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Prevalence of Undernutrition and Its Associated Factors Among Lactating Women in the Shebedino District, Sidama Regional State, Ethiopia

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Abstract

Background: Ensuring the nutritional status of lactating women is crucial to prevent maternal morbidity and mortality in poor countries like Ethiopia. Hence, this study aimed to assess the prevalence of undernutrition and its associated factors among lactating women in Shebedino district, Sidama Regional State, Ethiopia.

Methods: A community-based cross-sectional study was conducted among randomly selected 612 lactating women from February to March 2020. Data were collected by using an interviewer-administered, structured, and pretested questionnaire. Also, physical measurements (weight, height, and body mass index) were measured by using standardized and calibrated instruments. Data entered into Epi data version 3.1 and exported to SPSS version 23 for further analysis. Descriptive statistics, bivariable, and multivariable logistic regression analysis were done. A P-value of ≤.05 was used to consider the statistical significance.

Result: The prevalence of undernutrition was 25.9% (95% CI: 22.5, 29.5). Having polygamous husband (AOR = 3.47, 95% CI: 1.13, 10.68), belonged to households with less than 5 members (AOR = 1.81, 95% CI: 1.16, 2.83), abortion history in the last 6 months (AOR = 3.09, 95% CI: 1.73, 5.51), poor household wealth status (AOR = 3.85, 95% CI: 1.89, 7.81), and medium wealth status (AOR = 2.07, 95% CI: 1.06, 4.03) were factors positively associated with undernutrition.

Conclusion: Undernutrition among lactating women was high in the study area. Attention should be given to the economic status of the women, family planning services, abortion prevention, and habits of marrying more than 1 wife (polygamy).

Keywords

nutritional status, lactation, cross-sectional study, questions

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What do we already know about this topic?
The malnutrition-related problem remains the challenging health problem in the world. Failure to compensate for the increased demand for nutritious foods during pregnancies and lactation would increase the health risk of the women.

How does your research contribute to the field?
There is a necessity for updated information regarding the nutritional status of the lactating women and factors contributing to it in the study setting.

What are your research's implications towards theory, practice, or policy?
Evaluating the current nutritional status of lactating women as well as its correlates could play a big role in research, program designing, and initiating interventional activities.

Background

Malnutrition, in all its forms, is a persistent global public health challenge.[1] According to global nutrition report, about a half of the women suffer from a significant burden of undernutrition in the world. Of these, 8.2% of lactating women are underweight in economically poor countries.[2,3]

Women in the reproductive age group are most vulnerable to malnutrition due to low dietary intakes, inequitable distribution of food within the household, improper food storage and preparation, dietary taboos, and infectious diseases.[4]

Lactating mothers from low-income settings are a nutritionally vulnerable group due to different socio-demographic factors and lack of nutritional knowledge which impacts their health.[5,6] Additionally, women who do not get enough energy and nutrients in their diets are at risk of facing different health problems including malnutrition.[7]

Failure to compensate for the increased demand for nutritious foods during pregnancies and lactation would increase the health risk of mothers, resulting in high maternal mortality.[8]

Low body mass index (BMI) (<18.5 kg/m2) and/or short stature (height <145 cm) are common among women in low-income countries with the highest rates in southern and southeastern Asia, followed by sub-Saharan Africa.[9,10]

In Ethiopia, about 5 million people experience food shortages each year, and approximately 2.9 million people were receiving food assistance. It was also revealed that the dietary intake patterns are not adequate.[4,9] As a result, lactating women are highly vulnerable to nutritional deficiencies.[11,12]

Hence, particularly for women, the high nutritional costs of pregnancy and lactation also contribute to their poor nutritional status.[4] Furthermore, factors such as lack of control over resources, suboptimal dietary practices, lack of education, household food insecurity, and poor access to nutrition-related information are determinants that compromise the nutritional status of the women in Ethiopia.[13,14]

Overall, assessing the nutritional status of lactating women have many applications in research, policy development, program designing, initiating interventional activities, and evaluating it.[15] Despite this, in Ethiopia, there is scanty of literature that show lactating women's nutritional conditions in general and particularly in Sidama Regional state. Therefore, this study aimed to assess the prevalence of undernutrition and its associated factors among lactating women in Shebedino district, Sidama National Regional State, Ethiopia, 2020.

Methods and Materials

Study Area

This study was conducted in the Shebedino district which is located 27 km from Hawassa and 302 km from Addis Ababa, the capital of Sidama Regional state and Ethiopia, respectively. According to the Ethiopian Central Statistical Agency report, the total population of the district was 192,359. Among them, 51% are females. The district consists of 26 kebeles. It has a total of annually estimated 6656 (3.46%) lactating mothers. There are 6 health centers, 5 private clinics, and twenty-three health posts.[16]

Study Design, Period, and Population

A community-based cross-sectional study design was conducted from February to March 2020. The source population for this study was all lactating women in the Shebedino district. All lactating mothers in randomly selected kebeles who fulfilled the eligibility criteria were the study population. Those mothers who had up to 24 months of the child, and lived in the study area at least for 6 months were included. However, those mothers who were seriously ill and unable to be interviewed during the data collection period were excluded.

Sample Size Determination

For the first objective, the sample size was calculated by using single population proportion formula based on the following assumptions: prevalence of undernutrition among lactating mothers (P = 40.6%) taken from the previous study,[23] 10% of non-response rate, and design effect of 1.5, the final sample size was 612.

Sampling Procedures

From a total number of 26 kebeles (the smallest administrative unit in Ethiopia) found in the Shebedino district, 14 kebeles were selected by a lottery method. The lists of eligible

households were obtained from pregnant women registration book at health posts in the selected kebeles. Then, a calculated sample size was proportionally allocated based on the number of eligible mothers obtained from each kebele. Community health agents were assigned with data collectors to access the eligible households. Finally, the study participants were selected by simple random sampling technique.

Data Collection Tools and Procedures

Data were collected by using an interviewer-administered, pretested, and structured questionnaire. The questionnaire had different sections: socio-demographic characteristics of the respondents, items related to dietary practice assessment, and anthropometric measurements.

Minimum dietary diversity score was obtained by collecting 24-hours dietary recalls as consumed/not consumed from different food groups. The score was calculated by using 10 food groups as the summation of consumed food.

Anthropometric measurements (height, weight, and BMI) were measured by using standardized and calibrated instruments. Weight was measured to the nearest .1 kg on a battery-powered digital scale (Seca770, Hanover Germany), and height was measured to the nearest .1 cm using a wooden height-measuring board with a sliding head bar following standard anthropometric techniques.

Data Analysis

After checking for its completeness and consistencies, data were entered into Epi Data version 3.1 and exported to the Statistical Package for Social Science (SPSS) version 23 software for further analysis. Descriptive analysis was done for each predictor variable. A cross-tabulation was performed to see the distribution of predictors with the outcome variable. Bivariable logistic regression analysis was done for each independent variable with the outcome variable. Variables with a *P*-value of ≤.25 were entered into multivariable logistic regression analysis.

The wealth index was constructed by using locally available tools related to ownership of selected household's durable assets, domestic animals, and productive assets. Scores are derived by using principal component analysis. Wealth quintiles were compiled by assigning the household score to each usual household member, ranking by total score. The component with Eigenvalues greater than 1 was retained to construct the wealth index, and grouped into 3 socio-economic statuses as poor, medium, and rich.

To check multicollinearity effect, variance inflation factor less than 10 and tolerance test greater than .1 was considered. Adjusted odds ratio (AOR) with a 95% confidence interval (CI) was calculated. A P-value ≤.05 was used to consider statistically significant variables. Finally, the results were described by texts and tables.

All data collectors and supervisors were trained for 2 consecutive days on the general purpose of the survey and procedures. The tool was translated into local language (Sidaamu Afoo) and back to English by language experts to check its consistency. Instruments were calibrated before taking anthropometric measurements. A pretest was conducted on 5% of the sample outside of the study area. Collected data were checked for its completeness on daily manner, and all necessary modifications and measurements taken accordingly.

Variables

In this study, underweight was the primary outcome variable of interest, defined as body mass index (BMI< 18.5 kg/m^2).[2] In the final model (logistic regression analysis), we only considered underweight women and those with normal BMI and excluded those who were overweight and obese.

The independent variables were socio-demographic factors (age, marital status, occupational status, level of education, household's wealth index, and family size), obstetric and health care related factors (antenatal care, place of delivery, history of abortion, and mode of delivery), anthropometric measurements (weight, height, and BMI), and environmental factors (source of drinking water, availability of latrine, and waste disposal system).

Operational Definitions

Undernutrition: According to this study, it is a nutritional status of lactating women (underweight) when BMI <18.5 kg/m^2.

Body mass index (BMI): Calculated as weight in kilograms divided by square of the height in meter.

Results

Socio-Demographic Characteristics of the Study Participants

A total of 607 respondents participated, giving a response rate of 99.18%. The mean age of them was 27.7 ± 4.52 SD years. Most of the respondents (99.8%) were married. In terms of educational status, 186 (30.6%) had no formal education. The majority (92.4%) were unemployed by occupational status. 450 (74.1%) belonged to households with less than 5 members. In terms of the wealth status of the household, 279 (46.0%) were poor (Table 1).

Nutritional Status and Reproductive Related Characteristics of the Study Participants

Out of the study participants, 157 (25.9%, 95% CI: 22.5–29.5) were undernourished (BMI<18.5 kg/m^2). Out of this, 57 (36.3%) were mild, 62 (39.5%) were moderate, and 38 (24.2%) were sever form of undernutrition. Nearly half (49.9%) had children aged 12 months and above. The majority (95.2%) had ANC visits for their last pregnancy. About 558 (91.9%) delivered their child at the health facility. Above half (53.5%) were multi-gravida (Table 2).

Table 1. Socio-Demographic Characteristics of Lactating Mothers at Shebedino District, Sidama Regional State, Ethiopia, 2020.

Variable	Category	Frequency	Percentage
Age	19–24	101	16.6
	25–29	341	56.2
	30–34	116	19.1
	≥35	49	8.1
Marital status	Unmarried	1	0.2
	Married	606	99.8
Had polygamous husband	No	576	94.9
	Yes	31	5.1
Education status of lactating women	No formal education	186	30.6
	Primary school	357	58.8
	Secondary school	46	7.6
	College and above	18	3.0
Occupational status of lactating women	House wife	561	92.4
	Merchant	26	4.3
	Gov't employee	12	2.0
	Private worker	8	1.3
Occupational status of husband	Farmer	524	86.5
	Merchant	53	8.7
	Gov't employee	19	3.1
	Private worker	10	1.7
Household's wealth status	Poor	279	46.0
	Medium	219	36.1
	Rich	109	18.0
Head of household	Male	601	99.0
	Female	6	1.0
Number of family	≤5	450	74.1
	>5	157	25.9

Environmental and Health-Related Conditions

The majority (98.7%) of them reported that they use pipe water. Nearly three-fourths (74.0%) had cement/raw wood floors. Only 2.0% of them had a history of diarrhea in the past 2 weeks before this study (Table 3).

The Minimum Dietary Diversity Score of Lactating Mothers

The mean dietary diversity score of households was 3.4 (±1.70 SD). The majority (85.7%) had inadequate dietary diversity habits. Almost all (99.8%) reported that they had breakfast. The majority, 604 (99.5%), consumed foods from more than 4 food groups.

Factors Associated With Undernutrition

In bivariable logistic regression analysis, having polygamous husband, family size, household's wealth status, availability of latrine, having an abortion in the last 6 months, having antenatal care (ANC) follow-up, place of delivery, and source of drinking water were factors associated with undernutrition among lactating mothers. In multivariable logistic regression analysis, having a polygamous husband, belonging to households with less than 5 members, having an abortion in the last 6 months, and being poor and medium by household wealth status were predictors significantly associated with undernutrition among lactating mothers.

Accordingly, increased odds of undernutrition was observed among lactating woman who had a polygamous husband (AOR = 3.46, 95% CI: 1.13, 10.68), had more than 5 family members (AOR = 1.81, 95% CI: 1.16, 2.83), had an abortion in the last 6 months (AOR = 3.09, 95% CI: 1.73, 5.51), were poor (AOR = 3.85, 95% CI: 1.89, 7.81), and medium (AOR = 2.07, 95% CI: 1.06, 4.03) by household wealth status when compared with their counterparts (Table 4).

Discussion

This study has attempted to identify the prevalence of undernutrition and its associated factors among lactating women. Accordingly, the prevalence of undernutrition was found to be 25.9% (95% CI: 22.5–29.5). This finding was consistent with the results of the previous studies done in the Womberma district (25.4%),[4] Enderta district (25%),[17] and Vietnam (23.7%).[18]

However, the result of this study was higher when compared with the findings of previous studies done in Arba Minch Zuria districts (17.4%),[22] Nekemte town (20%),[19] India (21.3%),[20] Jammu (19.3%), and Kashmiri (10%) regions.[21] The possible explanation for this difference might be the socio-demographic

Table 2. Nutritional and Obstetric/Health Service Related Characteristics of Lactating Mothers at Shebedino District, Sidama Regional State, Ethiopia, 2020.

Variable	Category	Frequencies	Percentage
Age of breastfeeding child	<12 months	304	50.1
	≥12 months	303	49.9
Breast feeding twins	No	586	96.5
	Yes	21	3.5
Had antenatal care follow-up	No	29	4.8
	Yes	578	95.2
Place of delivery	Health facility	558	91.9
	Home	49	8.1
Number of pregnancy	One	139	22.9
	Two	144	23.7
	>2	324	53.4
Number of live children	One	144	23.7
	Two	147	24.2
	>2	316	52.1
Mode of delivery	Vaginal delivery	587	96.7
	Cesarean delivery	20	3.3
Had PNC visit	No	82	13.5
	Yes	525	86.5
Had abortion in the last 6 month	No	470	77.3
	Yes	137	22.7
Body mass index	<18.5 kg/m^2	157	25.9
	≥18.5 kg/m^2	450	74.1

Table 3. Environmental and Health-Related Conditions of Lactating Mothers at Shebedino District, Sidama Regional State, Ethiopia, 2020.

Variable	Category	Frequency	Percentage
Source of drinking water	Pipe	503	82.9
	Protected well/spring	104	17.1
Cement/raw wood floor	No	158	26.0
	Yes	449	74.0
Latrine available	No	37	6.1
	Yes	570	93.9
Ownership of the latrine	Private	480	84.2
	Communal/shared	90	15.8
Refuse disposing site	Open field	27	4.4
	Pit-hole	265	43.7
	Burning	228	37.5
	Garbage can	63	10.4
	Others	24	4.0
Type of water collection container	Pot	11	1.8
	Jerry can & bucket	596	98.2
Had diarrhea in the past 2 weeks	No	595	98.0
	Yes	12	2.0
Had cough in the past 2 weeks	No	599	98.7
	Yes	8	1.3

and cultural differences among study participants as well as the difference in study period and settings.

The finding of this study was lower when compared with previous results from the Dedo and Seqa-Chekorsa districts of Jimma zone (40.6%)[22] and Samre district (31%).[23] This discrepancy might be occurred due to the difference in the study setting and period. Similarly, variation of socio-economic status and food eating habits could contribute to dissimilarities in the findings.

The lactating women who had polygamous husband were 3.46 times more likely to be undernourished as compared with those women who had monogamous husbands. This finding is supported by similar study previously done in

Table 4. Bivariable and Multivariable Logistic Regression Analysis for Factors Associated with Undernutrition among Lactating Women at Shebedino District, Sidama Regional State, Ethiopia, 2020.

		Undernourished			
Variables		Yes	No	COR (95% CI)	AOR (95% CI)
Had polygamous husband					
	No	134	442	1	1
	Yes	23	8	9.48 (4.14, 21.69)	3.46 (1.13, 10.68)*
Family size					
	≤5	93	358	1	1
	>5	64	92	2.67 (1.80, 3.95)	1.81 (1.16, 2.83)
Household's wealth status					
	Rich	19	91	1	1
	Medium	51	168	1.43 (.80, 2.58)	2.07 (1.06, 4.03)**
	Poor	87	191	2.15 (1.23, 3.74)	3.84 (1.89, 7.80)**
Latrine available					
	No	17	20	3.45 (1.14, 10.44)	1.67 (.47, 5.93)
	Yes	150	420	1	1
Had abortion in last 6 months					
	No	101	369	1	1
	Yes	57	80	2.59 (1.73, 3.89)	3.08 (1.73, 5.51)**
Had antenatal care follow-up					
	No	15	14	3.29 (1.55, 6.98)	1.70 (.67, 4.38)
	Yes	142	436	1	1
Place of child delivery					
	Health facility	137	421	1	1
	Home	20	29	2.12 (1.16, 3.86)	2.01 (.99, 4.045)
Source of drinking water					
	Pipe	183	320	1	1
	Well/spring	64	40	1.79 (1.21, 2.68)	1.80 (.98, 3.30)

*Statistically significant at P < .05.
**Statistically significant at P < .001.

Kenya.[24] A more likely explanation might be most women are economically dependent on their husbands and cannot afford the cost of well-nourished and dietary diversity unless they get support from their husbands. In addition, the husband could be so busy to contribute equally to his wives. So, these factors might bring a shortage of nutritious foods for lactating mothers that cause undernutrition.

The finding of this study also revealed that the lactating women who belonged to households with less than 5 members were 1.81 times more likely to be undernourished when compared with those who had less than 5 family members. This finding was supported by previous studies conducted in Ethiopia.[4,25] The possible reason for this might be that when the number of family members increases, the demand for food also increases. So, this might affect access to enough and nutritious food for lactating women. On the other hand, increasing family size has the possible risk of overcrowding that could lead to the spread of various infections, which lead to malnutrition.[18,21,23]

The probability of being undernourished was 3.85 and 2.07 times higher among lactating women with poor and medium wealth status, respectively, when compared with the rich women. This result was consistent with the study conducted in India,[26] Bangladesh,[27] and Ethiopia.[28]

A possible reason for this might be lactating women with low-income status could not afford varieties of foods with high nutritious value. As a result, these might contribute to a household's food insecurity and lead to malnutrition.

This study also showed that lactating women who had history of abortion in last 6 months was 3.09 times more likely to be undernourished when compared with those not had an abortion. This study result was supported by previous study conducted in Bahir Dar.[29] A probable explanation for this might be that lactating women who had an abortion history could be exposed to anemia and different infections that lead to undernutrition. As a result, their chance of being malnourished could be high.

Limitations of the Study

Impossibility of assessing causal effects of the predictors on outcome variable due to a cross-sectional nature of the study design applied. Some of the responses might suffer from recall bias, but this was minimized by reminding them about

the events. An anthropometric measurement fault would occur; however, it was minimized by training the data collectors and calibrating the instrument.

Conclusion

This study revealed that more than one-fourth of the study participants were undernourished. Having a polygamous husband, belonging to households with less than 5 members, having an abortion in the last 6 months, and being poor and medium by household wealth status were predictors significantly associated with undernutrition among them. Giving due attention to family planning services to minimize family size and prevent abortion and improving the economic status of the women are necessary. Also, educating communities on the consequences of marrying more than one wife (polygamy) is crucial to decrease this problem.

Appendix

Abbreviations

ANC	Antenatal Care
BMI	Body Mass Index
AOR	Adjusted Odds Ratio
COR	Crude Odds Ratio
SPSS	Statistical Package for Social Science Students

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Authors' Contributions

YH made considerable contributions to conception and design, data analysis and interpretation of the result. AD contributed in design, data analysis, interpreting the results, preparing and revising the document. Both authors revised and gave the final approval of the version to be published.

Declaration of Conflicting Interests

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Ethics Approval

Ethical Clearance Was Obtained from the Institutional Review Board of Hawassa University College of Medicine and Health Sciences (Ref. No: IRB/097/12). Official Support Was Obtained from the Shebedino District Health Office.

Informed Consent

Informed written consent was taken from the study participants prior to study initiation. Study subjects found with nutrition problems were linked to the service at nearby the health facility.

Data Availability

The finding of this study is generated from the data collected and analyzed based on stated methods and materials. The original data supporting this finding are available from the corresponding author on reasonable request.

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