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Nutrition Status of Adolescent Street Children 10-17 Years in Nairobi City Central Business District, Kenya

Jomo Sofia Machocho[1], Elizabeth Nafula Kuria[2], Judith Kimiywe[3]

[1,2,3]Department of Food Nutrition and Dietetics, School of Health Sciences, Kenyatta University, Nairobi, Kenya

Corresponding Author: Sofia Machocho Jomo

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ABSTRACT

In Kenya, 15,347 adolescents are street inhabitants, and approximately 5,046 of them are in the streets of Nairobi. However, research on the nutrition status of adolescent street children is very limited. Therefore, the purpose of this study was to determine the nutrition status of adolescent street children 10-17 years in Nairobi. A descriptive and analytic cross-sectional study was conducted on a sample of 248 participants (89 females and 159 males) selected through cluster sampling. Data was collected using anthropometric tools, interviewer-administered questionnaires, and a focus group discussion. Anthropometric data was analysed using WHO AnthroPlus software, while quantitative data from the questionnaire was analysed using SPSS version 25. A few of the respondents were malnourished as 3.2% had severe thinness, 8.1% had thinness, 4.8% were overweight, 7.7% were stunted, and 2.8% were severely stunted. The rate of thinness in the respondents was more than the acceptable levels of wasting recommended by WHO in developing countries (<2%). The cases of under-nutrition were more in adolescent street males than adolescent street females.

Keywords: Nutrition Status, Adolescent Street Children

INTRODUCTION

Nutrition status is the absence or presence of malnutrition. The absence of malnutrition is considered a good nutrition status, while the presence of malnutrition indicates poor nutrition status (1). An individual's nutrition status is a key factor in determining one's health status. Street children can be defined as children below 18 years who identify the streets as their home, and they lack supervision or protection from responsible adults (2). On the other hand, adolescents are people within the age bracket of 10 to 19 years (3). Therefore, in this study, adolescent street children are those people within the age bracket of 10-17 years. Children and adolescents are at risk of malnutrition because their bodies are undergoing growth and development, and they, thus, have high nutrient requirements. What is more, this vulnerability increases if these children do not have guardians (who are usually the breadwinners) and if they live in an unhealthy environment that predisposes them to diseases; both of these are situations under which adolescent street children live in (4).

Globally, the burden of undernutrition in adolescents is approximately 12.4% and 8.4% for boys and girls, respectively (5). In Kenya, the prevalence of underweight in children and adolescents is approximately 31.6% and 18.4% for boys and girls, respectively (6). Adolescents who live in the streets are at a high risk of undernutrition because of diets that are of poor quality and are not enough. A poor dietary intake in adolescence may cause undernutrition that

can create an intergenerational cycle of malnutrition if nothing is done (3). An important foundation of growth and development is laid during childhood and adolescence. Therefore, ensuring adolescents are well-nourished breaks the intergenerational cycle of malnutrition, thus enabling future generations to have a good healthy start. Adolescent street children are food insecure as they cannot easily access adequate and nutritious foods as they usually get their food through hard means such as begging people or eating food thrown in the garbage. One of the major threats facing street children in Nairobi is lack of access to food, in addition to other basic needs (7, 8).

Article 24 of the United Nations Convention on the Rights of the Children (UNCRC) says that children have a right to the highest standard of health (9). Similarly, the United Nations Committee on the Rights of the Child recognizes the need to implement the rights of children in adolescence since it is a life stage with significant vulnerability (10). However, as aforementioned, one of the major threats facing street children in Nairobi is a lack of access to food (7). Therefore, consuming inadequate food may negatively impact their nutrition status, and their health status, consequently. A poor nutrition status will make Adolescent Street children not enjoy good health yet having a good health is a right for all children.

The objectives of this study were to determine the:

- Socio-economic and demographic characteristics of adolescent street children 10-17 years in Nairobi City Central Business District (CBD).
- Nutrition status of adolescent street children 10-17 years in Nairobi City (CBD).

MATERIALS & METHODS

This study used a descriptive and analytical cross-sectional design. The study was done in Nairobi City the Central Business District (CBD), Kenya, in February - March 2022. Fisher formula was used to determine the sample size and the finite population correction formula was applied to slightly reduce the sample size. The cluster sampling technique was used. Street children live in bases. Therefore, each base formed a cluster. Then, several bases (clusters) were randomly selected, and everyone who met the inclusion criteria in the randomly selected bases (clusters) took part in the study. The intended sample size for this study was 260. However, only 248 people ended up participating in the study. Anthropometric instruments were used to determine the nutrition status of the study population. They included weighing scales for measuring weight and stadiometers for measuring height. A questionnaire with both open-ended and closed-ended questions was used to obtain information about the socio-economic and demographic characteristics of the respondents, and a focus group discussion was done to corroborate the information provided through the questionnaires.

STATISTICAL ANALYSIS

WHO AnthroPlus software was used to analyse anthropometric data using the WHO Reference 2007 for adolescents while the 25th version of the Statistical Package for Social Science (SPSS) computer software programme was used for analysing quantitative data from the questionnaire.

RESULT

The Socio-Economic and Demographic Characteristics of Participants

The sample consisted of 248 adolescent street children. 159 (64.1%) of the street children were males, while 89 (35.9%) were females. The youngest adolescent street children were aged 10 years, while the oldest were aged 17 years old. The mean (SD) age was 15.87±1.822. 40 (16.1%) of the adolescents were aged 10-14 years, while 208 (83.9%) were between the ages of 15-17 years. Additionally, 88 (35.5%) of the respondents beg for money as a source of income, while 160 (64.5%) get money through informal jobs, such as, collecting

and selling plastics, helping people to carry their luggage, and helping people to park their cars. Also, majority of the respondents 128 (51.6%) approximately make 100-300ksh per day, 72 (29%) make <100ksh per day, 40 (16.1%) make 301-500ksh per day, and 8 (3.2%) had no earning at all.

Table 1. ***Socio-Economic and Demographic Characteristics of Adolescent Street Children 10-17 Years in Nairobi CBD***

Characteristics	Frequency	Percent
Gender		
Male	159	64.1%
Female	89	35.9%
Age Group		
10-14 Years	40	16.1%
15-17 Years	208	83.9%
	Mean (SD) Age: 15.87±1.822	
Source of Income		
Begging	88	35.5%
Informal Jobs	160	64.5%
Amount of money earned per day		
No earning/Zero	8	3.2%
<100ksh	72	29.0%
101-300ksh	128	51.6%
301-500ksh	40	16.1%

The Nutrition Status of Participants

Figure 1 shows that compared to the normal distribution curve of BMI-for-age by the 2007 WHO reference standards, the BMI-for-age curve of the study respondents is skewed to the left indicating that the study group had more cases of thinness than the reference group.

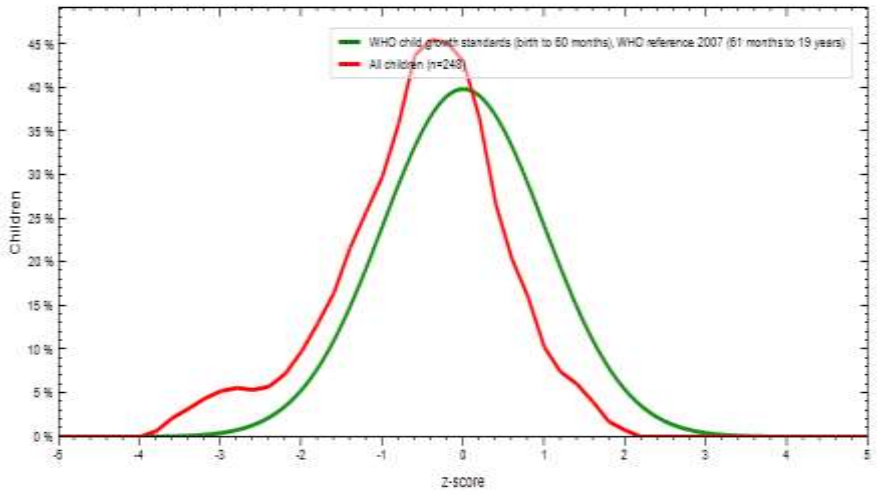

Figure 1. **Percent distribution of BMI-for-age of the respondents in comparison to the reference population**

Figure 2 shows that compared to the normal distribution curve of BMI-for-age by the 2007 WHO reference standards, the BMI-for-age curve of males in the respondents was more skewed to the left than that of females, thus, indicating that the cases of thinness in the study group were more in males than females.

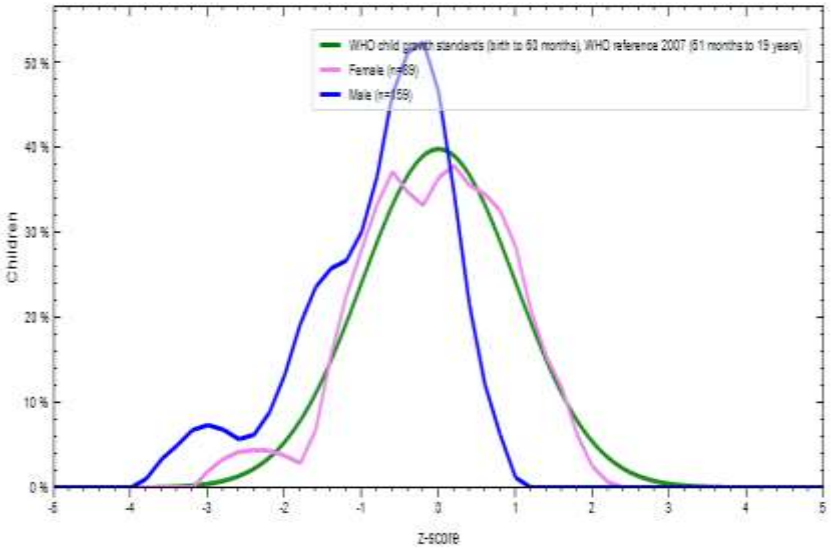

Figure 2. **Percent distribution of BMI-for-age of the different sexes of the respondents in comparison to the reference population**

While 44 (17.7%) of the respondents were malnourished, 204 (82.3%) had normal nutrition status. Additionally, 3.2% of the respondents had severe thinness (<-3SD) and 8.1% had thinness (<-2SD), while 4.8% were overweight (>+1SD). Also, 7.7% of the sample were stunted (<-2SD), and of these, 2.8% were severely stunted (<-3SD). None of the adolescents in the age group 10-14 had a BMI-for-age of <-2SD, but 20% of the adolescents in this age group were stunted (<-2SD).

Table 2: ***The Nutrition Status of Adolescent Street Children 10-17 Years in Nairobi CBD***

The Nutrition Status of Adolescent Street Children 10-17 Years in Nairobi CBD						
Nutrition Status	**Frequency**	**Percent**				
Normal	204	82.3				
Malnourished	44	17.7				
Age groups	N	BMI-for-age (%)				
Years		% < -3SD	% < -2SD	% > +1SD	Mean	SD
10-17	248	3.2	8.1	4.8	-0.54	0.98
10-14	40	0	0	0	-0.35	0.59
15-17	208	3.8	9.6	5.8	-0.58	1.04
		Height-for-age (%)				
Years		% < -3SD	% < -2SD	% > +1SD	Mean	SD
10-17	248	2.8	7.7		-0.83	0.94
10-14	40	0	20		-0.97	1.13
15-17	208	3.4	5.3		-0.8	0.89

5% of the male respondents had severe thinness (<-3SD) and 10.1% had thinness (<-2SD). Additionally, 11.9 % of the male respondents were stunted (<-2SD), and of these, 4.4 % were severely stunted (<-3SD). None of the male adolescents in the age group 10-14 had a BMI-for-age of <-2SD, but 25% of the male adolescents in this age group were stunted (<-2SD).

Table 3: ***The Nutrition Status of Male Adolescent Street Children 10-17 Years in Nairobi CBD***

The Nutrition Status of Male Adolescent Street Children 10-17 Years in Nairobi CBD			
Age groups	**N**	**BMI-for-age (%)**	
Years		% < -3SD	% < -2SD
10-17	159	5	10.1

10-14	32	0	0			
15-17	127	6.3	12.6			
		Height-for-age (%)				
Years		% < -3SD	% < -2SD	% > +1SD	Mean	SD
10-17	159	4.4	11.9		-0.98	1.04
10-14	32	0	25		-1.09	1.24
15-17	127	5.5	8.7		-0.95	0.98

None of the female respondents had severe thinness (<-3SD), 4.5% had thinness (<-2SD), while 13.5% were overweight (>+1SD). Additionally, none of the female respondents were stunted.

Table 4: ***The Nutrition Status of Female Adolescent Street Children 10-17 Years in Nairobi CBD***

	The Nutrition Status of Female Adolescent Street Children 10-17 Years in Nairobi CBD			
Age groups	**N**		**BMI-for-age (%)**	
Years		% < -3SD	% < -2SD	% > +1SD
10-17	89	0	4.5	13.5
10-14	8	0	0	0
15-17	81	0	4.9	14.8
			Height-for-age (%)	
Years		% < -3SD	% < -2SD	
10-17	89	0	0	
10-14	8	0	0	
15-17	81	0	0	

DISCUSSION

The Socio-Economic and Demographic Characteristics of Adolescent Street Children 10-17 Years in Nairobi CBD.

The results of the study revealed that boys made up 64.1% of the street children while girls were 35.9%. This finding is comparable to those of other studies that have shown boys form between 50-100% of street children (11-15) while girls usually make less of the street population (16). This is because boys are more likely to go to the streets when familial conditions are not conducive to staying at home, than for girls (15-16).

The findings of the study revealed that children between 15-17 years were more (83.9%) than those between 10-14 years (16.1%). Other studies have also shown almost similar results as they have found out that majority of street children are adolescents between 12-17 years, although younger children also form part of the street population (12, 15-16).

Additionally, this study found out that 88 (35.5%) of the respondents beg for money as a source of income, while 160 (64.5%) get money through informal jobs, such as, collecting and selling plastics, and helping people to carry their luggage, among others. This finding is similar to those of other studies that have shown street children usually earn money from either begging, stealing, or doing informal jobs (13-15). However, unlike Rahman & Hakim (4) who showed that only about 38% of street children work, the majority of the respondents in this study (64.5%) said that they do informal jobs. Also, majority of the respondents 128 (51.6%) approximately make 100-300ksh per day, 72 (29%) make <100ksh per day, and 8 (3.2%) had no earning at all. The finding on the amount of money earned by street children in this study disagrees with that of Rahman & Hakim (4) who showed that most street children make less than a dollar per day. Although, 29% of the respondents in this study made less than a dollar per day, and 3.2% did not make any money at all, the rest made a little bit more than a dollar per day. However, the focus group discussion revealed that although they use this money to purchase food, they also use it to buy drugs, and this finding is similar to others that have revealed most of the money earned by street children is used to purchase food and drugs (15).

The Nutrition Status of Adolescent Street Children 10-17 Years in Nairobi CBD

About 17.7% of the respondents were malnourished as 3.2% had severe thinness (<-3SD), 8.1% had thinness (<-2SD), 7.7% were stunted (<-2SD), 2.8% were severely stunted (<-3SD), and 4.8% were overweight (>+1SD). The rate of wasting in this sample was more than the acceptable WHO wasting levels (<2%) for developing countries, therefore, this is a cause of concern. The co-existence of both under-nutrition and overweight in this study is similar to other studies that have shown the presence of the double burden of malnutrition in street children. For instance, Rahman & Hakim (4) revealed that 6.3% and 60.4% of street children in their study were overweight and underweight, respectively.

The level of under-nutrition in this study was higher in boys than in girls since the BMI-for-age curve of males in the study respondents was more skewed to the left than that of females, thus, indicating that the cases of thinness in the study group were more in males than females. Additionally, 5% of the male respondents had severe thinness (<-3SD) and 10.1% had thinness (<-2SD), while none of the female respondents had severe thinness (<-3SD), and only 4.5% of the female respondents had thinness (<-2SD). Furthermore, there were no cases of overweight in the males, while the cases of overweight in the females were 13.5% (>+1SD). Also, while 11.9 % of the male respondents were stunted (<-2SD), and of these, 4.4 % were severely stunted (<-3SD), none of the female adolescents were stunted. This finding is dissimilar from that of another study which showed that adolescent street females had a more likelihood of having thinness than adolescent street males (3). This difference could probably be due to the fact that there were well-wishers who occasionally gave food to the adolescent street children in this study, and these well-wishers were more likely to sympathize with the females since most of the adolescent street males in this study were unruly.

This study showed that the number of malnourished adolescent street children (17.7%) was less compared to the number of adolescent street children whose nutrition status was normal (82.3%). This finding is similar to another study that showed a majority of the street children (58%) had normal nutrition status than those who were malnourished (42%) (13). However, this finding is in contrast to several other studies that have shown most street children are malnourished than well-nourished. For instance, in one study, 66.7% or two-thirds of the sampled street children were malnourished, while in another study, 65% of the studied street children were underweight (4,12). This dissimilar finding may be because in this present study, the focus group discussion revealed that some of the street children are usually given food on a regular basis, approximately once every week, by well-wishers, and also because most of the children in this study (51.6%) approximately made 100-300ksh per day, unlike other studies where street children earned less than a dollar per day (4).

Nevertheless, like in other studies, the presence of stunting and thinness in this study indicates the existence of both acute and chronic malnutrition in street children. In this study, 20% of adolescents aged 10-14 years were stunted (<-2SD). This rate is more than the WHO acceptable levels of stunting (<17%) in developing countries. Stunting seemed to be more in this age group than in those between 15-17 years since no respondent between 15-17 years was stunted. Other studies have shown that street children have a 6-times likelihood of being stunted than children living in CCIs (11). Also, in another study 24% of the street children were stunted (13). Additionally, in this present study, the rate of thinness was slightly higher than that of stunting as 8.1% of the total respondents were thin (<-2SD) while 7.7% of the total respondents were stunted (<-2SD). Other studies have also presented similar results where acute malnutrition is more than chronic malnutrition in street children. For instance, a different study showed that the

rate of underweight among street children in their study was 77.1%, while the rate of stunting was 35% (14). However, a different study revealed that chronic malnutrition was more than acute malnutrition in their study since 48% of the street children in their study were stunted, while 26% were wasted (17).

CONCLUSION

To sum up, although most of the street children in this sample had normal nutrition status, the rate of wasting in the sample, and the rates of stunting among those between 10-14 years were more than the acceptable levels of wasting and stunting set by WHO for developing countries. Few of the respondents were also overweight, indicating the existence of the double burden of malnutrition in developing countries. Therefore, the researcher recommends that relevant stakeholders, such as the government, and community organizations should develop programmes that focus on implementing measures aimed at improving the nutrition status of adolescent street children. Additionally, a longitudinal intervention study should be done to determine effective strategies that can be used to improve the nutrition status of adolescent street children.

Declaration by Authors

Ethical Approval: Approved by Kenyatta University Ethical Review Committee approval number PKU/2374/11511. Research permit was obtained from National Council of Science, Technology and Innovation (NACOSTI) Reference number NACOSTI/P/21/14466. The participation was voluntary. The researcher got assent from the adolescent street children who lived alone in the streets without their parents, and consent from the parents/guardians of adolescent street children who lived on the streets with their parents/guardians.

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Conflict of Interest: The authors declare no conflict of interest.

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