Prevalence of Chronic Energy Malnutrition and Maternal Health Service Utilizations among Lactating Mothers in Adama District, Oromia Region, Eastern Ethiopia

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Abstract

Introduction: High prevalence of malnutrition among lactating mothers is very common in Sub-Saharan Africa including Ethiopia. Determining nutritional statuses among lactating mothers helps to provide information and guides to design proper interventions program.

Objective: The aim of this study was to assess maternal health service utilizations and nutritional statuses among lactating mother in Adama district from January to March 2016.

Methods: A community-based cross-sectional study was conducted using quantitative data collection method. Simple Random Sampling was used to select a sample of 662 lactating mothers in the district. The collected data was entered into SPSS version 20.

Results: Then mean (+SD) BMI of respondents was 20.4 (+2.22 SD) Kg/m². One hundred twenty-nine (19.5%) of respondents scoring less than <18.5 Kg/m² and considered to have Chronic Energy Malnutrition (underweight). Six hundred twenty-one (93.8%) of the study participants attended antenatal care during their index pregnancy and 90.5% have got PNC services from health workers.

Conclusion and recommendations: A significant proportion (19.5%) of respondents were exposed to under nutritional status and suffered from underweight. However, the vast majority have used ANC (93.8%) and PNC (90.5%) utilization from health professionals. Emphasis should be given to promote and enhance the nutrition programs among the lactating mothers.

Keywords: Lactating mother; Maternal health service utilization; Nutritional status

Introduction

Malnutrition is a general term for the medical condition caused by an improper or insufficient diet [1]. 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]. Women’s heavy workloads and domestic responsibilities also make them vulnerable to malnutrition. Lactating women have increased demands for energy and nutrients above both the prepregnancy and pregnancy requirements because lactation is an energy expensive process [1]. In poorest countries, especially Sub-Saharan Africa including Ethiopia there is the high burden of malnutrition problem among lactating mothers. Determining chronic energy deficiency among lactating mothers helps to provide information which guides to design proper interventions program.

Adequate nutrition is an essential prerequisite for maintaining health status. The critical role nutrition plays in health and development warrants greater commitment and investment in nutrition [2]. Ethiopia had the second highest rate of malnutrition in Sub-Saharan Africa; and acute and chronic malnutrition and vitamin A, iodine, and iron deficiencies were major public health problems [3]. Malnutrition is a result of complex social economic and crosscutting issues, which require coordinated efforts to correct [4]. Evidence from poor, developing 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 [5]. 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 [6]. However, the findings appropriate and effective ways to reduce the prevalence of malnutrition in Africa remains a challenge for nutritionists and agriculturalists [6]. In order to address the malnutrition problem comprehensively and to accelerate the rate of progress, the Federal Ministry of Health of Ethiopia developed a National Nutrition Strategy which was the long-term program lasts 2008 -2013 divided into two phases, based on a thorough assessment of problems and issues to guide the implementation of the strategy (3). This strategy was aimed at reducing the magnitude of malnutrition in Ethiopia, especially amongst children under the age of five and pregnant and lactating women [3].

In order to mitigate the problem of Chronic Energy Deficiency among pregnant and lactating mothers in Ethiopia, the government did capacity building for Health Extension Workers and health task force [3]. Additionally, using Female Development Army awareness raising is given to the women especially, for pregnant and lactating mothers.

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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 of 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 gave oral consent were included. While, those lactating mothers who were critically ill, had the hearing impairment and had physical deformity 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 mother [9], 95% confidence level and 5% margin of error between sample and population parameter. Hence, the sample size (n) was calculated as follows.

\[
\begin{align*}
N &= \frac{Z^2 \times p \times (1-p)}{d^2} + 30 \\
&= \frac{(1.96)^2 \times 0.267 \times 0.733}{0.05^2} + 30 \\
&= 331
\end{align*}
\]

Where,

- \(N\) = sample size.
- \(Z\) value corresponding to a 95% level of significance = 1.96.
- \(p\) = the expected prevalence of malnutrition among lactating mother (P) = 26.7%.
- \(d\) = margin of error.

mothers determined by having BMI of less than 18.5 Kg/m2

Obese: Obese is the nutritional status of lactating mother having the BMI of more than 25 Kg/m2

Lactation: Lactation is the period of milk secretion for lactating mother (two years in Ethiopian context)

Weight (Kg): Weight 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): Height 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 Kg/m2 of Chronic Energy Deficiency

The calculated sample size (n) = 331. Considering the design effect of two because of the multistage nature of sampling and addition of 10% non-response rate the final sample size was found to be 662.

Sampling procedure

Firstly, five from the seven PHCU were randomly selected. Secondly, under the selected PHCU, 12 health post were also selected by lottery method. Tidily, based on the population of the Kebeles the number of study participants were proportionally assigned (Table 1). Lastly, to select the study participant the family folders having the lactating mothers were selected in the health posts and systematic random sampling was used to identify the target group. In the identified family folder only one lactating mother was selected if there were two or more target groups to control for intra-household correlation (Figure 2).

Operational definitions

Chronic energy deficiency: It is the nutritional status of lactating mothers determined by having BMI of less than 18.5 Kg/m2

Table 1: Lists of health centers and health posts for selecting lactating mothers from Adama districts, April, 2016 (n=662).

<table>
<thead>
<tr>
<th>Health centers</th>
<th>Name of Kebeles (HP)</th>
<th>Pop. of 2016</th>
<th># Lactating mother</th>
<th>#Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awash Melkasa</td>
<td>Awash malkasa Town</td>
<td>5475</td>
<td>137</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td>Adulala Haxee Haroret</td>
<td>5000</td>
<td>127</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Gorowaglo</td>
<td>2412</td>
<td>73</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Batu Dagaga</td>
<td>6856</td>
<td>171</td>
<td>97</td>
</tr>
<tr>
<td>Chekadawaro</td>
<td>Bokoje Dawero</td>
<td>4717</td>
<td>118</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>Ejeraaamersa</td>
<td>2965</td>
<td>105</td>
<td>42</td>
</tr>
<tr>
<td>Galdia</td>
<td>Galdiamukyee Egu</td>
<td>5013</td>
<td>125</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>Merebemarmarsa</td>
<td>3210</td>
<td>97</td>
<td>45</td>
</tr>
<tr>
<td>MukiyeHaro</td>
<td>Mukeye Haro</td>
<td>3686</td>
<td>96</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Bubisaksusaye</td>
<td>3935</td>
<td>101</td>
<td>55</td>
</tr>
<tr>
<td>Gadamasa</td>
<td>Debi kaloo</td>
<td>961</td>
<td>48</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Gadamasa kurlaa</td>
<td>2773</td>
<td>83</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>47002</td>
<td>1281</td>
<td>662</td>
</tr>
</tbody>
</table>

Figure 2: The Schematic Presentation of sampling procedures of to select lactating mother in Adama district 2016.
(underweight), from 18.5 to 24.9 Kg/m² of normal, 25 to 29.9 Kg/m² of overweight, 30 Kg/m² and above as obese and 40 Kg/m² or more indicates morbidly obese [10].

Data collection

A total of 12 health extension workers and five supervisors (Medical officers) were involved in data collection process. Three days intensive training was given on how to perform standardized height and weight measurement and on interviewing techniques using standard and structured questionnaire. The checklist and questionnaires were translated into a regional working language (Afaan Oromo) and back translated to English by experts. The questionnaire included information on demographic characteristics and maternal health service utilization. The calibrated instrument was used to measures 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 [9]. 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 collected data was checked, cleaned, coded and entered into SPSS version 20 by the principal investigator. The analyses were done according to the objective of the study. Findings were statistically analyzed for frequency, percentages and other summary measures.

Ethical considerations

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 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 to withdraw any time during the interview and measurements. Confidentiality was assured throughout the re-coding without a name and coding of questionnaires and placed in the safe place after it has been collected. Also, they 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 mother were participated 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. The majority (325) 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. About 59.4% of the participants were not educated and 234 (35.3%) were attended primary education (Table 2).

Maternal healthcare and services utilization

Six hundred twenty-one (93.8%) of the study participants reported that they had attended ANC during their pregnancy of the last child. More than half (58.3%) have got ANC for about four and above times, while about one in five of the participant got the services for two and fewer times. In a similar manner, five hundred ninety-nine (90.5%) of them attended postnatal care and 350 (52.9%) of them got services within seventy-two hours after delivery.

Maternal nutritional status

The mean (+SD) BMI of respondents was 20.4 (+2.22) Kg/m². From the study participants about 129 (19.5%) had BMI of <18.5 Kg/m² and considered to have Chronic Energy Deficiency (underweight). About 59.4% of the participants were not educated and 234 (35.3%) were attended primary education (Table 2).

Discussion

Women are generally vulnerable to undernutrition especially during pregnancy and lactation where the food and nutrient requirements are more during that period. A community-based cross-sectional study was conducted to assess the magnitude of malnutrition

Table 2: Socio-demographic characteristics of study participants, Adama districts, April 2016 (n=662).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Response category</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of lactating mothers in years</td>
<td>15-19</td>
<td>60</td>
<td>9.1</td>
</tr>
<tr>
<td></td>
<td>20-24</td>
<td>189</td>
<td>28.5</td>
</tr>
<tr>
<td></td>
<td>25-29</td>
<td>191</td>
<td>28.9</td>
</tr>
<tr>
<td></td>
<td>30-34</td>
<td>134</td>
<td>20.2</td>
</tr>
<tr>
<td></td>
<td>&gt;=35</td>
<td>98</td>
<td>13.3</td>
</tr>
<tr>
<td>Education</td>
<td>Not educated</td>
<td>393</td>
<td>59.4</td>
</tr>
<tr>
<td></td>
<td>Primary Education</td>
<td>234</td>
<td>35.3</td>
</tr>
<tr>
<td></td>
<td>Secondary and above</td>
<td>35</td>
<td>5.3</td>
</tr>
<tr>
<td>Religion</td>
<td>Orthodox</td>
<td>356</td>
<td>53.8</td>
</tr>
<tr>
<td></td>
<td>Protestant</td>
<td>141</td>
<td>21.3</td>
</tr>
<tr>
<td></td>
<td>Muslim</td>
<td>127</td>
<td>19.2</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Wakefata</td>
<td>38</td>
<td>5.7</td>
</tr>
<tr>
<td>Marital status</td>
<td>Married</td>
<td>637</td>
<td>96.2</td>
</tr>
<tr>
<td></td>
<td>Others*</td>
<td>25</td>
<td>3.8</td>
</tr>
<tr>
<td>Mother’s main occupation</td>
<td>Farming</td>
<td>160</td>
<td>24.2</td>
</tr>
<tr>
<td></td>
<td>House wife</td>
<td>457</td>
<td>69.0</td>
</tr>
<tr>
<td></td>
<td>Others**</td>
<td>45</td>
<td>6.8</td>
</tr>
<tr>
<td>Family size</td>
<td>1-3</td>
<td>181</td>
<td>27.3</td>
</tr>
<tr>
<td></td>
<td>4-6</td>
<td>304</td>
<td>45.9</td>
</tr>
<tr>
<td></td>
<td>&gt;=7</td>
<td>177</td>
<td>26.7</td>
</tr>
</tbody>
</table>

Note: NB: Others* - Unmarried, separated, divorced, widowed Others** - Trade, Employ, Day labor.
among lactating women in Adama District, East Shoa zone, Oromia Region, Ethiopia. The nutritional status of the lactating mother was measured by Body Mass Index (BMI), weight in kilogram divided by height in meter square, based on WHO standard classification. Most of the participants 520 (78.5%) had a BMI of 18.5-24.9kg/m² and considered to have normal. However, a significant proportion of the study participants (19.5%) had a BMI of less than 18.5kg/m² considered to be underweight. This indicates that the prevalence of underweight corroborating the findings from Nekemete Referral Hospital and Health Centers for which about 20.5% of the lactating mother were reported to have underweight. However, a study conducted in slum communities of Addis Ababa and in Dedo and Seqa-Chekorsa districts of Jimma Zone showed 27.1% and 40.6%, respectively [9,11,12]. These differences might be due to the difference in the study period and time. The geographical difference may also explain the variations. The study result from Rural India during 2010 indicated the prevalence of undernutrition among lactating women of 39.7% [13], which is much higher than the present study. The variation might be due to the study design and target population. In the current study, the two percent of the participants were overweight which is supporting studies from Dedo district of Jimma zone showed the prevalence of 1.5%. However, it is less than the prevalence in Nekemete town and Seqa-Chekorsa district showed 6.2% and 6%, respectively [9,11].

Generally, the result of the present study is lower than the national and regional underweight record among women and it may be due to high utilization of ANC (93.8%) and PNC (90.5%). The study done in Dedo and Seqa-Chekorsa district indicated that only 22.8% lactating women had gone ANC services according to WHO standard of at least four and above times in which in the present study 58.3% had it which is also more than the national ANC coverage (41%) as indicated in Mini Demographic and Health survey of Ethiopia 2014 [14]. In the present study, 52.9% of the participants have got postnatal services from health workers within 72 hours and 18.3% of them got services within a month after delivery. Approximately one-third of women in sub-Saharan Africa give birth in facilities, and no more than 13% receive a postnatal care visit within two days of delivery. From Save the Children and Population Reference Bureau report the early postnatal care given to mothers by trained health workers within three days after delivery indicated 57% in Bangladesh, 30% in Bolivia, 26% in Mali, 22% in Pakistan and 50% in Nepal [15,16]. Indeed, Provision of early postnatal care services is an opportunity to receive information and support for healthy behaviors such as getting proper nutrition during breastfeeding and using family planning [16] (Table 3).

### Conclusion and Recommendation

A significant proportion (19.5%) of respondents were exposed to under nutritional status and suffered from underweight. However, the vast majority have used ANC (93.8%) and PNC (90.5%) utilization from health professionals. Since under-nutrition resulting in underweight in lactating mothers basically can affect both mother's and her child’s health. To reduce these consequences the government and the concerned bodies including non-governmental organization should enhance the nutrition programs for the lactating mother availing the screening and supporting schemes. Further researches is recommended for identifying the nutritional statuses of lactating mothers using laboratory investigations.

### Limitation of the study

Due to climatic (Eleno) challenges encountered in the district, the majority of lactating mother offered food aid from the government according to their family size. This may have influences on the present result as the majority of rural residents of the district are suffering from food insecurity. Moreover, the present study used the cut-off points for BMI from WHO manual, that may not strictly applicable to the study area.

### Strength of the study

This study grasped twelve rural Kebeles by considering the variations by geographical location of the district. Data were collected by trained and experienced Health Extension Workers under the strict supervision of health officers who will give support to the Kebeles health post. Moreover, the study used the primary data.

**References**