

Dietary Practice and Associated Factors Among Lactating Mothers in Halu Woreda, Ilu Aba Bor Zone, South West Ethiopia

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Abstract: *Background:* Lactation is a critical time for meeting nutritional requirements. Low-quality, monotonous diets for lactating mothers are the norm in resource-poor environments around the world. In Ethiopia, suboptimal dietary consumption among lactating mothers persisted. As a result, the goal of this research was to assess dietary practices and associated factors among lactating mothers in Halu woreda, Ilubabor Zone, South West Ethiopia. *Method:* A community-based cross-sectional study of 504 randomly selected lactating mothers was conducted from July to August 2021. To collect socio-demographic and socio-economic data, a structured interview administered questioner was used. Dietary practice was assessed using a food frequency questioner to assess dietary diversity, food variety, and animal source food scores over a 24-hour and a week period, respectively. Data were entered into Epi-Data version 3.1 and exported to SPSS version 20 for analysis. Binary and multivariable logistic regression were used to identify independent predictors of dietary practice. An odds ratio with a 95% confidence interval was calculated to identify the predictors of the outcome variable. A statistically significant p-value of 0.05 was declared. *Result:* The prevalence of Optimal dietary practice among lactating mothers was 42.6%. Based on Multivariable logistic regression analysis; Maternal occupation (AOR= 2.89, 95%CI: (1.26, 5.1)), Food pattern change (AOR= 4.46, 95%CI: (2.12, 9.37)), Home gardening (AOR=1.5, 95% CI: (1.6, 3.1)), Wealth status (AOR= 1.9, 95% CI: (1.09, 3.43)) and Nutritional knowledge (AOR= 1.63, (1.96, 2.79)) were significantly associated with Dietary practice of lactating mothers. *Conclusion:* According to the study findings, the prevalence of suboptimal dietary practice was 57.4%, with its corresponding components being inadequate. The percentages of dietary diversity, poor food variety, and low animal source food were 38.9%, 31.9%, and 53.4%, respectively. As a result, different stakeholders, particularly the frontline health sector, should focus on an integrated and holistic approach to improving mothers' active hood and dietary practices.

Keywords: Dietary Practice, Lactating Mothers, Food Variety, Ethiopia

1. Introduction

Optimal nutritional intake can improve lactating mother's endurance, tolerance, and self-stem. International organizations recommend that optimal diets include fresh vegetables and fruits, whole grains, protein foods, and a limited amount of fat. Protein requirements rise by 15-20g per day during lactation. Lactation increased carbohydrate demand by 80g/day compared to pregnancy (130g/day). Because 20mg/day of vitamin C is

secreted through milk during lactation, an additional 25mg/day is required to compensate. The daily calcium intake recommendation is 1,300 milligrams; for example, one cup of milk or yogurt contains 300 milligrams of calcium. A minimum of 13 cups of water per day is recommended; alternatively, milk and juices can be consumed [1].

The energy required to produce one liter of breast milk is estimated to be around 700kcal, and recommendations include increasing energy intake by 500kcal/day above pre-pregnancy

requirements. Taking at least two additional meals per day during lactation is recommended for all lactating women, according to the Essential Nutrition Action (ENA) [2].

Nutrients are required to maintain the mother's health, the healthy growth of her infants, and post-partum recovery [3, 4]. Lactation is a critical period in terms of nutritional need. Poor nutritional vulnerability among lactating women is high due to a significant increase in nutrient requirements during lactation than at any other stage of a woman's reproductive life due to physiological change, resulting in a high metabolic demand to nourish their children with breast milk containing a high concentration of important nutrients [5].

Women of reproductive age are especially vulnerable to chronic energy deficiency and malnutrition as a result of inadequate dietary intake, unequal food distribution within the household, improper food storage and preparation, dietary taboos, infectious disease, and inadequate care practice [6]. In Ethiopia, evidence of dietary pattern among lactating mothers is limited, and some studies show that starch staples based diets such as rice, sorghum, barley, and wheat are the most common diet and are consumed by 9 out of every 10 households per week [7].

Maternal malnutrition, including chronic energy and micronutrient deficiency, accounts for 11% of disease burden globally. It is extremely common in low and middle-income countries [8]. In Asian countries, low dietary practice ranges from 55.2% to 87.8%. In African countries, however, low dietary practice ranges from 42.1% to 88.7% [9]. The prevalence of low dietary diversity remains high in Ethiopia. A study conducted in the north Ethiopia revealed that more than half (56%) of lactating mothers have a low dietary diversity intake [10]. Furthermore, a recent study in the Oromia region of North Showa revealed that approximately half (51.6%) of lactating mothers consumed low dietary diversity [11].

Lactating mothers' lack of dietary diversity is the leading cause of both macronutrient and micronutrient deficiencies. Among lactating women in low and middle-income countries (LMICs) in Africa, Asia, Latin America, and the Caribbean, studies found inadequate micronutrient intakes and very little dietary diversity [11]. Low-quality, monotonous diets are the norm in resource-poor environments around the world. Girls and women of reproductive age are disproportionately affected by deficiencies. Poor micronutrient status among women is a global issue that is exacerbated for poor women [12].

Previous research found that wealth status, educational level, residence, nutritional knowledge, occupation, food security, and home gardening were among the independent predictor variables associated with lactating mothers' dietary practices [10, 11, 13–15].

Nutrition in Multiple Sectors The strategic plan, which spans the years 2014 to 2025, establishes a comprehensive approach for maternal nutrition-specific and nutrition-sensitive interventions that can be considered for integration into programs across health platforms [16]. In 2016, Ethiopia plans to launch a revised national nutrition program (NNPII) among women of reproductive age, including lactating mothers and their children, with the goal of reducing maternal

undernutrition through dietary diversity intervention [17].

To the best of the researcher's knowledge, measuring food variety and animal source food scores on a weekly basis may slightly impede change in dietary intake due to day variations (fasting & weekends) and can improve the veracity of dietary practice among lactating mothers. Aside from that, a small study on lactating mothers' dietary practices was conducted in the study area. As a result, the study aimed to fill the aforementioned gap and may provide insight into the study area for future advanced studies.

2. Methods

2.1. Study Area

The study was carried out in Halu district, which is one of 14 woredas in the Ilubabor Zone. The district town is Ouka. According to projections for 2020, the total population in the district is 24,306, of which approximately 11,914 are females and 5,379 are of reproductive age. The research was carried out between July to August, 2021.

2.2. Study Design, Population and Sample Size

A community-based cross-sectional study design was used. Lactating mothers between the ages of 15 and 49 who had lived in the district for at least six months were included. Lactating mothers with confirmed hypertension and diabetes mellitus were excluded because of case-based dietary modification, which is not sound to infer. The sample size was estimated using a single population proportion formula, with the proportion of lactating mothers with good (optimal) dietary practices being 72.1% from a study done in Oromia region, Ambo district, at 95% confidence interval, with a margin of error of 5%, and a nonresponse rate of 10% [18]. Taking this into account, the sample obtained was multiplied by a design effect of 1.5, yielding 510 as the final sample.

Halu woreda is divided into one urban and twelve rural kebeles (the smallest unit of administration). Following that, two strata were formed as urban and rural, and a single existing urban kebele was primarily selected as a representative for residents, while the remaining five rural kebeles were chosen based on their priority proportional to size. As a result, the research was carried out in six villages.

The list of households with lactating mothers living in the village was coded with a specific ascending number in each urban and rural selected kebele. After listing the households one by one and rearranging and correcting the records/folders, a proportionally allocated appropriate sample size for each kebeles was determined. Then the participants selected by simple random sampling technique. One lactating mother was chosen at random from households with two or more lactating mothers.

2.3. Data Collection Tools and Procedures

Data were collected using an interviewer-administered structured questionnaire that was written in English, translated to Afar Oromo (the language spoken in the study area). The food frequency questioner (FFQ) was adapted

from previously validated tools for dietary diversity, food variety score, and animal source food [19, 20].

DDS was calculated using a mutually exclusive, ten food group containing dichotomous indicator, which states that women aged 15-49 years who consumed at least five (>5) food groups out of ten in the previous 24 hours recall are considered to have adequate (optimal) micronutrient intake, while those who did not are considered inadequate (sub-optimal). The food groups are as follows: 1. grains, white roots, tuber and plantains, 2. pulses, 3. nuts and seeds 4. Dairy, 5. Meat, poultry, and fish 6. Eggs 7. Vegetable with dark green leaves, Fruits and vegetables high in vitamin A, 9. Other vegetables; and 10. Other fruits.

The food variety score (FVS) was calculated by asking a series of list-based questions about food categories and items. The sixteen food categories were used, but the list of individual food items was modified based on locally available and commonly consumed foods in the study area, resulting in a total of 57 food items used in this study. The frequency of each animal source food consumed by the women over the course of a week was used to assess their utilization of animal source food (ASF).

Household food insecurity was assessed using the Household Food Insecurity Access Scale (HFIAS), a structured, standardized, and validated tool used in other developing countries [21]. All "Yes" responses were coded as "1," while "No" responses were coded as "0." The sum of the scores for each individual study subject was calculated to produce an index of household food insecurity. The score was later dichotomized into "food secure" and "food insecure" for scores zero and greater than zero, respectively.

The nutritional knowledge of mothers was calculated using ten questions that included the mother's awareness of nutrition and dietary practice. Mothers who scored higher than the mean cut-off point were considered to have good knowledge and were coded as "1," while those who scored lower were considered to have poor knowledge and were coded as "0." [11].

Household wealth status was assessed using wealth constructs reflecting household assets, utilities, and housing characteristics adopted from the Ethiopian Demographic and

Health Survey (6). The principal components analysis was used to generate latent factors representing the wealth data which was then categorized into wealth quintiles.

Data was collected by four grade twelve complete students assisted with Health extension workers in respective villages who were fluent in 'Afan Oromo' and also 'Amharic' languages. Prior to data collection, a three days comprehensive training for data collectors and two degree holder supervisors were provided. To ensure data quality, the questionnaire was pre-tested and the data abstract format was corrected and modified as needed. The actual data was then collected under cloth supervision, with the assigned supervisors regularly monitoring and checking for data completeness and consistency.

2.4. Data Analysis and Interpretation

Following an interview, the principal investigator visually checked the questioner, and the data was checked, coded, and entered into Epi-Data version 3.1 before being exported to SPSS version 20 software for analysis. Dietary practice was classified as "Optimal" or "Sub-Optimal" based on interims of dietary diversity, food variety, and animal source food. The logistic regression model was used to examine the relationship between the independent and outcome variables. Multi-collinearity and model fitness was examined. Using multivariable logistic regression analysis, the adjusted odd ratio with 95% CI was estimated to identify the factors associated with optimal dietary practice, and the level of significance was declared to be at a p-value of 0.05.

3. Results

3.1. Demographic Characteristic

The study included 504 participants, with a response rate of 98.8% and a mean age of 25.17 +4.56 years (SD). The majority of them (80.8%) are from rural areas, and nearly half (49%) are under the age of 25. Three hundred fifty-two (69.8%) of respondents are Oromo, and more than one-third (37.9%) of mothers practice Orthodox Christianity. (Table 1)

Table 1. Socio Demographic and Economic Status of lactating mothers in Halu district, Ilu Aba bor Zone, South west Ethiopia, 2021.

Variables	Categories	Frequency	Percent (%)
Residence	Urban	97	19.2
	Rural	407	80.8
Age of mothers in year	≤24	247	49.0
	25-35	224	44.4
	≥36	33	6.5
Religion	Orthodox Christian	191	37.9
	Muslim	172	34.1
	Protestant	137	27.2
	Other*	4	0.8
Ethnicity	Oromo	352	69.8
	Amahara	108	21.4
	Tigre	36	7.1
	Other**	8	1.6
Mothers Educational Status	No formal education	108	21.4
	Primary ***	224	44.4
	Secondary	127	25.2
	Diploma and above	45	8.9

Variables	Categories	Frequency	Percent (%)
Husband Educational Status	No formal education	90	17.9
	Primary	239	47.4
	Secondary	116	23.0
	Diploma and above	59	11.7
Mothers Occupation	Farmer	354	70.2
	Civil servant	35	6.9
	Merchant	46	9.1
	House wife	55	10.9
	Un employed	14	2.8
Marital Status	Single	6	1.2
	Married	459	91.1
	Divorced	3	0.6
	Widowed	4	0.8
	Separated	32	6.3
Sex Of the Household Head	Male	463	91.8
	Female	41	8.1
Number Of Family Members	1-3	249	49.4
	4-6	204	40.4
	>6	51	10.1
Decision On Food Purchase	Involved	445	88.2
	Not involved	59	11.7
Wealth Index Level	Lowest Class	112	22.2
	Second Class	98	19.8
	Middle Class	123	24.6
	Fourth Class	95	18.8
	Highest Class	76	15.07
Water source	Pipe	421	83.5
	Protected	66	13.09
	Unprotected	17	3.4
Type of toilet facility	Ventilated Improved pit latrine	18	3.6
	Pit latrine with slab	436	86.5
	Pit latrine without slab/open	65	12.8
Having book account	Yes	163	32.3
	No	341	67.6

*= Catholic, Jehovah **=Gurage, Kefa ***=Grade 1-8th.

3.2. Dietary Diversity Score

About ten food groups were used to assess mothers' dietary diversity score, and the results are listed below. Almost all of the respondents (97.4%) ate cereals, roots, and tubers. About 396 (78.5%) of the participants consumed dark green leafy vegetables, making it the second most popular food group, while the least popular food group (other vegetable) was

obtained by 30.9% of mothers.

3.3. Food Variety Score

The food variety measure was assessed using 16 food groups on a weekly basis, and the results for some of the most commonly consumed food groups are listed below. All of the mothers consumed cereals, and nearly all (97.6%) of them consumed dark green leafy vegetables. (Figure 1).

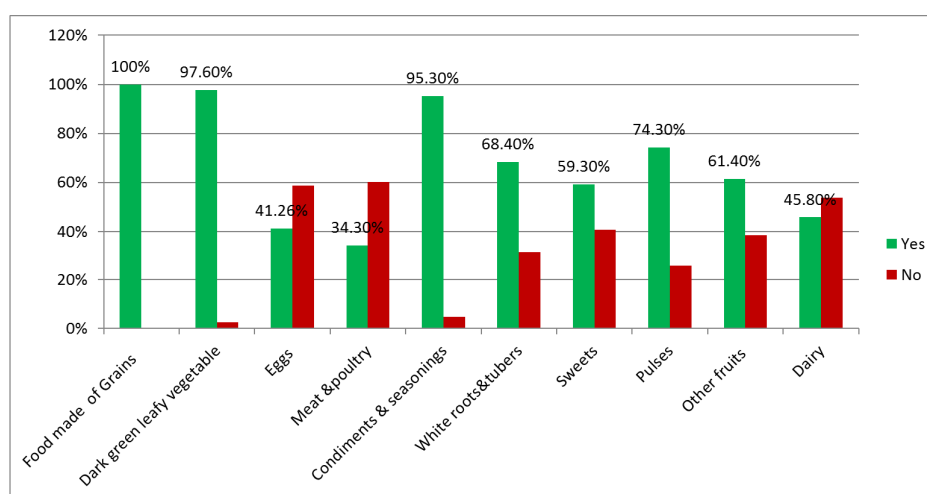


Figure 1. Food Variety consumed by lactating mothers within a week in Halu woreda, 2021.

3.4. Animal Source Food Consumption

Among the animal source foods used in the assessment, dairy products were consumed at a relatively higher rate (45.8%), meat and poultry were consumed by nearly one-third of the respondents (34.3%), and fish was the least consumed animal source food (1.3%).

3.5. Animal Source Food Score

According to the findings, less than half (48.2%) of respondents consumed animal source food in a week, with the majority of them (46%) scoring in the upper one-third category, and more than half (53.9%) scoring in the lower one-third category.

3.6. Components of Dietary Practice of Mothers

Three hundred and eight (61.1%) of the participants consumed five or more food groups out of ten. The majority of mothers (68.1%) scored total counted food items above the mean level, and more than half (53.4%) scored animal source food consumption in the two lower categories. (Table 2)

Table 2. Dietary Practice of Lactating Mothers in Halu Woreda, Ilu Aba Bor Zone, Southwest Ethiopia, 2021.

Variables	Categories	Frequency (n=504)	Percent
Dietary Diversity Score	≥5 (Adequate)	308	61.1
	<5 (In adequate)	196	38.9
Food Variety Score	Good	343	68.1
	Poor	161	31.9
Animal Source Food	High	112	46.0
	Low	131	53.9
Dietary Practice	Optimal	215	42.6
	Sub-Optimal	289	57.4

3.7. Magnitude of Dietary Practice

Dietary diversity, food variety, and animal source food scores were used to assess maternal dietary practice. Approximately 225 (42.6%) (95% CI: (37.7, 46.4) participants were identified as having optimal dietary practices. As a result, their dietary practice component category is adequate Dietary Diversity, good food variety, and high animal food scores. (Figure 2)

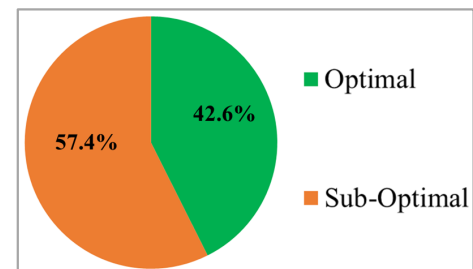


Figure 2. Magnitude of Lactating mothers Dietary practice in Halu Woreda, 2021.

3.8. Factors Associated with Dietary Practice

The results from Multivariable logistic regression implies that, Maternal occupation (AOR=2.89; (1.26, 5.1)), Home gardening (AOR=1.5; (1.6, 3.1)), Food pattern change (AOR=4.46; (2.12, 9.37)), wealth status (AOR=1.9; (1.09, 3.43)) maternal occupation (merchant) 1.12 (1.03, 8.37), family size (4-6, AOR= 0.35: (0.20, 0.82), Food pattern change (Frequency of meal)(AOR=1.4: (2.37, 12.29) and nutritional knowledge (AOR=1.63; (1.96, 2.79)) are variables which are significantly associated with Dietary practice of mothers at 95% CI and p value of 0.05. (Table 3)

Table 3. Factors Associated with Dietary Practice among lactating mothers in Ilu Aba Bor Zone, Halu district, 2021.

Variables	Categories	Dietary Practice		COR (95%CI)	AOR (95%CI)
		Optimal (%)	Sub-Optimal (%)		
Husband Education	No Formal education	42 (46.60%)	48 (53.3%)	Ref	Ref
	Primary	115 (48.1%)	124 (51.9%)	1.06 (1.12, 3.94)	0.78 (0.6, 2.41)
	Secondary	49 (42.2%)	67 (57.7%)	0.83 (0.94, 3.76)	0.64 (0.28, 1.71)
	Diploma & above	43 (0.72%)	16 (0.27%)	3.07 (1.15, 6.72)	1.92 (0.42, 5.23)
Maternal Occupation	Farmer	139 (39.2%)	215 (60.8)	1.16 (0.38, 3.21)	0.84 (0.5, 2.03)
	Civil servant	23 (65.7%)	12 (34.3%)	3.4 (0.94, 7.6)	2.89 (1.26, 5.1) *
	Merchant	26 (56.5%)	20 (43.5%)	2.3 (1.67, 5.07)	1.12 (0.9, 8.37)
	House wife	19 (34.5%)	36 (65.4%)	0.95 (0.27, 3.23)	0.83 (0.57, 3.95)
	Unemployed	5 (35.7%)	9 (64.3%)	Ref	Ref
Family size	1-3	113 (55.1%)	92 (44.8%)	2.01 (0.31, 0.77)	1.78 (0.31, 1.8)
	4-6	63 (30.8%)	141 (69.1%)	0.73 (0.14, 0.40)	0.35 (0.20, 1.2)
	>6	36 (37.9%)	59 (62.1%)	Ref	Ref
Home gardening	Yes	160 (46.2%)	186 (53.7%)	1.7 (1.84, 2.23)	1.5 (1.6, 3.1) **
	No	52 (32.9)	106 (67.08%)	Ref	Ref
Food pattern change	No change	25 (26.3%)	70 (73.6%)	Ref	Ref
	Frequency of meal	81 (45.3%)	98 (54.8%)	2.31 (1.34, 3.98)	1.4 (0.9, 6.4)
	Amount	39 (28.3%)	99 (71.7%)	1.1 (0.61, 1.98)	0.3 (0.14, 1.78)
	Frequency & Amount	67 (72.8%)	25 (27.2%)	7.5 (3.92, 14.3)	4.46 (2.12, 9.37) **

Variables	Categories	Dietary Practice		COR (95%CI)	AOR (95%CI)
		Optimal (%)	Sub-Optimal (%)		
Food security status	Yes	186 (41.8%)	259 (58.2%)	0.91 (0.52, 1.57)	1.48 (0.12, 1.79)
	No	26 (44%)	33 (55.9%)	Ref	Ref
	Lowest class	39 (34.8%)	73 (65.1%)	Ref	Ref
Wealth status	Second class	38 (38.7%)	60 (61.2%)	1.18 (0.57, 2.05)	0.87 (0.66, 4.09)
	Middle class	45 (36.5%)	78 (63.4%)	1.07 (0.49, 1.5)	0.64 (0.25, 1.96)
	Fourth class	56 (58.9%)	39 (41.05%)	2.6 (1.93, 5.2)	1.9 (1.09, 3.43) **
	Highest class	34 (44.7%)	42 (55.2%)	1.51 (0.57, 2.05)	0.72 (0.28, 1.46)
Nutritional Knowledge	Poor	122 (36%)	216 (63.9%)	Ref	Ref
	Good	90 (54.2%)	76 (45.7%)	2.09 (0.98, 2.12)	1.63 (1.96, 2.79) **

Note: * variables significant at $p < 0.05$, and ** significant predictors at $p < 0.01$.
COR: Crude odds ratio and, AOR: Adjusted odds ratio.

4. Discussion

The study's goal was to evaluate lactating mothers' dietary practices by determining their dietary diversity, food variety, and animal source food scores all at once. According to the findings of this study, 308 (61.1%) of mothers have an adequate (minimum) dietary diversity score (>5 food groups). This finding is greater than previous studies conducted in Ethiopia, Aksum town, southern part Angecha district, and northern Showa Zone; the difference could be due to socioeconomic status differences. Seasonal variation and the type of food produced Furthermore, starch staples were a highly consumed food group by the participants, which is nearly identical in proportion to the study results mentioned above [10, 11, 13].

The participant's minimum and maximum food variety consumption per week was 29 and 48, respectively. Approximately 343 (68.1%) of the study participants scored above the mean level of food variety. This finding is lower than that of a study conducted in Kenya [22]. More than half of the participants, 269 (53.3%), had a high animal source food score. The findings are more significant than those of an earlier study conducted in Indonesia. Only a few (3%) of the participants avoided consuming specific foods during lactation, which is significantly lower than the 29.14% found in a previous study in Poland [23].

According to the findings of the study, foods made of grains and fruits were consumed on a weekly basis by 100% and 61.4% of the respondents, respectively. This result is higher than that of a study conducted in Nigeria, where the magnitude of consumption was 10.7% and 37.6%, respectively. Aside from that, approximately 39.8% of mothers in this study consumed meat and poultry, and the result is nearly identical to the stated nation [24].

Also Lactating mothers whose livelihood is based on government employment were more likely to have optimal dietary practices than unemployed mothers. This result could be explained by employers' increased purchasing power as a result of earning a fixed and consistent income source. This result is slightly higher than that of the Tigray region study [10].

According to the findings Mothers who did not garden at

home were less likely to practice optimal dietary practices than their counterparts. This result is lower than that of a study conducted in the Tigray region's Aksum town. The possible reason for this could be that simply planting fruit, vegetables, and other food items in one's immediate vicinity can increase food accessibility, particularly in a rural community like here in the study area where people have a regular and fixed monthly income.

In this findings participants who changed their meal frequency and amount were more likely to have optimal dietary practice than those who did not change their meal during lactation. The possibility for this result is that the more frequent the meal, the greater the possibility of obtaining different food sources.

The study also found that the wealth status of lactating mothers is linked to their dietary habits. Mothers in the fourth wealth class were more likely to practice optimal dietary than those in the lowest wealth class. The possible explanation for this result is that being wealthier can increase an individual's food purchasing ability when compared to mothers with low economic status. This result is consistent with the findings of a study conducted in Ghana [25].

According to the findings of this study, mothers' nutritional knowledge is also linked to dietary practice. Mothers with good nutritional knowledge were more likely to practice optimal dietary. The possible explanation for this result is that mothers with good nutrition knowledge can consume a variety of foods because they understand the importance of different food sources. This result is lower than that obtained in a study conducted in Ethiopia's [25].

5. Conclusion and Recommendation

According to the findings of this study, the proportions of adequate dietary diversity, good food variety, and high animal source food scores were 61.1%, 68.1%, and 46.6%, respectively, with an overall sub-optimal dietary practice of 57.4%. According to the findings of multivariable logistic regression, maternal occupation, home gardening, food pattern change, wealth class, and nutritional knowledge are the variables that significantly associated with lactating mothers' Optima dietary practice. This study recommends that mothers be made aware of the importance of limiting the

number of children to be in line with their economic status, avoiding unwanted/unplanned pregnancy by providing access to family planning to mothers, and advising on birth spacing. Nutritional education/advice should be provided to mothers while they are visiting a health care facility for routine services such as ANC and PNC. To increase the number of food frequency, especially during lactation, two additional meals per day may be recommended. Maternal and child health unit staff should pay special attention to integrating nutritional education with other maternal health services. A list of major food items and their importance should be provided to mothers by a health professional in order for mothers to improve their dietary intake. Encourage mothers to plant a variety of vegetables and fruits in their gardens.

Abbreviations and Acronyms

ENA: Essential nutrition advice
 NNP: National nutrition program
 DDS: dietary diversity score
 FAO: Food and agricultural organization
 FVS: Food variety score
 ETB: Ethiopian Birr
 HFIAS: household food intensity scale
 FANTA: Food and nutrition technical assistance
 FMOH: Federal ministry of health
 HRERC: Health Research Ethics Review Committee
 KCAL: Kilo calorie
 RNI: Recommended nutritional intake
 ASF: Animal source food

Ethical Approval

Before starting the study, the Ethical clearance was approved from Ethical review committee of college of health science, Mettu University. Beyond this permission letter was taken from Halu woreda health office. Written and signed informed consent from participant was obtained before starting the interview.

Consent for Publication

Not applicable.

Availability of Data and Materials

Data will be available upon the request of the corresponding author.

Competing Interest

All the authors do not have any possible conflicts of interest.

Author Contributions

AK: conception of the research idea, design, analysis,

interpretation and SA: drafting the manuscript. SA, KB and SS: design, interpretation of results, reviewing and editing the manuscript. All authors have read and approved the final manuscript. SA is responsible for the overall content as guarantor.

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