

Magnitude of under nutrition and Associated Factors among Adolescent Street Children at Jimma Town, South West Ethiopia

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Research note

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Abstract

Objective : This study assessed the prevalence of under-nutrition and its associated factors among adolescent street children at Jimma town from March 1-31, 2019. **Results :** A community based cross sectional study was conducted among 312 street children from March 1 st to 31 st . The study found 29.2% [95% C.I: 24%- 34.0%] and 30.4% [95% C.I; 24.6% - 35.3%] prevalence of thinness and stunting respectively. Being female [AOR: 2.55, 95%C.I: 1.16- 5.63], Ever skipped one or more daily meal per day [AOR: 6.56, 95%C.I: 2.25- 19.15], Inadequate dietary diversity score [AOR: 1.86, 95%C.I: 1.05- 3.27] and using unprotected water source [AOR: 1.78, 95%C.I: 1.03- 3.05] were statistically significant factors for thinness whereas being in age group 15-18 [AOR: 5.78, 95%C.I: 3.20 -10.40] and ever used substance [AOR: 3.01, 95%C.I: 1.17 -7.77] were statistically significant factors for stunting. Interventions including nutritional support, lifestyle modification and personal and environmental hygiene shall be provided to these segments of the population to alleviate the problem. **Key Words** - Adolescent, street children, stunting, thinness, under nutrition.

Background

The term street children have many definitions in different settings[1]. United nations define Street children as children under 18 years of age, who spend all or parts of their time on the street, lacks supervision or protection which put them vulnerable to different problems[2]. The united nation children's fund (UNICEF) strengthen this definition [3]. Street children can be child of the street; those who have no family members left alive or the family may have abandoned him/her so that the child struggle to survive in the streets or child on the street; those who spend most of the day time on the street due to poverty, overcrowding, sexual or physical abuse at home. This group has chance to visit family members some days and even living under a good shelter [3–5].

Adolescence is a concept encompassing physical, physiological and emotional stages of transition from childhood to adulthood and the age ranges ten through nineteen[6]. Adolescents who gain adequate dietary demand and emotional support at this stage gain 15-20% of adult height, up to 60% of skeletal mass, and 50% of adult body weight [7]. On the contrary, Poor quality or quantity diet intake during adolescence may lead to under nutrition that could resonate throughout generations. Such problem can be worst enough among adolescent street inhabitants[8].

Under nutrition is common among underprivileged populations like women, children and adolescents especially who are street dwellers[9,10]. It is the single threat to global public health and by far the greatest contributing factor for child morbidity and mortality[11]. It is a significant Public Health problem described as silent killer [11,12]. This public health problem can touch any segment of the population like children, adolescents, pregnant mothers, children of the street and so on[12,13].

Adolescents which comprises 20% of world's population and 80% of the developing countries, are the most affected group of population due under nutrition though over nutrition is an emerging problem [6]. Even though prevalence of under nutrition among adolescents was not declared in the past three decades, it's

estimated that the global burden of under nutrition especially thinness found to be 8.4% for girls and 12.4% for boys. The global estimate for stunting among adolescents' data is varied with high estimate 52% in Guatemala and 44% in Bangladesh to 8% in Kenya and 6% in Brazil[7]. However, there is scarcity of data on the nutritional status of adolescents who are street dwellers in global and local context.

In Ethiopia there was limited information regarding the magnitude of under nutrition and their associated factors among adolescent street children. Academic understanding of street children is fragmented and research is not systematically conducted. As a result, the country lacks clear strategies or plans to solve the existing problem. Thus, this research aimed at filling information gap related to the problem so that policy makers, aid organizations and others will get information on existing problem.

Methods

Study design and setting

Community based cross sectional study design was employed 312 adolescent street children at Jimma town, Oromia regional state, South West Ethiopia from March 1-31, 2019. The town is found at a distance of 345 km away from Addis Ababa, the capital city of Ethiopia. According to 2015 National Urban System Study, population of the city was 199,576 of which 100,347 are male and 99,229 females. The town has thirteen urban Kebeles (*kebele refers the lowest administrative unit*) (Data from Jimma Town Municipality, Unpublished source).

Sample size determination and Sampling procedures

All Adolescent street children aged 12-18 years were included in the study. Children less than 12 years were excluded because of ethical issue as explained somewhere else [14]. Single population proportion formula was used to obtain sample size of 296 at the following assumptions: 95% confidence interval, 5% marginal error and 26% prevalence of thinness taken from studies conducted elsewhere [15]. However due to absence of recorded data, preliminary assessment was made to quantify the number of street children at the study area. Then a total of 312 participants who fulfill inclusion criteria were enumerated after intensive searching in all over the thirteen Kebeles in the town. Thus all enumerated adolescent children were included in the study making the final sample size 312.

Data collection methods

Data were collected using a pre tested Interviewer administered structured questionnaire. Questions were prepared originally in English language and then translated to local language for easy management, then translated back to English to maintain the quality and consistency of information. Stool specimens were collected using clean and labeled plastic vial. The collected stool samples were properly mixed with 10ml of 10% formalin for preservation and processed using formalin-ether concentration. All developmental stages of the parasitic organism were recorded. Dietary behavior was assessed using a qualitative food frequency questionnaire containing 29 food items, accessed elsewhere [16]. Food items were categorized into 9 groups based on FAO recommendations in order to assess individual dietary adequacy. The total

score were calculated and those with DDS score < 5 were categorized as inadequate dietary diversity and those with ≥ 5 adequate dietary diversity[17]. Individual level food insecurity was assessed using IFIAS that was previously validated in the study area[18].

Furthermore, weight measured using digital scales (SECA) with the subjects shoeless and in light cloths and recorded to the nearest 0.1 kg. Height measured in a standing position using a height meters mounted against a plastic board and recorded to the nearest 0.1 cm with detachable sliding head piece[19]. In this research, adolescent street children were considered as children of either sex who are within the age group of 12-18 years and who are both economically and socially engaged in street life[20]. Height for age Z-score below -2 standard deviation according to 2007 WHO standard reference values was used to identify stunted children and a BMI-for-age Z-score below -2 standard deviation according to 2007 WHO standard reference values was used to define thinness in the study population [21]. Ever substance using was defined based on use of at least one of the substances (alcohol, khat, cigarettes, and illicit drugs) to alter mood or behavior at any time in life[22].

Data analysis procedures

The data were entered using Epi-Data Version 3.1 then exported to SPSS version 20. Entered data were checked for completeness and errors, described and checked for outliers. For anthropometric data analysis, standard deviation (Z scores) were obtained by WHO Anthro Plus software. Bivariate and multivariable logistic regression was performed. Independent variables with p-value <0.25 in bivariate logistic regression were included for multivariable logistic regression. Variables were considered as statistically significant if p-value < 0.05 in multivariable logistic regression.

Results

Socio-demographic characteristics of the respondents

The study was conducted among 312 adolescent street children making a response rate of 100%. The median age of study participant was 14(IQR=2) years and the median duration of being street inhabitant was 12 (IQR= 17) months (**Table 1**).

Factors associated with thinness and stunting

After controlling for the effects of potentially confounding variables using multivariable logistic regression, Sex (Female)[AOR: 2.55, 95% C.I: 1.16- 5.63], ever skipping one or more meal/day[AOR: 6.56, C.I: 2.25- 19.15], inadequate dietary diversity score [AOR: 1.86, C.I: 1.05- 3.27] and using unprotected water source[AOR; 1.78, C.I: 1.03- 3.05] significantly predict thinness among street children(**Table 2**). Furthermore, Age (15-18 years)[AOR: 5.78, 95%C.I: 3.20- 10.40] and ever use of substance [AOR: 3.01, 95%C.I: 1.17-7.77] were variables that have increased the risk of stunting(**Table 3**).

Discussion

This study revealed that prevalence of thinness, stunting and both thin and stunting was 29.2% [95% C.I: 24%- 34.0%], 30.4% [95% C.I; 24.6% - 35.3%] and 4.2% [2.2% - 6.4%] respectively.

The prevalence of thinness seen at the study area was lower than the study conducted at Shabagh Area of Dhaka City[23] but nearly similar with the study conducted in south Indian[15] the discrepancy might be due to differences in age group at which the study was conducted (6-18 in Dhaka and 8-18 in south India versus 12-18 in the current study), variation in the denominator and socio-economic variability. The prevalence of stunting was 30.4% and higher among 15 to 18 years of age which was lower than study in south India (48%) and higher among under 10 years of age. The difference may be due to age composition, socio-economic characteristics of the study participants at different study area[15].

Even though there was no studies with similar study population in Ethiopia, magnitude of thinness and stunting in current study was higher than previous studies among adolescent girls in the normal population in Ethiopia[24–26]. Similarly the magnitude seen was also higher than school going adolescents of general population [27–30], adolescents from Somali refugee camps[31]and adolescents of pastoralist and Agro-pastoralist communities[32].

This study revealed that, female street adolescents were twice more likely to have thinness [AOR: 2.55, C.I: 1.16- 5.63] than male. This finding is different from studies conducted elsewhere among general population which states that females were less vulnerable to thinness than male[33–36].The reason behind for the difference may be, females in the street life has limited involvement for income generating activities, low daily income to purchase foods, less competent to fight and scramble foods from common pot. Furthermore, in this study 90%, 68% and 87% of female street inhabitants were skipping one or more daily meal, lived for more than one year in the street and food insecure respectively. So that, the cumulative effect of this and other may lead them to thinness.

The street children who were having inadequate dietary diversity score were more likely to be thin [AOR: 1.86, C.I: 1.05- 3.27] than those who were eating diversified meal. This finding is consistent with others finding in that inadequate dietary diversity is a well-established predictor of under nutrition among adolescents in normal population. Additionally, since adolescence is a period for rapid growth and development, failure in supplying adequate food for daily body demand would result in loss of weight.

The street children who had ever skipped one or more daily meal were six times more likely to be thin [AOR: 6.56, C.I: 2.25- 19.15] than those children who never skipped their daily meal. This may be due to a cumulative effect of daily deficiency in micro and macro nutrients that are essential for body metabolism and energy supply. Additionally, those who were using unprotected water source were more likely to be thin [AOR; 1.78, C.I: 1.03- 3.05] than those who didn't use it. This is may be due to impure water sources serve as a vehicle for intestinal parasites, and bacteria that would increase risk of infection especially diarrheal disease resulting in depletion of micro nutrients.

Variables like age, educational status of the child and parents, daily income, food insecurity and presence of intestinal parasites do not show statistical association with thinness though showed association in other target populations in the general population[21, 37, 38].

This study also revealed that being found in the age range of 15-18 was found to be five times more likely to be stunted [AOR: 5.78, C.I: 3.20- 10.40] than age groups 12-14. This finding is different from studies conducted among adolescents in normal population which revealed early adolescents are more likely to be stunted than late adolescents[28, 30]. The reason behind for this can be explained by the fact that stunting measures chronic or prolonged exposure to nutrient deficiencies so that the effect may be seen later in life.

In addition, those who were ever used substance were three times more likely to be stunted [AOR: 3.01, C.I: 1.17-7.77] than those who didn't use substance in their life span. This might be due to the fact that street children had involved in a range of substance utilization that can result in loss of appetite, early satiety, and increased expense for substances than food.

Limitation of the study

Recall bias for retrospective inquiry of personal, family history and dietary practice may affect the results of average daily income, frequency of skipping meal and dietary diversity score.

Abbreviations

AOR: Adjusted Odds Ratio; BAZ: Body mass index for age Z-score; BMI: Body Mass Index; CI: Confidence Interval ; COR: Crude odds ratio; CSW: Community Social Workers; ETB: Ethiopian birr; HAZ: Height for Age z score; IDDS: Individual Dietary Diversity Score; IFIAS: Individual Food Insecurity Assessment Scale; RERB: Research ethics review board; UN: United Nation; UNICEF: United Nation's Children Fund; WAZ: Weight for Age Z score;WHO: World Health Organization

Declarations

Ethics approval and consent to participate

The nature of the study was explained to the study participants to obtain assent prior to participation in the study. Privacy and confidentiality of collected information was ensured at all level. After reviewing study procedures in detail, ethical clearance was obtained from Jimma University Institute of Health, faculty of public health research ethics review board. Written informed consent was obtained retrospectively after the study has completed. Scanned copies of all signed consent will be submitted up on request.

Consent to publish

Not applicable

Availability of data and materials

All data that support the findings of this study is available from the corresponding author upon request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

DB involved in conception, design of study, data collection, analysis and final report writing. AW and TS participated on supervision and guidance of the work. KT has prepared the manuscript for publication. Finally all authors have proof read the final manuscript.

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Tables

Table 1: Characteristics of adolescent street children and their parents at Jimma town, South West Ethiopia, 201 (N=312)

Characteristics	Category	Frequency (%)	
Sex	Male	281	90.1
	Female	31	9.9
Age	12-14	191	61.2
	15-18	121	38.8
Highest Education attained by the child	Didn't attend school	78	25.0
	only read and write	23	7.4
	1-4	155	49.7
	5-8	56	17.9
Current Educational status of child	Attending	22	7.1
	Not attending	290	92.9
Educational status of Mother/Father	Attended school	193/214	61.9/68.9
	Didn't attended school	119/98	38.1/31.4
Alive natural parents	Yes	156	50.0
	No	130	41.7
	Didn't know	26	8.3
Ever skipped one or more meal/ day	Yes	249	79.8
	No	63	20.2
Dietary diversity score	Adequate	230	73.7
	Inadequate	82	26.3
Food security status	Food secure	64	20.5
	Food insecure	248	79.5
Use unprotected water source	Yes	173	55.4
	No	139	44.6
Hand washing habit during a meal	Yes	191	61.2
	No	121	38.8
Ever substance use	Yes	124	39.7
	No	188	60.3
Current substance use	Yes	96	30.8
	No	216	69.2
Low Physical violence	Yes	253	81.1
	No	59	18.9
Physical violence	Yes	135	43.3
	No	177	56.7

Table 2: Multivariable logistic regression analysis of factors associated with thinness among street Adolescent children at Jimma town, South West Ethiopia, 2019 (N=312)

Variable	Categories	Thinness COR [95% C.I]			AOR[95% C.I]	P-value
		Yes	No			
Sex	Male	76	205	1	1	
	Female	15	16	2.53[1.19- 5.36]	2.55[1.16- 5.63]	0.02*
Ever skipped meal/ day	Yes	87	162	7.92[2.784- 22.538]	6.56[2.25- 19.15]	0.001*
	No	4	59	1	1	
DDS**	Adequate	56	174	1	1	
	Inadequate	35	47	2.31[1.36- 3.94]	1.86[1.05- 3.27]	0.032*
Unprotected water source	Yes	61	111	2.00[1.198-3.328]	1.78[1.03- 3.05]	0.037*
	No	30	109	1	1	
Educational status of Father	Didn't attended	54	160	0.56[0.334- 0.928]	0.59[0.34- 1.03]	0.063
	Attended school	37	61	1		

* indicates variables that were statistically significant at P- value < 0.05 in multivariable logistic regression.

** implies dietary diversity score

Table 3: Multivariable logistic regression analysis of factors associated with stunting among street Adolescent children at Jimma town, South West Ethiopia, 2019 (N=312)

Variables	Categories	Stunting		COR(95%C.I)	AOR(95% C.I)	P-value
		Stunted	Not stunted			
Age categories	12-14	33	158	1	1	
	15-18	62	59	5.03[3.00- 8.44]	5.78[3.20- 10.40]	<0.001 *
Ever used substance	Yes	45	79	1.57[0.97- 2.56]	3.01[1.17- 7.77]	0.023*
	No	50	138	1	1	
Currently use substance	Yes	33	63	1.30[0.78- 2.18]	0.42[0.15- 1.13]	0.085
	No	62	154	1	1	
Maternal Education	Attended school	51	142	1	1	
	Didn't attend	44	75	1.63[1.00- 2.67]	0.61[0.34- 1.00]	0.100
Physical violence	Yes	28	107	0.43[0.26- 0.72]	0.48[0.26- 0.87]	0.016
	No	67	110	1	1	

* indicates variables that were statistically significant at P- value < 0.05 in multivariable logistic regression.

