

# Nutritional status and associated factors among orphan children below the age of five years in Gondar City, Ethiopia

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## To cite this article:

Teklemariam Gultie, Endalkew Sisay, Girum Sebsibie. Nutritional Status and Associated Factors among Orphan Children below the Age of Five Years in Gondar City, Ethiopia. *Journal of Food and Nutrition Sciences*. Vol. 2, No. 4, 2014, pp. 179-184.

doi: 10.11648/j.jfns.20140204.23

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**Abstract:** Introduction: Orphan and vulnerable children are at high risk for malnutrition due to poor economic status, less medical and social care. Despite the high number of Orphans and Vulnerable Children with potential risk for malnutrition in Ethiopia, there is insufficient evidence that indicates the nutritional status as well as the effect of orphan hood and child vulnerability on nutritional status. Objective: The objective of this study was to assess the nutritional status and associated factors among Orphans and Vulnerable Children in Gondar City, Ethiopia. Methods: A community based cross sectional study was conducted from August 01 to 30/2013 on under-five Orphans and Vulnerable Children. Structured questionnaires were used to collect data from the guardians. The child's nutritional status was assessed anthropometrically using a Height-for-Age, Weight-for-Age and Weight-for-Height. Epi Info 3.5.1 was used to enter the data and both bivariate and multivariate analysis was used to test the association between nutritional status and independent variables. Results: The overall prevalence of stunting, underweight and wasting was 45.7%, 27.8% and 9.9% respectively. The main contributing factors for malnutrition were family size, age of children, caregiver educational status, and main source of income, Households income, Vitamin A Supplementation, number of Orphans and Vulnerable Children and two weeks period diarrheal disease prior to the study. Conclusion: - The prevalence of malnutrition in children below the age of five was high. To improve the nutritional status of those Children, comprehensive nutrition intervention strategy needs to designed and strengthen the economic status of the households by income generating techniques.

**Keywords:** Malnutrition, Orphan and Under-Five Children, Gondar City, Cross Sectional Study

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## 1. Introduction

Malnutrition particularly in children, is a vice locked around humanity, preventing individuals and even whole societies from achieving their full potential. Children who are undernourished have lowered resistance to infection and are more likely to die from common childhood illness such as diarrheal diseases, febrile illness and respiratory infections [1].

For current and succeeding generations, good nutrition is the cornerstone for survival, health and development of the nation. Well-nourished children perform better in school, grow healthier and are able to give their own children a

better start in life. A well-nourished child is one with accesses to adequate food supply, social and medical care. Well-nourished child will have weight and height measurements that compare with the standard normal distribution of height and weight of a healthy child of the same age and sex [1,2].

AIDS and conflicts have orphaned millions of children in the African continent. As a result, the problem of orphans and vulnerable children has reached devastating level in some countries. The most affected region is sub-Saharan Africa, where an estimated 12.3 million children have been orphaned by AIDS. This orphan population will increase in the next decade as HIV-positive parents become ill and die from AIDS [3]. The percentage of orphans in the under-15

child population ranged from 4.4% in Guyana to 28% in Rwanda. In this sub region each country has higher orphan rates than the regional averages. The unparalleled growing of orphan populations in countries struggling with poverty is further reducing resources within the households and in the communities. As a result, orphans are vulnerable to a variety of risks including poverty, school dropout, malnutrition, and other forms of child deprivation [4, 5].

Orphans in sub-Saharan countries are more vulnerable than non-orphan children on a series of health indicators. Using data from Zimbabwe found strong associations between Orphan hood status and nutritional and health outcomes such as diarrhea, acute respiratory infection, and underweight status [6].

Ethiopia, one of the sub-Saharan African countries, has a high number of Orphans. The country has 5.5 million orphans, 640,802 maternal orphans, 550,300 paternal orphans, and 304,282 dual orphans. The majority of children orphaned are different from region to region with Amhara the highest orphan rate 1,535,104(39%) in the country followed by Oromo (22.4%). The main causes of orphan hood and vulnerability are HIV/AIDS, food insecurity, poverty, conflict, natural disasters, malaria, and other infectious diseases. Lack of parental care and support of children increased their vulnerability for food insecurity and chronic malnutrition, lack of protection, shelter, education, physical and sexual abuse [7-9].

Ethiopia has a high number Orphan and half of children below the age of five are stunted. The main contributing factors for malnutrition are the pandemic HIV/AIDS disease and shortage of food in the house holds. The nutritional status of young children is one of the sensitive indicators of sudden changes in health status and food availability acting as early warning signs of disasters, ill health and famine [10, 11] Orphan are potentially at greater risk of malnutrition because they are more likely to be extremely poor, receive less medical and social care [12, 13]. Many Orphan children are suffering from cycles of poverty as a result of death of their parents.

Although different researches have been done on the nutritional status of under-five children in different part of the world, little is known about the nutritional status of under -five Orphan children. To date only few studies have been conducted which assessed the nutritional status of this segment of population. This study explored the nutritional status and its associated factors among under-five orphan children.

## 2. Materials and Methods

### 2.1. Study Setting and Period

This study was conducted from august 01-30/2013 in Gondar city. Gondar city is the capital of North Gondar zone and it is located 727 km from the capital city of Ethiopia, Addis Ababa. The city has 202,832 people of whom 20,209 under five children. The city has twelve administrative

districts.

### 2.2. Study Design and Population

A community based cross sectional study that employed quantitative method was undertaken. The source populations for the study were all under five orphan children living in Gondar city. Study populations were randomly selected orphan children selected from the source population in the study period.

### 2.3. Sample Size and Sampling Procedure

A sample size of 352 was determined using sample size formula for estimating a single population proportion with the assumption that 52% of under-five children were stunted which is the most prevalent form of malnutrition (14). Margin of error, confidence interval, design effect and expected non response rate, 5%, 95%, 2 and 10%, respectively was considered for sample size determination. There were a total of 1900 Orphan children in the city and the sampling frame was obtained from the registration book of Gondar district children, youth and female's office to select the households where 352 Orphan was taken by systematic random sampling technique. The study participants were selected by an Orphan children supporting committee in Gondar City which was established to monitor the condition of these children. Only the youngest under-five child was included in the study where more than one Orphan child lives in the same house.

### 2.4. Data Collection Methods

A pre tested structured interviewer administered questionnaire, which was first prepared in English and translated into Amharic was employed to obtain information on demographic characteristics, feeding practices, food availability, family size, immunization status, periodic food, exposure to diarrhea and Acute febrile illness from the guardian of the children. Weight of the child was measured to the nearest 0.1 kg using 25kg Salter scale made by Salter (UNICEF) with the subjects without shoes and in light cloths. The height/length of the child was measured to the nearest 0.1cm. Length board was used to measure the length of below 2 years children whereas height measure was used to measure the height of 2 and above years old children. The child's shoes, hair clips and braids were removed before measurement and during the measurement the child were positioned feet together, feet flat on the ground, heels touching the back plate of the measuring instrument, legs straight, buttocks against the backboard, scapula against the backboard and arms were loosely at their side.

One BSc nurse supervisor, two data collectors who are public health Officer and twelve guiders at each district who know the selected house with orphan children were recruited. Intensive training was given on the interview techniques, sampling procedure, inclusion and exclusion criteria, sources, reduction of errors and anthropometric measurements.

## 2.5. Data Processing and Analysis

Data were coded, entered and cleaned using EPI-INFO version 3.5.1 statistical packages and further cleaned and analyzed using SPSS Windows version 16.0. Analysis of data was done starting with Univariate using descriptive techniques then bivariate analysis and finally a multivariate analysis was performed to control for potential confounding factors. A P- value of 0.05 or less was considered to be significant. Odds ratio with 95% CI was used to show the strength of association.

## 2.6. Operational Definition

Orphans are a child who has lost one or both parents by death or by chronic illness whereas vulnerable children are a child who is exposed to malnutrition and different disease.

Malnutrition is the condition that results from an imbalance between dietary intake and requirements.

Stunting is a height for age below minus two standard deviation deviations (<2SD) from the median of normal child reference population.

Underweight is weight-for-age below minus two standard deviations (< -2SD) from the median of NCHS reference population.

Wasting is weight-for-height/length below minus two standard deviations (<-2SD) from the median of NCHS reference population.

## 2.7. Ethical Consideration

Ethical clearance was obtained from institutional review board of university of Gondar research and publication office. The Ethical clearance was submitted to the Gondar city health department and letters were written to the respective districts offices.

The guardians were oriented about the purpose of the study and assured that participation was fully voluntary. Oral and written informed consent was obtained based the literacy state of the participants. For the under-five Orphan a consent was obtained from their guardians before anthropometric measurement was taken. The data collectors were oriented about how to manage if they found seriously ill or severely malnourished Orphan child during data collection. Measures were taken to ensure the dignity, confidentiality and freedom of each individual participating in the study. The consent form was written but for the illiterate guardians it was read by the data collectors. Oral consent is allowed by the institutional review board as long as the consent form and information sheet are properly written and read thoroughly to the illiterate participants.

## 3. Result

### 3.1. socio-Demographic Profiles of the Respondents

A total of 352 participants had participated in the study with the response rate of 100%. Among the 352 respondents interviewed, 300 (85.2%) were in the age group of

18-49years. There were no under-eighteen guardians and most of the guardians were females (89.2%). More than half of (55.4 %) the respondents were not literate, 27.6% and 17.3% were attained primary and secondary school, respectively.

According to the response given by the guardians; 185 (52.6%), 102 (29%) and 65 (18.5%) were married, divorced and widowed, respectively. About 301 (85.5%) respondents were parents to the orphans; the others were 41 (11.6%) grandparents and 10 (2.8%) relatives. According to the response given by the respondents 154 (43.8%) of the households had 4-6 family members. Most of the households, 305 (86.6%) had one Orphan child and the rest 47 (13.4%) had two.

The main source of income of the households were Casual labor for 218 (61.9%) and 54 (15.3%) were employed and more than half of the respondents 208 (59.1) earned below 600 Ethiopian birr monthly income [Table 1].

**Table 1.** Socio-demographic characteristic of guardians with under-five Orphan Children in Gondar city, Northwest Ethiopia, August 2013

Variables (n=352)	Frequency	Percent
Age in years		
18-49	300	85.2
50+	52	14.8
Sex		
Male	38	10.8
Female	314	89.2
Educational status		
Not literate	194	55.1
Primary	97	27.6
Secondary	61	17.3
Marital status		
Married	185	52.6
Divorce	102	29
Widowed	65	18.5
Family size		
<4 members	110	31.2
4-6 members	154	43.8
>6 members	88	25
Number of <5 orphan		
1Orphan	305	86.6
2 Orphan	47	13.4
Main source of income		
Petty trade	80	22.7
Casual labor	218	61.9
Employment	54	15.3
Monthly income of the HHs		
<600 ETB	208	59.1
600-999 ETB	144	40.9

### 3.2. Nutritional Status of Orphan and under Five Children

The nutritional status of under-five orphan children in Gondar City showed that wasting, underweight and stunting were 9.9%, 27.8% and 45.7% respectively. While severe wasting 4.8%, severe underweight 9.1% and 19.9% were severe stunting [Fig 1].

### 3.3. Factors Associated with Nutritional Status

The nutritional status of under-five orphan children is

affected by the age of orphan hood, Vitamin A supplementation, family size, educational status of caregiver, income and source of income were significantly associated with stunting. Family sizes, educational status of caregiver and income were significantly associated with underweight and family income, number of orphans and Diarrheal disease

two weeks prior to the survey were associated with wasting. Among the contributing factors for malnutrition family income was the most important factor which affects all the three indicators of the nutritional status of under-five children [Table 4, 5 & 6].

**Table 2.** Associated factors with Stunting among under five Orphan Children in Gondar City, Northwest Ethiopia, August 2013

Variables	Stunting		COR (95%CI)	AOR(95%CI)
	Yes (n)	No (n)		
Family size				
<4	33	77	1	1
4-6	71	83	2.0(1.19-3.35)	2.16(1.12-4.19)
>6	57	31	4.29(2.36-7.80)	3.33(1.53-7.12)
Age				
6-11	7	9	1.47(0.52-4.21)	1.37(0.39-4.87)
12-23	40	11	6.89(3.24-14.65)	6.56(2.49-17.30)
24-35	40	33	2.30(1.28-4.10)	3.54(1.66-7.55)
35-47	27	49	1.04(0.58-1.88)	1.22(0.58-2.59)
48-59 months	47	89	1	1
Education of care giver				
No	101	95	3.49(1.80-6.76)	2.83(1.25-6.37)
Primary	46	50	3.02(1.47-6.21)	2.58(1.05-6.37)
Secondary	14	46	1	1
Occupation of care giver				
Petty trade	16	64	0.59(0.27-1.32)	0.63(0.24-1.70)
Casual labor	129	89	3.44(1.81-6.55)	3.27(1.43-7.47)
Employee	16	38	1	1
Income of care giver				
<600 Ethiopian birr	131	77	6.46(3.96-10.56)	5.92(3.25-10.79)
600-999 Ethiopian birr	30	144	1	1
Vitamin A supplementation				
No	48	28	2.47(1.46-4.18)	3.15(1.56-6.36)
Yes	113	163	1	1

**Table 3.** Associated factors with underweight among under-five Orphan Children in Gondar City, Northwest Ethiopia, August 2013.

Explanatory variables	Underweight		COR (95% CI)	AOR(95% CI)
	Yes(n)	No (n)		
Family size				
<4 family members	13	97	1	1
4-6 family members	46	108	3.18(1.62-6.24)	2.97(1.45-6.10)
>6 family members	39	49	5.94(2.90-12.15)	4.21(1.95-9.08)
Income per month				
< 600 ETB	83	125	5.71(3.13-10.43)	4.41(2.34-8.31)
600-999 ETB	15	129	1	1
Education of caregiver				
Not literate	64	132	4.36(1.78-10.68)	3.26(1.26-8.41)
Primary	28	68	3.71(1.43-9.60)	3.10(1.12-8.61)
Secondary	6	54	1	1

**Table 4.** Associated factors with wasting among under-five Orphan Children in Gondar City, Northwest Ethiopia, August 2013.

Explanatory variable	Wasting		COR (95% CI)	AOR (95%CI )
	Yes (n)	No(n)		
Number of Orphan				
1 Orphan	22	283	1	1
2 Orphan	13	34	4.92(2.27-10.65)	4.89(2.04-11.68)
HHs Income per month				
<600 Ethiopian birr	31	177	6.13(2.11-17.78)	5.28(1.75-15.93)
600-999 Ethiopian birr	4	140	1	1
Diarrhea				
Yes	20	52	6.79(3.27-14.14)	6.61(3.01-14.52)
No	15	265	1	1

## 4. Discussion

This community based cross sectional study showed the magnitude of malnutrition and identify the factors which affect the nutritional status of orphan children in Gondar city.

The result of this study showed that the magnitude of malnutrition among under-five orphans and vulnerable children in Gondar city was 9.9% wasting, 27.8% underweight and 45.7% stunting. As compared with the Ethiopian demographic and health survey (EDHS) 2011 result of the urban prevalence of malnutrition among under five children with wasting, underweight and stunting 5.3%, 16.3% and 31.5% respectively, however it is lower than the prevalence in Amhara region both in urban and rural which is stunting and underweight 52% and 33.4% respectively but the prevalence of wasting was similar (9.9%). This finding is higher than most of Sub Saharan Africa countries under five children which showed stunting ranges from 26% to 51% [14, 15]. This variation might be due to the poor socioeconomic status of the guardians or parents in the study area than the other Sub Saharan African countries.

The prevalence of stunting and underweight was significantly higher in orphans than non-orphan vulnerable children (68% versus 38%) consistent with a study conducted in Malawi (33.3% versus 30 %) [16].

The finding of this study showed that the level of stunting in 24-35 months Orphan child was high compared with other age group and is similar with the stud done by EDHS-2011 which was high in the same age group (30.2%) and Ethiopia (45%) but inconsistent with a study with Nigeria which showed that older children are more likely to be stunted (14, 18, 19). This might be due to late initiation of complementary feeding and poor knowledge how to feed young child [20].

Family/household income was significantly associated with increase occurrence of stunting, underweight and wasting in agreement with the findings of EDHS 2011, Ethiopia and Zimbabwe [14, 21, 22]. Children belonging to the low-income group were at a higher risk of being wasted, underweight and stunted than children of better income families. This might be due to the concomitant effect of low family income and the inflation which further compromised the value of the already inadequate income that the poor families are earning and this lead to malnutrition.

Education of guardians significantly affected the nutritional status of children in stunting and underweight, the level of malnutrition decreases when the level of guardians education increase, especially the AOR of stunting was 2.83 (95% CI 1.25-6.37) times higher in children of not literate guardians than children of guardians attained secondary school consistent the study with in EDHS 2011, Garhwali Himalayas, Botswana and children of those whose mothers have no education have higher risks of stunting [14,23,24].

The prevalence of Diarrheal disease two weeks prior to the survey had significantly associated with wasting. The result showed that adjusted odds ratio of wasting 6.61(95% CI 3.01-14.52) times higher than those who had no diarrhea Orphan child. This might be due to less health care support, poor hygiene and sanitation because 48.3% don't have access to the toilet and this facilitates the spread of diarrheal disease. Frequent attack of diarrheal disease leads to under nutrition. Large family size (more than four family members) was significantly associated with stunting and underweight.

## 5. Conclusion

The level of malnutrition in under five orphan and vulnerable children was very high by far exceeding the existing Urban prevalence of malnutrition but lower than the prevalence of Amhara regional state in the same age group survey conducted by EDHS 2011 in the country. Many interrelated factors were found to be significantly associated with malnutrition of under-five Orphan child. Family sizes, educational status of caregiver were also found to be significantly associated with stunting and underweight of under-five Orphan child. Other factors like Age of orphan child, household main source of income and Vitamin A supplementation significantly associated with stunting whereas number of Orphan child in the households and presence of diarrheal disease two weeks prior to the study was significantly associated with wasting. Household income was the most important factor which affects all the three indicators of the nutritional status (stunting, underweight and wasting) of under-five orphan child.

## Acknowledgements

We would like to thank Gondar University for funding this study and Gondar city administrative office. Finally we would like to thank our data collectors, supervisor and study participants.

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