

Knowledge and Practices of Complementary Feeding Among Mothers/Caregivers of Children Age 6 to 23 Months in Horo Woreda, Horo Guduru Wollega Zone, Oromia Region, Ethiopia

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Abstract

An appropriate diet is a critical component for proper growth and development of children. Complementary feeding for children is not commonly well practiced in developing countries like Ethiopia, especially for the rural communities. Therefore, this study was designed to assess knowledge and practices of complementary feeding among mothers/caregivers of children age 6 to 23 months in Horo Woreda./ caregivers. Dietary diversity score was assessed using a 24-hour recall method. Binary logistic regression was carried out to see the variables that associated with complementary feeding practices by using SPSS version 20.0. A P value <0.05 was considered as statistically significant. About 40% of mothers/ caregivers initiated timely complementary feeding while 60% mothers/caregivers did not. Additionally, a high proportion (65.80%) of the study participants had low dietary diversity score and 34.20% had minimum dietary diversity score. Mothers who had education status of primary school were 66.7% less likely to initiate complementary feeding compared to those mothers/caregivers who had the educational status of high school and above (COR=0.333(95%CI=0.56 up to 0.712). In addition to these mothers/caregivers who had one child were 1.73 more likely to initiate complementary feeding compared to who had two and above (COR=1.73;95CF=1.02-2.974). The results indicated that more than half the caregivers in the study area not timely initiated complementary feeding. A high percentage of children also didn't get minimum dietary diversity score. Therefore, nutrition education should be given to communities to improve the knowledge, attitude, and practices of mothers/caregivers towards complementary feeding and dietary diversity score.

Keywords: Complementary feeding, Caregivers; Children, Practices, Knowledge.

Introduction

Malnutrition remains one of the main public health problems in Ethiopia contributing to 53% of infant and child mortality [1]. An appropriate diet is a critical component for proper growth and development of children [2]. The first two years of life are a critical window for ensuring optimal child growth and development [3]. Initiate safe and nutritionally adequate complementary foods at 6 months is crucial to achieving optimal growth, health development of an infant [4]. Nutritional deficiencies during this period can lead to impaired cognitive development, compromised educational achievement and low economic productivity which become difficult to reverse later in life [3,5]. Improving infant and young child feeding practices in children

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0-23 months of age is, therefore, critical to improved nutrition, health and development [6].

Complementary feeding is the period during which a young child's diet is expanded and its dependence on milk as the unique source of nutrition is ended. It is important for to introduce solid foods at the age of six months. Reasons for this are that, apart from the fact that solid foods provide in increased nutrient to complete daily needs, it might then be difficult for the baby to accept the new tastes and textures of food later in life [7]. The world health organization has defined complementary feeding period as the period during which other foods or liquids are provided along with breast milk and any nutrient containing foods or liquids given to young children [8]. Optimal infant and young child feeding have a single greatest potential impact on child survival. Complementary feeding interventions alone were estimated to prevent almost one-fifth of under-five children mortality in developing countries [9]. The child has increased nutritional needs to support rapid growth and development [10]. Various inappropriate complementary feeding practices such as; untimely introduction of complementary food, improper feeding frequency and low dietary diversity of complementary foods have been shown to have numerous negative effects on children's health [11]. Poor complementary feeding practices lead to children irreversible outcomes of stunting, poor cognitive development, and significantly increased the risk of infectious diseases leading to gastroenteritis, diarrhea and acute respiratory infection [12].

In the developing countries childhood, malnutrition is evident as of birth with low birth weight and progresses throughout the childhood age and beyond. However, starting from six months of age, the burden shows a dramatic escalation essentially due to substandard complementary feeding practices. In Ethiopia, many studies witnessed that complementary foods are usually initiated late and the feeding is notably dependent on monotonous cereal-based foods [13]. Only about half of children receive complementary foods at 6-9 months of age and only 4% of children ages 6-23 months are feed appropriately based on the recommended infant and young child feeding practices [13]. Furthermore, the energy density, dietary diversity, and feeding frequency are also known to be substandard.

Therefore, investigating of knowledge and practices of mothers/caregivers will be useful in designing appropriate interventions to improve complementary feeding of a child in the rural communities, increase maternal perception and knowledge and mitigating their malnutrition in the target area and other similar areas. The study has also contributed knowledge to ongoing research efforts on complementary feeding. In general, complementary feeding practice of children was reported in some parts of Ethiopia but there is no any research done before on knowledge and practices of complementary feeding among mothers of children (aged 6-23 months) in Horo Woreda. Therefore, the present study was designed to fill this gap. Hence, the major objectives

of this study were to assess knowledge, and practices of mothers/caregivers, dietary diversity scores of the children and identify associated factors that affecting complementary feeding practice of children.

Materials and Methods

Study Area

The study was carried out in Horo Woreda, Horo Guduru Wollega Zone, Oromia, Ethiopia, which is located at 333 km from Addis Ababa the capital city of Ethiopia. Total populations of Horo Woreda in 23 kebeles, registered by the kebele office are 93,129. There are 5041 under two years old children in 23 kebeles.

Study Design

A community-based cross-sectional study was conducted in Horo Woreda, Horo Guduru Wollega Zone, Oromia region, Ethiopia. Although the quantitative approach was predominantly used in this study, the study was carried out in June and July 2015.

Source Population

All children aged 6-23 months in selected kebeles of Horo Woreda were the source population.

Study Population

All children aged 6-23 months who were randomly selected from households of eight selected kebeles (Akaji Sabat, Didibe Kistana, Duyo Bariso, Gitilo Dale, Kombocha Chancho, Laku Higu, Rifenti Chabir and Sakela) were included in the study population.

Inclusion Criteria

Mothers/caregivers and their children 6-23 months old who were residents of Horo Woreda for the past 6 months were participated in the study.

Exclusion criteria

Eligible subjects who declined to consent and children 6-23 months old who had chronic or congenital illnesses at the time of the study were not included in the study. The status of the above conditions was determined based on mother/caregiver self-reports, observation, and records on the child health card.

Sample Size Determination

The sample size of the study was determined by considering the prevalence of recent previous similar study at a different place. For this study the prevalence that gives larger sample size, along with 95% confidence level and with 5% marginal error and a nonresponse rate of 10%. Based on this assumption, the actual sample size for the study was determined using single population proportion formula.

$$n = \frac{(Z_{\alpha/2})^2 P(1-P)}{d^2}$$

Where: n = Initial sample size

$Z = \text{Standard normal distribution corresponding to significance level at } \alpha = 0.05 \text{ or Confidence interval (CI), 95\%} = 1.96$

$P = (81.1\%)$ of the care giver (mother) had sufficient knowledge on complementary feeding practices.

$d = \text{margin of error (5\%)}$

$$n = \frac{(1.96)^2 \cdot 0.811(1-0.811)}{0.05^2} = 236 + 10\% (\text{nonresponse rate}) = 260$$

Therefore, a minimum of 260 mothers of infants 6–23 months were selected for this study.

Sampling Procedures

Horo Woreda was purposively selected as a study site because no research was conducted regarding knowledge and practice of complementary feeding of children in rural. Therefore, two stages sampling procedure were used to draw samples for the study.

Firstly, from the twenty-three kebeles of the woreda, eight rural kebeles were randomly selected. Next, based on the total number of children who registered at Horo Woreda health office children aged 6-23 months was selected using proportional allocation to sample size from each kebele. Finally, the sample size required for our study was randomly

selected from the eight kebeles of the woreda. If there were more than two children who fulfilled the criteria above, lottery method was used to select the child. Similarly, if there were mothers/caregivers who had children age 6-23 months, lottery method was applied. In short, the schematic procedure of sampling techniques of this study is shown in the following (Figure 1).

Data Collection Procedures

The quantitative data were collected using a structured questionnaire adapted from different relevant studies. The questionnaire was first developed in English and then translated in to Afan Oromo with some modification from the relevant sources. Training had been given for two health post workers in each kebele to collect data from the households. Totally, the data were collected by sixteen health post workers (diploma holders) from eight kebele and supervised by one public health professional and the researcher. At the end of each day, the completeness of questionnaires was checked by the principal investigator.

Socio Demographic and Economic Data

The socio-demographic variables such as; the age of mothers or caregivers, ethnicity, religion, marital status, the educational status of mothers or caregiver, the educational

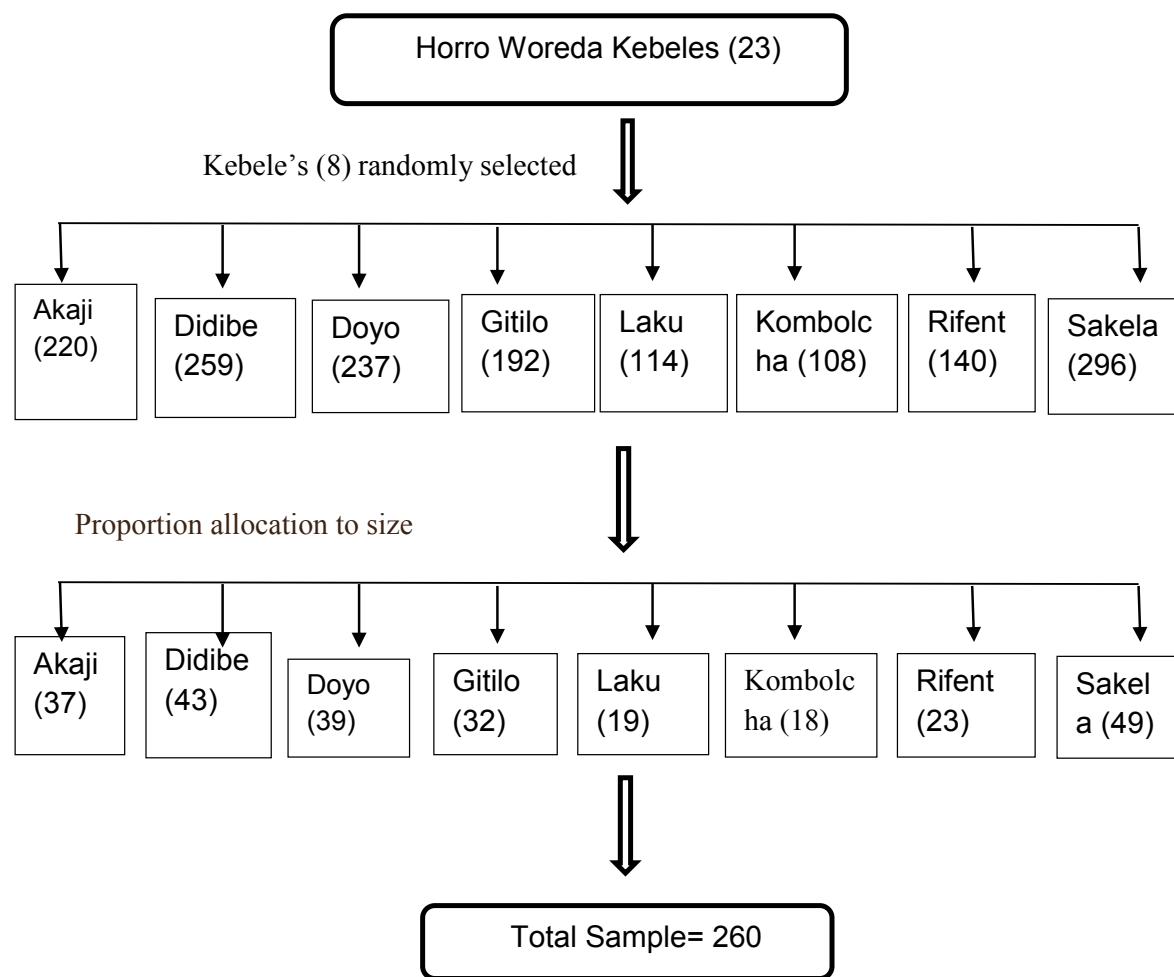


Figure 1: Schematic procedures of sampling techniques used for the selection of participants.

status of father, family size and children below five years of the family were collected.

Knowledge and practices of complementary feeding

An interviewer-administered questionnaire concerning knowledge and practices of complementary feeding of the child. Mothers/caregivers were requested to response age of complementary feeding started, types of complementary feeding given for their child, frequency of complementary feeding in per/day and time of breastfeeding stopped from the child. Finally, it was grouped into: timely initiation of complementary feeding and not timely initiation of complementary feeding.

Children's Dietary Diversity

The Diet Diversity Score (DDS) and a 24-hour recall method were conducted with mothers regarding their child's intake. Mothers/caregivers were requested to list all the foods consumed by the child both at home and

Dependent variable

The dependent variables for the study were knowledge and practice of complementary feeding. Complementary feeding practices namely: the introduction of solid, semi-solid foods and soft foods, dietary diversity, meal frequency and minimum acceptable diet.

Independent variables

The independent variables for the study were socio-demographic characteristics of mothers/caregivers' such as the age of mother, the occupation of mother, education status of mother, husband education status, husband occupation, husband substance use and family size.

Data Analysis

Data were edited, cleaned, coded, entered and analyzed using SPSS for windows version 20.0. A descriptive statistical analysis was conducted for all quantitative variables to check for outliers, consistency of data and missing values. Findings were statistically analyzed for frequency, descriptive statistics, and binary logistic regression to evaluate associations between dependent and independent variables using the statistical package against the significance level that was set at $p<0.05$.out of the home in the 24 hours preceding the interview. The seven food groups namely grains, roots, tubers; legumes, nuts, seed; dairy products, flesh foods (meats, fish, poultry); eggs, oils/fats and vitamin A rich fruits and vegetables were used in this study [14]. However, oils and fats were not considered and calculated for DDS; because these foods don't add nutritional quality of the diets. Considering four food groups as the minimum acceptable dietary diversity, a child with a DDS of < 4 , was classified as poor dietary diversity and high if a child DDS was ≥ 4 .

Ethical Consideration

The study received ethical approval from Wollega University. The objectives of the study were elucidated for

the interviewees to decide whether to participate in the study or not. The interview process was conducted with adequate confidentiality by approaching and interviewing each participant separately, and without revealing names of the interviewees.

Results

Socio-demographic characteristics of the study participants

In this study, a total of 260 mothers/ caregivers participated in the individual questionnaire interview. Of the 260-mother interviewed, about 177 (68.10%) household caregiver (mother) of the respondents was highest among mothers aged between 25 to 34 years. while 5 (1.90%) had 35-45-year-old.

Most of the respondents 234 (90%) were Oromo by ethnicity and protestant by religion 120 (46.15%). With respect to marital status, the majority (92.31%) of the mothers were married, 1.15 % unmarried, 1.92% widowed while 1.54% were Divorced. About the educational status of caregiver mother, 80 (39.23%) of the mothers had primary school education while 52 (21.67%) mothers did not have formal education. Most of 204 (78.46%) were housewives by occupation. Occupational status of caregiver mother, 204 (78.46%) of the caregiver was farmer but 21(8.08%) were the government. With regards to husband education level, 102 (39.23%) of them had a primary education while 183 (70.39%) of husbands were farmers by occupation. Half 131 (50.38%) of households had a family size four to six (Table 1).

Knowledge and practices of mothers/care givers on breastfeeding

The present study showed that: 93.08 %, 87.31%, 75.77% and 77% of mothers knew that breast milk is nutritious, health, ensures proper growth and development and protects the baby from illness and encourage strong mother-child relation respectively. Most the caregivers/mothers 75.77% interviewed knew that breastfeeding ensures proper growth and development and protects the baby from illness. Much of the study participants respond that 69.58% mother believe that baby can survive breast milk alone for the first 6 months of life while 30.42% caregiver mother believes baby cannot survive on breast milk alone without even water for the first 6 months (Table 2).

This study showed that 45.77% a mother breastfeeds a child four up to six times after 6 months while 18.08% of mother breastfeed their baby for only two up to three times after six months. In addition to these almost half 49.23% of mother stop breastfeed their baby between 1.7-2 .4 years but 5.39% of mother stop breastfeeding between 6month up to one year (Table 2).

Knowledge and practices of mothers/caregivers on complementary feeding of children

This study showed that the overall knowledge and practices of complementary feeding of Horo Woreda

Table 1: Socio-demographic Characteristic of Respondents.

Variables	Category	Frequency (n=260)	Percent
Maternal/caregiver age (years):	15-24	78	30
	25-34	177	68.1
	35-45	5	1.9
Ethnicity	Oromo	234	90
	Amhara	26	10
Religion	Muslim	35	13.46
	Orthodox	105	40.39
	Protestant	120	46.15
Marital status	Unmarried	3	1.15
	Married	248	92.31
	Divorced	4	1.54
	Widowed	5	1.92
Educational status of caregiver	Illiterate	73	28.08
	Read & Write	59	22.69
	Primary School	80	30.77
	High School and above	48	18.46
Occupational status of caregiver/mother	House wife	204	78.46
	Merchant	19	7.31
	Government	21	8.08
	Private	16	6.15
Educational status of husband	Illiterate	37	14.23
	Read & Write	65	25
	Primary School	102	39.23
	High School and above	56	21.54
Occupational status of Household	Farmer	183	70.39
	Merchant	28	10.77
	Government	35	13.46
	Private	14	5.39
Family size	1 up to 3	49	18.85
	4 up to 6	131	50.38
	>7	80	30.77
Below five years' age	1	97	37.31
	>= 2	163	62.69

Table 2: Mothers/caregivers knowledge on breastfeeding of children in Horo Woreda.

Variables	Category	Frequency (n=260)	Percent
Is Breastfeeding a nutritious for baby?	Yes	242	93.08
	No	18	6.92
Breast feeding used for healthy of baby	Yes	227	87.31
	No	33	12.69
Breastfeeding ensures proper growth and development and protects the baby from illness	Yes	197	75.77
	No	63	24.23
Breastfeeding encourage strong mother-child relation	Yes	201	77.31
	No	59	22.69
Baby can survive on breast milk alone without even water for the first 6 months?	Yes	181	69.58
	No	79	30.42
How many times should a mother breast feed a child after 6 months?	2-3 times	47	18.08
	4-6 times	119	45.77
	7-10 times	28	10.77
	Unknown	66	25.38
For how long should a mother breastfeed a child before stopping?	6mon-1yr	14	5.39
	1-1.6 yrs	87	33.46
	1.7-2 .4 yrs	128	49.23
	2.5-3 yrs	31	11.92

of mothers/care givers of 104(40%) were initiate complementary feeding timely while 156 (60%) of mothers/caregivers were not timely initiated (Table 3).

The current study clearly demonstrated that most of the mothers 139 (53.46%) knew that semi-solid, solid and soft foods should be introduced at 6 months but 55 (21.15%) should start complementary feeding (semi-solid, solid and soft foods) be introduced to a child at 4 months. As indicated in Table 3, approximately about 54.23% (n=154) of respondents had used cow milk, porridge, and gruel while 23.08% (n=60) practiced mixed feeding as a complementary food for their children. Surprisingly, the highest proportion of mothers (94.23%, n=245) believed that it essential for a child to consume a diverse diet. This study also showed that 109 (41.92%) of the mothers were aware that a 6-23 months old child should consume four up to six meals in a day but 88(33.08%) of the mother have practiced two up to three meals in addition to breast milk in a day.

More than half (58.85%) of mothers believed that child's porridge should be made of one type of flour. This result clearly showed that less than half of mothers or caregivers know that the knowledge of fortification of baby food preparation by mixing different types flour. This study also showed that the highest proportions 77.31% of mothers had good knowledge on the hygienic practices when preparing complementary foods of their children to protect the child from illnesses like diarrhea (Table 3).

Dietary Diversity Scores of children in Horo Woreda households

Dietary diversity was determined based on a 24-hour recall. The mothers have requested to state what their children consumed the previous day. Dietary diversity was then computed based on 7 food groups as recommended by [6]. The dietary diversity calculated from food groups reported by mothers to have been consumed by the child in the previous 24 hours. The mean ($\pm SD$) intake of dietary diversity score was 3.33 (± 0.576). A high proportion (65.80%) of the study participants were categorized in the lowest dietary diversity score (DDS), while 34.20% were categorized in the high dietary diversity score (Table 4).

Nearly all of the study participants 254(97.7%) consumed cereal-based foods (made of teff, maize, wheat, oat, and barley), root and tubers based foods (carrot, Beetroot, potato and sweet potato). The second commonly consumed food included legumes and nuts (Beans, peas, chickpeas, haricot bean, lentils, nuts), which was 220 (84.6%) in Horo Woreda households.

Among animal products, milk and milk products were consumed by 160(61.5%) of the study subjects whereas egg and MPF (meat, poultry & fish) were consumed by 79(30.4%) and 64(24.6%), respectively. Vitamin A-rich fruits and vegetables and other fruits and vegetables were consumed by 52(20%) and 38(14.6%) of the study participants, respectively (Table 4).

Table 3: Mothers/care givers knowledge and practices on complementary feeding of children.

Variables	Category	Frequency (n=260)	Percent
At what age in months should complementary feeding started	4 th month	55	21.15
	5 th month	43	16.54
	6 th month	139	53.46
	<7 month	23	8.85
Type of complementary Food	Cow milk alone	20	7.69
	Cow milk, porridge and soap	141	54.23
	Milk & gruel	39	15
	Mixed feeding	60	23.08
Is it essential for a child to consume a diverse diet	No	15	5.77
	Yes	245	94.23
How many times should you feed your child on complementary food each day?	2-3 times	86	33.08
	4-6 times	109	41.92
	7-10 times	25	9.62
	Unknown	40	15.38
Is it important to enrich or make your child's food more energy and nutrient 'dense'?	No	9	3.33
	Yes	251	96.67
Do you think that Children's porridge should be made of one type of flour?	No	107	41.15
	Yes	153	58.85
High standards of hygiene when preparing complementary foods will protect the child from illnesses?	No	59	22.69
	Yes	201	77.31
Total over all knowledge and practice of mothers/care givers on complementary feeding	Timely initiated CF	104	40
	Not timely initiated CF	156	60

Table 4: Dietary diversity scores of the study children in households.

Variables	Category	Frequency (n=260)	Percent
Grains, roots and tubers	No	6	2.3
	Yes	254	97.7
Legumes and nuts	No	40	15.4
	Yes	220	84.6
Dairy products	No	100	38.5
	Yes	160	61.5
Flesh foods	No	196	75.4
	Yes	64	24.6
Eggs	No	181	69.6
	Yes	79	30.4
Vitamin A rich fruits and vegetables	No	208	80
	Yes	52	20
Other fruits and vegetables	No	222	85.4
	Yes	38	14.6
Over all dietary diversity scores	High	89	65.8
	Low	171	34.2

Associated factor that affect complementary feeding practice of children

Variables like age of mothers or caregivers, ethnicity, religion, marital status, educational status of mothers or caregivers, educational status of father, family size and children below five years of the family entered to binary logistic regression to examine the association with timely initiation of complementary feeding. Mothers who had education status of primary school were 66.7% less likely to initiate complementary feeding compared to those mothers or caregivers who had the educational status of high school and above ($COR=0.333(95\%CI=0.56 \text{ up to } 0.712)$). In addition to these mothers/caregivers who had one child were 1.73 more likely to initiate complementary feeding compared to who had two and above child ($COR=1.73; 95\%CI=1.02-2.974$). This might be due to the facts that many children who aged less than five years in the same households may get higher attention by caregivers or mothers (Table 5).

Discussion

This study investigated knowledge and practices of a mother toward complementary feeding children from the age 6-23 months in Horo Woreda, Horoguduru Wollega Zone, Oromia region, Ethiopia. The results of this study revealed that educational status of mothers or caregivers and number of children below five years in the households were statistically associated with complementary feeding practices.

This study showed that the overall knowledge of the mothers on the quality of breast milk was found to be good among the women's who participated in this study. About 93.08 %, 87.31%, 75.77% and 77% of mothers knows that breast milk is nutritious, health, ensures proper growth and development and protects the baby from illness and encourage strong mother-child relation respectively. Several sources including Ethiopian Federal Ministry of Health protocol for the management of severe acute malnutrition [15], breastfeeding helps to protect babies and

young children against dangerous illnesses. This finding is supported by study result reported in Nekemter regarding mother's response on quality (benefits) of breast milk has revealed that, about 95.4%, 94.2%, 92.9%, and 89.6% of mothers has responded that breast milk is nutritious, healthy, protects from diseases and encourage bonding respectively[16].

The study revealed nearly half of the mother stopped breastfeeding their baby between 1.7 up to 2.4 years. This showed that the average cessation of breastfeeding was at 2 years. However, scientific evidence has consistently shown that breastfeeding from birth to 2 years and beyond plays a critical role in ensuring proper growth and development of a child [17]. This current study shows the rate of breastfeeding dropped to about by half, indicating that half of the children had prematurely stopped breastfeeding and therefore missing on the benefits of the practice. This finding contrasts to those of studies conducted in Addis Ababa that shows 90% of the children in the study population continued breastfeeding into the child's second year and beyond[18]. This difference might be due to lack of knowledge and information about breastfeeding among mothers/caregivers in the study area.

This finding showed that less than half of mother or caregiver practiced complementary feeding timely while above half did not practice timely. This finding is almost comparable with the study done in Gondar[19], which showed that, 36% of mother or caregiver, practiced complementary feeding at 6 month while 64% mothers or caregivers not initiated complementary feeding timely. However, a study done in Jimma showed that 42.9% of the mothers introduced complementary food before 6 months [20]. This result is also supported by the study done in Harar [21], which indicated that below half percentage of caregivers or mother practiced complementary feeding too early or too late.

In addition, the type of complementary foods given to the babies during the survey was cow milk, porridge, and

Table 5: Binary logistic regression analysis of associated factors that affect complementary feeding practice of children.

Variables	Category	Complementary initiation		Crude odds ratio (COR) 95% CI	P value
		Timely initiation of CF	Not timely initiation of CF		
Age of mothers or caregivers	15-24	34 (32.69)	44 (28.21)	3.091 (.33,28.93)	
	25-34	69 (66.35)	108 (69.23)	2.556 (.28,23.43)	0.327
	35-45	1 (0.96)	4 (2.56)	1	
Ethnicity	Oromo	95(91.35)	139(89.10)	1	0.555
	Amhara	9(8.65)	17(10.90)	0.775(0.331,1.811)	
Religion	Muslim	13(12.5)	22(14.10)	0.918(0.422,1.997)	1
	Orthodox	44(42.31)	61(39.10)	1.12 (0.657, 1.91)	
	Protestant	47(45.19)	73(46.80)	1	
Marital status	Unmarried	3(2.88)	0(0)	0	
	Married	99((95.19)	150(96.15)	0.99 (0.162, 6.032)	
	Divorced	0(0)	3(1.923)	0	0.243
	Widowed	2(1.92)	3(1.923)	1	
Educational status of care giver	Illiterate	35(33.65)	38(24.36)	0.921(0.444,1.909)	
	Read & write	25(24.04)	34(21.80)	0.735(0.342,1.582)	0.338
	Primary school	20(19.23)	60(38.46)	0.333 (0.56, 0.712)*	
	High school and above	24(23.08)	24(15.38)	1	
	House wife	79(75.96)	125(80.13)	1	
Occupational status of mothers/care givers	Merchant	7(6.73)	12(7.69)	0.923 (0.349, 2.44)	0.299
	Government	10(9.62)	11(7.05)	1.44 (0.584, 3.543)	
	Private	8(7.69)	8(5.12)	1.582(0.571,4.387)	
Educational status of husband	Illiterate	10(9.61)	27(17.31)	0.459(0.187, 1.126)	
	Read & Write	32(30.77)	33(21.15)	1.202(0.587, 2.463)	0.417
	Primary school	37(35.57)	65(41.67)	0.706(0.363,1.371)	
	High School and above	25(24.04)	31(19.87)	1	
Occupational status of household	Farmer	73(70.19)	110(70.51)	1	
	Merchant	12(11.54)	16(10.26)	1.13 (0.505, 2.527)	0.783
	Government	15(14.42)	20(12.82)	1.13 (0.544, 2.35)	
	Private	4(3.85)	10(6.41)	0.603 (0.182, 1.995)	
Family size	1 up to 3	20(19.23)	29(18.59)	1	
	4 up to 6	53(50.96)	78(50)	0.985 (0.505, 1.922)	
	>7	31(29.81)	49 (31.41)	0.917(0.444, 1.89)	0.78
Below five years' age	≥ 2	73(70.19)	90(57.69)	1.73 (1.02, 2.924)*	0.042
	1	31(29.81)	66(42.31)	1	

*=P<0.05 (Statistically significant)

Gruel which was totally 54.23%. This result was reduced by 8.27% compared to the study in Nekemte[16]. On the other hand, this result showed the knowledge and practices of complementary feeding in rural of mothers or caregivers were low in the study area compared to the study in Nekemte town. This could be due to mothers or caregivers in the study area may have poor information and far from mass media to start complementary feeding practices timely compared to mothers live in town.

In this study result, a high proportion of the study participants were categorized in the lowest dietary diversity score (DDS), while below half percentage were categorized in the high dietary diversity score. In the study area, food groups given to children are mainly stable foods: grains, roots, and tubers, which have relatively low nutrient density. This coincides with a study done by Fanos and their colleague in Shashemene revealed that majority of

food groups given to children are mainly made from grains, roots, and tubers [22]. This study also comparable to the study done in Tanzania, which indicated that proportion of children who were given food made of grains, roots, and tubers were high [23]. However, this study is contradicted with Ethiopia Demographic health survey in 2011; children consumed foods made from grains (66%) [11]. This might be due to the food consumption of children in the rural area is monotype, cheap and affordable.

This study showed that less than quarter of children aged 6-23 months had consumed meat, poultry, and fish during the past 24 hours and less than half of children consumed egg. This is might be due to mothers' knowledge on when to start additional foods to the child and their perception that the child is unable to digest foods in this age. Moreover, children in the study area had generally low consumption

of vitamin A-rich fruits and vegetables and other fruits and vegetables. This finding is comparable with other studies conducted in Kenya [24] and Nepal [25].

Per the finding of this study, mothers who had education status of primary school were 66.7% less likely to initiate complementary feeding compared to those who had the educational status of high school and above ($COR=0.333(95\%CI=0.56 \text{ up to } 0.712)$). The finding of this study was supported by a study done in India [26] and Ethiopia [16]. In addition to these mothers/caregivers who had one child were 1.73 more likely to initiate complementary feeding compared to who had two and above child ($COR=1.73; 95CF=1.02-2.974$). This might be due to the facts that many children who aged less than five years in the same households may get higher attention by caregivers or mothers. So, there are associated factors between socio-demographic factors and complementary feeding.

Conclusion and Recommendation

More than half the caregivers or mother in the study area not timely initiated complementary feeding, the main reason for too early initiation of complementary feeding was lack of knowledge and perceive inadequate breast milk production. A high percentage of children aged 6-23 months old didn't get minimum dietary diversity as recommended by World Health Organization. Besides, the consumption of animal source foods and vitamin A-rich fruit and vegetables and other fruit and vegetable were poor among the surveyed children. Maternal education and the number of children below five years were significantly associated with complementary feeding practices.

Nutrition education should be intensified to improve the knowledge, perception, and practices of mothers/caregivers of children aged 6-23 months on complementary feeding. Agricultural extension workers should increase the production of animal source foods, Vitamin A rich fruits and vegetables and other fruits and vegetables through rearing small animals and irrigation activities to meet minimum dietary diversity of children. Mothers/caregivers should be educated by health extension workers to promote complementary feeding practices of children. Mothers / caregivers should use family planning to reduce the number of children below five years to achieve minimum dietary diversity scores.

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