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Household Food Insecurity and Its Determinant Factors in Eastern Ethiopia in 2021

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ABSTRACT

Background: Many households in urban areas suffer from severe food insecurity. In Ethiopia, current economic recession, pandemic, locust invasion, and conflict, disproportionately aggravated the problems. This study aims to assess food insecurity in household and its factors in the Eastern Ethiopia. **Methods:** A community-based, cross-sectional study was conducted to assess 616 households in urban areas of Eastern Ethiopia using simple random sampling. FANTA Indicator Guide (v.3) Questionnaires were used as data collection tool. Then, the information was entered into Epi-data version 3.02 and exported to SPSS version 21. To determine factors affecting household food insecurity, binary regression analysis was performed, and a p-value of < 0.05 at a 95% confidence interval was considered statistically significant. Model fitness was checked using the Hosmer-Lemeshow test. **Results:** The prevalence of household food insecurity was 41.7% (95% CI: 37.4–45.6). The following factors were determined as food insecurity predictors: household head's sex [Adjusted Odds Ratio (AOR)=1.75, 95% CI: 1.08–2.84], household head's education (AOR= 0.52, 95% CI: 0.33–0.99), mother's occupation [AOR= 0.3, 95% CI: 0.19–0.57], households with the medium wealth index (AOR =1.72, 95% CI: 1.06–2.78) and households with the lowest wealth index (AOR=4.01, 95% CI: 2.35–6.86). **Conclusions:** The prevalence of household food insecurity in urban areas of Eastern Ethiopia is high. The food insecurity was significantly affected by residency, education, occupation, and wealth index. The government should focus on socio-economic policies targeting the vulnerable and improve their economic status.

Keywords: *Food insecurity; Urban households; Eastern Ethiopia*

Introduction

Food insecurity is defined as being uncertain of having, or unable of acquiring enough food due to insufficient money or resources. The spectrum of food insecurity includes low, and very low food security. In low food security, a household experiences reduced quality and variety of foods, and increased stress about food availability. Very low food security is a more

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severe form of food insecurity in which eating patterns of some family members are disrupted at times during the year (U.S. Department of Agriculture, 2021).

Globally, the vulnerable urban population is the most affected. More than 80% of the urban population is employed in the private sector and the poorest households spend more than 75% of their income on food; they are likely to face resource constraints regarding their essential and nonessential food needs due to decreasing and unstable income. Economic slowdown and partial or total blockages significantly affected income and food security levels, particularly across urban areas (Dempsey and Pautz, 2021). An estimate of the sustainable development goal (SDG) indicator, which monitors progress towards the goal of ensuring food for all, shows that approximately 2 billion people worldwide are exposed to severe and moderate food insecurity (World Health Organization, 2019, 2020). In terms of distribution and access, Africa had the highest level of food insecurity. COVID-19 pandemic has worsened the overall outlook of food insecurity. Currently, both developing and developed countries are tormented by food insecurity (World Health Organization, 2019, 2020) , . In addition, the desert locust's situation within the region remains a critical threat to food insecurity and livelihood, particularly in Kenya, Ethiopia, and Somalia, where hopper bands are developed into immature swarms. Regional conflicts, natural disasters, and global climate change have complicated national and regional locust prevention activities. In the horn of Africa, desert locust invasions increased alarmingly, and the COVID-19 pandemic weakened the locust prevention efforts of national governments. Simultaneously, locusts destroyed crops within the region, leaving farmers with bare hands (Graves *et al.*, 2019). In 2016, the modern urban plan was embraced; the agreed-upon, non-binding principles and promises would guide the struggle around urban development and might not solve food insecurity until 2036. For various reasons, the problems of urban food security remain unresolved (Udmale *et al.*, 2020).

In Ethiopia, the urban business and unemployment overview in 2018 revealed that nearly two thirds of urban population were involved in three main sectors: service, shop, and small market (32.4%); craft and art work (14.2%); and basic occupations (14.1%), whereas proficient and specialized positions constituted 21.6% of the population; this indicates the extremely low rate of household income. Furthermore, with the loss of pay and the rise of nourishment costs, destitute families in urban areas are increasingly incapable of bearing increasingly high, which may lead to a significant disintegration in the populace's wholesome status (Slater *et al.*, 2021). The family heads' lack of education, family size, wealth index, and the sex and occupation of the family head have been identified as major factors influencing food insecurity (Birhane *et al.*, 2014, Derso *et al.*, 2021, Gebremichael *et al.*, 2021, Shone *et al.*, 2017). Strong evidence on household food security is required not only to identify at-risk populations, but also to develop effective preventative and intervention strategies (Fan *et al.*, 2021). According to these studies, the magnitude and cause of a problem differ depending on the urban area. Additionally, this evidence helps urban administrators to involve households in a food safety net program. Therefore, this study evaluates food security and its factors among urban residences in Eastern Ethiopia in 2021.

Materials and Methods

Study design and area: A community-based, cross-sectional study was conducted on families in urban areas of Dire Dawa and Harar, Eastern Ethiopia. Dire Dawa and Harar are located 515 km and 526 km east of Addis Ababa, respectively. Dire Dawa urban administration in the northern, eastern, and western regions is bordered by Shinile zone of Ethiopian Somali regional state, and in the south and south-east by eastern Hararge zone of the Oromia national regional state. Based on the 2007 national census, Dire Dawa urban administration has 9 urban kebeles with a total urban population of 297, 361 (Central Statistical Agency, 2016). Dire Dawa is a desert and most

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food groups are imported to urban areas from different parts of the country, mostly from Oromia and Somalia regional states throughout the year. According to a 2007 report from Ethiopian Central Statistics Agency, Harari has a total population of 99,321- 54.17% of the population lives in urban areas (Central Statistical Agency, 2016). According to the 2010 Harari Region population projection, the total population is 397006 living in urban. A total household in the town is 64, 334. The region is divided into nine categories (woredas). Data were collected from July 15 to August 15, 2021.

Study population: The study population was calculated according to the households in Dire Dawa and Harar's urban areas from each kebele. All the selected households from the selected kebele in Dire Dawa and Harar urban areas with informed consent were included in the study. Family heads who were sick and unable to answer the questions during data collection and those with less than 6 months' residency were excluded from the study.

Sample size and sampling: The sample size was determined using a single population proportion formula, and the proportion was obtained from a previous study in Ethiopia. According to a study conducted in Ethiopia's Addis Ababa city, the prevalence of food insecurity was 58.16% (Gebre, 2012), considering a 95% confidence interval (CI) and a 5% marginal error. The sample size was calculated as follows: The level of significance was 5%, the Z/2 value was 1.96, and the absolute precision or margin of error was 5% (d = 0.05). n = $z^2p(1-p)/d^2$, where n = $(1.96)^2$ x 0.5816 (1-.5816)/$(0.05)^2$ = 373, and design effect = 373x1.5 = 560.The total sample size for this study was 616.

A multi-stage sampling method was used in Dire Dawa and Hara cities, with 9 and 18 kebeles respectively. 3 kebeles were selected from Dire Dawa and 5 kebeles from Harar. After systematic sampling techniques, a proportional study unit was selected by simple random sampling using lottery method. The total sample size was calculated as 616 people; 405 were from Dire Dawa and 211 from Harar; they were chosen proportional to the households in these two urban cities. A systematic sampling technique with a k^{th} interval for each kebele from Dire Dawa (kebele 01, (110), kebele 05, (172), kebele 07, (123); and from Harar, kebele 08, (18), Kebele 05(73), kebele 01(72), kebele 15(22) and kebele 07(26) was used to determine the number of households from each kebele. If there was more than one head in a house, the owner of the house was selected as the participant.

Operational definitions

- *Food access:* It refers to the resources to obtain food, either through production or purchase. Individuals have assets or income to produce, purchase, or barter stuff to obtain enough for an adequate diet and nutrition level. Hence, food access is largely related to household income and assets (USAID office of food for peace, 2015)
- *Food-secure household:* "The household experiences no food insecurity (access) conditions, or just experiences worry, but rarely" (Birhane, 2012). Mildly food-insecure households worry sometimes or often worry about not having enough food, and/or are unable to eat their favorite foods, or have a more monotonous diet than desired, and/or some foods are rarely considered undesirable. However, they do not experience any of the conditions of the three most severe categories (Birhane, 2012).
- *Moderately food-insecure households:* "sacrifice quality more frequently by sometimes or often having a monotonous diet or undesirable foods, or rarely or sometimes start to decrease quantity by reducing the size or number of meals,." However, they do not experience any of the three most severe conditions (Birhane, 2012).
- *A severely food-insecure household:* "is forced to often cut back on meal size or number, and/or experiences any of the three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without food), or going a whole day and night without eating (Birhane, 2012).
- *Wealth index:* "Possessions owned by a household are asset-based wealth indices. The

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index was built through household asset data using "principal component analysis" (PCA) (Hadley *et al.*, 2011).

- *Head of the household:* The head of a family is a person who economically supports or manages the household or, for reasons of age or respect, is considered the head by members of the household.

Household food security measurements: The measurement tool of food insecurity was food access. FANTA developed a guide for implementing one such option, the Household Food Insecurity Access Scale (HFIAS), which is an adaptation of the approach used to estimate the prevalence of food insecurity. The authors used FANTA version 3 of HFIAS. Households with "Yes" responses to at least one of the 1–9 items listed in Q1–9 based on household head interviews were classified as food insecure; these items include (1) "worry about not having enough food," (2) 'Unable to eat favorite food' (3) 'Eat just a few kinds of food,' (4) 'Eat foods you really do not want,' (5) 'Eat smaller amounts of food in meals,' (6) Eat fewer meals in a day, " (7) "No food of any kind in the household," (8) "Go to bed hungry," and (9) "Go a whole day and night without food". The frequency-of-occurrence question is skipped if the respondent reports that the condition described in the corresponding occurrence question was not experienced in the previous four weeks (30 days) (Coates *et al.*, 2007, Endale *et al.*, 2014). Accordingly, food security status was categorized into food-secure and food-insecure households.

Assurance of quality: At first, a few key informants invited those who were familiar with the conditions and experiences of food insecurity (access) in areas where the surveys were conducted. The key informants were consulted to ensure that food insecurity questions were understandable in their culture. English version FANTA Version 3 data collection tools were translated to local language (Amharic and Afan Oromo), and back-translated into English to check for consistency. Ten data collectors, two facilitators, and coordinators were involved during data collection activities, and one day of training was given on how to collect, what to collect, and how to fill out the questionnaire based on FANTA interview techniques. A pretest was performed on 48 families in Dire Dawa. After that, an examiner observed data collectors to guarantee the quality of the collected information. The data collection instrument was checked for consistency, and while collecting, the inconsistencies within the data were overseen by supervisors. Data clearance, completeness, extent, and rationale checks were conducted routinely to guarantee the quality of the information.

Ethics approval and consent to participate: This research article has been subjected to scientific screening and ethical integrity by Ethical Review Board of Dire Dawa University. Informed consent was obtained from each participant before data collection, and for illiterate people, informed consent was obtained from a parent or legal guardian. Data collection, clearance, entry, processing and interpretation were performed based on Dire Dawa University research guideline and protocols.

Data analysis: The data were entered into Epi-data version 3.02 before being exported to SPSS Version 21 for further analysis. The level of food insecurity was assessed using descriptive analysis based on FANTA Indicator Guide (v.3) as a HFIA category variable was calculated for each household by assigning a code for food insecurity (access) category in which it falls. The data analyst should have coded frequency-of occurrence as 0 for all cases, where the answer to the corresponding occurrence question was "no" (i.e., if Q1=0 then Q1a=0, if Q2=0 then Q2a =0, etc.) prior to assigning food insecurity (access) category codes. The four food security codes were categorized and created sequentially, in the same order based on FANTA Indicator Guide (Coates *et al.*, 2007). Then, food security status was categorized into food-secure and food-insecure. The primary variable analysis between the two cities indicated that there was no mean or proportion difference. Place of residence was

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considered the determinant variable, and comparison between two cities was not necessary. A multivariate binary logistic regression analysis was performed to identify determinant factors at household level. Exploratory data analysis was performed to check for missing values, potential outliers were identified, and the normal distribution for the continuous variables was checked. Variables with a p-value of <0.25 in the bivariate logistic regression analysis were candidates for multivariate binary logistic regression analysis to control potential confounders and identify factors influencing food insecurity. In multivariate binary logistic regression analysis, adjusted odds ratios (ORs) with 95% confidence intervals (CIs) were calculated to identify affective factors with regard to outcome variables, and a p-value <0.05 was considered significant. The fitness of the model was tested using Hosmer-Lemeshow goodness of fit test, and then, information about household food security and the findings were presented using text, frequencies, tables, graphs, and figures.

Results

Socio-demographic characteristics: The response rate in this study was 100%. Among the studied households, 218 (35.4%) of households heads aged between 35 and 44 years old , and 410 (66.6%) of the heads were male. Among the household heads, 457 (74.2%) were married. Regarding academic education, 191 (31% of household heads) had high school diplomas and higher education degrees. However, 223 (36.2%) household heads were employed in private sector, and 191 (31%) were employed by the government. 202 (32.8%) family heads were day laborers in both urban areas. The majority had an average income of 1501-2500 ETB and 41%–60% of their income expenses concerned food items. Regarding wealth index, 205 (33.3%) households were in the lowest wealth index category and 206 (33.4%) were in the highest wealth index category (**Table 1**).

Housing and environmental conditions: Overall, 458 (74.3%) respondents had access to water resources. Regarding drinking water sources, 408 (66.3%) of the family's drinking water was from private taps. 108 (17.5%) households reported that their drinking water was packaged water. Regarding the cooking site, 245 (39.8%) families had a kitchen detached from the main house, and 177 (28.7%) prepared meals in open fields. In addition, 278 (45.1%) and 239 (38.8%) households cooked food with electricity and charcoal, respectively. 370 (60.1%) houses had one bedroom, and 87 (14.1%) did not have a bedroom. 105 (17.1%) households reported that they had at least one disabled person in house. 49.6% had high dietary diversity practices, and 9.7% had low dietary diversity (**Table 2**).

Household's food security description: Among the participants, 45.6% were worried about having enough food, 35% did not eat the food they needed, and 30.5% reduced their food variety in the usual recall period of 4 weeks. Furthermore, 18.8% consumed undesirable foods, and 22.9% reduced the size of their meals. Among the households, 11% went to bed without food, and 9.3% reported that they did not eat the whole day and night in the last four weeks of this survey (**Figure1**).

Occurrences of the household food insecurity domains: The 9 occurrence questions were grouped into three domains according to the similarities in their characteristics. The proportion of families falling into the anxiety domain was 45.6% (281), the insufficient quality of food domain was 36.5% (225), and the insufficient quantity of food and physical consequences domain was 25.8% (159) (**Figure 1**).

Food insecurity status: The overall food insecurity among urban residents of Dire Dawa and Harar was 257 (41.7%), with a 95% CI: 37.4–45.6. 9.6% were mildly food-insecure households, 31% were moderately insecure, and the remaining 1.1% were severely insecure. However, 58.3% of the families in Dire Dawa and Harar urban areas had food security (**Figure 2**).

Food insecurity coping strategies: Among the

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257 food items in food-secure households, 191 (74.3%) had a lower quality diet, and 37.7% changed their consumption pattern to overcome food insecurity problems. 28.4% borrowed food items from their neighbors, and 42.4% participated in the urban food safety net program. Among 33.8% households, 29.2% reduced their school costs, 29.2% took loans from microfinance, and 26% sent their family members to foreign countries under risky conditions (**Table 3**).

Factors associated with food insecurity: A multivariable binary logistic regression analysis was performed to identify the factors influencing food insecurity. Household heads [AOR = 1.75, 95% CI: 1.08–2.84], primary school education [AOR = 0.52, 95% CI: 0.33–0.99], mothers working as day laborers [AOR = 0.3, 95% CI: 0.19–0.57], medium wealth index [AOR = 1.72, 95% CI: 1.06–2.78], and the lowest wealth index [AOR= 4.01, 95%CI: 2.35-6.86]. This indicated that female-headed families were 1.75 times more likely to be exposed to food insecurity than male-headed ones. Family heads with primary education were 0.52 times less likely to face food insecurity than those with illiterate heads. Households with a low wealth index were 4.01 times more likely to be exposed to food insecurity than the ones with a high wealth index (**Table 4**).

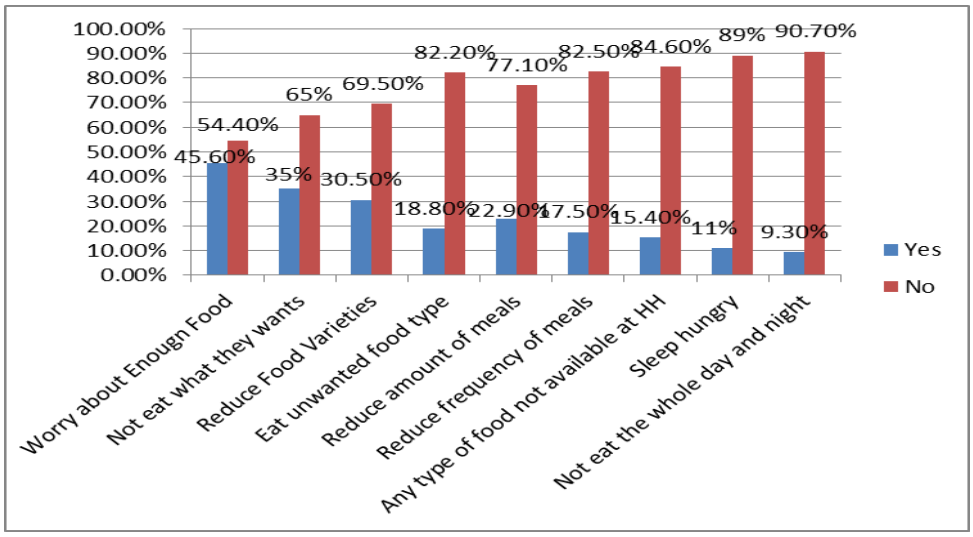

Figure 1. Household's response to food on a security access scale (HFIAS) in urban area of Eastern Ethiopia, in the last three months of 2021.

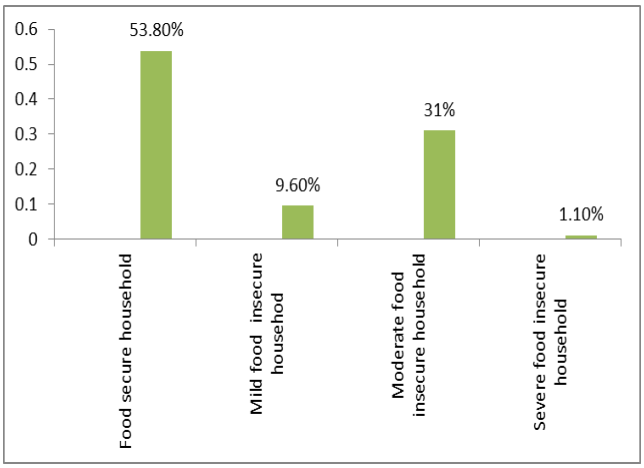

Figure 2. Food security status among urban areas' residences of Dire Dawa and Harar, Eastern Ethiopia, 2021

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Table 1. Households' socio-demographic characteristics among urban residences in Eastern Ethiopia, 2021

Variables	Category	N	%
Age of the head (year)	18-24	33	5.4
	25-34	152	24.7
	35-44	218	35.4
	45-54	127	20.6
	>=55	86	13.9
Sex of the head	Male	410	66.6
	Female	206	33.4
The head's marital status	Married	457	74.2
	Single	57	9.2
	Divorced	37	6
	Widowed	65	10.6
Household head's educational status	No academic education	84	13.6
	Primary	179	29.1
	Secondary	162	26.3
	High school diploma and higher	191	31
Household head's occupation	Day laborer	202	32.8
	Employee in private sector	223	36.2
	Government employee	191	31
Family size	1-3 families	253	41.1
	4-6 families	273	44.3
	>=7 families	90	14.6
Wealth index	High wealth index	205	33.3
	Medium wealth index	206	33.4
	Lowest wealth index	205	33.3
Monthly income (Ethiopian Birr)	<=1500	32	5.2
	1501-2500	217	35.2
	2501-5500	140	22.7
	5501-7500	97	15.7
	7501-9500	53	8.6
	>=9501	77	12.5
Monthly average expenditure for food items (%)	20%-40	85	13.8
	41%-60	209	33.9
	61%-80	178	28.9
	>=81	144	23.4

Table 2. Household's conditions and characteristics in Eastern Ethiopia in 2021

Variables		N	%
Is there a water source in the house?	Yes	458	74.3
	No	158	25.7
Source of household's drinking water	Public tap	93	15.1
	Private tap	408	66.3
	Packaged water	108	17.5
	Dump water	7	1.1
Cooking site	Kitchen attached to the main house	182	29.5
	Kitchen detached from the main house	245	39.8
	In open field	177	28.7
	Others	12	1.9
Household cooks food with	Electricity	278	45.1
	Charcoal	239	38.8
	Gas	31	5.0
	Wood	68	11.1

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Bedrooms	No bedroom	87	14.1
	One	370	60.1
	Two	133	21.6
	More than three	26	4.2
Windows	One	373	60.5
	Two	167	27.2
	More than three	76	12.3
Any disabled person in the household	Yes	105	17.1
	No	511	82.9
Presence of a toilet in the house	Yes	551	89.4
	No	65	10.6
Dietary diversity	Low	60	9.7
	Medium	251	40.7
	High	305	49.6

Table 3. Food insecurity coping strategies among urban residents in Eastern Ethiopia, 2021

Coping strategies		N	%
Consumption of low-cost food or lower-quality diet	Yes	191	74.3
	No	66	25.4
Changing food consumption pattern	Yes	97	37.7
	No	160	62.3
Eating street food with lower price	Yes	133	51.8
	No	124	48.2
Borrowing food items from neighbors	Yes	73	28.4
	No	184	71.6
Participating in food safety net program to generate income	Yes	109	42.4
	No	148	57.6
Selling assets which may reduce future productivity		41	16.3
	No	216	83.7
Reducing school costs	Yes	87	33.8
	No	170	66.2
	No	182	70.8
Sending family members abroad illegally	Yes	67	26.0
	No	190	74.0

Table 4. Multivariate binary logistic regression analysis of determinant factors affecting household food insecurity in Eastern Ethiopia, 2021

Variables	Food security status		COR	AOR	P-value	95% confidence interval	
	Food in secured	Food secured				Lower	Higher
City of residence							
Dire Dawa	179(69.6)[a]	226(62.9)		1			
Harar	78(30.4)	133(37.1)	0.73	0.66	0.058	0.43	1.01
Household head's sex							
Male	160(62.2)	250(69.6)		1			
Female	97(37.8)	109(30.4)	1.56	1.75	0.022	1.08	2.84
Household head's education status							
Illiterate	53(20.7)	31(8.6)		1			
Primary school	77(29.8)	102(28.5)	0.41	0.52	0.042	0.27	0.97
Secondary school	64(24.9)	98(27.4)	0.37	0.72	0.377	0.35	1.49
High school diploma and higher	63(24.6)	128(35.6)	0.27	0.73	0.47	0.31	1.71

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Household mother's occupation							
Housewives	130(50.6)	116(32.3)		1			
Day laborers	47(18.3)	69(19.2)	0.64	0.56	0.038	0.33	0.99
Employed in private sector	45(17.5)	121(33.7)	0.26	0.3	0.001	0.19	0.57
Employed in government	35(13.6)	53(14.8)	0.53	0.87	0.69	0.42	1.77
Household's wealth index							
Highest	48(18.7)	157(43.7)		1			
Medium	74(28.8)	132(36.8)	2.17	1.72	0.028	1.06	2.78
Lowest	135(52.5)	70(19.5)	7.46	4.01	0.001	2.35	6.86
Household's dietary diversity							
Low	49(19.1)	11(3.1)		1			
Medium	117(45.5)	134(37.3)	0.2	0.27	0.001	0.12	0.58
High	91(35.4)	214(59.6)	0.1	0.17	0.0001	1.01	2.45

[a] : N (%); AOR: Adjusted Odds Ratio; COR: Cumulative Odds Ratio

Discussion

Ethiopia is one of the developing sub-Saharan countries, and urban food insecurity is a common problem. This study demonstrated that food insecurity was 41.7% in eastern urban areas of Ethiopia. Mild and moderate household food insecurity is increasing at an alarming rate among urban residences of Eastern Ethiopia. The pooled prevalence of food insecurity among urban families in East Africa was 60·91 % (95 % CI 47·72, 74·11; I^2 = 100 %; P < 0·001) where the highest (91.0%) and lowest (36·5%) rates were observed in Sudan and Burundi, respectively (Gebremichael *et al.*, 2021). This higher prevalence may be due to data collection time and geographical differences.

The overall prevalence was considerably lower than Addis Ababa (Birhane *et al.*, 2014, Derso *et al.*, 2021, Gebre, 2012). This finding also indicated lower food insecurity compared with the findings in urban areas of Eastern Africa (60.9%) (Gebremichael *et al.*, 2021). In Accra, Ghana, food insecurity was 70% at household level (Akparibo *et al.*, 2021), and the urban areas of India showed that 77.2% of households suffered from food insecurity (Chinnakali *et al.*, 2014). A possible explanation could be that both Dire Dawa and Harar are trade centers. In addition, nearby farming centers can be a potential food source in both urban areas. Varieties of food items were imported to urban areas from different routes.

However, the rate of food insecurity in this study was higher than the study from India, which found that 26.7% of the households were food-insecure and 10.5% of U.S. families were food-insecure (Dharmaraju *et al.*, 2018). This variation might be due to socio-economic and geographical differences between those countries. Ethiopia is a developing country, and the USA is a developed country.

This study revealed 58.3% of families enjoyed food security, 9.6% were mildly food-insecure, 31% were moderately food-insecure, and the remaining 1.1% suffered from severe food insecurity. The findings from South Africa indicated that only 17% of the families can be categorized as ‘food-secure’ and more than half (57%) of them were ‘severely food-insecure’. Mildly food-insecure households experience food deprivation relatively infrequently (Frayne *et al.*, 2010). 39% of the sampled households were categorized as being severely food-insecure in terms of access to sub-Sahara countries (Fraval *et al.*, 2019). However, this was considerably higher than the findings from Addis Ababa's mild food insecurity (0.7%) and moderate food insecurity (21.3%) (Ethiopian Health and Nutrition Research Institute (EHNRI), 2009). Other studies in the same town found that 20.5% and 31.1% families faced mild and moderate food insecurity, respectively (Endale *et al.*, 2014). However, lower prevalence, compared with the findings from Sidama, suggested that the percentage of severe food insecurity was 47.8% (Regassa and Stoecker, 2012), and the results from Addis Ababa's study meant that 55.2% were severely food-insecure (Derso *et al.*, 2021). A possible explanation for the high levels of mild and moderate household food

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insecurity problems aggravated because of COVID-19 pandemic.

The results revealed that 30.5% of the families were reducing the variety of foods, 17.5% reduced the frequency of their meals, and 9.3% reported that they did not eat the whole day and night for one or more days in the last 4 weeks of this survey. However, another study on urban areas of Addis Ababa indicated that 52% of households reduced the variety of their food, 35.8% decreased their amount of food, and 25.5% reduced frequency of their meal; the results were inconsistent with the findings of this study (Birhane *et al.*, 2014). The difference could be because of market inflation, locust invasion, conflict in some parts of the country, or having no coping strategy.

Food-insecure household coping strategies included the followings: 74.3% went on a lower quality diet, and 37.7% changed their consumption pattern to overcome food insecurity. 28.4% borrowed food items from their neighbors and 42.4% participated in the urban food safety net program. In addition, 29.2% took loans from microfinance, and 26% sent their family members abroad through risky conditions or illegal emigration.

Such findings were similar to the coping strategies reported from Jimma Town; 44% changed their consumption patterns, and 72.4% ate inexpensive foods (Asesefa Kisi *et al.*, 2018). Findings from Northern Ethiopia indicated that borrowing money and food (38.11%) and receiving food and financial support (26.67%) were among major coping strategies used by households among urban dwellers (Asesefa Kisi *et al.*, 2018). However, emigration was not reported as a coping strategy, and it needs further research.

In present study, the multivariate binary logistic regression indicated that food insecurity was associated with the gender of the family head (AOR=1.75, 95% CI: 1.08–2.84) and his/her education (AOR= 0.52, 95% CI: 0.27–0.97). This was consistent with other findings from Addis Ababa, such as illiteracy of the family heads (AOR: 2.56; 95% CI: 1.08–6.07), illiterate heads (AOR=3.4, 95% CI =1.6–6.8) (Endale *et al.*, 2014), and a study from Southern Ethiopia that discovered sex was associated with food insecurity (OR=2.1; 95% CI 1.15, 3.74) (Shone *et al.*, 2017).

The results were in line with international findings regarding the fact that urban households' food insecurity in East Africa was associated with illiterate families (AOR=2.53; 95 % CI 2.11, 2.95, I 2= 90%; P=0.001), and female-headed families were at high risk of food insecurity (AOR = 1.45; 95% CI 1.16, 1.75; I^2 = 0%; *P*=0.993] (Bawadi *et al.*, 2012).

In present study, there was an association between day laborer mothers (AOR=0.56, 95% CI: 0.33–0.99) and food insecurity, and this was similar to a study conducted on Addis Ababa's day laborers (AOR=2.96, 95% 95% CI=1.1–8.3). Day labor fairs better than being a housewife regarding food insecurity. However, the study in Addis Ababa indicated daily laborers were at higher risk than government employees (Birhane *et al.*, 2014).

Medium wealth index (AOR=1.72, 95% CI: 1.06–2.78) and lowest wealth index (AOR = 4.01, 95% CI: 2.35–6.86) were identified as factors influencing households' food insecurity status; this was similar to different studies from Addis Ababa (Derso *et al.*, 2021, Gebre, 2012) , .

In present study, the age group of household heads, family size, and household mother's education did not have any association with food insecurity. However, studies from southern Ethiopia (Shone *et al.*, 2017) and findings from East Africa (Gebremichael *et al.*, 2021) showed these variables were associated with household's food insecurity. This variation may be due to socio-economic and geographical differences.

There were few studies in sub-Sahara Africa on urban food insecurity. The study's shortcomings included the absence of smaller sample size and the possibility of recall biases (Since the HFIAS questionnaires concern the last four weeks) influencing the results. Using cross-sectional study design also had its own limitations.

Conclusion

The prevalence of household food insecurity was high in Eastern Ethiopia. Consumption of low-cost

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food and street food available at a lower cost, and participating in food safety net programs are major coping strategies for food insecurity. Food insecurity was significantly affected by residency, gender and education of the household head, mother's occupation, wealth index, and dietary diversity practices. The government should focus on socio-economic policies regarding vulnerable communities and improve the food status of households.

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Authors' contributions

Derese T, Belay Y, Fantie D and Derese K designed and conducted the research; Belay Y evaluated the content and method; Derese T analyzed, interpreted, and entered data; Derese T, Fentie D, and Derese K developed and wrote the manuscript draft. Derese T had the primary responsibility for final content. All authors read and approved the final manuscript.

Conflict of interests

The authors declared no conflict of interest regarding this manuscript.

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Abbreviations and acronyms

AOR: Adjusted Odds Ratio; CMHS: College of Medicine and Health Sciences, COR: Cumulative Odds Ratio; CI: Confidence Interval; CSA: Central Statistics Agency. FANTA: Food and Nutrition Technical Assistance Project; HH: Household; HEW: Health Extension Worker; HHFSI: Household Food Security Index." OR: Odd Ratio, RAD: Research Affairs Directorate, SDG: Sustainable Development Goal; SPSS: Statistical Package for Social Science

References

Akparibo R, et al. 2021. Food Security in Ghanaian Urban Cities: A Scoping Review of the Literature. *Nutrients.* **13 (10)**: 3615.

Asesefa Kisi M, Tamiru D, Teshome MS, Tamiru M & Feyissa GT 2018. Household food insecurity and coping strategies among pensioners in Jimma Town, South West Ethiopia. *BMC public health.* **18 (1)**: 1-8.

Bawadi HA, Tayyem RF, Dwairy AN & Al-Akour N 2012. Prevalence of food insecurity among women in northern Jordan. *Journal of health, population, and nutrition.* **30 (1)**: 49.

Birhane T 2012. Assessment of Household Food Security and Nutritional Status of Women in the Context of High Food Price in Addis Ababa (Doctoral dissertation, Addis Ababa University).

Birhane T, Shiferaw S, Hagos S & Mohindra KS 2014. Urban food insecurity in the context of high food prices: a community based cross sectional study in Addis Ababa, Ethiopia. *BMC public health.* **14 (1)**: 1-8.

Central Statistical Agency 2016. Ethiopia Demographic and Health Survey 2016. Addis Ababa, Ethiopia, and Rockville, Maryland, USA: CSA and ICF. .

Chinnakali P, et al. 2014. Prevalence of household-level food insecurity and its determinants in an urban resettlement colony in north India. *Journal of health, population, and nutrition.* **32 (2)**: 227.

Coates J, Swindale A & Bilinsky P 2007. Household Food Insecurity Access Scale (HFIAS) for measurement of food access: indicator guide: version 3. https://psycnet.apa.org/ get-pe-doi.cfm?doi=10.1037/e576842013-001.

Dempsey D & Pautz H 2021. Food insecurity in times of COVID-19—An Insight into a Deepening Crisis. UWS-Oxfam Partnership: Scotland, UK.

Derso A, Bizuneh H, Keleb A, Ademas A & Adane M 2021. Food insecurity status and

[Downloaded from jnfs.ssu.ac.ir on 2025-06-06]

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[DOI: 10.18502/jnfs.v8i4.14017]

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determinants among Urban Productive Safety Net Program beneficiary households in Addis Ababa, Ethiopia. *PloS one.* **16 (9)**: e0256634.

Dharmaraju N, et al. 2018. Household food security in an urban slum: Determinants and trends. *Journal of family medicine and primary care.* **7 (4)**: 819.

Endale W, Mengesha ZB, Atinafu A & Adane AA 2014. Food Insecurity in Farta District, Northwest Ethiopia: a community based cross–sectional study. *BMC research notes.* **7 (1)**: 1-6.

Ethiopian Health and Nutrition Research Institute (EHNRI) 2009. Nutrition baseline survey report for the National Nutrition Program of Ethiopia. Addis Ababa, Ethiopia.

Fan S, Teng P, Chew P, Smith G & Copeland L 2021. Food system resilience and COVID-19–Lessons from the Asian experience. *Global food security.* **28**: 100501.

Fraval S, et al. 2019. Food access deficiencies in sub-Saharan Africa: prevalence and implications for agricultural interventions. *Frontiers in sustainable food systems.* **3**: 104.

Frayne B, et al. 2010. The state of urban food insecurity in southern Africa, No. 2. Queen's University and AFSUN: Kingston and Cape Town.

Gebre GG 2012. Determinants of food insecurity among households in Addis Ababa city, Ethiopia. *Interdisciplinary description of complex systems.* **10 (2)**: 159-173.

Gebremichael B, et al. 2021. Magnitude of Urban Household Food Insecurity in East Africa: A Systematic Review and Meta-Analysis. *Public health nutrition.* **25 (4)**: 994-1004.

Graves A, Rosa L, Nouhou AM, Maina F & Adoum D 2019. Avert catastrophe now in Africa's Sahel. *Nature.* **575 (7782)**: 282-286.

Hadley C, et al. 2011. Household capacities, vulnerabilities and food insecurity: Shifts in food insecurity in urban and rural Ethiopia during the 2008 food crisis. *Social science & medicine.* **73 (10)**: 1534-1542.

Regassa N & Stoecker BJ 2012. Household food insecurity and hunger among households in Sidama district, southern Ethiopia. *Public health nutrition.* **15 (7)**: 1276-1283.

Shone M, Demissie T, Yohannes B & Yohannis M 2017. Household food insecurity and associated factors in West Abaya district, Southern Ethiopia, 2015. *Agriculture & food security.* **6 (1)**: 1-9.

Slater R, et al. 2021. Beyond COVID-19: Lessons for social protection from WFP's work in East Africa in 2020.

U.S. Department of Agriculture 2021. "Measurement," September 2021. Available at: https://www.ers.usda.gov/topics/food-nutrition-assistance/.

Udmale P, Pal I, Szabo S, Pramanik M & Large A 2020. Global food security in the context of COVID-19: A scenario-based exploratory analysis. *Progress in disaster science.* **7**: 100120.

USAID office of food for peace 2015. Food Security Country Framework for Ethiopia, https://pdf.usaid.gov/pdf_docs/PBAAE621.pdf.

World Health Organization 2019. The state of food security and nutrition in the world 2019: Safeguarding against economic slowdowns and downturns. Food & Agriculture Org.

World Health Organization 2020. The state of food security and nutrition in the world 2020: transforming food systems for affordable healthy diets. Food & Agriculture Org.

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