

# Complementary Feeding Knowledge of Mother and Nutritional Status of Infant/Young Children (6-23 Months) in Ethiopia

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**Abstract:** Improving infant and young child feeding practices in children aged 6–23 months is critical to improved nutrition, health, and development. This paper examined the complementary feeding knowledge, attitude and practice of mothers and nutritional status of infants/young children in Jima Ganati District employing the cross sectional survey data conducted among 353 mothers of children aged 6-23 months. The result from the logit regression Education levels of mothers, age of mothers and mother occupation had a significant effect on mothers' complementary feeding knowledge, attitude and nutritional status of infants/young children. In this study 54.6%, 60.4% and 34.6% of mothers had good knowledge, attitude and practice on complementary feeding respectively. The prevalence of stunting, underweight and wasting of the infants/young children was 22.1%, 25.3% and 10.6% respectively.

**Keywords:** Complementary Feeding, Knowledge, Attitude, Practice, Nutritional Status

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## 1. Introduction

The period for complementary feeding is crucial for growth, development and overall health of infants and young children. Globally, 60% of the infant and young child deaths occurs due to inappropriate infant feeding practices and infectious disease were two thirds of these deaths are attribute to sub-optimal breast feeding practices [1]. Only 35% of infants world-wide are exclusively breastfed during the first four months of life and complementary feeding begins either too late with foods which are often nutritionally inadequate and unsafe [6]. It is estimated that over 7 million children under the age of five die each year in sub-Saharan Africa due to poor feeding practices. Poor infant feeding practices are known to have adverse consequences on the health and nutritional status of children, which in turn have consequences on the development of the child both physically and mentally [1, 10].

In Ethiopia almost 70% of the infants were reported to sub-optimally breastfed and 24% of death among infants was attributed to poor and inappropriate breastfeeding practices. According to 2011 EDHS, at six months of age

49% of infants/young children were timely initiate complementary feeding. Although breastfeeding is most common in Ethiopia large numbers of mothers, do not practice appropriate breastfeeding and complementary feeding recommendations. Recent report revealed that 27% of the mothers early offer water, butter and various types of food to nourish their children, thus reducing the percentage of exclusively breastfed and increasing the percentage of receiving complementary food at very young age [9]. 52% of infants started breastfeeding with one hour of birth and exclusive breastfeeding during first six months [3]. In Ethiopia, 66.3% of the mothers/caregivers knew that they should breastfeed for at least two or more years [3, 11]. Although, studies have documented the behavior of the mothers/caregivers in the other Regions of Ethiopia, such studies are scanty on pastoralist community and in this specific area; no such study has been conducted. Therefore, this study was designed to examine complementary feeding knowledge, attitude and practices of mothers/caregivers and nutritional status of infants in Jima Ganati district, Western, Ethiopia.

*Rationale of Study*

In Ethiopia malnutrition is the major cause of child mortality (58%). Almost 70% of the infants were reported to sub-optimally breastfed and 24% of deaths among infants were attributed to poor and inappropriate breastfeeding practices. Although breastfeeding is most common in Ethiopia large numbers of mothers, do not practices appropriate breastfeeding and complementary feeding recommendations. These are largely due to lack of knowledge how to feed properly and food insecurity. recent report revealed that 27% of the mothers early offer water, butter and various types of food to nourish their children, thus reducing the percentage of exclusively breastfeed and increasing the percentage of receiving complementary food at very young age [3], [8] and [9]. A community based cross sectional study conducted in east Ethiopia showed that the rate of early initiation of complementary feeding practice infants age less than six months was 28.3% [14].

Wide range of harmful infants and young children feeding practices were documented in Ethiopia. According [3], 52% of infants started breastfeeding with one hour of birth and exclusive breastfeeding during first six months. About (49%) of children 6-8 months consumed solid, or soft foods and 5% of children were fed minimum dietary diversity and 4% of children fed minimum meal frequency per day while 96% of children continued breast feeding at one year, and 82% continued at 2 year. only 4% of children 6-23 months living with mothers are fed in accordance with IYCF practices and 66% of children under the age of two receive age-appropriate breastfeeding. To improve appropriate complementary feeding knowledge, attitude and practices of mothers and national status of infants/young children factors influencing have to be identified in order to target these in program implementation.

In developing countries, empirical researches on estimating determinants of complementary feeding knowledge, attitude and practices of mothers and national status of infants/young children are too scarce. Similarly in Ethiopia, empirical studies on the areas of complementary feeding knowledge and practices of mothers and nutritional status of infants/young children are not extensive. To the best of my knowledge, no similar studies had been conducted so far in the same topic of this study. Therefore, to fill the above gaps and to add stock of knowledge in review of literature this study brought new estimates of determinants of complementary feeding knowledge, attitude and practices of mothers and national status of infants/young children.

## 2. Literature Review

### 2.1. Overview of Complementary Feeding

Complementary feeding is extremely essential and typically covers the period from 6 to 24 months of age. Well over two-thirds of these deaths, which are often associated with inappropriate feeding practices, occur during the first year of life. In developing countries, efforts to promote sound infant and young child nutrition are based on the World

Health Assembly's (WHA) recommendation that infants should be breastfed exclusively for the first 6 months of life and fed appropriate complementary foods from about the age of 6 months, with continued breastfeeding and frequent feeding with safe and adequate amounts of local foods[7]. A mother's complementary feeding practices are determined by a number of factors often out of her immediate control including local water and food availability and accessibility, employment, and environmental conditions. Knowledge of appropriate timing of introduction of foods and types of foods is another factor often complicated by lack of resources. Infants express hunger, satiety, and preferred feeding methods through a variety of behaviors from which a mother acts upon according to her interpretation. Infants do not necessarily have the capability to choose which types of foods and beverages they should consume; this responsibility usually lies with the mother [4] and [11].

### 2.2. Empirical Studies on Complementary Feeding on Infants/Young Children

Studies concluded that single mothers were less likely to breastfeed and complementary feeding adequately and longer due to absence of partners' support and confidence compared with married mothers [13]. Greater household income and assets directly raise the ability to purchase sufficient quantities of nutritious foods, clean water, clothing, adequately-ventilated housing, fuel for proper cooking, safe storage of food, personal hygiene items, and health services [5] and [14]. Young mothers were more likely to have malnourished children than the elder mother. This can be associated with the experience the mother has had and lack of social support system for the young mothers associated with urbanization. The study conducted at Nairobi, Kenya indicated that mothers that were engaged in full time or casual work were associated with improper complementary feeding and care of their infants/young children [6]. In early infancy there were virtually no differences between boys and girls in most of the countries studied. In Ethiopia, 57% of all under-five deaths are highly associated with abrupt cessation of breastfeeding and infectious diseases, but it is closely linked to gap of knowledge on how to feed appropriately [4].

Risks of giving complementary foods early:

1. A child does not need food yet, and they may displace breast milk.
2. As a consequence the mother produces less milk and later it may more difficult to meet the child's nutritional needs.
3. A child receive less of the protective factors in breast milk, so the risks of illness increases;
4. risks of diarrhea also increases because complementary food may not be clean as breast milk.
5. The complementary foods given are usually watery porridges or soups because they are easy for babies to eat. These foods fill the stomach but provide fewer nutrients breast milk.
6. Mothers are at greater risks to get pregnant if they

breastfeed less frequently.

7. Probably increases the risks of topic diseases and type I diabetes mellitus.
8. Risks of giving complementary foods too late:
9. A child does not get the extra energy and nutrients needed.
10. A child stops growing slowly.
11. Increase the risks of malnutrition or micronutrient deficiencies.

Source:(PAHO/WHO, 2003) Guiding principles for complementary feeding of the breastfed child.

### 3. Methods and Materials

#### 3.1. Description of the Study Area

JimmaGeneti is one of the 10 Districts found in HoroGuduruWollega Zone and is located to the southern part of the zone, at 27 km to the south of Shambu town, capital city of the zone and 314 km from Addis Ababa, capital city of the country. It is sub-divided in to 12 farmer associations and 2 towns for its administrative purpose. The Geographically the district is bordered by;In the south by East wollega Zone, In south west by East welega Zone, In the West by Horo district, In the North west by Horo and In the east by Gudurudistrict. In the east south by Jimma Rare district.

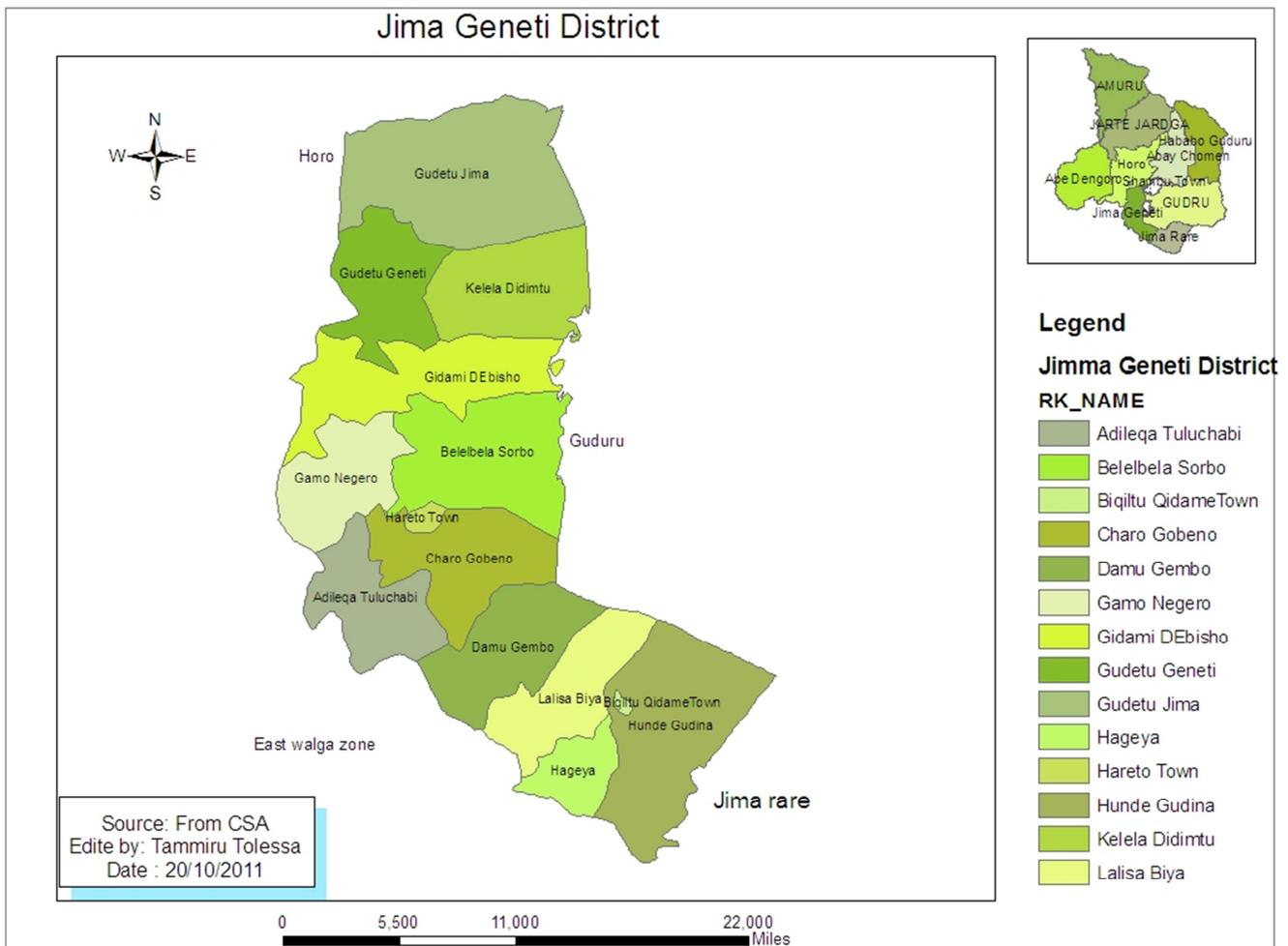


Figure 1. Map of the study area.

The altitude range of the district is from 1900m to 3000m above sea level. The District is situated at an altitude 1900m above sea level and the dominant climatic condition is sub-tropical climate type. The mean annual rain fall of the District is about 1600mm-2000mm and has a mean annual temperature between 15°C and 20°C (degree Celsius). Estimated total population in 2016 is 91,078 projected based on 2015 census. From this about 80,331 of the district's population are settled in rural and only 10,747 live in urban areas [2].

#### 3.2. Study Period and Study Designs

The study was conducted from February to August 30, 2018. A community based cross sectional study design was employed. Semi-structured interview and questionnaires were used to collect information in the area of socio-demographic, knowledge, attitudes and practices towards young children complementary feeding was obtained from caregivers/mothers and nutritional status of infants/young

children was employed to identify wasting and stunting of the child.

**3.3. Source of Population**

All mothers living in Jima Ganati who have young children aged 6-23 months were considered as the source of population.

**3.4. Inclusion Criteria and Exclusion Criteria**

The study participants were mothers who have child in age group from 6-23 months old and who have lived in the study area. The exclusion criteria for the study will be mothers/caregivers who were critically ill and have hearing impairment in study area. People who are not resident, family who are not volunteer and who have no infants were excluded from the data.

**3.5. Sample Size Determination**

The sample size of the study was determined by considering the following assumptions: the proportion of mothers who inappropriately complementarily feed their children to be 31% with marginal error, 95% confidence

interval, and 10% is a non-response rate. So, the following formula was used to decide the sample size [3].

$$n = \frac{(Z\alpha/2)^2 \cdot p \cdot q}{d^2}$$

Where; n = sample size

Z $\alpha/2$  = Value corresponding to a 95% level of significant = 1.96; d = margin of error (5% = 0.05)

p = Expected proportion of practices of mothers on, IYCF=31%=0.31

q = 1-p and hence, q = 0.69

$$n = \frac{(1.96)^2 \times 0.31 \times 0.69}{(0.05)^2} = 329 + (10\% \text{ none response rate})$$

$$n = 329 + 33 = 362$$

**3.6. Sampling Techniques**

The Woreda has 12 kebeles and 2 towns and five kebeles were selected purposefully; from each kebele the mothers who have children between age of 6-23 months were selected by lottery method. From five kebeles (n=1267).

*Table 1. Sampling distribution for each Kebele.*

Lalisa Biya	Gidami Dabsho	Gudatu Jima	Kalala Didimtu	Gamo Nagaro Total
n=189	n=300	n=295	n=283	n=200
67	96	72	70	57362

**3.7. Method of Data Analysis**

Raw data was cleaned, coded and entered into the computer using Stata Software. Both descriptive statistics and binary logit model were used to investigate the relationship between mothers' knowledge, attitude, practice of mothers, on complementary feeding and child nutritional status of child's. Measures of height in centimeters (to the nearest 0.1cm) and weight in kilograms to (the nearest 0.1kg) for every child were taken using a weighing scale with an attached height meter (Seca) provided at the Alibo health centers and from selected kebeles' health extension office. These measures of height and weight were done with the child standing with light clothing, facing away from the scale and a child who was not stand by their self laid on their back according to the standard protocol. The measures of height and weight were recorded on the questionnaire and used to calculate by statistical method. The derivation of the logit model begins from the linear probability model of the form:

$$P(y | x) = Z_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k \tag{1}$$

$$P_i = \frac{e^{z_i}}{1 + e^{z_i}} \tag{2}$$

Where, P<sub>i</sub> is the probability that the i<sup>th</sup> woman will have complementary feeding knowledge, z<sub>i</sub> is a linear function of n explanatory variables (x) and will be expressed as:

$$Z_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k + u_i \tag{3}$$

Where,  $\beta_0$  - intercept,  $\beta_i$  - regression coefficients to estimate, U<sub>i</sub> - is an error term.

$$1 - P_i = \frac{1}{1 + e^{z_i}} \tag{4}$$

Where 1 - P<sub>i</sub> is the probability that a woman will not have complementary feeding knowledge.

$$\left( \frac{P_i}{1 - P_i} \right) = \left( 1 + \frac{e^{z_i}}{1 + e^{-z_i}} \right) = e^{(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k)} \tag{5}$$

This is known as Odds ratio. Taking the natural logarithm of the Odds ratio, the logit model is:

$$L_i = \ln \left[ \frac{P_i}{1 - P_i} \right] = \ln e^{(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k)} = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k \tag{6}$$

Where x<sub>1</sub>, x<sub>2</sub>, x<sub>k</sub> are demographic, social, knowledge, attitude, practice and nutritional status factors which will be

included in the above econometric model.

## 4. Discussion

### 4.1. Descriptive and Inferential Analysis

Out of 362 mothers who were eligible for the study 353 mothers were volunteer to participate and 9(2.55%) refused to participate the nine dropouts due to sick of mothers and infants. The response rate was 97.5%. As showed in table 1, the age of mother considered in the study was (15-49) years.

This is a child bearing age. Out of 353 children participated in the study 123 (34.8%) were males and 230 (65.2%) were females. When the young children grouped according to their age 173(49%), 106(30.1%) and 74(20.9%) were 6-12, 13-18 and 19-23 months respectively. Of total mothers' interviewed most of them; 197 (55.8%) were aged 21-30 followed by 73 (20.6%) aged 31-40 years, 68(19.3%) were 15-20 aged, the rest 15(4.2%) morethan 41 years old respectively.

*Table 2. Shows the socio demographic characteristics of the selected kebelesin the study area.*

Variables	category	Frequency	Percents
Age of infants	6-12 Months	173	49
	13-18 months	106	30.1
	19-23 months	74	20.9
	Total	353	100
Sex of infants	Male	123	34.8
	Female	230	65.2
Age of mothers	Total	353	100
	15-20	68	19.3
	21-30	197	55.8
	31-40	73	20.6
	≥41	15	4.2
Marital status	Total	353	100
	Married	315	89.2
	Divorced	21	5.9
	Widowed	13	3.8
	Single	4	1.1
Religion	Total	353	100
	Orthodox	116	32.7
	Protestant	211	59.8
	Muslim	17	4.8
	Others	9	2.7
Ethnicity	Total	353	100
	Oromo	325	92.9
	Amhara	25	7.1
	Others	3	0.8
Mother's occupation	Total	353	100
	Housewife only	232	65.7
	Merchant	22	6.2
	Daily labor	25	7.1
	Government employee	59	16.7
	Other	15	4.2
Husband's occupation	Total	353	100
	Farmer	242	68.6
	Government employee	60	16.9
	Merchant	42	11.9
Current Residence	Others	9	2.5
	Total	353	100
	Urban	118	33.4
Monthly income	Rural	235	66.6
	Total	353	100
	Less than 1000 birr	91	25.8
	2000 birr	195	55.22
	Greater than 3000 birr	67	18.98
Family size	Total	353	100
	3	40	11.3
	4	83	24.1
	5 and Greater than 5	230	64.6
Relation to child/infant	Total	353	100
	Mother	339	96
	Grandmother	9	2.6
	Other	5	1.4
	Total	353	100
Mothers educational level	Categories	Frequencies	percent
	No education	93	26.3
	Read and write	80	22.7

Variables	category	Frequency	Percents
Husband educational level	Primary school	125	35.4
	Secondary school & above	55	15.6
	Total	353	100
	No education	80	26.9
	Read and write	145	39.4
	Primary & secondary school	71	17.6
	≥Secondary school	57	16.1
	Total	353	100

The finding of these study identified that 235(66.6%) of house hold had more than five of family members. Around 118(33.4%) of house hold contained <5 (five) family members. Majority of the respondents 232(65.7%) were house wife and most residences 235(66.6%) of the respondents were rural. As in table 2 showed out of 353 of

respondents 238 (67.4%) knew and correctly answered the meaning of complementary feeding and 115 (32.6%) of the respondents did not know the meaning of complementary feeding. 184(52.1%) of the respondents knew about the main food groups.

**Table 3.** Assessing of mothers/ caregivers knowledge towards complementary feeding for infants/Young children.

Variable	Frequency		percent		Total
	Yes	No	Yes	No	
Know correct definition of Complementary Feeding.	238	115	67.4	32.6	353(100%)
Knowledge about food staff/balance diet.	184	169	52.1	47.9	353(100%)
Knowledge about source of protein.	198	155	56.1	43.9	353(100%)
Knowledge about CF start.	211	142	59.8	40.2	353(100%)
Knowledge about carbohydrate	197	156	55.8	44.2	353(100%)
Knowledge about inappropriate CF	216	137	61.2	38.8	353(100%)
Knowledge about any food rich in vitamin	187	166	53	47	353(100%)
Knowledge about starting CF too late risk	288	65	81.6	18.4	353(100%)
Knowledge about merit of preparing foods from different crops.	228	125	64.6	35.4	353(100%)
Knowledge about the food that contain minerals like I, Fe, etc	163	190	46.2	53.8	353(100%)
Overall level of knowledge	Frequency		Percent		
Good	205		58.1		
poor	148		41.9		
Total	353		100		

Inappropriate feeding practices and low quality complementary foods are as significant cause of the higher burden of the child under nutrition worldwide [12]. Majority of the respondents 228(64.6%) had knowledge about advantage of preparing foods from different crops and 125(35.4%) had no knowledge on Variety/different foods giving for infants/young children. In general, the knowledge assessing this study pointed out (59.8%) of the respondents were found to be with good knowledge about complementary

feeding for infant/young children.

As in table 3 presented 246 (69.7%) of the respondents agreed about the risks of starting complementary feeding too late on child and 107 (30.3%) did not agree. It is good to give breast milk up to six month as explained by 195 (55.2%) of the respondents but, 158(44.8%) of the respondents had negative attitude on it. According to 213(60.3%) of the respondents inadequate complementary food intake affects health and 140(39.7%) respondents disagree on it.

#### 4.2. Results of Binary Logit Model Onfactors Affecting Knowledge of Mother on Complementary Feeding

**Table 4.** Result of Logistic regression and Marginal Effects after Logit.

Knowledge of mother on Complementary feeding	Logit estimation				Marginal Effects	
	Coef	Std. Err.	z	P> z	Std. Err.	Dy/dx
Age of mother	2.04068***	0.622824	2.28	0.001	0.12192	0.47003
Education level of mother	0.86379***	0.767502	1.13	0.000	0.18584	0.42603
Educational level of the husband	-1.61646	0.778102	-1.08	0.138	0.17085	-0.37858
Monthly income	2.58652***	0.734339	3.52	0.000	0.11366	6.56321
Family size	-0.4919***	0.411724	-3.19	0.000	0.10013	0.115555
Employment status of mother	-0.02514**	0.011357	-2.21	0.027	0.00255	-0.3567
Marital status of	-0.09406	0.034191	-2.75	0.216	0.00772	0.1212
Religion	-0.00882	0.066262	-0.13	0.894	0.01493	-0.00199
cons	0.855075	1.460527	0.49	0.000		

Source: From survey data (2018).

\*\*\*, \*\* shows significance levels at 1% and 5%.

Age coefficient is significant at 1% significance level influencing mothers's complementary feeding knowledge

positively. A one year increase in age of a mother has a more probability to get knowledge on complementary feeding. As age of the mother increases by one year, the probability of getting knowledge on complementary feeding increases by 0.47% marginal effect, holding other variables constant. The coefficient on the family size is significant at 1% significance level with negative sign. It puts forward that a mother who has more number of families is less likely to have good knowledge on complementary feeding as compared to a mother who has lesser number of families. Its marginal effect shows that one additional family member to a family will reduce the likelihood of a mother's to knowledge by 4.49% marginal effect, holding other factors constant.

The coefficient on the education level of mother is significant at 1% level of significance with positive sign. This shows that another with more years of schooling is more likely to complementary feeding knowledge as compared to those with less years of schooling. Its marginal effect shows that one additional year of schooling of a mother will increase the probability (the likelihood) of the complementary feeding knowledge by 0.426% marginal effect, holding other factors constant. Similarly, another who has more monthly income is more likely to have complementary feeding knowledge as compared to those who do have less monthly income. A complementary feeding knowledge for a

mother who has more monthly income increases by 65.60% marginal effect, holding other factors constant. The coefficient on the employment status of mother is significant at 5% level of significance with negative sign. It puts forward that an employed mother is busier to give care for her child as compared to unemployed mother. A complementary feeding knowledge for an employed mother decreases by 0.356% marginal effect, holding other factors constant.

#### 4.3. Nutritional Status of Infant/Young Children (6-23) Months

The nutritional status of infants/young children weight for age was measured by kilogram (kg), nearest to 0.1kg and height for age measured by centimeter (cm), nearest to 0.1cm. Anthropometric data weight and height of 6-23 months children was taken and used in the evaluation of the nutritional status of the children. The nutritional status of children was measured by Height for-age to determine how the child was stunted and Weight-for-age, to compare the weight of the child with the weight of a healthy reference child of the same age times hundred based on WHO Growth standards classification to determine overweight and underweight of the child.

*Table 5. Anthropometric measurement of children 6-23 months in Jima Ganati Woreda 2018.*

Variable	Range	Category	Frequency	Percent
Height for age	>95	Normal	285	80.6
	<95	Stunted	68	19.4
		Total	353	100
Weight for age	>110	Overweight	10	2.9
	90-110	Normal	265	75
	<90	Underweight	78	22.1
		Total	353	100
Weight for height	>90	Normal height	323	91.5
	<90	Wasted	30	8.5
		Total	353	100

## 5. Conclusion

The study was conducted on complementary feeding knowledge, of mothers/ caregivers and nutritional status of infants in Jima Ganatiworeda, Horo Guduru Wollega zone, Ethiopia. Based on the present study, it can be concluded that the highest respondents (39.4%) were without formal education where as the lowest respondents (16.1%) have completed secondary school and above level of education. This finding showed that (69.4%) of the respondents started complementary food at 6-8 months age of their child. In binary logit output, educational level of mothers, family size and mother's monthly income are all affecting complementary feeding knowledge of mothers significantly and positively. This study revealed that low income families have the highest rates of wasting and stunting. Based on the findings of the study, the following recommendations are made:

Need to expand a program which links nutrition

interventions and social protection in low income urban communities in order to reach young children.

Need to plan nutrition interventions to effectively address the nutritional conditions with Participation of stakeholders and community at large.

Strengthen and integrate counseling of mothers on appropriate child feeding knowledge by providing training on infant feeding and feeding options recommended to the children.

Need to increase awareness about family planning especially its importance for optimal growth of children in the community.

Need to give nutrition education for the community about maternal and child nutrition to accelerate prevention of stunting by focusing the most critical periods of child development.

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