



**PREVALENCE AND ASSOCIATED FACTORS OF STUNTING AMONG 6-59 MONTHS  
AGED CHILDREN IN DEDO DISTRICT, OROMIA REGION, SOUTH WEST ETHIOPIA:  
A CROSS-SECTIONAL STUDY**

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**JIMMA, ETHIOPIA.**

**PREVALENCE AND ASSOCIATED FACTORS OF STUNTING AMONG 6-59 MONTHS  
AGED CHILDREN IN DEDO DISTRICT; COMMUNITY BASED CROSS-SECTIONAL  
STUDY**

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## Abstract

**Background:** Stunting is a serious impediment to child survival and developing a full learning capacity. An estimated of 159 million children around the world are malnourished. Stunting remains a public health problem of greater magnitude and it more accurately reflects nutritional deficiencies of the most critical periods of growth and development in early life. Nonetheless, little is known about the magnitude and factors associated with Stunting among children aged 6 to 59 months across all corners of Ethiopia therefore, the study was aimed to assess the magnitude of stunting and associated factors among 6-59 months old children in Dedo District, Jimma zone, south west Ethiopia 2016.

**Methods and materials:** Across-sectional study was conducted among 6-59 months aged children in Dedo District of Jimma zone. A total of 647 children 6-59 months aged were included from 17 kebeles in Dedo woreda using simple random sampling. Descriptive statistics (Frequency, mean, standard deviation) were computed to show the picture of the data. Bivariate and multivariate logistic regressions were used for determining the independent predictors.

**Result:** A total of 647 children (201 males and 446 females) age 6-59 months living in Dedo district were enrolled in the study, giving a response rate of 100% and study result reveals that 29.98% of 6-59 months old children were stunted, with even higher rates among male children 123 (64.4%). Stunting were significantly associated with 24 to 35 months aged children [AOR= 1.3, (95%CI: 1.01, 3.45)], Initiation of Breast feeding after delivery within 24 hours [AOR= 2.6, (95%CI: 1.32, 5.13)], children whose their mothers were merchant [AOR= 3.94, (95%CI: 1.09, 14.2)] and those children in poor wealth status [AOR= 6.07, (95%CI: 2.16, 17.047)].

**Conclusion:** The findings of this study have proven stunting were a high prevalent problem in the study area. The child's age, household wealth index, mother's occupation and initiation of breast feeding after delivery were found to be associated factors of stunting. The findings of this study suggest that there is potential need for linking nutrition interventions in the study area.

**Recommendation:** Nutrition education by health extension works should be strengthening to improving the feeding practice of parents on appropriate children feeding at all ages of children and also woreda administration should strengthen and established income generation active and saving at HHs like credit and saving process in collaboration with stakeholders to improve family income.

**Keywords:** stunting, children aged 6-59months, Dedo ,Jimma ,Ethiopia

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## Abbreviations

ANC	Antenatal Care
CI	Confidence Interval
EDHS	Ethiopian Demographic and Health Survey
ETB	Ethiopian Birr
GC	Gregorian calendar
HFA	Height for Age
JU	Jimma University
MPH	Masters of Public Health
NCHS	National Center for Health Statistics
SD	Standard Deviation
SPSS	Statistical Package for Social Sciences
SRS	Simple Random Sampling
UNICEF	United Nations children Fund
WHO	World Health Organization

## **Chapter One: Introduction**

### **1.1 Background**

Malnutrition is a major public health concern affecting a significant number of under five age children influencing their health, growth and development, and future academic school performance. Stunting is an indicator of chronic malnutrition, meaning long-term or accumulated nutritional deficiency resulting from lack of adequate dietary intake over a long period of time and/or recurrent illness.

Stunting is defined by a height-for-age (HAZ) z-score below two SDs of the median WHO standards [7] Stunting is a serious impediment to child survival and developing a full learning capacity (1, 2). According to Ethiopian Demographic Health survey, 29 % of children among 6-59 months of age was underweight (have low weight-for-age), and 9 % are severely underweight (EDHS, 2011). About two in five children in sub-Saharan Africa (38%) are underweight, 10.5% of the children are wasted (2.2% are severely wasted) and 46.5% of the children are stunted that half of them are severely stunted (WHO, 2011). In Oromia region prevalence of child malnutrition indicated that 41 % of the children are stunted with 21.8 severe stunting, 9.6% of the children are wasted (2.4 % severe wasting) and 34.4% are underweight with 11% severe underweight (EDHS, 2010).

Stunting (low height-for-age) is acknowledged as the best indicator for child growth that indicates chronic under nutrition (3). Children those are stunted have a reduced learning ability in school and poor scholastic achievement (4), are more likely to repeat grades in school or drop out and could increase the risk that they do not complete primary or secondary education (5).

Stunted children do not reach their full growth potential and become stunted adolescents and adults. The functional consequences of stunting continue in adulthood, with reduced work capacity and, in women, increased risk of mortality during childbirth and adverse birth outcomes (6).

### **1.2 Statement of the Problem**

Globally, prevalence of stunting among under five children is about 23.8 percent. An estimated of 159 million children around the world are malnourished (1). Globally, 50-60% of child deaths were attributable to under nutrition; a third of these are due to inadequate complementary feeding followed by poor dietary diversity.

Stunting is defined by a Height-for-Age (HAZ) Z-score below two SDs of the median WHO standards (7). The first 1,000 days of life beginning with conception, through a mother's pregnancy and up until the age of two is the most critical period in a child's development(8). Stunting is an indicator of chronic malnutrition, meaning longterm or accumulated nutritional deficiency resulting from lack of adequate dietary intake over a long period of time and/or recurrent illness.

Stunting is caused by inadequate diet and by infection as immediate level. These primary causes of malnutrition are influenced by food access and availability, healthcare, water and sanitation, and the way a child is cared for such as whether the infant is breastfed and whether basic hygiene practices are used which includes hand-washing (3, 5, 6). Stunting in early childhood also results in diminished cognitive and physical develop-

ment, which puts children at a disadvantage for the rest of their lives. They may perform poorly in school, and as adults they may be less productive, earn less and face a higher risk of disease than adults who were not undernourished as children (6, 7). Height at two years of age is clearly associated with enhanced productivity and human capital in adulthood, so early nutrition is also an important contributor to economic development in which a 1% loss in adult height due to childhood stunting is associated with a 1.4% loss in productivity (5). Progress in reducing childhood malnutrition in developing countries has been slow. The larger burden for Africa is stunting that is the failure to grow in stature (8). Stunting is continued to be one of the most important public health problems in Ethiopia. In urban Ethiopia based on 2011 EDHS the prevalence of stunting in under five children was 32% which is with 2.2% increase in five years from 2005 EDHS (9,10). Therefore, this study is aimed to assess the magnitude of stunting and associated factors among under five children in Hossana town, Southern Ethiopia. Furthermore, the findings of this study will enable policy makers, public health advocates, nutritionists and researchers used as baseline data to design appropriate and effective interventions.

One of the most critical factors for children's health and development is their nutritional status. Children who are undernourished are less able to fight infections and more likely to die young. Less than one-third of under five years aged children met the minimum criteria for dietary diversity, and only 50% received the minimum number of meals in the world in general (7). Malnutrition remains one of the most common causes of morbidity and mortality among children throughout the world. Over two-thirds of these deaths, which are often associated with inappropriate feeding practices, occur during the first five year of life (8).

Nutritional deficiencies affect long term physical growth and development and may lead to high level of illness and disability in adult life. Moreover, high prevalence of malnutrition jeopardizes future economic growth by reducing the intellectual and physical potential of entire population. Under nutrition among children remains common in many parts of the world (9).

Ethiopia is the 14<sup>th</sup> rank in Malnutrition related deaths in the world (48.19%) (WHO world health death rate ranking reports, 2014). In Oromia region the prevalence of stunting among under five children is 38.2% (10).

According to 2014 Mini EDHS results, stunting persist as major public health problems in Ethiopia which rates 40%). These national levels mask geographic differences-malnutrition is higher in rural versus urban areas, due to cross cut issue. Inappropriate complementary feeding practices such as; untimely introduction of complementary foods, improper feeding frequency and low dietary diversity of complementary foods have been widely shown to increase the risk of stunting (2).

Nutritional status is the current body status of a person or a population group, related to their state of nourishment (the consumption and utilization of nutrients). This is determined by a complex interaction between internal/constitutional factors and external/environmental factors. Some of these internal factors include age, sex, nutrition, behavior, physical activity and diseases while the external factors include food safety, cultural, social and economic circumstances. There is increased risk of malnutrition than over-nutrition in children from poor socioeconomic families where the nutrition intake is reduced (11).

Child under nutrition can be mitigated through nutritional information campaigns, broader access to maternal and child health care practices and availing affordable, diverse, and nutrient-rich food (12).

In fact, malnutrition is the underlying cause of 57% of child deaths in Ethiopia with some of the highest rates of stunting in the world. Contributing factors to under nutrition include widespread poverty, limited employment opportunities, poor infrastructure, high population pressure, low education levels, inadequate access to clean water and sanitation, high rates of migration and poor access to health services. Without increased efforts to improve the nutritional status of vulnerable groups such as mothers and children under five years old, it is difficult and risks falling of halving underweight and reducing child mortality. Tackling child malnutrition remains a pressing challenge that requires improved food security, behavioral and attitudinal changes and improvements to basic services. (Save the Children, 2012). Problems can be actually be inevitable when a certain activity is in place since the child mal nutrition is still the major public health problem in Ethiopia; it is believed to be influenced by some factors. This study was partly seeing problem associated with it. Hence, this research tried to answer the following questions: What are the associated factors of Child Stunting in Dedo District, to what extent prevalence's of stunting and indicators child- stunting obtained at the study area

## **Chapter 2- Literature Review**

According to UNICEF, WHO and World Bank joint report the global prevalence of stunting of under five children is 23.8 percent. An estimated of 159 million children around the world are malnourished (1).

Globally, 50-60% of child deaths were attributable to under nutrition; a third of these are due to inadequate complementary feeding followed by poor dietary diversity. One of the most critical factors for children's health and development is their nutritional status. Children who are undernourished are less able to fight infections and more likely to die young. Less than one-third of under five years aged children met the minimum criteria for dietary diversity, and only 50% received the minimum number of meals in the world in general (7).

.According to Mini Ethiopian Demographic and Health Survey report of 2014; nationally, 40 percent of children under age five are stunted, and 19 percent of children are severely stunted. In general, the prevalence of stunting increases as the age of a child increases, with the highest prevalence of chronic malnutrition found in children age 24-35 months (52 percent) and lowest in children between age six and eight months ( 9 percent). Among the various determinant factors indicated by different studies conducted so far, few important factors indicated were reviewed below.

### **3.1 Socio-demographic and Socio economic Factors**

According to the study conducted in Democratic Republic of Congo and Kenya on Secondary data Analysis on prevalence of stunting shows that, stunting was higher among boys compared to girls; but there was no significance different observed between the two sexes according to the study conducted in Cambodia and Ethiopia.. This studies also showed that stunting prevalence was significantly higher among children of high birth order in Cambodia whereas the study in Kenya Nairobi showed that the odds of stunting for children born to mothers who had two births and three or more births are 31percent and 39 percent higher compared to those that had one child respectively (13-16).

Finding from Nairobi shows that the prevalence of stunting among children age 6-59 months was about 47%, and the prevalence increased with age through 36-47 months (58%) (38). This is contradicted with study done in Democratic Republic of Congo which shows, an inverse linear association with age of the child and stunting (38). The study conducted in Nepal also showed that maternal age at pregnancy was the determinate factors for stunting. This showed that age more than 55 years old associated with risk of acquiring stunting in their children. According to the study conducted on Prevalence and associated factors of stunting among primary school children in Eastern Ethiopia in 2015; children being born to older mothers greater than or equals to 35 years were found to be protective against stunting when compared with their counterparts (2, 17).

The study conducted in Tanzania, Nairobi Kenya and Ethiopia showed that children of mothers with more than secondary education are less likely to be stunted (19 percent) while children whose mothers are had no education are the more likely to be stunted (47%) (2, 14, 17)

According the study conducted on Prevalence and associated factors of stunting in 6-59 months children in Areka town, southern Ethiopia, showed that those mothers occupation who were unemployed was 2.04 times more likely to be stunted than whose their mothers were employed (17). The study conducted in Meskan District, Gurage Zone, South Ethiopia shows that Children whose mothers worked as merchant and were more likely to develop stunting than children whose mothers worked as house wives (36). The study in India, Cambodia and Ethiopia indicated that children from medium or higher economic status households, children of poor households were 1.9 time more likely to be stunted (2, 19, 20). But the 2012 EDHs showed that there is an inverse relationship of house hold wealth quintile and the stunting levels of children that were a higher proportion of children in the lowest house hold quintile are stunted (40%) than on the higher wealth quintile (2). Study done in Ethiopia, Sub-Saharan Africa, Ghana and Asia shows that Children living in poor wealth status households were more likely to be stunted than those living in richest wealth status households (10, 46, 47, 48, 49). EDHS 2011 shows higher proportion of children in the lowest household wealth quintile were stunted (49%) than children in the highest wealth quintile (30%) (10). A study done to southern region of Ethiopia also identified low socioeconomic status of household as risk factors for Child under nutrition (40).

### **3.2 Environmental related factors**

According to the study conducted in Cambodia showed that safe drinking water was negatively associated with prevalence of stunting (16). The study in Ethiopia also showed that the prevalence of stunting among children of households with no protected water source was significantly higher as compared with those who had (2).

But in a study conducted on Prevalence and associated factors of stunting 6-59months children in Areka town, southern Ethiopia, depicted that there was no significant association between stunting with unimproved water source (18).

### **3.3 Inadequate Dietary intake related factors**

According to the study in India showed that the proportion of stunting among children whose mothers initiated breast feeding within six hours (49.6%) was significantly less than that 64.6% for those whose mothers initiated breast feeding after six hours during their delivery (2, 19). But the study conducted in Gojjam of Ethiopia indicated that there was no significant difference in prevalence of stunting by initiation of breast feeding after delivery. This study was also showed that bottle feeding was significantly associated with stunting among children whose were battle fed (49.8%) than their counterparts (22).

### **3.4 Health care related factors**

According to the study conducted in Southern Ghana showed that, stunting were 44.2 % and 2.1 more likely to develop stunting in children with diarrhea and as compared to those without diarrhea (27.4%) (21). The study conducted in Democratic Republic of Congo showed that stunting were higher among children whose mothers have had no prenatal care visit were 1.5 times more likely to develop stunting as compared with those mothers having more than five times or more (13).EDHS 2011 shows that those children breast feed less than optimum time is 2.1 more likely to develop stunting than those breast feed great or equal to optimum time.

### **3.5 Knowledge attitude and practice related factors**

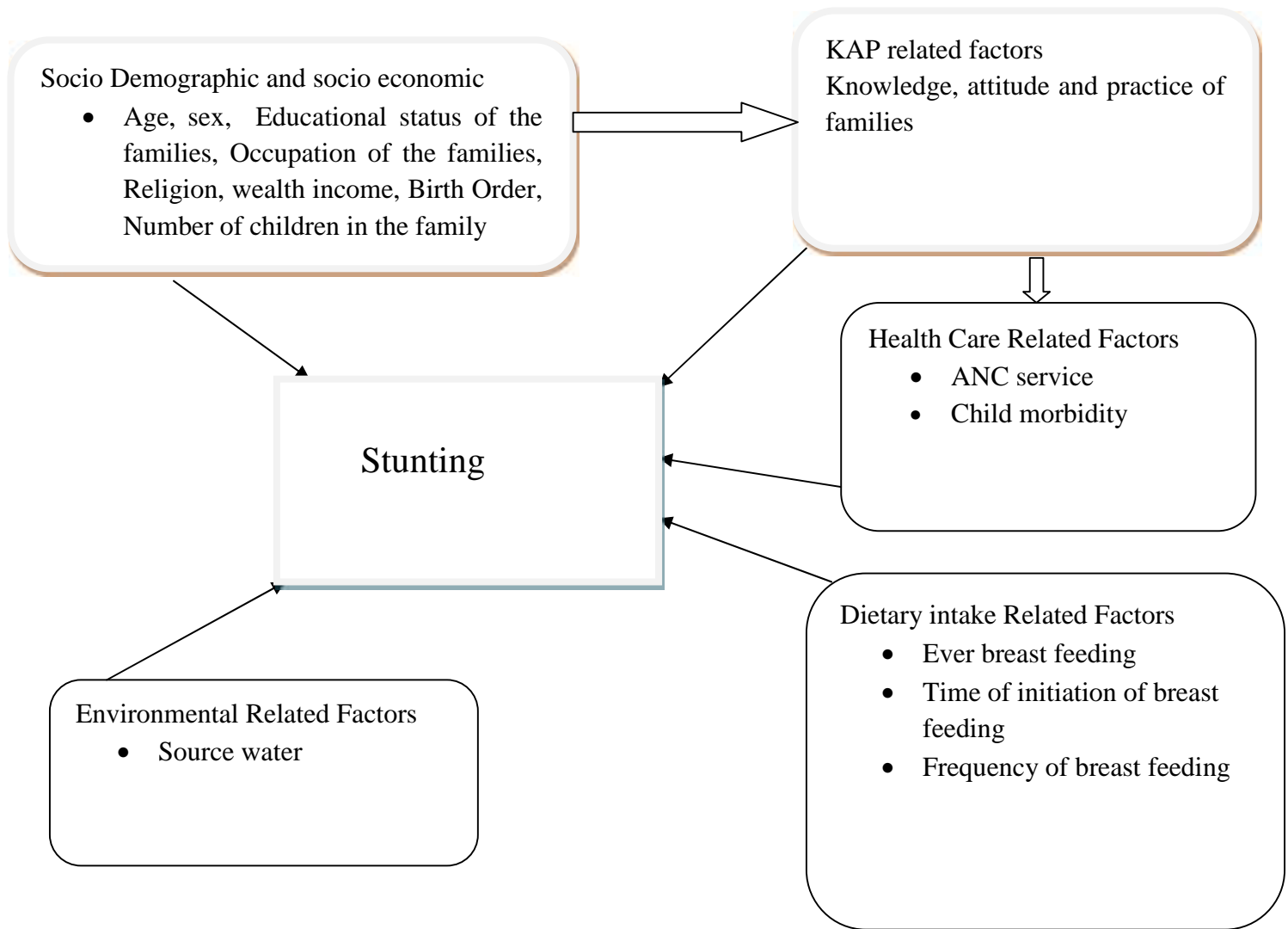
According to the study conducted in Egypt on nutritional knowledge, attitude an practice of parents and its impact on their children showed that, there was no significant correlation between nutritional knowledge of parents and nutritional practice of their children ( $P > 0.05$ ), where as there was a significant correlation between parents knowledge score and health food intake in general by children ( $P < 0.05$ ) (14)

### **Significance of the study**

This study was designed to determine the prevalence of stunting and associated factors among 6-59 months aged children in Dedo district which would give a hint about the possibility of a double burden of malnutrition in this age group especially in rural areas in Ethiopia. It will also provide information on the groups at higher risk and the risk factors contributing to stunting among 6-59 months aged children in the study area which would be an important input for effective interventions in Dedo district .As a result, this study will have great contribution on designing preventive action of early age stunting .It will help educational planners, health policy makers, parents or guardians and all other stakeholders to have a clear understanding on magnitude and associated factors of stunting. On the other hand, enhance health of the children and contributions to the development of the country at large. This study is also used as a base line for researchers to conduct further researches on related issue. Finally the result obtained from this study was a useful baseline against which future data can be compared. Furthermore it will use as an input for any interested body that needs to intervene in this area.



## Conceptual framework



**Figure 1:-A conceptual frame work adapted from different literatures to assess the magnitude of stunting and associated factors among 6-59 months children in Dedo District**

## **Chapter 3- Objectives**

### **3.1 General Objective**

To assess the prevalence of stunting and associated factors among 6-59 months aged children in Dedo District, Ethiopia 2016.

### **2.2. Specific Objectives**

- To determine prevalence of stunting among 6-59 months aged children in Dedo District, Ethiopia 2016.
- To identify factors associated with stunting among 6-59 months aged children in Dedo District, Ethiopia 2016.

## **Chapter 4- Methods and Materials**

### **4.1. Study area**

The study was conducted in Dedo District, which is one of the eighteenth Districts of the Jimma Administrative Zone of Oromia region. It is located 378 km to south west of Addis Ababa. The Woreda shares Seka woreda to North, Omonada woreda to East, South nation and nationality to south. Based on 2008 population projection the district has a total population of 366,430 (179,551M and 186,879 F) of which 348856 is rural and the rest urban and 15 % ( 54965) of the total population is children 6-59 months aged. 1208 children are in MAM and 687 children are in SAM. There are 105 primary schools and 5 high schools. The woreda has 13 Health centers, 56 Health posts, 8 private clinics, 2 drug vendors which provide service for all woreda populations and other residing woredas.

### **4.2 Study period**

This study were conducted in Dedo district from May 1-30/2016 G.C.

### **4.3. Study design**

Community based Cross-sectional study design were used.

### **4.4. Population**

#### **4.4.1. Source population**

All 6-59 months aged children who are living in Dedo district.

#### **4.4.2. Study population**

Children aged 6-59 months those representatively selected from the source population

### **4.5 Inclusion and Exclusion Criteria**

#### **4.5.1 Inclusion Criteria**

All children in the age range of 6-59 months who have been living in Dedo district for at least six months

#### **4.5.2 Exclusion Criteria**

Those critically ill, have physical deformities of limbs and spines were excluded because of difficulty in anthropometric measurement during the study period.

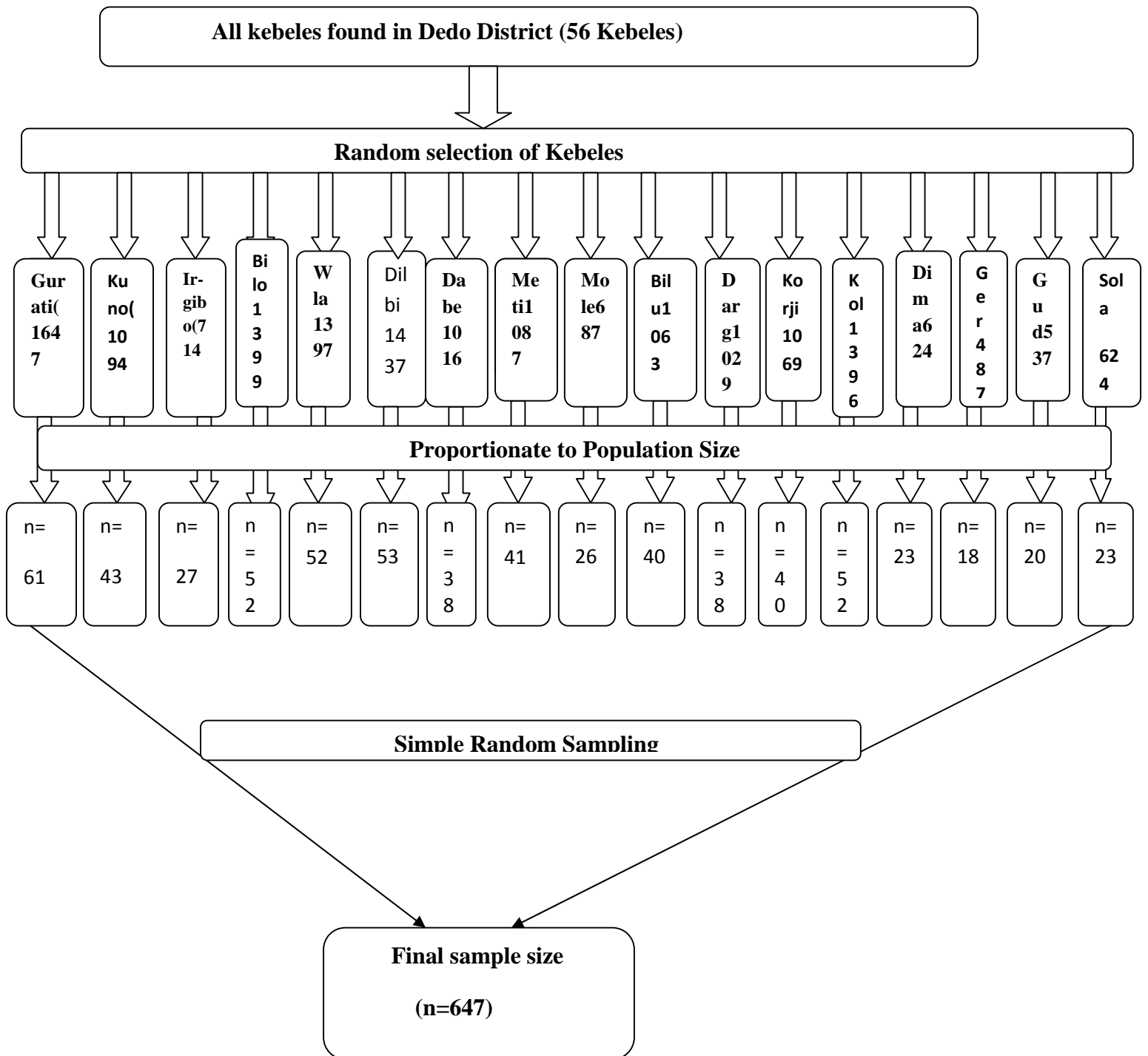
### **4.6 Sample size determination**

The minimum required sample size for this study was determined by using Epi-info Version 7.4.1 for single population proportion formula based on the following assumptions. Based on the previous study (24) the magnitude of stunting among 6 to 59 months aged children was found to give the larger sample size. Based on this assumption the magnitude of stunting was 26% and assuming 95% of

level of confidence, 80% of power and using 5% of margin of error, and design effect of two, the minimum sample required was 588. By considering none response rate of 10%, maximum sample size required was 647.

#### **4.7 Sampling technique and procedure**

From the total of fifty-six kebeles seventeen kebeles were selected by using simple random sampling which is 30% of the total kebeles. Then among the selected kebeles proportional to size allocation ratio were computed for selected kebeles to get the number of desired children from the selected house hold. Finally simple random sampling was performed. From each study center 17 kebeles census was done to get eligible's. For more than one eligible aged child in the household, the oldest child were selected and included in the study because of that stunting is common in oldest age.



**Figure 2 Schematic presentation of sampling procedure of study subjects.**

## **4.7. Variables**

### **4.7.1. Dependent variable**

- stunting

### **4.7.2 Independent Variables**

#### **Socio Demographic and socio economic**

- Age, sex, Educational status, Occupation, Religion, Wealth income, Family size

#### **Health Care Related Factors**

- ANC service, Vaccination status, child morbidity, place of delivery

#### **Dietary intake Related Factors**

- Ever breast feeding,
- Time for initiation of breast feeding,
- Colostrums feeding,
- Pre-lacteal feeding,
- Duration of breastfeeding,
- Age for introduction of complementary food
- Method of feeding

#### **Environmental Related Factors**

- Source water
- Toilet facility
- Waste disposal system

#### **Knowledge, Practice and attitude related factors**

- Knowledge
- Attitude
- Practice
- Source of information

## **4.8 Data collection tool and procedure**

Structured interview questionnaire that was adapted from different literatures (2, 15, 17 18, 19) were used to collect data from the respondents. The questionnaire were prepared in English language and translated to local language (Afan Oromo). Twenty eight Diploma Nurses collected the data and Seven degree holders in Health science supervised the data collectors. For height, length measurement for children below 24 months were taken in laying down or recumbent position and standing height was taken for children 24-59 months and the measurement were taken to the nearest 0.1 cm using UNICEF standard Height Measuring Board with the subjects shoeless (25, 26), and for age, the

child's age were collected from the mother/care giver and were confirmed by using birth certificate or vaccination cards and also a "local-events calendar" were used. The mothers/care takers from all kebeles who were eligible and randomly selected were interviewed using standard questionnaire.

#### **4.9. Data quality control**

Data quality were controlled by designing appropriate data collection materials, training of data collectors and supervisors for two days, and pretest were conducted in five percent of the total sample size, 32 children samples in out of the study area to examine the questionnaire for consistency. At the end of each days of data collection, the collected data were reviewed and checked for completeness, accuracy and consistency by the supervisors and investigator and corrective discussion were undertaken with all the research team members to minimize errors.

#### **4.10 Operational definition**

**1. Knowledge:** - Knowledge of family measured by the total number of correct answers to 11 items on knowledge questions, with a minimum score of 0 and maximum of 11. Those who were score above 80 were declared as having good knowledge, those who were score 60-80% were declared as having Moderate knowledge and those who were score less than 60% were declared as having poor knowledge (27).

**2. Good attitude for Dietary intake:** - This was measured by likert scale. Those who were score above/equal the mean for Dietary intake from attitude questions were declared as having good attitude.

**3. Poor attitude for dietary intake:** - This was measured by likert scale. Those who were score below the mean for Dietary intake from attitude questions were declared as having good attitude.

**4. Good practice about child feeding:-**When the respondent woman identified correctly at least eight correct or true statements out of ten statements prepared about child feeding practice

**5. Poor practice about child feeding:-**When the respondent woman identified correctly less than eight correct or true statements out of ten statements prepared about child feeding practice

**6. Stunting:** HFA<-2SD of the median of the standard curve (NCHS/WHO, 2007)

#### **4.11. Data processing and Analysis**

The data were entered, edited, coded by Epidata version 3.1.and was exported into SPSS version 20.0 for analysis. Descriptive statistics (frequencies, percentages, means and standard deviations) were computed to show the picture of the data. Statistical tests at 95% CI were made. Those variables with P-value less than 0.25 in bivariate analysis were selected by stepwise backward elimination method as candidate variables for multivariate analysis. Multivariate logistic Regression analysis was used for

the associated variables. The adjusted odds ratios together with their corresponding 95% confidence intervals were determined to measure the strength and level of significance of the association WHO ANTRO software was used to determine HAZ and PCA for wealth index. Multycollinarity was checked by checking multycollinrity statistics VIF <2 and tolerance>0.1 Hosmer and Lemeshow test were computed to assess goodness of fit of the model.

**Wealth index:** Those respondents who were in the first to fifth quintiles to wealth income questions and declared as the poorest to richest respectively, after composite variables were extracted by using Principal Component Analysis (PCA). Wealth index was computed as a composite indicator of living standard based on variables related to ownership of selected household assets, presence of livestock and materials used in the house. Variables that used to measure wealth index at house hold level were piped water source, flush toilet piped to sewer system, electricity, separated room for sleeping, separated room for cooking, refrigerator, mobile phone, fixed phone line, radio, electric mad, own home, cement roof type, vehicle and live stock. The computation was made using principal component analysis (PCA) and composite variables were extracted by summing up the principal components into three components. The adequacy of the model for PCA was checked by value of Kaiser-Meyer-Olkin measure of sample adequacy (KMOSA) and it became 0.78 and the sample was adequate. Eigen values were used to decide number of PCs to be retained. Only PCs with Eigen values greater than 1.0 were retained. Three components were explained wealth index with the overall cumulative variance percentage of 69.4%. Detection of outliers & inter-item consistency was performed. To check inter-item consistency, Chronbach alpha for all factor lodgings of each component were computed and it became 0.82. Then, Quintiles of wealth index were generated using the composite score.

**First quintile (Poorest):** respondents in 0-20% of wealth index percentile

**Second quintile (Poor):** respondents in 21-40% of wealth index percentile

**Third quintile (Medium):** respondents in 41-60% of wealth index percentile

**Fourth quintile (Rich):** respondents in 61-80% of wealth index percentile

**Fifth quintile (Richest):** respondents in 81-100% of wealth index percentile

#### **4.12 Ethical consideration**

Ethical were obtained from Ethical Review Board (IRB) of Institute of Health Science of Jimma University. Letter of cooperation and support from the university together with the ethical approval letter were presented to the Oromia Regional Health bureau and Dedo woreda health office. Successively, letter of support were written to the local kebeles to get permission before the start of the data collection. Moreover, all the study participants and their families were informed verbally about the purpose and benefit of the study along with their right to refuse and consent were obtained. Confidentiality of



study participants were assured by using questionnaire identification number and privacy by removing names and other identifiers during the interview.

#### **4.13. Plan for dissemination of findings**

Mock, final defense was presented and submitted to Epidemiology Department of Jimma University. The final result of this study will also submitted to Oromia Regional Health Bureau, Dedo woreda Health office, presented on woreda health office performance review meeting and maximum efforts will be done to publish on scientific journal.

## Chapter -5 Result

A total of 647 children (204 males and 443 females) age 6-59 months living in Dedo district were enrolled in the study, giving a response rate of 100%. According to this particular study the prevalence of stunting (HFA <-2ZScore) in children of age 6-59 months living in Dedo district was 29.98%.

### 5.1 Socio demographic Characteristics

The mean age children enrolled in the study was 30.3+/- 10.2SD months; with a minimum age of 6 months and maximum age of 59 months.

Majority of respondents were Oromo (85.6%), followed by Woleyita (10%) in Ethnicity. Majority of the respondents were Muslim 582(90%) followed by Orthodox 45(7%) in religion. Regarding to the Wealth index of the respondents majority of respondents were the moderate to richest (third to fifth quintile).

Table 1: Socio demographic characteristics of the respondents in Dedo district; 2016

Socio demographic Characteristics			
		Frequency	Percent
Age of children in months	6-11	49	7.6
	12-23	305	47.1
	24-35	151	23.3
	36-47	78	12.1
	48-59	64	9.9
Sex of child	Male	204	31.5
	Female	443	68.5
Height of child in cm	40-70	391	60.3
	71-110	256	39.7
Birth order of the child	<=2	227	35.08
	>2	420	64.92
Under five children in HHs	<3	309	47.7
	>=3	338	52.2

	Oromo	554	85.6
	Woleyita	65	10.0
	Yem	16	2.5
	Others*	12	1.9
Religion of the Respondents	Muslim	582	90.0
	Orthodox	45	7.0
	Protestant	13	2.0
	Others**	7	1.0
Women's Educational status	Informal (can't read& write)	298	46.0
	Informal (read and write)	248	35.5
	Primary (1-8grade)	46	10.0
	Secondary (9-11 grade)	32	5.0
	Tertiary (>/=12 <sup>th</sup> grade)	23	3.5
Husband's Educational Status	Informal (can't read& write)	262	40.5
	Informal (read and write)	204	31.5
	Primary (1-8grade)	83	12.8
	Secondary (9-11 grade)	65	10.0
	Tertiary (>/=12 <sup>th</sup> grade)	33	5.2
Women's Occupation	House wife	569	88.0
	Government employee	13	2.0
	Student	3	0.5
	Merchant	41	6.35
	Daily laborer	12	3.0
	Others***	9	0.15
Husband's Occupation	Government employee	13	2.0
	Farmer	569	88.0
	Merchant	32	5.0
	Daily laborer	27	4.0
	Others***	6	1.0
Wealth index	First quintile	129	19.9
	Second quintile	127	19.6
	Third quintile	130	20.1
	Fourth quintile	130	20.1

	Fifth quintile	131	20.2
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Key ----- \* is Amhara, Tigre and Yem; \*\*-----is Wakefata; Pagan \*\*\*----- is Driver, private clinic owners and mechani

## 5.2 Environmental related factors of respondents

Regarding to environmental related factors that stunting affects; 451 HHs (69.7%) have access to drinking water from public tab and 182 HHs (28.2%) have access to drinking water from unprotected spring water.

Environmental related factors		Frequency	Percent
Main source of drinking water	Public tab	451	69.7
	Protected well	182	28.2
	Unprotected well	9	1.5
	Others*	5	0.6
Have functional toilet facility	Yes	517	80.0
	No	130	20.0
Solid waste management system exists	Yes	259	40.0
	No	388	60.0
Liquid waste management	Yes	210	32.5

system exists	No	437	67.5
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Table 2 Environmental related factors of respondents in Dedo district; 2016

Key.....\* indicates sources of drinking water such as bottled water and piped in to yard

### 5.3 Health care related factors of the respondent

Regarding to the health care related factors 338 women have no ANC visit where as the rest 124 women have ANC less than two times and 140 women 3-4 times ANC visit and 45 women had greater than 4 times ANC visit.

**Table .3 Health care related factors of the respondent in Dedo district; 2016**

Health care related factors		Frequency	Percent
Number of ANC attended	Do not have ANC visits	338	52.24
	<=2	124	19.1
	3-4	140	21.6
	>=4	45	6.95
Child fully immunized	Yes	362	55.95
	No	285	44.04
Child ever ill	Yes	410	63.4

	No	237	36.6
Types of illness experienced before	Diarrhoea	120	18.54
	Pneumonia	89	13.7
	ARI	159	24.57
	Measles	42	6.49
	Do not experienced illness before	237	36.6

#### 5.4 Dietary intake related factors of respondents

Regarding dietary intake of the respondents 584 children had ever breast feed and 63 children had no breast feed. From those had breast feed 348 children had breast feed for more than two years and 236 children breast feed for less than two years.

**Table 4 Dietary intake related factors of respondent in dedo district; 2016**

Dietary related factors		Frequency	Percent
Ever breast fed her Child	Yes	584	90.26
	No	63	9.73
Duration of breast milk	2years	348	59.6
	<2 years	236	40.4
Frequency of breast feeding	< 8 times per 24hr	419	71.7
	8 times per 24hr	165	28.3
Only breast milk feed up to 6 months	Yes	223	38.2
	No	361	61.8
Time of start of breast feeding after delivery	<= 1 hrs	127	20
	Within 24hrs	247	68.5
	>24hrs	210	11.5
Child received Colostrums	Yes	498	85.2
	No	86	14.7
Child received additional feeding within six months of delivery	Yes	398	68.15
	No	186	31.85
Child received complementary feeding at six months	Yes	263	45.0
	No	321	55.0

Child practiced bottle feeding	Yes	453	70.01
	No	194	29.99
Reason for bottle feeding	Mother considered as additional feeding	444	98.0
	Mother died	3	0.66
	Mastectomy	2	0.44
	Other reason	4	0.9

### 5.5. Knowledge, Attitude and practice of the respondents

The Knowledge status of family on dietary related was measured by the total number of correct answers to eleven items on knowledge, with a minimum score of zero and maximum of eleven. Based on this assessment 30 (4.6 %) respondents had good knowledge, 205 (31.7%) respondents of them had moderate knowledge whereas 412(64%) respondents had poor knowledge for respective knowledge questions.

The attitudes of the respondents were assessed by twelve attitude respective questions with likert scale measurements for positive questions from 1 strongly disagree to 5 strongly agree. Those respondents who scored greater than the mean score were had positive attitude. The mean attitude score of the respondents were 27.96+/-6.01SD and 305(47.14%) of the respondents had positive attitude towards dietary intake; whereas the rest had negative attitude.

The practice of respondents towards their child feeding included in this particular study were assessed by ten practice related questions. Based on this assessment 306 (47.3%) of respondents had been good practiced towards their child feeding; whereas the rest 341 (52.7%) of respondents poorly practice their child feeding and caring. Regarding the source of information toward healthy eating 248 (38.3%) respondents heard about healthy eating from radio 312 (48.2%) respondents from HEW and 87 (13.4%) heard from HAD.

### 5.6 Factors associated with Stunting

Factors that determine for stunting such as Age of child, sex of child, wealth index, knowledge and Initiation of Breast feeding after delivery as indicated in the table below were tested at P-value less



than 0.25 for their association as candidate variables for multivariate analysis by using step wise elimination methods by binary logistic regression analysis.

Table5: Candidate variables for multivariate analysis used to assess factors associated with stunting in Dedo District; 2016

Sr. No	Variables		Stunting		P-value	COR (95% CI)
			Yes	No		
01	Age of child in months	6-11	1(0.15%)	48(7%)		1
		12-23	47(7.2%)	258(40%)	0.03	0.11(0.15,0.84)
		24-35	31(4.8%)	120(19%)	0.015	0.08 ( 0.01, 0.6)
		36-47	58(8.9%)	20(3%)	<0.001	0.007 (0.001, 0.05)
		48-59	54(8.3%)	10(1.5%)	<0.001	0.004 (0.001,0.031)
02	Sex of the child	Male	123(19%)	80(12.4%)		1
		Female	68(10.5%)	376(58%)	0.001	8.5 ( 5.9, 12.75)
03	Wealth index	First	19(2.9%)	110(17%)	0.001	4.06 (2.23, 7.38)
		Second	42(6.5%)	85(13%)	0.17	1.42 (0.85, 2.35)
		Third	42(6.5%)	88(13.6%)	0.13	1.47 (0.88, 2.43)
		Fourth	34(5.2%)	96(14.8%)	0.10	1.98 (1.17, 3.34)
		Fifth	54(8.3%)	77(11.9%)		1
04	Level of knowledge	Good	17(2.6%)	13(%)		1
		Medium	58(8.9%)	147(22.7%)	0.003	3.31 (1.51, 7.25)
		Poor	116(17.9%)	296(45.7%)	0.002	3.33 (1.57, 7.08)
05	Mothers occupation	House-wife	126(19.5%)	295(45.6%)		1
		Government employee	39(6%)	70(10.8%)	.240	.767 (0.4, 1.1)
		Daily labor	15(2%)	47(7%)	.355	1.338 (0.7, 2.4)
		Merchant	4(0.6%)	20(3%)	.174	2.13 (0.7, 6.3)

		Others	7(1%)	24(3.7%)	.389	1.46 (0.6, 3.4)
06	Initiation of Breast feeding after delivery	Within one hour of delivery	41(6.3%)	86(13%)		1
		Within 24hrs of delivery	50(7.7%)	197(30%)	0.008	1.82 (1.16, 2.84)
		After 24hrs of delivery	70(10.8%)	140(21.6%)	0.97	0.99 (0.6, 1.5)

### **Factors independently associated with stunting**

After adjusting for potential confounders such as age of children, wealth index of families and others indicated below were tested for their independent association for stunting corresponding to their adjusted odds ratio and P-value less than 0.05 in multivariate analysis. Based on these, those children whose their age between 24 to 35 months were 1.3 time more likely stunted than those children with age between 6-11 months [AOR= 1.3, (95%CI: 1.01, 3.45)]. Being Initiation of Breast feeding after delivery within 24 hours were 2.60 more likely stunted than those child who initiate their breast fed within one hour of their delivery [AOR= 2.6, (95%CI: 1.32, 5.13)].

**Table 6: Independent factors associated with stunting in Dedo District; 2016**

Sr. No	Variables	Stunting		P-value	AOR (95% CI)	
		Yes	No			
01	Age of child in months	6-11	1(0.15%)	48(7%)		1
		12-23	47(7.2%)	258(40%)	0.17	0.23 (0.26, 1.95)
		24-35	31(4.8%)	120(19%)	< 0.001	1.3 (1.01, 3.45)
		36-47	58(8.9%)	20(3%)	0.27	0.30 (.034, 2.65)

		48-59	54(8.3%)	10(1.5%)	<0.001	0.002 (0.001, 0.016)
02	Wealth index	First	19(2.9%)	110(17%)	0.001	6.07 (2.16, 17.047)
		Second	42(6.5%)	85(13%)	.008	2.97 (1.324, 6.68)
		Third	42(6.5%)	88(13.6%)	.035	2.37 (1.06, 5.33)
		Fourth	34(5.2%)	96(14.8%)	.094	2.00 (0.88, 4.51)
		Fifth	54(8.3%)	77(11.9%)		1
03	Mothers occupation	Housewife	126(19.5%)	295(45.6%)		1
		Govern-ment em-ployee	39(6%)	70(10.8%)	0.29	0.58 (.217, 1.59)
		Daily labor	15(2%)	47(7%)	0.86	0.92(0.37, 2.27)
		Merchant	4(0.6%)	20(3%)	0.03	3.94 (1.09, 14.2)
		Others	7(1%)	24(3.7%)	0.08	2.53 (0.88, 7.26)
04	Initiation of Breast feeding after delivery	Within one hour of de-livery	41(6.3%)	86(13%)		1
		Within 24hrs of delivery	50(7.7%)	197(30%)	0.006	2.60(1.32, 5.13)
		After 24hrs of delivery	70(10.8%)	140(21.6%)	0.65	1.17 (0.584, 2.36)

## Chapter -6 Discussion

This study tried to assess the prevalence of stunting and associated factors among 6-59 months children. Based on the findings, the prevalence of stunting in this study was 29.98% .The prevalence of stunting in this study is less than the study conducted in Hidabu Abote district (46.7%) Haramaya (42.2%), Bule hora district (47.6%) and the national prevalence in EDHS2011, 40% (2) and this discrepancy might be due to difference in method used and sample size variation and evergreens of the study area. The prevalence of stunting in this study is greater than study conducted in KembaWoreda, Southern Ethiopia 18.7% 95% CI (15.6–22.1), Gimbi district (2.4%) this might be due to the farm land in the study area had been more eroded and cultivated for many years.

.This study was in line with study conducted in Brazil 29.9% (29) The magnitude of stunting in this study also was higher than study conducted in Peru 26.6% (42), , Sirilanka 11.8% (27),South Africa 20.2% (30) and Egypt 13.8% (31) this might be due to socio-economic, topographic, developmental and cultural difference.

However, the prevalence of stunting in the study was lower than study conducted in, Nepal 37% (17), India 51.6% (20), Lao PDR 40%(21), Cambodia 38.6(22) also the study conducted in Democratic Republic of Congo 43.9% (13) ,Uganda 41.6% (40), Tanzania 44% (28),Kenya 40% (37), Sudan Khartoum 51% (26) and Ethiopia 42% (19). This difference might be due to population migration from rural to urban in order to get better job and living condition, decreased purchasing power of the community, increment of food prices, inappropriate infant and young child feeding practices and child health care in the above countries.

Child's age was one of the factors significantly associated with stunting in the study area.

Based on these, those children whose their age between 24 to 35 months were 1.3 time more likely stunted than those children with age between 6-11 months [AOR= 1.3, (95%CI: 1.01,3.45)]. Being Initiation of Breast feeding after delivery within 24 hours were 2.60 more likely stunted than those child who initiate their breast fed within one hour of their delivery [AOR= 2.6, (95%CI: 1.32, 5.13)]. But, there is a tendency for the odds ratio to decrease as age increase, example, the odds ratio of being stunted for children 47-59 months were 0.002. The reason might be children gradually adopt supplementary foods after four years the finding was in agreement with the study in Ethiopia (27) and Egypt (17). This might be due to stunting in children age 24 months and above were resulted from poor nutritional status of mother's at pregnancy, inappropriate infant and young child feeding practices and other related factors which were needed to be under gone beginning from conception, through mother's pregnancy and up until the age of two which was the most critical period in a child's development after child reaches above 24 months of age stunting was irreversible. Finding from Nairobi also shows, the prevalence of stunting among children age 6-59 months was about 47%, and the prevalence increased with age through 36-47 months (58%) (39) This is contradicted with study done in In Democratic Republic of Congo which shows, an inverse linear association with age of the child and stunting (38). Household's wealth status were one of the factors significantly associated with stunting in the study area. Children living in poor wealth status households were 6.07 more likely to be stunted than those living in richest wealth status households [AOR= 6.07, (95%CI: 2.16, 17.047)]. This is in line with similar studies in Ethiopia (10, 33, 34, 35, and 36).Sub- Saharan Africa, Ghana and in Asia. This might be due to in adequate diet which might be caused by household food insecurity. Households with poorest wealth index status might not be able to afford for the possible requirement to the child than households with richest wealth index. In addition to this it might be because of

short raining season and short production season for low wealth index in the community. The lower wealth status from the family might increase the chance of children in the family sick and eventually become stunted. Initiations of breast feeding after delivery were also independent factor for stunting. This finding was similar to other study done in Ethiopia, EDHS 2011 shows higher proportion of children in the lowest household wealth quintile were stunted (49%) than children in the highest wealth quintile (30%) (10). A study done to southern region of Ethiopia also identified low socio-economic status of household as risk factors for child under nutrition (19). This might be due to difference in methods used in this studies and difference in socio-economic, topographic and farming mechanisms. Also from multivariable analysis Mothers occupation is one of the independent factors that affect stunting. Accordingly, Children whose mothers worked as merchant were 3.94 times more likely to develop stunting than children whose mothers worked as house wives [AOR= 3.94, (95%CI: 1.09, 14.2)]. This might be due to decreased contact time to the child that brings short period of exclusive breast feeding, early cessation of breast feeding, increase exposure to bottle feeding and improper complementary food, which may have a large negative effect on the growth children. This finding is comparable with the study conducted in Meskan district Gurage Zone, South Ethiopia(34) Being Initiation of Breast feeding after delivery within 24 hours were 2.60 more likely stunted than those child who initiate their breast fed within one hour of their delivery [AOR= 2.6, (95%CI: 1.32, 5.13)]. This might be due to those children initiated breast feeding within 24 hours may lose chance to get the first milk which is very important for the growth of children.

## **Chapter7 Strength and Limitation of the Study**

### **7.1. Strength of the study**

This study was community based showing real nutritional condition of children 6–59 months of age. Thus it has strong generalization power because other studies were conducted with relatively small sample size and were institutional based.

#### **7.1.2 Limitation of the study**

Recall bias may be introduced even if it was minimized by probing mothers to report by associating with different life events may not remember events occurred in the past, and possibility of interviewer bias and misreporting of events were the potential limitation. Another limitation of the study was failing in assessing dietary diversity, household food security and maternal nutritional status

## **Chapter-8 Conclusion and Recommendation**

### **8.1 Conclusion**

Prevalence of malnutrition was high and it was the top list among the health problems in Dedo district among children aged 6-59months and the prevalence stunting in this study area were lower than the regional and national figures found from EDHS, 2011 national reports.

According to investigation of independent variables with dependent variables in multivariate analysis, child age, maternal occupation, wealth index and initiation of breast feeding after delivery were significance association with stunting.

### **8.2 Recommendations**

- ❖ Dedo district health office

- ✓ Special attention should be given to nutritional intervention program like the therapeutic feeding centers and community nutrition Community based nutrition program should be established to tackle the problem of malnutrition at community level depending on the severity of malnutrition identified in this study.
- ✓ Nutrition education by health extension works should be strengthening to improving the feeding practice of parents on appropriate children feeding at all ages of children.
- ✓ Continued attention by midwives and other health professional who delivers should mandatory to support and educate the mothers early initiation of breast feeding after delivery within an hour following delivery.
- ❖ Woreda administration
  - ✓ Should strengthen and established income generation active and saving at HHs like credit and saving process in collaboration with stakeholders to improve family income.
    - ❖ Researchers
      - ✓ Further comprehensive study with advanced analysis of methodology is needed by including community and health facility characteristics to see other an explored associated factors that were not included in the present study.

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## **Annex1. Questionnaire**

**Jima University**

**College of Health Science**

Questionnaire to assess the magnitude and associated factors of stunting among six to fifty nine months aged children in Dedo District.

**Dear sir/madam:**

My name is \_\_\_\_\_, I am here on the behalf of Gemechis Ayana who is Epidemiology specialty student in Jimma University. Now I am here for conducting on the magnitude and factors associated with stunting of stunting among six to fifty nine months aged children in Dedo District. The information you give is useful for you, for the surrounding community and especially for under five children in reducing child death related problems due to stunting as a result of malnutrition by identifying

associated factors .So I would like your honest participation to give me information related to my questions. I am sure that this interview is private and confidential. You are free not to answer any questions you do not want to. Your name will not be used. This will take about 30 minutes. Your ideas are important to me. Are you willing to participate?

A. Agreed \_\_\_\_\_ (tick and proceed to fill the questionnaire)

B. Not agreed \_\_\_\_\_ (tick and go to the next respondent)

Questionnaire Identification number \_\_\_\_\_.

House number \_\_\_\_\_

Result: 1-Completed 2. Partially completed 3. Others specify \_\_\_\_\_.

Date Collectors Name \_\_\_\_\_ Sig \_\_\_\_\_ Date \_\_\_\_\_

Supervisor Name \_\_\_\_\_ Sig \_\_\_\_\_ Date \_\_\_\_\_

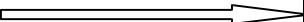
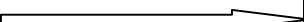
#### **Instruction for data collectors**

1. Collect data from children six to fifty nine months children in the household who are avail during the study
2. Check the completeness of the questionnaire before ending the interview with the respondent

<b>PART ONE- SOCIO-DEMOGRAPHIC FACTORS</b>			
Sr. No	Questions	Response	Skip
101	What is the sex of your child	1. Male 2. Female	
102	What is the age of your child	_____years	
103	What is the weight of the child	_____Kg	
104	What is the Height of the child	_____cm	
105	What is the birth order of the selected child	1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> , 4 <sup>th</sup> ,_____	
106	What is your child's religion	1. Muslim 2. Orthodox 3. Protestant 4. Catholic	

		5. Others specify_____	
107	What is your child's Ethnicity	1.Oromo 2.walayita 3.kafa 4.Others specify_____	
108	What is your educational status (mothers)	1. Informal (can't read and write) 2. Informal (can read and write) 3. Formal (write last class or level attended_____)	
109	What is your educational status (Father)	1. Informal (can't read and write) 2. Informal (can read and write) 3. Formal (write last class or level attended_____)	
110	How many number of children in the HHs	_____	
111	What is your Occupation (Mother)	1. House wife 2. Gov,t employee 3. Daily laborer 4. Merchant 5. Others specify_____	
112	What is your Occupation ( Father of the child)	1.Head of the house 2.Gov,t employee 3.Daily laborer 4.Merchant 5. Others, specify_____	
<b>➡ SOCIO ECONOMIC STATUS (WEALTH INCOME)</b>			

112	Wealth income	<p>1. What is your water source?</p> <p>1.Piped into dwelling A Yes B .No</p> <p>2. .Public tap/standpipe A.Yes B .No</p> <p>3 Protected spring A Yes B .No</p> <p>2 How many rooms do you used for sleeping?</p> <p>1. Greater than or equal to one room A Yes B .No</p> <p>2. No separated sleeping room A Yes B .No</p> <p>.3.Floor Type</p> <p>1. Earth/sand A Yes B .No</p> <p>2 Ceramic A Yes B .No</p> <p>3. Cement A Yes B .No</p> <p>4. Roof type of the house</p>	Q7
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		<p>1 corrugated</p> <p>A Yes</p> <p>B .No</p> <p>2 sari</p> <p>A Yes</p> <p>B .No</p> <p>5. Have you a radio?</p> <p>A Yes</p> <p>B .No</p> <p>6. Have you a TV?</p> <p>A. Yes</p> <p>B. No</p> <p>7. Have you Livestock</p> <p>A. yes</p> <p>B. no </p> <p>If yes</p> <p>A. _____cows</p> <p>B. _____oxen</p> <p>C. _____mule/donkey/horse\</p> <p>D. _____ Goat/sheep</p> <p>8. Have you Mobile Phone?</p> <p>A. Yes B No</p> <p>9. Have you Refrigerator</p> <p>A. Yes B. NO</p> <p>10 .Have you farmland owned by family</p> <p>A. Yes B. No</p> <p>11. Have you Vehicles?</p> <p>A .yes B. No</p> <p>B. no </p> <p>If yes</p> <p>A. _____cars</p> <p>B. _____tax</p> <p>C. _____ motorcycle</p>	<p>Q12</p>
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		<p>D. _____ bicycle</p> <p>12.Larine type 1. pit latrine A Yes B .No</p> <p>2.VIP A Yes B .No</p> <p>12.Home ownership 1.yes 2.no</p> <p>13 .Wall type 1.mud A Yes B .No</p> <p>2.cemented A Yes B .No</p> <p>14.Energy for cooking 1.wooden A Yes B .No</p> <p>2.electricity A Yes B .No</p> <p>15.Availabilioty of Electricity 1.yes 2.NO</p> <p>16.Fixedline Phone 1.yes 2.No</p>	
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**PART TWO: ENVIROMENTAL RELATED FATORS**

201	What is the main source of drinking water for members of your HH	<ol style="list-style-type: none"> <li>1. Piped into dwelling</li> <li>2. Piped to plot/yard</li> <li>3. Public tap</li> <li>4. Bottled water know</li> <li>5. Protected well</li> <li>6. Unprotected well</li> <li>7. Others specify_____.</li> </ol>	
202	Do you have functional toilet facility in your house (observe)	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	
203	Is there solid waste disposal system practice	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	
204	Is there liquid waste disposal system practice	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	
<b>PART-THREE- HEALTH CARE RELATED FACTORS</b>			
301	How many times had you been attended ANC during pregnancy (for the selected child)	<ol style="list-style-type: none"> <li>1. One times</li> <li>2. Two to three time</li> <li>3. Greater than or equals to four</li> <li>4. Do not have ANC visits</li> <li>5. Don't know</li> </ol>	
302	Did your child fully immunized (observe the card if)	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	
303	Did your child ever ill?	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	
304	If yes for Q303, list them	_____.	
305	Place of last child delivery	<ol style="list-style-type: none"> <li>1. at home</li> <li>2. health facility</li> <li>3. others</li> </ol>	
<b>PART FOUR: DIETARY INTAKE RELATED FACTORS</b>			
401	Have you ever breast fed your child?	<ol style="list-style-type: none"> <li>1 Yes</li> <li>2 No</li> </ol>	If No to Q405
402	For how long you breast feed your child?	<ol style="list-style-type: none"> <li>1. Less than or equal to two years</li> <li>2. Greater than 2years</li> </ol>	
403	Did you breast feed your child only breast	<ol style="list-style-type: none"> <li>1. Yes</li> </ol>	

	milk up to 6month	2.No	
404	When did you start breast feeding after delivery?	1.Less than or equal to 1hr 2..Within the first 24 hrs 3.Greater than 24hrs	
405	Did your child receive the first milk (colostrums)?	1. Yes 2. No	
406	Did your child receive any foods or drinks other than breast milk during the first six months?	1. Yes 2. No	
407	Did your child start complementary feeding at the age of six months?	1. Yes 2. No	
408	Did your child receive any foods or drinks other than breast milk during the first six months?	3. Yes 4. No	
409	Did your child practiced bottle feeding?	1. Yes 2. No	
410	If yes for Q407, What was the reason behind	1. Mothers died 2. Mothers considered as additional feeding 3. Mother sero positive 4. Mastectotomy 5. Others specify_____	
411	How many times you fed your child per day? (frequency)	_____	
<b>PART FIVE: KNOWLEDGE, ATTITUDE AND PRACTICE OF FAMILIES</b>			
<b>KNOWLEDGE</b>			
501	What is/are the signs indicating your child is healthy? (multiple answer is possible)	1. Has appropriate HFA. 2. Gain weight every month 3. Active and do sports 4. Had good appetite 5. Rarely ill	
502	What does nutritious food mean? (Multiple answer)	1. Contain vitamins 2. Healthy and clean foods 3. Fruit and vegetables	
503	List diets necessary for growth and dev,t?	1. Protein	

		<ol style="list-style-type: none"> <li>2. Fat foods</li> <li>3. Vegetables</li> <li>4. Others(specify)_____</li> </ol>	
504	Why is it good to breastfeed your baby?	<ol style="list-style-type: none"> <li>1. gives baby protection from disease</li> <li>2. creates bond between child and mother</li> <li>3. makes the child strong and intelligent</li> <li>4. It is the right food for the child</li> <li>5. Other</li> </ol>	
505	Why do you think some women do not have enough breast milk to feed their baby	<ol style="list-style-type: none"> <li>1. Mothers are malnourished</li> <li>2. Mothers eat the same food every day</li> <li>3. stress/problem</li> <li>4. Too much work /no enough rest</li> <li>5. women is sick</li> <li>6. others</li> </ol>	
506	How do you prevent water-borne disease?	<ol style="list-style-type: none"> <li>1. Drink boiled water</li> <li>2. Wash hands with soap</li> <li>3. cover and protect drinking water</li> <li>4. wash fruits and vegetables with boiled water</li> <li>5. protect living space (including food and water from insects)</li> <li>6 .Don't know</li> </ol>	
507	In what moments do you wash your hands with soap?	<ol style="list-style-type: none"> <li>1 before cooking</li> <li>2 before eating</li> <li>3 before feeding the children</li> <li>4 after going to the toilet</li> <li>5 other (specify)</li> </ol>	
508	When your child was sick, was he or she offered less, more or the same amount to drink?	<ol style="list-style-type: none"> <li>1 less to drink</li> <li>2 same to drink</li> <li>3 more to drink</li> </ol>	
509	When your child was sick, was he or she offered less, more or the same amount to eat?	<ol style="list-style-type: none"> <li>1 less to eat</li> <li>2 same to eat</li> <li>3 more to eat</li> </ol>	
510	How do you feel about immunizations for your child?	<ol style="list-style-type: none"> <li>1 good for my child</li> <li>2. Protect my child from disease</li> <li>3. May make my child sick</li> <li>4. Other (specify)</li> </ol>	
511	What is the advantage of preparing food from different crops	<ol style="list-style-type: none"> <li>1. good for growth of my child</li> <li>2. contains all important nutrients</li> </ol>	

		3.prevent different disease 4.other	
<b>ATTITUDE QUESTIONS (Rate 1 as Strongly disagree to 5 as strongly agree)</b>			
512	I believe that fast food like fried chicken is good to eat every day	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
513	I usually consider nutrition when I choose foods_____.	Level of agreement (1-5)	
514	I believe that it is important for my good health to enjoy eating variety of food_____	Level of agreement (1-5)	
515	I believe that I m willing to cut down on foods that are not good for my child_____.	Level of agreement (1-5)	
516	I believe that I make conscious effort to try drinking milk for my child	Level of agreement (1-5)	
517	I believe that It is important for my child's good health to eat more than three meals a day without skipping	Level of agreement (1-5)	
518	I believe that I like home made foods better than restaurants for my child_____	Level of agreement (1-5)	
519	I believe that Eating healthy is just another fashion_____.	Level of agreement (1-5)	
520	I believe that I don't need to make changes to my child's diet as it is healthy enough	Level of agreement (1-5)	
521	I believe that It is important to feed my child an adequate amount of rice or alternative carbohydrate food as staple food__	Level of agreement (1-5)	
522	I believe that I should feed more child when I'm bored, frustrated, and unhappy or angry_____.	Level of agreement (1-5)	
523	From where do you get information towards healthy eating	1. Media 2. HDA 3. HEW	

		4. HF 5. Religious leaders 6. Others specify_____	
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**PRACTICE QUESTIONS**

524	Did you give the child pre-lactation food/fluid	1. Yes 2. No	
525	If yes to Q 524 what did you give him/her?	1. Water 2. Butter 3. Milk 4. Other (specify) _____	
526	Did you squeeze out and throw the first milk (colostrums)	1. Yes 2. No	
527	Did you squeeze out and throw the first milk (colostrums)	1. Yes 2. No	
528	Which food you give frequently for your child? (More than one answer is possible?)	1. Cow's milk 2. Butter 3. Sugar solution. 4. Formula milk 5. Atmite/ bula 6. Porage 7. Other (specify)_____	
529	. Do you prepare the food for your child from different crops?	1. Yes 2. No	
530	What do you use to feed child?	1. Bottle 2. Cup 3. Spoon 4. Other (specify)_____	
531	. Who is usually taking care of the child feeding?	1. Mother 2. Father 3. Sister 4. Grandmother 5. House maid 6. Other (specify)_____	
532	How frequent you wash the dishes?	1. Twice daily 2. Once daily 3. Every other day. 4. Immediately after use 5. Other (specify)	

533	Do you wash your hands whenever you feed your child?	1. Yes 2. No	
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## Annex 2; Oromic version Questionnaires

### UNIVARSIITII JIMMAATTI KOLLEEJJII SAAYINSII FAYYAA DAMEE EPIDIMOLO-OJII

#### QORANAA SADARKAA GABAABINA IJOOLLE

#### GODINA JIMMAA AANAA DEEDOO

Waraqaa Gaafii

Waraqaan gafii kun kan qopha'e ragaa sadarkaa sirna gabaabina ijoole fi dhimoota murtessoo isaa ta' aan

sadarkaa mana manatti funaanuuf, aanaa Dedoo, Naannoo Oromiyaa

#### Waligaltee

Nagaa

Seensa;

Maqaan koo \_\_\_\_\_ jedhama. Ani kan hojjachaa jiru ragaa qoranaa Univarsitii Jimmaatti,

Kolleejjii saayinsii fayyaa damee epidimoolojii walin ta'uun mata duree "Sadarkaa sirna gabaabina ijoole fi dhimoota murteessoo isaa ta'an" irratti gageefamuuf oolu funanuu dha.

Maqaan keessan guca kana irrattii hin-bareefamu, akkasummas ragaa naa keenitan walin qabsifamees itti hin-fayyadamamu. Gaaffiin isin deebisuu hin-barbanne yoo jiratee dhisuun mirga keessan ta'e yeroo barbaadanis gaaffii fi deebii gaggeesinu dhaabu ni-dandeessu.

Haa ta'u malee, gaaffilee hundaaf deebiin sirrii ta'e kayyoo qorannaa kanaaf bay'ee barbaachiisaadha. Hirmaachuudhaaf fedhii qabduu?

Gaaffii fi deebii kana xumuruuf sa'aa \_\_\_\_\_ ta'u nutti ni-fudhata.

Mallattoo gafataa, Namni gaafatamu kun waligatee issa jechaan ibsu isaa mirkaneessuuf

001. Lakkoofsa waraqaa gafii / \_\_\_\_\_ / \_\_\_\_\_ /

002. Maqaa nama gaafatuu \_\_\_\_\_

003. Guyyaa gaaffii fi deebii \_\_\_\_\_

004. Teessoo; 1. Magaalaa 2. Baadiyyaa

005. Firii: 1. Hundi guutame 2. Walakkaa guutame 3. kan biraa (Ibsi)

To'ataa hordofe; Maqaa \_\_\_\_\_, Mallattoo \_\_\_\_\_

**KUTAA TOKOFAA: GAAFFILEE HAWASSUMAA FI DINAGDEE**

<b>Lakk</b>	<b>Gafii</b>	<b>Debii</b>	<b>Darbu/lbsa</b>
101	Saala daa'imaa	1.dhiira 2.dubara	
102	Umurii daa'imaa	Ji'a _____	
103	Ulfaatina daa'imaa	Kg _____	
104	Dheerina daa'imaa	Cm _____	
105	Tartiiba daa'imaa maali ?	1.Tokkoffaa 2.lammaffaa 3.sadaffaa 4.kanbiroo	
106	Amantaa daa'imaa maali?	1.musiliima 2.ortodoksii 3.protestaantii 4.kaatolikii 5.kanbiroo ibsi	
107	Sadarkaa barumsaa haadhaa maali?	1.Idilee alaa (dubbisuu fi barreessuu hin danda'u) 2.idilee alaa(dubbisuu fi barreessuu danda'a 3.idilee kutaa-----	
108	Sadarkaa barumsaa abbaa maali?	1.Idilee alaa (dubbisuu fi barreessuu hin danda'u) 2.idilee alaa(dubbisuu fi barreessuu danda'a 3.idilee kutaa-----	
109	Manakeessa daa'imaa meeqatu jira	_____	
110	Jiruun haadhaa maali?	1. Hadha mana qofa 2. Qotee bulaa 3.Daldalaa 4. Hojjata jarmiyaa dhunfaa 5. Hojjataa mootummaa. 6. Hojjataa guyyaa 96.Kan biraa (lbsi)	
111	Jiruun abba mana (Deebiin toko ol ni-danda'ama)	1. Qotee bulaa 2. Hojjata mootummaa 3. Daldalaa 4. Hojjataa jarmiyaa dhunfaa. 5. Hojjataa guyyaa 5.. kan biraa (lbsi)	

**HAALA DINAGDEE WALQABATE**

112	1.Maddi bishaan dhugatti keessan?	1. Laga 2. Haroo 2. Burqaa hin-ijaaramane 3. Burqaa ijaarame 4. Birii dhunfaa 5. Boono 5.. Kan biraa (lbsi)	
	2.Kutaan ciisichaaf fayyadamtan meeqa?	1.tokkoo fi isaa ol 2.kutaan ciisichaaf adda bahe hin jiru	
	3. Gosni mana jireenya?	1. Tukkuuli/citaa 2. Qorgoroo	



	(Ilaali)	3.. Kan biraa (lbsi)	
	4.Lafti mana jireenya maal irra hojjatame?	1. Biyyoo 2. Simintoo(Brick) 3. Muka (Bambuu) 4. Seramikii 5.Kan biraa(lbsi)	
	5.Raadiyoo qabduu?	1.eeyyee 2.lakki	
	TV qabduu?	1.eeyyee 2.lakki	
	6. Horii qabduu?	1.eeyyee 2.lakki	Yoo hinqabne, 8 tti darbi
	7. Meeqa ta'u ? - Loon - Re'een - Hooloni - Indaqoon - Fardaa fi hareen Waligalatii	Lakkofsan _____ Lakkofsan _____ Lakkofsan _____ Lakkofsan _____ Lakkofsan _____ Lakkofsan _____	
	8.Bilbila mobilaa qabduu?	1.eeyyee 2.lakki	
	9.meeshaa dilaleessa qabduu ?	1.eeyyee 2.lakki	
	10.lafa qonnaa qabduu?	1.eeyyee 2.lakki	
<b>KUTAA LAMAFFAA HAALA NAANNOON WALQABATE</b>			
201	Maddi bishaan dhugatti keessan?	1. Laga 2. Haroo 2. Burqaa hin-ijaaramane 3. Burqaa ijaaramane 4. Birii dhunfaa 5. Boono 5.. Kan biraa (lbsi)	
202	Mana fincaanii qabduu?(ilaali)	1.eeyyee 2.lakki	
203	Bakka kosii gogaa itti gatamu qabduu? (ilaali)	1.eeyyee 2.lakki	
204	Bakka kosii dhan-galaha itti gatamu qabduu? (ilaali)	1.eeyyee 2.lakki	
<b>KUTAA SADAFFAA HAALA TAJAAJILA FAYYAAN WALQABATE</b>			
301	Tajaajila dahumsa durraa al meeqa argatte?(kan mucaa filatamee)	1.al tokko 2.lama haga sadii 3.al afurii fi isaa ol 4.hin beeku	
302	Mucaan tajaajila kittibaataa guutuu argateeraa?(kaardii ilaali)	1.eeyyee 2.lakki	
303	Mucaankee dhukkubee beekaa ?	1.eeyyee 2.lakki	Yoo hinqabne, 304 tti darbi
304	Yoogaaffii 303 f eeyyee jette	Tarreessi _____	
305	Bakka mucaan filatame itti dhalate	1.Manatti 2.Buufata fayyaatti 3.Kan biroo ibsi__	
<b>KUTAA ARFAFFAA HAALA SIRNA NYAATAA DAA'IMAA</b>			
401	Mucaakee harma ni hoosistaa?	1.eeyyee 2.lakki	Yoo lakki, 402 tti darbi
402	Dahamsa booda yoom harma hoosisuu ee-	1.Sa'a tokkoo fi gaditti 2.sa'a 24 keessatti	

	galte?	3.sa'a 24 olitti	
403	Mucaankee aannan haadhaa jalqabaa argateeraa?	1.eeyyee 2.lakki	
404	Mucaankee harama haadhaan ala nyaata ykn dhangalahoo biroo ji'a 6 osoo hin guutin fudhateeraa?	1.eeyyee 2.lakki	
405	Mucaan kee nyaata dabalataa ji'a 6 gaafa gahu eegaleeraa?	1.eeyyee 2.lakki	
406	Mucaankee xuuxoo hodheeraa?	1.eeyyee 2.lakki	
407	Yoo deebiin gaaffii 406 eeyyee jette sababni isaa maali?	1.haati mucaa waan duuteef 2.haati akka nyaata dabalataatti waan yaadduuf 3.haati dhukkuba HIV waan qabduuf 4.harmi haadha waan mu-raameef 5.kan biroo ibsi	
408	Guyyaatti daa'ima al-meeqa hoosista?	_____	
<b>KUTAA SHANAFFAA HAALA DANDEETTII ,GOCHAA FI ILAALCHAA</b>			
501	Mallattooleen mucaankee fayyaa ta'uu argisiisan maal fa'i?(deebiin tokkoo ol ni danda'ama)	1.hojjaa umurii isaa waliin deemu yoo qabaate 2.ulfaatina ji'a ji'aan yoo dabale 3.si'ataa fi jabeenyaa fi guddina qaabaa yoo hojje-ete 4.fedha nyaataa gaarii yoo qabaate 5.darbee darbee qofa yoo dhukkube	
502	Nyaata madaalamaa jechuun maali?(deebiin tokkoo ol ni danda'ama)	1.vaayitaaminii yoo qabaate 2.fayya qabeessaa fi qulluu kan ta'e 3.kuduraa fi muduraa yoo qabaate	
503	Nyaata guddinaa fi dheerinaaf barbaachisoo ta'an tarreessi	_____	
504	Mucaakee harma hoosisuun maaliif gaarii ta'e?	1.daa'ima dhukkubarraa ittisa 2.jaalala mucaa fi haadhaa cimisa 3.mucaa cimaa fi dandheettii qabu taasisa 4.mucaaf nyaata sirrii dha 5.kan biroo ibsi	
505	Haati tokko tokko maaliif mucaa hoosisuuf harma gahaa hin qabaan jettee yaadda?	1.haati hanqina nyaataa waan qabduuf 2.haati yeroo mara nyaata gosa tokko waan nyaattuuf 3.haati dhiphina ykn rak-	

		koo waan qabduuf 4.hojiin waan itti baay'atuuf 5.haati waan dhukkubduuf 6.kan biro ibsi	
506	Dhukkuboota bishaan faalameen dhufan akkamiin ittista?	1.bishaan danfe dhuguun 2.harka saamunaaan dhiqachuun 3.bishaan qadaaduu fi ittisuun 4.kuduraa fi muduraa miiccuun 5.ilbiisota irraa eeguun 6.kan biro ibsi	
507	Yeroo akkam akkamii harkakee saamunaaan dhiqatta?	1.nyaata bilcheesuun dura 2.nyaachuun dura 3.mucaa nyaachisuun dura 4.mana boolii deemuun dura 5.kan biraa ibsa	
508	Yeroo mucaankee dhukkubu dhangala'aa ammam kennitaaf ?	1.amma duraa gadi 2.amma duraan qixa 3.amma duraan oli	
509	Yeroo mucaankee dhukkubu nyaata ammam kennitaaf ?	1.amma duraa gadi 2.amma duraan qixa 3.amma duraan oli	
510	Mucaakee talaalchisuu akkamiin ilaalta?	1.mucaakoof gaariidha 2.mucaakoo dhukkuba irraa ittisa 3.mucaakoo dhukkubsuu danda'a 4.kan biro ibsi	
511	Nyaata midhaan akaakuu adda addaa irraa qopheessuun maal fayyada?	1.guddina mucaakoof gaariidha 2.wantoota nyaataaf barbaachisan mara of keessaa qaba 3.dhukkuboota adda addaa ittisa 4.kan biroo ibsi	
<b>GAAFFILEE ILAALCHA WALIIN WALQABATAN(1.baay'ee itti walii hin galu</b>			
<b>5.baay'ee itti walii gala</b>			
512	Nyaata kan coomaa akka keessoo hanqaaquu yeroo mara nyaachuun gaariidha jedheen amana	1.baay'ee itti walii hin galu 2. itti walii hin galuu 3.giddugaleesa 4.itti walii gala 5. 5.baay'ee itti walii gala	
513	Nyaata madaalama yeroon nyaata filadhu argadheedha jedheen amana	sadarkaa walii galtee(1-5)	
514	Fayyumaakoof nyaata gosa adda addaan bashanunuun gariidha jedheen amana	sadarkaa walii galtee(1-5)	
515	Nyaata guddina daa'imakoof hin taane irraa dhaabuun qaba	.sadarkaa walii galtee(1-5)	

	jedheen amana		
516	Mucaakoo aannan hoo-sisuuf dammaqiinsa gochuu akkan qabu nan amana	sadarkaa walii galtee(1-5)	
517	Mucaakoof osoo ad-daan hin kuti guyyaatti alsadii ol kennuun qaba jedheen amana	sadarkaa walii galtee(1-5)	
518	Nyaati manatti qophaa'uu kan mana nyaataa ykn hoteelaaira ni woyya jedheen amana	sadarkaa walii galtee(1-5)	
519	Nyaata madaalamaa nyaachuun faashiinii biraa jedheen amana	sadarkaa walii galtee(1-5)	
520	Mucaan koo fayya bu-leessa waan ta'eef nyaata gedderuu fi hin barbaachisu jedheen amana	sadarkaa walii galtee(1-5)	
521	Nyaata akka ruuzii ykn nyaata harosaa fi ijaarsaa akka nyaata dhaabbataatti kennuun gaariidha jedheen amana	sadarkaa walii galtee(1-5)	
522	Yeroon aaru ,yeroon jeeqamu mucaakoo caalaatti nyaachisuun gariidha jedheen amana	sadarkaa walii galtee(1-5)	
523	Waa'ee nyaata madaalamaa nyaachuu odeefannoo eessaa argatta	1.miidi'aa 2.raayyaa misooma dubartootaa irraa 3.hojjettuu ekistenshinii fayyaa irraa 4.buufa fayyaa irraa 5.abbootii amantaa irraa 6.kan biroo ibsi	
<b>GAAFFILEE GOCHAAN WALQABATAN</b>			
524	Mucaakeef nyaata ykn dhangala'aa harma haadhaan duraa ni-kennitaaf?	1.eeyyee 2.lakkii	
525	Yoo gaaffii 524 eeyyee jette maal kennitaaf?	1.bishaan 3.dhadhaa 4.aannan horii 5.kan biro ibsi	
526	Aannan harmaa isa duraa cuunfuun ni dhangalaastaa?	1.eeyyee 2.lakkii	
527	Nyaata kam yeroo baay'ee daa'imakeef laatta?(deebiin tokkoo	1.aannan loonii 2.dhadhaa 3.bulbula sukkaaraa 4.aannan gabaa irraa	

	ol ni danda'ama)	5.mooqa qal'aa 6.marqaa 7.kan biro ibsi	
528	Mucaakeef midhaan akaakuu adda addaa irraa niqopheessitaaf?	1.eeyyee 2.lakkii	
529	Mucaakee nyaachisuuf qodaa akkamii fayyadamta?	1.qaruuraa 2.sinii 3.fal'aana 4.kan biro ibsi	
530	Yeroo baay'ee mucaa kan eegu ykn tajaajila godhuuf eenyu?	1.haadha 2.abbaa 3.obboleettii 4.akkoo 5.hojjettuu manaa 6.kan biro ibsi	
531	Saanii mucaan itti nyaatu almeeqa dhiqxa?	1.guyyaatti ala lama 2.guyyaatti al tokko 3.guyyaa tokko tokko darbee darbee 4.battaluma fayyadamameen 5.kan biro ibsi	
532	Yeroo mucaa kee nyaachistu harka ni dhiqattaa?	1.eeyyee 2.lakki	
533	Guyyaatti mucaakeef nyaata almeeqa kennitaaf?	Ala_____	

