

FULL-LENGTH ARTICLE

Child Nutritional Status, Food Safety Practice and Food Insecurity Experiences of Low-Income Households in Addis Ababa: The Case of Households Not Selected for Urban Productive Safety-Net Program Support.

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ABSTRACT

Low-income households suffer from food insecurity due to, among others, illnesses coming from unsafe food, malnutrition and poor diet diversity. This study aimed to assess child nutritional status, mothers' knowledge and practice in food safety and food insecurity experience in low-income households who were not supported by the urban productive safety net program. A cross-sectional study was conducted among 328 randomly selected households and 242 under-five children therefrom. Data was collected using structured questionnaires on knowledge and practice of mothers in food safety, household diet diversity and food insecurity experiences. Anthropometric measurements were done on under-five children. Descriptive statistics was used to analyze data. About 80% of our respondents were young mothers who had elementary or secondary school education (72.6%), with no occupation or worked as daily laborers (84.5%). Most households (91.8%) were food insecure at different levels.. Mothers had poor knowledge (30%), good positive attitude (95%) and poor practice (51%) in food safety. Anthropometric measurements revealed that prevalence of thinness, stunting and underweight among the study children was 10.7%, 2.1% and 9.5%, respectively. More under-five girls than boys suffered from thinness and underweight. Most households fed their under-five children with legumes (93%) and grains (80%). Our study households need safety-net support to improve their food security status. Training should be given to mothers on food safety and nutrition by health extension workers.

Keywords: Food Security, Child nutrition, Food Safety, KAP

INTRODUCTION

Food security is said to exist when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 2019). To guarantee household food security, accessed food must be safe enough that, when it is consumed in the usual manner, it does not affect human health and wellbeing. According to the Director-General of FAO (FAO, 2019), there is no food security without food safety.

At household level, poor knowledge and practices in safe food handling, poor personal hygiene, and lack of basic sanitary facilities are causes of poor sanitary conditions during preparation of food and drinking (Kassa *et al.*, 2017). Contamination of food from food handlers causes a considerable proportion of food-borne diseases (Mudey *et al.*, 2010). As mothers are usually the food handlers in low-income households in developing countries, they are responsible to ensure food safety at the household level. It is, thus, important to evaluate the status of their food handling knowledge and practices.

Unsafe food contains harmful bacteria, viruses, parasites, or chemical substances and because of consuming unsafe food, globally 600 million people fall ill and 420,000 die each year (Lee and Yoon, 2021). Unsafe food poses global health threats, endangering the life of, particularly, infants, young children, pregnant women, the elderly, the immune-compromised and those with an underlying illness (WHO, 2015)

To ensure household food security, food should also be nutritious enough to supply the needed energy and other micro- and macronutrients for an active and healthy life. However, despite existing interventions to address child malnutrition, it is still a major global public health problem (Akombi, *et. al.*, 2017). Severe acute malnutrition is a major problem among developing countries and it is one of the major causes of mortality and morbidity in Ethiopia (Gebremaryam *et al.*, 2022). Nutrition at household level is assessed by, among others, anthropometric measurements of household members and diet diversity of available food for the household.

Since the world Bank last updated the global poverty line from USD 1.90 to USD 2.15, approximately 719 million people in the world are living under the poverty line (Peer, 2023). Food insecurity is a manifestation of poverty. Various recent studies show that, in Addis Ababa, a large proportion of the population is food insecure (Belay and Ashenafi 2021; Derso *et al.*, 2021; Alemayehu *et al.*, 2023).

The Ethiopian government, with assistance from WFP and some aid organizations, initiated the Urban Productive Safety Net Program (UPSNP) to improve the life of the urban households living under the poverty line. The program is implemented in all woredas (the lowest administrative units) in Addis Ababa. Beneficiaries belonging to households categorized as the “poorest of the poor” are selected from among the low-income households in each woreda. The program allows beneficiaries (usually mothers) to participate in paid public works such as urban beautification and solid waste management, mainly during the morning hours. The program runs for three years, a new group of beneficiaries is recruited thereafter.

There are still many low-income households who thrive below the poverty line but are not supported by the UPSNP. The objective of this study was, thus, to evaluate the food insecurity experience of the study households, their knowledge and practice in food safety, the nutritional status of under-five children in the households and the diet diversity at the community level in Woreda five, Lideta sub city, Addis Ababa, Ethiopia.

MATERIALS AND METHODS

Description of Study Area

Lideta, one of the eleven sub-cities, comprises of 10 woredas. The sub-city is located in the central-western area of the city (Fig. 1). Woreda Five, the study area, has a population of 20,201 with 10,800 female and 9,401 male within 5081 households.

Research Design

Cross sectional design was used in this study employing both qualitative and quantitative approaches. Quantitative approach was used to estimate the magnitude of the effects using statistical analysis. Qualitative approach was used to explore detail information.

Sampling and Sample Size Determination

In 2021, Lideta sub-city administrations registered a total of 1184 households from woreda-five as food insecure households but not yet supported by the productive safety net program. Woreda-five was, thus, selected purposively as it contained the highest number of such low-income households. The selected woreda has seven sub-woredas (“*ketenas*”) and samples were proportionally selected from each sub-woreda by random sampling.

Sample size was determined according to Yamane (1967) and a corrected sample size of 328 households was considered in this study.

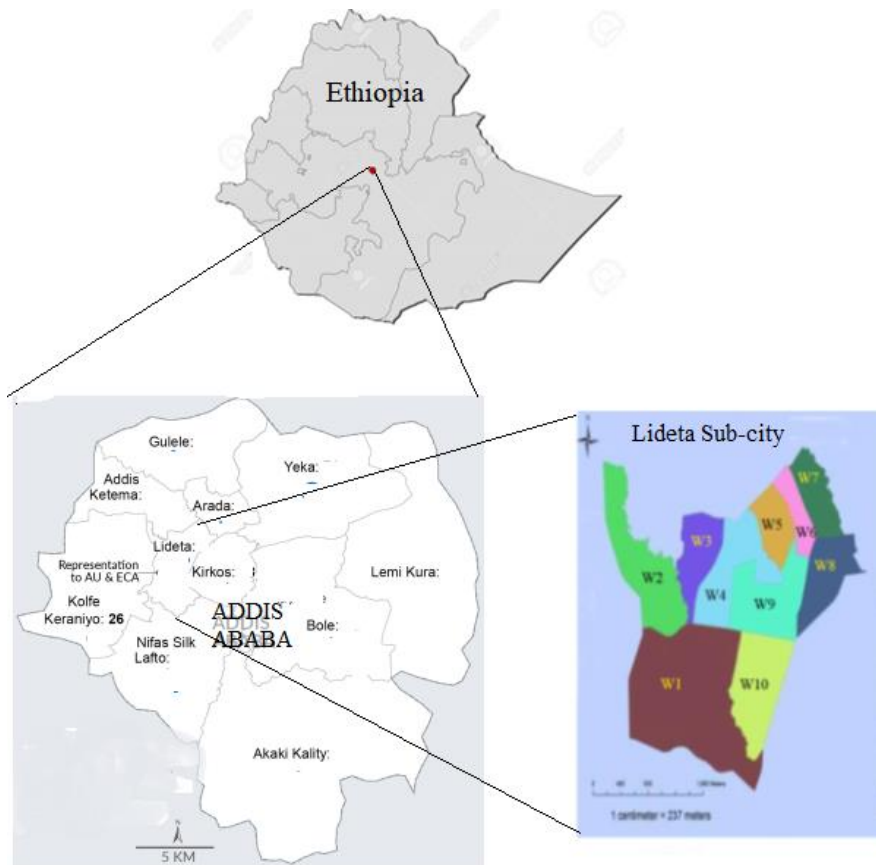


Fig. 1. Map of the study area (Woreda Five, light brown)

Data collection

Structured questionnaires were used to assess Household Food Insecurity Access Scale (HFIAS) according to Coates *et al.* (2007). Diet diversity was assessed as in Abdela *et al.* (2017).

Nutritional status of under-five children was measured using anthropometric methods (Bhattacharya *et al.*, 2019). Composite index of anthropometric failure (CIAF) was computed to assign under-five children into “No failure” groups, for children with normal growth status in terms of stunting, thinness, underweight. Children who suffered from any one of the three indices were categorized as “Failure”. The seven subgroups of anthropometric failure were considered namely (A) no anthropometric failure (B) thinness

only; (C) Thinness and underweight; (D) Stunting, thinness and underweight; (E) stunting and underweight; (F) Stunting only; and (Y) underweight only (Tariku *et al.*, 2021). The proportion of Anthropometric Failure is the sum of the percentages of each failure group, except group A, and was calculated as

$$\text{CIAF} = 1 - A\%$$

Knowledge, attitude and practice on food safety was determined according to Macías and Glasauer, (2014) as follows:

$$\text{Percent of knowledge} = \frac{\text{Sum of correct responses given by all respondents}}{\text{Sum of all responses given by all respondents}} \times 100$$

Total positive attitude among respondents was calculated as

$$\text{Percent of positive attitude} = \frac{\text{Sum of positive responses given by all respondents}}{\text{Sum of all responses given by all respondents}} \times 100$$

Similarly, appropriate practice was calculated as

$$\text{Percent of practice} = \frac{\text{Sum of appropriate responses given by all respondents}}{\text{Sum of all responses given by all respondents}} \times 100$$

Values of food safety KAP of food handlers were classified as good ($\geq 80\%$), moderate (60%-79%) and poor ($< 60\%$), using Bloom's cut-off points for KAP studies, (Destaw *et al.*, 2021).

Secondary data was collected from Food Security Administration office and Job Creation office of Woreda-five. Data was analyzed using STATA for windows version 14.2. Data was analyzed using descriptive statistical techniques such as mean, percentages and frequency.

Ethical Consideration

Verbal informed consent was obtained from study households in Woreda-five. Interview was carried out only with full consent of the person being interviewed. Confidentiality regarding respondents' details and information obtained therefrom as well as anonymity of respondents were maintained. Written consent to conduct the study was obtained from the Woreda's food Security Office.

RESULTS AND DISCUSSIONS

Socio-Economic and Demographic Characteristics

Mothers' age ranged from 20 to 64 years. Married women constituted 69.3%; the rest were either single, divorced or widows (Table 1).

Table 1. Socio-economic and demographic characteristics of study households in Woreda-Five, Lideta Sub-city, Addis Ababa

Variable	Frequency	Percentage
Age of mother		
18-45	289	88.1
46-60	37	11.3
61-80	2	0.6
Marital status		
Single/ Divorced/ Widowed	97	29.6
Married	231	70.4
Religion		
Muslim	81	24.7
Orthodox	227	69.2
Protestant	20	6.1
Mother level of education		
can't read & write	44	13.4
can read & write	40	12.2
Grade 1-8	157	47.9
Grade 9-12	81	24.7
College/university	7	2.1
Mother occupation		
Housewife	156	47.6
Govt. employee	11	3.4
Merchant	18	5.5
Daily labor	121	36.9
Other	22	6.7
Monthly income		
0-1000	125	38.1
1001-3000	164	50
3001-5000	33	10.1
Age of infant		
1-5	286	52.9
>5	255	47.1
Sex of infant		
Male	324	59.2
Female	217	40.1

Mothers with under-five children made up 53%. About 26% of mothers either could not read or write and about 52% had primary or secondary school level education. Most worked as daily laborers (38%), village level outdoor commodity vendors (6%), low level government

employees (4%) to support the family. About 46% had no work at all. Consequently, household monthly income ranged between <ETB 1000 (38.8%) and ETB 4001-5000 (5.1%) with an average monthly income of ETB 1700 (USD 1=ETB 50, at time of study). There were a total of 541 children in all study households, of which 57.5% were under-five years old and 57.1% were male.

Food security status of the study households

Household food insecurity experience was assessed using HFIAS (Coates *et al.*, 2007) in terms of worrying about the sufficiency of available food for the household, compromising the quality or quantity of food household members consumed or experiencing hunger by any household member. Occurrence and frequency of occurrence of the experiences were noted (Table 2)

Table 2. Food insecurity experiences of study households (n=328) during the previous four weeks.

Household food insecurity experience	Occurrence	Frequency		
		Rarely	Some-times	Often
Feeling of anxiety and uncertainty	281 (85.7%)	90 (27.4%)	172 (52.4%)	19 (5.8%)
Reducing quality of food	215 (65.5%)	49 (14.9%)	125 (38.1%)	41 (12.5%)
Reduced quantity of food	141 (43%)	35 (10.7%)	93 (28.4%)	13 (4%)
Experience of hunger	138 (42.1%)	42 (12.8%)	86 (26.2%)	10 (3.1%)

Rarely (1 or 2 times), sometimes (3 to 10 times), Often (more than 10 times).

As food insecurity is a daily reality for hundreds of millions of people around the world (Webb *et al.*, 2006), such experiences show the extent of the problem in a household. Most households (86%) in this study worried sometimes (52%) or often (6%) if they could have sufficient food for the household members in the past four week (Table 2). A similar proportion was seen among food insecure households in Addis Ababa (Disassa and Ashenafi. 2022) and in North Ethiopia (Negash *et al.*, 2022). A lesser proportion of our respondents (66%) reduced the quality of food they ate (including eating food they did not like) sometimes or often (50%) because they did not have resources to obtain other types of food. This was much lower than that reported from South Wollo (Endris *et al.*, 2020) but much higher than the finding of Tarekegn and Ashenafi (2021) from Awi Zone. About 43%

of the households did not have enough food for the household members and had to experience hunger either from missing a meal or not having food the whole day and night because there was no resource in the household to buy food. The proportion of households who experienced hunger among our respondents was much lower than that reported from Awi Zone (Tarekegn and Ashenafi. 2021) and different woredas in Addis Ababa (Alemayehu *et al.*, 2021; Belay and Ashenafi. 2021).

Based on the various experiences of food insecurity (Coates *et al.*, 2007), households considered in this study could be grouped into four categories (Table 3). Only 8% of our respondents were food secure. The proportion of food secure households was similar to the observations of Teferi *et al.* (2018) in East Shewa zone, Ethiopia but much lower than that reported by Awoke *et al.* (2019) in Wolayta zone. About 92% of our respondents were categorized as food insecure at various levels: mildly (29%), moderately (36%) or severely (27%) food insecure.

The prevalence of mild or moderate food insecurity was higher among our respondents when compared to findings from Ataye, North Shoa zone (Getachew *et al.*, 2020), Sidama and Hadiya (Dejene & Cochrane, 2022) and different rural areas in Ethiopia (Abebaw *et al.*, 2022). However, the proportion of households who were severely food insecure was higher in Sidama and Hadiya (Dejene and Cochrane, 2022)

Table 3. Food security categories of households in the study area

HFIAS category	Number	(%)
Food secure	27	8.2%
Mildly food insecure	96	29.4%
Moderately food insecure	117	35.8%
Severely food insecure	87	26.5%

Knowledge, attitude and practice of mothers in household food safety

Food safety KAP of mothers was assessed in terms of food handling, personal hygiene and household water sanitation.

Knowledge in Food Handling: All our respondents knew the signs of thorough cooking, Knowledge in separating raw foods from ready-to-eat foods and washing fruits and vegetables before eating was good (>90%). As raw foods are loaded with contaminating spoilage or disease-causing microbes, they should not have any direct or indirect contact

with ready-to-eat foods (WHO, 2015). However, knowledge of our respondents in storing perishable foods in a cool place or avoiding left-over foods, which were not kept in a cool place, was poor (<25%). Leftover foods are surplus foods remaining unconsumed at the end of a meal (Gupta *et al.*, 2016). In the Ethiopian context, left-over foods are mostly sauces (*wett*) which are left in the cooking pot and kept at ambient temperature for later consumption. Such foods should be kept in cool places because lower temperature retards the growth of contaminating microbes in foods (WHO, 2015). Average knowledge of respondents in food handling was moderate (68%). This was higher than that reported by Tarekegn and Ashenafi (2021) and Negash *et al.*, (2022) from Injibara, and Adigrat, respectively, both from Ethiopia.

Knowledge in Personal Hygiene: One of the essential measures in food safety is personal hygiene which helps prevent the spreading of harmful bacteria from the food handlers to food. The most important action during food handling is appropriate handwashing. Unfortunately, the knowledge of our respondents in key moments of handwashing to prevent germs was very poor (16%). Generally, average knowledge of our respondents in personal hygiene was poor (25%) (Table 4). A moderate handwashing knowledge was reported from Wondogenet, Ethiopia (Demissie *et al.* (2017).

Table 4. Average household food safety knowledge of respondents in the study area

KNOWLEDGE	Frequency (%)
Food Handling	
Reason for Separation of raw and cooked foods	304 (92.6%)
Signs of thorough cooking	328 (100%)
Perishable foods to be stored in a cool place	82 (25.2%)
Reasons to avoid leftovers not kept in a cool place	82 (25.2%)
Washing raw fruits and vegetables before eating	304 (95.7%)
<i>Average knowledge of food handling</i>	67.7%
Personal Hygiene	
Actions to take to avoid sickness from germs coming from human or animal faces?	109 (33.2%)
Key moments to wash hands to prevent germs from reaching food.	55 (16.7%)
<i>Average knowledge of personal hygiene</i>	25%
Water Sanitation	
Treating unsafe water	16.7%
Total average knowledge	30.4%

Knowledge in Water Sanitation: Knowledge in water sanitation at home was measured in terms of treating unsafe water to make it safe for drinking and food preparation. This knowledge was very low (17%) among our respondents (Table 4).

Attitude

Mothers' attitude towards food safety was evaluated in terms of perceived susceptibility to illness coming from unsafe food; perceived seriousness of such illness; and perceived benefit of or difficulty in cold storage of perishable foods, reheating of left-over foods, and washing of fruits and vegetables before consuming them.

Table 5. Average positive attitude of respondents towards food safety in the study area

ATTITUDE	Frequency (%)
Food Handling	
Perceived susceptibility: Likelihood of getting sick from eating contaminated food?	313 (95.4%)
Perceived severity: Seriousness of getting sick from eating contaminated food.	310 (94.5%)
Perceived benefits: Goodness of keeping perishable foods in cold place; reheating left-over foods before eating; and washing fruits and vegetables with clean water	316 (96.3%)
<i>Average positive attitude to food handling</i>	95.4%
Personal Hygiene	
Perceived susceptibility: Likelihood of having stomach/ diarrhea from not washing your hands	318 (97%)
Perceived severity: Seriousness if one gets sick from oneself not washing one's hand	289 (88.1%)
Perceived benefits: Goodness of washing one's hand before preparing / eating foods	312 (95.1%)
Perceived barriers: Difficulty to wash one's hand before preparing/ eating foods	300 (91.5%)
<i>Average positive attitude in personal hygiene</i>	92.9%
Water Sanitation	
Perceived susceptibility: Likelihood of getting diarrhea from using unsafe water.	318 (97%)
Perceived severity: Serious of sickness coming from using unsafe water.	307 (93.6)
Perceived benefits: Goodness of boiling water before drinking or using it.	314 (95.7%)
Perceived barriers: Difficulty in boiling water before drinking or using it.	314 (95.7%)
<i>Average positive attitude to water sanitation</i>	95.5
Total average positive attitude	94.6%

Food handling attitude: Our respondent mothers had believed in the likelihood of getting sick from eating contaminated food, seriousness of the sickness, and goodness of cold storage of perishable foods, reheating of left-over foods or washing fruits and vegetables (95%). Similarly, attitude towards maintaining personal hygiene through proper handwashing was very positive (93%). Attitude towards likelihood and seriousness of getting diarrhea from using unsafe water and goodness of or difficulty in treating unsafe water to make it safe to drink was also very positive (95.5%). In general, total average attitude towards food safety was very positive (94.6%) (Table 5). Good (positive attitude was also observed among mothers in different parts of Ethiopia (Tarekegn and Ashenafi, 2021; Negash *et al.*, 2022).

Personal Hygiene Attitude: Positive attitude in personal hygiene was assessed in terms of likely of getting ill from not washing hands, the seriousness of the illness, and goodness or difficulty of washing hands during food handling. Average attitude in personal hygiene was very good (positive) (93%). A lower rate of good (89%) or moderate (73%) good attitude was reported by Dawit Getachew *et. al.* (2021) and Dagne *et al.* (2019a), respectively.

Water Sanitation Attitude: Our responding mothers showed good attitude (95%) towards boiling water to make it safe. Similar high proportion of attitude to water treatment was also reported by Aregawi *et al.* (2020) in Tigray and Kuddus *et. al.* (2020) in Bangladesh. In contrast, attitude towards water treatment was poor (54%) in northwest Ethiopia (Bitew *et al.* (2017).

Practice

Respondents' practice in food safety was assessed in terms of how they cleaned kitchen surfaces and utensils, how they washed their hands, how they treated water collection and storage items; and how they treated water to make it safe.

Food handling practice: Despite the positive attitude towards the importance of cleaning kitchen surfaces and utensils, practice in these activities was very poor (25%) (Table 6). Practice in storing perishable foods in cold places was also poor (25%). Dagne *et al.* (2019b) reported a better food safety practice (50%) among mothers in Debarq town although it was still poor. Similar poor practice among mothers in food handling (31%) was also reported from southwestern India (Mendagudali *et al.*, 2016). However, good practice (>80%) among postnatal mothers was reported from western Ghana (Odonkor *et al.*, 2020).

Personal Hygiene practice: It is very important to practice good personal hygiene as it prevents contamination of food and make it unsafe to eat. Unfortunately, as the level of knowledge in personal hygiene of our respondents was poor, the corresponding practice was also poor. The steps our respondents followed in washing hands and the practice of using soap and water for handwashing was very poor (28.8%) (Table 6). Similarly, Ogutu *et al.*, (2022) reported that, among caregivers of under-two children, only 4% washed their hands using water and soap and 66% did not wash their hands at all. Ayanew *et al.* (2022) also observed poor hygienic practices (33.6%) during complementary feeding of their under-two children in northwest Ethiopia. Appropriate training to mothers in personal hygiene and other food safety issues may reduce the hazard that emanates from poor hygienic practices. According to the report of Ogwezzy-Ndisika and Solomon (2019), a campaign against dirty hands resulted into good knowledge of hand washing in Lagos, Nigeria.

Table 6. Average appropriate practice of respondents in food safety in the study area

PRACTICE	Frequency (%)
Food Handling	
Cleaning of kitchen surfaces and utensils after preparing dinner	82 (25%)
Cold storing perishable fresh foods	82 (25%)
<i>Average practice in food handling</i>	82 (25%)
Personal Hygiene	
Appropriate practice of washing hands	69 (21%)
Washing hands with soap or ashes	120 (36.6%)
<i>Average practice in personal hygiene</i>	28.8%
Water Sanitation	
Proper collection and storage of water	23 (7%)
Treating water to make it safe to drink	328 (100%)
<i>Average practice in water sanitation</i>	53.5%
Total appropriate practice	37.8%

Water sanitation practice: All respondents collected piped water for domestic purposes using pot, jar or Jerry can. All treated collection item to make it clean and covered storage containers (Table 6). Of the various actions used to treat water to make it safe for drinking, all respondents used one or another action. A study by Pathak (2015) showed that although respondents used improved source of water, practice of purifying water before drinking was very low. It was understood long ago that drinking water obtained from 'safe' sources may become contaminated during storage in the house (Jensen *et al.* 2002). A significant contamination of water after collection was also reported (Wright *et al.* 2004). Another study by Clasen and Bastable (2003) showed that collected safe water was subjected to

frequent and extensive fecal contamination. Therefore, household food handlers might need to understand that even collected and stored safe water could be contaminated at any point during household use.

Nutritional status of under-five children

Of the under-five children (n=242) in the study households, about 24% of the children suffered from under nutrition (Table 7). Prevalence of thinness among the study children was 11%, which was similar to the national average reported by Molla (2015); and that of underweight was 9.5%, much lower than the observation from Adigrat, Ethiopia (Negash *et al.*, 2022) or the national average (Molla, 2015). A higher proportion of underweight girls (17%) was noted when compared to that of boys (0.9%) although some studies claimed that thinness and underweight in under-five children were associated with gender, boys being more affected than girls (Thurstans *et al.*, 2020; Jawaregowda and Angadi, 2017).

Table 7. Nutritional status of under five children by age and sex (n=242)

Age (yrs)	Sex	Prevalence			
		Thinness	Stunting	Underweight	Total
2-3	Girls	9 (6.9%)	4 (3.1%)	7 (5.3%)	20 (15.3%)
	Boys	5 (4.5%)	4 (3.6%)	0	9 (8.1%)
3-4	Girls	6 (4.9%)	0	5 (3.8%)	11 (8.4%)
	Boys	2 (1.8%)	1 (0.9%)	1 (0.9%)	4 (3.6%)
4-5	Girls	2 (1.5%)	0	10 (7.6%)	12 (9.2%)
	Boys	2 (1.8%)	0	0	2 (1.8%)
Total (sex)	Girls	17 (13%)	4 (3.1%)	22 (16.8%)	43 (32.8%)
	Boys	9 (8.1%)	5 (4.5%)	1 (0.9%)	15 (13.5%)
Total (malnutrition)		26 (10.7%)	9 (3.7%)	23 (9.5%)	58 (24%)

The prevalence of thinness and underweight among our study children was much lower than that observed among under-five children in Debre-Berhan, Ethiopia (Menalu *et al.*, 2021) and Bijapur district, India (Jawaregowda and Angadi, 2017). Despite the high national average (37%) of stunting in under-five children in Ethiopia (Mengesha *et al.*, 2021), stunting in our study had the lowest prevalence in under-five children of both sexes (<5%). According to the Ethiopian Demographic Health Survey of 2019, about 37% of children under five years of age are stunted (Tariku *et al.*, 2021). As was the case in our study, under-five children in food insecure households had long been reported to suffer from malnutrition (Govender *et al.*, 2004).

Of the 242 under-five children considered in this study, 81% did not have any anthropometric failure. About 19% showed one or another type of anthropometric failure (Table 8). Only 3.7% of our under-five children had more than one anthropometric failure. Multiple anthropometric failures in the same child were seen mainly in 6% of the girls.

Both thinness and underweight were seen in the same time on 1.5% of girls, while in 3.1% of the girls, all three failures, (stunting, thinness and underweight) were manifested. Composite index of anthropometric failure among our under-five children was 19%. These values were much higher than the prevalence of each of the currently used indices of undernutrition (thinness, stunting and underweight) recorded in our study. However, our CIAF value was lower than the 46% national average reported by Tariku *et al.*, (2021) for under-five children. CIAF values as high as 57% and 48% were also reported from Malawi (Ziba *et al.*, 2017) and India (Savanur and Ghugre, 2015) for the age group, respectively.

Table 8. Composite Index of Anthropometric Failure (CIAF) in under-five children

	CIAF category	Girls (131)	Boys (111)	Total (242)
A	Without anthropometric failure	97 (74%)	99 (89.2%)	196 (81%)
B	Thinness only	13 (10%)	7 (6.3%)	20 (8.3%)
C	Thinness and underweight	2 (1.5%)	0	2 (0.8%)
D	Stunting, thinness and underweight	4 (3.1%)	0	4 (1.7%)
E	Stunting and underweight	2 (1.5%)	1 (0.9%)	3 (1.2%)
F	Stunting only	1 (0.8%)	1 (0.9%)	2 (0.8%)
Y	Underweight only	12 (9.2%)	3 (2.7%)	15 (6.2%)
	CIAF (%)	34 (26%)	12 (10.8%)	46 (19%)
	Total (%)	100	100	100

Diet Diversity

The nutritional status of children under five years of age is directly affected by their feeding practices. Most household in our study fed their under-five children with legumes (93%) and grains (80%) (Table 9). Similarly, grains and legumes dominated the diet of children in northwest Ethiopia (Temesgen *et al.* (2018). Grains were also dominant diet of children in sub-Saharan Africa (Aboagye *et al.*, 2021) and Lebanon (Abi-Khalil *et al.*, 2022). Based on the amount and consistency of the meal the children consumed, these foods might supply good amount of energy and protein. Moreover 83% children were fed with eggs which are good sources of essential amino acids and antioxidants (Attia *et al.*, 2020). However, the proportion of under-five children who consumed fleshy foods (11%), dairy products (9%), and all types of fruits and vegetables (14%) was very low. These types of foods are important sources of, not only complete proteins, but also important nutrients such as vitamins and minerals. Chronic lack of vitamins and minerals in the diet causes micronutrient malnutrition, which is also called hidden hunger (Wieser *et al.*, 2013). Micronutrient malnutrition, even in mild levels, can lead to lower disease resistance in

under-five children and can also hamper their cognitive development (Bandoh, and Kenu, 2017).

Table 9. Diet diversity of under-five children

Type of products consumed	Frequency
Grains, roots and tubers Porridge, bread, rice, noodles or other foods made from grains, White potatoes,	194 (80.2%)
Legumes and nuts Any foods made from beans, peas, lentils, nuts or Seeds	225 (93%)
Dairy products Infant formula	21 (8.7%)
Flesh foods Any meat, such as beef, lamb, goat, or chicken	26 (10.7%)
Eggs	200 (82.6%)
Vitamin A, fruits and vegetables: Pumpkin, carrots, squash or sweet potatoes that are yellow or orange inside	34 (14.1%)
Other fruits and vegetables	45 (18.6%)
Any oil, fats, or butter or foods made with any of these	204 (84.5%)

CONCLUSION

Although about 62% of our study households had to reduce amount of food consumed by family members or had to experience hunger because of lack of resources, prevalence of, particularly, stunting and the composite index of anthropometric failure were low. Although child feeding, as seen from diet diversity data, might supply sufficient energy and proteins, the children, however, might suffer from micronutrient deficiency. Moreover, mothers of under-five children had poor knowledge in food safety issues. The good attitude they had towards food safety was, unfortunately, not translated into practice. Training in household food safety and child feeding could improve the situation. In addition, support should be extended to low-income households through public safety net program.

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