

Research Article

Traditional Foods and Herbal Preparations to Improve the Perceived Insufficiency of Breast Milk Among Lactating Women in the Dire Dawa Administration, Ethiopia: Mixed Study

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Abstract

Background: Perceptions of insufficient breast milk quantity and the use of some traditional food items and local herbs to increase it are a common phenomenon worldwide, particularly in low-resource countries like Ethiopia. But the food items and herbs used are variable and inconsistent in different areas. So far, studies are scarce nationally and in the study area. **Purpose:** This study was aimed at assessing the use of traditional food items and local herbs for the perceived benefit of breast milk increment and its associated factors among lactating women. **Methodology:** A community-based mixed study was conducted from October 01- 30, 2023 in the Dire Dawa administration, eastern Ethiopia. A systematic random sampling technique was used to select 722 participants for the quantitative study and purposive sampling for the qualitative study. Data were collected through face-to-face interviews using a pre-tested structured questionnaire and semi-structured questions for focus group discussion. Quantitative data were entered and cleaned by Epi DATA (Version 3.1) and analyzed using SPSS (Version 22). A P-value < 0.25 at bivariate to select variables for multivariate and ≤ 0.05 at multivariate with 95% confidence intervals was considered statistically significant. Qualitative data were analyzed using thematic analysis using open-source software. **Results:** 722 women for quantitative and nine focus group discussants for qualitative were included and the overall traditional food and local herbs use to increase perceived insufficient breast milk was 32.8% (95% CI: 29.4%–36.6%). A higher age group (AOR=2.31, 95%CI: 1.37-3.90), rural residence (AOR=1.98, 95%CI: 1.21-3.23), no formal education (AOR=2.25, 95%CI: 1.16-4.36), primary level education (AOR=2.02, 95%CI: 1.18-3.46), presence of medical illness (AOR=4.73, 95%CI: 1.96-11.43), prior use experience (AOR = 2.81, 95% CI: 1.78-4.46) and a lack of postnatal counseling (AOR = 1.80, 95% CI: 1.20-2.70) were associated with a higher likelihood of traditional food and local herbs use. Traditional food items and local herbs were the main identified themes in the qualitative results. **Conclusion:** The extent of traditional food and local herbs use to increase perceived insufficient breast milk was a common practice and associated with women's age, education, resident area, presence of medical illness, prior use experience, and a lack of postnatal counseling. Stakeholders were recommended to increase postnatal counseling and awareness while taking women's residence and education level into account, as well as conduct additional community-based research.

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Keywords

Traditional Food, Herbs, Breast Milk

1. Introduction

Lactation is a critical period where mothers' breast milk provides various immunological factors, bioactive components, and macro- and micronutrients required for infant growth and development [1-5].

Nutrients are required to maintain the mother's health, infant growth and health, and postpartum recovery [6, 7]. However, if the safety is not supported by evidence, it may cause harm to the mother and infant [8-10]. But the use of traditional knowledge can pave the way toward finding effective medicines for increasing breast milk [4, 11-13].

Galactagogues are foods, herbs, or medications thought to support or increase breast milk supply [14-16, 20, 31]. The use of galactagogues during lactation is becoming increasingly common despite limited evidence regarding indication, safety, effectiveness, the exact mechanisms being yet unknown, and no definitive recommendations for use [9, 11, 17-19].

The use of galactagogues by lactating women is influenced by problematic experiences with health care professionals due to the provision of either inconsistent or insufficient information in counseling about benefits and harms [22-24]. Others also have an impact, such as the internet as a major source, friends and family relating cultures or norms [18, 19, 22]. The perceived insufficiency of breast milk or the inability to give breastmilk to her child can lead to different approaches to enhance breastmilk, including medication, herbal preparations, and some food substances [19, 25-28]. This is among the key factors that increase the rate of suboptimal breastfeeding among lactating mother [21, 26, 27]. Besides, it is a common practice that has implications for the health of women and their offspring [9, 28-30].

Traditional foods and herbs selected to enhance breastmilk vary in different place [10, 19, 32, 33]. Some use fenugreek and peanut [19, 27]. Others also use *Foeniculum vulgare*, *Anethum graveolens*, *Pimpinella anisum*, *Nigella sativa*, and *Vitex agnus-castus* [11]. Banana flower, lemon basil, Thai basil, bottle gourd, pumpkin, egg tofu, chicken, fish, and seafood are also included [8]. Still, fresh vegetables and fresh legumes, red meat, cereals, and eggs, as well as fungi and algae, dried legumes, and soy milk are also revealed [9]. Furthermore, in Ethiopia, "Shameta," a traditional homemade fermented porridge, and "Genfo," a traditional porridge made of barely, are served to breast-feeding mothers with the belief that they enhance breast milk production [33-35]. However, the perceptions of insufficient breast milk and the use of some food items and local herbs to increase it are a common phe-

nomenon in low-resource countries like Ethiopia, so far, studies are scarce nationally and in the study area. Therefore, this study was aimed at assessing the use of food items and local herbs for the perceived benefit of breast milk increment and associated factors among lactating women.

2. Methods and Materials

2.1. Study Setting and Design

A facility-based mixed (quantitative cross-sectional and phenomenological qualitative) study was conducted in Dire Dawa administration, eastern Ethiopia, from October 01 to 30, 2023.

Dire Dawa administration is located about 515 kilometers east of Addis Ababa, the capital city of Ethiopia. According to 2020 population projections, 506,000 people live in the Dire Dawa City Administration, 68% of whom are estimated to be urban inhabitants) and there are 38 rural and 9 urban kebeles (the smallest administrative units). Dire Dawa city has six hospitals (2 public and 4 private), and 17 health centers. Additionally, there are a total of 58 different level clinics, 35 pharmacies, 35 drug shops, and 2 non-governmental clinics (Family Guidance and Mari Stops International Clinics) [36].

2.2. Sample Size and Sampling Procedure

The sample size was determined using a single population proportion formula considering the following assumptions: standard normal distribution ($z = 1.96$), 95% level of significance, 4% margin of error, prevalence = 25.2% (27), 10% non-response rate, and 1.5 design effect. The final sample size became 746. But 722 women who had a child (0-23 months) were selected using systematic random sampling technique for the quantitative study, and nine participants for FGD was determined by data saturation (6 from urban and 3 from rural) were purposefully selected for the qualitative study. However, those who were critically ill and unable to respond were excluded [Figure 1].

The multi-stage sampling method was used to select study participants from urban and rural site.

At first, from the six urban operational woreda, three (Gendekore, Sabiyan and Legehare) were selected (by lottery method). Then from the 3, Legehare has 3 kebeles, Gendekore has 2 kebeles and Sabiyan has 1 kebele. From LH and GK

which have more than one kebele, 2 kebeles from each were selected (randomly) and including 1 from Sabiyan, being a total of 5 kebeles from urban site.

Likewise, from three rural operational Woredas (Biyoawale, Jeldessa and Wahir) all were included. After all, households which have mothers having a child 0-23 months were selected. Based on the information obtained from health extension workers (HEWs), the total number of those mothers was 1329

(551 in rural and 778 in urban) and used to determine the interval. So, the K^{th} interval was two (for rural=551/310 \approx 1.8, urban=778/436 \approx 1.78 \approx 2). Sample size was proportionately allocated [Figure 1] and were interviewed every 2 interval by systematic random sampling technique using household with infants (0-23 months) as sampling frame. For more than one eligible in the same compound, a lottery method was used to choose one eligible [Figure 1].

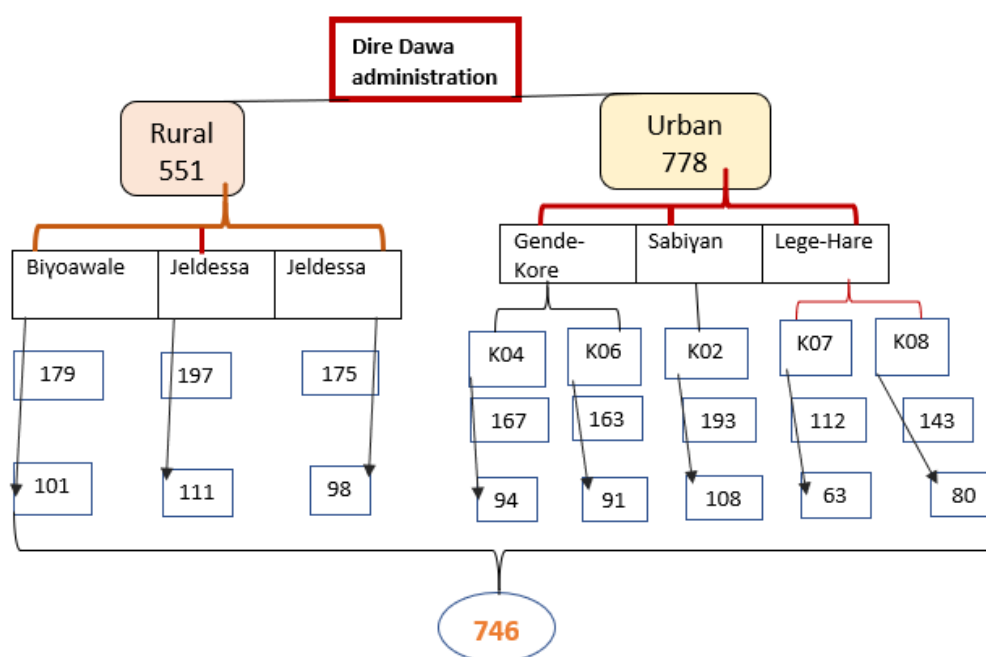


Figure 1. Diagrammatic presentation of sampling procedure in selection of study participants in Dire Dawa administration, Ethiopia, 2023.

2.3. Data Collection Methods

Quantitative Part: The data was collected via face-to-face interview using a pre-tested, interviewer guided, structured questionnaire that was adapted from literature designed for the same study purpose, and then variables were reviewed to suit the local context [8, 27, 37]. A total of six Health extension workers were recruited for data collection, and two MSc midwives supervised the whole process.

Qualitative Part: Qualitative data was collected by 3 BSc midwives who have experience with qualitative data collection through in-depth interviews (IDI) and focus group discussion (FGD) using semi-structured questions. The principal investigator was moderating the in-depth interview (IDI) and assisted by an experienced note-taker. After the note taker and the interviewer introduce themselves, the purpose of the study and the confidentiality of the data are told to the participants, and then the probing questions are forwarded to the participants. All interviews were tape recorded and transcribed in full text.

Operational Definitions:

Traditional food: a special food prepared for the purpose of

enhancing the perceived insufficiency of breast milk by lactating women [8, 27, 37].

Local herb: a locally available herb taken for the purpose of enhancing the perceived insufficiency of breast milk by lactating women [8, 27, 37].

Outcome variable: those lactating women who took traditional foods and local herbs for the purpose of enhancing the perceived insufficiency of their breasts; an outcome variable was categorized as "takers" (coded as 1) and "non-takers" (coded as "0") [8, 27, 37].

2.4. Data Quality Control

For the quantitative part, the questionnaire was developed in English and translated into the local languages (Afan Oromo, Somali, and Amharic) and then back to English to maintain its consistency. Two days of training were provided to all data collectors and supervisors. We performed a pretest on 5% of the sample size out of the selected study sites in the community 2 weeks before the actual data collection. Based on the findings of the pretest, we made minor modifications to the questionnaire. The data collection process was closely supervised, and the completeness of each questionnaire was

checked by the investigators and supervisors daily. Data was entered into the EPI DATA software as part of data management. During data cleaning, a logical checking technique was used to identify the errors. Questionnaires are secured in a safe place for confidentiality and as a backup for later, in case a check is necessary. Finally, double data entry was done by two data clerks, and the consistency of the entered data was cross-checked.

For the qualitative part, a pre-test in one key note and in-depth interviews at the Dire Dawa city administration (non-selected sites) were conducted for consistency and possible modification. The qualitative design is prone to bias, but open-ended questions were used to avoid acquiescence bias, and two days of training were given for the data collectors regarding in-depth interviews, taking keynotes, and using a tape recorder. The recorded data were listened to repeatedly to understand the responses of each participant and transcribed directly after each interview by experts. Each sample response and each transcription were coded to check the consistency of the data. The in-depth interviews were conducted privately. The following strategies were used to increase the credibility, transferability, dependability, conformability, and trustworthiness of the study: (a) triangulation; (b) peer debriefing, and (c) inquiry auditing.

Findings were triangulated through the use of multiple coders. The coders then held meetings to compare the outcomes; where inconsistencies were noted, they were discussed and resolved through consensus. In this study, the debriefer was another faculty member who is an expert in qualitative approaches. To increase the dependability of the findings, an inquiry audit was done. Auditors (the first author and two co-authors) examined the research process and findings to assure their accuracy, including how records are kept during each step of data collection and analysis. For this study, these records included: (a) the raw data of the interviews; (b) field notes; (c) data reduction and analysis trails; (d) reflexive memos; (e) notes describing the trustworthiness process; and (f) notes describing the theoretical frameworks.

2.5. Data Processing and Analysis

Quantitative Part: The data were coded and entered into Epi Data (Version 3.1) and exported to SPSS (Version 22) statistical software for analysis. A univariate analysis was used to describe the frequency distribution variables. We coded the outcome variables as "1" for "takers" and "0" for "non-takers." The association between the outcome and independent variables was analyzed using a logistic regression model. Covariates with a p-value less than 0.25 were retained and entered into the multivariable logistic regression analysis using a forward step-wise approach. A multicollinearity test was performed to determine the linear correlation among the independent variables using the variance inflation factor (>10). The goodness-of-fit test was performed using the Hosmer–Lemeshow test ($p > 0.05$). For an outcome variable, an adjusted odds ratio (AOR) with a 95% confidence interval (CI) and a p-value of less than 0.05 was considered statistically significant.

Qualitative Part: The data was analyzed thematically using computer-assisted qualitative data analysis software ATLAS-ti (Version 7). The transcribed data was entered into the software, and similar ideas were organized together to create codes. Then two major themes were derived from the codes in the transcribed data and translated into an English version by language experts. Their inductive meaning was extracted using the verbatim accounts of participants. The final report was developed using the narrative analysis method.

3. Results

Socio-demographic characteristics: A total of 722 study participants were included, yielding a response rate of 96.8%. The respondents' ages ranged from 18 to 42 years (mean = 27.1 years, SD = ± 6.5 years). Less than half (42.7%) of the study participants were rural residents and quarter (25.1%) were housewives and had post-secondary education level (24.1%) [Table 1].

Table 1. Socio-demographic characteristics of study participants and their infants, Dire Dawa Administration, eastern Ethiopia, 2023 ($n = 722$).

Variables	Category	Frequencies	Percentage
Age (in completed years)	35 and above	240	33.2
	25-34	258	35.7
	24 and less	224	31.0
Residence	Rural	308	42.7
	Urban	414	57.3
Level of education (women)	No formal education	145	20.1
	Primary level	264	36.6

Variables	Category	Frequencies	Percentage
Marital status	Secondary level	139	19.3
	Post-secondary level	174	24.1
	Married	665	92.1
	Single	36	5
	Divorced	13	1.8
	Widow	8	1.1
Level of education (husbands, n=665)	No formal education	95	14.3
	Primary level	157	23.6
	Secondary level	174	26.2
Occupation	Post-secondary level	239	35.9
	House wife	181	25.1
	Merchant	256	35.5
	Private employee	79	10.9
	Public employee	97	13.4
	Daily laborer	109	15.1
Monthly income	<100USD	206	28.5
	100-150USD	442	61.2
	>150 USD	74	10.2
Religion	Muslim	315	43.6
	Orthodox	136	18.8
	Protestant	230	31.9
	Catholic	41	5.7
Age of infants	< 6 months	254	35.2
	6-12 months	468	64.8
Sex of infants	Male	306	42.4
	Female	416	57.6

Obstetric characteristics: Half (50.4%) of study participants were multiparous, and majority (90.3%) had antenatal care visits and were gave birth at a health facility (86%) [Table 2].

Table 2. Obstetric characteristics of study participants, Dire Dawa Administration, eastern Ethiopia, 2023 (n = 722).

Variables	Category	Frequencies	Percentage
Parity	Grand multiparous	251	34.8
	Multiparous	364	50.4
	Primiparous	107	14.8
ANC	Yes	652	90.3
ANC counseled (n=652)	Not counseled	481	73.8

Variables	Category	Frequencies	Percentage
Place of delivery (last baby)	Counseled	171	26.2
	Home	101	14.0
	Health facility	621	86.0
PNC counseled (n=621)	Not counseled	332	53.5
	Counseled	289	46.5
Sing/twins delivery	twins	39	5.4
	single	683	94.6

3.1. Use of Traditional Food and Herbs to Enhance Breast Milk

Out of the total of 722 respondents, two hundred thirty seven, 32.8% (95% CI: 29.4%–36.6%) used traditional food

and local herbs to increase perceived insufficient breast milk for their child. More than half (67.2% and 51.5%) of them perceive having insufficient and source from families and relatives respectively. They use this in three forms as using herbs only, traditional food only and food mixing with herbs, this being the most [Table 3].

Table 3. Use of traditional food and herb to enhance perceived insufficient breast milk, Dire Dawa Administration, eastern Ethiopia (n=722), 2023.

Variables	Category	Frequencies	percentage
Do you feel your breastmilk is adequate for your child?	1. Yes	485	67.2
	2. No	237	32.8
If no, what do you do to enhance your breast milk?(n=237)	1. herbs use only	13	5.5
	2. Traditional food use only	26	11
	3. food with herbs	198	83.5
Frequency of traditional foods and herbs taken in a day	1. Only once	51	21.5
	2. twice	109	46
	3. 3 times	56	23.6
	4. >3 times	21	8.9
How was special food/herb used?	Added to food	198	83.5
	Prepared separately	39	16.5
	1. Family and relatives	122	51.5
Source of information (n=237)	2. Friends	93	39.2
	3. Internet	22	9.3
Prior experience	Yes	245	33.9
	No	477	66.1
Perceived efficacy of lactagogue use	“good”	371	51.4
	“poor”	351	48.6
Awareness of harm in lactagogue use	Lack	310	42.9
	Not	412	57.1

Variables	Category	Frequencies	percentage
Is there breast problems?	Yes	101	14.0
	No	621	86.0
Presence of co-medical illness	Yes	130	18.0
	No	592	82.0
	Intestinal parasites	32	24.6
	DM	9	6.9
Types of co-medical illness (n=130)	Bacterial infection	28	21.5
	chronic hypertension	11	8.5
	Gastritis	29	22.31

3.2. Types of the Common Traditional Foods

- The common traditional foods were from this study were
 - “green lentil dish” a traditional food which is mad of green lentils, olive oil, tomatoes, green chills, red onion, salt, pepper, mustard, lemon and its juice. It is popular during lent when meat is prohibited.
 - “Genfo” is a traditional porridge which is mainly made with barley or wheat flour and mound with a hole in the center, filled with a mixture of “niter kibbeh”, prepared butter and pepper. Thought to have a benefit of post-partum physical, physiological recovery of the women and to enhance breast milk production and amount.
 - “Bulla” is another traditional porridge which is a processed starch made from “Enset” (*Enset ventricosum*), commonly known as the “false banana.” However, it is the root of enset that is consumed, after cooked and mixed with “niter kibbeh”, prepared butter or honey.
 - “Borde” with “Bekolt” or “Nifro”: “Borde” is another traditionally produced through traditional fermentation taken along with traditionally prepared local foods “Nifro”. “Nifro” is ether the cooked bean or cooked maize” while “Bekolt” is similar to “Nifro” except that which is stayed inside water more time until the bean or maize brings up a growing root.
 - “Hulbat Merek”: It refers to a broth with meat along with berbere (optional), fenugreek, tomato, onions, potato and other spices. But the meat and fenugreek, being the main ingredient can be smelt more than the other spices.
 - “Abish wet”: It is slightly sour and habitually made with meat (optional), potatoes, fenugreek (*Trigonella foenum-graecum*), lentils and “shiro”, powder of pea.
 - “Hanid “is made out of goat meat that has been cooked very slowly in an oven made from the soil around termite mounds. The unctuous meat is then dipped into tamarind sauce and a little berbere.
 - “Ful plus yogurt”: Cooked beans are blended into a smooth paste and the tomatoes, peppers, onions, and chili are served separately. Then homemade yogurt is added and usually eaten with bread or sometimes injera
 - “Camel hump”: a traditional food made of raw camel meat+ herbs (either Rue or flax seed and spices, peppers, and salt.
 - “Yebeg Alcha wet”: a traditional food made of sheep’s lean meat, mustard, spices, and salt.

3.3. Types of the Common Local Herbs

Papaya (*Carica papaya*), flax seed (*Linum Usitatissimum*), mustard (*Brassica nigra*), garlic (*Allium sativum*), green lentil (*Lens culinaris*) were the most commonly used herbs to enhance the perceived insufficient breast milk [Table 4].

Table 4. Commonly used herbs to enhance the perceived insufficient breast milk by study participants, Dire Dawa Administration, eastern Ethiopia (n=237), 2023.

Local name/English name	Scientific name	Frequency	Reason of use with frequency	Part use	Other additive used with
“Papaye”/papaya	<i>Carica papaya</i>	41	to enhance the perceived insufficient breast milk	Leaves	Honey, water & sugar
“Talbaa”/flax seed	<i>Linum Usitatissimum</i>	37	to enhance the perceived insuffi-	seeds	Yogurt or honey

Local name/English name	Scientific name	Frequency	Reason of use with frequency	Part use	Other additive used with
			cient breast milk, increase appetite and decrease constipation		
“Sinafch”/mustard	<i>Brassica nigra</i>	35	to enhance the perceived insufficient breast milk and appetite	leaf	banana/Musca paradisiac
“Nech shinkurt”/garlic	<i>Allium sativum</i>	33	to enhance the perceived insufficient breast milk	bulb	honey or sugar ginger
“Misir”/green lentil	<i>Lens culinaris</i>	29	to enhance the perceived insufficient breast milk	seeds	Yogurt
“Shifera”/moringa	<i>Moringa oleifera</i>	22	to enhance the perceived insufficient breast milk and constipation	Leaf	Yogurt or honey
“Tenaadam”/Rue	<i>Ruta chalepensis</i>	17	to enhance the perceived insufficient breast milk and constipation	leaves	zinger garlic
“Zingibil”/Ginger	<i>zingiberofficinale</i>	12	to enhance the perceived insufficient breast milk	root	with honey
“Abish”/fenugreek	<i>Trigonella foe-num-graecum</i>	11	to enhance the perceived insufficient breast milk	Seeds	Yogurt or moringa

Regarding the influential reasons for the use of traditional foods and herbs, the majority (41.35%) stated tradition or norm, followed by parents and relatives (12.6%) [Figure 2].

Influential reasons for traditional food and local herbs use to enhance perceived insufficient breast milk

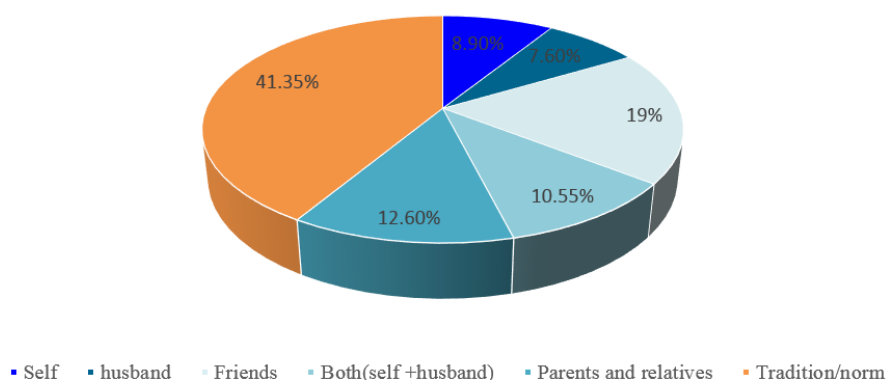


Figure 2. Influential reasons for the use of traditional foods and herbs to increase perceived insufficient breast milk, Dire Dawa Administration, eastern Ethiopia (n=237), 2023.

3.4. Factors Associated with the Use of Traditional Foods and Local Herbs to Enhance Breast Milk

In the multivariable logistic regression analysis, the use of traditional foods and herbs to increase breast milk was associated with women's age group of 35 or older (AOR=2.31,

95%CI: 1.37-3.90), rural residence (AOR=1.98, 95%CI: 1.21-3.23), no formal education (AOR=2.25, 95%CI: 1.16-4.36), primary level education (AOR=2.02, 95%CI: 1.18-3.46), presence of medical illness (AOR=4.73, 95%CI: 1.96-11.43), prior use experience (AOR = 2.81, 95% CI: 1.78-4.46) and a lack of postnatal counseling (AOR = 1.80, 95% CI: 1.20-2.70)[Table 5]

Table 5. Bivariate and multivariable analysis of factors associated with the use of traditional foods and herbs to increase breast milk, Dire Dawa Administration, Ethiopia (n=722), 2023.

Variables	Category	Food and herb use		COR (95% CI)	AOR (95% CI)	P-value
		Yes	No			
Age (in completed years)	35 and above	50(20.8%)	190(79.2%)	3.12(2.10-4.70)***	2.31(1.37-3.90)	.002
	25-34	86(33.3%)	172(66.7%)	1.64(1.13-2.40)**	1.39(0.83-2.31)	.207
	24 and less	101(45.1%)	123(54.9%)	1	1	
Residence	Urban	174(42.0%)	240(58.0%)	1	1	
	Rural	63(20.5%)	245(79.5%)	2.80(2.01-3.96)***	1.98(1.21-3.23)	.006
Education level	No formal education	36(24.8%)	109(75.2%)	1.63(1.03-2.70)*	2.25(1.16-4.36)	.016
	Primary (1-8 th grade)	83(31.4%)	181(68.6%)	1.20(0.78-1.77)	2.02(1.18-3.46)	.010
	Secondary	57(41.0%)	82(59.0%)	0.78(0.49-1.23)	1.02(0.58-1.78)	.955
	Post-secondary	61(35.1%)	113(64.9%)	1	1	
Occupation	housewife	41(22.7%)	140(77.3%)	3.11(1.90-5.20)***	1.67(0.77-3.64)	.194
	Merchant	72(28.1%)	184(71.9%)	2.33(1.50-3.71)***	1.46(0.70-3.06)	.309
	Private employee	38(48.1%)	41(51.9%)	0.98(0.55-1.76)	1.84(0.74-4.60)	.192
	Public employee	34(35.1%)	63(64.9%)	1.70(0.96-2.96)*	1.40(0.62-3.16)	.414
Education level (husbands', n=665)	Daily laborer	52(47.7%)	57(52.3%)	1	1	
	No formal education	33(34.7%)	62(65.3%)	1.42(0.87-2.33)	.54(0.17-1.64)	.274
	Primary (1-8 th grade)	41(26.1%)	116(73.9%)	2.14(1.40-3.32)**	.61(0.25-1.50)	.281
	Secondary	48(27.6%)	126(72.4%)	1.99(1.31-3.02)**	.45(0.19-1.05)	.067
Husbands' occupation	Post-secondary	103(43.1%)	136(56.9%)	1	1	
	Daily laborer	36(36.0%)	64(64.0%)	1.50(0.93-2.42)	1.64(0.55-4.84)	.373
	Merchant	43(25.9%)	123(74.1%)	2.41(1.60-3.70)***	2.11(0.91-4.88)	.082
	Farmer	33(21.7%)	119(78.3%)	3.04(1.92-4.82)***	4.73(1.96-11.43)	.001
Prior use experience	Civil servant	113(45.7%)	134(54.3%)	1	1	
	No	202(42.3%)	275(57.7%)	1	1	
Medical illness	Yes	35(14.3%)	210(85.7%)	4.41(2.95-6.58)***	2.81(1.78-4.46)	.000
	No	207(35.0%)	385(65.0%)	1	1	
Awareness of harm	Yes	30(23.1%)	100(76.9%)	1.79(1.15-2.80)*	1.67(0.84-3.31)	.145
	“good”	158(38.3%)	254(61.7%)	1	1	
Perceived efficacy	“Lack”	79(25.5%)	231(74.5%)	1.82(1.32-2.51)***	1.24(0.82-1.89)	.308
	“low”	152(43.3%)	199(56.7%)	1	1	
Place of delivery	“High”	85(22.9%)	286(77.1%)	2.60(1.86-3.54)***	1.49(0.93-2.39)	.093
	Health facility	220(35.4%)	401(64.6%)	1	1	
PNC counseled	Home	17(16.8%)	84(83.2%)	2.71(1.60-4.70)***	1.19(0.61-2.34)	.610
	Yes	108(37.4%)	181(62.6%)	1	1	
	No	81(24.4%)	251(75.6%)	1.85(1.31-2.61)***	1.80(1.20-2.70)	.004

Significant at: *p<0.05, **p<0.01, ***p=0.000, 1=reference, Hosmer-Lemeshow test=0.541

Qualitative Results: A total of nine focus group discussants were involved. Their average age was 35.6 years; 66.7% were urban residents, 77.8% were married, 22.2% were widowed, 33.3 were merchants, and 66.7% were housewives. 77.8% and 22.2% had primary and secondary education levels, respectively, and 44.4% were Muslims, 44.4% were Orthodox, and 11.1% were protestant religion followers. 55.6% were grandpara, 44.4% were multiparous, and all (100%) had ANC visits, institutional delivery, and traditional food and herb usage experiences for enhancing breast milk.

Traditional food and herb use related: Many women, especially multiparous mothers, choose traditional foods and herbs to enhance their breast milk for the reason that "they perceive inadequacy for the child and some norms enforce them to do so."

A 40-year-old female discussant shared her experience as follows: *"During my last pregnancy, I was forced to take a traditional food called "Bulla," a traditional porridge that is made from "Enset" (Enset ventricosum), cooked and mixed with "niter kibbeh," prepared butter or honey. Personally, I had no interest in it, but my parents advised me to do it for the purpose of increasing my breast milk for my child and to be strong enough. Similarly, focus group discussants stated that "women in our living area are using traditional foods like "Borde" with "Bekolt" or "Nifro," "Hulbat Merek," "Abish Wet," and "Camel Hump" to enhance breast milk commonly. "This is known as traditional support for her body and milk amount enhancement," as they stated it.*

Furthermore, focus group discussants also stated that *"Full Plus Yogurt," "Yebeg Alcha Wet," "Abish Wet," "Green Lentil Dish," "Genfo," and "Hanid" are used to enhance breast milk by women when they feel that their supply is insufficient or if they are told that it is insufficient by others, like family or friends," as they reported.*

Regarding the common local herbs used to enhance the perceived insufficiency of breast milk, focus group discussants reported *"Talbaa" (flax seed; Linum usitatissimum); "Papaye" (carica papaya); "Nech shinkurt" (garlic; Allium sativum); and "Sinafch" (mustard; Brassica nigra) are used by most women.*

Other types mentioned by focus group discussants included *"Zingibil" (ginger, Zingiber officinale), "Tenaadam" (Ruta chalepensis), and "Shifera" (Moringa oleifera).*

Moreover, focus group discussants added *"Misir" (green lentil, Lens culinaris) and "Abish" (fenugreek, Trigonella foenum-graecum) as major local herbs used by most women in their area to enhance insufficient breast milk.*

4. Discussion

This study explored the prevalence and factors associated with the use of traditional foods and herbs to improve the perceived insufficiency of breast milk among lactating women in the Dire Dawa administration, Ethiopia, in 2023.

The prevalence of traditional foods and local herbs used to increase lactating women's perception of insufficient breast milk was 32.8% (95% CI: 29.4%-36.6%). Accordingly, the result reveals that one-third of the study participants are using traditional foods and herbs to improve the perceived insufficiency of breast milk in the study area. This finding was almost congruent with a study conducted in Sierra Leone (37% herb use), but lower than food use (93.9%) [11]. This finding was also lower than a study conducted in the West Bank, Palestine (67.5%) and Ghana (67.7%) [27, 38]. This inconsistency might be due to differences in some socio-demographic characteristics like age, educational level, and residence area. The variation also might be due to variations in study times, sample size, and counseling interventions either during ANC visits or postnatal visits.

According to the findings of this study, older women (35 and up), women with no formal or primary level education, women with prior use experience, and rural residents were more likely to use traditional foods and herbs to improve perceived insufficient breast milk.

The possible reason might be related to the fact that older women might relate their prior experiences with the present, and those women who live in rural areas and lack education might lack some sort of information or might lack a concern for harm compared to urban ones. This could also be due to uneducated women's lack of awareness about the risks of unproven traditional foods and herb use. Such a gap may be filled through adequate counseling during ANC and PNC visits about potential benefits and harms [8, 10, 22].

From this study, more than half had awareness of the harm of lactagogue use, one-third used it due to traditional customary influence, and most of them obtained information from their families. This is consistent with other studies [18, 21, 22, 27]. This consistency could be attributed to the fact that most cultures pass down knowledge of breastmilk production from generation to generation, as well as the influence of societal culture on women's and children's health decision-making.

This study showed that the perceived insufficiency of breast milk can lead women to use different approaches to enhance breast milk, like herbal preparations. This is consistent with studies conducted in two different Likewise, this study revealed that the perceived insufficiency of breast milk can lead women to use some food substances to enhance breast milk. This was consistent with a finding from a variety of studies [19, 25-28]. This consistency could be attributed to the fact that individual perceptions influence actions even when harm has not been proven or the risk-benefit ratio has not been outweighed.

Moreover, the current study showed that a higher likelihood of traditional food and local herb use was associated with the presence of medical illness and a lack of postnatal counseling. The possible reason might be that the presence of some medical illnesses might lead lactating women to perceive

"insufficient breast milk." This was congruent with other studies, which state galactagogues are used by lactating women influenced by problematic experiences or health care professionals due to the provision of either inconsistent or insufficient information in counseling [22-24, 37, 39].

The current study showed that almost one-third of respondents use local herbs for the purpose of enhancing breast milk. This is consistent with other studies [12, 37, 38]. According to studies, ginger is one of the most commonly used herbs, and fenugreek and moringa are also popular [37, 39]. Furthermore, the current study found that some traditional foods with lean meat are used to improve the perceived insufficiency of breast milk. This is consistent with studies, as are traditional foods like porridge made of maize flour "Genfo," porridge made of barely flour, and "Shameta" or "Borde" [9, 27, 33-35].

Generally, lactation is a critical period in terms of nutritional needs to maintain postpartum recovery, the mothers' health, the infants' health, and their growth [6, 7, 33, 37]. Thus, this suggests that maternal use of traditional foods or herbs is a community practice that has raised disputes for the health of women and their offspring; this is congruent with other studies [28, 30]. The use of traditional knowledge and practice can pave the way toward finding effective medicines for increasing breast milk. This is consistent with other studies too [11, 27, 37, 39].

4.1. Study Strengths

The study's strength was that it concentrated on traditional interventions for lactating women, which can affect both the women and their breastfeeding child, which is an important topic in obstetrics. Besides, the study used experienced data collectors who were local language speakers and knew the local norms. Moreover, the study included many study areas (both urban and rural), which increases the external validity of the study, and the quantitative study was supported by a qualitative (focus group discussion).

4.2. Study Limitation

The study had some limitations; due to the cross-sectional nature of the study, it did not show causal relationships between variables. Because we used the interview response method, we were limited by recall bias and some social desirability biases. However, scientific procedures were used to minimize the possible effects of these limitations, such as a contextually modified and pre-tested questionnaire, using easy and simple words to understand, giving time to memorize, and explaining the aims of the study. Besides, we had provided intensive training for data collectors and supervisors before the actual data collection on how to approach and interview the participants privately to minimize social desirability bias. Therefore, using appropriate and scientific procedures at the time of interviewing participants addressed

these limitations.

5. Conclusion

The extent of traditional food and local herbs use to increase perceived insufficient breast milk was a common practice and associated with women's age, education, resident area, presence of medical illness, prior use experience, and a lack of postnatal counseling. Hospitals and health centers were recommended to increase postnatal counseling and awareness while taking women's residence and education level into account, as well as conduct additional community-based research.

Abbreviations

PNC	Postnatal Care
ANC	Antenatal Care
CI	Confidence Interval
COR	Crude Odds Ratio
AOR	Adjusted Odds
SPSS	Statistical Package for Social Science

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Author Contributions

Aminu Mohammed Yasin: participated in conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Software, Resources, Supervision, Validation, Visualization, writing original draft, Writing review and editing.

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All authors agree to take responsibility and be accountable for the contents of the article, agree on the journal to which the article will be submitted, and read and approve the final manuscript.

Ethical Approval and Consent to Participate

Ethical approval was obtained from the Ethical Committee of the Dire Dawa Administration Health Bureau (DDAHB) (File-DDAHB-1910/July/2023). Written informed consent was obtained from study participants. All protocols were carried out in accordance with relevant guidelines and regulations from Helsinki.

Declaration

We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us.

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Availability of Data and Materials

The datasets used and analyzed during the current study are not available publicly due to privacy reasons, but are available from the corresponding author on reasonable request.

Data Availability Statement

The datasets collected and analyzed for this study are available from the corresponding author and can be obtained upon reasonable request.

Conflicts of Interest

The authors declare no conflicts of interest.

Appendix

Appendix I: Preamble

Thank you very much for meeting with me today and agreeing to participate in this interview. I want to remind you that what you say here is confidential and will not be linked back to you or your family or identify you in any way. I recorded this interview so that I could transcribe it. This means that I will type out the words said in this interview into a secure document for analysis. There were no identifiers of the transcripts. De-identified transcripts will be accessed by other members of the research team to perform the analysis. The

purpose of this interview/discussion is to explore your current or prior experiences relating to the use of traditional foods and herbs to improve the perceived insufficiency of breast milk among lactating women in the Dire Dawa administration, Ethiopia, in 2023. We are here to learn from you, so anything you have to share is welcome. There are no correct or incorrect answers.

Appendix II: FGD Guideline

Good morning or afternoon... Thank you once again for your willingness to conduct discussion on our study.

What are the traditional foods and herbs lactating women in this area/community use to improve the perceived insufficiency of breast milk?

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