



Original Article

## Drink combination made from *Fenugreek* seeds and *Phoenix dactylifera* to increase prolactin hormone levels in postpartum mothers and its impact on baby weight

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### ARTICLE INFORMATION

Received: July 13, 2022  
Revised: August 13, 2022  
Accepted: August 15, 2022

### KEYWORDS

Breast Feeding; Fenugreeks; Phoenix dactylifera; Prolactin

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### ABSTRACT

**Background:** Breast milk is the best leading food for the growth and development of the baby; however, the production of breast milk produced by breastfeeding mothers is still lacking and impacts the baby's weight. One of the efforts is consuming a combination drink of *Fenugreek* seeds and *Phoenix dactylifera* containing galactagogue, which has never been done in this study before, to see an increase in breast milk production from indicators of prolactin hormone levels and its impact on baby weight.

**Purpose:** Knowing the effect of giving drinks a combination of *Fenugreek* seeds and *Phoenix dactylifera* on the hormone prolactin and its impact on baby weight.

**Methods:** This is an experimental study with a combination design, pretest-posttest, and posttest-only design. Respondents totaled 32 breastfeeding mothers, 16 were given drinks combination of *Fenugreek* seeds and *Phoenix dactylifera*, and 16 were given *Phoenix dactylifera* drinks. The intervention was given for 14 days, and the Mann-Whitney test analyzed prolactin hormone and baby weight using the Independent T-test.

**Results:** Mean levels of the hormone prolactin in the intervention group were higher (279.52 ng/ml) than in the control group (263.31 ng/ml) with  $p > 0.05$ . The average increase in body weight of infants of the intervention group (606.25 g) was higher than the control group (381.25 g) with a  $p < 0.05$ .

**Conclusion:** A drink combination made from *Fenugreek* seeds and *Phoenix dactylifera* can increase hormone prolactin. However, it is not statistically meaningful, and mothers who consume drinks have babies weighing higher than mothers who only give *Phoenix dactylifera* drinks.

### INTRODUCTION

Breast milk production is influenced by nutritional factors, suction of the baby, frequency of breastfeeding, history of the disease, psychological status, rest patterns, early initiation of breastfeeding, breast care, education, and the experience of breastfeeding the mother.<sup>1-3</sup> In addition, the prolactin hormone factor can also affect breast milk production because the prolactin hormone that comes out into the bloodstream due to stimulation in the anterior pituitary will stimulate acini cells in the alveolus to produce breast milk.<sup>4</sup> The level of the hormone prolactin is influenced by the frequency of breastfeeding, the duration of feeding, and the food consumed during breastfeeding.<sup>5</sup> Foods that

can increase breast milk production contain galactagogues, compounds that can increase and maintain breast milk production.<sup>6</sup> Examples of natural galactagogues commonly used are banana heart, fennel, fenugreek, ginger, moringa, dates, and others.<sup>7</sup>

*Fenugreek* seeds are one of the herbs that act as antilipidemic and hypoglycemic effects, manage diabetes mellitus and cholesterol, and act as galactagogues to increase breast milk production in breastfeeding mothers.<sup>8</sup> Fenugreek seeds are rich in protein, carbohydrates, calcium, iron, vitamin A, B vitamins, vitamin C, and amino acids, and the content of active compounds such as alkaloids, flavonoids, and polyphenols, saponins, steroids, tannins, and coumarins.<sup>8-10</sup> Alkaloids, flavonoids, and saponins

<https://doi.org/10.30595/medisains.v20i2.14240>

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found in *Fenugreek* seeds are at high concentrations. Flavonoids of 2,455 g and saponins of 1,502 g were obtained in 100 g of *Fenugreek* seeds based on the results of testing phytochemical compounds at the Semarang Unika Laboratory. Alkaloid constituents and volatile *Fenugreek* seeds are the two main components that cause the bitter taste and stench of fenugreek seeds.<sup>8</sup> That is what causes Indonesia's lack of interest and utilization, even though it has great potential in increasing maternal milk production.

*Phoenix dactylifera* is identical to this sweet taste and can be a solution to the bitter taste of fenugreek seeds, so they are more in demand. Besides being able to help neutralize the bitter taste of *Fenugreek* seeds, *Phoenix dactylifera* can increase breast milk production because it contains flavonoids, tannins, proteins, glucose, fiber, iron, vitamins, folic acid, potassium, calcium, saponins, and other substances.<sup>11-13</sup> Iron and calcium play a role in the growth of babies and the process of forming milk. The content of phytosterols and phytoestrogens serves to improve quality and facilitate breast milk production.<sup>14</sup>

Previous research related to increasing breast milk production was by giving *Moringa* leaves in the form of flour, used as nastar, and cookies were proven to increase the hormone prolactin and breast milk production.<sup>15-17</sup> Then, the administration of papaya leaves and extract of papaya leaves can also increase the hormone prolactin and baby weight.<sup>18,19</sup> The banana heart extract administration is also proven to increase prolactin hormone levels.<sup>20</sup> Then, the administration of sweet potato leaves is also proven to increase the prolactin hormone, breast milk volume, and baby weight.<sup>21</sup>

Previous research related to the use of *Fenugreek* seeds to increase breast milk production is available in capsule preparations, teabags, tea from pure *Fenugreek* seed steeping as well as powdered tea and with a mixture of other ingredients whose measurements related to breast milk production only use breast milk adequacy indicators seen from breast milk volume, baby weight, baby height, frequency of breastfeeding babies, defecation, urination, and other breast milk adequacy indicators.<sup>22-24</sup>

The previous study conducted with three research groups conducted giving *Fenugreek* seed tea derived from 2 tablespoons pure *Fenugreek* seeds and 100 g of dates, as well as a control group that was not given anything obtained significant results on breast milk volume and baby body weight in the *Fenugreek* seed group and dates.<sup>24</sup> The study only used *Fenugreek* seeds and *Phoenix dactylifera* in different groups. Meanwhile, a combination of *Fenugreek* seeds and *Phoenix dactylifera* in this study because no one had combined these two ingredients in beverage preparations that measured breast milk production using indicators of the hormone prolactin and baby weight, so it

was necessary to test its effectiveness. Therefore, the purpose of this study is to make and test a combination drink of *Fenugreek* seeds and *Phoenix dactylifera* to increase breast milk production as seen from the indicators of prolactin hormone levels and its impact on baby weight.

## METHOD

### Study Design

This is an experimental study with a combination design, pretest-posttest, and posttest-only design.<sup>24</sup>

### Setting and Respondents

This research was conducted at the Sidomulyo Health Center in Pekanbaru City between February and March 2022. The population in this study were postpartum 14th-day breastfeeding mothers with a sample number of 32 with the inclusion criteria being standard puerperal mothers with a productive age range (20-35), had no history of breast-related diseases, gave breast milk only without additional food or drinks, were not consuming breast milk booster, did not smoke and consumed alcohol, did not use hormonal contraceptives, has no history of legume allergies, the baby's weight was born  $\geq 2500$  grams, the baby's weight on the 14th day of postpartum returned to his birth weight. The baby's suction reflex was good. The exclusion criteria in this study are that the mother gets a special massage that can increase the mother's milk production, the baby is sick for more than three days, and the mother gives additional food or drinks to the baby.<sup>23-25</sup> The sample was randomly divided into two groups: the group given a combination drink of *Fenugreek* seeds and *Phoenix dactylifera* and the group given the *Phoenix dactylifera* drink only.

### Making the Drink

In this study, the combination drink of *Fenugreek* seeds and *Phoenix dactylifera* used a base of 25 grams of *Fenugreek* seeds, 100 grams of *Phoenix dactylifera*, and 250 ml of water.<sup>24</sup> The equipment used is containers, digital scales, measuring cups, copper, sieves, and bottles. The manufacturing step begins with washing all the ingredients that have been weighed using clean water, then soaking the *Fenugreek* seeds as much as 25 grams in 250 ml of hot water and waiting for 10 minutes. After that, blend 100 grams of *Phoenix dactylifera* using water from *Fenugreek* seed baths, separate the pulp using a filter, and the drink is ready to be packaged into bottles by breastfeeding mothers. This drink has been proven safe for consumption because it has passed an examination in the laboratory, which states that there is no heavy metal and bacteria content and contains flavonoids and saponins as much as 0.35 g and 0.52 in 1 bottle of drink.

### Exsperimental Procedure

The intervention group was given a combination drink of *Fenugreek* seeds and *Phoenix dactylifera* consisting of 25 grams of Fenugreek seeds and 100 grams of *Phoenix dactylifera* in 250 ml of water for 14 days.<sup>24</sup> While the control group was only given 100 grams of drink from *Phoenix dactylifera* in 250 ml water for 14 days.

### The Variable, Instrument, and Measurement

The variables measured in this study were prolactin hormone levels and the baby's weight. Prolactin levels were measured using the ELISA method carried out by the laboratory on the 15th day of the intervention by taking the blood of a breastfeeding mother in the morning. In contrast, the baby's weight variable was measured using baby scales carried out on days 1, 7, and 15 in the morning.

### Statistical Analysis

The difference in prolactin hormone levels was tested using the Mann-Whitney test, while the difference in baby weight was tested using the Independent T-test.

### Ethical Consideration

This research has passed the ethical test conducted by the Ethics Commission of the Poltekkes of the Ministry of Health Semarang on January 25, 2022, with number No. 037/EA/KEPK/2022.

## RESULTS

Figure 1 is an example of a drink combination of *Fenugreek* seeds and *Phoenix dactylifera* with the brand name "Greek-Ku. The product consists of 25 grams of *Fenugreek* seeds and 100 grams of *Phoenix dactylifera* in 250 ml. Table 1 shows that all respondents in this study were in the productive age range (20-35 years), which was dominated by mothers with an age range of 20-30 years, middle education, does not work, and multipara parity. Babies of the female gender dominated the gender of babies in this study.

The prolactin hormone levels in the intervention and control groups were measured on the 15th day, namely, after the intervention, which was carried out in the morning. Table 2 showed that the difference in the average level of the hormone prolactin of the intervention group given drinks combination of *Fenugreek* seeds and *Phoenix dactylifera* was higher than the control group given drinks of *Phoenix dactylifera* only (Intervention: 279.52 ng/ml, Control: 263.31 ng/ml), but based on the results of the Mann Whitney test obtained insignificant ( $p > 0.05$ ).



Figure 1. Beverage Products

Table 1. Characteristics of Respondent (n=32)

Characteristic	Distribution	Percentage
<b>Age</b>		
20-30 Years	26	81.25%
31-35 Years	6	18.75%
<b>Education</b>		
Primary	0	0%
Middle	24	75%
High	8	25%
<b>Profession</b>		
Does not Work	24	75%
Work	8	25%
<b>Parity</b>		
Primipara	8	25%
Multipara	24	75%
<b>Baby Gender</b>		
Male	14	43.75%
Female	18	56.25%

Table 2. Differences in Prolactin Hormone Levels After the Intervention Period (ng/ml)

Group	Min-Max	Mean $\pm$ SD	p-value
<b>Intervention</b>	82.32-541.80	279.52 $\pm$ 149.17	0.366
<b>Control</b>	37.70-788.70	263.31 $\pm$ 213.64	

Measurements related to infant weight were carried out on days 1, 7, and 15 in the intervention group with the given combination drinks of *Fenugreek* seeds and *Phoenix dactylifera* and the control group with the given drinks *Phoenix dactylifera* drinks only based on Figure 2 obtained results of higher infant weight gain in the intervention group compared to the control group with a difference in infant weight gain in the intervention group of 606.25 grams than a control group of 381.25 grams ( $p < 0.001$ ).

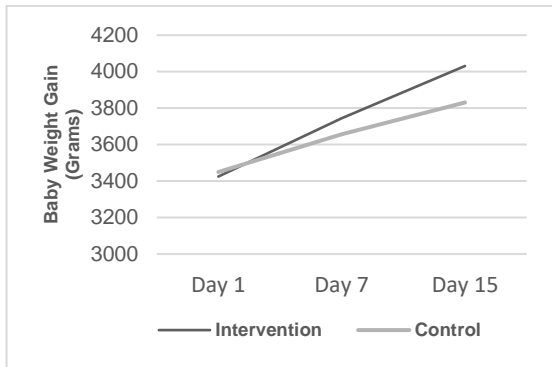


Figure 1. Average Baby Weight Gain

## DISCUSSION

The combination drink of *Fenugreek* seeds and *Phoenix dactylifera* in this study can increase breast milk production of breastfeeding mothers as seen from indicators of prolactin hormone levels and baby weight. Average levels of the hormone prolactin in the intervention group were higher compared to the control group but showed insignificant results. This can be caused by the measurement of prolactin hormone levels carried out after the intervention alone, then the control group, which also obtained the intervention of date palm drinks which are also the constituent ingredients of the intervention group drinks, became the cause of not too different levels of the hormone prolactin from the two groups.

The level of the hormone prolactin is influenced by the frequency of breastfeeding, the duration of feeding, and the large number of food additives the mother consumes during lactation.<sup>5</sup> Regarding breastfeeding frequency in this study, there was no significant difference between the two groups. Researchers assumed that the cause was not too different in prolactin hormone levels in the two groups in this study because the control group was also given date palm drinks which also played a role in increasing breast milk production, which was the constituent ingredient of the intervention group's drinks. Then the dose of drink administration not based on the mother's body weight is suspected to be something that may affect the results of prolactin hormone levels in this study. Previous studies also found the same thing regarding the dose of administration to prolactin hormone levels, the administration of grass tuber extract in the study group using a dose of 300 mg/kg BW with 450 mg was found to have no effect ( $p > 0.05$ ).<sup>26</sup>

The administration of a combination of *Fenugreek* and *Phoenix dactylifera* seeds containing nutrients and phytochemical compounds can increase breast milk production. The content of polyphenols and flavonoids can increase the level of the hormone prolactin, which has an impact on increasing breast milk production and leads to an increase in the baby's weight.<sup>27</sup> The baby's weight in this study was

found to have a higher average weight gain in the intervention group with administration of a combination drink of *Fenugreek* seeds and *Phoenix dactylifera* was compared with the group control that *Phoenix dactylifera* drink only gives.

The process of feeding breast milk determines the weight gain of the baby. Breastfeeding is recognized as one factor that most affects the baby's weight. Adequate intake of nutrients will further increase the baby's weight.<sup>27</sup> The increase in infant weight in this study is thought to be influenced by the content of the two constituent ingredients in a mixed drink of *Fenugreek* seeds and *Phoenix dactylifera*, which contains nutrients and phytochemical compounds that can increase breast milk production in breastfeeding mothers. In addition, the content of polyphenol and flavonoid compounds in estrogenic beverages is also suspected of causing an increase in breast milk production. Previous studies have also found the same thing related to the increase in infant weight by giving mixed juice drinks of green beans and fennel to breastfeeding mothers ( $p < 0.001$ ).<sup>27</sup> Then, the administration of *Fenugreek* tea and black tea resulted in a significant increase in baby weight ( $p < 0.001$ ).<sup>23</sup> Therefore, the combination drink of *Fenugreek* seeds and *Phoenix dactylifera* can be used as an innovation to increase maternal milk production following.

## CONCLUSIONS AND RECOMMENDATION

Postpartum mothers who consume a combination drink based on *Fenugreek* seeds and *Phoenix dactylifera* have an average higher prolactin level than mothers who consume *Phoenix dactylifera* drinks alone, which has an impact on increasing the baby's weight. For the next, researchers can then combine with other ingredients that can increase breast milk production or can make a beverage product in a more durable preparation.

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