

2019-09

# Magnitude and Associated Factors Of Under Nutrition among Orphans Residing In Selected Orphanages in Addis Ababa, Ethiopia

Beyene, Lesan

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**BAHIR DAR UNIVERSITY**  
**BAHIR DAR INSTITUTE OF TECHNOLOGY**  
**SCHOOL OF RESEARCH AND POSTGRADUATE STUDIES**  
**FACULTY OF CHEMICAL AND FOOD ENGINEERING**

**MAGNITUDE AND ASSOCIATED FACTORS OF UNDER  
NUTRITION AMONG ORPHANS RESIDING IN SELECTED  
ORPHANAGES IN ADDIS ABABA, ETHIOPIA**

**MSc. Thesis**

**By**

**Lesan Beyene**

**BAHIR DAR, ETHIOPIA**  
**September, 2019**

MAGNITUDE AND ASSOCIATED FACTORS OF UNDER NUTRITION AMONG ORPHANS  
RESIDING IN SELECTED ORPHANAGES IN ADDIS ABABA, ETHIOPIA

Lesan Beyene


A Thesis Submitted to Faculty of Chemical and Food engineering Bahir Dar  
University in partial fulfillment of the requirements for the  
Degree of  
Masters of Science in Applied Human Nutrition

Advisor Name: Alemu Tesfahun (MPH, PhD fellow)

Bahir Dar, Ethiopia  
September, 2019

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Name of the student Lesan Beyene Signature 

Date of submission: 08/10/2019

Place: Bahir Dar

This thesis has been submitted for examination with my approval as a university advisor.

Advisor Name: Alemu Tesfahun

Advisor's Signature:  8/10/2019

Bahir Dar University  
Bahir Dar Institute of Technology  
School of Research and Graduate Studies  
Faculty of Chemical and Food Engineering

THESIS APPROVAL SHEET

Student:

Lisan Bevene

[Signature]

28/09/2019

Name

Signature

Date

The following graduate faculty members certify that this student has successfully presented the necessary written final thesis and oral presentation for partial fulfillment of the thesis requirements for the Degree of Master of Science in Applied Human Nutrition

Approved By:

Advisor:

Alemu Tesfahun

[Signature]

08/10/2019

Name

Signature

Date

External-Examiner:

Dr Endale Amare

[Signature]

08/10/19

Name

Signature

Date

Internal-Examiner:

Mesfin Wogayehu

[Signature]

10/11/2019

Name

Signature

Date

Chair Holder:

Mesfin Wogayehu

[Signature]

11/11/2019

Name

Signature

Date

Faculty Dean:

Mi Seid

[Signature]

13/11/2019



## **ACKNOWLEDGEMENTS**

Above all, I would like to give thanks and glory to GOD who gives me the courage to pursue my study and also who provides me everything throughout my study. I would like to thank my advisor Alemu Tesfahun for his valuable advice, critique and encouragement in the development of the thesis.

My special thanks are extended to orphan children, care givers of the orphans and orphanage heads for their willingness to participate in the study.

I wish to gratefully acknowledge to my family for their all rounded support.

## **ABSTRACT**

**Background:**The number of children who are left orphaned in the world due to loss of parents has increased in recent years. Ethiopia contains and struggles to care for millions of orphaned children. Orphanages may lack adequate resources to provide adequate necessities including food and healthcare services.Children living in orphanages are more vulnerable to under nutrition as various factors which are linked to child nutritional well-being are more likely to be inadequate. The main objective of this study therefore was to assess the magnitude of under nutrition and associated factors among school-age orphans residing in selected orphanages in Addis Ababa.

**Methods:** A cross sectional, descriptive study design was used and the study was conducted from December 2018 to January 2019. Total of 246 school-age orphans were the study population selected using simple random sampling technique from selected orphanages in Addis Ababa, Ethiopia. The data was collected using pretested and structured institution-based questionnaire. Quantitative data was analyzed using SPSS version 20.0. For qualitative data, an in-depth interview and key informant interview was conducted with care givers and orphanage administrators using semi-structured topic guide, and thematic analysis was applied.

**Result:**The prevalence of underweight, stunting and low BMI for age among the orphans were 10.7%, 19.7 % and 11.5% respectively. Underweight was associated with presence of illness. The odds of underweight in those orphans who were sick in the last two weeks was 3.3 times more likely than those who were not sick (AOR=3.32; 95% CI;(1.31-8.79)). Care givers in the orphanages had good personal and environmental hygienic practice.

**Conclusion and recommendation:**the magnitude of under nutrition among the school- age orphans residing in the five orphanages who were sick in the last two weeks was higher than those who were not sick. There's a need for the government to support and enforce the orphanages administration to have a strong follow-up protocol for sick children in the orphanage.

Key words: orphans, nutrition, under nutrition, orphanages, school-age

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## LIST OF ABBREVIATIONS

AIDS	Acquired Immune-Deficiency Syndrome
AOR	Adjusted odds ratio
ART	Anti Retroviral Treatment
BAZ	BMI-for-age Z score
BMI	Body Mass Index
CI	Confidence Interval
COR	Crude odds ratio
EDHS	Ethiopian Demographic Health Survey
ENA	Emergency Nutrition Assessment
HAART	Highly Active Antiretroviral Therapy
HAZ	Height-for-age Z-score
HIV	Human Immune Deficiency Virus
ICN	International Conference on Nutrition
IQ	Intelligent Quotient
MDG	Millennium Development Goal
NGO	Non-Governmental Organization
OI	Opportunistic Infection
OVC	Orphans and Vulnerable Children
PEM	Protein Energy Malnutrition
SAM	Severe Acute Malnutrition
SD	Standard deviation
SDG	Sustainable development goal
SPSS	Statistical Package for Social Science
SSA	Sub-Sahara Africa
WAZ	Weight-for-age Z-score
WHO	World Health Organization
WHZ	Weight-for-Height z-score
UNICEF	United Nation Children's Fund
VC	Vulnerable Children

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# **1. Introduction**

## **1.1. Background**

The number of children who are left orphaned in the world due to loss of parents has increased in recent years. UNICEF reported that there are nearly 140 million orphans including 61 million in Asia, 52 million in Africa, 10 million in Latin America and the Caribbean, and 7.3 million in Eastern Europe and Central Asia (UNICEF, 2015). There is also an estimate that 16.5 million [range: 13.9-19.2 million] children worldwide had lost one or both parents due to AIDS. More than 80 percent of these children (13.8 million) live in sub-Saharan Africa.

As an effect of the poor conditions of this developing nation, Ethiopia contains and struggles to care for millions of orphaned children. According to UNICEF, Ethiopia had 4.5 million orphans on a population of 90 million in 2014 which was 5% of the total population and their parents died of AIDS (UNICEF, 2014).

Nutritional inadequacy has a serious negative impact on the growth and development of children (Serere et al., 2013). Being an orphan may make children more vulnerable to under nutrition, as maternal and paternal level factors, and household food availability which are linked to child nutritional well – being are more likely to be inadequate (Evangeline et al., 2017). There has been differences observed in nutrition related problems such as Protein Energy Malnutrition (PEM), Vitamin A and B Complex deficiencies, iron deficiency anemia and iodine deficiency disorders between children who are living with their families and children who are living in institution run by government and non-governmental organizations (Naheed, 2013).

A study conducted to compare institutionalized infants with family-reared infants in Romania has found substantial delays in cognitive development, growth, and social competence among young children who were raised in institution (Mary & John, 2014). Children living in the institution had higher prevalence of stunting, wasting and under weight than non-institutionalized children.

Orphanages may lack adequate resources to provide adequate necessities including food and healthcare services. There may also be limited awareness about nutritional needs of the children, appropriate childcare and hygiene practice and the consequences of

childhood malnutrition among the caretakers in the orphanages (Shukla B. & Shukla D., 2011)

Because orphan children are at higher risk of developing malnutrition, investigating the magnitude and risk factors that contribute to under nutrition in an ever-increasing number of children in orphanages of Addis Ababa was crucial.

## **1.2. Statement of the problem**

Nutrition interventions often focus mainly on preventing malnutrition during foetal development and the first years of life – the most critical period for growth and development. However, school-age children are also vulnerable to under nutrition and need support for their survival and growth (Elizabeth et al., 2014).

Malnutrition among school-age children still remains a significant problem all over the world and continues to be a public health problem in developing countries with 52% and 34-62% prevalence of stunting and underweight, respectively (Dawit et al., 2015). In a study conducted in Northwest Ethiopia, the prevalence of stunting, underweight and wasting among primary school children were 27.5%, 20.4% and 8.7%, correspondingly (Biachew et al., 2018).

School-age children living in orphanages world-wide often present with nutritional deficiencies (Chowdhury et al., 2017). These orphans are potentially at greater risk of malnutrition because they are more likely to be extremely poor, receive less medical and social care. Tragically, the countries with the highest rates of orphanhood are among the economically poorest and most under resourced. They are poorly equipped to meet the social, educational, and health care needs of these children, which include adequate shelter, education, nutritional support, psychosocial support, and health care. Donor funding to support such diverse needs is grossly inadequate (Thielman et al., 2012).

Several studies have found that underweight prevalence was higher in orphaned children living disproportionately in the poorest households than their non-orphaned counterparts (Evangeline et al., 2017; Helen, 2007; Elizabeth et al., 2014). In Zimbabwe a strong association was found between living in an orphanage and nutritional and health outcomes such as diarrhea, acute respiratory infection, and underweight status among school-age children (Elizabeth et al., 2014). In this study orphanage children were more wasted (9%) compared to non-orphanage group (2%).

Orphanages may lack adequate resources to provide adequate necessities including food and healthcare services. There may also be limited awareness about nutritional needs of the children, appropriate childcare and hygiene practice and the consequences of childhood malnutrition among the caretakers in the orphanages (Shukla B. & Shukla D., 2011). In a study conducted in orphanages in Benin City, Nigeria; best orphanage practices such as provision of adequate nutrition, good quality of health service, safe and potable water and adequate toilet facilities were poor. In this study, most of the children had stunted growth (Nwaneri & Sadoh, 2016).

Despite the seriousness of the problem, the number of studies conducted to explain factors affecting the nutritional status of school-age orphans living in orphanages is still relatively inadequate and particularly programmatic implications are not paid due attention. This is the main reason for under taking this research to provide important information to the programmers to manage malnutrition among orphan children at orphanages.

### **1.3. Objectives of the study**

#### **1.3.1. General objective**

- ✓ To assess the magnitude of under nutrition and associated factors among school-age orphans residing in selected orphanages in Addis Ababa.

#### **1.3.2. Specific objectives**

- ✓ To determine the magnitude of under nutrition among school-age orphans residing in selected orphanages in Addis Ababa.
- ✓ To identify the associated factors of under nutrition among school-age orphans residing in selected orphanages in Addis Ababa.



#### **1.4. Scope**

This study focused on assessing magnitude of under nutrition and associated factors affecting the nutritional status of orphan children who were living in selected orphanages in Addis Ababa. It was conducted from December 2018 to January 2019. It identified issues that would help in achieving correct government policies and recommend interventions to solve problems. Since Addis Ababa is more urban than other cities, the finding of this study may not reflect other cities in Ethiopia. The research methodology only provides a snapshot analysis so there is always a possibility that a study could have differing results if a longitudinal study would have been done.

#### **1.5. Significance of the Study**

Malnutrition is a huge public health problem in orphan children. But there is little evidence that indicates the nutritional status of institutionalized school-age orphan children in Ethiopia. This study was intended to fill this gap by assessing the nutritional status among institutionalized school-age orphans in Addis Ababa.

The findings of this study will improve our knowledge on the nutritional status of orphanage children. The findings will also help governments, policy makers, non-governmental organizations and donors to make decisions to address the needs of institutionalized orphaned and vulnerable children and to provide holistic support for the orphanages. It will also be used as Baseline data for future nutrition intervention programs in orphanages.

## **2. Literature Review**

### **2.1. The state of orphanhood in the world**

Large numbers of orphan and vulnerable children have resulted in mushrooming of orphanages due to many factors. Globally, there are nearly 140 million orphans including 61 million in Asia, 52 million in Africa, 10 million in Latin America and the Caribbean, and 7.3 million in Eastern Europe and Central Asia (UNICEF, 2015). UNICEF estimates 16.5 millions [range: 13.9-19.2 million] children worldwide had lost one or both parents to AIDS. More than 80 percent of these children (13.8 million) live in sub-Saharan Africa (UNICEF, 2015).

Many children have been made vulnerable because of family illness, family breakups, school withdrawals, stigma, poverty, property loss, loss of their shelter, child labor, inadequate health care, loss of rights of inheritance, vulnerability to either sexual or physical abuse and children heading their households (Evangeline & Mugambi, 2017).

An increase in the number of children losing their parent(s) due to infectious and non-infectious causes in Nigeria has increased the magnitude of orphan and vulnerable children (Adeniyi et al., 2008).

### **2.2. The state of orphanhood in Ethiopia**

Orphan children living in developing countries struggle to survive without the support and protection of parents or the love of a family environment. Though traditional Ethiopian kinship systems provide support for orphans, the third-world conditions have devastated this cultural safety network increasing the need for orphanage care (Bimal, 2014). A great majority of Ethiopian orphans are placed in one of the nation's numerous orphanages. Many foreign aid organizations have established orphanages in Ethiopia to help relieve this nation's strain. Ethiopia had 4.5 million orphans on a population of 90 million in 2014 which was 5% of the total population and their parents are died of AIDS, untreated illness, hunger, drought and war (UNICEF, 2014; UNICEF, WHO, & World Bank, 2016).

Ethiopia counts a steady increase in the number of street children orphaned by different reasons. In Addis Ababa more than 30 % of girls aged 10-14 were not living with their parents (Ayele, 2017). It was also showed that the rights of most orphans in Ethiopia as well as in Amhara region were not protected due to various socio economic problems and

cultural factors. Because of this, orphans were found in a worse situation (Tsegaye, 2001).

Most of orphanages in Ethiopia were initiated as a quick response to solve the problem of unaccompanied and orphaned minors. Because of this situation many problems were faced at home (Ayele, 2017). The former Children and Youth Affairs Organization in Ethiopia assessed the problems faced by the orphanages and found out inadequate funding to support programs designed for the children, shortage of trained personnel, inadequate skills training that resulted in long care in orphanage, lack of psychosocial service, lack of long-term strategic planning were some of the problems faced in the orphanages. Various governmental and some nongovernmental organizations are involved in the support of orphans. But this couldn't address the problem of orphans in a sustainable way as they lack a coordinated approach. There is duplication of effort and wastage of resources. Due to this a few benefited from various institutions and most orphans left without any form of support (UNICEF, WHO, & World Bank, 2016; Stephen et al., 2012).

### **2.3. Prevalence of malnutrition in orphanages**

Child under nutrition is still one of the major public health problems across the world even if its burden is declining as compared to its magnitude in the 1990s. Its prevalence may vary from country to country but predominantly is the problem of the developing countries especially in the sub-Saharan Africa (Sanjana et al., 2017).

Findings from Bangladesh reported that more than half of the children (60.3%) living in orphanages were malnourished (Chowdhury et al., 2017). In other study in Bangladesh 63% underweight, 60.7% stunting and 48% wasting were reported (Obidul et al., 2013). A study carried out in Malawi established that the prevalence of malnutrition in orphanage children ( $\leq 6$  years old) was 55 %, 64% of the orphans being stunted (Lindblade et al., 2003). A study in Botswana found that orphanage children were (49%) more likely to be underweight than non-orphanage children (Mishra & Bignami, 2008). A study in North Western Tanzania found higher stunting levels among orphanage children than among non-orphanage children (Ainsworth & Semali, 2000). In a study conducted in Mygoma orphanage center Sudan a prevalence of 44.1% mild malnutrition, 38.2%

moderate malnutrition and 17.7% severe malnutrition was reported (Abdelsafi et al., 2014).

Orphanages in Jimma community between the ages of 5 and 14 years showed that the orphanage children were more likely to be stunted but not more likely to be wasted than the family children (Abdelsafi et al., 2014). A study conducted in under five orphan children in Gondar also showed that the prevalence of wasting, underweight and stunting to be 9.9 %, 27.8 % and 45.7 % respectively (Teklemariam et al., 2014).

According to a study done in all regions of Ethiopia, orphan school children seemed to have a better anthropometric status than non-orphans although, the significant differences that were observed were relatively small. It also showed that maternal and double orphans were less likely to be thin than paternal orphans (Andrew et al., 2010).

Information regarding the nutritional status of orphans in orphanages is limited in the study setting and most studies mainly focus on under five children than these segments of population. Currently a number of Non-Governmental Organization in Ethiopia are providing different types of care and support to OVC based on the Guideline developed by the Ministries of Women's Affaires on care and support for orphan and vulnerable children.

## **2.2. Factors affecting the nutritional status**

### **2.2.1. Socio demographic factors**

#### **Age of child**

As to a study done in Kashmir valley India, it was observed that the prevalence of underweight ( $<-2SD$ ) was found more in the age group of 10-14 years (50.6%) as compared to 14-18 years (16.1%) and this association between age and underweight was found to be statistically significant ( $p<0.001$ ) (Sameena et al., 2017). Increased age of the orphaned children was associated with stunting in Lebanese orphanages (Germine & Fouad, 2017).

According to a study conducted in an orphanage in Dhaka city; Bangladesh, the prevalence of malnutrition was higher among orphan children aged 15 to 18 than orphan children of the age group 10-14 (Chowdhury et al., 2017).

### **Sex of the child**

A study conducted in Bangladesh reported that boys were more likely to be malnourished than girls in the orphanage (Chowdhury et al., 2017).

Sex of the orphans didn't find any significant relation with the nutritional status of orphaned children in a case control study conducted in Ethiopia (Hallgeir et al., 2014).

### **Parental status**

According to a study conducted in Tanzania, the loss of either parent and the death of other adults in the household will increase stunting of children (Ainsworth & Semali, 2000). In the same study, both maternal and paternal orphans were more likely to be short for their age than non-orphans.

A study done in an orphanage in Bangladesh revealed that orphan children having no parent alive had a significantly higher ( $P < 0.05$ ) malnutrition status compared to those who had at least one parent alive in a Bangladesh orphanage (Chowdhury et al., 2017). Maternal and double orphans were less likely to be thin than paternal orphans, in a study conducted in all regions of Ethiopia (Andrew et al., 2010).

### **Duration of stay**

A study done in Karnataka India shows statistically very high significant association between the duration of stay and the presence of medical illness in the orphanage children ( $P = 0.000$ ). The longer duration of stay in orphanage, children were more prone to medical illness (Mayuri & Ramya, 2017). A study conducted in Bangladesh revealed that duration of stay in an orphanage had significant effect on nutritional status of the orphan children (Chowdhury et al., 2017). In this study, one-fourth (24.6%) of the orphans whose duration of stay were between 0-4 years were found to be malnourished. Children who had been admitted to the orphanages for a longer period were more likely to be stunted and underweight ( $p < 0.05$ ) than those who had been recently admitted in an orphanages in Kenya (Elizabeth et al., 2014).

According to a study in Sri Lanka, non-conduciveness of institutional environments is evidenced by the finding that acute PEM (wasting) was prevalent in 28.6% of children who had been institutionalized for over 12 months (Channa & Jayasekera, 2006).

In Zimbabwe a strong association was found between living in an orphanage and nutritional and health outcomes such as diarrhea, acute respiratory infection, and underweight status among five to ten year old children (Helen, 2007).

In a study in an Indian orphanage the participants whose duration of stay was  $\leq 1$  year (53.1%) were having a higher prevalence of underweight as compared to those whose stay was  $> 1$  year (32.5%) and this significance was found to be statistically highly significant ( $p < 0.001$ ) (Shukla B & Shukla, D., 2011).

### **2.2.2. Health related factors**

Children with malnutrition have high morbidity and mortality. In one global study, malnourished children had higher rates of infectious complications than well-nourished children ( $P 0.042$ ) (Secker et al., 2007). A study in Nairobi, Kenya showed a higher underweight rate among orphanage children having common diseases: cough and diarrhea (Elizabeth et al., 2014). A study conducted in Hawassa town showed that the odds of wasting among OVC who had cough prior to 2 weeks of the survey were 2.272 times increased risk than OVC who had no cough (AOR 2.272; 95% CI 1.997, 5.181) (Bisrat et al., 2016).

A study conducted in Angolela tera Woreda north Ethiopia revealed that One-third of the participants were found to have a protozoan infection, while 7.1% were found to have a helminthic infection. Approximately 11% of the students were stunted, 19.6% were wasted, and 20.8% were underweight (Nguyena et al., 2012).

While huge strides have been made worldwide to increase vaccination coverage, there is still room for improvement. Tragically, the poorest children are also at a disadvantage when it comes to immunization. The richest children are more than twice as likely to have received the measles vaccination as the poorest 20 per cent of children in Azerbaijan, the Central African Republic, Chad, the Democratic Republic of the Congo, Niger and northern Sudan. A strengthening of disease surveillance as well as the upscaling of vaccination coverage significantly contributed to a reduction of infections among both young and school children (UNICEF, 2006).

According to the guidelines developed by the World Health Organization, children are considered to have received all basic vaccinations when they have received a vaccination

against tuberculosis (also known as BCG), three doses each of the DPT-HepB-Hib (also called pentavalent), polio vaccines, and a vaccination against measles (WHO, 2016).

Statistically, a significant association was found between malnutrition and immunization status of the child in rural Karnataka; India (Mayuri & Ramya, 2017).

A study conducted in Papua New Guinea showed that underweight children (3, 11.5%) are less likely to be fully vaccinated compared to children within normal weight ranges (13, 16.5%), OR = 0.662 (95% CI, 0.173 to 2.534) (Samiak & Emeto, 2017). In the same study, Children with stunting (6, 13.6%) are less likely to be fully vaccinated compared to children without stunting (10, 16.4%), OR = 0.805 (95% CI, 0.269 to 2.409). Malnourished children (1, 6.3%) are less likely to be fully vaccinated compared to children with normal nutrition (15, 16.9%), OR = 0.329 (95% CI, 0.040 to 2.683).

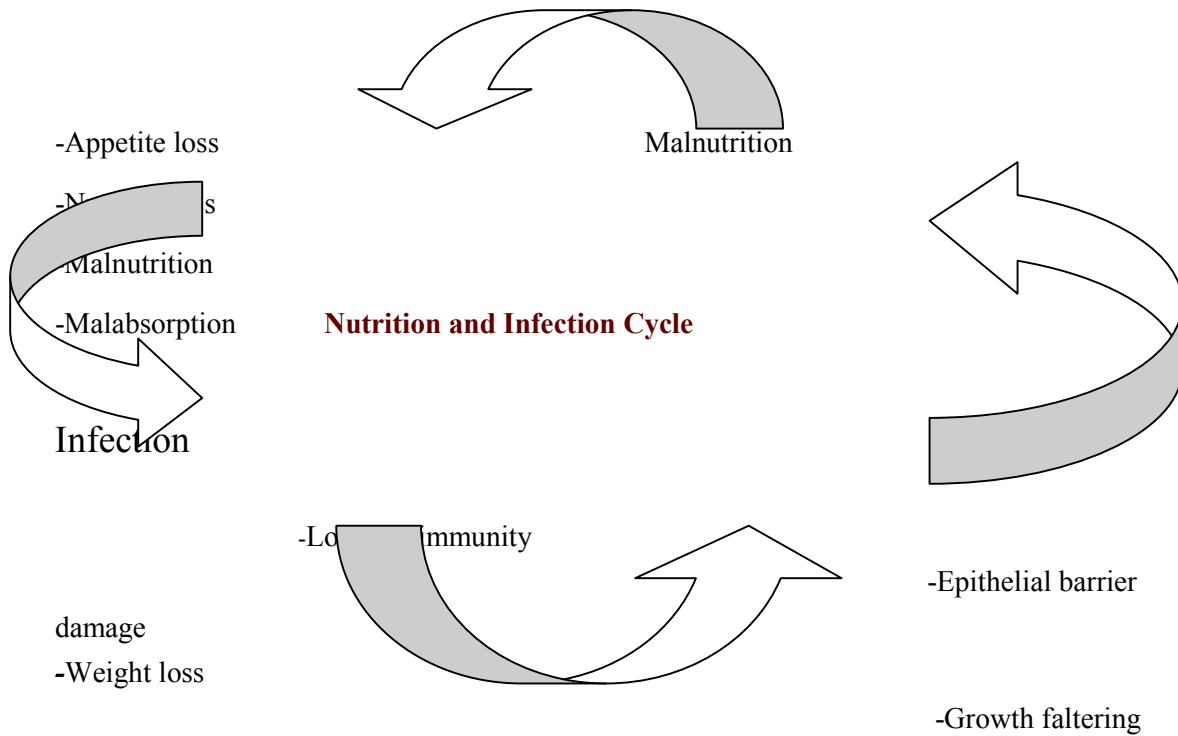
EDHS reported 39 percent of children age 12-23 months has received all basic vaccinations. Sixteen percent of children in this age group have not received any vaccinations (EDHS, 2016).

#### **Presence of diarrhea and Malnutrition**

A study conducted in Sudan shows high magnitude of malnutrition among children who had diarrhea. About 67.5% of malnourished infants developed diarrhea (odds ratio=5.1, 95% confidence interval=2.4-10.9) (Andrew et al., 2010).

The problem in Ethiopia is even worse than elsewhere in the world, with an Ethiopian child being 30 times more likely to die by his/her fifth birthday than a child in Western Europe (Animut et al, 2018). Regarding the determinants of wasting, a study done in Dabat, Ethiopia revealed that diarrheal morbidity remained significantly and independently associated with wasting (Terefe et al, 2017). A study conducted in Gonder city, Ethiopia showed that the prevalence of Diarrheal disease two weeks prior to the survey had significantly associated with wasting (Teklemariam et al., 2014). A study conducted in Jimma, west Ethiopia showed that the childhood diarrheal disease was statistically associated with under-five children (Kasye et al., 2018).

A study in Kenya orphanages showed there was no significant relationship between wasting and diarrhea and cough/colds (Elizabeth et al., 2014).



**Figure 1 Nutrition and infection cycle**

### 2.2.3. Orphanage related factors

#### 2.2.3.1. Role of care givers

Orphan children suffer from malnutrition and poor health due to many factors affecting their basic needs such as food, safe water, parental care, supervision and protection. Children living in orphanages tend to be neglected and become malnourished (Ryan et al., 2009).

Care is considered an underlying determinant of child malnutrition, on part with food insecurity and poor health services or unhealthy environment. Care is the provision in the Household and the community of time, attention and support to meet the physical, mental, and social needs of the growing child and other household members (ICN, 1992).

This provision of time, attention, and support is manifest in certain types of behaviors exhibited by caregivers (typically women): such as, psychosocial stimulation of children and support for their development; food preparation and food storage behaviors; hygiene behaviors; and care for children during illness, including diagnosis of illness and health-seeking behaviors (Engle, 1992).



A critical aspect of quality of care seems to be responsiveness to the child's cues, verbalizations, signals, etc. Responsiveness does not mean that the caregiver always gives the child what is requested, but that the caregiver's response takes the child's needs and developmental level into account. Among active and well-nourished children, not acceding to inappropriate demands is an important part of responsiveness.

Usually, a positive emotional (affective) relationship between caregiver and child will be reflected in warm and responsive care giving behaviors. However, the lethargic or unresponsive child will have a harder time stimulating responsiveness.

A study conducted in Nigeria has revealed that the nutritional status of the infants and pre-school children in the motherless babies' homes were generally poor and were associated with poor feeding habit of the children as well as the inadequate nutrition knowledge by the care-givers (Ngozi et al., 2014).

According to WHO/UNICEF identifies two fundamental qualities that determine the caregiver's ability to provide effective care: sensitivity and responsiveness to the child. These skills enable the caretaker to detect the child's signals and to respond appropriately in order to meet the child's needs (WHO, 2016).

#### **2.2.3.2. Environmental and personal hygiene**

The prevalence of underweight was significantly associated with personal hygiene ( $p < 0.001$ ) with a higher prevalence in those with poor hygiene (55.4%) as compared to those whose personal hygiene was satisfactory (28.6%), as to a study in Kashmir orphanage (Sameena et al., 2017). The hygienic conditions of orphanage children in Budgam district was found to be poor with 70% of the orphans having unclean and untrimmed nails (Sanjana et al., 2017). Widespread environmental contamination with *E. coli* has been demonstrated in Peru, indicating that exposure to pathogenic microbes is common among children living in impoverished conditions (Peter & Judit, 2008). Observational study of rural Zimbabwean infants showed that many have high exposure to *Escherichia coli*, due to active ingestion of soil and chicken faeces together with feco-oral transmission through contaminated fingers and drinking water. A recent analysis of data from 137 developing countries identified diarrhoea and lack of improved sanitation as two of the leading risk factors for stunting (Danaei et al., 2016).

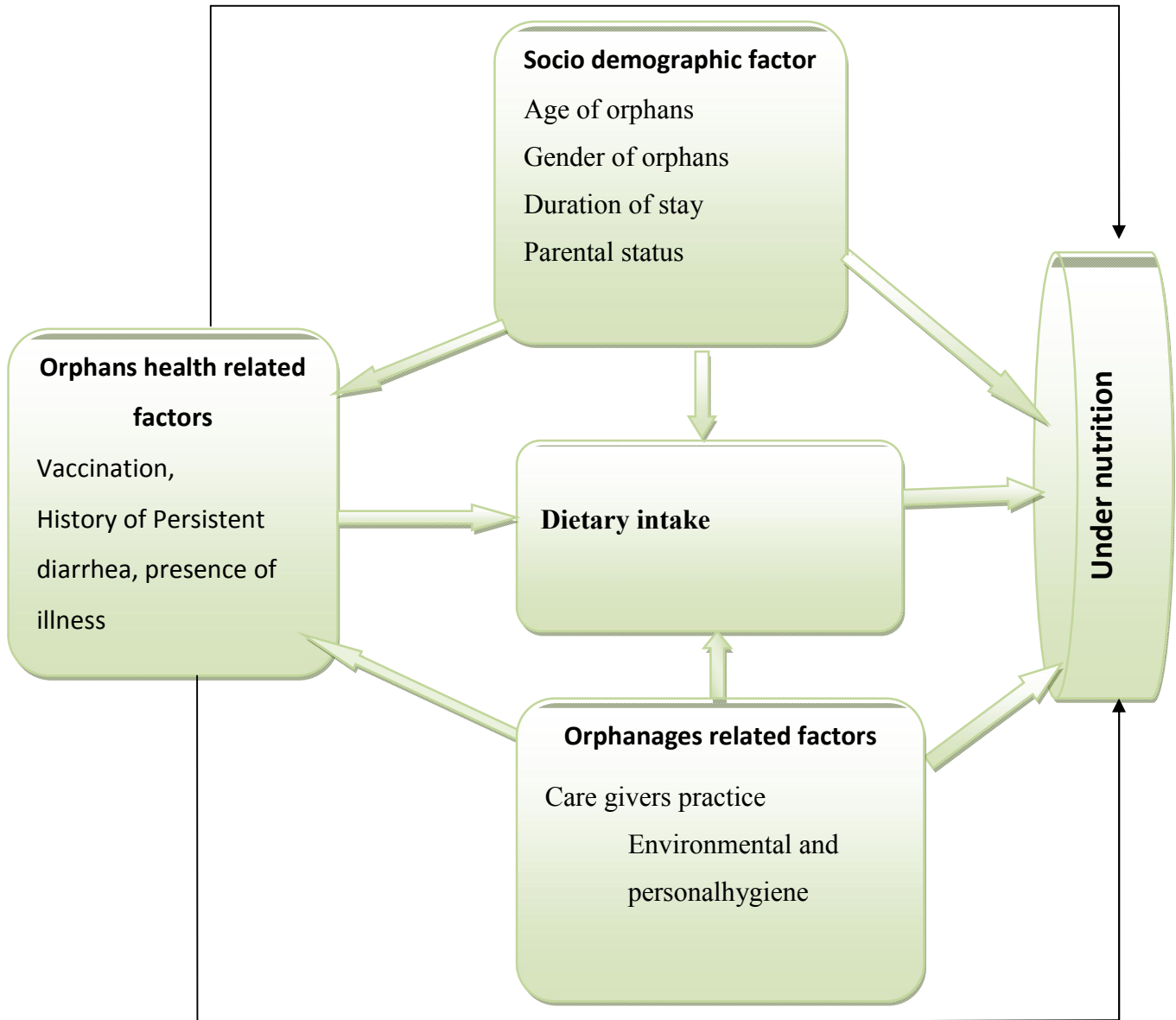
#### **2.2.4. Dietary intake**

A diet consisting of recommended servings of grain, vegetable, fruit, meat and dairy promotes growth and development in children and also decreases the risk for developing chronic diseases later in life (Serere et al., 2013). Regarding calorie and protein intake, a study in India observed that the prevalence of underweight was found to be more in participants having deficit diet as compared to those who had adequate diet and this association was found to be statistically highly significant ( $p < 0.001$ ) (Sameena et al., 2017).

Clinical examination done in Orphanages in India showed that 53% of participants were suffering from dys-pigmentation of hair, oedema, conjunctival xerosis, xerosis of skin, cheilosis, magenta tongue, spongy bleeding gums, and mottled dental enamel (Naheed, 2013). A study conducted in Kasaragod orphanage, India found that 95% of the orphans had signs of nutritional deficiency (Haleemath et al., 2017). Among those 68% had signs of anemia. Among signs of anemia pallor (60%) had higher incidence, followed by nail changes (platynychia and koilonychia) and angular stomatitis which was 31% and 34% respectively. According to a study conducted in Kenya, the total mean energy intake among the non-orphanage children was 1890 Kcal per day and was significantly higher ( $p < 0.05$ ) than that of the orphanage children energy intake which was 1547 Kcal per day (Elizabeth et al., 2014). Children in the orphans were also more than twice less likely to consume foods from more than four food groups compared to non-orphanage children.

Despite the fact that majority of children living in orphanages of Libanon confirmed that meals satisfy their appetite, the dietary intake of proteins, fruits, and vegetables of more than half the children was inadequate, suggesting that the dietary quantity may be sufficient but the quality is not (Germine & Fouad, 2017).

## 2.6. Conceptual framework



**Figure 2:** Conceptual framework of factors associated with under nutrition among orphans residing in selected orphanages in Addis Ababa

## **5. Methodology**

### **5.1. Study Design**

This study was done using an institutional-based cross sectional study design.

### **5.2. Study Period**

The study was conducted from December 2018 to January 2019 using a cross-sectional study design among school-age orphans at selected orphanages in Addis Ababa.

### **5.3. Study Area**

The study was conducted in selected orphanages in Addis Ababa, which is the capital city of Ethiopia. There are totally 30 orphanages which are licensed by the Addis Ababa women's and children affairs office. These orphanages are devoted for the care and rearing of children who lost their parents and some of these orphanages give health care services for the peoples outside the orphanage and give support for the vulnerable and fostered children. This study was conducted in five orphanages. Those orphanages were Selamta family ink, Selam village, SOS village, Abebech Gobena orphanage and Hana orphans home. There were 590 orphans reared in those orphanages during the study period.

### **5.4. Population**

#### **5.4.1. Source population**

All orphans in selected orphanages in Addis Ababa.

#### **5.4.2. Study population**

School-age orphans who were living in selected orphanages in Addis Ababa during the study period.

#### **Inclusion and exclusion criteria**

**Inclusion criteria-** School-age orphans with a minimum of 4 months stay in selected orphanages in Addis Ababa.

**Exclusion criteria** – School-age orphans who were severely ill or with disability during the study period.

### 5.5. Sample Size

The sample size was determined using a single population proportion formula assuming 5% margin of error and 95% confidence interval ( $Z_{\alpha}=0.05$ ). The prevalence of stunting, underweight and low BMI for age (47.2%, 33.2% and 9.2%, respectively) among orphans was taken from similar study conducted in Kenyan orphanages (Elizabeth et al., 2014). Finally, by considering a non-response rate of 10% the highest calculated sample size from the three indicators was taken as the final sample size.

#### Sample size calculation by using the prevalence of stunting in orphans

$$n = \frac{z^2 p(1 - p)}{d^2} = \frac{(1.96)^2 (0.472)(1 - 0.472)}{(0.05)^2} = 383$$

Where;

Z = level of confidence  $(1.96)^2$

P = single population proportion (47.2%)

d = margin of error (5%)

n = sample size

n=383; by adding 10 % non-response rate, the sample size was 421

#### Sample size calculation by using the prevalence of underweight in orphans

$$n = \frac{z^2 p(1 - p)}{d^2} = \frac{(1.96)^2 (0.332)(1 - 0.332)}{(0.05)^2} = 341$$

Where;

Z = level of confidence  $(1.96)^2$

P = single population proportion (33.2%)

d = margin of error (5%)

n = sample size

n=341; by adding 10% non-response the sample size was 375

**Sample size calculation by using the prevalence of low BMI for age in orphan**

$$n = \frac{z^2 p(1 - p)}{d^2} = \frac{(1.96)^2(0.092)(1 - 0.092)}{(0.05)^2} = 128$$

Where;

Z = level of confidence (1.96)<sup>2</sup>

P = single population proportion (9.2%)

d = margin of error (5%)

n = sample size

n=128; by adding 10% non-response rate, the final sample size was 141

**Table 1:** Sample size calculation by using the prevalence of stunting, low BMI for age and underweight

Index	Prevalence in orphanage children (p)	CI	Margin of error(d)	Non response rate	Sample size (n)
Stunting	47.2%	95%	5%	10%	421
Low BMI for age Z score	9.2%	95%	5%	10%	141
Underweight	33.2%	95%	5%	10%	375

By taking the largest sample size, the final sample size was 421.

Since the total population is < 10,000 correction were made and n final was calculated as

$$n \text{ final} = \frac{n}{\left(1 + \frac{n}{N}\right)} = \frac{421}{\left(1 + \frac{421}{590}\right)} = 246$$

### 5.6. Sampling procedures

From the total of 30 orphanages, 5 of the orphanages were selected using purposive sampling method. These orphanages have been established for a long time, have relatively large number of children and allow research activities.

The number of sample size required for each orphanage was allocated proportional to the number of orphans in each orphanage. Finally, eligible participants were selected randomly from the list of the orphans.

Using given information as baseline data, the total number of orphans that were included for each orphanage was calculated as follows:

$$\frac{\text{Total number of orphans in an orphanage}}{\text{Total number of orphans in the five orphanages}} \times \text{sample size}$$

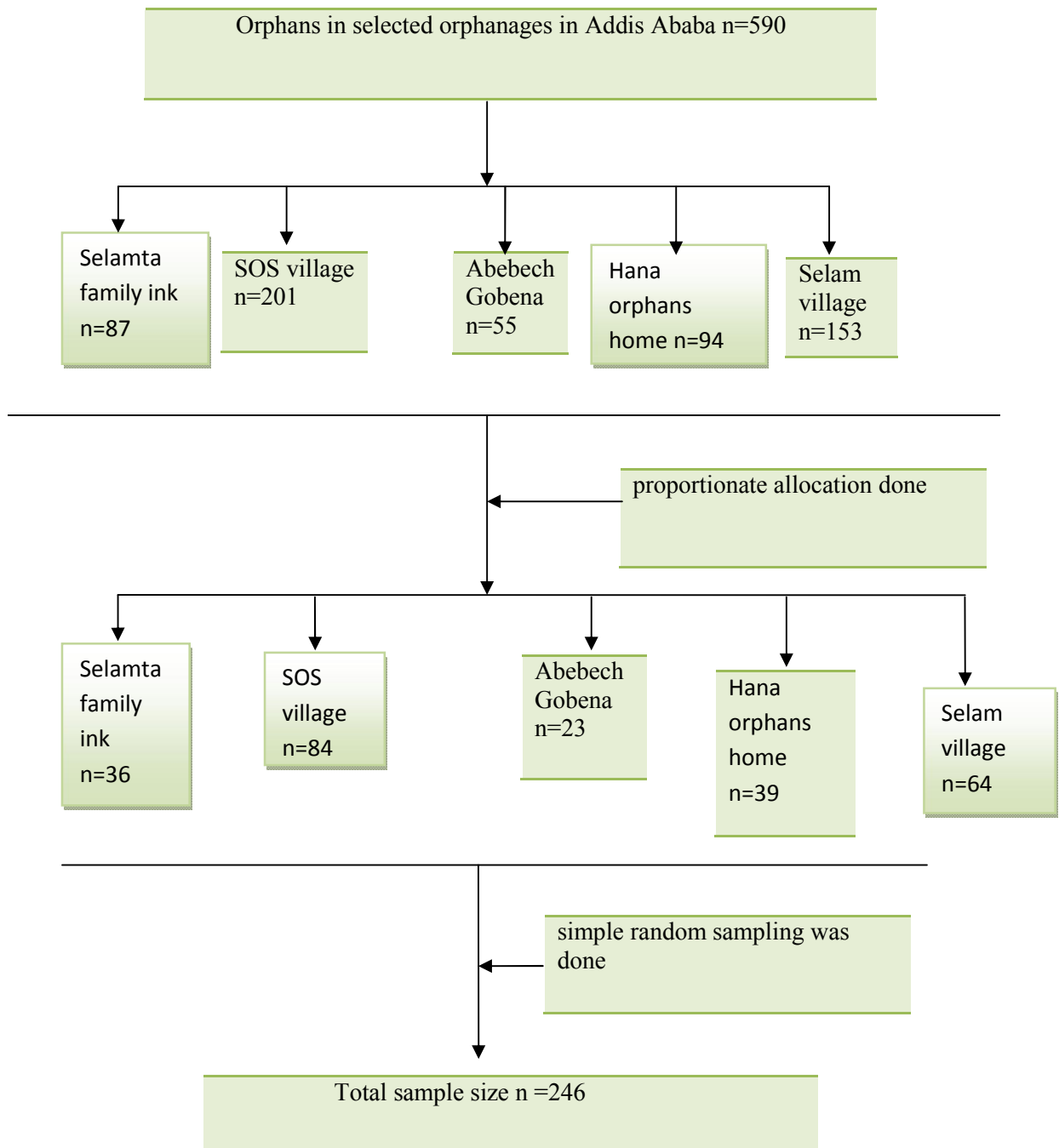
<b>Orphanages</b>	<b>Numbers allocated</b>
<b>SOS village</b>	$\frac{201 \times 246}{590} = 84$
<b>Selamta family ink</b>	$\frac{87 \times 246}{590} = 36$
<b>Selam village</b>	$\frac{153 \times 246}{590} = 64$
<b>Abebech Gobena</b>	$\frac{55 \times 246}{590} = 23$
<b>Hana orphans home</b>	$\frac{94 \times 246}{590} = 39$

A computer registered list of the orphan children was used as a sampling frame and a simple random sampling method was used to recruit the orphans who were included in the study. A minimum of 4 months stay in an orphanage was required to be eligible for

inclusion in this study. Those children in orphanages who had less than four months stay in the orphanage would be reflecting nutritional status (wasting and underweight) not fostered by orphanages' food consumption.



## Schematic Presentation of Sampling Procedure



## **5.7. Variables**

**5.7.1. Dependent variables:** Under nutrition (stunting, low BMI-for-age and underweight)

**5.7.2. Independent variables:** Age and sex of the child, parental status, duration of stay in the orphanage, vaccination, presence of illness in the last two weeks, Sanitation and hygiene, dietary intake, care givers practice.

## **5.8. Data Collection Procedures**

Quantitative and qualitative data were collected using structured and semi-structured questionnaire, respectively. An in-depth interview was held with one care giver and a key informant in each orphanage. Observational check list was also used for assessing environmental hygiene of the orphanage. Socio-demographic and anthropometric data were collected after written consent was obtained from parents or caregivers of the children by interviewing. Data on period of stay in the orphanage, morbidity occurrence, health seeking behavior and 24 hour recall to obtain the common types of foods taken was also collected from the children and caretakers of children in orphanages.

Pretesting of the questionnaire was done in an orphanage which was not included in this study (Silenat orphanage). The questionnaire was translated and back translated from English language to Amharic (the local language).

Two data collectors who had bachelordegree in nursing and a supervisor who had bachelordegree in Public health were involved in the process of data collection. The data collectors were trained for two days by the principal investigator. The training was on how to conduct interviewing and on how to do anthropometric measurements. The supervisor was already trained on nutritional assessment. In addition, data collection guideline was prepared and used during the data collection procedure.

Relevant information about socio-demographic characteristics was collected using structured questionnaire by interviewing the child and parent or caregivers of the child who were following the child in the orphanages. Socio-demographic information was collected including age and sex of the child, parent marital status, duration of stay in orphanage. History of diarrhea and presence of other morbidity are also included in the questionnaire.

To gather information regarding the nutritional intake of the subjects, 24-hour dietary recall method was used. The food intake during the last 24-hours recall was used to obtain dietary diversity score consumed by the children.

Foods consumed within the previous 24-hour period were asked to children. Nine food groups were included to measure dietary diversity of the children. These food groups were starchy staples, dark green leafy vegetables, other vitamin A fruits and vegetables, other fruits and vegetables, organ meat, meat and fish, eggs, legume, nuts and seeds, milk and milk products. Dietary diversity score was calculated by summing up the number of food groups consumed during the last 24 hours (Krebs-Smith et al, 1987). Any yes answer to any of the groups mentioned was given one point and zero to any no answer given (0 to 9 points). Scores were allocated according to points e.g. points <4 were termed low diet diversity score, points between 4 and 5 was termed as moderated diet diversity score while points >5 were termed as high diet diversity score (Bisrat, 2016). Child's growth and health monitoring cards were used to extract information on vaccination and from caretakers' verbal history of the child.

In each orphanage, anthropometric measurements were performed by the trained health professionals. This included weight and height of the child. The weight of the children was measured using weighing scale (seca gmbh) which was calibrated twice daily against known weight. It was recorded to the nearest 0.1kg. Height of the child was also measured by two trained health professionals. Height was measured on a standing position using stadiometer which was calibrated using calibration standard rod. Height of the child was recorded to the nearest 0.1 cm.

## 5.8. Operational Definitions

**Anthropometry** - Measurement of the variation of physical dimensions and the gross composition of the human body at different age levels and degrees of nutrition by weight-for-age, height-for-age and weight-for-height.

**Orphans**- was a child whose mother, father, or both have died.

**Orphanage** - An institution that shelters orphans, vulnerable or abandoned children.

**Double orphans**: Children who have lost both parents.

**Single orphans**: Children who have lost one of their parents.

**Caregiver**: a person who looks after infants and young children.

**Under nutrition**: Is a consequence of insufficient intake of essential nutrients and repeated infectious diseases.

**Dietary diversity**: Is a qualitative measure of food consumption that reflects household access to a variety of foods, and is also a proxy for nutrient adequacy of the diet of individual.

**Persistent diarrhea**- diarrhea that lasted for more than two weeks in the preceding 6months.

**School age** – the age range of children normally attending school.

**Other co-morbid illness**- chronic illness with settled diagnosis of the disease other than HIV infection. This included tuberculosis, renal, malignancies and other chronic illnesses.

**Vaccination**- The process of administering weakened or dead pathogens to a healthy person, with the intent of conferring immunity against the pathogen.

**Vulnerable children**-children who are more exposed to multiple risks than their peers due to their inability to access education, health care and protection.

### Standard Definition

**Stunting**- which is below -2 S.D from median height for age of reference population (WHO, 2018).

**Low BMI for age** - BMI for age Z scores below minus 2 standard deviations (<-2 SD) from the median of the WHO reference 2007 (61 month-19 years) (WHO, 2018).

**Underweight**-which is below -2 S.D from median weight for age of reference population (WHO, 2018).

### **5.9. Data analysis**

The data were entered into a computer and checked for its completeness and analyzed using SPSS 20.0. The following anthropometric indicators were used to assess the magnitude of under nutrition in the orphanages; Weight-for-age Z-score (WAZ), BMI-for-age Z-score (BAZ) and height-for-age Z-score (HAZ). Malnutrition is diagnosed when the anthropometric Z-score of the child falls -2SD below the median of the reference population. Children whose anthropometric value falls -3SD below the reference population median is considered to have severe malnutrition.

Using the explanatory and response variables, univariate, bivariate and multivariate analyses of the data was done. Univariate analysis was used to calculate simple frequencies and proportions. A bivariate analysis was done to see the relationship between the independent variables and each type of child nutritional indicator that is wasting, stunting and underweight using odds ratio with its 95% CI. In the multivariate analysis, logistic regression was used. The logistic model considered the relationship between malnutrition and a set of independent variables. Variables included in multivariable analysis were those variables which had significant statistical association in the bivariate analysis (p-value less than 0.25). The response variable constituted binary outcomes taking a value of 1 if a child was malnourished and a value of 0 if child was not malnourished. A p-value less than 0.05 were regarded as statistically significant.

The one-to-one interviews were conducted in Amharic language using a semi-structured questionnaire. Each interview usually lasted for 40-60 minutes. Responses from the key informant interviews and in-depth interviews were first recorded using MP3 recorder and then transcribed. The data were analyzed on the basis of emerging themes in the context of the study framework. The interviews were usually conducted after the work hours.

### **5.10. Data Quality Management**

To ensure the quality of the data, trained health professionals were used as a data collector. The questionnaire was pretested in an orphanage which was not included in the study. The principal investigator and the supervisor monitored the data collection process by checking completeness of the required type of data and correct faults on the spot.

The investigator coded and entered questionnaires into Statistical Package for Social Science 20.0.

After data entry completed, data cleaning was performed by running frequencies of each variable to check for accuracy, outliers and consistency. Age was collected from the child, mother/caretakers and looking up in official registers for counter check. Length/Height was measured using Wooden board in standing-up position while the child being barefooted and free of any head wearing recorded to the nearest 0.1 cm. Weight was measured using weighing scale (seca gmbh & co. Germany) and was recorded to the nearest 0.1 kg. The scale was calibrated immediately before and during each session by placing standard calibration weights of 5 kg iron on the scale to ensure accuracy.

For the qualitative data, the interviews were conducted and analysed before the next interview for avoidance of unnecessary data collection and possible amendment of the tool. In addition appropriate note taking and tape recording were taken.

#### **5.11. Ethical considerations**

Ethical clearance from Bahir dar University Institutional Health Research Ethics and Review Committee (BHRERC) was obtained prior to the data collection. Permission to collect data was obtained from Addis Ababa city administration women and children affairs bureau. Before informed consent obtained, the clear description of the study title, procedure and duration, possible risks and benefits of the study were explained for the caregivers/parents, children and key informants. Their rights during the interview were also guaranteed. Then, informed consent were asked from the caregivers/parents and key informants before starting interviewing and the responses of interviewee's were kept confidential.

## 6. Results

### 6.1. Socio-demographic characteristics

Out of 246 orphans living in the orphanages, a total of 243 actually participated in the study with response rate of 98.8%. According to this study, 162 (67.7%) were male. The mean age of the participants was 8.55 (SD  $\pm$  1.516) years. Among the orphans 83.9 % were in the age group 7-9 followed by 10-12 (12.8%) and 13-14 (3.3%) respectively. Two hundred forty-three (100%) of the orphans were double orphans. Regarding duration of stay in the orphanage 96.3% of the participants stayed in the orphanage between 6-10 years (**Table 2**).

**Table 2:** Socio-demographic characteristics among school-age orphaned children in Addis Ababa orphanages, Ethiopia, Jan. 2019(N=243).

Variables	Category	Frequency (n)	Percent (%)
<b>Sex of the child</b>	Male	162	67.7
	Female	81	32.3
<b>Age of the child</b>	7-9	204	83.9
	10-12	31	12.8
	13-14	8	3.3
<b>Child's parents alive</b>	Yes	0	0
	No	243	100
<b>School level of the child</b>	Didn't start school	0	0
	Kindergarten	0	0
	Primary and above	243	100
<b>Duration of stay</b>	0-5	3	1.2
	6-10	234	96.3
	11-14	6	2.5

### 6.2. Hygiene and health status

About 235 (96.7 %) of the orphans wash their hands before eating food and 217 (92.3 %) of them reported washing hands with soap. Among those orphans who participated, 88

(36.2 %) were sick two weeks before the data collection time. The major symptom was cough/common cold 41 (46.6 %). From those who had illness in the last two weeks, 76 (86.3 %) of them were getting treatment. Fifty nine (67 %) of the sick orphans were seeking treatment in health facility outside the orphanage.

Among the orphans who participated in this study, 17 (7 %) of them were taking medication for chronic illness. Anti-retro viral medications were taken by 6 (35.3%) of the orphans who took medications.

**Table 3:**Hygiene and health related factors among school-ageorphans in Addis Ababa orphanages. Ethiopia, Jan. 2019

<b>Variables</b>	<b>Category</b>	<b>Frequency (n)</b>	<b>Percent (%)</b>
<b>Hand washing before meal</b>	Yes	235	96.7
	no	8	3.3
<b>Things used for hand washing</b>	Water only	18	7.7
	Water and soap	217	92.3
<b>Hand washing after visiting toilet</b>	Yes	129	53.1
	No	114	46.9
<b>Things used for hand washing</b>	Water only	31	24
	Water and soap	98	76
<b>Presence of dirt in finger nails</b>	Yes	96	39.5
	No	147	60.5
<b>Vaccination</b>	Complete	239	98.3
	Incomplete	4	1.7
<b>Any sickness in the last two weeks</b>	Yes	88	36.2
	No	155	63.8
<b>Type of illness</b>	Cough	41	46.6
	Fever	26	29.5
	Diarrhea	16	18.2
	Vomiting	5	5.7
<b>Treatment of illness</b>	Yes	76	86.4
	No	12	13.6



**Table 3:** Hygiene and health related factors among school-age orphans continued...

Variables	Category	Frequency (n)	Percent (%)
<b>Place of treatment of the sick child</b>	Orphanage's health center	17	19.3
	Other health centers	59	67
	Didn't get treatment	12	13.7
<b>Chronic illness of the child</b>	Yes	17	7
	No	226	93
<b>Medication taken for chronic illness</b>	Yes	17	100
	No	0	0
<b>Types of medication taken</b>	ART medications	6	35.3
	Others	11	35.3

### 6.3. Dietary assessment of the orphans

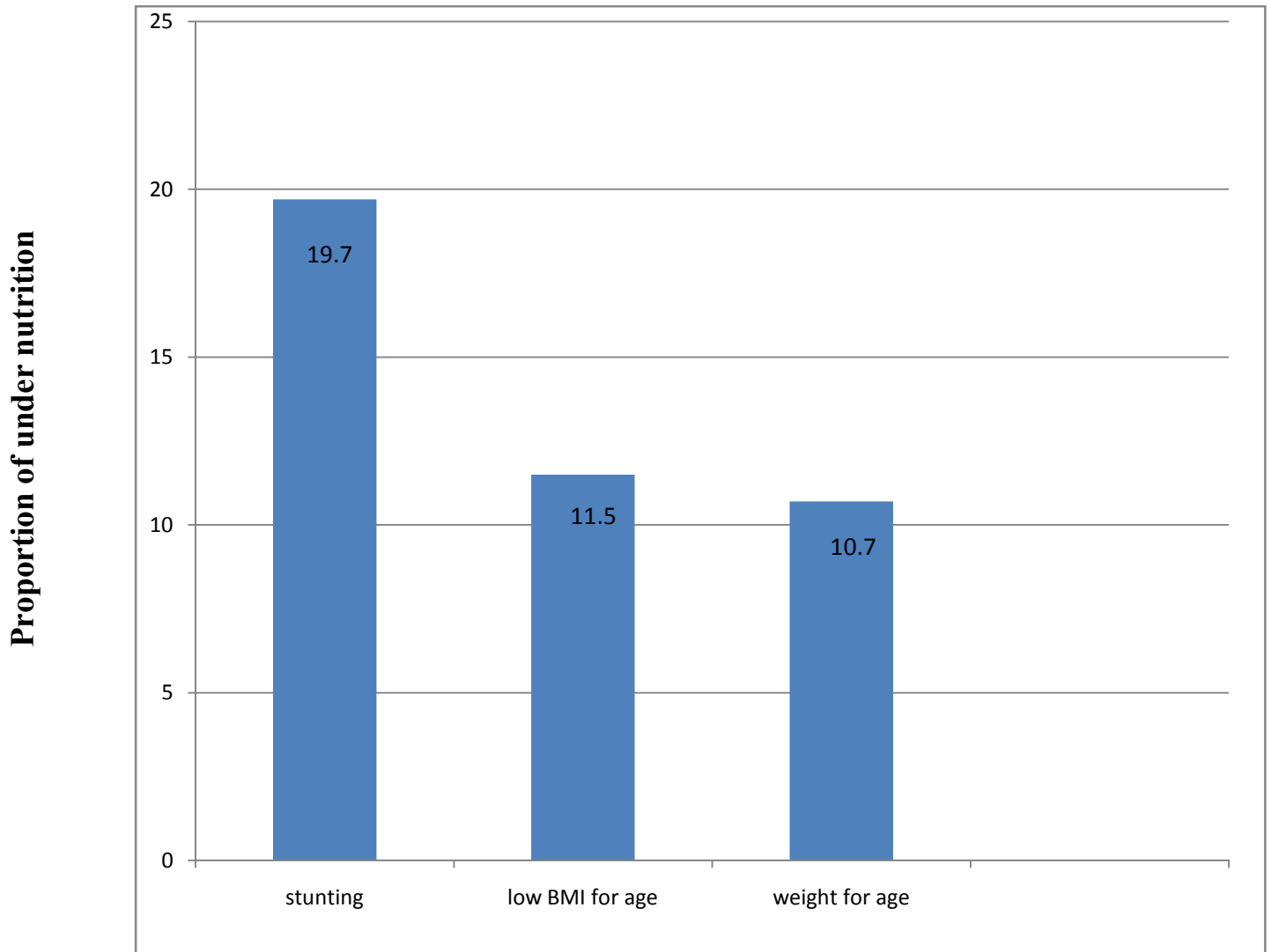
About 209 (86 %) of the orphans eat more than 3 meals regularly over 24 hours. It was also reported by the orphans that 38 (15.6 %) of them miss one of their meals in 24 hours (Table 4). There were 28 food items consumed by the orphans. About 54 (22.2%) of the orphans consumed <4 groups of foods and 189 (77.8%) of the orphans consumed  $\geq 4$  groups of food.

**Table 4:** Dietary assessment of orphans in selected orphanages in Addis Ababa, Ethiopia, Jan. 2019

Variable	Category	Frequency (n)	Percent (%)
Number of meals eaten regularly	Three times	27	11.1
	More than three	209	86
	Less than three	7	22.2
Food groups	$\geq 4$ food groups	189	77.8
	<4 food groups	54	22.2
Missing of one of the meals in the last 24 hour	Yes	38	15.6
	No	205	84.4

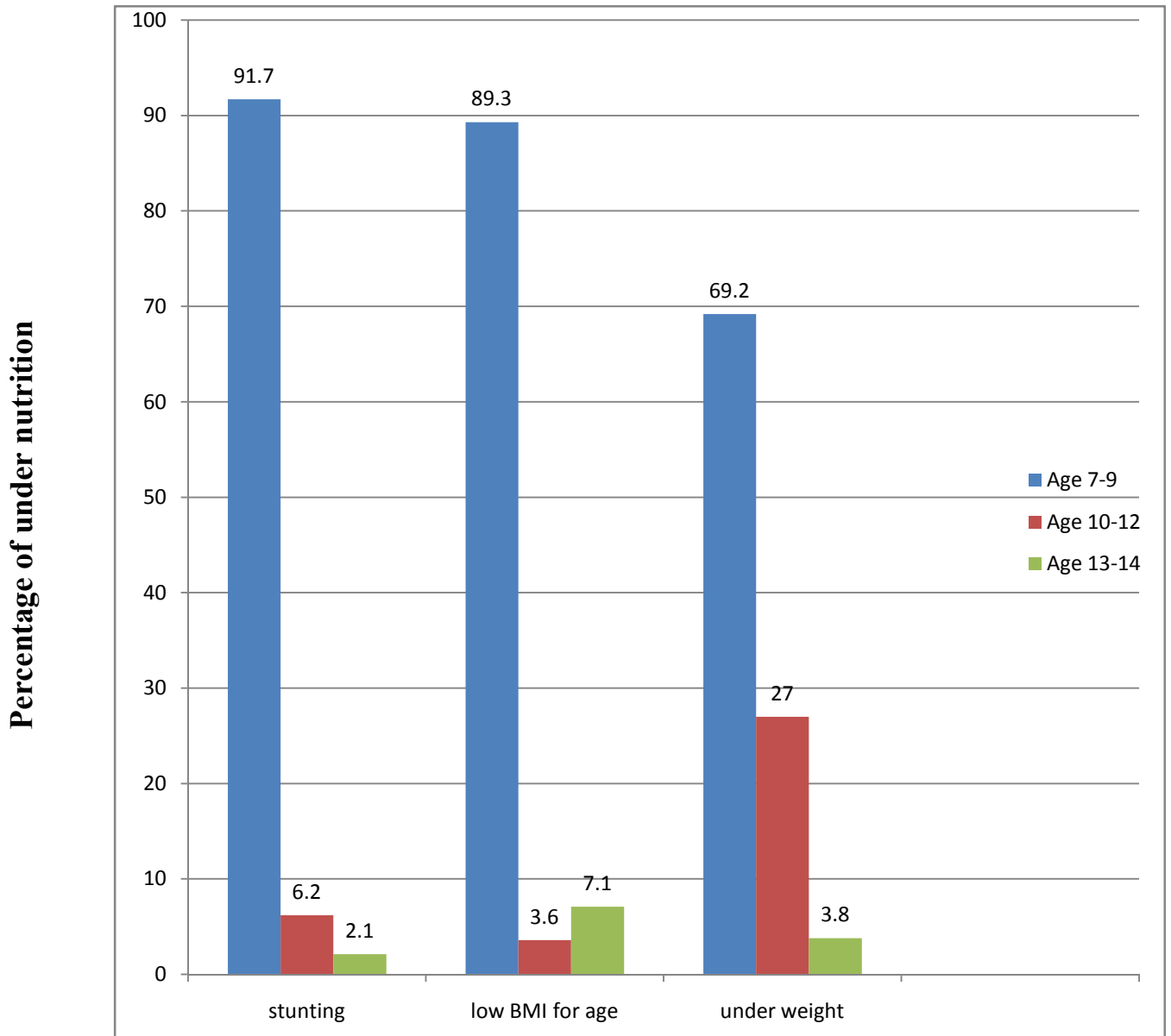
#### 6.4. Measures of Nutritional status of orphans

Figure 4 illustrates the magnitude of under nutrition among the children. Out of the 243 orphans 48 (19.7 %) of them were found to be stunted. The proportion of low BMI for age in this study was 28 (11.5%). Twenty six (10.7%) of the children were found to have underweight.



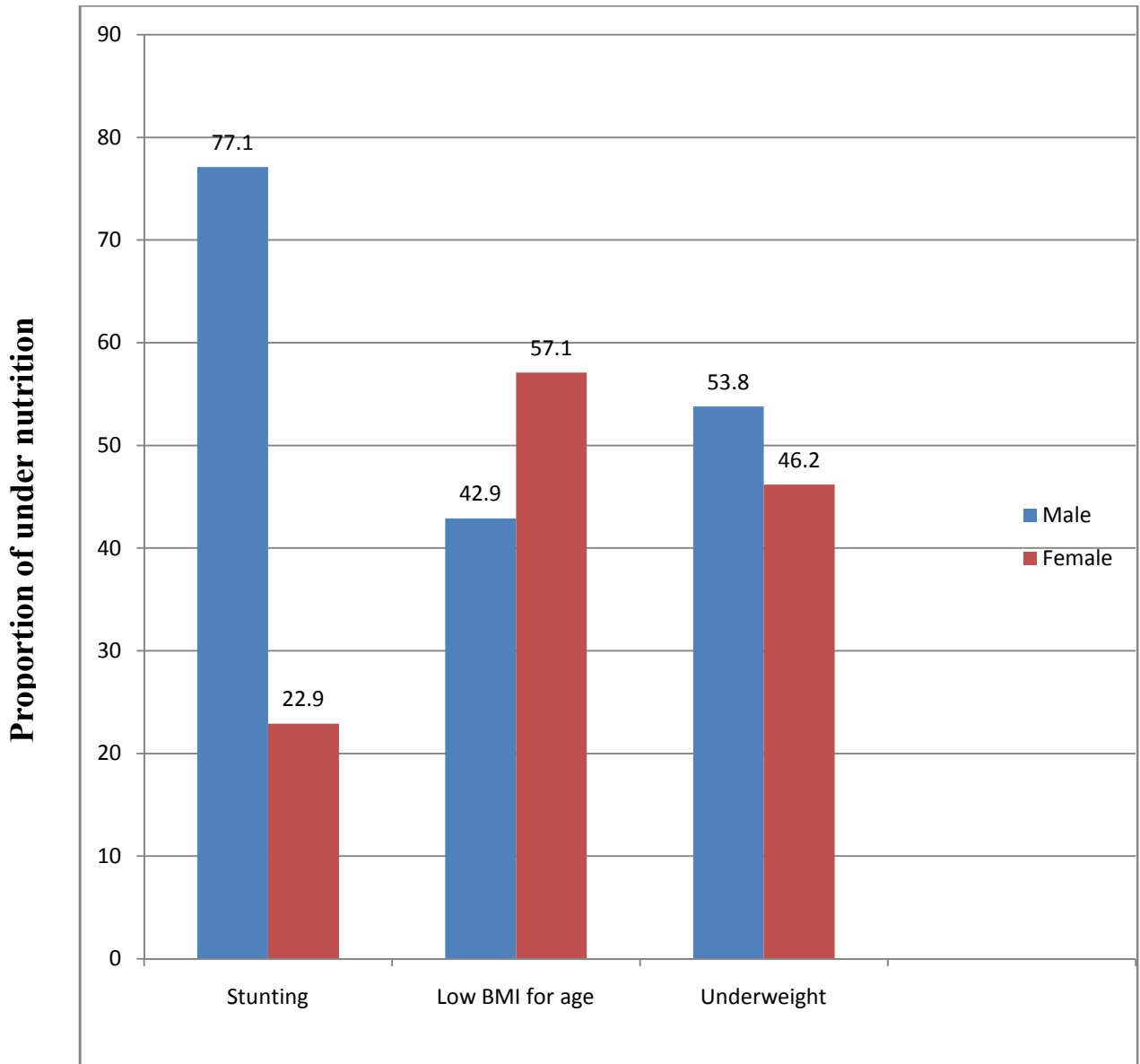
**Figure 4:** Magnitude of under nutrition among school-age orphaned children in selected orphanages in Addis Ababa, Ethiopia, Jan. 2019

As figure 5 illustrates, the proportion of stunting in the age group of 7-9, 10-12 and 13-14 were 91.7 %, 6.2 % and 2.1 % respectively.



**Figure 5:** Magnitude of under nutrition among school-age orphaned children by Age in selected orphanages in Addis Ababa, Ethiopia, Jan. 2019

As figure 6 illustrates, the proportion of stunting was 77.1 % among males and 22.9 % of females had low BMI for age. The proportion of underweight among males was 53.8%.



**Figure 6:** Magnitude of under nutrition among school-age orphaned children by sex in Addis Ababa orphanages, Addis Ababa, Ethiopia, Jan. 2019

## 6.5. Factors associated with under nutrition

### 6.5.1. Factors affecting low BMI for age

The multivariate logistic regression analysis identified sex of the child as a determinant predictor for low BMI for age. In this study, female children were 68.4 % at reduced risk to be thin than male children (AOR=0.316; 95% CI; (0.133-0.608)).

**Table 5:** Factors associated with low BMI for age among school-age orphans in Addis Ababa, Ethiopia, Jan. 2019

Variables	Low BMI for age		Crude OR(95% CI)	Adjusted OR(95% CI)
	Yes	No		
<b>Sex of the child</b>				
Male	12	150	0.325 (0.145-0.725)	0.316(0.133-0.608)**
Female	16	65	1	1
<b>Duration of stay</b>				
0-5 years	2	1	1	1
6-10	25	209	0.05(0.005-0.683)	0.38(0.25-1.01)
11-14	1	5	0.1(0.004-2.504)	0.3(0.163-2.496)
<b>Sickness in the last two weeks</b>				
Yes	15	73	2.24(1.01-4.96)	2.17(0.92-4.57)
No	13	142	1	1
<b>Regular meal intake</b>				
Three times per day	11	16	0.91(0.17-4.93)	0.83(0.14-4.68)
More than three times per day	14	195	0.09(0.05-0.12)	0.07(0.03-0.11)
Less than three times	3	4	1	1

\*\* indicates Significance at *P* value less than 0.05.

### 6.5.2. Factors affecting underweight

The multivariate logistic regression analysis identified sickness in the last two weeks and age of the child as determinant factors for low weight for age (underweight).

As table 6 describes, sickness in the last two weeks was significantly associated ( $p=0.001$ ) with underweight. The odds of underweight in those orphans who were sick during the past two weeks was 3.32 times more likely than those who were not ill in the last two weeks (AOR=3.32% CI; (1.31-8.79)). (Table 6)

**Table 6:** Factors associated with underweight among school-age orphans in selected orphanages in Addis Ababa, Ethiopia, Jan. 2019

Variables	Underweight		Crude OR(95% CI)	Adjusted OR(95% CI)
	Yes	No		
<b>Sex of the child</b>				
Male	14	148	0.54(0.23-1.23)	0.49(0.19-1.18)
Female	12	69	1	1
<b>Age of the child</b>				
7-9	18	186	1	1
10-12	7	24	3.01(1.41-7.95)	2.51(1.13-5.72)**
13-14	1	7	1.48(0.17-12.68)	1.36(0.15-12.63)
<b>Sickness in the last two weeks</b>				
Yes	17	71	3.88(1.64-9.14)	3.32(1.31-8.79)**
No	9	146	1	1
<b>Vaccination</b>				
Complete	24	215	0.11(0.01-0.82)	0.32(0.19-1.15)
Incomplete	2	2	1	1
<b>Hand washing before meal</b>				
Yes	21	214	0.058(0.013-0.263)	0.025(0.011-0.207)
No	5	3	1	1

\*\* indicates Significance at *P* value less than 0.05.

## **Qualitative results**

### **I. Socio demography of care givers and orphanage heads/representatives**

There were 5 female (100%) caretakers and 4 (80%) of the caregivers were married (Table 8). A proportion of (20%) of the caretakers had attained post primary education.

**Table 7:** Demographic characteristics of care givers of school-age orphans in selected orphanages in Addis Ababa, Ethiopia, Jan. 2019

<b>Characteristics</b>	<b>Frequency</b>	<b>Percent</b>
<b>Age</b>		
<b>25-35</b>	1	20%
<b>Above 35</b>	4	80%
<b>Sex</b>		
<b>Male</b>	0	0
<b>Female</b>	5	100%
<b>Educational status</b>		
<b>Primary school</b>	2	40%
<b>Secondary school</b>	1	20%
<b>Read and write</b>	2	40%
<b>Marital status</b>		
<b>Currently married</b>	4	80%
<b>Currently unmarried</b>	1	20%
<b>Training on care and support</b>	5	100%

There were 4 (80%) males and a female (20%) among the orphanage head and 3(60%) of them were aged above 46 years (Table 9). A proportion (40%) of the caretakers had second degree.

**Table 8:** Demographic characteristics of orphanages head/representative of school-age orphans in selected orphanages in Addis Ababa, Ethiopia, Jan. 2019

<b>Characteristics</b>	<b>Frequency</b>	<b>Percent</b>
<b>Age</b>		
<b>35-45</b>	2	40%
<b>Above 46</b>	3	60%
<b>Sex</b>		
<b>Male</b>	4	80%
<b>Female</b>	1	20%
<b>Educational status</b>		
<b>First degree</b>	3	60%
<b>Second degree</b>	2	40%
<b>Marital status</b>		
<b>Currently married</b>	3	60%
<b>Currently unmarried</b>	2	40%

## **I. History and resources in the orphanages**

### **1. History of the orphanages**

Most of the orphanages had started over twenty years ago to rescue the orphaned and vulnerable children whose relatives were not able to take them into their families. Two orphanages were started by international aid organization whereas the rest of the organizations were founded by local residents who have since been endeavoring for support from well-wishers to achieve the goals.



## **2. Resources for the orphanages**

Money for food and other care and support comes from non-governmental organizations, individual donors and community representatives. And in addition, some homes have subsistence self-supporting activities such as involving in business sectors. Sometimes two of the orphanages had financial shortage in providing the children need.

## **3. Services given in orphanages**

Regarding services given in the orphanages, the entire orphanages were giving food, shelter and health care services. Heads of the orphanage responded that foods preparation was made according to the standards set by the Addis Ababa bureau of women and child affairs. One responded that:

*“Our center gives food, shelter, and healthcare service and since we have our academy nearby the children attend school five days a week. We get support from the governmental body in terms of training and they give us comments and suggestions on the activities and over all practice of the orphanage during their time in our center for supervision.”*

Other orphanage head responded that:

*“We provide everything we can to fulfill the basic necessities of our children. We have our own health center so if children feel sick we will take them so they can have proper treatment of the disease. Food handlers were trained on sanitation and food preparation as well as proper child care.”*

### **I. Role of care givers**

Five care givers were interviewed. Burdens of care givers, training on caring, hygiene and related aspects were included in the questions and assessed. Regarding burden of caregivers, all of them responded that they didn't have any work load that would have impact on their overall activities. One of the care givers said:

*“We work in shifts and have enough number of care givers with proper division of labor. So this decreased our work load.”*

In order for care behaviors to be exhibited, the caregiver needs sufficient education, time, and support.

Regarding training, four of the caregivers had training more than once this year while one care giver had only once because she missed one-day training. She was not in the city.

According to the care givers training focused basically on caring for children. One of the respondents said:

*“I was trained before I was hired in this organization. And later I attended two training sessions given by non-governmental organization and a psychology expert.”*

To the question ‘Do you think you have adequate understanding on malnutrition and nutritional status of the orphans?’

Most of the respondents think that they have little knowledge regarding nutrition and they acquired it from their lower school education. Almost all of the care givers answered that they didn’t have any training that would increase their knowledge on malnutrition and nutritional status of orphans. Meals eaten regularly at the orphanages were asked and all the respondents replied that same meals were not given daily. An orphanage head explains about meals given in the orphanages:

*“Meals are prepared and provided to the orphans according to standards set by a government office which is Addis Ababa bureau of women and children affairs. So we arrange the schedule of food program accordingly.”*

A care giver responded:

*“I have an understanding that foods are fundamental for life. They help children grow. We have a nurse in our orphanage that follows the children growth. So, I personally don’t have that much information on the nutritional status of the children.”*

Regarding personal and environmental hygiene, one care giver said:

*“Being clean is everything and it helps you prevent from being infected with disease. If someone is not having a good hygienic practice then she will be vulnerable for diseases.”*

Another respondent explained about her personal and environmental hygiene:

*“Hygienic practices are given priority in our orphanage. Proper hand washing is our day to day practice, soap is found in the basins. The compound is cleaned and the garbage is taken away daily.”*

All of the care givers said that they have very strong relation with the orphans they care. One of the care givers said:

*“My relation to the orphans is very strong that most of them call me mom. Even when I’m off work for few weeks I miss them so much.”*

On the other hand, an orphanage administrator said:

*“In our orphanage, there is a gap on creating a strong relationship between care givers and orphans. Frankly speaking there is no satisfying relationship between them. And I think it will affect the orphan children psychology.”*

Regarding children health and nutrition, most of the care givers replied that both nutrition and health are interrelated. A care giver replied that:

*“From my experience in this orphanage, I know when a child is sick. Because if a child is sick he will have a behavioral change such as feeling of stupor and mainly loss of appetite.”*

Another care giver also explained about the sickness and nutrition:

*“This question reminded me of our probe, which says someone who is educated and eats a good food never fails. From this we can see good nutrition will help you combat disease. But children wouldn’t eat their food as they used to when they are sick.”*

Another care giver described about the relationship of health and nutrition and pointed out a factor for delay of treatment:

*“Since children in this orphanage are relatively grown enough to tell whether they are sick or not, we will report to the clinic nurse. Afterwards the clinic nurse will check for severity and decide what to do. Children are usually taken to nearby health center and are always given the same tablets but yet recur. So those sick children will not eat the whole portion of food served which in turn affects their growth. ”*

#### **IV. Challenges in the orphanages**

The main challenges faced by the orphanages were:

- Lack of specific training on optimal nutrition and nutritional status of the orphans
- Some caregivers having a rough relationship with orphans
- Psychological impacts of fixed meal schedule on orphans
- no organized clinic in the orphanages
- financial problems

#### **Observation**

The orphanages compound, kitchen, utensils, dish racks were observed for their cleanliness. All of the orphanages had a clean kitchen with plenty space of area. The kitchens had shelves in which washed utensils were kept. Main source of water used by the orphanage for other purposes such as cooking and hand washing was piped water. Two of the orphanages used water Bio sand /composite pot filter. Toilets of the orphanages were ventilated improved type. Each orphans had their own plate and there was no sharing of meals between each other. There were spots/places of waste disposal in every orphanage which had dust bins.

## **7. Discussion**

### **7.1. Magnitude of malnutrition**

This study tried to assess the nutritional status among school age orphans who were living in five orphanages in Addis Ababa and the factors affecting their nutritional status. The magnitude of stunting among the children was 19.7%. Whereas, the prevalence of underweight and low BMI for age among the children were 10.7% and 11.5% respectively.

Presence of sickness in the last two weeks, age and sex of the child were the significant predictors of nutritional status of school age children residing in orphanages.

The magnitude of stunting was higher than a study conducted in Tamale orphanage in Ghana with prevalence of 10 % stunting (Sadik, 2010). This study also showed that stunting and low BMI for age were higher than among orphans in Bangladesh having 14.3 %, and 6.3 % respectively (Obidul et al., 2013). In contrary to this in orphanages of Kashmir valley, there was a report of 37% and 37.3% of underweight and stunting respectively (Sameena et al., 2017). Other study conducted in Kenya orphanages also reported stunting and underweight prevalence of 47.2% and 33.2 respectively which was higher than the present study (Elizabeth et al., 2014). Likewise; a study done in Karasagod, India orphanages reported underweight prevalence of 23 % (Haleemath et al., 2017). This difference might be due to socio-demographic factors, dietary pattern and child health care.

### **7.2. Factors associated with under nutrition**

Hunger and malnutrition among children in developing countries continue to impair health, quality of life, and survival. In this study, male orphan children were 0.316 times more likely to be thin than female orphans (AOR=0.316; 95% CI; (0.133-0.608)). In contrary to this; studies done in orphanages of India and Zimbabwe reported no regular correlation between sex of the child and low BMI for age (Sameena et al., 2017; Serere et al., 2013).

Poor nutrition and limited access to health services put orphans at increased risk of starvation, illness and death (Gopal et al., 2018).

Sickness in the last two weeks increased the odds of underweight (AOR=3.32; 95% CI; (1.31-8.79)). This finding was similar with a study done in Kenya which showed a higher

underweight rate among orphanage children having common diseases: cough and diarrhea (Elizabeth et al., 2014). Likewise, another study done in Kenya reported that diarrhoea and colds/cough were positively and significantly correlated to the prevalence of underweight in the orphanages (Evangeline & Mugambi, 2017).

Conversely, a study in Ethiopia found that underweight was not significantly associated with sickness of the child (Bisrat et al., 2016). The reason for this variation might be due to the severity and duration of the illness was not assessed (Hallgeir et al., 2014).

Nutritional deficiencies increase the risk of the child suffering from infectious diseases such as diarrhea, fever and malaria and these illnesses in turn contribute to worsened nutritional status through loss of appetite or nutrient loss during the course of illness. Under nutrition tends to weaken a child's resistance to disease and these interactions are especially evidenced in diarrheal disease (Elizabeth et al., 2014).

This study revealed that age of the child was associated with underweight ( $p < 0.5$ ). Similarly, findings from India reported that prevalence of underweight was found to be higher in the 10-14 year age group and they had a 3.923 times higher risk of being underweight as compared to 14-18 year olds ( $p < 0.001$ ) (Sameena et al., 2017).

### **Qualitative findings**

The nutritional status of the children, the contributing factors and the application of appropriate interventions, were very important, taking into consideration the environment of the orphanage, the administrators, caregivers and background of the children. Furthermore, the interventions would need to focus more on caregivers, since studies showed that nutrition knowledge, motivation and behavior could significantly improve the quality of children's health (Sadik, 2010).

The findings from this qualitative study undertaken in selected orphanages, Addis Ababa on the assessment of orphans under nutrition have shown that orphanage related factor such as poor healthcare service had affected the nutritional status of children living in the orphanages.

In this study, the health care practice was found to be inadequate. Even though 86.4% of sick children got treated in health centers, low BMI for age and underweight were significantly associated with sickness of children before two weeks of data collection.

Underweight among school children can reflect prenatal under nutrition, infection and possibly inadequate attention by care givers. Wasting is not as common as either underweight or stunting in school age children. Nevertheless, wasting rates can change rapidly in situations of acute starvation and/or severe disease occurrence (Elizabeth et al., 2014).

Inaccurate care giving in an orphanage may make the nutritional care less optimal, resulting in long-term chronic malnutrition during institutionalization (Naheed, 2013; Mary et al., 2014). According to a study done in Nigeria, poor adherence to best practices in orphanages was statistically associated with children malnutrition (Nwaneri & Sadoh, 2016).

In this study, some care givers have forwarded their doubt on the quality of health service given in the health centers and this would have an impact on the nutritional status of orphan children.

## **8. Strength and limitation of the study**

### **Strength of the study**

- The study has included qualitative study and was triangulated with the quantitative study.

### **Limitation of the study**

- The study design was not comparative. The cross-sectional design employed did not allow establishing causal-effect relationship of independent and dependent variables.
- Physical activity was not assessed
- Energy intake, micronutrient deficiency and protein intake were not calculated.



## **9. Conclusion and recommendation**

### **9.1. Conclusion**

The study has important implications for understanding the optimal care environments for orphaned children. This might also have its own impact on the morbidity of the children. Children who were sick in the last two weeks in orphanage had higher rate of underweight than those who were not sick in the last two weeks.

### **9.2. Recommendations**

Management of the orphanage should put emphasis on decreasing the proportion of under nutrition and improve the nutritional status of institutionalized orphans by improving the nutritional and health care services given to those children in the orphanage.

Activities that incorporate better nutritional practices, hygiene and childhood illnesses should be strengthened to address childhood needs.

There's a need for the government to support and enforce the orphanages administration to have a strong follow-up protocol for sick children in the orphanage.

This study needs a further investigation because the nutritional status of orphans was assessed by anthropometry and dietary diversity only. Further dietary assessment studies need to be conducted to assess the adequacy of macro and micro nutrients intakes in the orphanages.

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# Appendix I

## የመረጃ ቅጽ

ሰላምታ! ስሜ .....እኔ ቃለ መጠይቅ አድራጊ በባህርዳር ዩኒቨርሲቲ በስነ ምግብ የድህረ-ምረቃ ተማሪ የመመረቂያ ጽሑፉን በመሰብሰብ ላይ እገኛለሁ። ይህ ጥናት ለመሰራት የታቀደው በአዲስ አበባ ከተማ የህጻናት ማሳደግ ተቋማት ላይ ሲሆን የጥናቱ ዋና ዓላማም ወላጅ ያጡና ተጋላጭ የሆኑ ሕጻናትን የሥነ-ምግብ ሁኔታ የተመለከተ ጥናት ሲሆን፣ ከዚህ ጥናት የሚገኘው ውጤት በእነኚህ ወላጅ ያጡና ተጋላጭ ህጻናት ድጋፍ እንክብካቤ ላይ ለተሰማሩ ድርጅቶች ስራቸውን እንዲገመገሙና ማሻሻል ያለባቸውን ለማሻሻል፣ ለወደፊቱ ስልት እንዲነድፉ ያስችላቸዋል። የአንትሮ ፓሞትሪክ ልኬት የሚወሰደው ከልጁ/ጅቷ ሲሆን ቃለ-መጠይቅ የሚቀርበው ለርስዎ ነው። በዚህ ጥናት ላይ የእርሶ እና የልጆች ተሳትፎ በጣም ጠቀሜታ አለው። ልጆች ወደ ጥናቱ የተካተቱት በእጣ ሲሆን የምታደርጉትም ተሳትፎ በፈቃደኝነት ላይ የተመሰረተ ነው። ያልተስማማዎት ጥያቄ ሲኖር አለመመለስ፣ በማንኛውም ሰዓት ቃለ መጠይቁን የማቋረጥ መብትዎ የተጠበቀ ነው። የሰጡኝ መረጃ በሙሉ በሚስጥር ስለሚያዝ

ማንም ሰው ሊያገኘው አይችልም። ለበለጠ መርጃ ጥናቱን የሚያካሂደው ስም፣ ልሳን በየነ ፣ የሞ.ስልክ ቁ. 0912690515፣ ኤሜል፡

### የመተማመኛ ቅጽ

እኔ ከላይ በተሰጠኝ መርጃ መሰርት ፣ የጥናቱ ዋና ዓላማ ወላጅ ያጡና ተጋላጭ የሆኑ ሕጻናትን የሥነ-ምግብ ሁኔታ የተመለከተ ጥናት መሆኑ የተገለጸልኝና የምናደርግው ተሳትፎ በፈቃደኝነት ላይ የተመሰረተ መሆኑን ፣ ያልተስማማኝ ጥያቄ ሲኖር አለመመለስ፣ በማንኛውም ሰዓት ቃለ መጠይቁን የማቋረጥ መብቴ የተጠበቀ መሆኑ። የምስጠው መረጃ በሙሉ በሚስጥር ስለሚያዝ ማንም ሰው ሊያገኘው አንደማይችል በመርዳት ወላጅ ያጡና ተጋላጭ የሆኑ ልጆችን የሥነ-ምግብ ሁኔታ በሚመለከተው ጥናት እኔ የጥናቱ ተሳታፊ በመሆን የመተማመኛ ፈርማ ከዚህ በታች አኑሪያለሁ ።

ይህን ምልክት (✓) በሳጥን ውስጥ በማሰይት የጥናት ተሳታፊው ፈቃደኝነታቸውን ያመለልክቱ፡

- 1. እስማማለሁ
- 2. አልተስማማሁም

ቃለ መጠይቅ ተደራጊው ፈርማ \_\_\_\_\_ ቀን \_\_\_\_\_

Appendix II

ወላጆቻቸውን በሞት ሳቢያ ላጡ ልጆችን የስነ-ምግብ ደረጃቸውን እና ተዛማጅ ጉዳዮችን ማጥናት የተዘጋጀ የጥናት መረጃ መሰብሰቢያ መጠይቅ

ይህ ጥናት የሚካሄደው በባህር ዳር ዩኒቨርሲቲ በኬሚካልና ምግብ ምህንድስና ትምህርት ክፍል ለማስተርስ ዲግሪ ማሟያ ሲሆን የጥናቱ አላማ በህፃናት ማሳደጊያ ውስጥ በሚኖሩ ወላጆቻቸውን በሞት ሳቢያ ላጡ ልጆችን የስነ-ምግብ ደረጃቸውን እና ተዛማጅ ጉዳዮችን ለማጥናት ነው ። መጠይቁ አምስት ክፍሎች ሲኖሩት የማህበራዊ እና ስነምግባር መጠይቆች፣ ንፅህናን ፣ የጤና ሁኔታ ፣ ምግብ እና የአመጋገብ ሁኔታ እና አካላዊ ልኬትን ያካትታል።

የቃለ መጠይቅ ውጤት:

1- የተጠናቀቀ 3- ያልተስማሙ

2- በክፍል የተጠናቀቀ 4- በቃለ መጠይቅ ወቅት ያልተገኙ

የተቆጣጣሪው ስም ፊርማ \_\_\_\_\_ ቀን \_\_\_\_\_

ቃለ መጠይቁ የተደረገበት ቀን	ቀን	ወር	አመት			
መለያ ቁጥር						
የመረጃ ሰብሳቢው ስም			ፊርማ			
የተቆጣጣሪው ስም			ፊርማ			

ክፍል I: ማህበራዊና የሥነ-ምግባር መጠይቆች			
ተ.ቁ	ጥያቄ	መልስ	ይለፍ
101	የማሳደጊያው ስም		
102	የልጁ/ጅቷ እድሜ (በአመት)		
103	የልጁ/ጅቷ ጾታ		
104	የልጁ/ጅቷ ወላጆች በሕይወት አለ?	<input type="checkbox"/> 1. አዎ <input type="checkbox"/> 2. የለም	ወደተ.ቁ108

105	አዎ ካለ ማን?	<input type="checkbox"/> 1. እናት ብቻ <input type="checkbox"/> 2. አባት ብቻ <input type="checkbox"/> 3. ሁለቱም በሕይወት አሉ <input type="checkbox"/> 4. አይታወቅም		105
106	የእናት/አባት የጋብቻ ሁኔታ	<input type="checkbox"/> 1. ያላገባ/ች <input type="checkbox"/> 2. ያገባ/ች <input type="checkbox"/> 3. የተፋታ/ች <input type="checkbox"/> 4. ባል/ሚስት የሞተባት/ችበት		106
107	የእናት/አባት የትምህርት ደረጃ	<input type="checkbox"/> 1. ያልተማረ/ች <input type="checkbox"/> 2. አንደኛ ደረጃ(1-8) <input type="checkbox"/> 3. ሁለተኛ ደረጃ(9-12) <input type="checkbox"/> 4. ከሁለተኛ ደረጃ በላይ		107
108	ልጁ/ልጅቷ የማሳደግያ ተቋሙን መቼ ተቀላቀለ?	<input type="checkbox"/> 1. ከ0-5 አመት በፊት <input type="checkbox"/> 2. ከ6-10 አመት <input type="checkbox"/> 3. ከ11 አመት በፊት		108
105	አዎ ካለ ማን?	<input type="checkbox"/> 1. እናት ብቻ <input type="checkbox"/> 2. አባት ብቻ <input type="checkbox"/> 3. ሁለቱም በሕይወት አሉ <input type="checkbox"/> 4. አይታወቅም		105
109	የልጁ/ልጅቷ የትምህርት ደረጃ	<input type="checkbox"/> 1. የመጀመርያ ደረጃ <input type="checkbox"/> 2. ሁለተኛ ደረጃ <input type="checkbox"/> 3. ት/ቤት ያልሄደ/ደች		109
ተ.ቁ	ክፍል II : የግል ንጽህናን በተመለከተ			
201	ትላንት ምግብ ከመብላትህ/ሽ በፊት እጅህን/ሽን ታጥቦሃል/ሻል?	<input type="checkbox"/> 1. አዎ <input type="checkbox"/> 2. አልታጠብኩም	መልስ የለም ከሆነ ወደ ቁ 203	201

202	ትላንትና ምግብ ከመመገብ በፊት እጅህን ለመታጠብ ምን ተጠቅመህል	<input type="checkbox"/> 1. ወሃ ብቻ <input type="checkbox"/> 2. ወሃና ሳሙና	
203	ትላንትና ከመጻጃ ቤት መልስ እጅህን ታጥባል/ታጥባሻል?	<input type="checkbox"/> 1. አዎ <input type="checkbox"/> 2. አይ	
204	ትላንትና ከመጻጃ ቤት ከወጣህ በኋላ እጅህን ለመታጠብ ምን ተጠቅመህል/ሻል?	<input type="checkbox"/> 1. ወሃ ብቻ <input type="checkbox"/> 2. ወሃና ሳሙና	
ተ.ቁ	ክ ፍ ል III : ምግብና የአመጋገብ ሁኔታ		
301	ልጅ/ልጅቷ በቋሚነት በቀን ስንት ጊዜ ይመገባል/ትመገባለች?	በቀን _____ ጊዜ	
302	ትላንት ቁርስ፣ ምሳ፣ መክሰስ እና እራት ምን በላህ/ሽ?		
303	ልጅ/ልጅቷ በትናንትና ወ. እለት ከቁርስ፣ ከምሳ፣ ከእራት አንዱን አልተመገበም?	<input type="checkbox"/> 1. አዎ <input type="checkbox"/> 2. አይደለም	
ተ.ቁ	ክፍል IV: ጤና ነክ ጥያቄዎች		
401	የህፃኑ/ኗ የክትባት ደረጃ?	<input type="checkbox"/> 1. ክትባት ጨርሷል/ለች <input type="checkbox"/> 2. ክትባት አልጨረሰም/ችም	
402	ባለፉት ሁለት ሳምንታት ህፃኑ/ኗ ትኩሳት ነበረው/ራት?	<input type="checkbox"/> 1. አዎ <input type="checkbox"/> 2. የለም	
403	ባለፉት ሁለት ሳምንታት ህፃኑ/ኗ ሳል ያለው ህመም ነበረው/ራት?	<input type="checkbox"/> 1. አዎ <input type="checkbox"/> 2. የለም	

404	ባለፉት ሁለት ሳምንታት ህፃኑ/ኗ ተቅማጥ ይዞት/ይዟት ነበር?	<input type="checkbox"/> 1.አዎ <input type="checkbox"/> 2.የለም	መልስ የለም ከሆነ ተ.ቁ 407
405	ምን አይነት ተቅማጥ ነበር?	<input type="checkbox"/> 1.ቀጭን ወሃማ <input type="checkbox"/> 2.ደም የተቀላቀለ <input type="checkbox"/> 3.ሁለት ሳምንት ያለፈው	
406	በተቅማጥ ወቅት ምን ያህል የሚጠጣ /በፍሳሽ መልክ/ ተሰጠው/ጣት?	<input type="checkbox"/> 1.ከተለመደው በመጠኑ ያነሰ <input type="checkbox"/> 2.ከተለመደው ጋር ተመሳሳይ <input type="checkbox"/> 3.ከተለመደው የበለጠ <input type="checkbox"/> 4.ምንም የሚጠጣ አለመኖር	
407	ባለፈው ሁለት ሳምንት ጊዜ የተውከት በሽታ አጋጥሞት/ሟት ያውቃል?	<input type="checkbox"/> 1.አዎ <input type="checkbox"/> 2.የለም	መልስ የለም ከሆነ ተ.ቁ 409
408	የተውከት በሽታ ከታየ በኋላ የምግብ/ፈሳሽ አወሳሰዱ/ዱ?	<input type="checkbox"/> 1.ከተለመደው በመጠኑ ያነሰ <input type="checkbox"/> 2.ከተለመደው ጋር ተመሳሳይ <input type="checkbox"/> 3.ከተለመደው የበለጠ <input type="checkbox"/> 4. ምንም የሚጠጣ አለመኖር	
409	ለህመሙ/ሟ ህክምና አገኘ/ች?	<input type="checkbox"/> 1. አዎ <input type="checkbox"/> 2. የለም	
410	ከላይ ለተጠቀሱት ህመሞች ህክምና ለማግኘት የት ሄደ/ደች?	<input type="checkbox"/> 1.የማሳደግያው ጤና ተቋም <input type="checkbox"/> 2.ከማሳደግያው ውጪ ባለ ጤና ተቋም <input type="checkbox"/> 3.ሌላ ካለ ይገለጽ	
411	ልጁ/ቷ ለረጅም ጊዜ የሚወስደው/የምትወስደው መድሃኒት ካለ?	<input type="checkbox"/> 1.አዎ <input type="checkbox"/> 2.የለም	

412	ለተ.ቁ 411 መልስ አዎ ከሆነ	የበሽታው ስም  የመድሃኒት ስም	
ተ.ቁ	ክፍል V: አንትሮ ፖሞት-ሪክ ልኬት		
501	የልጁ/ጅቷ አሁን ያለው/ላት ቁመት በሴ.ሜ	1ኛ ልኬት _____ 2ኛ ልኬት _____ አማካይ ልኬት _____	
502	የልጁ/ጅቷ አሁን ያለው/ላት ክብደት በኪ.ግ	1ኛ ልኬት _____ 2ኛ ልኬት _____ አማካይ ልኬት _____	

**Appendix III**

**የወላጅ/የአሳዳጊ ተሳታፊነት ና የፍቃደኝነት ማረጋገጫ ቅፅ**

እኔ እና በዚህ ማሳደግ ያሉ ወላጅ አልባ ልጆች በጥናቱ ላይ እንድንሳተፍ በጥናት አጥኝው አካል በተሠጠኝ ግንዛቤ መሠረት የእኔ እና በዚህ ማሳደግ ያሉበት ወላጅ አልባ ልጆች ስም በጥያቄ መልስ መሰጫ ወረቀት ላይ እንደማይፀና እና ከእኛ የሚገኘው መረጃ ለሌላ ምክንያት እንደማይውል እና በማንኛውም መልኩ ጉዳት የማያደርስብን ከመሆኑም ባሻገር የሚሰበሰበው መረጃ ወላጆቻቸውን በሞት ያጡ ልጆች የሥነ-ምግብ ደረጃ ለውጥ እንደሚያመጣ እና ሌሎች ተያያዥ ጉዳዮች ዙሪያ ማብራሪያ ተደርጎልኛል። ስለዚህ በጥናቱ ላይ ለመሳተፍ ፈቃደኛ ከሆኑ

ፊርማዎትን፡፡

የወላጅ/አሳዳጊ ስምና ፊርማ ----- ቀን-----

ፈቃደኛ ስለሆኑ አመስግን

የመረጃ ሰብሳቢው ስምና ፊርማ ----- ቀን -----

**ለወላጅ/አሳዳጊ የተዘጋጀ መጠየቅ**

1. የወላጅ/አሳዳጊ እድሜ \_\_\_\_\_
2. ጾታ \_\_\_\_\_
3. የትምህርት ደረጃ \_\_\_\_\_
4. የትምህርት ደረጃ \_\_\_\_\_
5. ሀይማኖት \_\_\_\_\_

3. የጋብቻ ሁኔታ \_\_\_\_\_ 6. በእርሶ እንክብካቤ ስር ያሉ ሕጻናት ቁጥር \_\_\_\_\_

መጠይቅ

ክፍል 1: የመነሻ ጥያቄዎች

በመጀመርያ ስለ አንተ/ች ታሪክ የተመለከተ ጥያቄ

1. እራስህን/ሽን አስተዋውቅ/ቁ (ትምህርት እና የስራ ልምድ)
2. በዚህ የሕጻናት ማሳደግ ተቋም ውስጥ ለምን ያህል ጊዜ ስራህ/ሽ?
3. የአንድ ቀን ስራህ/ሽ (ውሎ) እንዴት ትገልጻለህ/ሽ?  
- በዚህ ተቋም ውስጥ የስራ ጫና አለብኝ ብለህ ታስባለህ/ሽ?  
አዎ ከሆነ ምክንያቱ ምንድነው ትያለህ/ሽ?
4. በዚህ ተቋም ውስጥ ለመስራት ምን አነሳሳህ/ሽ?
5. እዚህ ተቋም ውስጥ ስራ ከጀመርክ ጀምሮ ምን ስልጠና ወስደሃል/ሻል?(የስልጠና ይዘት፣ በስልጠናው የተሰጠ የአሰራር መመሪያ ካለ)  
- ስልጠናው በምን መልኩ ረድቶኛል ብለህ/ሽ ታስባለህ/ሽ?

ክፍል 2: የህጻናት ስነ ምግብና የማሳደግ እንክብካቤ በተመለከተ የተዘጋጀ

6. ስለ ህጻናቱ ስነ ምግብና ሁኔታ ያለህ/ሽ እውቀት?  
- የምግብ እጥረትን በተመለከተ መንስኤና ጉዳት ብትነግረኝ
7. ህጻናቱ በተደጋጋሚ የሚመገቡት ምግብ ምንድን ነው?  
7.1 ቁርስ?  
7.2 ምሳ?  
7.3 እራት?  
7.4 ተጨማሪ የሚሰጥ ምግብ ካለ  
- ተደጋጋሚው የሚሰጡ ምግቦች ካሉ ምክንያቱ ምንድነው?
8. የማሳደግ ያው የአከባቢ ንጽህናን በተመለከተ ያለህ አስተያየት እጅህን/ሽን መቼ ትታጠባለህ/ሽ? ለመታጠብ ምን ትጠቀማለህ/ሽ?
9. የህጻናት አሳዳጊ ቀረቤታ ምን መምሰል አለበት ትላለህ/ሽ

-ህጻናት መራባቸውን እንዴት ታቃለህ/ሽ?

-ህጻናት ምግብ አልበላም ካሉ ምን ታደርጋለህ/ሽ?

10. አንድ ሕጻን መታመሙን እንዴት ማወቅ ይቻላል? ከታወቀ በኋላስ ምን አይነት እርምጃ ይወሰዳል ብለህ/ሽ ታስባለህ/ሽ?

- ያጋጠመህ/ሽ አንድ ታሪክ ብትነግረኝ/ሪኝ

APPENDIX IV

የማሳደግያው ኃላፊ/ ተወካይ የፍቃደኝነት ማረጋገጫ ቅፅ

እኔ እና በዚህ ማሳደግያ ውስጥ ያሉ ወላጅ አልባ ልጆች በጥናቱ ላይ እንድንሳተፍ በጥናት አጥኝው አካል በተሠጠኝ ግንዛቤ መሠረት የእኔ እና በዚህ ማሳደግያ ያሉ ወላጅ አልባ ልጆች ስም በጥያቄ መልስ መሰጫ ወረቀት ላይ እንደማይፃፍ እና ከእኛ የሚገኘው መረጃ ለሌላ ምክንያት እንደማይውል እና በማንኛውም መልኩ ጉዳት የማያደርስብን ከመሆኑም ባሻገር የሚሰበሰበው መረጃ በሞት ያጡ ልጆች የሥነ-ምግብ ደረጃ ለውጥ እንደሚያመጣ እና ሌሎች ተያያዥ ጉዳዮች ዙሪያ ማብራሪያ ተደርጎልኛል። ስለዚህ በጥናቱ ላይ ለመሳተፍ ፈቃደኛ ከሆኑ ፊርማዎትን።

የማሳደግያው ሀላፊ ስምና ፊርማ ----- ቀን-----

ፈቃደኛ ስለሆኑ አመስግን

የመረጃ ሰብሳቢው ስምና ፊርማ ----- ቀን -----

ከማሳደጊያ ተቋሙ አስተዳዳሪ /ተወካይ ጋር የሚደረግ ቃለ መጠይቅ የያዘ መጠይቅ

1. ግላዊ መረጃ

- 1. የአስተዳዳሪ/ተወካይ እድሜ \_\_\_\_\_ 2. የትዳር ሁኔታ \_\_\_\_\_
- 3. ጾታ \_\_\_\_\_ 4. የትምህርት ደረጃ \_\_\_\_\_
- 5. የስራ ድርሻ \_\_\_\_\_
- 6. በማሳደጊያ ውስጥ አጠቃላይ የህጻናት ቁጥር \_\_\_\_\_
- የወንዶች ቁጥር \_\_\_\_\_ የሴቶች ቁጥር \_\_\_\_\_



1. የሕፃናት ማሳደጊያው ታሪክ

1.1. የሕፃናት ማሳደጊያው መቼ ተቋቋመ?

.....

1.2. የሕፃናት ማሳደጊያው ለምን አገልግሎት ተከፈተ?

2. የገቢ ምንጭ እና የሚሰጡ አገልግሎቶች:

2.1. የህጻናት ማሳደጊያው በዋነኝነት የሚሰጣቸው አገልግሎት ምንድን ናቸው? (ስነ ምግብ ዳሰሳ፣ የጤናና ጤና ነክ ድጋፍ፣ ስለ ምግብ ይዘትና ምግብ ዝግጅት ስልጠና ከተሰጠ)

.....

2.2. የምግብ ድጋፍ የሚደረግ ከሆነ፣ በምን መንገድ ድጋፉን ያግኙ ነበር? (የምግብ እጥረትን በመዳሰስ የአልሚ ምግብ አርዳታ በማድረግ፣ የስነምግብና የጤና ፕሮግራሞች ጋር ግንኙነት በማጠናከር ለአሳዳጊዎች የስነምግብ አያያዘና አዘገጃጀት ስልጠና መስጠት)

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2.3. የህጻናት ማሳደጊያው አሁን የሚሰጠውን አገልግሎት እንዲያከናውን የሚረዳው የገቢ ምንጭ ምንድን ነው ?

.....

3. ለህጻናቱ የሚሰጡ አገልግሎቶች ላይ ተግዳሮት ሊሆኑ የሚችሉ ጉዳዮችን ካሉ ይገለጽ?

.....

3.1. ከላይ ለተገለጹት ተግዳሮቶች መፍትሄ ሊሆን ይችላል የሚሉት ካለ

ቢገልጹ?.....

.....

**== አመሰግናለሁ!!! ==**

## Appendix V:

### **An English Questioner Designed to assess the magnitude and Associated factors among institutionalized orphans in selected orphanages in Addis Ababa**

This was a thesis is conducted by Bahir Dar university faculty of chemical and food engineering for the partial fulfillment of master degree in applied human nutrition .The aim of the study was to assess the nutritional status of institutionalized orphan children in selected orphanages in Addis Ababa.The following Questionnaire classified in to five parts as socio-demographic factors, Hygiene, health related factors, Dietary factors and Anthropometric measurements.

CODE OF THE QUETIONNAIRE \_\_\_\_\_

Name of the interviewer \_\_\_\_\_

Signature \_\_\_\_\_

Date of interview (dd/mm/yyyy) \_\_\_\_\_

*Result of interview:*

- 1- Completed 2- Partially completed  
3- Refused 4- Respondent not available

*Checked by supervisor;*

Name ..... Signature ..... Date .....

NO.	Part 1. Demographic characteristics of the child		
101	Name of orphanage		
102	Age of child in year		
103	Sex of the child		
104	Are the parents of the child alive	1. Yes 2. No	If No, skip to 110
105	who is alive	1. Mother 2. Father 3.Both 4.Not known	105

<b>106</b>	<b>What is mother's marital status?</b>	<b>1. Single 2. Married 3. Divorced</b>	<b>106</b>
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<b>107</b>	<b>What is father's marital status?</b>	<b>1. Single 2. Married 3. Divorced</b>	<b>107</b>
<b>108</b>	<b>What is mother's educational status</b>	<b>1. No education 2. Primary education (1-8) 3. Secondary (9-12) 4. Above secondary</b>	<b>108</b>
<b>109</b>	<b>What is father's educational status</b>	<b>1. No education 2. Primary education (1-8) 3. Secondary (9-12) 4. Above secondary</b>	<b>109</b>
<b>110</b>	<b>When did the child come to the orphanage?</b>	<b>1. 0-5 years ago 2. 6-10 years ago 3. 11 years ago</b>	<b>110</b>
<b>NO.</b>	<b>Part 2. Sanitation and hygiene</b>		
<b>201</b>	<b>Did you wash your hands before eating yesterday?</b>	<b>1. Yes 2. No</b>	<b>If no, skip to Q203</b>
<b>202</b>	<b>What do you use to wash your hands?</b>	<b>1. water only 2. water and soap</b>	<b>202</b>
<b>203</b>	<b>Did you wash your hands after visiting toilet yesterday?</b>	<b>1. Yes 2. No</b>	<b>203</b>
<b>204</b>	<b>What do you use to wash your hands?</b>	<b>1. water only 2. water and soap</b>	<b>204</b>
<b>No.</b>	<b>Part 3. Dietary intake</b>		

301	How many times do you regularly eat in a day?	_____	301
302	What did you eat yesterday? Breakfast? Lunch? Supper?	_____	302
303	Did you miss any of the meals yesterday?	1. Yes      2. No	303

NO.	Part 4. Child Health related factors		
401	What is the vaccination status?	1. Complete 2. Incomplete	
402	Fever for the past 2 weeks?	1. Yes      2. No	
403	Cough for the past 2 weeks?	1. Yes      2. No	
404	Diarrhea for the past 2 week's	1. Yes      2. No	If No ,skip to 406
405	What is the type of diarrhea?	1. Watery 2. Dysentery 3. Persistent (Diarrhea greater than 2 weeks)	
406	Now I would like to know how much fluid/food was given to drink during diarrhea  Was the child given less than usual to drink, about the same amount or more than usual to drink?	1. less than usual 2. somewhat less 3. about the same 4. more 5. Nothing to drink	
407	Has the child had Vomiting in the last two week?	1. Yes      2. No	If No ,skip to 410
408	When you had vomiting ,were you given less than usual to eat/drink, about the same amount ,more than usual or nothing to eat/drink	1. much less than usual 2. somewhat less than usual 3. about the same 4. More 5. have not eaten any food	

409	Did the child get treatment for the illness	1. Yes 2. No	
410	Where do you seek treatment for the child for above symptoms?	1. health facility of the orphanage 2. health facility outside the orphanage 3. Don't seek treatment 5. others(specify)	
411	Is the child taking medication for chronic illness?	1. Yes 2. No	
412	If yes to Q. 411,	Name of disease  Medication	

<b>Part 5 Anthropometric Measurements</b>	
1 <sup>st</sup> Height of child in cm	
2 <sup>nd</sup> Height of child in cm	
Average height	
1 <sup>st</sup> Weight of child in kilograms	
2 <sup>nd</sup> Weight of child in kilograms	
Average weight in kilograms	

**APPENDIX V: In-depth interview with care giver**

**Magnitude and associated factors of under nutrition among orphans in selected orphanages in Addis Ababa**

**Date...../...../.....**

**Facilitator.....**

**Moderator.....**

**Time: Start..... Finish.....**

**Time for interview 1hr**

**A. Information sheet**

Good morning/good afternoon! My name is Lesan Beyene. I am a graduate student of Applied human nutrition in Bahir dar University, Faculty of chemical and food engineering and we are now conducting a survey in this institution to explore magnitude of under nutrition and associated factors among orphans. We believe that this study will help us to bring change in factors affecting the nutritional status of orphan children. You and the child you take care of are selected to be one of the participants in this study and

you will help us by answering the questions we ask you. We ask you to participate voluntarily and that there will not be any negative consequences on the services your child is entitled to receive if you refuse to participate. We assure you that whatever answers you give us will be kept strictly secret. We do not need yours and the child name and address. We also inform you that you have the full right to withdraw from the study or stop the interview at any time and /or skip any questions that you don't want to answer. You may find some of the questions too personal and difficult to talk about, but your experience will be very helpful for other people. Also you will not get/receive direct benefit for participating in the study. The interview takes approximately 45-60 minutes.

Do you have any question to ask?

Thank you very much!

Are you willing to participate in this study?

Yes  No  If yes

## **B. Consent form**

I, the undersigned have been informed that the purpose of this particular research project is to study magnitude of under nutrition and associated factors among orphans.

- I have been informed that I am going to respond to this question by answering what I know concerning the issue.
- I have also been informed that the information I give will be used only for the purpose of this study.
- My identity and the information I give will be treated confidentially.
- I have also been informed that I can refuse to participate in the study or not to respond to questions I am not interested. Furthermore I have been informed that I can stop responding to the questions at the time in the process.

Based on the above information I agree to participate in the research voluntarily with the hope of contributing to the effort of knowing magnitude of under nutrition associated factors among orphans in selected orphanages.

**Signature:**

**Date:**

**Address of investigator**

Name: Lesan Beyene

Bahir dar University MSc student

Tel: 0912690515

**I. demography of care giver**

1. Age of care mother/father \_\_\_\_\_ 2. Gender \_\_\_\_\_  
3. Marital status \_\_\_\_\_ 4. Educational level for  
respondent \_\_\_\_\_  
5. Religious affiliation. \_\_\_\_\_ 6. Number of children under respondent's  
care \_\_\_\_\_

**Interview Guide:**

**Part I: questions**

1. Please, introduce yourself (education and work experience)
2. For how long have you been working here in this orphanage?
3. How is your single work day stay in the orphanage? Do you think it is a hard time? If yes, what is the reason?
4. What inspired you to work in this orphanage?
5. After starting working in this orphanage, have you ever had any training?
  - What was the training about?
  - Do you think that it helped you? How

**Part II: care and support of the child**

6. What is your knowledge regarding nutritional status of the child?
7. What is the meal the children eat regularly?



**a) Breakfast?**

- b) Lunch?
- c) Supper?
- d) Any other food /snack (specify)? [If same meals given repeatedly ask why?]

8. How do you describe the environmental hygiene? How is your hand washing practice? Any cleaning chemicals used

9. Is care giver to child relationship important?

I. How do you know that a child is hungry?

II. What do you do when a child refuses to eat?

10. How do you know when a child is sick? What actions do you take?  
-could you tell me a story

**Appendix VI: in-depth interview with orphanage administration**

**I. Demography of orphanage head/representative**

- 1. Age \_\_\_\_\_ 2. Gender \_\_\_\_\_
- 3. Marital status \_\_\_\_\_ 4. Educational level of respondent \_\_\_\_\_
- 5. Number of children in the orphanage \_\_\_\_\_

**1. History of the orphanage**

1.1. When was the orphanage founded?

.....

1.2. What is the reason for launching the service for orphans?

.....

**2. Organization income and service given**

2.1. What are the main services given by the orphanage?

**(Nutritional assessment, health related support, training on food safety, quality and preparation)**

.....

**2.2. If there is food support, in what way it is provided?**

**(Nutritional assessment and supplementary feeding, Link to other health and nutrition Interventions, Training on Nutrition, Diet and food preparation for care takers)**

.....

**2.3. If Health Care, what type of Support is provided?**

**(Free access to Health services for orphans and guardians, Regular home visits to assess health status of the child, Training to caregivers on the importance of immunization, hygiene and sanitation, and optimal nutrition)**

.....

**2.4. Your opinion on adequacy of support**

.....

**1. Is there any provision of special menu provided for the orphanage children?**

**If yes, what are the foods given and when?**

.....

**2. What are the challenges faced in the process of the orphanage?**

**2.1. What do you think is the solution?**

.....

## APPENDIX VII: OBSERVATION CHECKLIST

<b>1.a Kitchen</b>	<b>Present.....</b> <b>Absent.....</b>
<b>1.b Kitchen condition</b>	<b>Clean.....</b> <b>Dirty.....</b>
<b>2.Food preparation surface</b>	<b>Clean.....</b> <b>Dirty.....</b>
<b>3.Utensils for cooking and serving food</b>	<b>Clean.....</b> <b>Dirty.....</b>
<b>4.Food storage Utensils</b>	<b>Clean.....</b> <b>Dirty.....</b>
<b>5.Dish rack</b>	<b>Present.....</b> <b>Absent.....</b>
<b>6.Method of refuse Disposal</b>	<b>Refuse pit.....</b> <b>Burning.....</b> <b>Dumping.....</b> <b>Others.....</b>
<b>7.Toilet facilities</b>	<b>None.....</b> <b>Public latrine.....</b> <b>Private latrine.....</b> <b>Flush toilet.....</b>

**8. Source of drinking water**

**Vendor/well.....  
Piped water .....**

**9. Presence of animals in the house or kitchen**

**Yes.....  
No.....**

**10. General cleanliness of the compound**

**Clean.....  
Littered.....  
Presence of excreta.....  
Outgrown grass.....  
Others.....**

**11. care giver activity when feeding child**

**Chaos in the room.....  
Encourages child to eat.....  
Concentrates on child.....**

**12. How child is served food**

**Shares plate with other children.....  
Eats from individual plate.....**