

The Impact of Educational Intervention on Public Knowledge Regarding Fenugreek Seeds (*Trigonella foenum-graecum* L.) as a Galactagogue Supplement in Cibening Village

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Fenugreek seeds (*Trigonella foenum-graecum* L.) are an herbal plant that has long been used as a natural supplement to boost the production of breast milk. This plant has active ingredients like flavonoids, saponins, and phytoestrogens that help nursing moms produce more prolactin. The lack of public knowledge regarding the use of natural ingredients, especially fenugreek seeds as a lactation supplement, is one of the reasons for the need for further education. The aim of this study is to ascertain how education affects public awareness of the use of fenugreek seeds as a supplement to boost breast milk production. The quantitative descriptive study conducted used a *one-group pretest-posttest method*. A total of 62 respondents were selected using purposive sampling. The data collection instrument was a questionnaire administered before and after the educational intervention. Data normality was assessed using the Kolmogorov-Smirnov test; based on the distribution, a Wilcoxon signed-rank test for non-normal data. The results of the study using the *Wilcoxon* test showed an increase in respondents' knowledge after education, indicating a statistically significant difference in knowledge levels before and after the educational intervention, with a p-value of 0.000 ($p < 0.001$). In addition, the *N-Gain* test results showed an average knowledge increase of 0.96, which falls into the high category. Thus, education has been proven to increase public knowledge about the use of fenugreek seeds as a supplement to enhance breast-milk production.



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Breast milk is an essential source of nutrition secreted by the mammary glands to support infant growth and development. Rich in vital nutrients—including carbohydrates, proteins, fats, and vitamins—breast milk plays a crucial role during early

childhood[1]-[2]. The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of life, followed by the introduction of nutritionally adequate complementary foods alongside continued breastfeeding up to two years of

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age or beyond [3]-[4]. Despite these recommendations, exclusive breastfeeding rates in Indonesia remain sub-optimal due to various challenges faced by lactating mothers. Common obstacles include maternal health conditions, lack of social and environmental support, high stress levels, and perceived or actual inadequate breast milk production [5].

The seeds of fenugreek (*Trigonella foenum-graecum* L.), a perennial herb in the Fabaceae family, have long been used in Ayurvedic and traditional Chinese medicine as a galactagogue—a natural compound to help breastfeeding mothers produce more breast-milk [6]-[7]. Fenugreek seeds contain saponins (0.6–1.7%) that can be hydrolyzed into steroidal sapogenins such as diosgenin, yamogenin, tigogenin, and neotigogenin [6]-[8]. Additionally, fenugreek seeds are rich in alkaloids like trigonelline, choline, and gentianine, and they also contain flavonoids, polyphenols, mucilage, and soluble fiber. Diosgenin is a type of saponin found in fenugreek seeds and is considered to play a key role in supporting milk production. Diosgenin, a steroidal sapogenin present in fenugreek, has been proposed as one of the compounds potentially involved in its lactation-related effects. However, the mechanisms underlying the galactagogue effects of fenugreek remain incompletely understood. [8].

Previous studies have investigated the potential galactagogue effects of fenugreek. Simanungkalit reported an increase in breast milk production among breastfeeding mothers who received fenugreek seed supplementation, while Trini's study suggested that compounds such as diosgenin and phytoestrogens may contribute to its potential lactation-related effects [9]-[10]. A network meta-analysis also reported a significant increase in breast milk production following fenugreek use compared with placebo or control groups; however, the available evidence was based on a limited number of studies and participants [11].

In addition to its potential benefits, the safety of fenugreek use should also be considered. A recent scoping review reported that the most common

adverse effect of oral fenugreek consumption was mild gastrointestinal discomfort, while allergic reactions and interactions with certain medications have also been reported [12]. Therefore, information regarding fenugreek should not focus solely on its potential to support lactation but should also address its appropriate and safe use. The Drug and Lactation Database (Lactmed®) states that the usual dosage used to enhance breast-milk production is 1–6 grams per day [13]-[14].

A recent study by Karo et al. reported that an educational intervention using video media significantly improved the knowledge of postpartum mothers regarding galactagogues ($p = 0.001$). The study also found that video-based education was more effective than lecture-based education in improving knowledge [15]. However, the study focused on galactagogues in general among postpartum mothers rather than specifically addressing fenugreek. Evidence regarding community-based educational interventions specifically focused on fenugreek and its potential benefits, limitations, and safe use remains limited. This gap highlights the need for community-based education that provides balanced information regarding the potential benefits, limitations, and safety considerations of fenugreek.

Cibening Village was selected as the study location because it provides a relevant community setting for implementing health education related to breastfeeding and the appropriate use of herbal products. The community setting was considered appropriate for providing structured information regarding fenugreek, particularly its potential benefits, limitations, and safety considerations. Therefore, the novelty of this study lies in evaluating a structured community-based educational intervention specifically focused on fenugreek and assessing changes in community knowledge before and after the intervention. Rather than evaluating the direct lactation effects of fenugreek, this study addresses the educational aspect by examining whether community-based education can improve knowledge regarding its potential use as a galactagogue. Accordingly, this study aimed to

determine the effect of an educational intervention on community knowledge regarding fenugreek (*Trigonella foenum-graecum* L.) as a potential galactagogue in Cibening, Bekasi.

Results and Discussion

The study involved 62 respondents from Cibening Village, Bekasi, who met the established inclusion criteria. Data collection was carried out from January to April 2026. The instrument used in collecting respondent data was a questionnaire containing 12 statements designed to measure the extent of the impact of education on the level of public knowledge regarding fenugreek seeds (*Trigonella foenum-graecum* L.) as a galactagogue supplement.

Based on the data in Table 1, the respondents in this study were predominantly women, with 57 respondents (91.9%), while men accounted for 5 respondents (8.1%). The predominance of female respondents is relevant to the topic of this study because women, particularly those of reproductive age and mothers, are directly involved in the breastfeeding process and are therefore more likely to have an interest in information related to breast-milk production and lactation supplements. The higher proportion of female respondents may also be related to the data collection period, which was conducted during the morning hours, when women or mothers who were not engaged in formal employment may have been more likely to be present in the community. Although male respondents were fewer in number, their inclusion reflects the community-based nature of the study, as health-related information may be discussed and shared among family members. The involvement of both women and men therefore provides a broader community perspective, although the unequal distribution of respondents by gender should be considered when interpreting the findings.

Table 1. Respondent Characteristic Data

Characteristic	Number	Percentage
Gender		
Female	57	91.9%
Male	5	8.1%
Age		
17–25	1	1.6%
26–35	12	19.4%
36–45	18	29.0%
46–55	17	27.4%
56–65	14	22.6%
> 65	0	0%
Last Education		
Elementary School	7	11.3%
High School	11	17.7%
Senior High School	33	53.2%
D1/D2/D3	7	11.3%
Bachelor's Degree (S1)	4	6.5%

The respondents were predominantly aged 36–45 years, comprising 18 individuals (29.0%), followed by those aged 46–55 years, with 17 individuals (27.4%), and those aged 56–65 years, with 14 individuals (22.6%). Respondents aged 26–35 years accounted for 12 individuals (19.4%), while only one respondent (1.6%) was aged 17–25 years. Although lactation-related education is primarily relevant to women of reproductive age, the relatively high proportion of respondents aged ≥46 years remains relevant in the context of community-based health education. A systematic review by Negin et al. reported that grandmothers can influence breastfeeding practices and decision-making within families, highlighting their potential role in breastfeeding promotion interventions [17]. Similarly, Wu et al. found that grandmothers' breastfeeding knowledge and attitudes were associated with mothers' perceptions of breastfeeding support, while their educational level and attitudes were associated with breastfeeding practices [18]. These findings indicate that older family members may contribute to breastfeeding support and the dissemination of breastfeeding-related information within families. Therefore, the involvement of older respondents in

this community-based educational intervention remains relevant, as they may serve as potential sources of accurate information and support for breastfeeding mother's information.

The analysis of respondents' educational backgrounds indicated that 33 individuals (53.2%) had completed senior high school or an equivalent level of education. This finding indicates that most respondents had completed secondary-level education. A recent systematic review found a consistent positive association between educational attainment and health literacy, with higher education levels associated with higher health literacy across the reviewed studies [19]. Therefore, the predominance of respondents with a senior high school education may provide a relevant educational background for receiving and understanding health

information. However, the improvement in knowledge observed following the educational intervention provides more direct evidence of the effectiveness of the intervention in this study.

Instrument Data Test

Validity Test

The purpose of the validity test is to determine the validity of the employed questionnaire. SPSS version 25 was used to perform the validity test. If the computed r value is higher than the table r value, which is 0.246, the validity test is deemed valid. Based on the validity test results from the questionnaire data with 62 respondents, 12 statements were deemed valid with the following calculated r values.

Table 2. Validity Test Results

Item	Questionnaire Statement	Correlation coefficient (r)	Critical value (r)
P1	Exclusive breastfeeding means that infants are given only breast milk without any additional food or drinks during the first six months of life.	0,369	0,246
P2	The nutritional and hormonal balance of the mother affects the success of breastfeeding	0,259	0,246
P3	The more often the baby is breastfed, the smoother the breast milk production will be.	0,312	0,246
P4	Breastfeeding mothers need a healthy and nutritious diet to ensure a smooth milk production.	0,268	0,246
P5	Fenugreek seeds (<i>Trigonella foenum-graecum</i> L.) are known as a herbal plant that may help promote breast milk production.	0,474	0,246
P6	Consumption of fenugreek seeds may increase breast milk production during the early breastfeeding period.	0,640	0,246
P7	One of the main compounds found in fenugreek seeds is diosgenin.	0,446	0,246
P8	Diosgenin in fenugreek seeds has estrogen-like properties (phytoestrogen) that may stimulate the breasts to produce breast milk and support the breastfeeding process.	0,689	0,246
P9	Fenugreek seeds also have antioxidant properties that may help improve the body's immune system.	0,695	0,246
P10	Consuming fenugreek seeds in moderate amounts, approximately 1–6 grams per day, is safe for breastfeeding mothers.	0,594	0,246
P11	Fenugreek seeds are commonly consumed in the form of an infusion/tea or herbal capsules.	0,572	0,246
P12	Fenugreek seeds are recommended as a traditional herbal remedy to promote breast milk production, similar to katuk leaves and fennel seeds.	0,618	0,246

Reliability Test

The consistency of the questionnaire is evaluated using reliability testing. If a questionnaire's Cronbach's Alpha value is higher than 0.6, it is deemed reliable.

Table 3. Reliability Test Results

Cronbach's Alpha	N of Items
0,773	12

The reliability test yielded a Cronbach's Alpha rating of 0.773. It may be stated that the questionnaire instrument employed in this study is reliable because this value is higher than the minimum reliability level of 0.60. This indicates that all the statement items employed demonstrate a good level of consistency and are reliable for use in research data collection.

Pre-test and Post-test Knowledge Level Results

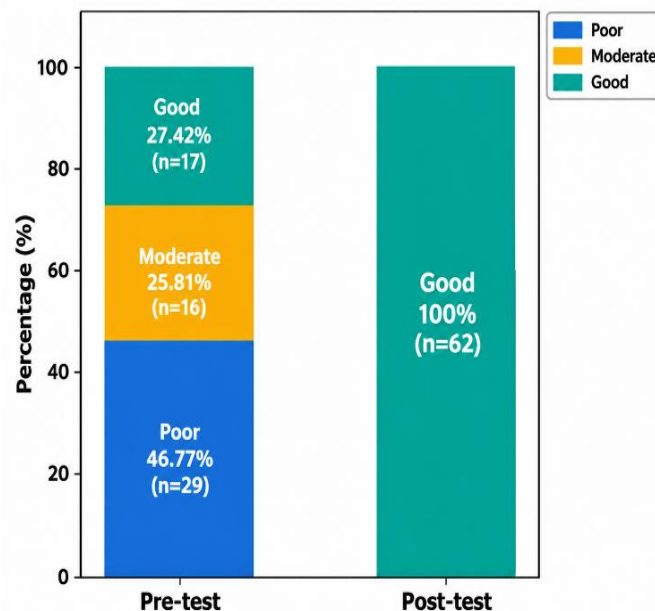
The knowledge scores of the respondents were assessed before and after the educational intervention. The descriptive statistics of the pretest and posttest knowledge scores are presented in table below.

Table 4. Descriptive Statistics of Pre-test and Post-test Knowledge Scores

Variable	N	Minimum	Maximum	Mean $\pm$ SD
Pre – test	62	2	12	7,19 $\pm$ 2,94
Post – test	62	9	12	11,73 $\pm$ 0,58

The mean knowledge score increased from 7.19 ± 2.94 at pre-test to 11.73 ± 0.58 at post-test, indicating an improvement in respondents' knowledge following the educational intervention. Based on the graph below, the results of the community's knowledge level before education showed that the majority of respondents had poor knowledge, with 29 people (46.77%), followed by good knowledge with 17 people (27.42%), and sufficient knowledge with 16 people (25.81%). The

pretest knowledge level results indicate that the community's understanding of the use of fenugreek seeds is still in the poor category (46.77%). This shows that fenugreek seeds are still not widely recognized by the community in the research area as a galactagogue supplement.



Graphic 1. Distribution of Knowledge Levels (Pre – test vs Post – test)

Based on the results of the community's knowledge level after being educated about the benefits of fenugreek seeds as a galactagogue supplement (post-test results), it shows that all 62 respondents experienced an increase in their results to the "Good" category (100%). This result indicates a very significant improvement compared to the condition before the education (pretest), where there were still respondents with "Sufficient" and "Poor" knowledge levels. This increase shows that the education provided was effective in enhancing the community's understanding comprehensively to reach the "Good" knowledge category, while also reflecting that the method used was appropriate and well-received by the respondents.

Wilcoxon Signed Rank Test Results

A non-parametric test called the Wilcoxon Signed Rank Test is used to compare two paired or related samples, such as pretest and post-test data, to

see if there is a significant difference between them [20].

Table 5. Wilcoxon Test Results

	Posttest-Pretest
Z	-6.858 ^b
Asymp. Sig (2-tailed)	0.000

The Wilcoxon Signed Ranks Test findings shown in the above table yielded a Z value of -6.858 with a significance value (Asymp. Sig. 2-tailed) of 0.000. There is a difference between the pretest and post-test data since this significance value is less than $\alpha = 0.05$ ($p < 0.001$).

Normalized Gain Test Results (N-Gain)

The N-Gain test in this study is used to determine the increase in public knowledge after being educated about the use of fenugreek seeds as a galactagogue supplement. To determine the degree of the rise, the N-Gain test compares pre-test and post-test scores and classifies the increase into three categories: low ($g < 0.30$), moderate ($0.30 \leq g \leq 0.7$), and high ($g > 0.70$) [21].

Table 6. Distribution of N-Gain Test Results

N- Gain Category	Value Range	n	%
Low	$g < 0.30$	0	0
Moderate	$0.30 \leq g \leq 0.7$	3	4,84
High	$g > 0.70$	59	95,16
Total		62	100

The N-Gain score was calculated using the following formula:

$$g = \frac{Sp_{posttest} - Sp_{pretest}}{S_{max} - Sp_{pretest}}$$

where g represents the N-Gain score, $Sp_{posttest}$ represents the posttest score, $Sp_{pretest}$ represents the pretest score, and S_{max} represents the maximum possible score. The mean N-Gain score was obtained by calculating the N-Gain score for each respondent and then averaging the individual N-Gain scores across all 62 respondents.

The normalized gain analysis revealed a mean N-Gain score of 0.96, which was classified as high. Of the 62 respondents, 59 (95.16%) achieved a high N-Gain, while 3 (4.84%) achieved a moderate N-Gain. Furthermore, all respondents (100%) achieved a good level of knowledge after the intervention, indicating a substantial improvement in knowledge regarding fenugreek as a potential galactagogue. These findings are consistent with Karo et al., who reported a significant improvement in mothers' knowledge regarding galactagogues following health education ($p = 0.001$). However, unlike Karo et al., who focused on postpartum mothers and galactagogues in general, the present study involved community members and specifically addressed fenugreek (*Trigonella foenum-graecum* L.), including its potential benefits, limitations, and safety considerations. Nevertheless, the findings should be interpreted cautiously because the one-group pretest–posttest design without a control group does not establish that the intervention alone caused the observed improvement.

Discussion

The findings of this study demonstrate a significant improvement in public knowledge regarding the use of fenugreek seeds (*Trigonella foenum-graecum* L.) as a galactagogue supplement following an educational intervention. Prior to the intervention, nearly half of the respondents (46.77%) possessed a low level of knowledge. This baseline data indicates that despite its long-standing traditional use in various regions, fenugreek remains relatively unfamiliar as a lactation enhancer among the community in Cibening Village.

The item-level results provided further detail on the improvement in knowledge. Before the intervention, the highest number of incorrect responses was found in P7 regarding diosgenin as one of the main compounds in fenugreek (41 respondents; 66.13%), followed by P10 regarding the moderate dosage of 1–6 g/day (41 respondents; 66.13%) and P8 regarding the estrogen-like properties of diosgenin (37 respondents; 59.68%). After the intervention, the number of correct responses increased to 59

respondents (95.16%) for P7, 58 respondents (93.55%) for P10, and 61 respondents (98.39%) for P8

The post-test results showed a dramatic shift, with 100% of respondents achieving the "Good" knowledge category, accompanied by an average N-Gain score of 0.96 (High category). This substantial increase highlights the efficacy of combining direct health talk with visual educational media (leaflets/brochures). The improvement was also supported by the N-Gain analysis, which showed a mean score of 0.96, classified as high. Most respondents (59; 95.16%) were in the high N-Gain category, while 3 respondents (4.84%) were in the moderate category. The Wilcoxon Signed Rank Test also showed a significant difference between pre-test and post-test scores ($p < 0.001$). These findings indicate a substantial improvement in respondents' knowledge after the educational intervention. However, because this study used a one-group pretest-posttest design without a control group, the improvement cannot be attributed solely to the intervention. Visually structured information helps bridge complex pharmacological concepts - such as active compounds (diosgenin, saponins, phytoestrogens) and their mechanism in stimulating prolactin—into accessible health knowledge for laypeople.

Beyond improving knowledge among breastfeeding mothers, the findings suggest that community-based education may also be relevant for family members and other community members who can provide support and share breastfeeding-related information. Providing balanced information about fenugreek, including its potential benefits, appropriate dosage, possible side effects, and safe use, may help community members develop a more informed understanding of herbal galactagogues. This is particularly relevant in community settings where health information may be shared among family members. Therefore, the educational intervention may have broader implications for supporting informed and safe breastfeeding-related decision-making within the community.

Interestingly, the demographic characteristics provide important context for interpreting the educational intervention. More than half of the respondents had completed senior high school or an equivalent level of education (53.2%), which aligns with previous findings stating that higher educational attainment positively correlates with health literacy and information processing. Furthermore, although galactagogues directly target breastfeeding mothers, the inclusion of older demographic groups (ages 36–65 years) is relevant in a community-based educational context. Grandmothers and senior family members may influence infant-feeding practices and maternal care decisions within families. Educating family members may therefore contribute to a supportive environment for breastfeeding and facilitate the dissemination of accurate breastfeeding-related information.

From a clinical and pharmacological perspective, community education regarding herbal supplements must strictly balance potential benefits against safety profiles. The public frequently perceives herbal medicines as entirely harmless. Therefore, this intervention emphasized rational usage, appropriate dosage forms (such as infusions or capsules), and adherence to the recommended daily dose of 1–6 grams as outlined in LactMed®. Furthermore, educating the community about potential mild side effects, such as gastrointestinal discomfort, empowers participants to make safe, evidence-based health decisions and seek professional consultation when necessary.

Limitations of the Study

Despite the positive outcomes, this study acknowledges certain methodological limitations. The one-group pretest-posttest design without an uneducated control group limits the ability to completely rule out external confounding factors. Additionally, this study evaluated short-term knowledge gain immediately after education, rather than long-term retention or actual behavioral change (practice of fenugreek consumption). Future studies are recommended to utilize a randomized control

group and evaluate the long-term impact on breastfeeding exclusivity and actual milk production parameters.

Conclusion

Educational intervention regarding fenugreek seeds (*Trigonella foenum-graecum* L.) as a galactagogue was associated with a significant increase in community knowledge. This finding highlights the positive impact of structured health education in promoting informed practices for lactation support.

Materials and Methods

This is a quantitative study conducted using a *one group pretest-posttest* design utilizing a structured questionnaire. Respondent knowledge was measured before and after the educational intervention within the same cohort, without a control group. This research was conducted in the village of Cibening Bekasi from January to April 2026. The population in this study is the community in Cibening village, Bekasi. This technique is used to select a portion of the population members who are deemed most suitable for the research objectives, so not the entire population is used as a sample [16]. The respondents were selected using purposive sampling, in which participants were selected based on predetermined inclusion and exclusion criteria that were considered relevant to the research objectives. The inclusion criteria were: (1) men and women aged 19–65 years and (2) willing to participate as respondents. The exclusion criteria were: (1) individuals under 19 years of age and (2) respondents who were not present during data collection. Based on these criteria, 62 community members who met the eligibility requirements were included in the study.

The research instrument used is a questionnaire to measure the level of public knowledge about fenugreek seeds (*Trigonella foenum-graecum* L.) as a breast-milk supplement. The educational intervention was delivered in a single session lasting approximately 15 minutes using the

extension method with the aid of educational tools such as leaflets or brochures. The questionnaire consists of 12 statements that have undergone a validity test and are deemed valid. Knowledge measurement uses the Guttman scale with "YES" and "NO" answer options.

Data Analysis

Data were processed using Microsoft Excel and analyzed using IBM SPSS Statistics version 25. Descriptive statistics were used to summarize respondents' characteristics and knowledge scores. Normality was assessed using the Kolmogorov–Smirnov test. As the data were not normally distributed, the Wilcoxon Signed-Rank Test was used to compare pretest and posttest scores at a significance level of 0.05. N-Gain was also calculated to assess knowledge improvement and classified as low ($g < 0.30$), moderate ($0.30 \leq g \leq 0.70$), or high ($g > 0.70$). This research has obtained ethical approval from the Health Research Ethics Committee of Hermina Health Institute with the permit number E.029/KEPK/EC/IKH/II/2026.

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