JOURNAL OF NATURAL REMEDIES
DOI: 10.18311/jnr/2024/35635
RESEARCH ARTICLE

# Therapeutic benefits of Fenugreek on Breast Milk Production and Weight Gain Among Newborns

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## Abstract

**Background:** Breast milk is highly effective in fulfilling the nutritional needs of infants, providing them with a complete range of essential nutrients for healthy growth and development. However, it is well-documented that many mothers face challenges with insufficient breast milk production during the postpartum period. Fenugreek, a commonly used herbal remedy, is often sought to increase lactation. It has been used for centuries to help nursing mothers enhance milk production. Its action is thought to involve stimulating the synthesis of prolactin, a hormone crucial for breast feeding. Furthermore, breast feeding is linked to supporting weight gain in newborns. **Aim:** The study aimed to assess the effect of fenugreek on improving breast milk production and promoting weight gain among newborns during the early weeks. **Methods:** A quasi-experimental design with a pre-test and post-test approach was employed, involving 30 postnatal mothers in the experimental group and 30 in the control group, selected through non-probability purposive sampling. Newborn weight was measured using an infanto-meter, and a checklist was used to evaluate breastfeeding practices. Both descriptive and inferential statistical methods were applied in the study. **Results:** The findings indicated a notable improvement in breast milk secretion among mothers who took fenugreek, compared to those who did not take it. **Conclusion:** The positive effects of fenugreek consumption were particularly evident in the frequency of urination and weight gain of newborns.

**Keywords:** Fenugreek, Frequency of Urination, Galactagogue, Weight Gain

## 1. Introduction

Breast feeding is the preferred method of natural newborn feeding recommended by the World Health Organization (WHO). For a new born, for the first 6 month period, the WHO and UNICEF suggest exclusive breastfeeding without the addition of any further liquids or solids[1]. Because exclusive breastfeeding protects against noncommunicable diseases (like breast cancer, diabetes, overweight and obesity) and improves the health of mothers and infants, it is essential to achieving many of the sustainable development goals by 2030 in all countries[2]. In addition to promoting healthy weight growth, breastfeeding lowers the risk of childhood obesity. Insufficient breast milk supply or poor breastfeeding can result in lactation failure, which can lead to several issues during the early stages of life. Compared to breastfed babies, infants that get alternative nourishment had four times higher chances of death and morbidity[3].

According to UNICEF and the WHO, 1.5 million babies die every year as a result of not getting enough breast milk. Millions of babies who were bottle-fed endure infectious infections, hunger and never reach their full potential as a result[4].

Breastfeeding a child is one of the happiest things a mother can experience. While some moms are lucky enough to have this option, other mothers would like

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Article Received on: 17.11.2023 Revised on: 21.10.2024 Accepted on: 25.11.2024

to nurse their babies but are unable to do so mostly because of inadequate support from their family and the medical staff. According to studies, India does not practice breastfeeding very well. In India's various districts, less than one-fourth (21%) of newborns were nursed within an hour of their delivery[5]. Many give up breastfeeding due to inadequate or insufficient milk production. The incapacity of the mother to produce milk increases the baby's health risks and leaves mothers with intense feelings of despair, sorrow and inadequacy[6]. Medical practitioners often prescribe pharmaceuticals or other substances to effectively manage this particular concern[7].

Medicinal herbs or other substances that increase milk production are usually natural galactagogues[8]. In many cultures around the world, moms who prefer not to use pharmaceutical alternatives to increase milk production have access to a variety of natural galactagogues[9].

One of the most well-liked galactagogues that nursing moms frequently utilize is fenugreek. Fenugreek seeds activate precursors of hormones that increase milk production. It is also believed that the presence of diosgenin and phytoestrogens in fenugreek may be the cause of the increase in breast milk[10]. The plant belonging to the pea family, fenugreek, is the most widely used herbal galactagogue worldwide[11]. It is included among the frequently used safe herbs by the FDA[12]. Studies have shown that fenugreek is safe for both mother and child and can effectively stimulate the production of breast milk[13]. Fenugreek is a seed widely present in middle Eastern and Asian culinary traditions, with a rich historical background as a medicinal plant in India and China. It is noteworthy that this seed is non-toxic in nature. Breastfeeding mothers often use it as a galactagogue, whereby they consume it with the intention of augmenting their lactation[14]. The aim of this research work is to evaluate the effectiveness of fenugreek on the frequency of urination and weight gain among newborn babies, assess the impact of fenugreek on breast milk production in postnatal mothers, as indicated by the frequency of urination in newborns and to evaluate the effect of fenugreek on weight gain in newborns within the experimental group. Also, to compare the effects of fenugreek on breast milk production and weight gain between newborns in the experimental and control groups and to identify the association between the frequency of urination and weight gain in newborns with selected demographic variables.

## 2. Materials and Methods

The study's research approach was evaluative, and a quasi-experimental, one-group pre-test and post-test control group design was adopted. The study was conducted at tertiary care hospitals in Vadodara, Gujarat. The study's target group was postnatal mothers and their newborns who satisfied the inclusion criteria. The total sample size consisted of 60 postnatal mothers, thirty (30) of whom belonged to the experimental group and thirty (30) to the control group. Participants in this research were selected using a non-probability purposive sampling technique.

Postnatal mothers who met the following criteria were eligible to join: (1) 0-1 week of postnatal period; (2) Term, healthy babies; (3) Poor milk supply; and (4) Willingness to participate. Postnatal mothers who met one of the following two criteria were excluded: (1) had breast problems such as mastitis, breast abscess, breast engorgement, inverted nipples, or clinical sickness; or (2) were currently using any other herbal supplements.

After learning about the purpose of the research, every participant gave written permission. The gathered data was kept private and confidential.

Data on newborns, obstetrics, and demographics variables were gathered before the intervention.

The amount of breast milk that the postpartum mothers were able to produce was assessed by using a checklist, that considered the number of breastfeeds per day, complaints about insufficient breast milk, and the baby's incessant cries. Using a checklist and a calibrated infanto-meter, the experimental and control groups underwent a pre-test on the first day of the trial. Throughout seven days, post partum mothers in the experimental group received ten grams of fenugreek water that had been soaked overnight. The control groups received standard treatment without any interventions. When the newborn's diaper was changed at a specific time in the morning, the quantity of wet diapers was counted and the infants weights were recorded in a calibrated infanto-meter. On the first, third, and seventh days, the babies in the control and

experimental groups had their weights and frequency of urination compared.

The infanto-meter was used to measure the weight growth in newborns, and the collected data were coded, analyzed, and subjected to descriptive and inferential statistics. For seven days, the experimental group received the intervention every morning. It included giving them 10g of fenugreek soaked in water overnight. The experimental group received this intervention on the same day as the pre-test. On the 7$^{th}$ day, post-tests were given to both groups using an infanto-meter to gauge neonatal weight gain and a standardized checklist to assess the sufficiency of breast milk. In the data analysis, both descriptive and inferential statistics were utilized.

Data analysis for the study, both descriptive and inferential, statistics was used. The sociodemographic, maternal, and newborn factors were described using frequency, percentage distribution, mean and standard deviation. To find out the association between breast milk supply and socio demographic factors, the Chi-square ($X^2$) analysis was used. The statistical significance was evaluated and the neonatal weight gain and breast milk production scores were compared between the groups using the unpaired t-test.

## 3. Results

Table1 displays the frequency and percentage distribution of demographic information on postpartum moms and newborns. In the experimental group, the age distribution of the postnatal mothers was as follows: 16 (53.3%) were between the ages of 18 and 23, 13 (43.3%) were between the ages of 24 and 28, and 1 (3.3%) was between the ages of 34 and 38. In contrast, the majority of the 16 (53.3%) postnatal moms in the control group were between the ages of 24 and 28, 12 (40%) were between the ages of 18 and 23, and 2 (6.7%) were between the ages of 29 and 33.

In terms of postnatal mothers parity, 6(20.0%) of the 24 (80.0%) postnatal women in the experimental group were multipara, whereas the majority of postnatal moms were primipara. Of the 20 postnatal moms in the control group, 10 (33.3%) are multipara and the bulk, 20, (66.7%), are primipara.

In the experimental group, the postnatal mothers educational status was as follows: 3 (10%) had no formal education, 18 (60%) had only completed primary school, 7 (23.3%) had completed high school, 1 (3.3%) had completed higher secondary education and 1 (3.3%) had graduated or above. Within the control group, 8 (26.7%) postpartum women had no formal education, a maximum of eighteen (60%) had completed elementary school, 3 (10%) had completed high school, 1(3.3%) had completed upper secondary education, and none had completed college or higher.

The majority of the 30 (100%) postnatal moms in the experimental group were housewives, while 27 (90%) postnatal mothers in the control group were also housewives, and 3 (10%) postnatal mothers were self-employed.

As for the postnatal mothers religion, in the experimental group, 30 (100%) of the postnatal mothers were Hindu, and among the control group 30 (100%) of the postnatal mothers were Hindu.

In the experimental group, the majority of postnatal mothers (17, or 56.7%) were in joint families, while 13 (43.3%) were in nuclear families. In contrast, the majority of postnatal mothers (16, or 53.3%) in the control group were in nuclear families, and 14 (46.7%) were in joint families.

In terms of delivery mode, 16 (53.3%) of the postnatal females in the experimental group gave birth normally through the vagina, and 14 (46.7%) had a caesarean delivery. Conversely, the majority of postnatal mothers in the control group,18 (or 60%) had a vaginal delivery that went normally, and 12 (or 40%) had a caesarean.

Of the postnatal mothers in the study group, 13 (43.3%) had female babies and 17 (56.7%) had male offspring. However, the majority of postnatal women in the comparison group 20 (66.7%) had male babies and 10 (33.3%) had girl babies.

Table 2 displays the frequency and percentage distribution of demographic information on newborns. In the experimental group, the weight of the newborn was as follows: <2.5 kg, 18 (60.0%) were newborn weight 2.5 kg -3 kg, 11 (36.7%) were weight above> 3 kg, 1(3.30%), andin contrast, the control group newborn weight was<2.5 kg 8 (26.7%), 18 (60.0%) newborn weight were 2.5 kg -3 kg, 4 (13.30%) were the newborn weight was> 3 kg.

In terms of breastfeeding, in the experimental group majority of the mothers breastfeed 3-4 times breastfeed

**Table 1.** Baseline characteristics of postnatal mothers in the experimental group and control group N=60

| Demographic Variables | | Experimental Group (30) | | Control Group (30) | |
|---|---|---|---|---|---|
| | | Frequency (f) | Percentage (%) | Frequency (f) | Percentage (%) |
| Age of Mother (Years) | 18-23 | 16 | 53.30% | 12 | 40.00% |
| | 24-28 | 13 | 43.30% | 16 | 53.30% |
| | 29-33 | 0 | 0.00% | 2 | 6.70% |
| | 34-38 | 1 | 3.30% | 0 | 0.00% |
| Parity | Primipara | 24 | 80.00% | 20 | 66.70% |
| | Multipara | 6 | 20.00% | 10 | 33.30% |
| Educational Status | No formal education | 3 | 10.00% | 8 | 26.70% |
| | Primary education | 18 | 60.00% | 18 | 60.00% |
| | High school | 7 | 23.30% | 3 | 10.00% |
| | Higher Secondary | 1 | 3.30% | 1 | 3.30% |
| | Graduate and above | 1 | 3.30% | 0 | 0.00% |
| Occupation | Homemaker | 30 | 100.00% | 27 | 90.00% |
| | Self employed | 0 | 0.00% | 3 | 10.00% |
| | Private employee | 0 | 0.00% | 0 | 0.00% |
| Religion | Hindu | 30 | 100.00% | 30 | 100.00% |
| | Muslim | 0 | 0.00% | 0 | 0.00% |
| | Other | 0 | 0.00% | 0 | 0.00% |
| Type of Family | Nuclear | 13 | 43.30% | 16 | 53.30% |
| | Joint | 17 | 56.70% | 14 | 46.70% |
| Type of Delivery | Normal vaginal delivery | 16 | 53.30% | 18 | 60.00% |
| | Caesarean section | 14 | 46.70% | 12 | 40.00% |
| | Assisted vaginal delivery | 0 | 0.00% | 0 | 0.00% |
| Gender of the Baby | Male | 17 | 56.70% | 20 | 66.70% |
| | Male | 13 | 43.30% | 10 | 33.30% |

**Table 2.** Baseline characteristics of newborns in the experimental group and control group

| Section-1 New Born Variables | | Experimental Group (n=30) | | Control Group (n=30) | |
|---|---|---|---|---|---|
| | | Frequency (f) | Percentage (%) | Frequency (f) | Percentage (%) |
| Weight of Newborn(kg) | <2.5 kg | 18 | 60.00% | 8 | 26.70% |
| | 2.5 kg -3 kg | 11 | 36.70% | 18 | 60.00% |
| | > 3 kg | 1 | 3.30% | 4 | 13.30% |
| Number of Breastfeeding | 1-2 times per day | 3 | 10.00% | 1 | 3.30% |
| | 3-4 times per day | 17 | 56.70% | 27 | 90.00% |
| | 5-6 times per day | 10 | 33.30% | 2 | 6.70% |
| | 7-9 times per day | 0 | 0.00% | 0 | 0.00% |
| Urination in Newborn | 2-3 times per day | 14 | 46.70% | 25 | 83.30% |
| | 4-7 times per day | 16 | 53.30% | 5 | 16.70% |
| Initiation of Breastfeeding | Within half an hour | 4 | 13.30% | 1 | 3.30% |
| | Within one hour | 7 | 23.30% | 7 | 23.30% |
| | More than one hour | 19 | 63.30% | 22 | 73.30% |

per day 17, (56.70%), 5-6 times breastfeeding per day 10(33.30%), in control group mothers breast fed 3-4 times breastfeed per day 27, (90.0%), 5-6 times breastfeeding per day were 2(6.7%).

In the experimental group, regarding urination in newborns, 2-3 times per day 14 (46.7%), urination at 4-7 times were 16 (53.3%). In control group regarding urination in new borns, 2-3 times per day 25, 5 (83.3%), urination at 4-7 times was 5 (16.7%).

Table 3 indicates that the mean and Standard Deviation (SD) scores frequency of urination of newborns in the experimental group were 10.17± 1.744, respectively, while the control group had scores of 19.77±1.455. The calculated t-value (t = 23.182, df = 58) exceeded the critical table value at the 0.05 level of significance. Therefore, it concluded that fenugreek had a significant effect on breast milk production, as demonstrated by the increased frequency of urination in infants.

Table 4 reveals that the mean and Standard Deviation (SD) scores of weight gain at newborns in the experimental group were 10.2±1.69, respectively, while the control group had scores of 19.77±1.999. The calculated t-value (t = 0.161, df = 58) was not statistically significant P value=0.874.there were no notable changes in the overall weight gain among newborns in both the groups. The sequential changes in mean weights of infants in both the experimental and control groups suggest a significant interaction between the treatment and time.

Table 5 depicts the weight mean and standard deviation of the newborn in the control group were 2.8+/-0.73 on the 1st day, 2.5+/-0.64 on the 3rd, 2.5+/-0.64 on the 5th, and 2.3+/-0.41 on the 7th. Whereas in the experimental group mean and standard deviation of the newborn weight were 2.1+/-0.44 on the 1st day, 2.2+/-0.44 on the 3rd, 2.7+/-0.54 on the 5th, and 2.8+/-0.61 on the 7th to ascertain if the observed mean difference was statistically significant, an ANOVA (F-test) was performed. The table value of 0.05 was less than the observed F-value of 2.263. Given that the degree of freedom 29 was determined to be non-significant with a p-value of 0.0731 in the control group, whereas in experimental group table value of 0.05 was less than the observed F-value of 24.37. Given that the degree of freedom 29 was determined to be non-significant with a p-value 0<0.001, This includes the fact that the experimental groups newborns had shown a notable weight gain over the days and there was a statistical significance present.

Hence, it was inferred that fenugreek had an effect on breast milk production. This was evidenced by the increased frequency of urination among newborns in the experimental group.

Table 6 shows the association between breast milk production among postnatal mothers with their selected demographic variables in the experimental group, the above table states that even when the computed Chi-square values were less than the table value at the 0.05 level of significance, there was no

**Table3.** Frequency of urination among newborns in experimental and control group

| Frequency of Urination among Newborns in Experimental and Control Group | | | | | | Un Paired 't' Test | | |
|---|---|---|---|---|---|---|---|---|
| Experimental Group (n=30) | | | Control Group(n=30) | | | | | |
| N | Mean | SD | N | Mean | SD | df | 't' | Result |
| 30 | 10.17 | 1.744 | 30 | 19.77 | 1.455 | 58 | 23.182 | P value=<0.001 Significant |

Maximum = 21Minimum = 0 P<0.05 level of significance

**Table 4.** Comparison between newborn weights among experimental and control group

| Weight of Newborn between Experimental and Control Group | | | | | | Un Paired 't' Test | | |
|---|---|---|---|---|---|---|---|---|
| Experimental group (n=30) | | | Control group (n=30) | | | | | |
| N | Mean | SD | N | Mean | SD | df | 't' | Result |
| 30 | 10.2 | 1.69 | 30 | 19.27 | 1.999 | 58 | 0.161 | P value=0.874 non-significant |

Maximum = 21Minimum = 0P<0.05 level of significance

**Table 5.** Comparison of weights of newborns over days in the experimental group and control group

| Experimental Group | | | | | Control Group | | | |
|---|---|---|---|---|---|---|---|---|
| **Weight of Newborn in Days** | **1st day** | **3rd day** | **5th day** | **7th day** | **1st day** | **3rd day** | **5th day** | **7th day** |
| **N** | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| **Mean** | 2.1 | 2.2 | 2.7 | 2.8 | 2.8 | 2.5 | 2.5 | 2.3 |
| **SD** | 0.42 | 0.44 | 0.54 | 0.61 | 0.73 | 0.64 | 0.64 | 0.41 |
| **F- value** | 24.37 | | | | 2.263 | | | |
| **df** | 29 | | | | 29 | | | |
| **P value** | < 0.001 | | | | 0.0731 | | | |
| **Result** | Significant | | | | Non-significant | | | |

**Table 6.** Association of breast milk production scores among postnatal mothers with their selected demographic variables in experimental group N=30

| Demographic Variables | Options | Above Adequate | Adequate | inadequate | Chi Test | P Value | df | Table Value | Result |
|---|---|---|---|---|---|---|---|---|---|
| **Age of Mother** | 18-23 Years | 16 | 0 | 0 | 1.353 | 0.508 | 2 | 5.991 | Not significant |
| | 24-28 Years | 12 | 1 | 0 | | | | | |
| | 29-33 Years | 0 | 0 | 0 | | | | | |
| | 34-38 Years | 1 | 0 | 0 | | | | | |
| **Parity** | Primipara | 24 | 0 | 0 | 4.138 | 0.042 | 1 | 3.841 | Significant |
| | Multi para | 5 | 1 | 0 | | | | | |
| **Educational Status** | No formal education | 3 | 0 | 0 | 0.69 | 0.953 | 4 | 9.488 | Not significant |
| | Primary education | 17 | 1 | 0 | | | | | |
| | High school | 7 | 0 | 0 | | | | | |
| | Higher Secondary | 1 | 0 | 0 | | | | | |
| | Graduate and above | 1 | 0 | 0 | | | | | |
| **Occupation** | Homemaker | 29 | 1 | 0 | | NA | | | |
| | Self employed | 0 | 0 | 0 | | | | | |
| | Private employee | 0 | 0 | 0 | | | | | |
| **Religion** | Hindu | 29 | 1 | 0 | | NA | | | |
| | Muslim | 0 | 0 | 0 | | | | | |
| | Other | 0 | 0 | 0 | | | | | |
| **Type of Family** | Nuclear | 12 | 1 | 0 | 1.353 | 0.245 | 1 | 3.841 | Not significant |
| | Joint | 17 | 0 | 0 | | | | | |
| **Type of Delivery** | Normal vaginal delivery | 16 | 0 | 0 | 1.182 | 0.277 | 1 | 3.841 | Not significant |
| | Caesarean section | 13 | 1 | 0 | | | | | |
| | Assisted vaginal delivery | 0 | 0 | 0 | | | | | |
| **Gender of Baby** | Male | 16 | 1 | 0 | 0.791 | 0.374 | 1 | 3.841 | Not significant |
| | Female | 13 | 0 | 0 | | | | | |

**Table 7.** Association of breast milk production scores among postnatal mothers with their selected demographic variables in control Group N=30

| Demographic Variables | Options | Above Adequate | Adequate | inadequate | Chi Test | P Value | df | Table Value | Result |
|---|---|---|---|---|---|---|---|---|---|
| **Age of Mother** | 18-23 Years | 0 | 12 | 0 | 1.875 | 0.392 | 2 | 5.991 | Not significant |
| | 24-28 Years | 0 | 14 | 2 | | | | | |
| | 29-33 Years | 0 | 2 | 0 | | | | | |
| | 34-38 Years | 0 | 0 | 0 | | | | | |
| **Parity** | Primipara | 0 | 18 | 2 | 1.071 | 0.301 | 1 | 3.841 | Not significant |
| | Multi para | 0 | 10 | 0 | | | | | |
| **Educational Status** | No formal education | 0 | 8 | 0 | 14.821 | 0.002 | 3 | 7.815 | Significant |
| | Primary education | 0 | 17 | 1 | | | | | |
| | High school | 0 | 3 | 0 | | | | | |
| | Higher Secondary | 0 | 0 | 1 | | | | | |
| | Graduate and above | 0 | 0 | 0 | | | | | |
| **Occupation** | Homemaker | 0 | 25 | 2 | 0.238 | 0.626 | 1 | 3.841 | Not significant |
| | Self employed | 0 | 3 | 0 | | | | | |
| | Private employee | 0 | 0 | 0 | | | | | |
| **Religion** | Hindu | 0 | 28 | 2 | | NA | | | |
| | Muslim | 0 | 0 | 0 | | | | | |
| | Other | 0 | 0 | 0 | | | | | |
| **Type of Family** | Nuclear | 0 | 15 | 1 | 0.01 | 0.922 | 1 | 3.841 | Not significant |
| | Joint | 0 | 13 | 1 | | | | | |
| **Type of Delivery** | Normal vaginal delivery | 0 | 17 | 1 | 0.089 | 0.765 | 1 | 3.841 | Not significant |
| | Caesarean section | 0 | 11 | 1 | | | | | |
| | Assisted vaginal delivery | 0 | 0 | 0 | | | | | |
| **Gender of Baby** | Male | 0 | 18 | 2 | 1.071 | 0.301 | 1 | 3.841 | Not significant |
| | Female | 0 | 10 | 0 | | | | | |

significant association found between the breastmilk production scores and the other demographic variables there was no significant correlation between the breastmilk production scores of postnatal mothers with their selected demographic variables such as the mother's age, parity, educational status, occupation, religion, type of family, type of delivery, and gender of the baby, found there was a significant association between parity and breast milk production scores of postnatal mothers.

Table 7 shows the association between breast milk production among postnatal mothers with their selected demographic variables in the control group, the above table states that there was no significant correlation between the breastmilk production scores of postnatal mothers with their selected demographic variables such as the mother's age, parity, occupation, religion, type of family, type of delivery, and gender of the baby, found there was a significant association educational level and breast milk production scores of postnatal mothers. At the 0.05 level of significance where the calculated Chi-square values were less than the table value.

Based on the Chi-square value, it can be concluded that there was no statistically significant relationship between the weight gain scores of newborns and other demographic variables such as the newborn's weight, number of breastfeeds, frequency of urination, and the time of beginning breastfeeding (Table 8).

Table 9 indicates that there was no significant association between weight gain scores of newborns with their selected demographic variables such as weight of newborn, urination in newborn, and initiation of breast feeding. Found the significant association between newborn weight gain and the number of breast feeding among newborns. The calculated Chi-square values were less than the table value at the 0.05 level of significance.

**Table 8.** Association of weight gainscores among newborns with their selected demographic variables in the experimental group

| Demographic Variables | Options | Above Adequate | Adequate | inadequate | Chi Test | P Value | df | Table Value | Result |
|---|---|---|---|---|---|---|---|---|---|
| **Weight of Newborn** | <2.5 kg | 18 | 0 | 0 | 1.787 | 0.409 | 2 | 5.991 | Not significant |
| | 2.5-3 kg | 10 | 1 | 0 | | | | | |
| | > 3 kg | 1 | 0 | 0 | | | | | |
| **Number of Breastfeeding** | 01-Feb | 3 | 0 | 0 | 0.791 | 0.673 | 2 | 5.991 | Not significant |
| | 3-4 times per day | 16 | 1 | 0 | | | | | |
| | 5-6 times per day | 10 | 0 | 0 | | | | | |
| | 7-9 times per day | 0 | 0 | 0 | | | | | |
| **Urination in Newborn** | 2-3 times per day | 13 | 1 | 0 | 1.182 | 0.277 | 1 | 3.841 | Not significant |
| | 4-7 times per day | 16 | 0 | 0 | | | | | |
| **Initiation of Breastfeeding** | Within half an hour | 4 | 0 | 0 | 0.599 | 0.741 | 2 | 5.991 | Not significant |
| | Within one hour | 7 | 0 | 0 | | | | | |
| | More than one hour | 18 | 1 | 0 | | | | | |

**Table 9.** Association of weight gain scores among newborns with their selected demographic variables in the control Group

| Demographic Variables | Options | Above Adequate | Adequate | inadequate | Chi Test | P Value | df | Table Value | Result |
|---|---|---|---|---|---|---|---|---|---|
| **Weight of Newborn** | <2.5 kg | 0 | 7 | 1 | 0.759 | 0.684 | 2 | 5.991 | Not significant |
| | 2.5-3 kg | 0 | 17 | 1 | | | | | |
| | > 3 kg | 0 | 4 | 0 | | | | | |
| **Number of Breastfeeding** | 01-Feb | 0 | 1 | 0 | 6.488 | 0.039 | 2 | 5.991 | Significant |
| | 3-4 times per day | 0 | 26 | 1 | | | | | |
| | 5-6 times per day | 0 | 1 | 1 | | | | | |
| | 7-9 times per day | 0 | 0 | 0 | | | | | |
| **Urination in Newborn** | 2-3 times per day | 0 | 24 | 1 | 1.714 | 0.19 | 1 | 3.841 | Not significant |
| | 4-7 times per day | 0 | 4 | 1 | | | | | |
| **Initiation of Breastfeeding** | Within half an hour | 0 | 1 | 0 | 0.779 | 0.677 | 2 | 5.991 | Not significant |
| | Within one hour | 0 | 7 | 0 | | | | | |
| | More than one hour | 0 | 20 | 2 | | | | | |

## 4. Discussion

The fenugreek used in this study enhanced breast milk production, which likely contributed to better weight gain in infants in the fenugreek group. the parameters measured included the frequency of urination and the weight gain among newborns. Results showed that breast milk production was higher in mothers who used fenugreek than in the other group. However, fenugreek was still recommended due to its affordability and local availability. No negative side effects of fenugreek were reported in either the mothers or infants in the experimental group.

Earlier studies found that fenugreek effectively increased serum prolactin and oxytocin levels. Additionally, fenugreek was shown to have a positive impact on breast milk volume, infant weight, and the chemical composition of breast milk.

In the experimental group, daily urine output increased steadily among newborns. Notably, newborns in this group experienced significant weight gain during the first week compared to the control group.

This overall weight gain, combined with the increased frequency of urination, suggests a potential improvement in the nutritional status of the newborns. The experimental group showed greater weight gain than the control group, highlighting a positive change in growth and development.

Overall, the results of this study suggest that fenugreek is effective in boosting breast milk production, leading to increased weight gain in newborns, especially during the early days of life. The study's limitations included insufficient follow-up with postnatal mothers and newborns, as well as the lack of control over the dietary intake of fenugreek or other foods that may have influenced breast milk production.

## 5. Conclusion

Fenugreek, known as a galactagogue, effectively enhances and boosts breast milk production. The current study indicates that fenugreek effectively enhances breast milk production, as reflected by the rise in urination frequency and weight gain observed in infants during their first week of life.

The daily oral intake of 10g of fenugreek-soaked water exhibited no reported side effects or complications throughout the study. Furthermore, none of the participants in the fenugreek group expressed any dislike for the taste or opted to discontinue the intervention.

The study recommends that lactating mothers facing milk insufficiency could be encouraged to include fenugreek as part of their routine in postnatal care. However, it's crucial to emphasize that fenugreek should not be a substitute for proper lactation assessment and counseling for postpartum mothers.

Nurse-led clinics should be held regularly as an essential part of antenatal and postnatal care, to adopt proper breastfeeding practices among mothers and families.

Breastfeeding is a crucial women's issue that empowers mothers while offering optimal nutrition to infants. Insights gained from the lactation clinics and breastfeeding practices involving fenugreek will drive further research to build more robust scientific evidence on the herbs effectiveness in boosting milk production.

## 6. Limitations and Scope of the Study

The sample size was limited to 60 postnatal mothers and newborns.A small sample was selected for the research using a non-probability purposive sampling approach. Mothers who were newly hospitalized in tertiary care hospitals were included in the study. The trial included postpartum women who experienced decreased milk production after delivery.

In the future, the study can be broadened with a larger sample size across multiple settings like, many locations, including private hospitals and primary care centers. Such research could also serve to educate staff nurses, family members, and postpartum mothers about the significance of fenugreek in enhancing breastfeeding outcomes.

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