WOLKITE UNIVERSITY COLLEGE OF MEDICINE AND HEALTH SCIENCE DEPARTMENT OF MIDWIFERY

PREVALENCE AND ASSOCIATED FACTORS OF WASTING AMONG CHILDREN AGED 6-59 MONTHS IN WOLKITE TOWN OF GURAGE ZONE, SNNPR, ETHIOPIA, 2020

By:

1. Tinsae Mulu
2. Gemechu Chabaki
3. Yirgedu Kibruyisfa

WOLKITE, ETHIOPIA

JANUARY 2021

WOLKITE UNIVERSITYCOLLEGE OF MEDICINE AND HEALTH SCIENCE DEPARTMENT OF MIDWIFERY

PREVALENCE AND ASSOCIATED FACTORS OF WASTING AMONG CHILDREN AGED 6-59 MONTHS IN WOLKITE TOWN OF GURAGE ZONE, SOUTH WEST ETHIOPIA, 2020

By:

4. Tinsae Mulu
5. Gemechu Chabaki
6. Yirgedu Kibruyisfa

Advisors:

1. Mr. Alex Yeshaneh (BSc, MSc)
2. Mr. Daniel Adane (BSc, MSc)

A research proposal submitted to Wolkite University College of medicine and health science department of Midwifery in partial fulfillment of requirements for the degree of Bachelor of Science in Midwifery

WOLKITE, ETHIOPIA

JANUARY 2021

EXAMINERS' APPROVAL SHEET

We, the undersigned, members of the Board of Examiners of the final open defense by _____ have read and evaluated their research entitled "_____", and examined the candidate. This is, therefore, to certify that the research has been **accepted/rejected** in partial fulfillment of the requirements for the degree of Midwifery.

_____	_____	
Name of the Chairperson	Signature	Date
_____	_____	
Name of Major Advisor	Signature	Date
_____	_____	
Name of Internal Examiner	Signature	Date
_____	_____	
Name of External examiner	Signature	Date
_____	_____	
SGS Approval	Signature	Date

Final approval and acceptance of the research is contingent upon the submission of the final copy of the thesis to the School of Graduate Studies (SGS) through the Department/School Graduate Committee (DGC/SGC) of the candidate's department.

Stamp of SGS Date: _____

Declaration

We hereby declare that this research is our original work and has not been presented for a degree in any other university, and all sources of material used for this research have been duly acknowledged.

Name: **1. TINSAE MULU** Signature: _____

2. GEMECHU CHABAKI Signature: _____

3. YIRGEDU KIBRUYISFA Signature: _____

This research has been submitted for examination with my/our approval as the research advisor/s.

Name: **Mr.** ----------Signature: _____

Place and Date of Submission: date _____

ACKNOWLEDGEMENT

First and foremost we would like to thank God who has been the source of our excellence, strength, and wisdom throughout this work and our studies at large; and we express our deepest thanks to Wolkite University College of Medicine and Health Science Department of midwifery for providing us such an opportunity. And We would like to acknowledge our advisorsMr. Alex Yeshaneh and Mr. Daniel Adane for their loveable approach, sociable character, and constructive advice during the development of this proposal. Finally, we would like to express our internal gratitude to the Wolkite town administration, Wolkite town Health center, Manaheriya kebele health office, all study participats for their welcoming environment and readiness to help us regardless of our status, if they did not help us this study would not be real.

Table of Contents

LIST OF TABLES

LIST OF FIGURES

ACRONYMS/ABBREVIATION

ACRONYM	DEFINITION
MAM …….	Moderate Acute Malnutrition
MUAC …..	Mid Upper Arm Circumference
PEM …...	Protein Energy Malnutrition
SAM ……	Severe Acute Malnutrition
UNICEF ….	United Nations International Children's Fund

ABBREVIATION	DEFINITION
AOR ……	Adjusted Odds Ratio
CBF ……	Exclusive Breast Feeding
COR ……...	Crude Odds Ratio
EDHS ……	Ethiopian Demographic Health Survey
EMDHS ……	Ethiopian Mini Demographic Health Survey
HHs …….	Households
SPSS …….	Statistical Package for the Social Science
WHO …….	World Health Organization

ABSTRACT

Background: Acute malnutrition (wasting) is characterized by a rapid deterioration in nutritional status over a short period of time in children under five years of age. In children, it can be measured using the weight for-height nutritional index or MUAC.Majority of the studies conducted in Ethiopia have focused on studying in the whole broad forms of malnutrition. However, data are scarce concerning specified acute undernutrition. Therefore, this study significantly bridges the knowledge gap on the subject.

Objective: To assess the prevalence and associated factors of wasting among children from six months to fifty-nine months in Wolkite town, South Nation Nationalities and people region, Ethiopia 2020/2021.

Methods: A community based cross sectional study design was conducted from December 20-January 32020/2021and simple random sampling method was used to select Kebeles thenby using Systematic random sampling we selected 301 study participants from 2618 Households in every 9 intervals.Data was collected using pretested, interviewer administered questionnaire. Data entry and analysis weremade by using Epi info and SPSS version 26. Both bivariate (at p value <0.25) and multi variate analysis with 95% confidence level was carried out and those variables (P< 0.05) were considered as statistically significant.

Results: The prevalence of wasting among children aged from 6-59 months in the study participants was 14.7%. Among several factors that would affect the occurrence of wasting, age of children, educational status of the mother/care giver, and diarrheal disease in the past two weeks prior to data collection, and hand washing practice of the mother were found to be significantly associated factors.

Conclusion and Recommendation:Depending on facts of the study, it can be concluded that; child wasting problem is highly observed in Menaheriya Kebele. The prevalence's of wasting in the study area was the same but slightly excised EDHS, 2016 report. It can be concluded that most households were in low economic status, illiterate, and poor child caring practice. Therefore, it is a time to tickle child undernourishment, which is a silent killer of the community.

Key Words: Acute malnutrition; Wasting; under five children;Wolkite town south central Ethiopia

1. INTRODUCTION

1.1 Background

A results from eating a diet in which one or more nutrients are either not enough or are too much such that the diet causes health problems is called Malnutrition(1). Malnutrition often used specifically to refer undernutrition where an individual is not getting enough calories, protein, carbohydrates or micronutrients (2).

Undernourishment is often due to shortage of high-quality food being available to eat(3). This is usually related to high food prices and poverty, especially in developing countries(3). It is classified in to chronic and acute undernutrition. The chronic undernutrition (stunting), reflects failure to receive adequate nutrition over a long period of time and is affected by recurrent and chronic illness. It has the same underlying causes as acute undernutrition but occurs more gradually over a longer period of time(4).

Wasting is the general term and a measure of acute undernutrition, which is the result from inadequate food intake usually from a recent episode of illness that caused weight loss. It is further classified into Marasmus, Kwashiorkor and Marasmic-Kwashiorkor(5).

Marasmus is the result of cumulative, usually slow, inadequate energy and protein intake. As the stored fats and tissue proteins are used up for the production of energy, severe weight loss and severe muscle wasting are evident.Progressive wasting of the body and is associated with insufficient intake or malabsorption of nutrients(6).

Kwashiorkor is a form of sever PEM characterized by edema, irritability, ulcerating dermatoses, an enlarged with fatty infiltrates(7). Sufficient calorie intake but insufficient protein consumption distinguishes it from marasmus(8). Marasmic-kwashiorkor is the combination of the two forms (Marasmus and kwashiorkor); and is the sever form of acute undernutrition that is distinguished from others by clinical and anthropometric measurements characterized by bilateral edema and the child is low weight for height/weight for age z-score(9).

Wasting in children under five is defined as children who are thin for their height because of acute food shortages or disease(5). Wasting Also known as acute malnutrition is characterized by a rapid deterioration in nutritional status over a short period of time in children under five years

of age(5). Wasted children are at higher risk of dying. In children, it can be measured using the weight for-height nutritional index or mid-upper arm circumference (MUAC). There are different levels of severity of acute malnutrition: moderate acute malnutrition (MAM) and severe acute malnutrition (SAM)(10).

Moderate acute malnutrition (MAM), which is also known as wasting, is defined by a weight-for-height indicator between -3 and -2 Z-score (standard deviation) of the international standard or between 11 cm and 12.5 cm by a mid-upper arm circumference (MUAC). Severe acute malnutrition (SAM) is another type of acute malnutrition and the most dangerous forms. If left untreated, SAM can result in death. It can manifest in two ways, severe wasting and edema(11).

Undernutrition among children is still now one of the leading major public health problem throughout the world. Globally, one in every three under-five children is undernourished. Among all under five children deaths, childhood malnutrition is responsible for 35% of deaths. More than 2 million children die each year as a result of undernutrition before the age of 5 years(12).

1.2 Statement of the problem

Combating undernutrition in all its forms is one of the greatest global health challenges. Around 45% of deaths among children under 5 years of age are lined to under nutrition(14).

In 2016, about 52 million children under the age of 5 years were wasted worldwide. Asia and Africa contributed 69% and 27.2% of wasting, respectively, of the global undernutrition burden (13). Among all under five children deaths, childhood malnutrition is responsible for 35% of deaths. More than 2 million children die each year as a result of undernutrition before the age of 5 years(12).

In Ethiopia Overall, 10% of children are wasted, a sign of acute malnutrition.(15). Results from the 2019 EMDHS show that overall, 7% of children in Ethiopia are wasted, and 1% are severely wasted(16).Undernutrition among children is an alarming problem because of effects long lasting beyond childhood. It has both short and long term problem(17). For instance, undernourished as compared to non-undernourished children are physically, emotionally and intellectually less productive and suffer more from chronic illnesses and disabilities(18).

The risk factors that determine acute undernutrition among under five children in Ethiopia as reported in different articles are socio-demographic, child caring practices, environmental Health and sanitation factors(19-21). Poverty amplifies the risk of malnutrition. People who are poor are more likely to be affected by different forms of malnutrition. Also malnutrition increases health care costs, reduces productivity and slows economic growth, which can perpetuate the cycle of poverty and ill health(14).

Although Ethiopia has already achieved a remarkable progress in reducing under-five mortality in the last decades(11), undernutrition among children is still a common problem in this country(11, 22). Ethiopia is one of the countries with very high burden of undernutrition(23). Multi-sectorial and multi-dimensional approaches to address malnutrition in Ethiopia were designed to reduce these events; among those the education and Health sectors are prominent(24).

The majority of the studies conducted in Ethiopia and abroad have focused on studying the whole broad forms of malnutrition and some studied the chronic form of malnutrition (stunting). However, data are scarce concerning specified acute undernutrition. Children aged between 6

and 59months have rapid growth and development and is a period when a nutrient requirement is highest, and there is a change in their dietary habits. Therefore, this study significantly bridges the knowledge gap on a comprehensive understanding of the magnitude and determinants of wasting among children aged between 6 and 59months in Wolkite town, south-central Ethiopia. This study will also be a door for a further comprehensive and more focused study that deals to improve the physical, mental and psychological wellbeing of the future generation of the country by improving the occurrence of acute undernutrition over children under five.

1.3 Significance of the study

Assessing the prevalence and associated factors of wasting among children under five will draw a clear picture on how much work is left to be done to awaken the health system in environmental and nutritional health.The findings of this study helps to design appropriate intervention and strategies providing a convenient programmatic approach to address a good level of improvement of the occurrence of wasting.

It also helps the policy makers to target and tailor nutritional health programs and it helpful in providing information as baseline for the future studies and also re commend responsible bodies for actions to be taken. Therefore this study will help to assess and identify the magnitude and associated factors of wasting in under-five children for maintenance of their health and produce a productive generation.

2. LITERATURE REVIEW

2.1 Prevalence of acute undernutrition

A community based cross-sectional study conducted in India (south Asia) in 2019 reflected that overall prevalence of underweight was found 35.7%. The percentage of moderately and severely underweight children was 26.1 and 9.6%, respectively. Wasting was found among 10.5% children, from which 8.0% were moderately wasted and 2.4% having severe wasting(25).

A study conducted in Nigeria Western Africa shows that 25.6% of children under five were underweight, while 8.8% were wasted. The prevalence of protein energy malnutrition (PEM) was 17.6%, and of which 63.6% were marasmic, 13.6% had kwashiorkor, while 22.7% had marasmic-kwashiorkor(26).

Based on a population based cross sectional study done in Tanzania since 2017, The prevalence of children classified as underweight was 46.0%, stunting was 41.9%, and wasting was 24.7%(27).

In 2016 EDHS reported that Overall, 10% of children are wasted (too thin for height), a sign of acute malnutrition. In addition, 24% of children are underweight, or too thin for their age(15).

Results from the 2019 Ethiopia mini demographic and health survey (EMDHS) show that Overall, 7% of children in Ethiopia are wasted, and 1% are severely wasted (below -3 SD)(28). Regional variations exist, with the highest percentages of children who are wasted in Somali (21%), Afar (14%), and Gambela (13%), and the lowest percentages of wasted children in Addis Ababa (2%) and Harari (4%)(28).

Prevalence of stunting, underweight and wasting among study participants in Bulehora district, south Ethiopia were 47.6%, 29.1% and 13.4% respectively. Prevalence of severe stunting, underweight and wasting among the children were 20.2%, 6% and 3.9% respectively. MUAC measurement also indicated that 10% of the children were undernourished (<12.5 cm)(20).

Of the total children participated in the study conducted in Northwest Ethiopia in 2019, 28.4% were stunted, 10% wasted and 13.4% underweight. The prevalence of the mixed undernutrition was found to be 0.25% for both stunting and wasting, 8.23% for stunning and underweight, and 4.99% wasting and underweight(29).

The prevalence of malnutrition in the study area Adi-Harush and Hitsats Refugee Camps in Tigray Region Northern Ethiopia in 2017 was 11% (95%CI: 8.2-13.8%) for wasting, 21% for underweight and 37% for stunting. Sever stunting was above the WHO standards and remains a critical problem in the area and needs special attention to prevent morbidity and mortality relating to nutritional status(19).

A research conducted in Dilla town on magnitude and associated factors of wasting among under five orphans shows us a high result which is 11.1% orphans were wasted from which 3.3 were severely wasted(30).

A Community Based Cross Sectional Study conducted at Hawassa Zuria, South Ethiopia reported that the study children who fell below -2SD of the indicator 28.20% was wasted. Prevalence of severe wasting was 3(0.84%. The highest prevalence of wasting (acute malnutrition) found in the age group of 48-60 months (35.6%). The prevalence of wasting was higher in female children (31.1%) than male (24.2%)(21).

2.2 Factors affecting acute undernutrition

Socio demographic factors

A community based cross sectional study conducted in India in 2019 revealed that Socio demographic determinants such as age of child, caste, number of sibling's child has, birth order, birth weight, education status of the parents and economic status of the family were positively associated with underweight and stunting, whereas wasting was not associated with birth order of the child(25).

According to a descriptive study done in Nigeria in 2016, about 18% were diagnosed with various forms of protein energy malnutrition and is most common among male children (23.2%), younger children (31.8%) (Between 0-11 months) and children of mothers with no formal education (25.2%)(26).

A population based cross-sectional study was conducted in Tanzania in 2017, and it is reported that child age and birth weight were associated with all anthropometric indices. This study launched that in a univariate logistic regression, the following factors were associated with wasting: child aged 7–12 months, child aged 13–24 months. In a multivariate logistic regression, child aged between 7–12 months (AOR: 1.9, 95%CI: 1.3, 2.6), child aged 13–24 (AOR: 1.9,

95% CI: 1.4, 2.7), child being female (AOR: 0.8, 95% CI: 0.6, 0.9) remained associated with wasting(27).

Study conducted in Bulehora district of South Ethiopia in 2015, Underweight in Male children were 2.5 times (AOR=95% CI: 1.5-4.1) more likely to be underweight than female children. Risk of under-weight among children whose fathers were illiterate was 6.7 times (AOR= 6.7, 95% CI: 1.8-62.2) more likely than children whose fathers were literate. Regarding stunting, male children were 2.8 times (AOR=2.8, 95% CI: 1.5-5.3) more likely to be stunted compared with female children. There was no significant association between wasting and birth order, number of sibling's child has, father's age and educational status(20).

A community based cross sectional study conducted in North West Ethiopia in 2019 revealed that Children from low birth order; 1st (AOR=8.60, 95%CI: 2.40, 3.70) and 2nd -4th (AOR=5.80, 95%CI: 1.80, 18.90), from large family size (AOR=3.67, 95%CI: 1.92, 7.00) were at a higher risk of stunting. Based on this study child's age, sex, mother's educational status and economical status were slightly associated with wasting, whereas type of delivery, place of delivery and gestational age were not significantly associated with wasting(29).

In 2016 cross sectional study was conducted in Hawasa Zuria of South Ethiopia, and reported that the prevalence of wasting was significantly higher among female children (31.10%) than male children (24.20%). Prevalence of wasting was greatest among children aged between 48-60 months (35.6%). Binary logistic regression revealed that wasting was significantly associated with poor /lower wealth rank households' socio-economic conditions (adjusted odds ratio (AOR) =4.41 [95% CI: 2.94-8.45]. Those children between 36-47 months of age were 2.87 times more likely to be wasted than 48-60 months' age AOR:2.87 (1.73-4.77)(21).

Child caring practices and health

A community based cross sectional study conducted in Nepal in 2017 shown that bottle feeding (AOR 2.19, 95% CI 1.73 to 12.03); and not initiating complementary feeding at the age of 6 months (AOR 2.91, 95% CI 1.73 to 12.03) were significantly associated with SAM. This study also revealed that initiation of breastfeeding, colostrum feeding, and exclusive breastfeeding were not significantly associated with SAM(31).

A research conducted in Nigeria reported that the prevalence of PEM among children who were exclusively breastfed was low when compared with those not exclusively breastfed. It is unfortunate that the relationship between exclusive breastfeeding and PEM is not statistically significant. 19.7% who were not exclusively breastfed had PEM while 7.1% who were exclusively breastfed were diagnosed with PEM(26).

The study conducted in Tanzania shown that child being ill was associated with all anthropometric indices. Child being breastfed was associated with being underweight and wasting. EBF was not significantly associated with stunting and wasting. In a multi variate logistic regression, child illness AOR: 2.3 (1.7, 3.0) remained associated with wasting(27).

According to a study conducted in Bulehora district of South Ethiopia regarding wasting, children who had a diarrhea in the past two weeks prior to the data collection were 2.7 times AOR: 2.7 (1.1-6.4) more likely to be wasted than children had no diarrhea. It was also observed that the likelihood of being wasted was significantly higher for children who started complementary feeding before the age of 6 months(20)..

As compared with children who started complementary feeding at 6 months, the risk of wasting was 3.3 times AOR: 3.3 (1.5-7.4) more for children who started complementary feeding before 6 months. Children whose mothers had never used family planning were 3.8 times AOR= 3.8 (1.3-4.4) more likely to be wasted compared to children whose mother had ever used family planning(20).

Based on study conducted in North West Ethiopia, the multivariable logistic regression analysis showed that cow milk feeding of children was significantly associated with wasting. An increased odds of wasting were observed among children who were not fed on cow milk AOR: 5.48 (2.29, 13.09)(29).

The research conducted in Dilla shows us the duration of breast feeding AOR: 2.039 (1.027-4.048), age when complementary feeding started (AOR: 2. 023 (1.028-3.980) and the access to balanced diet AOR: 2.022 (1026-3.889) significantly affects the nutritional stats of the child(30).

A case control study conducted in Karat town of Southern Ethiopia in 2017 revealed that After conducting Multivariate logistic regression analysis, duration of child breast feeding those who were feed breast milk less than 12 months, AOR 3.02 (1.57,23.04), Dietary diversity of less than

or equal to three food groups, AOR 5.13 (1.56,16.84). Children who had diarrhea illness for the last two weeks prior to data collection, AOR 8.41 (4.03, 27.26) were significantly associated with acute malnutrition(32).

Environmental health related factors

A community based cross sectional study done in North Showa of Oromia region in 2013 reported that treatment of water at HHs level was the only variable significantly associated with malnutrition as measured by wasting. Children who were from those family not treat water by any means (boiling, straining, bleaching) 2.4 times more likely wasted as compared to children who were from those family treat drinking water obtained from river and unprotected spring water AOR: 2.42 (1.34,4.35)(33).

According to a cross sectional study conducted in North West Ethiopia in 2019, the multivariable logistic regression analysis showed that hand washing practice of mothers'/care takers' were significantly associated with wasting. An increased odds of wasting were observed among children whose mothers had poor hand washing practice AOR: 11.00 (4.34-27.90)(29).

Figure 1. Conceptual frame work

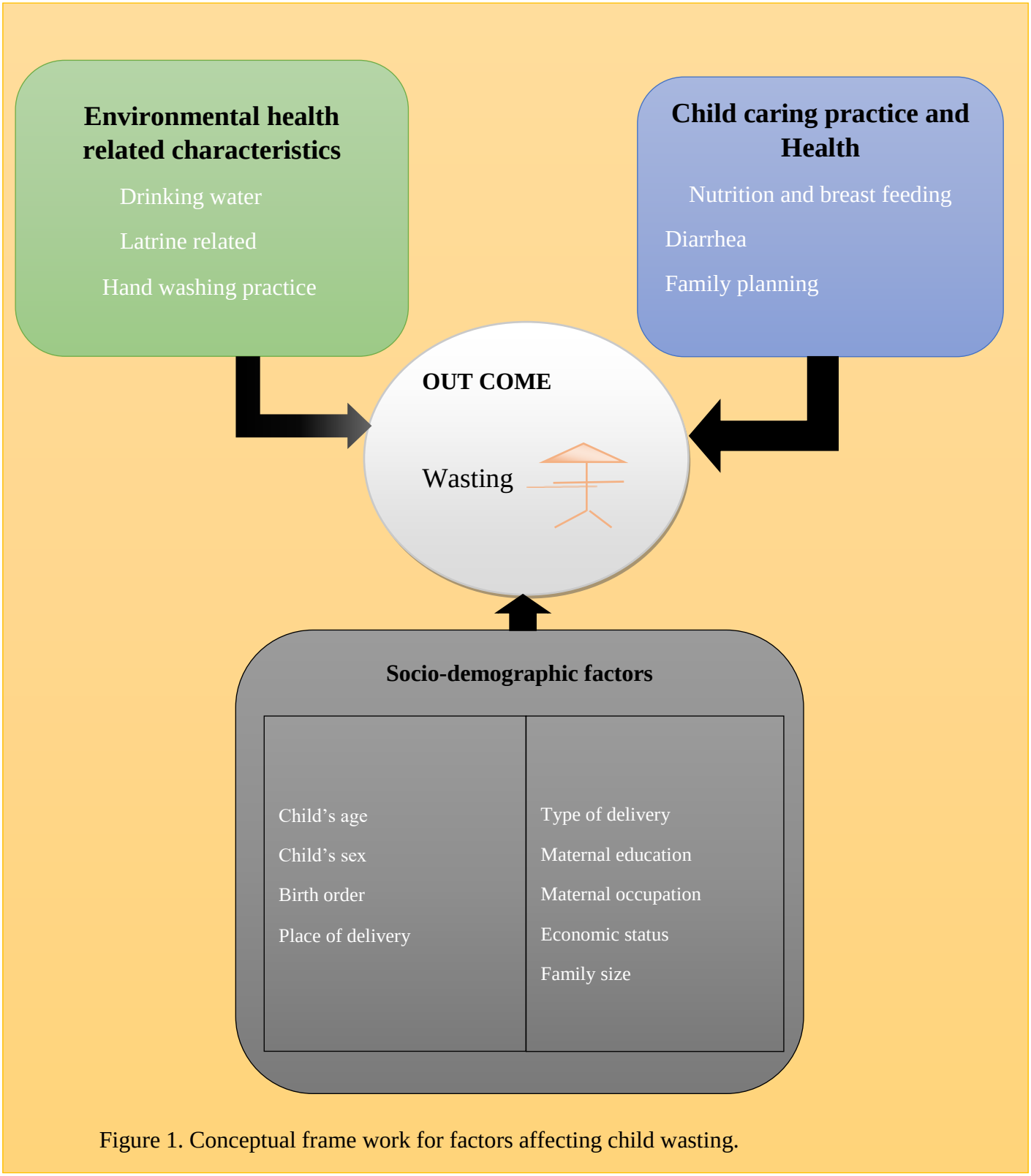

Figure 1. Conceptual frame work for factors affecting child wasting.

3. OBJECTIVES OF THE STUDY

3.1 General objective

To assess the prevalence and associated factors of wasting among children from six months to fifty-nine months in Wolkite town, South Nation Nationalities and people region, Ethiopia 2020.

3.2 Specific objectives

1. To assess the prevalence of wasting among children from six months to fifty-nine months in Wolkite town.
2. To identify the associated factors of acute undernutrition among children from six months to fifty-nine months in Wolkite town.

4. METHODS AND MATERIALS

4.1 Study area

Our study was conducted in Wolkite town which is the capital city of Gurage zone, found in S/N/N/P/R and 158KM far from Addis Ababa in southern direction. Wolkite town is located between latitude of 8 17/ N 37 47Æ and longitude of 8.283 N 37.783 E with an elevation of 1,910 and 1,935 meters above sea level .The structural plane of Wolkite town is set up from 6 Kebeles and 3 sub-towns. The 3 sub-towns are Bekure, Addis Brihan and gubreye plus the corresponding 6 Kebeles are Selamber, Edigetchora and Menaheriya in Addis Brihan sub-city, Addis hiwot and Edigetber in Bekure sub-city and 01 Kebele in Gubrye sub-city. According to Wolkite town statically agency report, Wolkite town has a total population of 70,796 peoples of these 53% are males, 47% are females. (Wolkite administration office). Menaheriya is located south to Edigetchora, east to Selamber, west to Kabena wereda fekad Kebele, and north to Kabena wereda Zekemil Kebele. This Kebele is structured from six villages (Ketenas) which are 70 ketena, Museum, Autobistera, Tegbare'ed kutirand, and Tegbare'ed kutirhulet. The total population of this Kebele is 13,359 of these under five population constitutes 2,169 from 2,618 households.

4.2 Study design and period

A community based cross-sectional study was conducted in Wolkite town South Nation Nationalities and people region, Ethiopia. And it was done from December 20 to January 3 2020/2021.

4.3 Population

4.3.1 Source population

The source population of this study included all 6–59 months old children (paired with their mothers or caregivers) who lives in the town.

4.3.2 Study population

The study population was randomly selected 6–59 months old children (paired with their mothers or caregivers).

4.4 Inclusive and exclusive criteria

4.4.1 Inclusive criteria

Mothers who have permanent residence (at least six months) in the study area having a children from 6-59 months old were a criterion for this study.

4.4.2 Exclusive criteria

An exclusion criterion was a child with evidence of physical impairment (such as physical defects or a grossly deformed and hands amputated), seriously ill (with diarrhea and /or malaria), mental impairment, and whose mothers'/care givers were unable to communicate.

4.5 Sample size determination

The minimum sample size was calculated by using single population proportion formula. This has been done based on the following assumptions: taking 95% of confidence interval and 5% margin of error. Thus

(n= [(Z (1-α/2)) 2. p. (1-p)]/d2) where,

n= sample size

(Z (1-α/2)) = 95% 1.96 confident interval

d= 5% margin error

1. Sample size determination for specific objective one:

p= prevalence of acute undernutrition (wasting) in Hawasa Zuria, S/N/N/P/R Ethiopia is 28.20%(21)

$$n = \frac{(1.96)^2 (0.282) (1-0.282)}{(0.05)^2} = 311.132 \approx 312$$

2. Sample size determination for specific objective two:

For factors the sample size was calculated using Epi info version 7.2 STAC CALC double population proportion formulas. Previous similar literatures have referred and proportion of age of child, diarrhea in the past two weeks prior to data collection, maternal education and hand washing practice were taken .For each factors power of 80%,confidence level of 95% and 1:1 Unexposed to exposed ratio was considered.

Table 1: Summary of sample size calculation for main exposure variables associated with suboptimal birth spacing practice using variables from different literatures

Factors	Proportion among exposed	Ratio	AOR	CI	Sample size	Reference
Age of the child from 36-47 months	17	1:1	2.87	1.73-4.77	217	(21)
Diarrhea in the past two weeksbefore the data collection	8.4	1:1	2.87	1.73-4.77	119	(32)
Maternal education	24.2	1:1	1.94	1.01,3.69	306	(21)
Hand washing practice of mother	26.6	1:1	1.96	1.05,3.96	311	(33)

Hence we take the maximum sample size which is the prevalence of wasting (n=312).

Using an adjustment formula to find, n = no/ (1+no/N), if the total study population less than 10,000

Where,

n= minimum required sample size

no= minimum sample if population size was more than 10,000

N= total population size

The required final total sample size for study is

n= 312/ (1+ (312/2169)) = 273

Then we added 10% non-response rate.**n= 301**

4.6 Sampling Technique

From 5 Kebeles in the town, weselectedKebele by using simple random sampling method and by using Systematic random sampling we selected households in every 9 intervals. Interval (K) – The interval by which 301children selected from 2618 HHs in Menaheriya Kebele was calculated as

K= Total HH/Sample size =2618/301 = 9

Each household was assigned by codes (0001-2618) & then randomly we have been selected the first household among 301 children of the HHs. We jumped of the Households with no under five children.

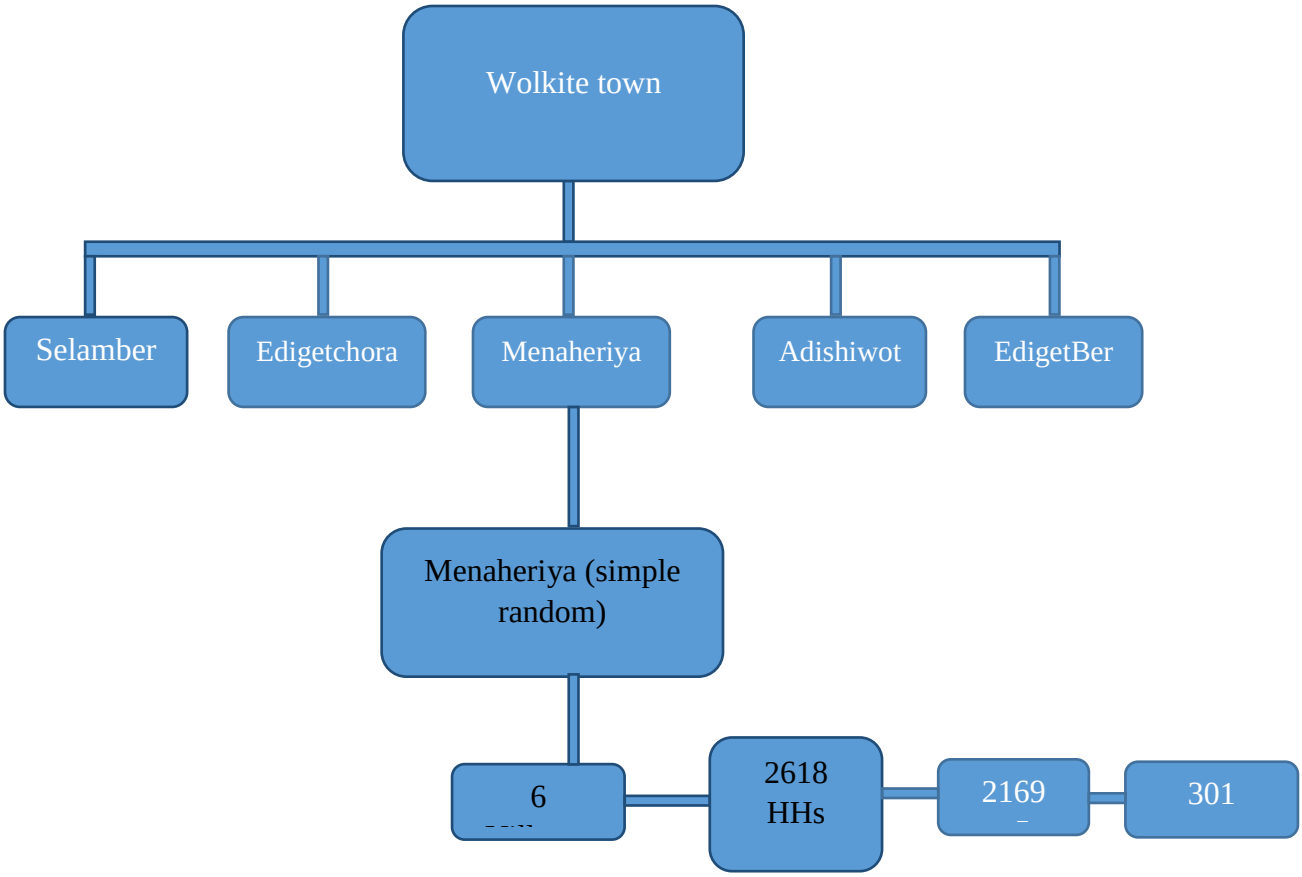

Figure2. Schematic presentation of sampling procedure and selection

4.7 Study Variables

4.7.1 Dependent variable

- Wasting

4.7.2 Independent variable

- Sociodemographic variables: Head of HHs, Child sex, Family size, In-come, Ethnicity, Religion, Maternal/paternal education and occupation, Marital status of the mother, and Number of livestock owned

- Child characteristics: Age, Sex, Birth order, Place of delivery, Gestational age, Types of birth, Breastfeeding status, Child illness, and Morbidly status (fever, measles, diarrhea and ARI)
- Child caring practices: Feeding, Hygiene, Health care seeking, and Immunization
- Maternal characteristics: Age, Number of children ever born, ANC visits, Health status during pregnancy, Extra food during pregnancy/lactation, and Autonomy in decision-making on use of money
- Environmental health conditions: water supply, Sanitation, and housing condition

4.8 Operational definition

Complementary food: Foods which are required by the child, after six months of age, in addition to sustained breastfeeding(1).

Food is secured: If the respondent does not worry that the household would lack enough food for the past for weeks(2).

Food mildly insecure: Rarely worry about food (once or twice in the past four weeks)(2).

Food moderately insecure: sometimes worry about food (three to ten time in the past four weeks)(2).

Food severely insecure:often (more than ten times in the past four weeks)(2).

Good hand washing practice: If the respondent washes hand before and/ or after actions (before cooking, before eating, after latrine visit, after child cleaning, before child feeding…)(3).

Household food security: Measured whether the respondent worries that the household would not lack have enough food for the past four weeks(2).

Poor hand washing practice:if respondent does not wash hands before and/ or after actions(3).

Continued breastfeeding at 1year: Children 12–15 months of age who continued breast feeding after the age 1 year(3).

Continued breastfeeding at 2years: Children 20–23 months of age who continued breast feeding after his/ her 23months of age(3).

4.9 Data collection tools and procedure

4.9.1 Data collection tools

A structured interview questionnaire was used to collect data related to the objectives of the study. The questionnaire was filled with close ended questions. Questionnaire, pen, paper, measuring tape, flashcard, laptop etc. were utilized for collecting, analyzing and writing the data.

4.9.2 Data collection procedure

Data was collected by data collectors through face to face interview method and measuring the anthropometry using structured questionnaire and measuring tape. The data was collected by three people after taking common understanding and orientation for one day about data collection procedure after having consent from Kebele office and data wascollected for four consecutive days.One day of training was given for data collectors and supervisor on objectives. Demonstrations were held which was aided by video and doll.

4.10 Pretest

Before the actual data collection, the questionnaire was pre tested on 5% of the total sample size in the Gugrye sub city to ensure that the respondents are able to understand the questions and to check the words and logic and order of the question in a sensible way to the respondents.

4.11 Data quality assurance and control

To ensure the validity and reliability of data by considering 5% of the total sample size pretest was conducted one week before the start of actual data collection in Gubrye town which was not part of this study. Then Based on the finding of pretest the questionnaire was assessed for its clarity, length, completeness and the necessary correction was done accordingly.

Throughout the data collection, interviewers were supervised, regular meetings were held between the data collectors and the principal investigator together in which problematic issues arising from interviews during the data collection and any challenges found were discussed. Completeness of the data was evaluated by the supervisor every night. The collected data were again reviewed and checked for its completeness before data entry. The data entry format template was prepared and programmed by the principal investigator.

4.12 Data prossesing and analysis

Data were coded, cleaned, and entered into Epi Data version 7 and exported to SPSS version 26 for statistical analysis. Descriptive statistical analysis was carried out to identify frequency, percentage, and mean for continuous independent variables. The socio-demographic and other background profiles were compared using the chi-square test. Before the analysis, the assumptions of the chi-square test were checked. When smaller expected frequencies were encountered, re-categorization of variables or merger of the levels was made. Binary logistic regression analysis was used to ascertain the association between the dependent and independent variables and some of the statistical tests like; the odds ratio was used. Variables with a significant association at $P < 0.25$ in the binary analysis were entered into multivariable analysis using the enter method to determine the risk factors of wasting and those variables $P<0.05$ were considered to be statistically significant. Hosmer- Lemeshow tests for goodness of fit were carried out. Finally, the results were presented in texts, tables, and graphs and it was discussed using the odds ratio and 95% confidence level.

4.13 Ethical consideration

Ethical clearance was obtained from Ethical Review Board of University of Wolkite, College of Medicine and Health sciences, department of Midwifery and student research program and it was given to office of Wolkite Town and the permission was taken from the Town. Verbal consent was obtained from the respondent after detailed explanation about the benefit of the study.

4.14 Plan for dissemination and communication

The finding of this study will be disseminated and shared to S/N/N/P/R Health Bureau, Gurage Zonal Health Department, Wolkite town and respective Kebele administrations as well to all stakeholders working on nutritional interventions for appropriate nutritional intervention strategy. Efforts will be made to present the results on scientific conferences and peer reviewed journal publications will be considered.

5. RESULT

5.1 Socio economic and demographic characteristics of the participants

Out of 301 children sample to be included in this study, about 293 children were included in the final analysis making response rate of 97.34%, and the rest data were not complete.From the total 293 actively participated children, 148(50.5%) were females, according to age group 69(23.5%) were 6-11 months and 56 (19.1%) were 24-35 months. Concerning the birth order, 206 (70.3%) were 2nd to 4th. About, 249 (85.0%) born were borne at health center, and majority 89.8% of the children were born at term. Regarding to the birth type, 203 (69.3%) were born through spontaneous vaginal delivery (SVD).

In relation to maternal characteristics, 130 (44.4%) were 25-29 years old, about 26.3% of the mothers had no formal education, 36.2% completed primary education. Majority 206 (70.3%) of the mothers/care giver were House wives of these 269 (91.8) were married**.**From the total of 293 households, 119 (40.6%) were Muslims and 121 (41.6%) were Orthodox.About (73.4%) of the respondents were Gurage. Concerning household food security, food is secured in 56% and 21.8% moderately insecure.

Table 2: Socio-economic and demographic characteristics of study participants in Wolkite town, 2020/2021.

Variables (N=293)	Categories	Frequency	Percent (%)
Child age	6-11 months	68	23.2
	12-23 months	59	20.1
	24-35 months	60	20.5
	36-47 months	67	22.9
	48-59 months	39	13.3
Child sex	Male	145	49.5
	Female	148	50.5
Place of delivery	Home	44	15.0
	Health facility	249	85.0
Maternal educational status	Unable to read and write	21	7.2
	Able to read and write	56	19.1
	primary education	106	36.2
	Secondary education	89	30.4
	diploma and above	21	7.2
Maternal occupation	House wife	206	70.3
	Civil servant	20	6.8
	Merchant	51	17.4
	Private employee	4	1.4

	Daily laborer	3	1.0
	other	9	3.1
Family size	1-4	101	34.5
	>4	192	65.5
Religion	Muslim	119	40.6
	Orthodox	121	41.3
	Protestant	42	14.3
	Other	11	3.8
Ethnicity	Gurage	215	73.4
	Amhara	27	9.2
	Oromo	21	7.2
	Wolaita	19	6.5
	Other	11	3.8
Household food security	Food secured	164	56.0
	Food mildly insecure	57	19.5
	food moderately insecure	64	21.8
	Food severely insecure	8	2.7

5.2 Child caring practice and Health

In relation to breast feeding and weaning, about 8.2% of respondents reported they started complementary feeding before age of four months and 8.5% beyond six months. Concerning the dietary diversity, about 62.5% of households consumes more 4 types of food groups. The report shows 68.9%respondents consumes food less than three time per a day. Regarding to vaccination status, about, 44.4% were fully vaccinated while7.8% were partially vaccinated.About 27.3% of the study participants have had diarrhea in the past two weeks prior to data collection.

Table 3: child caring practice and health characteristics of the study participants in Wolkite Town Menaheriya Kebele, 2020/2021.

Variables (N=293)	Categories	Frequency	Percent (%)
Exclusive breast feeding	<4 months	24	8.2
	4-6 months	244	83.3
	>6 months	25	8.5
Dietary diversity score	> 4 foods	183	62.5
	< 4 foods	110	37.5
Meal frequency	<3/day	202	68.9
	≥3/day	91	31.1
	<3/day	202	68.9
Vaccination status	Not vaccinated	16	5.5
	Partially vaccinated	23	7.8
	Vaccinating	124	42.3
	Fully vaccinated	130	44.4
Diarrheal disease in the past year	Yes	141	48.1
	No	152	51.9
Ever used family planning	Yes	290	99.0

	No	3	1.0

5.3 Environmental health related characteristics

The report shows that all of the Households in the study have treated and protected water source by water pipe.About 99.3% of the respondents have latrine, of these 99.7% utilize. Concerning hand washing practice about 9.9% reported that they have poor hand washing practice. In relation to disposal of refuse, 23.5% in to open field, and about 62.8% of the respondents have no liquid waste disposal pit.

Table 4:Environmental health related characteristics of study participants in Wolkite town, 2020/2021, *burn **Toilet.

Variables (N=293)	Categories	Frequency	Percent (%)
Availability of latrine	Yes	291	99.3
	No	2	.7
Hand washing practice	Good	264	90.1
	Poor	29	9.9
Solid waste disposal	Pit	62	21.2
	Open	69	23.5
	Bag	55	18.8
	Municipality service	99	33.8
	Other	8	2.7
Availability of liquid waste disposal pit	Yes	109	37.2
	No	184	62.8

5.4 Prevalence of wasting

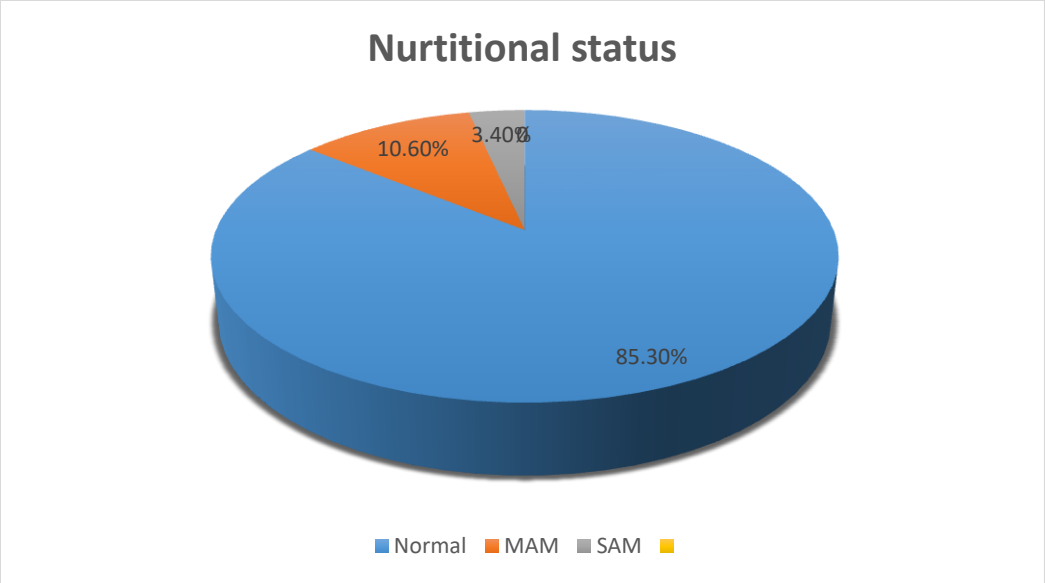

Figure 3 .Prevalence of wastingamong children from 6-59 months, in Wolkite Town Menaheriya Kebele, South central Ethiopia, 2020/2021

Based on the WHO reference standard for MUAC taking 12.5cm as a cutoff, children in the study who fell below 12.5cm in the measurement 43 (14.7%) were wasted. Based on the levels of severity, 31 (10.6%) and 10 (3.4%) moderate acute malnutrition (MAM) and severe acute malnutrition (SAM) respectively.

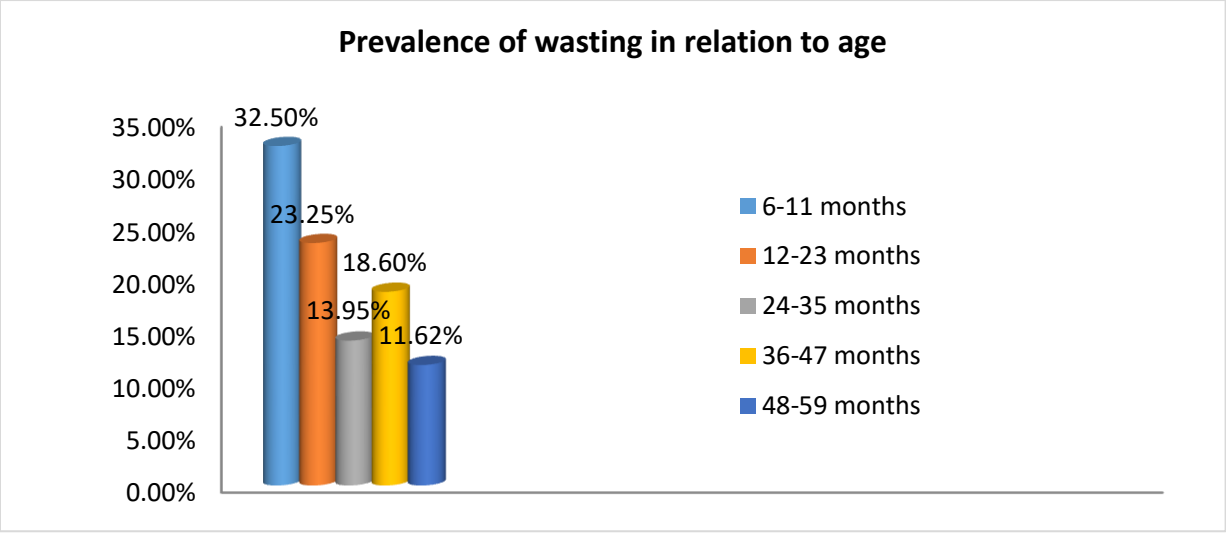

Figure 4: Prevalence of wasting in relation to age of underfive in Wolkite Town Menaheriya Kebele, South central Ethiopia, 2020/2021

The age group of 6-23 months found to be the highest (8.2% of the total and 55.81% of the wasted) in the prevalence of wasting, whereas children from 24-59 months scored lesser

prevalence of wasting which is 6.48% of the total and 44.18% of the wasted. The age is intentionally classified in to two as the complementary feeding starts and ends in the age group of 6-23 months and showed us higher prevalence of wasting. Females were more wasted than males in this study, 60.4% and 39.53% respectively.

5.5 Factors associated with wasting

Both bivariate and multivariate analysis were used in order to examine the selected variables with MUAC result of the children. Using the bivariate analysis, in relation to socio economic and demographic characteristic, the nutritional status as measured by wasting is significantly associated withage ($p<0.001$), sex, birth order, maternal education ($P<0.03$),economic status of the family, and poor hand washing practice of care giver. However, there was no statistically significant association with place of delivery, type of birth, maternal age and occupation, marital status, over all paternal characteristics, religion and ethnicity.

In order to manage the confounding effect of variables over acute malnutrition, binary logistic analysis was done by using multivariable logistic regression and children aged 6-11 months, maternal education, , and recent diarrheal diseases were significantly associated with wasting ($P<0.001$). However there is no significant association of acute under nutrition with birth order, household size, Household food security and meal frequency. In comparison of age children with age group of 6-11 months 3.5 times wasted than other age groups (AOR: 3.457 [95% CI: 1.549-7.717]). Mothers who had no formal education were 4.34 time wasted than the educated ones (AOR:4.348 [95% CI: 2.044-9.251]). Children with recent diarrheal diseases (two weeks prior to the data collection) were 3.7 time wasted than children without the recent history of diarrhea (AOR: 3.7669 [95% CI: 1.751-11.181]).Also mothers/care givers who have poor hand washing practice scored 8.5 times higher chance of wasting than those with good hand washing practice (AOR: 8.453, 95% CI: [2.784-14.116]).

Table- 5: Unadjusted and Adjusted Odds ratio and (95% confidence intervals) of logistic regression showing socio ecconomic and demographic factors associated with wasting among study participants in Wolkite town Menaheriya Kebele, South central Ethiopia, 2020/2021

Variables	Category	status		OR (95%)	
		Normal	**wasting**	**COR**	**AOR**

Child age (Months)	6-11	59	14	1.499 (1.79-1.919)	3.457(1.549-7.717)*
	12-23	48	10	2.330 (1.098-3.562)	
	24-35	52	6	4.374 (1.528-12.519)	
	36-47	59	8	-	-
	48-59	32	5	1	1
Child sex	Male	128	17	1	1
	Female	122	26	1.605(1.030-3.104)	-
Birth order	1st	38	9	1	1
	2-4	173	33	1.805 (10.356-2.822)	-
	>4	39	1	.108 (0.013-0.896)	2.044(1.308-3.544)*
Maternal Education	Unable to read and write	7	15	43.429 (10.156-185.714)	4.348(2.044-9.251)*
	Able to read and write	45	10	54.697 (13.922-214.893)	
	Primary education	99	7	87.611 (20.087-382.117)	
	Secondary education	85	4	-	-
	Diploma and above	14	7	1	1
Household food security	Food secure	163	4	1	1
	Mildly insecure	38	15	14.000 (1.615-121.369)	
	Moderately insecure	46	17	42.875 (4.635-396.582)	
	Severely insecure	1	7	185.5 (19.586-1756.903)	1.811(1.290-3.267)*

Table- 6: Unadjusted and Adjusted Odds ratio and (95% confidence intervals) of logistic regression showing child caring practice, health and Environmental factors associated with wasting among study participants in Wolkite town Menaheriya Kebele, Southcentral Ethiopia, 2020/2021.

Variables	**Category**	**Status**		**OR (95%)**	
		Normal	**wasting**	**COR**	**AOR**
Exclusive breast feeding	<4 months	6	18	1.190 (1.050-1.724)	4.093 (1.945-18.730)*
	4-6 months	234	10	-	-
	>6 months	10	15	1	1
Diarrheal disease in the past two weeks	Yes	29	37	46.99 (39.888-54.100)	2.7669 (1.751-3.7669)*
	No	221	6	1	1
Hand washing practice	Good	21	22	1	1
	poor	8	242	28.875 (11.462-72.739)	8.453 (2.784-14.116)*

6. DISCUSSION

Now a days as the knowledge and interventions concerning malnutrition are more improved, a good progress is being achieved in ajourney of preventing occurrence of acute malnutrition.However wasting is still prevalently occurring in developing countries like Ethiopia and still needs a concern. Much of the studies conducted either in an organizational level or individual have a nestled result even though the time and place variety is affecting. This means the prevalence of wasting is a public health concern.

As mentioned above the prevalence of wasting in this study was 14.7% with 95% CI(10.9-18.8) and this is found to be higher when compared to the 2019 EMDHS result which 7% (28) and a cross-sectional study conducted in Northwest Ethiopia, which is 10% (29). The present result was also higher than the study conducted in Adi-Harush and Hitsats Refugee Camps in Tigray, 11% was wasted (19).This may be due to time and study area variation.

A research conducted in Dilla town on magnitude and associated factors of wasting among under five orphans shows us a lesser result which is 11.1% (30). This may be because of study concentration as they focused on under-five orphans. The present result indicated lesser magnitude in comparison to a community Based Cross Sectional Study conducted at Hawassa Zuria, South Ethiopia 28.20% was wasted.This may be due to the reason that the study areas were rural and our study in urban.

Concerning socio demographic characteristics like birth order, number of sibling's child has, father's age and educational status, type delivery, place of delivery and gestational age, there is no association with wasting in much of studies (20)(21)(29). This was true for this study as well.

A cross sectional study conducted in Hawasa Zuria of South Ethiopia reported that the prevalence of wasting was significantly higher among female children (31.10%) than male children (24.20%), children aged between 48-60 months has also higher prevalence (35.6%). Binary logistic regression revealed that wasting was significantly associated with poor /lower wealth rank households' socio-economic conditions. Those children between 36-47 months of age were 2.87 times more likely to be wasted than 48-60 months' age (21). When we compare to this study also there is a significant association between wasting and sex, age, economic status.

However the opposite was true regarding to age, children aged 6-23 months were more wasted than the other age groups. This might be due to time and place variation.

Children with recent diarrheal diseases prior to data collection were 2.7 time wasted than children without the recent history of diarrhea (AOR: 2.7669 [95% CI: 1.751-3766]), and a research conducted in Bulehora district also show similar result(20). This means diarrhea has a significant association with wasting.

The research conducted in Dilla shows us the duration of breast feeding AOR: 2.039 (1.027-4.048), age when complementary feeding started (AOR: 2. 023 (1.028-3.980) significantly affects the nutritional stats of the child(30). In contrast with our study those who breast fed before six months were higher chance of being wasted (AOR: 4.093, 95% CI [1.945-18.730]).

Concerning environmental health conditions the report from North Showa of Oromia region shows that treatment of water at HHs level was the only variable significantly associated with malnutrition as measured by wasting. Children who were from those family not treat water by any means (boiling, straining, bleaching) 2.4 times more likely wasted as compared to children who were from those family treat drinking water obtained from river and unprotected spring water AOR: 2.42 (1.34,4.35)(33). The opposite was true for this study, there was no association of wasting and the condition of drinking water. This might be due to the reason that almost all (99.7%) of households in the study area have a protected source of drinking water.

In relation to hand washing practice as found by this result the adjusted odds ratio of poor hand washing practice was AOR: 8.453, 95% CI: [2.784-14.116].This score is lesser when we compare to a study conducted in North West Ethiopia as it shows An increased odds of wasting were observed among children whose mothers had poor hand washing practice AOR: 11.00 (4.34, 27.90)(29).However, both results indicates that how much the condition of hand washing affects the health of children.

Strength of the study

- A trained data collectors (health students) were used for interview data collection anthropometric measurement (MUAC).
- The study was conducted in the community level.

- One day pre data collection meeting and common understanding has been taken.
- Different types of data collection instruments (interviewer administered questionnaire and anthropometry) were used to collect data from different sources to increase validity of the study.
- Childs mothers with severe acute malnutrition (SAM) has been warned to go to health institution for therapeutic feeding and mothers with moderately malnourished child has been advised for them to receive supplementary feeding

Limitation of the study

- As it was the first encounter for the researchers for the SPSS and Epi software, there might be an error on the analysis.
- Egg and chicken dilemma as it is cross-sectional study.

7. CONCLUSION AND RECOMMENDATION

7.1 CONCLUSION

The prevalence of wasting among children aged from 6-59 months in Wolkite town is 14.7%. Among several factors that would affect the occurrence of wasting, age of children, educational status of the mother/care giver, and diarrheal disease in the past two weeks prior to data collection, and hand washing practice of the mother were found to be significantly associated factors.The magnitude of wasting in this study is higher than many studies conducted in Ethiopia and abroad, thus especial attention should be given in order to intervene the occurrence and causes of acute malnutrition among children under five. Moreover, further and more comprehensive study should be done to assess and investigate the magnitude and determinants of wasting.

7.2 RECOMMENDATION

- Wolkite town health bureau and other stakeholder should work on health education in order to change the mind setup of the society as every action arises from knowledge and attitude.
- Community based nutrition program should be established to overcome the problem of wasting and its associated factors at community level.
- Continued attention is mandatory to environmental health issues as many factors of wasting arises from it.
- Health extensions should be collaborated with others sectors and stake holders to improve the knowledge of mothers' child care practice.
- Nutrition surveillance should be done continuously and special attention should be given to vulnerable groups such as poorest and the most severely malnourished children.

REFERENCE

1. UNICEF W, UNESCO, UNDP, UNAIDS, WFP, World Bank. New York: United Nations Children's Fund; 2010.
2. Young EM. Food and Development. Abingdon, Oxon: Routledge; 2012. p. 36-8.
3. WHO. Mternal, newborn, child and adolescent healthJuly 4, 2014.
4. EDHS. Key Findings. Ethiopia, Addis Ababa, Ethiopia: Central Statistical Agency (CSA) [Ethiopia] and ICF; 2016. p. 11.
5. United nations children's fund who, The wold bank. UNICEFWHO-world bank joint child malnutrition estimates. UNICEF, New York; WHO, Geneva; The world bank, washington, DC; 2012.
6. Roland J. What you should know about Marasmus. Healthline. 2017.
7. Benjamin O LS. Kwashiorkor: StatPearls Publishing; 2020.
8. Badaloo AV FT, Reid M, Jahoor F. lipid kinetic differences between childern with kwashiorkor and those with marasmus2006.
9. Cabana MD, editor. Protein-energy Malnutrition: Wolters Kluwer Health; 2015.
10. GLOBAL NUTRITION REPORT. 2018.
11. International I. Children's Health and Nutritional Status. Calverton, Maryland, USA: ICF International.: 2018.
12. WHO. Comprehensive implementation plan on maternal, infant and young child nutrition. 2014.
13. Unicef. Levels and trends in child malnutrition 2018. .
14. WHO. Malnutrition. 2018.
15. 2016 Ethiopia Demographic and Health Survey Key Findings. Addis Ababa, Ethiopia, and Rockville, Maryland, USA. CSA and ICF.: 2017.
16. Mini Demographic and Health survey. Adiss Ababa, Ethiopia2019.
17. Collins S DN, Binns P,Bahwere P, Saldler K, HAllam A. Management of of severe acute malnutrition in Childern. 2019. p. 1992-2000.
18. Jesmin A YS, Malik AA, Haque MA. Prevalence and determinants of malnutrition among preschool childern. Cross sectional study. Dahka: 2017.
19. Hagos Brhane BM, Hedja Yenus Yeshita, Kedir Abdela Gonete. Prevalence and Associated Factors of Acute Malnutrition Among 6-59 Month Children in Adi-Harush and Hitsats Refugee Camps in Tigray Region Northern Ethiopia, 2017. American Journal of Life Sciences. 2018;6(5):57-64.
20. Mandefro A MW, Mohammed T, & Lamessa D. Prevalence of undernutrition and associated factors among children aged between six to fiftynine months in Bule Hora district, South Ethiopia. BMC public health. 2015.
21. Tsedeke W TB, Debebe M. Prevalence of Acute Malnutrition (Wasting) and Associated Factors among Preschool Children Aged 36-60 Months at Hawassa Zuria, South Ethiopia: A Community Based Cross Sectional Study. J Nutr Food Sci 2016.
22. Z. S. The magnitude and Factors of Malnutrition of Childern under five yrears of age in rural kebeles of Haramaya. 2016.
23. challenges and possibilities in Ethiopia's nutrition sector. Analysing Nutrition Governance. From food crisis to nutrition:. Ethiopia2016.
24. Amare ZY, Mossa Endris Ahmed, and Adey Belete Meharie. Determinants of Nutritional Status among Children under Age 5 in Ethiopia. Further Analysis of the 2016 Demographic and Health Survey. 2019.
25. Agrawal PCaM. Malnutrition and associated factors among children below five years of age residing in slum area of Jaipur City. Asian J Clin Nutr. 2019(11):1-8.
26. Andy Emmanuel1 NOJ, Oyedele E. Adetunji1, Gotodok K. Hosea1, Kumzhi R. Partience1. Malnutrition and Associated Factors among underfive in a Nigeria Local Government Area International Journal of Contemporary Medical Research. 2016;3(6).
27. Melina Mgongo NASC, Tamara H. Hashim, Jacqueline G. Uriyo, Damian J. Damian, Babill Stray-Pedersen, Sia E. Msuya, Margareta Wandel and Siri Vangen. Underweight, Stunting and Wasting

among Children in Kilimanjaro Region, Tanzania; a Population-Based Cross-Sectional Study. International journal of Environmental Health and Public Health. 2017:4&5.
28. Institute EPH. Ethiopia Mini Demographic and Health Survey 2019. Rockville, Maryland, USA: EPHI and ICF.: 2019.
29. al Ge. Undernutrition and associated factors among urban children aged 24–59months in Northwest Ethiopia: a community based cross sectional study. BMC Pediatrics. 2019:4.
30. Wete AT ZT, Anbese, A.T. Magnitude and associated factors of wasting among under five orphans in Dilla town 2019;1(33).
31. Pravana NK Piryani S, Chaurasiya SP, et al. Determinants of severe acute malnutrition among children under 5 years of age in Nepal. BMJ Open 2017;7.
32. Abebaw M WG, Meseret G, and Feleke G. Determinants of Acute Malnutrition among Under-Five Children in Karat Town Public Health Facilities, Southern Ethiopia. Insight Medical plPblishing group. 2017.
33. Mengistu K AK, Destaw B. Prevalence of Malnutrition and Associated Factors Among Children Aged 6-59 Months at Hidabu Abote DistrictNorth Shewa. 2013.
34. http://www.who.int/childgrowth/standards/Technical_report.pdf

ANNEX I. INFORMATION AND INFORMED CONSENT

Introduction

My name is _____. I am working with my team who are doing a research for the partial fulfillment of Bachelor Degree in Midwifery at Wolkite University. This questionnaire is intended to assess prevalence of wasting and its associated factors among children aged from 6 months to fifty-nine months in Wolkite town south central Ethiopia. You are selected to be one of the Participants in the study.

Study title: Assessment on prevalence of wasting and its associated factors among children aged from six months to fifty-nine months in Wolkite town south central Ethiopia.

Purpose: purpose of the project is to identify the magnitude of wasting and its associated factors. The other purpose is for the fulfillment of our bachelor degree in Midwifery. The information you provide here will be very helpful to the investigator of this study to write a research paper for the requirement in completion of Bachelor program. The findings of this project could help in designing priority intervention strategies for better improvement of nutritional and Health status of the children and forth fruit a productive generation.

Duration of the Study: From January2020- to January/2021 GC

Procedures: There are questions that assess factors associated with wasting in children under five age group and I will measure your child's nutritional status by using the "measuring tape". I would like to ask you to give me a genuine and honest answers on the questions I will ask. If you need clarification you can ask me. It will take you about 15 minutes to finish this survey.

Benefits and Risks: By participating in this study and answering our questions, you will notreceive any direct benefit. However, the information will help the researcher to understand and identify the prevalence and factors associated with wasting among under five age group in

order to appropriately identify future interventions related to problem to be found. Your participation in this study will not involve any risks. If a question makes you feel uncomfortable, you may choose not to answer.

Confidentiality: you will not be asked your name on to be written the survey questions. All theinformation you give to us will be kept private. Whatever information you provide will be kept strictly confidential. The information you give will kept in a locked file cabinet. Only the researcher will have access to see the answers you give. No information identifying you will ever be released to anyone outside of this data collection activity.

Participation: Participation in the survey is completely voluntary. If you are not comfortable inanswering any question(s), you can skip it. You can stop answering the question at any time without giving a reason and your relationship with the community or any other body will not be affected in any way. If you would like to know more, please contact.

We thank you in advance for taking your time to answer questions.

Would you be willing to participate in the study?

If yes, we are in advance to ask you. If no, please stop here.

Consent of the participant: I the undersigned have been informed that the purpose of thisresearch project. Based on the above information I agree to participate in the research voluntarily.

Signature of Participant ----------

Date----------

ANNEX II: QUESTIONNAIRE

Questionnaire on wasting and associated factors among children aged from 6 months to fifty nine months.

Kebele…….. Interviewer Name…… Interviewee No……

Woreda/Town…… Date of Interview……...

Part I. Nutritional status			
A. Anthropometry			
No	**Questions**	**Possible responses**	**Skip**
1	**Mid upper arm circumference (MUAC)**		
Part II. Socio- economic and demographic characteristics			
A. Child Characteristics			
1	Child age (month)		
2	Sex of Child	**Male**	
		Female	
3	Birth order of a child		
4	Place of delivery	Home	
		Health facility	
		Other (Specify)	
5	Gestational age at delivery (Month)		
6	Type of birth	SVD	
		Instrumental delivery	
		C/S	
B. Maternal Characteristics			
1	Maternal age (in years)		

2	Maternal education	Unable to read and write		
		Able to read and write		
		Primary education		
		Secondary education		
		Diploma and above		
3	Maternal occupation	House wife		
		Civil servant		
		Merchant		
		Daily laborer		
4	Marital status	Married		
		Single		
		Divorced		
		Widowed		
	C. Paternal Characteristics			
1	Paternal Age			
2	Paternal education	Unable to read and write		
		Able to read and write		
		Primary education		
		Secondary education		
		Diploma and above		
3	Paternal occupation	Farmer		
		Civil servant		
		Merchant		
		private employ		
		Daily laborer		
	D. Family Characteristics			
1	Religion	Muslim		

		Orthodox		
		Protestant		
		Other (Specify)		
2	Ethnicity	Gurage		
		Siltie Hadiya		
		Others (Specify)		
3	Number of children			
4	Household size			
5	Monthly income			
6	Household food security	Food secure		
		Mildly food insecure		
		Moderately food insecure		
		Severely food insecure		
Part III. Child caring practice and Health				
A. Nutritional Characteristics				
1	Initiation of breast feeding	Early (within first hour after delivery)		
		Late (after first hour of delivery)		
2	Exclusive Breastfeeding (in months)			
3	Pre-lacteal feeding	Yes		
		No		
4	Extra meal during pregnancy/lactation	Yes		
		No		
5	Initiation of complementary food (Month)			

6	End of breast feeding (Year)			
7	Dietary diversity score	>4 food groups		
		<4 food groups		
8	Meal frequency	<3/day ≥3/day		
B. Health characteristics				
1	Vaccination status	Not vaccinated		
		Partially vaccinated		
		Fully vaccinated		
2	Vitamin A supplementation	Yes		
		No		
3	Diarrheal morbidity in the past year	Yes		
		No		
4	Diarrheal morbidity in the last two weeks	Yes		
		No		
5	Episodes of diarrheal morbidity per year			
6	Child ever taken to Health institutions	Yes		
		No		
7	Antenatal care follow-up	Yes		
		No		
8	Knowing FP methods	Yes		
		No		
9	Ever used of FP methods	Yes		
		No		

Part IV. Environmental health related characteristics				
1	Source of drinking water	Protected		
		Unprotected		
2	Water treatment by any means	Yes		
		No		
3	Availability of latrine	Yes		
		No		
4	Utilization of latrine	Yes		
		No		
5	Hand washing practice	Good		
		Poor		
6	Where do you dispose refuse?	Pit		
		open		
		Municipality service		
		Other (specify)		
7	Availability of liquid waste disposal pit	Yes		
		No		

Thank you for your participation!