one breast to her baby for about 3 hours block of time. She then switches to the unused breast for the next block. During each block, if the infant wants to feed several times, the mother offers the same breast. In this way, the local control via the accumulation of milk in the unused breast would lead to reducing milk supply.<sup>2,4</sup> Topical cabbage leaf has been used as an early, available, cheap, and likely safe intervention for oversupply, but there are no scientifically valid studies that support the effectiveness of cabbage leaf.<sup>1,3,5</sup> The most common herb used to lower milk supply is sage (*Salvia officinalis*), but there is neither adequate study on the efficacy of this herb for oversupply nor its safety on the breastfeeding baby. It should be used with caution due to known side effects.<sup>2,6</sup> Studies on lactating women have demonstrated the efficacy of topical application of jasmine flowers in reducing prolactin level and suppression of puerperal lactation.<sup>7</sup> It has been claimed that leaves or juice of parsley taken orally could reduce milk supply, and also hot compresses of parsley have been suggested for breast engorgement and mastalgia.<sup>6,34</sup> Chasteberry is another herb that may reduce milk supply.<sup>35</sup> Topical peppermint oil is suspected to decrease milk supply and can be toxic for the baby depends on dosage.<sup>2,6</sup> Pharmaceuticals such as pseudoephedrine, estrogen-containing oral contraceptives, and, eventually, cabergoline have been used in reducing milk supply.<sup>2</sup>

## Discussion and Conclusion

This review presents the viewpoints of traditional Persian medicine about etiology, effective factors, complications, and treatment of milk oversupply and comparing them with recent findings and beliefs. In current medicine, the knowledge of etiology and management of milk oversupply with safe medications is limited. Descriptions and etiology of breast milk overproduction according to traditional Persian medicine texts are based on humors theory. The scientific language of traditional Persian medicine and modern medicine are different and cannot be easily used to compare their concepts.

According to the traditional Persian medicine, blood humor is the substance and origin of breast milk, so factors that affect blood humor are able to control milk production. These factors include amount and type of foodstuff ingested, blood loss, exercise depending on its intensity and duration, body and/or breast temperament. In traditional Persian medicine, the amount of food intake and the type of foodstuff play a significant role in increasing milk supply. Traditional Persian physicians have believed that maternal overeating and high consumption of foodstuffs such as meat products, and sweets may lead to milk oversupply. According to the traditional Persian medicine, reducing food intake and consuming foodstuff with cold and dry temperament in mothers with milk oversupply and particularly mothers with a history of overeating is helpful.<sup>19,23,32</sup>

According to modern medicine, during lactation, maternal nutritional requirements are significantly increased to maintain optimal milk production as well as increase in energy

requirements in nursing mothers. Maternal energy balance is related to her nutritional status, which affects maximal milk production.<sup>24,36</sup> Of course, a certain amount of extra energy in nursing mothers during the first 6 months is recommended with regard to energy stored during pregnancy.<sup>37</sup> Milk production is supported with some available energy and nutrients which are stored during pregnancy.<sup>36</sup> Increasing evidence in modern medicine supports the role of maternal diet in milk production.<sup>24</sup> In a study, the quantity of milk secreted by a chronically malnourished mother who was not able to produce sufficient milk, increased by supplementing her diet for 45 days. Food such as meat, eggs, cheese, beans, and rice was added to her diet and maternal caloric intake increased at about 1400 calories/24 hours, but during this period, the maternal weight increased slightly.<sup>38</sup> An increased output of breast milk has been reported by supplementing the diet of Nigerian nursing mothers with soya flour as well with skim milk in poor Indian mothers.<sup>39</sup> A study from Bangladesh demonstrated the effect of at least 200-g weight gain of nursing mothers in the first 3 months of breastfeeding on increasing milk volume, milk energy, and milk nitrogen, regardless of initial weight of nursing mothers.<sup>40</sup>

A study on low-income expectant mothers demonstrated that the prenatal diet can affect the ability of the mothers in breastfeeding their infants successfully. The mothers' diet of one group of the study was improved from about fourth month of pregnancy up to 6 weeks after delivery with the following foods daily: milk, egg, cheese, orange, canned tomatoes, wheat germ, and viosterol capsule of vitamin D. In this study, after 6 weeks, sending of food surplus to them stopped, then a sudden drop in the incidence of nursing was reported.<sup>41</sup> A reduction in maternal caloric intake usually leads to a decrease in milk production as well a small change in its compounds.<sup>38</sup> Some modern medicine studies claimed that starvation may reduce the amount of milk and the duration of lactation.<sup>42</sup> According to the data of modern medicine in lactation, it is possible that maternal overeating may be one of the etiology of overabundant milk supply and on the other hand, reduction in food intake may be helpful in the therapy of uncomplicated mothers with milk oversupply, and with a history of overeating. No scientific studies have evaluated the relationship between a history of maternal overeating and milk oversupply or reduction in food intake and consuming foodstuffs such as lentil on its treatment.

From the perspective of traditional Persian medicine, temperament plays a significant role in lactation and its problems, but the temperament is not defined in the perspective of modern medicine. The negative effect of blood loss on milk production has also been reported in modern medicine. A case series revealed a relationship between maternal postpartum hemorrhage and failure of lactation.<sup>43</sup> Sheehan's syndrome or ischemic necrosis of pituitary gland can occur due to significant obstetrical hemorrhage. Failure to lactate is the most common symptom of Sheehan's syndrome.<sup>44</sup> According to traditional medicine, the probability of milk oversupply is higher in the spring season. In modern medicine, studies from

Africa and Bangladesh have suggested the effect of seasons on milk production,<sup>40,45</sup> but there is no documented study on the seasonal effect of spring on milk oversupply. Both traditional and modern medicine have noted the effect of exercise on lactation depending on its intensity and duration.<sup>24</sup>

Maternal and infant complications of breast milk oversupply that have been mentioned by traditional Persian scholars are in line with their complications reported by modern medicine studies.

Many natural products are presented to decrease milk production by distinguished traditional Persian physicians of traditional medicine. Nowadays, despite the intense interest to investigate the effectiveness and safety of ancient medical herbs, very few studies have been carried out on natural remedies that reduce milk production by current medicine. According to studies, chasteberry may increase or decrease lactation.<sup>35</sup> Different effects on lactation can be attributed to its dosage. Evidence indicates that chasteberry in higher doses may affect breastfeeding negatively and reduce lactation. Studies suggest that high dose of this herb suppresses prolactin release<sup>35,46,47</sup> Traditional Persian scholars have noted dose-dependent effects of chasteberry.<sup>19</sup> Caraway is presumed to have lactogenic effect. Given that there are few rigorous studies on lactogenic natural substances such as caraway to evaluate their effectiveness, standard dosage and safety for lactation, scientific peer review on the effects of caraway on breastfeeding and overabundant milk supply is necessary.<sup>46,48,49</sup> In traditional Persian medicine, oral administration of caraway and topical application of caraway mixed with vinegar have been recommended for milk oversupply.<sup>19</sup> Based on data of traditional Persian medicine, the difference in susceptibility to disease and response to interventions like diet and herbs may be attributed to differences in the temperament of individuals.<sup>19,23</sup> In modern medicine, topical cabbage leaf is applied in treating breast engorgement, but studies in this field lack strong evidence. It has also been recommended for milk oversupply, although there are no valid studies.<sup>1,3,5</sup> Application of topical cabbage has also recommended for milk oversupply by Persian medieval scholars as a poultice made of its mashed root.<sup>19</sup> The majority of traditional Persian medicine interventions for decreasing milk production have not been scientifically investigated.

This study provides an overview of the knowledge of breast milk oversupply and its management during lactation in traditional Persian medicine, which may be helpful to inspire further studies to investigate this issue.

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### Author Contributions

MK was involved with literature review and drafting the manuscript. MK gave the first idea for this study. FS supervised the work and edited the manuscript scientifically. SB provided several ideas about

traditional treatment. MB improved the language and edited the drafted manuscript.


### Declaration of Conflicting Interests

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