

Full Length Research Paper

Intra- household food allocation among adolescents in coffee farming households in Jimma Zone, South west Ethiopia

Getu Gizaw Haile* and Kalkidan Hassen Abate

Department of Population and Family Health, Faculty of Public Health, Jimma University, Jimma, Ethiopia.

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There are wide ranges of factors that determine individual food insecurity within households. In cash crop area products are for market rather than for agricultural households that can cause food accessibility to a severe challenge. There is, however, a dearth of information about the food security status of adolescent living inside coffee farming households. The aim of this study is to investigate the prevalence of adolescent food insecurity and determine its factors among coffee producing districts in Jimma Zone, South west Ethiopia. Community based cross-sectional study was employed in coffee producing district in Jimma zone, from April-May 2016. A total of 550 households having adolescents were included. Data were entered into EpiData and the analyses were made by SPSS version 20. Bivariate and multivariable logistic regression was done and p-value < 0.05 considered as a cut-off point to determine statistical significance. Sixty percent of adolescents (60%) were found to be food insecure. Female adolescents [AOR=2.18, 95%CI (1.4-3.48)], household food insecurity [AOR=9.4, 95%CI (5.49-16.19)], male of household heads [AOR=2.77, 95%CI (1.44-5.33)], high dependency ratio [AOR=2.53, 95%CI (1.447-4.446)], not formally educated household head [AOR=4.925, 95%CI (2.636-9.201)] and have no own land for farm [AOR=2.484, 95%CI (1.24-4.96)] were positively independent predictors of adolescent food insecurity. This study highlighted the problem of food insecurity in coffee producing farmers. Sex of adolescent, dependency ratio, sex of household head, household heads' educational status, food security status of household and farm land ownership are predictors of adolescent food insecurity. This pushes us to advance direct nutrition interventions focusing on adolescents to endorse catch-up growth and break the intergenerational cycle of malnutrition.

Key words: Adolescent, food insecurity, coffee farmer.

INTRODUCTION

FAO (2009) says food security exists when all everybody has physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and

food preferences for an active and healthy life (FAO, 2009) all the time. Food security has four pillars: availability, access, utilization and stability. Availability (all

*Corresponding author. E-mail: gechgizaw21@gmail.com.

household members get reliable and consistent food), access (economic aspect of getting food), utilization (it is dietary intake and our body physiologic condition to absorb nutrient and food interaction to be absorbed) and finally, stability (FAO, 2009; US, 2010). FAO (2009) explains household food security as the use of food security concept to the household level, with individuals within households as the focus of concern (FAO, 2009). The interests of adolescent are not always clearly advocated in food security programs but as Feighery et al. (2011) affirm adolescents should be viewed as primary part of the solution to food security (Feighery et al., 2011) and their particular health needs (WHO, 2017). World populations quickly grow particularly in the developing world on condition that food security is challenging. The United Nations in 2017 estimate that by 2050 world populations will increase nearly to 2.5 billion people, among the greater part of this enlarge happening in the growing world. Moreover a lot of this growth will be along with adolescents, who will like compose half of the 2050 population. Because of these demographic transitions, adolescents are tremendously vulnerable to food scarcity. Moreover, current challenge of increasing food prices and crop loss from climate change weather patterns can make worse this vulnerability. The problem is much palpable in Ethiopia, which currently has the uppermost share of youth population at 21.8% for these reasons, they should focus on the overall youth group to address the developmental challenge associated with long term consequence of food insecurity (Lederer, 2017).

Though, there is a small number of studies that look at food security from adolescents' point of view (Brooks et al., 2013). Household Food Insecurity Access Scale (HFIAS) is one method used to measure food scarcity at family level; it was used within two recent surveys in Ethiopia (Ethiopian Health and Nutrition Research Institute, 2009), and different studies in developing countries show that these qualitative self-reports give valid indicators of food insecurity at individual level (Frongillo et al., 2006; Belachew et al., 2013; Belachew et al., 2012; Webb et al., 2006; Belachew et al., 2011).

Currently, there has been mounting conversation in coffee industry on the determinant of food insecurity in coffee cultivating population. Small-scale producers are expected to provide 70% of the world's coffee supply (Eakin et al., 2009). The remote countryside areas where the world's most excellent coffee is grown are exposed to several food insecurity threat factors (CFS, 2012). This is not common to one exacting area or a division of the population. Many reasons hinder smallholders' elasticity for making adjustments toward more productive or money-making crops, making to have insufficient cash to buy food; lack of time and/or land to contribute to cultivation of food crops (Caswell et al., 2012).

It is increasingly being recognized that one of the strategies used to reduce poverty and hunger is improving food security. Despite the well-known

development in financial growth and welfare enhancement in developing countries over the recent years, food security has not been achieved in most developing countries. Especially, food insecurity continues to form a deep-rooted problem in several sub-Saharan African (SSA) countries. FAO (2014)'s report indicates that the number of undernourished people in Africa is still high at 226.7 million (FAO, 2014). Even now, countries in the Horn of African are snowed under sensitive food security crises, making the problem of food security an issue of great concern to governments and the international community.

Even if it is clear that the household food insecurity condition represents the occurrence of individuals within the household, research – first from Asia – shows that this often is not true (Haddad et al., 1996). Different research centers on within-household favoritism against young children and women as some data show that young children are favored than adults in terms of food security (Leonard, 1991; Messer, 1997). There are works connected to food insecurity at the household level in reference to adolescents' food insecurity. This is particular true for individuals in sub-Saharan Africa (Haddad et al., 1996). Issues concerning adolescent and food insecurity are especially few in cash crop areas.

Adolescence is a challenging period for one's path of life and one in which individuals are expected to make a chain of life span change into adulthood. Nutritional status of the adolescents can affect those key transitions. Food shortage can cause nutritional and health related problem in their later life span (Kuruville et al., 2016). The aim of the study is to have an understanding of the intra-household food insecurity in Jimma zone coffee producing districts by investigating adolescent food insecurity and its associated factor in Gomma, Manna and Limu-kosa coffee producing districts. Ethiopia remains the top producer of coffee in Africa and is the fifth largest coffee producer in the world. Our country is the origin of Coffee Arabica and frequently produces this in array. Coffee has socio-economic significance to the country. 95% of the coffee produced is organic as most of them are grown using traditional method without pesticides and fertilizers. These factors give Ethiopia a comparative advantage in the international specialty coffee market. Despite all these positive factors, the country contributes only 4.2, two percent of the total world coffee production (Francom and Counselor 2015; Tefera and Tefera, 2014), and food insecurity is a major challenge.

Rationale of the study

Currently, we have an extraordinary chance to advance the health of adolescents and answer more effectively to their specific requests. The global strategy of health of women, children and adolescents (2016-2030) identifies adolescents as critical in attaining SDGs

(Kuruville et al. 2016). Adolescents constitute 16% of the world's population. And they account for 6% of the world's global burden of disease and injury. The recent very rapid reductions in mortality among infants and young children have not been observed among adolescents. Investments in adolescent health will bring a triple dividend of health benefits (for adolescents now, in the future and next generation) (WHO, 2017).

Ethiopia is one of the least developed countries in the world according to all measures of poverty. Even though the country has made improvement in economic growth over recent decade, food insecurity is marked. Previous studies have taken only the views of the household head into reflection in classifying food insecurity status of the household. By so doing, the potential of discrepancy experiences of food insecurity by individual household members was unnoticed. To date, however, due to limited information regarding food insecurity for adolescents within a household in coffee producing districts in Jimma zone, intra-household differences in food insecurity among adolescent have not been examined. This paper will address this research gap.

METHODOLOGY

Study area and design

The study was conducted in Jimma Zone, Southwestern Ethiopia at community level. The study is a cross sectional design. Jimma Zone is known for organic Coffee Arabica production. The zone has consistent good rain (Lemessa, 2000); however, the climate of Ethiopia has changed. Ethiopia has been having increased temperature of about 0.3°C per decade (from the 1950s), and in some areas low rainfall (Farming, 2017). This can threaten the food security of the zone.

Sample size calculation and sampling technique

Single population proportion formula was used to determine sample size with the following assumptions: prevalence of adolescents' food insecurity of 20.5% in Jimma Zone (Belachew et al., 2011); 550 study participants were proportionally allocated to each district; multistage sampling technique was used to get information. The inclusion criteria include: being a permanent registered farmer residing in the districts; at least one that has witnessed the latest harvest season with their adolescents.

Data collection and procedures

To collect the data an organized questionnaire was used. For households' characteristics, mothers were our primary choice instead of fathers. Pretest was done on 5% nearby districts and all possible amendment was made. The final data were collected by trained nurses, while supervision was made by trained nutritionists. Ethical clearance was obtained from the Review Board of Jimma University, College of Health Sciences and local concerned boys.

Measurements and analysis

Adolescent food insecurity was calculated with a customized

version of the household food security scales by choosing the things that relate to their individual practices (Frongillo et al., 2006; Belachew et al., 2011, 2013, 2012; Webb et al., 2006). They were asked of their last one month's own experience. Rarely, sometimes and often responses were coded as one and "never" responses were coded as zero; the responses were summed to produce an index of adolescent food insecurity and were further dichotomized as "food secure" for a score equal to zero "food insecure" and a score greater than zero. Household Food Insecurity Access Scale (HFIAS) version 3 was used to measure food insecurity, a tool that has been developed by FAO and FANTA and validated for use in several developing countries to assess household food security status including Ethiopia (Coates et al., 2007).

Data coding and editing was done manually; entry was done using Epi Data 3.1 version and then exported to SPSS version 20 for analysis. Data were checked for its distribution by P-P plot for all numerical variables and also multi-collinearity was checked. Frequencies and percentages of variables were produced and presented in table and graph; wealth index was generated using principal components analysis. Bivariate and multivariable logistic regression analyses were done to get this association: a p-value <0.25 and p-values < 0.05 respectively were the cut offs.

RESULTS

Adolescents' socio demographic characteristics

More than half (56.7%) of the adolescents were females while their mean age was 13.37(SD= 2.448). Regarding their educational status, majority of them attend secondary school 383(69.6%) followed by primary school 110(20%). Only 223(40.5%) of them have access to food outside their homes (Table 1).

Socio-demographic characteristics of household

Of the 550 households 469(85.3%) were rural residents and 81(14.7%) were urban residents. Four hundred forty five (80.9%) households were headed by males. Majority of the respondents 496(90.2%) were married. Regarding religion more than two third (69.8%) of the respondents were Muslims followed by 144 (26.2%) orthodox. Most (72%) of the households were Oromo by ethnicity followed by Dawero 81(14.7%). The mean household size was 5.89 (SD±1.65); concerning households' dependency ratio, 168(30.5%), 200(36.4%) and 182(33.1%) had low, middle and high dependency ratio, respectively (Table 2).

Regarding their educational status 263 (47.8%), household heads have completed grade 1-8 followed by secondary education 164(29.8%); whereas most of spouses 262(47.6%) have completed grade 1-8. Concerning household wealth, 227(41.3%), 158(28.7%) and 165(30%) households have low, medium and high wealth index, respectively, while mean monthly expenditure on food was 1114.38 Birr (SD 641.8). More than two third (68.4%) husbands purchase food, whereas more than three quarter (76%) of households do not have access to savings and credit (Table 2).

Table 1. Adolescent socio demographic Characteristics of Mana, Limu-kosa, and Gomma coffee producing districts , Jimma zone, south west Ethiopia 2016.

Variable n=550		Frequency	Percentage	P value
Sex of adolescent	Male	238	43.3	<0.0001
	Female	312	56.7	
Age	10-14	433	78.7	0.37
	15-19	117	21.3	
Educational status	No Formal Education	57	10.4	0.002
	Primary	110	20	
	Secondary	383	69.6	
Access To food outside home	Yes	240	43.3	<0.0001
	No	312	56.7	

Table 2. Socioeconomic and demographic Characteristics of the households in Mana, Limu- kosa and Gomma coffee producing districts, Jimma zone, south west Ethiopia 2016.

Variable N=550		Frequency	Percent	P value
Setting	Urban	81	14.7	0.001
	Rural	469	85.3	
Sex of HH head	M	445	80.9	<0.0001
	F	105	19.1	
Marital status	Married	496	90.2	0.469
	Divorced	18	3.3	
	Widowed	36	6.5	
Religion	Muslim	384	69.8	0.398
	Orthodox	144	26.2	
	Protestant	22	4	
Ethnicity	Oromo	396	72	0.315
	Dawero	81	14.7	
	Amehara	49	8.9	
	Others	24	4.4	
Educational status of HH head	No Formal Edu.	123	22.4	<0.0001
	Primary Edu.	263	47.8	
	Secondary Edu.	164	29.8	
Educational status of spouse	No Formal Edu.	223	40.5	<0.0001
	Primary Edu.	262	47.6	
	Secondary Edu.	65	11.9	
Wealth Index	Low	227	41.3	0.522
	Middle	158	28.7	
	High	165	30	
Dependency Ratio	Low	168	30.5	<0.0001
	Middle	200	36.4	
	High	182	31.1	
Access To Credit	Yes	132	24	0.244
	No	418	76	

Table 3. Agricultural related characteristics of the households in Mana , Limu- kosa and Gomma coffee producing districts, Jimma zone, south west Ethiopia 2016.

Variable n=550		Frequency	Percentage	P value
Own land for farm	Yes	459	83.5	<0.0001
	No	91	16.5	
Use of agricultural input	Yes	255	46.4	<0.0001
	No	295	53.6	
Use of agricultural extension service	Yes	229	41.6	0.041
	No	321	58.4	

Table 4. prevalence of Adolescent food scarcity in Mana, Limu- kosa, and Gomma coffee producing districts in Jimma zone, south west Ethiopia 2016.

Characteristics		Number	Percent
Ever worried about food in last four week	Never	315	57.3
	Rarely(1-7 Day)	216	39.3
	Sometimes(8-21 Day)	16	2.9
	Often(> 21 Day)	3	0.5
	Never	282	51.3
Reduced Food Intake	Rarely	252	45.8
	Sometimes	16	2.9
	Often	0	0
	Never	467	84.9
Spend The Whole Day Without Food	Rarely	81	14.7
	Sometimes	2	0.4
	Often	0	0
	Never	389	70.7
Ever Had To Ask Outside The Home For Food.	Rarely	147	26.7
	Sometimes	14	2.5
	Often	0	0
	Never	467	84.9

Agricultural related characteristics

Majority 474(86.2%) of the households have their own land for farm. More than half (53.6%) don not use agricultural inputs and 58.4% do not use agricultural extension service (Table 3).

Prevalence of adolescent food insecurity

A high number of adolescents gave positive responses to reduction of meals (48.7%), 42.7% worry about food inaccessibility, 15.1% spend the whole day without food and 35.7% have never ask for food outside their homes (Table 4). In all the prevalence of adolescent food insecurity is 59.6% (Figure 1).

Prevalence of household food insecurity

From all the pictures of HFIAS, the proportion of household food insecurity was 75%. From this, 19(3.5%), 321(58.4%) and 72(13.1%) were mildly, moderately and severely food insecure respectively (Figure 2).

Factors associated with adolescent food insecurity

Bivariate and multivariable logistic regression analysis was done using enter method to identify factors associated with adolescent food insecurity. On the Bivariate analysis, adolescent food insecurity had statistical association with 13 factors which had $p < 0.25$.

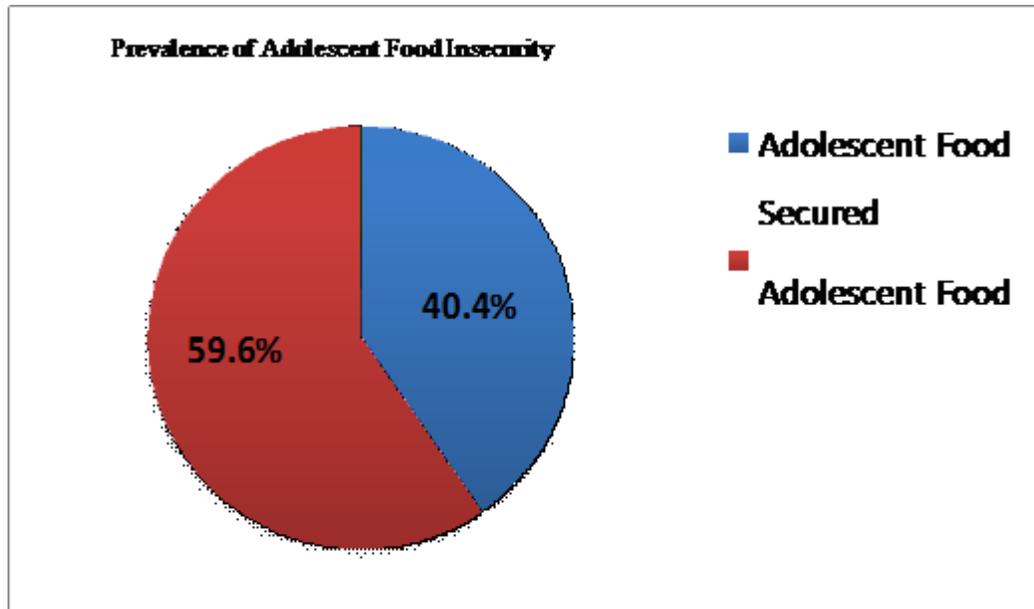


Figure 1. prevalence of adolescent food security status in Mana,Gomma and Limu- kosa coffee producing Woredas in Jimma zone, south west Ethiopia 2016.

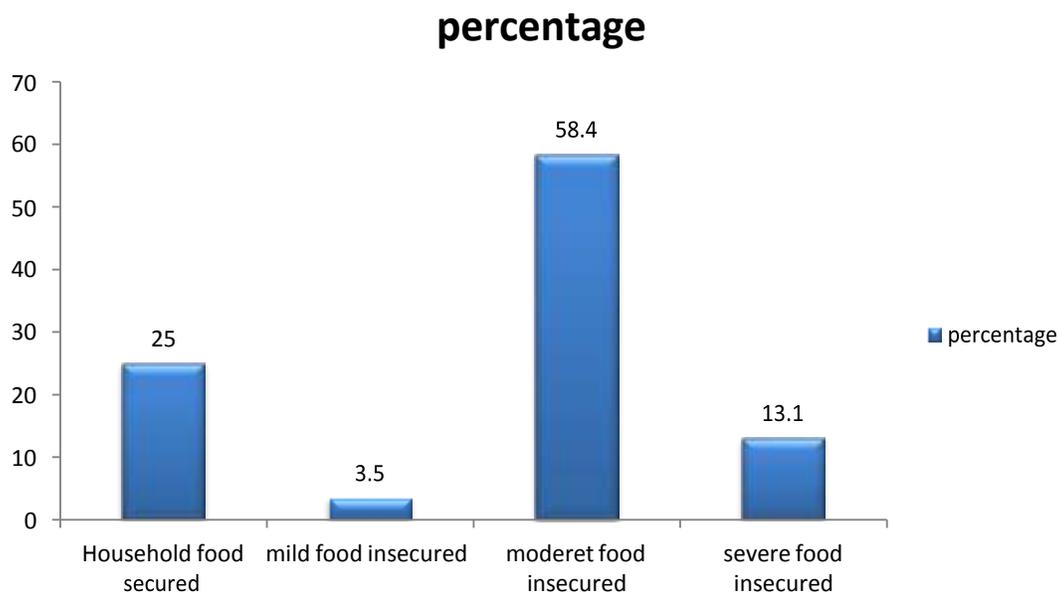


Figure 2. Prevalence of household food insecurity in Mana, Limu-kosa and Gomma coffee producing districts, Jimma zone, south west Ethiopia 2016.

Multivariable logistic regression analysis confirmed dependency ratio, sex of household head, household head educational status, land ownership, sex of adolescent and household food security status as potential predictors of adolescent food insecurity ($p < 0.05$) (Table 5).

By taking other variables constant female adolescents were 2 times more likely to be food insecure than male

[AOR=2.18, 95%CI (1.4-3.48)]. Adolescents living in a food insecure household were 9.4 times more likely to be food insecure than their counterparts [AOR=9.4, 95%CI (5.49- 16.19)] and adolescent living in households without their own land for cultivating coffee were 2.5 times more likely to be food insecure than those living in households having their own land for coffee farm [AOR=2.484, 95%CI (1.24-4.96)] (Table 5). Adolescents living in female

Table 5. Multivariable logistic regression models predicting adolescent food insecurity in Mana, Gomma and Limu- kosa coffee producing Woredas in Jimma zone, south west Ethiopia, 2016.

Factors	Categories n=550	Adolescent Food Security Status				COR(95%CI)	AOR(95%CI)
		Secure		Insecure			
		N	%	N	%		
Sex Of Household Head	F	207	46.5	238	53.5	1	1
	M	15	14.3	90	85.7	5.28(2.92-9.29)	2.773(1.443-5.33)
Educational Status Of Household Head	No Formal Education	30	24.4	93	75.6	6.315(3.73-10.67)	4.925(2.636-9.20)
	Primary Education	82	31.2	181	68.8	4.496(2.96-6.82)	3.446(2.09-5.676)
	Secondary Education	110	67.1	54	32.9	1	1
Dependency Ratio	Low	88	52.4	80	47.6	1	1
	Middle	78	39	122	61	1.72(1.136-2.606)	2.049(1.20-3.48)
	High	56	30.8	126	69.2	2.475(1.599-3.83)	2.537(1.447-4.44)
Sex Of Adolescent	M	121	50.8	117	49.2	1	1
	F	101	32.4	211	67.6	2.16(1.52-3.059)	2.18(1.4-3.38)
Own land for farm	No	13	14.3	78	85.7	5.016(2.7-9.28)	2.484(1.24-4.96)
	Yes	209	45.5	250	54.5	1	1
Household Food Security Status	secure	115	83.3	23	16.7	1	1
	insecure	107	26	305	74	14.25(8.65-23.47)	9.43(5.49-16.19)

Hosmer and Lemeshow test = 0.749, Maximum SE= 0.353, CI = Confidence interval. AOR = Adjusted Odds ratio. COR= Crud Odds ratio.

headed households were almost 2.8 times more likely to be food insecure than those living in male headed household [AOR=2.77, 95%CI (1.44-5.33)]. Adolescents living in household heads not formally educated were almost 5 times more likely to be food insecure than those living in households whose heads have secondary school education [AOR=4.925, 95%CI (2.636-9.201)]. Adolescents living in household whose heads have primary school education were 3.4 times more likely to be food insecure than those living in households whose heads have secondary school education [AOR=3.44, 95%CI (2.09-5.67)]. Adolescents living in a household with high dependency ratio were 2.5 times more likely to be food insecure than those living in households with low dependency ratio [AOR=2.53, 95%CI (1.447-4.446)]. Adolescents living in a household with middle dependency ratio were 2 times more likely to be food insecure than those living in households with low dependency ratio [AOR=2.04, 95%CI (1.2-3.480)] (Table 5).

DISCUSSION

This study revealed that more than half (59.6%) of the adolescents were food insecure which was higher compared to a research conducted in Jimma which was 20.5 and 48.4%, respectively (Belachew et al., 2011,

2012). The observed difference could be due to seasonal variation of food insecurity. This study was done in pre harvest (flowering) season of coffee which is more vulnerable to food insecurity. Female adolescents were more likely to be food insecure than their counterparts. This result is inconsistent with research conducted in Zimbabwe where there was no gender difference in adolescent food insecurity (Gundersen et al., 2007). In this study gender stratification might be due to the biased hoarding of food by elders and/ or males have more chance of getting food outside their home.

The findings do make sense in the socio-cultural context of Ethiopia, and definitely in many countries, where patriarchy is the dominant cultural model (Facio, 2013). This finding is best explained by other findings of the study, stating that only 28% females had access to food outside their homes compared to 56% of male adolescents who could access food outside their homes. The study showed majority (75%) households were food insecure calculated from full version of HFIAS tool. The adolescents living in a food insecure households were more likely to be food insecure than adolescents living in a food secure household. This finding is in line with the study conducted in Jimma zone (Belachew et al., 2012). This finding shows elders can give priority to younger children and in sever condition both can experience food insecurity.

In this study adolescents living in a household in

which the head has completed primary and secondary school were less likely to be food insecure compared to those adolescents whose households' head are not formally educated (Oluyole et al., 2009; Birhane et al., 2014; Gecho et al., 2014). The possible explanation is educated parents can use advanced technology. Adolescents living in a male headed household were 2.7 times more odds of food insecure than their counterparts. It might be that most males that control financial assets like money spend it for other activity rather than food (Meinzen-et al., 2011). Adolescents who were members of households with high and middle dependency ratio were more likely to report food insecurity compared to those in low dependency ratio households. This study is similar to a study done in Jimma, Nigeria and USA (Belachew et al., 2012; Ojogho, 2010; Coleman-Jensen et al., 2013). This could mean that as the dependent age group size increases, there is larger number of people to be taken care of by the same source of income. Adolescents who are members of households without their own farm land were more likely to be food insecure than their counterparts. The reason is that households who rent land can pay the owner some portion of production from this plot.

Conclusion

Generally, it was found that there was high prevalence of adolescent and household food insecurity in the study area. Sex of adolescent, dependency ratio, sex of household head, educational status of household head, household food security status and farm land ownership are predictors of adolescent food insecurity. There is need to improve direct nutrition specific interventions targeting adolescents. School feeding program should be an integral component of food security intervention to reduce intergenerational rotation of undernourishment. Multi-sectoral interventions approach should be improved to address multifaceted causes of food insecurity; gender equality and the status of women and girls through operative health information at ordinary level needs to be considered. Further research is required to see the cyclic pattern of seasonal food insecurity in the study area using different methodological approach like longitudinal study.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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