

RESEARCH ARTICLE

Factors Associated with Underweight among Lactating Mothers in Adama District, Oromia Region, Ethiopia

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Abstract

Introduction: In Sub-Saharan Africa, including Ethiopia, there is a high prevalence of malnutrition among lactating mothers. To reduce Underweight problems among lactating mothers Ethiopia government implemented different programs.

Objective: The aim of this study was to identify the associated factors of underweight among lactating mother in the Adama district, East Shoa Zone, Oromia Region, Ethiopia, 2016.

Method: A community based cross-sectional study design was conducted from January 15 to March 30 2016, using quantitative data collection method. Simple Random Sampling was used to select a sample of 662 lactating mothers registered in family folders in at healthy post. The collected data were principal analyzed using logistic regression by SPSS version 20.

Result: Educational status (AOR, 4.96; 95% CI: 1.12, 21.96), waste disposal practices (AOR, 3.63; 95% CI: 1.91, 6.89), postnatal service (AOR, 1.98; 95% CI: 1.12, 3.48) and advice from health workers on nutrition (AOR, 2.07; 95%CI: 1.29, 3.33) were factors significantly associated with maternal underweight.

Conclusion and Recommendations: Factors like education, postnatal service utilization, and advice during pregnancy were associated with underweight among lactating mothers. Health education and promotion towards enhancing nutritional status, hand washing after toilet utilization of lactating women should be given starting from pregnancy period.

Keywords: Lactating Women; Under Weight; Associated Factor

Introduction

Malnutrition is a state in which a deficiency, excess or imbalance of energy, protein and other nutrients causes measurable adverse effects on tissue/body form (body shape, size and composition), function or clinical outcome [1]. Hence adequate nutrition is an essential prerequisite for maintaining health status [2]. The critical role nutrition plays in health and development warrants greater commitment and investment in nutrition [2].

Evidences from low income countries suggests that maternal lactation can support adequate infant growth during the first six months although the consequences for maternal nutrition in the whole period are not clearly known [2,3]. The untenable situation in Africa demands that nutritionists take lead in placing the nutritional status of the vulnerable at the center of any discussions concerning globalization and development [4]. However, the appropriate finding and effective ways to reduce the prevalence and associated factors of malnutrition in Africa remains a challenge for nutritionists and agriculturalists.

Ethiopia had the second highest rate of malnutrition in Sub-Saharan Africa [5]. Acute and chronic malnutrition, Vitamin A deficiency, Iodine deficiency disorder, and iron deficiency are the major nutritional health problem having public health importance in Ethiopia [6]. It was identified that malnutrition is happening as a result of complex social, economic, and other crosscutting issues and thus requires coordinated efforts for correction [7].

In order to address the nutritional problem the government of Ethiopia had developed a National Nutrition Strategy with the long term program lasts from 2008- 2013 divided in two phases based on a thorough assessment of problems and issues for the implementation [6]. Hence the Ministry of Health of Ethiopia in collaboration with partner organizations developed the National

Nutrition Program (NNP) to implement the strategy with the aim of reducing the magnitude of malnutrition amongst under five children, pregnant and lactating mother [6].

Moreover, to mitigate underweight the government of Ethiopia has tried to capacitate the Health Extension Workers and all other health workers by providing pre-service and in-service trainings [8,9]. Additionally, awareness rising was continuously given to pregnant and lactating mothers using Female Development Army [9]. Also, nutritional support is being given for those pregnant and lactating mothers exposed to underweight after screening in the selected vulnerable places of a country including the study area [9]. Despite these, no study was conducted in the study area and this study was intended to determine the associated factors of underweight among lactating mothers in Adama district of East Shoa zone, Oromia region located in the rift valley area.

Methods and Materials

Study area and period

The study was conducted in Adama districts, Oromia Region of Eastern Ethiopia from January 15 to March 30/2016. Oromia is one of the nine Regional States of Ethiopia having 18 Wereda/district and 13 town administration. Adama town is the capital of the district, which is located 99km from the Addis Ababa (the capital of Ethiopia) toward the East. Adama Wereda/district is located in East Shoa Zone, in the Oromia Regional State. The total population of the district during 2016 was 183,503 of which 93,587 (51%) were male and 89,916 (49%) were female [9]. Detailed description of the study area was published elsewhere [10].

Study design

A community-based cross-sectional study was conducted using quantitative data collection method.

Population

All lactating mothers living in Adama district and registered in the family folder at Health Posts during the study period were the source population. While, a randomly selected lactating mothers who met the selection criteria were the study population.

Inclusion and Exclusion Criteria

Those lactating mothers aged 15 years and above, living in the study area for six months and above and able to give oral consent were included. While, those lactating mothers who were critically ill, had the hearing impairment and had physical deformities during anthropometric measurements were excluded from the study.

Sample Size determination

The sample size was determined using single population proportion formula with the assumption of 26.7% prevalence of malnutrition among lactating mothers, 95% confidence level and a 5% margin of error between sample and population parameter. Hence, the sample size (n) was calculated as follows [11].

$$n = \frac{(Z\alpha / 2)^2 p(1-q)}{d^2} = \frac{(1.96)^2 0.267 \times 0.733}{0.05^2}, n = 301 + 30 = 331,$$

Where: n= sample size, Z value corresponding to a 95% level of significance = 1.96, the expected prevalence of malnutrition among lactating mother (P) = 26.7%. The calculated sample size (n) = 331. Considering the design effect of two because of the multistage nature of sampling and the addition of 10% non-response rate the final sample size was found to be 662.

Sampling Procedure

Firstly, five from the seven Primary Health Care Units (PHCU) were randomly selected from the three geographic areas. Secondly, under the selected PHCU, 12 health posts were selected by lottery method. Thirdly, based on the population of the Kebeles (lowest level in the government administrative structure) the number of study participants was proportionally assigned.

Operational definitions

Underweight: is the nutritional status of lactating mothers, who had <18.5 BMI Kg/m²

Lactation: The period of milk secretion

Enjera: Is the type of food prepared from flour of Tef (eragroots), wheat, maize or the mixture of these cereal crops and many times sorghum flour also mixed with Tef flour.

Shiro- watt: Are the types of food commonly eaten with Enjera and prepared from the Onion, Oil, and flour of roasted Bean, Peas, chick pea or ventch.

Roasted Grain: These are prepared from roasted Barley, Wheat, Maize or chickpea. It can be prepared from a mixture of two or more than two types of those crops.

Boiled Grain: Like roasted grain it is prepared from maize, barley, wheat, chicken pea, lentils, Bean, pea. And for the many times it is prepared from mixture of two of these cereal crops.

Weight (Kg): was measured by electronic scales with digital display (UNICEF SECA Electronic weight scale (± 10 precision scale) and Participants was asked to remove their shoes and any bulky clothing during measurement was taken.

Height (m): was measured using a portable stadiometer with a sliding head plate, a base plate and connecting rods marked with a measuring scale. Participants were asked to remove their shoes.

Body Mass Index (BMI): A simple measurement of body weight in relation to height. The result was interpreted according to WHO classification, less than 18.5 BMI Kg/m² underweight, from 18.5 up to 24.9 BMI Kg/m² as normal, 25 to less than 29.9 BMI Kg/m² as overweight, and 30 or more obese and 40 or more indicates morbidly as obese [12].

Data collection

A total of 12 Health Extension Workers and five supervisors (Medical officers) were involved in the data collection process. Three days intensive training was given on how to perform standardized height and weight measurement and on interviewing techniques using standard checklist and structured questionnaire. The checklist and questionnaires were translated into a regional working language (Afaan Oromo) and translated back to English by experts. The questionnaire included information on demographic characteristics and maternal health service utilization. The calibrated instrument was used to measure height and weight.

Data Quality assurance

The Standard Operating Procedure adopted from WHO anthropometric measurement manual was used on how to measure correct height and weight [13]. The weight scale was calibrated using known the weight (Kg) and height scale was calibrated using meter tape. Pretesting of the data collection process and the instrument was done in two Kebeles on similar study subjects in the district that were not included in the study. During data collection, continuous supervision was done by the supervisors and principal investigator.

Data processing and analysis

The data were checked, cleaned and entered into SPSS software for windows version 20. Descriptive statistics were computed to determine the prevalence of underweight among lactating mothers. Both bivariable and multivariable analyses were employed to identify the associated factors of underweight among lactating mothers. Forward stepwise selection of variables was used for multivariable logistic regression analysis. Those variables with P- value of less than 0.2 were selected and retained for multivariate analysis to test the net effect of each selected predictor variable on the dependent variable for controlling confounding. In the final model the odds ratio determined from the binary logistic regression was used to identify the strengths and directions of the associated factors and P-values of less than or equal to 0.05 were considered to be statistically significant. All the assumptions for the analysis were checked to be satisfied.

Ethical consideration

Ethical clearance was obtained from College of Health and Medical sciences, Arsi University Ethical Review Committee. The official letter was written to Adama District Health Offices and to the respective Kebeles. The participants were informed that they had the full right to participate or not to participate in the study as well as withdraw any time during the interview and measurements. Confidentiality was assured throughout the data collection and coding was done without a name of the respondents. Also, the respondents were told that any information collected from them would be kept confidential. Consent was obtained from all individual respondents.

Results

Socio-demographic characteristics of the respondents

All the sampled 662 lactating mothers were participated in to the study, making a response rate of 100%. The mean (+SD) age of the respondent was 26.79 (+5.96) years ranged from 16 to 48 years. Half (50%) of the respondents were between the age of 25-34 years. One hundred three (15.6%) gave birth within the last three months before the survey. The predominant (88.2%) ethnic group was Oromo. Three hundred fifty-six (53.8%) participants were Orthodox by their religion and 96.2% were married during the time of data collection. About 59.4% of the participants were not educated, and 234 (35.3%) were attended primary education (Table 1).

From the study participants about 19.5% were underweight and this was published elsewhere [10]. Four hundred forty seven (67.5%) of the study participants ate Enjera with Shiro-watt at breakfast. About 23.3% ate bread with tea. Then the proportion of mothers ate Enjera during lunch and dinner was 84.7 and 67.8, respectively. All study participants reported for the absence of traditional belief that inhibits from eating culturally acceptable foods during pregnancy and lactation period. Participants were asked about the source of dietary use and 26 (3.9%) and 36 (5.4%) were using from their own production and market, respectively. However, the majority of mothers (72.4%) reported that their families got food aid from the government.

Variables		Frequency	%
Age in years	15-19	60	9.1
	20-24	189	28.5
	25-29	191	28.9
	30-34	134	20.2
	35-39	74	11.2
	>=40	14	2.1
Education	Not Educated	393	59.4
	Primary Education (1-8)	234	35.3
	Seconder and above	35	5.3
Religion	Orthodox	356	53.8
	Protestant	141	21.3
	Muslim	127	19.2
	Wakefata	38	5.7
Ethnicity	Oromo	584	88.2
	Ahmara	78	11.8
Marital status	Married	637	96.2
	Others*	25	3.8
Occupation	Farming	160	24.2
	Housewife	457	69.0
	Others**	45	6.8

NB: *Others- unmarried, separated, Divorced, widowed,

**Others-Trade, Employ, Day labor

Table 1: Socio-demographic characteristics of lactating mothers, Adama District, East Shoa Zone, Oromia Region, Ethiopia, April 2016. Maternal dietary practices and health care utilization

Four hundred ninety one (74.2%) mothers reported to eat with their family members and 140 (21.1%) used to eat after all other family members had eaten. Only 22 (3.3%) of mothers reported to have food before their family members and nine (1.4%) reported to have eaten as they need.

Six hundred twenty one (93.8%) of the study participants reported that they had attended antenatal care during their pregnancy of the last child. Five hundred ninety nine (90.5%) of them attended postnatal care of which 350 (52.9%) have got the services within 72 hours of delivery. About 81.7% of the study participants have toilet during the study time and reported for using it. Less than half (42.6%) of them used to wash their hands after the toilet use. Only about one out of five (21.9%) respondents was disposing household waste in the open field (Table 2) [14].

Variables (n= 662)		Frequency	%
Breakfast	• Enjera with shuro Watt	447	67.5
	• Bread, Bread with tea many times	154	23.3
	• Others*	53	8.0
Lunch	• Enjera with shuro watt	561	84.7
	• Bread or Bread with tea	53	8.0
	• Others**	46	6.9
Dinner	• Enjera with Shuro watt	508	76.7
	• Bread or Bread with Tea	41	6.2
	• Others***	113	17.1
Food Aid	• Yes	479	72.4
	• No	183	27.6
Source of staple food	• Owen production	26	3.9
	• Purchasing	36	5.4
	• Food Aid	34	5.1
	• Purchase and Food Aid	103	15.6
	• Production, Purchase and Food Aid	193	29.2
	• Production and purchase	129	19.5
	• Production and Food Aid	140	21.1

Variables (n= 662)		Frequency	%
Source of income to purchase staple food	• Salary	11	1.7
	• Day labor	319	48.2
	• Purchasing of cattle	48	7.3
	• Cattle purchasing and day labor	81	12.2
Toilet Facility	• Yes	541	81.7
	• No	121	18.3
Hand washing	• Yes	282	42.6
	• No	380	57.4
Waste disposal	• Open field	145	21.9
	• In garden	412	62.2
	• In pit	105	15.9
Antenatal care	• Yes	621	93.8
	• No	41	6.2
Numbers of ANC attendant	• Four times and above	386	58.3
	• Three times	143	21.6
	• Two and less times	133	20.1
Mothers attend PNC services	• Yes	599	90.5
	• No	63	9.5
Time of postnatal care	• Within 72 hours	350	52.9
	• Within a month	121	18.3
	• After a month	191	28.9

NB: *Others - Porridge, diary product occasionally, roasted and Boiled grain, **Others- Boiled or roasted grain, Porridge, ***Others- Roasted and Boiled grain, Porridge

Table 2: Dietary practice and health service utilization of lactating mothers, Adama District, East Shoa Zone, Oromia Region, Ethiopia, April 2016. Factors associated with Underweight among Lactating mothers

In multivariable analysis, maternal education, advice from health workers on nutrition, open field waste disposal, hand washing practice after toilet utilization and time of postnatal service were significantly associated with underweight among lactating mothers. Accordingly, lactating mothers who never attended education were more than four times (AOR, 4.96; 95% CI: 1.12, 21.96) as likely to be underweight compared to those attended primary education and above. Lactating mothers disposed household wastes on open field were more than three times (AOR, 3.63; 95% CI: 1.91, 6.89) as likely to be underweight compared to those who disposed to the household wastes to disposal pit. Similarly, those lactating mothers who hadn't got advise on nutrition were more than two times (AOR, 2.07; 95%CI: 1.29, 3.33) as likely to be underweight compared to their counterparts. Also, those lactating mothers, not having a postnatal service from health professional within 72 hours after delivery were about two times (AOR, 1.98; 95% CI: 1.12, 3.48) more likely to be underweight compared to those having postnatal services within a 72 hours after delivery (Table 3).

Variables	Underweight				COR (95% CI)	AOR (95% CI)	
	Yes No (%)	No No (%)	No No (%)	No No (%)			
Maternal Education	• Primary and above	28	16.8	241	83.2	1:00 (Reference)	1:00(Reference)
	• No Formal	101	25.7	292	74.3	5.71 (1.35, 24.21)*	4.96 (1.12,21.96)*
Hand washing after toilet	• No	50	13.2	330	86.8	2.57 (1.73,3.81)*	1.57 (0.99,2.48)
	• Yes	79	28	203	72	1.00 (Reference)	1:00(Reference)
Waste disposal	• Open field	55	42	359	54	2.59 (1.44, 4.69)	3.63 (1.91,6.89)***
	• In the garden	54	13.1	358	86.9	0.64 (0.36, 1.13)	1.11 (0.59, 2.08)
	• Pit	55	37.9	90	62.1	1:00 (Reference)	1:00 (Reference)
Got advice on Nutrition	• No	62	14.9	355	85.1	2.16 (1.46,3.18)***	2.07(1.29,3.33)***
	• Yes	67	27.3	178	72.7	1.00 (Reference)	1:00 (Reference)
Got early PNC (within 72 hr)	• Yes	53	5.1	297	84.9	1:00 (Reference)	1:00 (Reference)
	• No	76	48.6	236	51.4	1.77 (1.06,2.94)*	1.98 (1.12,3.48)*

NB: ***p-value <0.001 ** p-value <0.01* p-value <0.05 COR- Crude Odds Ratio; AOR- Adjusted Odds Ratio

Table 3: Factors associated with Underweight in Adama District, East Shoa zone, Oromia regional state, Ethiopia, April, 2016

Discussion

This study identified the associated factors of underweight among lactating mothers in the study area. Indeed the nutritional status of lactating mother was measured by Body Mass Index (BMI) based on WHO standard classification that has been published before [10].

In the current study, respondents who didn't attend any formal education were more likely vulnerable to underweight than those who attended primary and above educational level. Supporting the study from Ghana, the rate of maternal underweight was higher among women with no education, showing 11% compared to 7% for those with at least primary or secondary school education [15]. This goes with the idea that individuals with higher educational levels have better nutrition knowledge and nutritional status. Ethiopia Mini Demographic and Health Survey of 2014 indicates that only 42% of females have some primary education [16]. But the result of Ethiopian DHS of 2010 findings revealed that education of women in rural areas was not significantly associated with underweight of the lactating mothers [17]. Indeed, education is a key determinant of individual opportunities, attitudes, economic and social status [18].

Next to the provision of education, the health worker advice during pregnancy and lactation plays an important role to reduce undernutrition problems. The result of the present study indicated that lactating mothers who hadn't got advice from health workers either during pregnancy or lactation were more likely to be underweight. Participants reported that the absence of food inhibited during pregnancy and lactation period. This attitude and practice were attributed to be developed through health education given to them by health workers or Health Extension Workers. The findings from Kenya and India revealed that cultural beliefs and practices had an effect on the nutrient intake of the women [19,20].

In this study, only 42.6% of study participants washed their hands with soap or ash after toilet use. Indeed, the hand washing Handbook published in USA listed the hand washing practices after defecation for 34% in India, 35% in Ghana, 31% in Senegal and 6% in Peru [21]. Hand washing with soap or ash can prevent the transmission of a variety of pathogens. It may be more effective than any single vaccine or hygiene behavior [21]. This study also indicated that lactating mothers who washed hands with soap or ash after toilet facility were less likely exposed to infectious diseases that lead to underweight than their counterparts. Lactating mothers have a high probability to be contaminated with feces during the time of cleaning their child after defecation. Inadequate sanitation facilities result in an increased risk of diarrheal disease, which might contribute to underweight. Basically, human feces are the main source of diarrheal pathogens [22]. Moreover, study participants who disposed household wastes to open fields were more likely vulnerable to be underweight than those who disposed household wastes in the waste disposal pit. Poor handling and disposal of household wastes are major causes of environmental pollution, which creates breeding grounds for pathogenic microorganisms [23].

In this study, having early PNC from health professionals is a protective effect for underweight among lactating mothers. This is a time when nutritional information is widely provided and might contribute to the lower probability of getting underweight. Approximately one-third of women in sub-Saharan Africa give birth in facilities, and only about 13% receive a postnatal care visit within two days of delivery. Also, from another report, early postnatal care provided to mothers within three days after delivery by trained health workers was 57% in Bangladesh, 30% in Bolivia, 26% in Mali, 22% in Pakistan and 50% in Nepal [18]. For mothers, early postnatal care services are an opportunity to receive information and support for healthy behaviors such as getting proper nutrition during breastfeeding [19].

As to the limitation of this study, seasonal variation in food consumption might exist, so that results regarding dietary information are only limited to the specific season of the year in which the study was conducted. Moreover, due to climatic (El Niño) challenges encountered in the country and in the district as well, the majority of lactating mothers were given food aid from the government according to their family size and this might have influenced the result, because the majority of rural residents of the district exist under similar food insecurity. Data was collected during which the majority of kebeles in the district declared the open defecation free and the women had awareness regarding environmental sanitation.

Conclusion and Recommendation

Among the respondents, 19.5% were underweight. Educational status, waste disposal practices, postnatal service and advice from health workers on nutrition are factors significantly associated with underweight among lactating mothers. Health education and promotion towards enhancing nutritional status, hand washing practices after toilet utilization should be given starting from pregnancy period. Special support and advice should be given to girl students to advance in their education level before marriage. Further researches using laboratory investigations are also recommended.

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