Prevalence of Undernutrition and Associated Factors among Children Aged 6-59 Months in Bishoftu Town, Oromia Region, Ethiopia

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ABSTRACT

Malnutrition is decreasing during the two-decade but still in a major public health problem in the world especially in developing countries including Ethiopia. The study was aimed to assess the prevalence of malnutrition and associated factors among children of aged 6 months - 59 months of Bishoftu town, Oromia region. Community based cross-sectional design was employed in the randomly selected five kebele. The sample size was determined by using single population proportion formula then adjusted by finite population correction factor to draw the final 410 sample children and then allocated proportionally to each Kebele in the town. The survey was conducted using standard procedures developed questionnaires with experienced enumerators. Anthropometric measurement was used to collect height, weight and MUAC following the standard measurement tools and procedures. Information was entered into Epi-Data version 3.1 and anthropometric measurements were converted into Z scores by WHO Anthro version 3.2.2., 2011 software. Then exported to STATA 13 and analyzed using descriptive statistics and inferential statistics. The result revealed that the prevalence of overall malnutrition was (46.1%); specifically, stunting was (16.1%), underweight (22.6%) and wasting (7.4%). Bivariate and multivariate logistic regression model was employed to analyze prevalence of child malnutrition. The result of multivariate model revealed that Family size, Birth interval, Child age and Frequency of breast feed as significant determinants for wasting. While for stunting, family size, level of mother's education, birth order, currently breast feeding, exclusive breast feeding and monthly income were found as statistically significant (p<0.05) determinants of child malnutrition. Additionally, age of child and household who hadn't got advice and visited by health extension workers were more than five as likely to be underweight compared to those who are frequently advised? Thus, the studied households need continues training, awareness creation activities, special attention for child and maternal healthcare services by the Health Office and other practitioners in different income generating activities to improve child nutrition.

KEYWORDS

1. INTRODUCTION

Background of the study

Malnutrition is a major public health problem in the world especially in Sub Saharan countries. Stunning and wasting rates are dropping but 159 million children around the world are still affected [1]. Malnutrition is attributed to

one third of under-five death, in the first five years of life which is preventable by economic growth [2]. Malnutrition remains one of the most common causes of morbidity and mortality among children throughout the world. It has been responsible, directly or indirectly for 60% of the 10.9 million deaths annually among children fewer than five and two-thirds of these deaths are often associated with inappropriate feeding practices [3]. Globally an estimated 101 million children below five years of age are underweight (16%). There were 59 million in South Asia; the prevalence was the highest which was 33%, followed by Sub-Saharan Africa while 30 million were in sub-Saharan Africa (21%). Child malnutrition affects academic performance and physical and mental development throughout their lives [2]. Under-five malnutrition is an indicator of one's countries health status as well as economic conditions [4]. Malnutrition among children is a critical problem because its effects are long lasting and go beyond childhood. It has both short and long term consequences [5]. Malnutrition, especially under five children stills a devastating problem in developing countries, especially in sub-Saharan Africa, including Ethiopia [6]. Stunting, wasting, and underweight are among those anthropometric indicators which are commonly used to measure malnutrition of under five children. Underweight, low weight-for-age reflects both low height-for-age and low weight-for-age and therefore reflects both cumulative and acute exposures of malnutrition. Ethiopia has a high prevalence of acute and chronic malnutrition with almost half of Ethiopian children chronically malnourished and one-in-ten children wasted. About 47% of children under-five are stunted, 11% are wasted and 38% are underweight [7]. Nearly half of under-five death is attributable to malnutrition. Malnutrition puts children at greater risk of dying from common infections and results in increased infection and delayed recovery. Poor nutrition in the first 100 days of a child's life can also lead to stunted growth, which is irreversible and associated with impaired cognitive ability

and reduced school and work performance [8]. About one-third of deaths among children below five years of age were attributed to under nutrition and it can lead children to be at greater risk of death and severe illness due to common childhood infections such as pneumonia, diarrhoea, malaria, human immune deficiency virus, or AIDS and measles [9,10].

In Ethiopia, the levels of under nutrition are not decrease significantly. The EDHS [11] report showed that stunting was 58% in 2000, 51% in 2005, and 44% in 2011. This report also showed that wasting was 12% from 2000 to 2005 and 10% in 2011. The third predictor is underweight, which was 41% in 2000, 33% in 2005, and 29% in 2011 [12]. Prevalence of malnutrition in Sebeta, Oromia, Ethiopia was identified that 46% children were malnourished and 10.9% were severely malnourished. More specifically 22.6%, 16.1% and p7.4% children were stunted, underweight and wasted, respectively. Though 6.1%, 3% and 1.7% children were severely stunted, severely underweight and severely wasted, respectively [13]. For percent of children under age five were stunted, 9% were wasted and 25% underweight in Ethiopia [14]. Even though the government health sector developments plan with targeted supplementary food and transitioning of enhanced outreach strategy into the health extension program, health facility nutrition services. Besides, community based nutrition and micronutrient interventions and essential nutrition actions integrated infant and young feeding counselling services continues to improve the nutritional status of mothers and children through different programs but under nutrition among children is still a common problem in Ethiopia [15]. In Oromia region, prevalence of child malnutrition indicated that 26% are underweight with 7.8% severe underweight, 9.7% of the children are wasted 2.8 % severe wasting and 41.4 % of the children are stunted with 18% sever stunting [16]. Similar to other parts of the country Oromia region prevalence of child malnutrition is also serious public health problem. As discussed above, Bishoftu town is

vulnerable to malnutrition and there is a common case of under-five malnutrition in OPD at Bishoftu Hospital. In Bishoftu town, because of malnutrition, many under five children became underweight, wasted and stunted because of socioeconomic, demographic, cultural problem and inadequate Breast feeding and lack of knowledge of Mother's that complementary feeding is important for children.

Despite the fact that malnutrition is one of the major public problems in Ethiopia, limited information is available on prevalence of malnutrition and associated factors in Bishoftu town. Besides, the high percentage of death malnutrition rate in the country is alarming which needs further study to describe the intervention and to assess the factors contributing to problem. Therefore, this study was aimed to assess the prevalence of under nutrition and associated factors among children of aged 6 months - 59 months in Bishoftu town, Oromia Regional State, Ethiopia, 2018/9.

Conceptual Framework

This conceptual framework adapted and modified for the prevalence and associated factors of malnutrition among 6 months - 59 months aged children in Bishoftu town. In developing countries and particularly in Sub-Saharan Africa, under-five child malnutrition is normally associated with a large number of factors to the extent that it sometimes becomes difficult to predict the risk factors (Victoria et al., 1997). Such associated factors act through a number of interrelated proximate determinants to bring about under five malnutrition that is stunting, underweight and wasting. The demographic and socio-economic factors (Child and maternal factors) such as age of child, birth order, mother's education level, marital status, mothers' age at birth, as well as maternal occupation work through proximate variables like practice of breast feeding and mother's health seeking behaviours are associated with under five malnutrition.
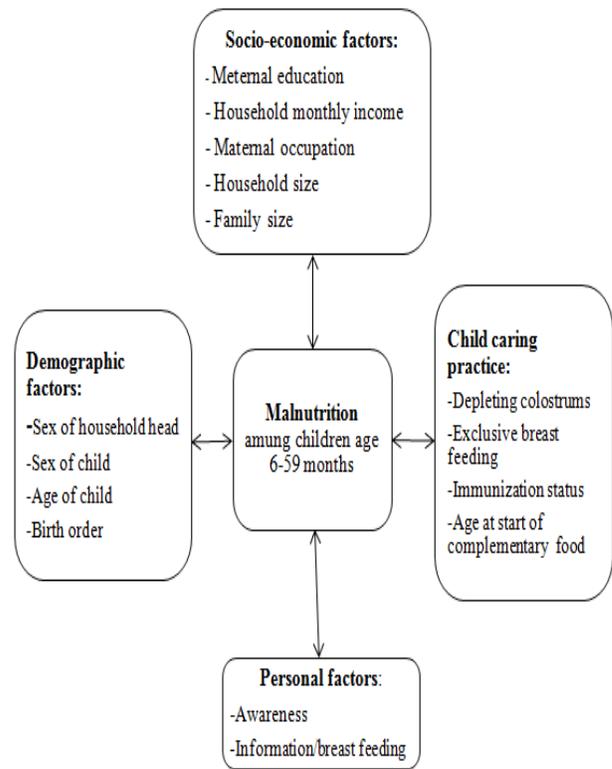
Figure 1: Conceptual Framework showing the prevalence of malnutrition and associated factor of UFAC. (Source: researcher modified work, 2019).

2. DESCRIPTION OF THE STUDY AREA AND RESEARCH METHODS

Description of the study area

The study was conducted in Bishoftu town which is geographically located in the Eastern Shewa Zone of the Oromia Region located between 80045 North latitude and 38059 East longitudes with an elevation of 1,920 meters. Bishoftu is located 47.9 kilometres southeast of Addis Ababa along its route four highway. Bishoftu town has currently estimated projected total population of 171, 115 of which about 81,047 are women and 90,068 males based on the 2007 National Census Agency. People are engaged in various Socio economic activities Small and micro enterprises, large scale, government employees etc. Bishoftu town have 15 kebele, one referral Hospital, five Health canter and 45 health extension agents that they providing health service and health extension services.

Research approach and design

Community-based cross-sectional descriptive survey study was employed to collect relevant and sufficient information within short period of time. The study design was used quantitative and qualitative research approach to assess the complexes variables of the child malnutrition prevalence and associated factors among under five children in Bishoftu town. The study period was from January 18 to February 22 2018/9.

Source and study population

The source of population was children age 6 months - 59 months pair with their mothers or caregivers lived in four kebele of study area. The study population was randomly selected households of the selected kebele dwellers.

Inclusion and exclusion criteria

Mothers or caregivers who have children age 6 months - 59 months whose residents in Bishoftu town at least for six months prior to the data collection was included to participate under this study as respondent. While, manner visitors of the selected household during the data collection who have a child age 6 months - 59 months were not included under the study.

Data sources

Both primary and secondary sources of data were used to gather the information required for the study. The primary data was collected from eligible respondent's mother or caregiver of the index child and anthropometric measurement. While, secondary data were collected from available document at Health Centre, Office and Extension workers.

Sample size determination

Sample size was determined Cochran (1963:75) formula to yield the required sample for proportions were used as Cited by Israel (1992).

$$n = \frac{(Z\alpha/_2)^2\ p(1\text{-}p)}{d^2} = 384$$

n = is the desired sample size, Z = is the standard normal deviation at a confidence level set at 95% which is 1.96, p = estimated proportion of an attribute that is present in the population, q = is the proportion of an attribute that without population, d = desired level of precision.

The total population (total children age 6-59 months) of the towns are 12,257; need to adjust using finite population correlation factors. Because, it was advisable to adjust the sample size to finite population correction factor applied when the sample represents a significant (e.g. over 5%) proportion of the population as cited by Susan et al. (2015). The formula should be:

$$n_a = \frac{n}{1\ +\ \frac{n\ -\ 1}{N}}$$

Where: n_α = the required sample size, N = the total population of the children age 6-59 months in the study area, n = the sample size estimated based on the assumption of p = 0.50. Hence substituting the formula sample size = 373, so with adjustment for non-response (10%) n = (373+37), the final sampling size was 410 children.

Sampling techniques

The study area was purposively selected multistage sampling technique followed by simple random sampling was used to select children from households. From 15 kebele namely kebele 01, 03, 05 and 07 kebele were select by simple random sampling method. Study participants/households/care takers were also selected kebele by proportionate allocation from each selected kebele. Study participants were selected by simple random sampling (table of random numbers) based on frame existing in health posts, from households with children 6 to 59 months in these four Kebele. Participants of the focus group discussions (FGDs) were selected to take part with the help of village elders and Health Extension Workers (HEWs). This ensured that participants who were easily accessible and those who have adequate information regarding child feeding in the study area have been

selected. To enhance homogeneity, each FGD of participant was made up of 6 to 14 mothers with children below 2 years who will not be part of the main sample. The FGDs will be held in all the four Kebele after quantitative data had been collected.

Tools and techniques of data collection

In this study information was collected using structured questionnaire which was administered to eligible respondent's mothers/caregivers of child to obtain quantitative data. Focus group discussion was also conducted to collect qualitative data. A close supervision of enumerator during the field work and administration (FGD) from different economic status household was done through the principal investigator. In addition to investigate the nutritional status of the children anthropometric measurement on height, weight, and MUAC was taken from each sample child. Weight of the child has been measured by using weight scale and their height was measured through measuring board while MUAC was measured using WHO standard MUAC tape. The height of infants aged 6 months - 23 months (less than 85cm) calculated in recumbent position while for children aged 24 months - 59 months was measured in stand up position. Accordingly, Weight of the infants and measured to the nearest 10 g by standard weight scale for a child who stand alone and as well for not stand alone the mother was weighted together with a child and then without the child. The difference during data collection the researcher has checked and followed up in the field and observed how well data collectors were doing their task. At the end of the data collection check the completeness of filled questioner. At the end of every day filled data collection.

Data quality assurance

To maintain the quality of data the questionnaire was first prepared in English and later translated into Afan Oroma (the local language of the study area) and back translated into English to check for its conceptual equivalence. The data was collected by 6 data collectors who have health related background and able to communicate, reading and writing Afan Oroma and Amharic languages. The data collectors were recruited from Hospital and health center. Inanition two days training has been provided for data collectors with regards to administration of the questionnaire and anthropometric measurement. To ensure the quality of research data, data collectors were taken one-day training on the how to administer structured questionnaires and take anthropometric measurements. Measurements was taken using standard instruments of weighting scale and height board and routinely checked and adjusted to maintain its accuracy, precision and validity. For instance, every day similar weight was taken by investigator before starting weighting of child and zero reading was checked following weighing child.

Study variables

The dependent variables were wasting, underweight and stunting. While the factors assessed as independent variables were; feeding, health care seeking, hygiene and immunization, age, sex, birth order, gestational age, types of birth, place of delivery, breast-feeding status and morbidly status, head of HHs, ethnicity, religion, family size, marital status, occupation income, education, ownership of livestock and farm land. Moreover, extra food during pregnancy/lactation, number of children ever born, use of extra food during pregnancy or lactation and autonomy in decision-making on use of money were also taken as independent variables.

Data analysis procedure

The quantitative data collected through structured questionnaire was entered into Epi-Data version 3.1 and exported to STATA 13 for analysis. To convert the anthropometric data into Z-scores of the indices WHO Anthro 2011 version 3.2.2, software was used for stunting HAZ (Height for Age Z-score), underweight WAZ (Weight for Age Z-score) and wasting WHZ (Weight for Height Z-score) and exported STATA 13 for further analysis. Descriptive statistical analysis was used to

compute frequency percentage, mean and standard deviation was used to organize distribution of child demographic, household's demographic, socioeconomic, and maternal & child caring practice. Bivariate regression model was used first to identify the association between independent determinants and outcome variables. As well multivariate regression used to estimate the imperative determinants that influence on malnutrition of children.

Ethical consideration

The ethical clearance was obtained from board of ethical committee of Addis Ababa University College of Development Studies. The permission got from related government office for conducting the research with briefing of study purpose and benefits to the community. It was planned to get the consent earlier before starting to obtain the data from respondents or any one with children before starting the interview or taking body measurements. Those respondents who were not willing to participate in the study were not forced to be involved. The respondent also being informed that all data from them measurements were kept confidential by using coding instead of any personal identifiers and is intended only for the purpose of the study.

3. RESULT AND DISCUSSION

Result

The study is presented as background characteristics of respondents and children, analysis of leading factors which contribute for malnutrition, bivariate analysis and multivariate analysis results of the relationship among independent variables (predictor factors) and malnutrition. From the total planned study subjects, complete response was obtained for 410(100%) which are presented in (Table 1 and Table 2).

Demographic characteristics of children and caretakers

The background characteristics are divided into child and maternal factors in Bishoftu districts are presented in Table 1. Two hundred seventeen 52.93 % male children

and one hundred ninety-threes were included. The average age of children incorporated in this study was 28.62 with a minimum age 6 months and maximum age of 59 months.

No.	Issues	Freq.		Percent		
1	**Sex of child**					
	Male	217		52.93		
	Female	193		47.07		
	Total	**410**		**100**		
2	Variable	Obs	Mean	Std. Dev.	Min	Max
	Child age in month	410	28.62	15.54	6	59
3	Family size	410	3.87	.97	3	6
4	Number of under 5 years	410	1.32	.55	1	3
5	Mother's age	410	30.22	5.59	21	43

Table 1: Demographic characteristics of children in Bishoftu town, Oromia, 2019 (N = 410). **Source:** From researcher own data, 2019.

No.	Items	Freq.	Percent			
1	Residence					
	Urban	45	10.98			
	Rural	365	89.02			
2	Religion					
	1 Orthodox Christian	194	47.32			
	2 Muslim	100	24.39			
	Catholic	9	2.20			
	Protestant	98	23.90			
	Traditional	9	2.20			
	Total	410	100.00			
3	Mother education					
	No Education	83	20.24			
	Read and Write Only	20	4.88			
	Primary School	29	7.07			
	Secondary School	140	34.15			
	College and above	138	33.66			
	Total	410	100.00			
4	Occupation					
	Farming	18	4.49			
	Agro pastoralist	18	4.49			
	Employment	244	60.85			
	Merchandise	52	12.97			
	Labourer	69	17.21			
	Total	401	100.00			
5	Marital status					
	Unmarried	82	20.00			
	Married	301	73.41			
	Divorced	9	2.20			
	Widowed	18	4.39			
	Total	410	100.00			
6	Head of Household					
	1 Mother	18	4.39			
	2 Father	270	65.85			
	3 Both	122	29.76			
	Total	410	100.00			
7	Variable	Obs	Mean		Std. Dev	Min	Max
	Monthly income	410	3652.317		1717.966	700	9050

Table 2: Socio-economic characteristics of respondents in Bishoftu town, Oromia, 2019 (N = 410). **Source:** From researcher own data, 2019.

Normal family size of households involved in the study was 3.8 with a minimum 3 and maximum 6. The maximum number of children aged 6 months - 59 months in a household were 3 and minimum was 1 and in average

there were 1.32 children. According to the above table the maximum described by the respondents was 43 and minimum age was 21, the mean ages of the respondents were 30.22.

Socio- economic characteristics of respondents

As indicated in (Table 2) below, the resident of most of respondents 365 accounted for more 89 percent under the survey were in rural area while 45 (10.98%) were from urban area. In this sample, 47.32 percent of the mothers were orthodox Christian, 24.39 percent were Muslims, 23.9 percent were protestants 2.2 percent were Catholics, whereas the remaining 2.2 were worshiping traditional believes. The majority of the mothers 34.15 percent have received secondary schooling, 33.66 percent had college and above educational level 20.4 percent.

Prevalence of malnutrition

Overall prevalence of stunting, underweight and wasting

With regards of prevalence of malnutrition of children among aged 6 months - 59 months in Bishoftu town as it was indicated in Table 3 were 6.9 % severely stunted, 13.8 % were stunted, 2.2 % were underweight and 11.2 % were wasted. Moderate level of prevalence of malnutrition children aged 6 months - 59 months were seen in male.

Indicators	%<-3SD	%<-2SD	Mean	SD
Length/height for age (Stunting)	6.9	13.8	1.22	2.34
Weight for age (Underweight)	0	2.2	0.95	1.2
Weight for Height/Length (Wasting)	0	11.2	0.14	1.65

Table 3: Prevalence malnutrition in Bishoftu town, Oromia, 2019 (N = 410). Source: Survey result of 2019 in Bishoftu.

Prevalence of stunting

Stunting is a failure to reach linear growth potential of height relative to chronological age. Shortness is used to tell if a child is abnormal in height for age as a result of malnutrition. The higher level of Stunting was observed in male (27.1%) as compare with girls that was (14%). A peak degree of stunting (42.9%) was made known among children aged 6 months - 11 months, the level of stunting

among children aged 36 months - 47 months was (30%) and followed by children aged 48 months - 59 months were (24.4%), the lowest magnitude of stunting was perceived in children aged 12 months - 23 months (10.02%) (Table 4).

Sex	Total Number	%<-3SD	%<-2SD	Mean	SD
Male	217	9	18.1	0.91	2.4
Female	193	4.7	9.3	1.54	2.24
Age group in month					
(6-11)	63	14.3	28.6	-0.83	2.05
(12-23)	120	0	8.1	2.92	2.06
(24-35)	84	0	10.7	1.34	1.72
(36-47)	60	15	15	0.71	2.28
(48-59)	83	12.2	12.2	0.69	1.84

Table 4: Prevalence of stunting in Bishoftu Town, Oromia, Ethiopia, 2019 (N = 410).

Prevalence underweight by sex and age group weight for age

Table 5 was indicated that 4.1% of male children were categorized as underweighted as weighed against girls. The current status of body proportion of with their sequential age 10.8 % of children grouped under the age category of 48 months - 59 months were not linear in other word underweighted.

Sex	Total Number	%<-3SD	%<-2SD	Mean	SD
Male	217	0	4.1	0.98	1.42
Female	193	0	0	0.91	0.91
Age group in month					
(6-11)	63	0	0	0.78	1.13
(12-23)	120	0	0	2.26	0.5
(24-35)	84	0	0	0.52	0.76
(36-47)	60	0	0	0.94	0.44
(48-60)	83	0	10.8	-0.38	0.82

Table 5: Prevalence underweight (sex and age group weight for age) in Bishoftu town, Ethiopia, 2019 (N = 410).

Sex	Total Number	%<-3SD	%<-2SD	Mean	SD
Male	217	0	10.6	0.47	1.35
Female	193	0	12	-0.23	1.86
Age group in month					
(6-11)	63	0	0	1.26	1.86
(12-23)	120	0	0	1	1.4
(24-35)	84	0	23.8	-0.28	1.26
(36-47)	60	0	0	-0.15	0.98
(48-69)	83	0	31.1	-1.42	1.14

Table 6: Prevalence of Wasting (Sex and Age Group Weight for Height/Length) in Bishoftu town, Ethiopia, 2019, (N = 410).

Prevalence of wasting sex and age group weight for height/length

Table 6 is indicated that (10.6%) of boys and (12%) of girls were wasted in addition (31.1%) and (23.8%)

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occurrence of wasting (low weight-for-height) was seen in the age group of 48 months – 59 months and 24 months - 35 months, respectively.

Prevalence of MUAC for age Z-Score in Bishoftu

The MUAC measurement result is an indicator of immediate acute malnutrition for children age 6 months - 59 months. To vigour the results of weight for height Z-score (wasting) MAUC for age Z-score (MUACZ) was estimated. Therefore, 2.2% of children were affected by acute malnutrition 14.6 were slightly higher than the result observed in the weight for height measurement. As it was pointed up in Table 7, that superior level 34.9 % of malnutrition was observed in the age group of 48-59 moths followed by score 23.8% malnutrition among the age group of 24 months - 35 months (Table 7).

MUAC for age Z-Score	Total Number	%<-3SD	%<-2SD	Mean	SD
MUAC for age	410	2.2	14.6	-0.96	0.89
Age group in month					
(6-11)	63	0	0	-0.66	0.57
(12-23)	120	0	16.7	-0.94	0.69
(24-35)	84	0	23.8	-1.43	1
(36-47)	60	0	0	-0.35	0.83
(48-59)	83	10.8	24.1	-1.16	0.95

Table 7: Prevalence of MUAC for age Z-Score in Bishoftu town, Ethiopia, 2019, (N = 410).

Nutritional practice of family

The amount of expenditure spent for food consumption from monthly income which is determinant to malnutrition was also assessed in the study and as pointed up in table 4.8 84.63%, 6.59%, 2.2% and 6.59% were witnessed that they were paying for household food consumption, children education, purchasing of cows and purchase of clothed, respectively. At the same table more than three fourth 84.63% of respondents indicated that they were buying their food from markets the remaining 10.98%, 2.2% and 2.2% or respondents identified Aid donation, shared market and other sources of supplies as sources of food in chronological order.

As indicated in Table 8 below, the highest information gained about nutrition 31.95% was from health extension workers and the second 28.78 % source of information was from relatives, friends and families; whereas: 4.39% form magazine and newspaper, 12.20% form television, 10.24% from mobile telephone and 10.24% were gotten from radio. However, 2.2% of respondents indicated that they have not get information from any of the sources.

No.	Items	Freq.	Percent
1	Expenditure spend		
	Household food consumption	347	84.63
	Children Education	27	6.59
	Purchasing of cow	9	2.20
	Purchase of clothes	27	6.59
	Total	410	100.00
2	Main Sources of Food		
	Market	347	84.63
	Aid Donation	9	2.20
	Shared production	45	10.98
	Others	9	2.20
	Total	410	100.00
3	Source of Information about Nutrition		
	Magazine and Newspaper	18	4.39
	Television	50	12.20
	Mobile telephone	42	10.24
	Radio	42	10.24
	Relative/friend/family	118	28.78
	Health extension workers	131	31.95
	No information	9	2.20
	Total	410	100.00
4	Means of transportation		
	Vehicles	95	23.17
	Bajaj	243	59.27
	Don't use any transport system	72	17.56
	Total	410	100.00

Table 8: Nutritional practice, means of transportation and information of family in Bishoftu town, Oromia, Ethiopia, 2019, (N = 410).

With regards to the transportation system used by the respondents' majority of the respondents 59.27% were using Bajaj while 23.17 pointed out that they were transporting their food through vehicles and the remaining 17.56% were not using transportation.

Health conditions of children

As the result shows in Table 9 that 83.66%, 86.83%, 86.83%, 70.9% and 63.41% of children were vaccinated in BGC, PCV, Polio, Measles, Penta valent and Vitamin A, respectively. Out of the total of children only 63.41% were completed their vaccination, while 38(9.27) children were not received any type of vaccination. Concerning

health history of children 8.78% of children had diarrhoea, 7.07% respiratory disease, 4.39% measles, 11.46% fever, 20.98% cough and 6.59% vomiting.

Awareness towards breast feeding

The result Table 10 shows that the majority 86.83% mother's perceived breastfeeding as crucial for the child development, however, 13.17% of respondents were not recognize breastfeeding as an important. Sixty six point eight three (66.83%) of the respondents were providing breast milk only for their newly born child, 19.02% were deliver formula milk and the remaining 14.15% were supplying plain water with breast milk. With regards to the length of breastfeeding 42.2% were provides breast milk for more than 6 months their children, 27.56% were feed their children breast milk for 4 months - 6 months only, 18.78% were nourish breast milk for less than 4 months and the remaining 11.46% were never feed breast milk for their children. The view of female towards the importance of breast milk is a determinant point for eradicating malnutrition, bearing this in mind mothers were asked for their perception to indicate whether feeding breast milk is harmful or not accordingly 91.22 % were denied it. And the remaining 8.78% were confirming that nourishing the child with breast milk is harmful. Consequently, another question was forwarded to know whether bottle feeding is harmful or not and 68.05% were agreed and the remaining 31.95% were disagreed.

The practice of breastfeeding also was raised as an issue and 95.61% of respondents were previously had an experience of breastfeeding where as 4.39% of mothers do not have past experience of breastfeeding. In addition, 52.93% of respondents were currently implementing breastfeeding while 47.07% of respondents were not currently nourishing breast milk for their children. Of total respondents 60.10% were stop to breastfeeding in order to start additional food, 13.99% were discontinue breastfeeding by perceiving breast milk has not an adequate amount of food, others 13.88% of mothers

impede breastfeeding in order to prevent themselves from tiredness, 10.36% were brought to an end of breastfeeding due to pregnancy while 4.66% were ended up breast feeding based on an insight of breast milk can able to destroy child's health.

Sixty-seven (28.51%) mothers out of the total participants responds that they don't know how many times they gave breastfeed their children, and 61(25.31%) pointed out that they provide breastfeed more than eight times a day, 51(29.6%) were notified that they offer breastfeed 4 up to 7 times a day. Only 23(16.17%) of mothers responds' that they offered breast feed for less than or equal to three times per twenty-four hours.

No.	Issues	Yes		No	
		Freq.	Percent	Freq.	Percent
1	Child vaccination	372	90.73	38	9.27
	BCG	343	83.66	67	16.34
	PCV	356	86.83	54	13.17
	Polio	356	86.83	54	13.17
	Measles	291	70.98	119	29.02
	Pentavalent	356	86.83	54	13.17
	Vitamin A	260	63.41	150	36.59
2	Health condition				
	Diarrhoea	36	8.78	374	91.22
	Respirator	29	7.07	381	92.93
	Measles	18	4.39	392	95.61
	Fever	47	11.46	363	88.54
	Cough	86	20.98	324	79.02
	Vomiting	27	6.59	383	93.41
	Take to health institution	74	18.05	336	81.95

Table 9: Health conditions of children in Bishoftu town, Oromia, Ethiopia, 2019, (N = 410).

Respondents were asked about the type of food provided to their children and 42.44% have gave their children breast milk, 31.22% had offer them cow's milk 16.34% have provide them fruit juice and only 10% mothers' deliver formula milk for their children.

Provision of complementary foods

The result Table 11 showed that 55.11% of mothers included in this study were starts after 6 months to deliver complementary food for their children, 24.44% were started it at 6 months while the remaining indicates that they have started before the age of 6 months.

Identifying the underlying grounds that push of delivery of early complementary food in a particular locality is important to solve the nutrition problems (Table 12).

No.	Issues	Yes		No	
		Freq.	Percent	Freq.	Percent
1	Mothers' awareness towards breast feeding.				
	Breast feeding is important	356	86.83	54	13.17
2	Important for newly born	Freq.		Percent	
	Brest milk only	274		66.83	
	Breast milk with plain water	58		14.15	
	Formula milk	78		19.02	
3	Duration of EBF				
	No EBF	47		11.46	
	<4 months	77		18.78	
	>6 months -	173		42.20	
	4-6 months	113		27.56	
	Total	410		100.00	
	Variables	Yes		No	
		Freq.	Percent	Freq.	Percent
4	Breastfeed is harm	36	8.78	374	91.22
5	Bottle feed is harm	131	31.95	279	68.05
6	Previously practised breast feeding	392	95.61	18	4.39
7	Currently breast feeding	217	52.93	193	47.07
8	Main reason for not giving Breast milk	Freq.		Percent	
	Breast milk is not enough	27		13.99	
	Child starts to take additional solid	116		60.10	
	Breast milk make child sick	9		4.66	
	Mothers tired of breastfeeding	21		10.88	
	Mother's pregnancy	20		10.36	
	Total	193		100.00	
9	How many time did you feed in last 24 hours				
	<3times	38		16.17	
	4-7 times	51		29.36	
	≥8 times	61		25.96	
	I don't Know	67		28.51	
	Total	217		100.00	
10	Type food feed last 24 hour including day and night	.			
	Caw's Milk	128		31.22	
	Formula milk	41		10.00	
	Breast milk	174		42.44	
	Fruit juice	67		16.34	
	Total	410		100.00	

Table 10: Breast feeding in Bishoftu town, Oromia, Ethiopia, 2019, (N = 410).

No	Variables	Yes		No	
1		Freq.	Percent	Freq.	Percent
	Do you deliver complementary food for your children	410	100	-	-
2	When start complementary feeding	Freq.		Percent	
	>6 months	221		55.11	
	At 6 months	98		24.44	
	<6 months	82		20.45	
	Total	401		100.00	
3	Reason for early complementary feeding				
	Inadequacy of breast milk	197		48.05	
	Being deficient in time	21		5.12	
	To motivate child to start food	9		2.20	
	Child reaching for food	40		9.76	
	Child becomes active	27		6.59	
	Child always crying	9		2.20	
	Good for child growth	51		12.44	
	Protects child from disease	29		7.07	
	No reason at all	9		2.20	
	Tradition thinking	18		4.39	
	Total	410		100.00	

Table 11: Provision of complementary foods in Bishoftu town, Oromia, Ethiopia, 2019, (N = 410).

48.05% of respondents indicated that inadequacy of breast milk the main reason, 12.44 % of mothers pointed out that it is because they thrust that early provision is good for the child, 9.76%, 7.07%, 6.59%, 4.39%, 5.12%, 2.2%, 2.2%, were indicates that as it is because of the fact that child reaching, to protect children from disease, to make their children active, traditional thinking, inadequacy time to feed their children, to keep out of their children from crying and without any reason, respectively.

No	Issues	Yes		No	
		Freq.	percent	Freq.	Percent
1	Child take any liquid	229	55.85	181	44.15
	If no Why do not feed the diversified diet	Freq.		Percent	
	It has no advantage.	39		21.96	
	The child may not like it.	43		23.83	
	It is Culturally forbidden.	29		13.55	
	It may cause discomfort and illness for a child	9		4.21	
	High market price of vitamin A rich food source's	61		36.45	
	Total	181		100.00	
2	Frequency of breast and complementary feeding				
	Immediately/within 1hour	202		51.53	
	After first hour	51		13.01	
	After more than one day	9		2.30	
	Don't remember/ don't know	72		18.36	
	After 7-12 hour	58		14.80	
	Total	392		100.00	
3	How often does the breastfeed given for a child				
	1 4-6 time a day	131		31.60	
	2>8 time a day	279		68.04	
	Total	410		100.00	
4		Yes		No	
		Freq.	percent	Freq.	Percent
	Did exclusively breast feed	63	15.37	347	84.63
	If yes For How long?	Freq.		Percent	
	1No EBF	9		7.14	
	2< 4 months	9		7.14	
	34-6 months	18		14.29	
	4> 6 months	27		71.43	
	Total	63		100.00	
5		Yes		No	
		Freq.	Percent	Freq.	Percent
	Give colostrums	307	74.88	103	25.12
	Reason for not giving colostrum	Freq.		Percent	
	I had not white milk	26		25.24	
	Everybody say it is shouldn't be given	21		20.39	
	First milk is dirty like bus	56		54.37	
	Total	103		100.00	

Table 12: Complementary food in Bishoftu town, Oromia, Ethiopia, 2019, (N = 410). **Source:** Survey result of (2019) in Bishoftu.

Preparation and provision complementary foods

The result Table 13 revealed that, a very high proportion of the mothers 74.39% initiated feeding of newborns with pre-lacteal feeds primarily breast milk, 14.15% provides their preliminarily their child formula milk, 9.27% uses water with breast milk as a first nutrient for their children 2.2% mothers provides sugar with water solution. Mostly used type of complementary food indicated by majority

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33.16% was porridge followed by 30.87%, 20.66% and 15.31% were Injera, cow's milk and bread respectively.

No.	Issues	Frequency		Percent	
1	First nutrient				
	Water with breast milk	38		9.27	
	Breast milk	305		74.39	
	Formula milk	58		14.15	
	Sugar with water	9		2.20	
	Total	410		100.00	
2	Complementary food type				
	Injera	121		30.87	
	Bread	60		15.31	
	Porridge	130		33.16	
	Cow milk	81		20.66	
	Total	**392**		**100.00**	
3		Yes		No	
		Freq.	Percent	Freq.	Percent
	Food prepared from different crops	283	69.02	127	30.98
4		Freq.		Percent	
	Kind complementary food prepared				
	Cereal/grain only	59		15.05	
	Cereal mix with pulse	134		34.18	
	Pulse only (beans and peas)	60		15.31	
	Fruits and vegetables	110		28.06	
	Milk and milk products	11		2.81	
	Eggs	18		4.59	
	Total	392		100.0	
5	Did you feed the child anything from a bottle with a nipple yesterday or last night?	Yes		No	
		Freq.	Percent	Freq.	Percent
		215	52.44	195	47.56
	Material to use to feed your child?	Freq.		Percent	
	1 Spoon	27		6.59	
	2 Cup	76		18.54	
	3 Hand	166		40.49	
	4 Bottle	141		34.39	
	Total	**410**		**100.00**	

Table 13: Preparation and provision complementary foods in Bishoftu town, Oromia, Ethiopia, 2019, (N = 410).

Delivery of the type of food prepared from different types of crops was carried out by 283(69.02%) of mothers among the mothers 34.18 % and 28.08% children were found in using Cereal mix with pulse, fruits and vegetables. Whereas a smallest proportion 2.81% and 4.59% of mothers were not using egg, milk and products of milk as a complimentary food for their children. As shown in the table below the number of under-five children who received feeding from a bottle with a nipple yesterday or last night was 215(52.44%) and out of these 40.49%, 34.39%, 18.54% and 6.59% were used hands, bottle, cup and spoon, respectively. Fifty six point six one percent (56.61%) of mothers deliver milk to their children and among these 54.36% mothers feed their children more than three times a day, 26.68% of mothers, offers milk three times per day and18.95 nourish their children with milk less than three times.

Availability and preparation of cow's milk

The result Table 14 showed that cow's milk was not available in households of 174(43.39%) while 227(56.61 %) of households have received cow's milk, among these 107(47.14%) of mothers feed cow's milk at least three times a day. While 76(33.48%) were feed cow's milk to their children less than three times per a day and the remaining 44(19.38%) gave their children cow's milk more than three times a day. With regards to preparation of cow's milk food 137(31.3 %) of study subject had prepared in soaking, germination and cooking, 57(25.11%) were prepared in soaking alone, 21(9.25%) were prepared soaking and germination the remaining 12(5.28%) were prepared in mixed with other foods.

No.	Variables	Freq.		Percent	
		Yes		No	
		Freq.	Percent	Freq.	Percent
1	Is milk available	227	56.61	174	43.39
	Cow'smilk feed daily	Freq.		Percent	
	>3 times	44		19.38	
	<3 times	76		33.48	
	3 times	107		47.14	
	Total	**227**		**100.00**	
2	Preparation				
	Soaking alone	57		25.11	
	Soaking and germination	21		9.25	
	Soaking, germination and cooking	137		60.35	
	Mixing with other foods	12		5.28	
	Total	**227**		**100.00**	
3	In what form				
	Solid	32		14.09	
	Semi-solid	69		30.39	
	Soft foods	126		55.51	
	Total	**227**		**100.00**	
4	Number of feed meat/bread/milk/fruit for your child (diversity food)				
	Two or three times a week	141		34.39	
	More than once a day	11		2.68	
	Once a month	27		6.59	
	Once a week	135		32.93	
	Never	96		23.41	
	Total	**410**		**100.00**	
5		Yes		No	
	Contact health extension worker	Freq.	Percent	Freq.	Percent
		329	80.24	81	19.76

Table 14: Availability and Preparation of Cow's Milk in Bishoftu town, Oromia, Ethiopia, 2019, (N = 410).

From the total study participants, 126(55.51%) prepared cow's milk food in a form of soft food, 69(30.39%) prepared cow's milk food in a type of semi-solid the remaining 32(14.09%) of the respondents have been prepared cow's milk food in the form of solid. The majority, 1419(34.39%) of the study participant did feed meat/bread/milk/fruit diversified food for their children

two up to three times a week, 135(32.93%) children were eating diversified food once a week, 96(23.41%) were never used dietary diversity at all, 27(6.59%) were providing dietary diversity for their children and 11(2.68%) of mothers did provided their children feed meat/bread/milk/fruit diversified food.

Bivariate logistic regression analysis

The bivariate analysis (crude analysis) was conducted to find out the independent effect of each explanatory variable on the binary outcome variables. It helps to identify potential variables for the multivariate analysis. The variables associated at 10% level of significance were taken into account in order to not exclude potential determinants from the analysis at early stage.

Bivariate analysis result wasting

To determine the association between prevalence of wasting malnutrition and explanatory variables, bivariate analysis was performed using logistic regression.

Independent Variables	Coefficient	95%CI	
Residence place			
Rural re			
Urban	-14.60 (605.00)	-1200.37	1171.16
Family size	0.32* (0.19)	-0.04	0.69
Level of Mother education			
No formal education re			
Read and write only	15.13 (1240.09)	-2415.40	2445.67
Primary	15.13 (1029.84)	-2003.31	2033.58
Secondary	-0.43 (0.42)	-1.26	0.40
College and above	0.24 (0.46)	-.67	1.16
Birth interval	0.65*** (0.17)	0.32	0.99
Child age	-0.08*** (0.01)	-0.10	-0.05
No. children under-five	0.50 (0.35)	-0.19	1.18
Vitamin A supplements			
Yes re			
No	0.86** (0.39)	0.09	1.62
Frequency of breast feed in the last 24 hour	-0.94*** (0.29)	-1.51	-0.36
Providing enough cow's milk			
Yes re			
No	-1.17*** (0.39)	-1.93	-0.40

Table 15: Bivariate Analysis Result Wasting in Bishoftu town, Oromia, Ethiopia, 2019, (N = 410). **Note:** ***significant at 1%, **significant at 5% * significant at 10%, unmarked not significant; RC: Reference Category; the number in the bracket indicates Standard error; CI: Confidence Interval.

As indicated in the Table 15 family size, birth interval, child's age, supply of vitamin A, frequency of breast feeding and provision of cow's milk were identified as significant predictors for wasting in the bivariate analysis. Maternal educational levels, number of under five years' children with in household were not statistically significant predictors wasting.

Bivariate analysis result underweight

According to bivariate statistical analysis in the Table 16 for underweight age of child, number of children under five years with in a household, maternal age, total number of children, birth interval, children's age and the frequency of visit the household by health extension workers were found to be statistically significant indicators. However, variables such as, birth order and the previous practice breastfeeding were not significantly associated with underweight.

Independent Variables	Coefficient	95%CI	
No children under-five	-1.47*** (0.45)	-2.36	-0.59
Mother age	-0.17*** (0.61)	-0.29	-0.06
Total number of children	-1.31*** (0.40)	-2.09	-0.54
Birth interval	-0.42* (0.26)	-0.92	0.08
Birth order	-0.34 (0.35)	-1.02	0.34
Child age	-0.12*** (0.04)	-0.20	-0.05
Ever practiced breast feeding			
Yes re			
No	11.37 (451.93)	-874.41	897.14
Number of visit by health extension worker	-1.41*** (0.47)	-2.33	-0.50

Table 16: Bivariate statistical analysis for underweight age of child. **Note:** ***significant at 1%, **significant at 5% *significant at 10%, unmarked not significant; RC: Reference Category; the number in the bracket indicates standard error; CI: Confidence Interval.

Bivariate analysis result stunting

Table 17 showed bivariate logistic regression analysis was conducted to identify the independent significant variables that affect the prevalence of stunting family size, residential area, parental marital status was associated with prevalence of stunting on children based on the survey result stunting is highly prevalence in urban than in rural residential areas. The other factors which were significantly associated with prevalence of malnutrition stunting were educational status of mothers, family size, residence place, marital status, household monthly income, and children's birth order, children's sex, birth

interval, provision of vaccination, current condition of breastfeeding and exclusive breastfeeding practice of mothers. Whereas, prevalence of stunting was of high magnitude in female as compared with males at the same time, it is more prevalence among children whose mothers are not offer breastfeeding.

Independent Variables	Coefficient	95%CI	
Family size	0.43*** (0.16)	0.11	0.76
Residence place			
Rural ʳᶜ			
Urban	1.56*** (0.34)	0.88	2.23
Mothers marital status			
Currently married ʳᶜ			
Living together	.72** (0.32)	0.10	1.36
Divorced/separated	-18.51 (1848.61)	-3641.73	3604.71
Windowed	15.97 (1307.17)	-2546.03	2577.98
Level of Mother education			
No fomal education ʳᶜ			
Read and write only	16.85 (1165.23)	-2266.97	2300.67
Primary	16.85 (967.68)	-1879.76	1913.46
Secondary	1.65*** (0.34)	0.99	2.30
College and above	2.40*** (0.41)	1.59	3.20
Household Monthly income	0.0004*** (0.00009)	0.0002	0.0006
Birth order	0.97*** (0.24)	0.50	1.44
Sex of child			
Male ʳᶜ			
Female	0.93*** (0.30)	0.35	1.51
Birth interval	0.38*** (0.12)	0.15	0.61
Vaccination			
Yes ʳᶜ			
No	-1.90*** (0.36)	-2.59	-1.17
Currently breast feeding			
Yes ʳᶜ			
No	-0.48* (0.28)	-1.02	0.06
Exclusive breast feeding			
Yes ʳᶜ			
No	1.87*** (0.31)	1.26	2.48

Table 17: Bivariate Analysis Result Stunting in Bishoftu town, Oromia, Ethiopia, 2019, (N = 410). **Note:** ***significant at 1%, **significant at 5% * significant at 10%, unmarked not significant; RC: Reference Category; the number in the bracket indicates Standard error; CI: Confidence Interval.

Multivariate logistic regression analysis

Multivariate logistic regression analysis was conducted to identify the independent predictor variables that affect child malnutrition. All explanatory variables up to 10% level of significance in the bivariate analysis were analysed in the multivariate model to find out the imperative determinants of child malnutrition. The table below shows the estimated coefficients of explanatory variables along with the 95% confidence interval.

4. DISCUSSION

Multivariate analysis

In multivariable analysis displayed in (Table 18 - Table 20) above table the multivariate analysis was identified Family size, Birth interval, Child age and Frequency of breast feed as significant determinants for wasting. While for stunting, family size, level of mother's education, birth order, currently breast feeding, exclusive breast feeding and monthly income were found as independent and statistically significant determinants. Additionally, age of child and household who hadn't got advice and not visited by health extension workers was found statistically significant determinants of underweight.

Independent Variables	Coefficient	95%CI	
Family size	−2.73** (1.16)	-5.01	-0.45
Birth interval	4.46** (1.97)	0.59	8.32
Child age	−0.56** (0.23)	-1.02	-0.11
Vitamin A supplements			
Yes ʳᶜ			
No	-3.82 (3.70)	-11.08	3.44
Frequency of breast feed in the last 24 hour	2.47* (1.40)	-0.29	5.22
Providing enough cow's milk			
Yes ʳᶜ			
No	-0.56 (3.42)	-7.28	6.15

Table 18: Multivariate Analysis Result Wasting in Bishoftu town, Oromia, Ethiopia, 2019, (N = 410). Note: ***significant at 1%, **significant at 5%*, significant at 10%, unmarked not significant; *RC:* Reference Category; the number in the bracket indicates Standard error; CI: Confidence Interval.

Independent Variables	Coefficient	95%CI	
No of children under five	-1.33(0.35)	-8.3	0.56
Mothers age	-006(0.042)	-0.09	0.08
Total number of children	0.47(0.33)	-1.11	0.17
Birth interval	0.10(0.21)	-0.31	0.52
Birth order	-0.34(0.35)	-1.02	0.34
Children age	-0.2**(0.01)	-0.05	-0.005
Number of visit by extension workers	-0.58**-(0.47)	-1.11	-0.05

Table 19: Multivariate Analysis. **Note:** ***significant at 1%, **significant at 5% *significant at 10%, unmarked not significant; RC: Reference Category; the number in the bracket indicates Standard error; CI: Confidence Interval.

Independent Variables	Coefficient	95%CI	
Family size	2.30*** (0.45)	1.41	3.19
Level of Mother education			
Nofomal education [rc]			
Read and write only	22.00 (1992.48)	-3883.20	3927.17
Primary	16.08 (1322.03)	-2575.05	2607.20
Secondary	5.80*** (0.99)	3.86	7.74
College and above	5.08*** (1.22)	2.69	7.48
Household Monthly income	0.00037** (0.00017)	0.00003	0.0007
Birth interval	2.26** (1.10)	0.11	4.41
Sex of child			
Male [rc]			
Female	0.87 (0.71)	-0.53	2.27
Vaccination			
Yes [rc]			
No	-2.70 (2.31)	-7.24	1.83
Currently breast feeding			
Yes [rc]			
No	−3.15*** (0.60)	-4.34	-1.97
Exclusive breast feeding			
Yes [rc]			
No	2.80*** (0.61)	1.61	4.00

Table 20: Multivariate analysis result stunting in Bishoftu town, Oromia, Ethiopia, 2019, (N = 410).

Multivariate analysis result wasting

Family size

The study findings show that the higher family numbers in the household, the greater the chance of being wasted. However, the result is significant only at 5% significance level. This might be the care and treatment decrease as the family number increases in the household. This finding is consistent with previous studies of which found rather than household family size number was critical and significant determinant in aggravating wasting.

Birth interval

The birth interval of child is found to be a statistically significant determinant of wasting. The positive coefficient indicates relationship that's as birth interval of child increase the child has high probability of being wasted at 5% significance level. This result is in harmony with finding of which found birth interval was the most important positive determinants of children nutritional status in Ethiopia.

Child age

Unexpectedly, this result revealed that age of child had a negative coefficient and significant at 5%. This implies that as age of the child increases the child has less risk of being wasted. This result is similarity with previous studies of [17,18] which revealed that the risk of being wasting to be decrease as the age of a child increase. It might be because of wasting is a cumulative effect of short term food deficient, care and exposure to acute diseases.

Frequency of breast feeding

Wasting is also influenced by frequency of breast feeding with a statistically 10% significant positive coefficient indicating children from a less frequently breast fed has higher likelihood of being wasted compared to those high frequency of breast feeding. This finding is similar to previous studies of [19,20] showed that less frequently of breast feeding children was the significantly determinant of wasting.

Multivariate analysis result underweight

Age of child

The finding showed that the probability of child to be underweight is significantly higher among children who are relatively low age. In particular, as child age increases the probability of being normal in nutrition status among under-five children increases. This implies that as age of the child increases the child has less risk of being underweight. This result is similarity with previous studies of [17,18] which revealed that the risk of being underweight to be not increased as the age of a child increase.

Number of visit by health extension workers

The regression result revealed that limited access to information on child care and feeding practices was negatively and significantly associated with underweight at 5% level of significance. This implies that as number of visit with health extension workers increases the child has less risk of being underweight. This result is similarly with

[21] which revealed that the risk of being underweight to be not increased as the number of visit by health extension workers. Moreover, health extension workers assigned to the study area expected to provide basic knowledge and skill on improved child nutrition for the communities under study. However, the FGD respondents indicated that although there were some attempts made to improve our awareness on how to care and feed our children especially through health extension workers, it was adequate and we have access to get adequate awareness creation and knowledge disseminations conducted through health extension workers to improve our knowledge on child care and breast feeding practices.

Multivariate analysis result stunting

Family size

The study findings show that the higher family numbers in the household, the greater the chance of being stunted. However, the result is significant only at 1% significance level. This might be the care and treatment decrease as the family number increases in the household. This finding is consistent with previous studies of which found rather than household family size number was critical and significant determinant in aggravating stunting.

Mother's education

This study demonstrated that there is significant association between mother's education and stunting. The level of significance increased with level of education. Children whose mother's education level at secondary and college level and above had positively associated with stunting at 1% significance level. This finding is in line with study results obtained by [22] which found out children from mother which has higher education level attainment was less chance to be being stunted. The direct relationship of mother's education and stunting could be explained that educated mothers are more conscious about their children's health; child nutrition, and they tend to look after their children in a better way.

Monthly income

Stunting is also influenced by household monthly income with a statistically 5% significant positive coefficient indicating children from a household with less monthly income has higher likelihood of being stunted compared to those household higher monthly income. This finding is similar to previous studies of [19] showed that the monthly family income was the significantly determinant of stunting.

Birth interval

The birth interval of child is found to be a statistically significant determinant of stunting. The positive coefficient indicates direct relationship that's as birth interval of child increase the child has probability of being stunted at 5% significance level. This result is in harmony with finding of which found birth interval was the most important determinants of children nutritional status in Ethiopia.

Currently breast feeding

Currently breastfeeding showed an effect on being stunted with a statistically 1% significant negative coefficient indicating children who were not fed breast currently were not likely being stunted compared to those children who fed breast currently. Similar finding was reported by [18] which revealed that the risk of being not currently breastfeeding practice was not associated with stunting. It might be because of stunting is a cumulative effect of long term food deficient, care and exposure to chronic diseases.

Exclusive breastfeeding

Not exclusive breastfeeding showed an effect on being stunted with a statistically 1% significant positive coefficient indicating children who were not fed breast exclusively were more likely being stunted compared to those children who fed breast exclusively. Similar finding was reported by [19] not exclusive breastfeeding practice was greatly associated with stunting.

5. CONCLUSION

It was indicated in this study that prevalence of malnutrition manifested by incongruity of weight for age that means underweight is significantly influenced by the number of under five years old children with in a household maternal age, total number of children, birth interval, children's age and the rate of recurrence of advice visit of health extension workers. The study made sure out that the power of infections such as diarrhoea, respiratory diseases, measles, fever, cough and vomiting in rising malnutrition, was decisive factor. Inadequate dietary diversity intake and disease has been found the leading factors that were push children to be more vulnerable to malnutrition. The role of health extension workers in creating awareness on mothers or caretaker towards generating conducive and preventive environment in order to avoid the immediate causes of malnutrition provision of proper foods, health care has not been found at the expected in this study this in turn can contribute to increase the prevalence of malnutrition. Health extension workers should enhance their effort of advising and supervising each household with a special focus on eradicating the prevalence malnutrition and its causes. An introduction and provision of weaning foods for severely malnourished children and children from less income family will have a vital importance by Public Health Centres and other NGOs.

REFERENCES

1. WHO (2015) Indicators for assessing infant and young child feeding practices: (Part 1) Conclusions of a consensus meeting held in Washington DC, USA.

2. Asfaw M, Wondaferash M, Taha M, et al. (2015) Prevalence of undernutrition and associated factors among children aged between six to fifty nine months in Bule Hora district, South Ethiopia. BMC Public Health 15(1): 38-41.

3. WHO (2016) Strengthening action to improve feeding of infants and young children 6-23 months of age in nutrition and child health programmes: Report of proceedings; Geneva.

4. Rayhan MI, Khan MSH (2006) Factors causing malnutrition among under five children in Bangladesh. Pakistan Journal of Nutrition 5(6): 558-562.

5. Glewwe P and Miguel EA (2007) The impact of child health and nutrition on education in less developed countries. In: Paul Schultz T, John S (Eds.). Hand book of Development Economics. Oxford: Elsevier BV: 3561-3606.

6. Joosten KF and Hulst JM (2008) Prevalence of malnutrition in pediatric hospital patients. Current Opinion in Pediatrics 20(5): 590-596.

7. Aberash T (2014) Relationship between household food security and nutritional status of children under five in Tigrai: The case of Klteawlaelo, Tigrai, Ethiopia. St. Mary's University.

8. UNICEF (2016) Strategy for improved nutrition of children and women in developing countries.

9. UNICEF (2013) Improving child nutrition: The achievable imperative for global progress, United Nations Children's Fund.

10. UNICEF (2013) Improving child malnutrition. Achievable imperative for global progress. New York.

11. CSA (2011) Ethiopia demographic and health survey (EDHS), Addis Ababa, Ethiopia.

12. Lutter CK, Rivera JA (2003) Nutritional status of infants and young children and characteristics of their diets. The Journal of Nutrition 133(9): 2941S-2949S.

13. Haile A, Amboma TA (2018) Children's nutritional status and its determinants in small towns, Sebeta Hawas district, Oromia, Ethiopia. Journal of Food Science and Nutrition 1(1): 33-47.

14. CSA (2014) Ethiopia minidemographic and health survey (EDHS), Addis Ababa, Ethiopia.

15. Zewdie T and Abebaw D (2013) Determinants of child malnutrition: empirical evidence from Kombolcha District of Eastern Hararghe Zone, Ethiopia. Quarterly Journal of International Agriculture 52(892-2016-65185): 357-372.

16. Mengistu K, Alemu K, Destaw B (2013) Prevalence of Malnutrition and Associated Factors Among Children Aged 6-59 Months at Hidabu Abote District, North Shewa, Oromia Regional State. Journal of Nutritional Disorders & Therapy T1: 1-15.

17. Betebo B, Ejajo T, Alemseged F, et al. (2017) Household food insecurity and its association with nutritional status of children 6–59 months of age in east Badawacho District, south Ethiopia. Journal of environmental and public health: 17.

18. Teshome B, Kogi-Makau W, Getahun Z, et al. (2009) Magnitude and determinants of stunting in children underfive years of age in food surplus region of Ethiopia: the case of West Gojam zone. Ethiopian Journal of Health Development 23(2): 98-106.

19. Roy RK, Matubbar MS, Kamruzzaman M, et al. (2015) Determination of nutritional status of under-five year children employing multiple interrelated contributing factors in southern part of Bangladesh. International Journal of Nutrition and Food Sciences 4(3): 264-272.

20. Takele K (2013) Semi-parametric analysis of children nutritional status in Ethiopia. International Journal of Statistics and Applications 3: 5-141.

21. Liben ML, Abuhay T, Haile Y (2016) Determinants of child malnutrition among agro pastorals in northeastern Ethiopia: A cross-sectional study. Health Science Journal 10(4): 1.

22. Brhane G, Regassa N (2014) Nutritional status of children under five years of age in Shire Indaselassie, North Ethiopia: Examining the prevalence and risk factors. Kontakt 16(3): e161-e170.