

Research Article

Children Feeding Practices and Household Dietary Diversity in Adea, Girar Jarso, and Sebeta Hawas Districts, Oromia, Ethiopia

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Abstract

Background: Malnutrition among children in Ethiopia remains a serious public health concern, with feeding practices frequently falling below international standards. Diets are often cereal-based with low inclusion of animal-source foods, resulting in poor dietary diversity. This study assessed child feeding practices and household dietary diversity in three districts of Oromia. **Methods:** A community-based cross-sectional survey was conducted among 332 caregivers of children aged 6–59 months. Data were collected using a structured questionnaire and a 24-hour dietary recall. Nutrient intake was analyzed using the Ethiopian Food Composition Tables and SPSS v25. Dietary diversity was evaluated using WHO and FAO criteria, and nutrient adequacy was determined using Nutrient Adequacy Ratio (NAR) and Mean Adequacy Ratio (MAR). **Results:** Early initiation of breastfeeding was 59%, while exclusive breastfeeding at six months was 63%. Timely introduction of complementary feeding was only 39%, and continued breastfeeding at two years was 64.5%. Just 43% of children consumed at least four food groups, with 37% falling into the low dietary diversity category. The MAR was 82%, with inadequate intakes of calcium, fat, and vitamin C, while protein, carbohydrate, iron, and energy were sufficient. At the household level, 51% consumed from four food groups, but only 10% consumed more than six. Cereals dominated diets (>90%), while meat (12.7%), eggs (5.7%), and fruits (25%) were seldom consumed. **Conclusion:** Suboptimal infant and young child feeding practices and low dietary diversity persist in the study areas. Strategies are needed to strengthen optimal breastfeeding, promote nutrition education, and diversify diets through improved livestock production, horticulture, and small-scale irrigation.

Keywords

Dietary Diversity, Children Feeding Practice, Nutrient Adequacy Ratio, Mean Adequacy Ratio

1. Introduction

Undernutrition remains one of the leading contributors to childhood morbidity and mortality worldwide. It is estimated to cause 3.1 million deaths among children under five annually, with stunting, wasting, and micronutrient deficiencies

being the major underlying factors [5, 7]. Approximately 28% of children under five in low- and middle-income countries are stunted [6], and the prevalence in sub-Saharan Africa is among the highest at 40% [6]. The risk is greatest between 6

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and 24 months, when poor feeding practices significantly affect growth and development [1].

The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of life and continued breastfeeding up to two years and beyond, complemented by safe and diverse diets [22]. Despite these recommendations, many countries in sub-Saharan Africa continue to record low compliance, with a large proportion of infants not receiving the minimum dietary diversity or acceptable meal frequency [6, 18].

In Ethiopia, infant and young child feeding (IYCF) practices remain suboptimal. The national survey data indicate that exclusive breastfeeding, early initiation, and dietary diversity are far below the recommended thresholds. Efforts have been made to improve IYCF practices through national nutrition strategies such as the Sekota Declaration and National Nutrition Program, but the challenges persist [12]. For example, in parts of Oromia, studies have found breastfeeding initiation rates of around 70%, exclusive breastfeeding rates near 62%, and complementary feeding practices below optimal levels [9]. These findings highlight the urgent need for local-level assessments to inform targeted interventions [19].

Household dietary diversity is also a critical indicator of nutrition security, reflecting the variety of food groups consumed within a household over a given period. Higher dietary diversity is associated with improved energy and nutrient intake, as well as better socioeconomic status [15, 20]. However, Ethiopian diets remain heavily cereal-based, with limited intake of animal-source foods, fruits, and vegetables [8]. Studies from different parts of Oromia have shown high cereal consumption but low utilization of fruits, vegetables, eggs, and meat, which worsens the risk of nutrient deficiencies [3, 10].

Therefore, the current study was designed to evaluate child feeding practices and household dietary diversity in Adea, Girar Jarso, and Sebeta Hawas districts of Oromia.

2. Materials and Methods

2.1. Study Area

The study was conducted in three rural districts of Oromia—Sebeta Hawas, Girar Jarso, and Adea—between December 2020 and March 2021. These districts were selected due to their fertile agricultural land and relatively good access to markets and infrastructure. Sebeta Hawas lies about 20 km from Addis Ababa, Adea is 50 km away, and Girar Jarso about 100 km.

2.2. Study Design and Participants

A community-based cross-sectional design was applied. The study targeted caregivers of children aged 6–59 months. Sample size was calculated with a 95% confidence interval, 80% power, and an assumed 15% non-response rate, resulting in 338 households. Complete data were obtained from 332 participants.

2.3. Inclusion and Exclusion Criteria

Caregivers engaged in farming, having children between 6–59 months, and willing to participate were included. Households with sick children or those not residing permanently in the study area were excluded.

2.4. Data Collection

A structured questionnaire was prepared in English and translated into Afan Oromo. It covered caregiver characteristics, exposure to media, land use, and child feeding practices. Data were collected through interviews conducted by trained enumerators. A 24-hour dietary recall method was used to capture children's and households' food consumption. Portion sizes were estimated using direct weighing and locally prepared food replicas. Nutrient intake was computed using Ethiopian Food Composition Tables and NutriSurvey software.

2.5. Dietary Diversity Assessment

Children's dietary diversity score was calculated based on seven WHO food groups, while household dietary diversity was assessed using twelve food groups. Nutrient adequacy was determined using the Nutrient Adequacy Ratio (NAR) and Mean Adequacy Ratio (MAR). Intakes were considered inadequate if $NAR < 66\%$, fairly adequate if 66–99%, and adequate if $\geq 100\%$.

2.6. Data Analysis

SPSS v25 was used for statistical analysis. Results are presented as frequencies and percentages for categorical variables, and as means $\pm$ standard deviation for continuous variables.

2.7. Ethical Considerations

The study was approved by the Institutional Review Board of Addis Ababa University and the Oromia Health Bureau. Informed consent was obtained from all participants, and confidentiality of responses was maintained.

3. Results

3.1. Children Feeding Practices

Forty-one percent of the children did not feed breast milk within one hour of birth (Table 1). However, exclusive breastfed during the first six months of age is 63%. On time introduction of complementary foods was below 50% (39.2%). On the other hand, continuous breastfeeding was 65%. Literature show that child-feeding practices had a direct link with childhood diarrhea. More than a quarter (28%) of the children were suffering from diarrhea during the past two

weeks. Household owning of toilet facility can also be linked to sanitation and hygiene of children and feeding practice of

children in turn. In the current study seventy-six percent of the households, own toilet facility.

Table 1. Under five Children feeding practices and diarrhea related in Sebeta Hawas, Adea, and Girar Jarso woredas of Oromia.

Feeding practices	All n (Percent) 332	
Breastfeeding within one hour of birth	Yes	196 (59)
	No	136 (41)
Exclusive breastfeeding for six months	Yes	208 (62.7)
	No	124 (37.3)
Timely introduction of complementary foods	Yes	130 (39.2)
	No	202 (60.8)
Continuous breastfeeding up to 2 years	Yes	214 (64.5)
	No	118 (35.5)
Diarrhea during the past 2 weeks	Yes	93 (28)
	No	239 (72)
Own toilet facility	Yes	252 (75.9)
	No	80 (24.1)

3.2. Child Dietary Diversity

Table 2. Food groups consumed during the 24 hour recall period and dietary diversity score of under five children in Adea, Sebeta Hawas and Girar Jarso woredas of Oromia.

Dietary diversity	Frequency (Percent)
Minimum dietary diversity*	
Consumed ≥ 4 food groups	142 (42.7)
Consumed < 4 food groups	190 (57.3)
The scale of dietary diversity score	
Low (0-2 food groups)	124 (37)
Medium (3-4 food groups)	111 (33)
High (> 4 food groups)	97 (29)

* The classification of minimum dietary diversity is according to WHO (2008)

On the other side, concerning dietary diversity only 43% of the children consumed from more than or equal to four food groups, while majority of the children (57%) consumed from less than four food groups. Depending on the scale of dietary diversity score, greater percentage of the children (37%) were categorized under low dietary diversity score, which was consumption of zero to two food groups. Depending on the category, children who consumed medium and high food groups were 33% and 29% respectively.

3.2.1. Nutrients Adequacy Ratio and Mean Adequacy Ratio of Children Aged 6 to 59 Months in Sebeta Hawas, Adea and Girar Jarso, Oromia

The mean adequacy ratio (MAR) was calculated to be 79.2% for female and 84.6% for male children. Calcium and ascorbic acid NAR were 60 and 43 respectively for female children as

the NAR ranges less than 66%. Therefore, female children are inadequate of these two nutrients. However, protein, carbohydrate, phosphorus, thiamine and Riboflavin NAR of the female children included in the study ranges between 66% and 100% and these children are classified as fairly adequate of the listed nutrients. The NAR of iron and energy are above 100, and the female children in the present study area were adequate of iron and energy.

Similar to under-five female children included in the present study areas, NAR of fat and ascorbic acid were found to

be less than 66, and accordingly the male under five children in Girar Jarso, Adea and Sebeta Hawas of Oromia are inadequate of fat and ascorbic acid. However, protein, carbohydrate, calcium thiamine and riboflavin were the nutrients whose NAR ranges between 66 to 100% and these nutrients were classified as fairly adequate nutrients. Similarly, under-five male children were found to be adequate of energy, phosphorus and Iron as the range of NAR are more than 100% as shown in the [table 3](#) below.

Table 3. Nutrients Adequacy Ratio and Mean Adequacy Ratio (MAR) for both male and female children aged 6 to 59 months in sebeta Hawas, Adea and Girar Jarso, Oromia.

Types of nutrients	Female			NAR	Male			
	6-12 months	b/n 13 and 36 mon	b/n 37 and 60 mon		6-12 mon	b/n 13 and 36 months	b/n 37 and 60 mon	NAR average
Energy	132	101	120	117	113	109	97	106
Protein	59	78	67	68	83	89	104	92
Fat	60	80	40	60	30	50	40	40
Carbohydrate	70	98	130	99	110	100	81	97
Calcium	65	54	61	60	110	60	60	76
Phosphorus	112	101	72	95	16	150	150	105
Iron	89	122	93	101	70	110	120	100
Thiamine	62	80	91	77	90	90	90	90
Riboflavin	71	84	53	69	86	67	74	76
Ascorbic acid	80	30	20	43	80	18	90	62.7
MAR	80	82.9	74.7		78.8	84.5	90.6	

NAR- Nutrients Adequacy Ratio

MAR- Mean Adequacy Ratio

3.2.2. Household's Dietary Diversity (HDDS) in Sebeta Hawas, Adea, and Girar Jarso Woredas of Oromia

Dietary diversity is a qualitative measure of food consumption that reflects household access to a variety of foods. The dietary diversity consists of a simple count of food groups that a household or an individual has consumed over the preceding 24 hours (FAO, 2011). In the current study, household dietary diversity was analyzed following FAO guideline, which is the sum of the different food groups

consumed, and 12 food groups are used in the analysis. The result of current study indicated that 51% of the households included in the study are consuming from four different food groups whereas small (6%) of the respondents included in the study are consuming from only three food groups. It is also found that 33.4% of the households consumes from five food groups and 8.4% of the respondents from 6 food groups and only 1.2% of the households are consuming from seven food groups. Even though there is no cut off point for the adequacy food groups consumed, only 10% of all the households consume more than half (greater than 6) of all the food groups.

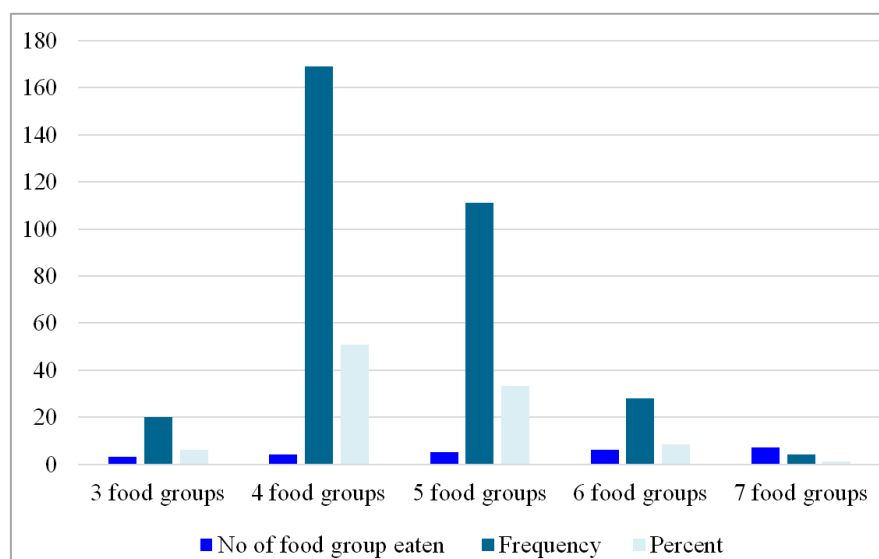


Figure 1. Number, frequency and percent of food group consumed in Sebeta Hawas, Adea, and Girar Jarso woredas of Oromia.

Table 4. Frequency and percentage of food groups consumed in Sebeta Hawas, Adea, and Girar Jarso woredas of Oromia.

Food groups	N (%)
Cereals	316 (95)
Tubers And Roots	42 (12.7)
Vegetables	263 (79.2)
Fruits	83 (25)
Meat	42 (12.7)
Eggs	19 (5.7)
Fish And Other Seafood	67 (20.2)
Legumes, Nuts And Seeds	259 (78)
Milk And Milk Products	103 (31)
Oils And Fats	286 (86.1)
Sweets	43 (13)
Spices	306 (92)

In the study areas that are currently included, cereals are widely produced and consumed. It is found that more than 90% households consume cereals. Tubers and roots are consumed only by 13% of the respondent's households. Only 25% of the respondents consume foods categorized under fruit food groups, which are excellent source of essential vitamins, minerals and antioxidants including flavonoids.

Foods of animal source in general are not highly consumed developing countries because of relatively their price [2]. Only 12.7% of the respondents in the current study area

consume meat and egg is the less consumed than meat; only 5.7% of the households included in the study area reported that they are consuming eggs. Legumes and nuts are a group of food widely consumed by 78.2% of the sampled households. Group of food that is categorized as milk, cheese, yoghurt is also under consumed. 31% of the households are consuming foods that are grouped as dairy product. Oils and fats are widely consumed group of food by 86% of the households. Sweets are foods like cookies, biscuits, honey, candy, cakes. In the current finding study areas 25% of the households consume from fruit food group.

4. Discussion

Improper breastfeeding and complementary feeding practices were common. High proportion of children were not breastfed within one hour of birth and were not exclusively breastfed (~ 40%). This is unlucky considering the losses from various dimensions such as health, economic, social and environment [21]. Not only the children but the mothers will also miss the opportunity to be protected from breast and ovarian cancer [4, 21]. In addition, the improper breastfeeding will increase greenhouse gases, a carbon footprint and waste of the environment through formula feeding [14]. The prevalence of breastfeeding within one hour of birth (59%) and the prevalence of continuous breastfeeding at 2 years (64.5) were distant from the national proportion of 72% for both feeding practices [19]. However, exclusive breastfeeding for six months was 63%, which was slightly higher than the national prevalence of 59% from the 2019 Ethiopian National Health survey [19]. The reason for the observed differences in proportion could be differences in the study design. This study is a cross sectional study and only one data point is collected.

The current rate of exclusive breastfeeding in the study area met the WHO global nutrition targets percentage of at least 50%

by the year 2025. This is encouraging considering that breastfeeding support lifelong health for the mother and the child [17]. However, the collective targets for these global rates in 2030 are 70% for initiation in the first hour, 70% for exclusive breastfeeding, 80% at one year, and 60% at two years [19]. Based on this, the rate of breastfeeding within one hour of birth; exclusive breastfeeding; and continuous breastfeeding at two years in the study area were only 84%, 89.6% and 80.6% of the global target set to be met in 2030. Therefore, the country's efforts towards meeting the target rates of breastfeeding must be amplified. Exclusive breastfeeding for six months was only 63% this may be because of the high ownership of domestic animals/cattle among the households that is associated with early introduction of milk [18].

The proportion of timely introduction of complementary foods was better in this study compared to the reported 98% of children who were complemented before the age of 6 months in Kenya [16]. Part of the reason for the proportion difference could be variation in the mothers' perception about child feeding or it might be related to the effectiveness of the nutrition education delivered to the mothers. In addition, the timely introduction of complementary foods was less than 40% in this study, which is problematic given that early introduction of complementary feeding is associated with a substantially increased risk of frequent diarrhea and other infectious diseases resulting in undernutrition [20]. This will explain diarrhea reported by 1/3 of the children in this study that could be linked to inadequate access to clean and safe water in the country leading to microbial contamination of complementary foods through unsafe preparation and storage.

More than 90% of households consume cereals in the present study, which is in line with Dereje (2020), Admasu and Beneberu (2019). The reason of high consumption of cereals could be attributed to high production capacity and less awareness of dietary diversity among the society. However, tubers and roots are consumed only by 13% of households, which is different from Dereje (2020). Only 25% of the respondents consume foods categorized under fruit food groups, which are excellent source of essential vitamins, minerals and antioxidants including flavonoids. Although, the production of fruits are easy at household, by using for example home gardening using small area of land, due to lack of awareness there is little consumption.

Food of animal sources are good for supplying nutrients that are essential to life and needed for healthy growth, development, and functioning. However, they are not highly consumed developing countries because of relatively their price. Only about 19% of the households in the current study area consume meat and eggs. Legumes and nuts are also consumed highly by 78.2% of the sampled households, which is similar to Dereje (2020). Cattle production is one of the main agricultural industries in Ethiopia and currently [13], the country produces over 3.8 billion liters of milk (FAO and NZAGRC, 2017). Per capita consumption is approximately 19 kg of milk [11]. However, dairy products are consumed

only by 31% of the households are consuming foods that are grouped as dairy product.

Concerning scale of dietary diversity, 37% of the households fall within low dietary diversity category, which is more than study conducted by Admasu and Beneberu (2019).

5. Conclusion and Recommendations

5.1. Conclusions

The infant and young child feeding practices were sub-optimal. Even though majority of the households own toilet facility the prevalence of diarrhea was substantial among the children. Starchy staples, legume and nuts were consumed widely among the children. But consumption of animal source foods was very low except dairy products. Majority of the under-five children consume less than four food groups, which is less than half of the total food group. In addition, about 33% of the children consumption of food groups fall under low and 37% under medium. The calculated Nutrients adequacy ratio (NAR) of Calcium, fat and ascorbic acid showed that the intake were inadequate. However, the calculated NAR showed that intake of protein, carbohydrate, phosphorus, thiamine and Riboflavin were fairly adequate. However, energy and Iron intake in take were adequate. Highest percentage of the households (51%) consume from four different food groups whereas only 10% of all the households consume more than half (greater than 6) of all the food groups.

5.2. Recommendations

- 1) Strengthening breastfeeding promotion and timely complementary feeding through community health programs.
- 2) Expanding nutrition education focusing on the benefits of diversified diets.
- 3) Promoting poultry, apiculture, intercropping, and small-scale irrigation for fruits and vegetables.
- 4) Supporting policies that enhance year-round access to affordable, diverse foods.

These interventions are essential for improving dietary adequacy and achieving national and global nutrition targets.

Abbreviations

WHO	World Health Organization
NAR	Nutrient Adequacy Ratio
IYCF	Infant and Young Child Feeding
MAR	Mean Adequacy Ratio

Author Contributions

Geleta Dereje: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology,

Resources, Software, Validation, Visualization, Writing – original draft, Writing – review & editing

Aynadis Tamene: Conceptualization, Investigation, Project administration, Resources, Supervision, Validation, Writing – original draft

Conflicts of Interest

The authors declare no conflicts of interest.

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