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Nutritional Status of under Two Years Old Infants in the Pastoral Community of Somali Regional State, Ethiopia: Case of Awbare District

Mulubrhan Kahsay[1,*], Tadele Tuba[1], Yerega Belete[2], Anbisa Muleta[1], Natnael Tadesse[1]

[1]Department of Food Science and Nutrition, Collage of Dry-land Agriculture, Jigjiga University, Jigjiga, Ethiopia
[2]Department of Public Health, Collage of Medicine and Health Science Jigjiga University, Jigjiga University, Jigjiga, Ethiopia

Abstract **Background:** Infants are at increased risk of malnutrition afterward of six months, when breast milk alone is no longer sufficient to meet their nutritional requirements. However, there has limited published documents in the study area. Thus, study was aimed to assess the complementary feeding practices and nutritional status of infants and young children aged 6–23 months at Awbare district of Somali Region, Ethiopia. **Method:** A community-based cross sectional study was employed in Awbare district on 180 mother-child pairs. Anthropometric measurements were collected from children aged 6–23 months and analyzed using ENA software. The Descriptive statistics was used to express results by frequency, percent (%) and mean. **Result:** The result of our study indicated that 6.1%, 56.1%, 10.0% of children in Awbare district were wasting, stunting and underweight respectively. **Conclusion:** The prevalence of under nutrition; stunting, underweight and wasting, among under-two children is very high in the study area. Thus, an intervention should be done by governmental and non-governmental organizations that aim at improving children's nutritional status.

Keywords Breastfeeding, Children feeding, Complementary feeding, Malnutrition, Stunting, Awbare district, Pastoral community

1. Background

Malnutrition is the largest risk factor in the world for disability and premature mortality among young children, especially in developing countries (Muller O, *et al.*, 2005). It is a background factor for deaths like diarrhea, measles, acute respiratory infection, meningitis and malaria (Pelletier DL, *et al*, 1995). In Ethiopia, 40%, 29% and 10% of children under five years of age are stunted, wasted and underweight, respectively (EDHS, 2011). An Ethiopian child is 30 times more likely to die by his or her fifth birthday than a child in Western Europe and the most common cause of child death is the interacting combination of malnutrition and infection (Joan J, Mesfin BH, 2008). Some children in low-income countries with high rates of malnutrition grow normally due to better education and household management, or coping skills of their mothers (Pelto GH, 2000) which mean that proper feeding practices, which ensure intake, are as important as the provision of complementary foods that meet nutritional requirements.

An analysis of data sets from several Latin American countries demonstrated that appropriate breastfeeding and complementary feeding practices were positively associated with child height-forage in most of the countries studied (Pelto GH, 2000). Transition from exclusive breastfeeding to family foods typically covers the period from 6 to 23 months of age. It is the time when malnutrition starts in many infants, contributing significantly to the high prevalence of malnutrition in children <2 years of age worldwide. During this time, complementary foods should be added to the diet of the child (Müller O, *et al,* 2005). It is needed to fill the gap in energy and other essential nutrients, between what is provided by exclusive breastfeeding and the total nutritional requirements of the infant. This gap increases with age, demanding an increasing contribution of energy and nutrients especially iron, from foods other than breast milk (WHO, 2009). Currently in Ethiopia, but also in many developing countries, interventions mainly address the issue of what to fed infants (Pelto*,* 2000). Although early childhood malnutrition can be attributable to poverty and lack of resources, family and caregiver characteristics, such as education and household management or coping skills of the mother, can determine normal growth and development. Lack of knowledge regarding appropriate foods and feeding practices can contribute to malnutrition to a greater degree

* Corresponding author:
smulu332@gmail.com (Mulubrhan Kahsay)
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than lack of food (Penny *et al.,* 2005). It is not only providing the appropriate combination of complementary foods to meet the child's nutritional needs that is important, but also feeding practices such as frequency of meals and feeding style need to be considered (Patrice, *et al*., 2005). However, there has not yet been information known about the current complementary feeding practice and prevalence of child malnutrition in a study area. Therefore, the aim of this study was to assess the complementary feeding practices and nutritional status of infants and young children aged 6-23 months.

2. Objective

General objective

- ✓ To assess the nutritional status of infant and young children aged 6-23 months among pastoral community of Somali Regional state.

Specific objective

- ✓ To evaluate the current complementary feeding practice of infant and young children aged 6-23 months.
- ✓ To assess the prevalence of child malnutrition in the district.

3. Methodology

Study site (area)

The study was conducted in Awbare district of faafan zone, Somali regional state, Ethiopia. Awbare is bordered on the southwest by Jigjiga, on the west by the Shinile zone, on the east by Somalia, and on the southeast by kebri beyah. Awbare is one Woreda of Somali regional state of Ethiopia which located about 80 km from Jigjiga city (town) with total numbers of population 405,161 (CSA, 2001).

Study Design

A cross-sectional study was used to assess the complementary feeding practice of infants and young children aged 6-23 months at the study area.

Study period

This study was conducted from February 2017 to March 2017 in Awbare district of fafan zone, Somali regional state.

Study Population

The study populationwere180 women whose children are aged between 6-23 months old of age living in Awbare district, and who have been breastfed for the first 6 months of life and history of breastfeeding and complementary feeding practices at the time of the study.

Sampling

The source of population in this study included all residents of Awbare district who had history of breastfeeding and complementary feeding practices of infants and young children aged 6-23 month. The sample size was calculated by using the single population proportion formula. Sample size calculation was obtained by using 34% of prevalence rate with a 95% confidence level and 5% tolerable error (Ma'alin, *et al*., 2016).

The calculated sample size is:

$$\boldsymbol{n_o = \frac{Z^2 pq}{e^2}}$$

Where:

n= Total sample size that was included in this study

Z is the standard normal deviate at 95% confidence level (1.96);

P= prevalence rate is 0.34

q is **1-p**; which is 0.66

e= marginal error is 0.05

$$\boldsymbol{n_o = \frac{(1.96)^2(0.34)(0.66)}{(0.05)^2} = 344}$$

5% of the calculated sample size was added for possible drop out or non response; the calculation results a total of 361 respondents. Due to the nature of the residence being sparse, population correction was performed as follow.

$$\boldsymbol{n = \frac{n_o}{1 + \frac{(n_o - 1)}{N}}}$$

Where: n= desired sample size N=the estimate of the population size= 355 in our case. $\boldsymbol{n = \frac{361}{1+\frac{(361-1)}{355}} = 180}$.

Sampling Technique

Out of ten, three kebelles were randomly selected. The calculated sample size was proportionally allocated according to household population load of each kebele. Random sampling technique was also used to identify the study households from each kebele. In the event that there is no eligible person in the selected household, the next doors were visited.

Anthropometric measurements

Anthropometric indices were taken using standardized techniques with the children wearing no shoes and light clothes. All anthropometric measurements were made by the same person. Z-scores for length-for-age (LAZ), weight-for-age (WAZ) and weight-for-height (WHZ) were calculated using ENA software (2007), based on WHO multicenter growth reference data (WHO, 2006).

Sample Collection Procedure

Data were collected by a face-to-face interview technique using semi-structured questionnaire. The questionnaire was first prepared in English and later translated into Somali (the local language of the study area.) and back translated into English to check for its conceptual equivalence. Pre-test was first conducted then the questionnaire was slightly modified.

Eligibility of the subjects

Children between 6 and 23 months of age who have breastfed and started eating complementary food were

included in the study. While those who were below 6 months, above 2 years didn't introduced to complementary foods were excluded.

Data Processing and Analysis

All the collected data were checked for completeness and internal consistency by cross checking and then was coded and double entered into computer software package and cleaned for inconsistency. For further analysis, the data was exported to Statistical Package for Social Science (SPSS) version 20 software. The Descriptive statistics was used to express results using frequency, mean and percent (%).

4. Result

4.1. Socio-Economic and Demographic Characteristics of Mothers

The below table indicates the socio-economic and demographic characteristics of households at Awbare district, Somali regional state. In this study, a total of 180 households were participated. The age of respondents was ranged from 20-45 years with mean age of 26.9±SD3.8) years. More than half of mothers were in the age group of 26-30 years. All the respondents were Muslim religion followers and were Somali. Concerning the educational status, 60% of respondents were not taken a formal education. Out of the total households included in this study, 134(74.4%) were housewives. Most of the respondents owned houses made of plastic, some wood or piece of clothes. Also almost all of the respondents didn't own livestock and agricultural land that satisfy their needs. While some respondents that owned agricultural land could able produce staple crops in which cereals are more predominantly found in the district than others. Above half of the respondents showed that sorghum and wheat are commonly consumed and used to prepare complementary food for infants followed by cow pea.

Table 3.1. Socio-economic and demographic characteristics of mothers, who had infants and young children aged from 6-23months, who lived in Awbare district, 2017

Variable	n (%)	μ±S.D	Variable	n (%)	μ±S.D
Relation to a child			**Live place**		
Mother	178(98.9%)		Rented house	50(27.8%)	
Grand mother	1(0.6%)		Own house	130(72.2%)	
Others	1(0.6%)		**If rented amount of birr per month**		
Age of mother		26.9±3.8	<1000	32(64%)	
20-25	60(33.3%)		> 10000	18(36%)	
26-30	79(43.9%)		livestock existence		
31-35	23(12.8%)		Yes	10(5.6%)	
36-40	9(5%)		No	170(94.4%)	
41-45	9(5%)		**If yes, what are they:**		
Educational status			Cow	5(50%)	
Illiterate	108(60%)		Goat	2(20%)	
Primary school	40(22.2%)		Camel	3(30%)	
Secondary school	28(15.6%)		**Owned agricultural land?**		
Higher education	4(2.2%)		Yes	12(6.7%)	
Religion			No	168(93.3%)	
Muslim	180(100%)		**If yes, amount of hectare**	2.33±0.88	
Others	0		**Types of crops produced farm land**		
Ethnicity					
Somali	180(100%)				
			Staple crops	135(75%)	
Occupations			Cash crops	45(25%)	
	134(74.4%)				
House wife	36(20%)		**Most common staple crops**		
Gov't employee	2(1.1%)		• Sorghum	75(41.7%)	
Farmer			• Wheat	54 (30%)	
Self-employee	2(1.1%)		• cow pea	43(23.9%)	
Student			• others	8(4.4%)	
	6(3.3%)				

4.2. Complementary Feeding Practice

Our finding revealed that, 79(70.5%) respondents' introduced child weaning after 6months and above (6-18 months) however; the period of stopping breast feeding is less than 2 years. Almost 78.2% of these respondents affirmed that the reason weaning before 2 years was introduction to complementary foods to their children which they thought as enough for child feeding at this age. Another reason for that was, at this age, child is considered as older age so that it is time to stop breastfeeding. In contrast to those reasons, 20(18.2%) of respondents said because they became sick so that they could not breastfed their children instead complementary food was given to infants whereby (3.6%) them stopped breast feeding for other reasons but they failed to provided the tangible reasons.

Regarding timely of initiated complementary food to children, majority of respondents 116(80%) in the study area introduced complementary food to their infants after 6months. Most complementary foods given were the same as those prepared for other family members.

4.3. Nutritional Status of the Infants and Young Children Aged 6-23 Months

The result of Anthropometry demonstrates that malnutrition is prevalent among infants and young children in Awbare town. The prevalence of wasting, stunting, and underweight among young children in this study was 6.1%, 56.1%, 10.0% respectively.

The below result indicates that 44% of children had normal nutritional status, 24.5% were moderately stunted and of 180 infants 58(32.3%) were severely stunted (Table 3.3).

Almost all 90% of the infants had normal nutritional status while 5.5% and 6.4% were moderately and severely undernourished respectively (Table 3.4).

Of the children examined 93.8% had normal nutritional status, 6.1% were moderately wasted while none of them were severely wasted (Table 3.5).

Table 3.2. Information of complementary feeding practice

Variables	N (%)	Variables	N (%)
Care givers of the child		**Time of stopping breastfeeding**	
Mother	164(91.1%)	At 4 months	26(23.2%)
Father	13(7.2%)	Before six months	7(5.4%)
Brother	1(0.6%)	After six months but less than 2years	79(70.5%)
Sister	2(11.1%)	**Reason for termination of breastfeeding practice**	
Age group mothers		older of age(Weaning Age)	86(78.2%)
18-20	8.9%	Sickness	20(18.2%)
21-30	62.2%	Other	4(3.6%)
31-40	28.9%	**Is the child commending complementary feeding?**	
Sex of children		**Yes**	143(79.4%)
Male	55.6(1000%)	**No**	37(20.6%)
Female	44.4(80%)	If yes when did you start complementary feeding?	
Birth order of children		Before 6 months	13(9.0%)
First	56(31.1%)	After 6 months	116(80.0%)
Second	47(20%)	At 6 months	12(8.3%)
Third and other	77(42.8%)	I don't know	4(2.8%)
Age group of child of children (months)		**How much do you feed your child**	
6-11	36(20%)	1cup per/feeding	56(38.9%)
12-17	36(20%)	3cup/feeding	74(51.4%)
18-23	108(60%)	2cups/feeding	11(7.6%)
Is child still breast feeding		Others	3(2.1%)
Yes	69(38.3%)		
No	111(61.7%)		Marconi
Knowledge of CF		**Commonly given foods**	
Yes	54(30%)		Pasta
No	126(70%)		Others

Table 3.3. Number of children with height- for- age z-score (HAZ) in Awbare (56% stunted)

Age group	±2SD	<-2SD – (-3SD)	>(3SD)	Remark
6-8	28(15.5%)	11(6.1)	16(8.9)	56% stunted
9-11	31(17.2%)	23(12.77	30(16.7%)	
12-24	21(11.6%)	10(5.6)	12(6.7)	
Status	Normal (44.3%)	Moderately 24.5 %	Sever (32.3%)	

Table 3.4. Number of Children (%) with weight-for-age z-score (WAZ) underweight

Age group	±2SD	<-2SD – (-3SD)	>(3SD)	Remark
6-8	73(40.5%)	7(3.8%)	3(1.7%)	10% underweight
9-11	54(30%)	2(1.1%)	2(1.1%)	
12-24	35(19.4%)	1(0.6%)	4(2.2%)	
Status	Normal 90%	Moderately underweight 5.5%	Sever underweight 6.4%	

Table 3.5. Number of children (%) with weight –for-height z-score (WHZ)

Age group	±2SD	<-2SD – (-3SD)	> (3SD)	Remark
6-8	78(43.3%)	3(1.67%)		6.1% wasted
9-11	41(22.8%)	1(0.55%)		
12-24	50(27.7%)	7(3.88%)		
status	Normal (93.8%)	Moderately wasting (6.1%)	Sever wasting	

Table 3.6. Number of children (%) with MUAC

MUAC	>13.5 cm	12.5-13.5 cm	11-12.5 cm	<11cm	Total
Number	50(27.8%)	69(38.3%)	53(29.4%)	8(4.4%)	180(100%)
status	Normal	Mild	Moderate	Sever	

Results showed that 27.8% of children had normal nutritional status, 38.3%, 29.4% & 4.4% were mild, moderately and severely undernourished (Table 3.6).

5. Discussion

In the current study the prevalence of wasting was lower than the study reported in the 2011 EDHS prevalence of wasting, because of positive association of maternal education with wasting indicators of nutritional status. Also the stunting prevalence (56.1%) in current study were higher than that of 2011 EDHS (29%). This is Because of negative association of income level and mostly low association of breast feeding with stunting indicator of nutritional status. But our underweight indicator is in line with 2011 EDHS study that is 10%.

A study from North Showa, Ethiopia, reported that the prevalence of wasting, stunting, and underweight were 10.6, 54.2, and 40.2% respectively (Aweke KA y, *et al*., 2012). The prevalence of wasting (6.1%) was found to be slightly lower, while the prevalence of stunting is relatively higher than reported by Aweke KA et al., 2102. This is due to the mother's lack of information about food and nutrition education to use the food in recommended and safety strategies. Also in the present study the associated factors that cause wasting and underweight were more than half percent of diarrheal disease and breastfeeding. Diarrheal disease was associated with higher chances of wasting and underweight while breastfeeding was found to be protective for wasting and underweight. Childhood morbidity status, especially diarrhea, has been reported in other studies to have a negative effect on growth of children, specifically on weight gain (Saha KK, *et al.,* 2008). In this study despite of diarrhea, there were other conditions such as cough, vomiting, headache were affect both dietary intake and utilization, consequently affecting a child's nutritional status. These were because of the problem of usually care takers that have a lack of sanitation of good quality of food, environment and proper handling practices related to eating habits.

6. Conclusions and Recommendations

6.1. Conclusions

The prevalence of under nutrition (including wasting, stunting and underweight) is a public health problem, among young children in Awbare pastoralist area, Somali region, Ethiopia. Lack of nutrition knowledge and inappropriate complementary feeding initiation were identified to be significant predictors of child malnutrition in the Awbare district. Interventions to improve breastfeeding practices, and timely initiation of complementary feeding are the most

important to reduce under nutrition in Awbare district, Somali region. Besides those nutrition interventions, prevention of diarrheal disease and would have important effects in reduction of under nutrition.

6.2. Recommendations

Based on the study findings, the following recommendation is forwarded:-

- There should be an intervention done by governmental and non-governmental organizations that aim at improving children's nutritional status, considering at this area of study regions with a high rate of childhood stunting.
- On Nutritional status, better education should be given to care takers to reduce child's malnutrition problems.
- Since, Many caregivers were no information about nutrition, the government must be employee a person that have deeply know about food and nutrition knowledge to overcome the problem that were catch-up the respondents nutrition scarcity information.
- Better education should be given to improve the ability of mothers to implement simple health knowledge and facilitates their capacity to manipulate their environment including health care facilities, interact more effectively with health professionals, comply with treatment recommendations, and keep their environment clean.
- Based up on the food that children intake, healthy professional (nutritionist, dietitian and other working health branch) should be understand the food nutrient contents, because there were lack of sanitation, inadequate nutrition and lack of food quality or food security up to now.

Abbreviation

WHO: World HealthOrganization SD: Standard Deviation EDHS: Ethiopian Demography Health Survey CSA: Central statistical agency CF: Complementary foods.

Ethical Consideration

Ethical clearance was obtained from Jigjiga University Research, Technology transfer and Publication Directorate. Official letter was sent to Awbare district health office for commencing the study and the data collection was begun after permission and cooperation letter was written to all Kebeles on which the study is being carried out. The study, purpose, procedure and duration, possible risks and benefits of the study were clearly explained for the participants using local language. At household level, informed oral consent was obtained from mothers to precede the data collection process.

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