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Research Article

Prevalence of Indicators of Malnutrition and Associated Factors among Public Primary School Children in Hargeisa, Marodi Jeh Region, Somaliland, 2019.

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Abstract

Background: Malnutrition is one of the major public health problems in Africa and other developing nations and major contributors to the global disease burden. Globally, approximately 151 million children under 5 suffer from stunting. These children begin to face learning difficulties in school, do not reach their full growth potential, and face barriers to participate the activities in their communities. The effects of stunting continue in adulthood, with reduced work capacity and, in women, increased risk of mortality during childbirth and adverse birth outcomes. Stunting is the overwhelming result of poor nutrition in early childhood. Children suffering from stunting may never attain their full possible height and their brains may never develop to their full cognitive potential.

Objective: Prevalence of indicators of malnutrition and associated factors among public primary school children in hargeisa, Somaliland

Methods: School based cross-sectional study was conducted among primary school children in Hargeisa, Marodi Jeh Region. A total of 482 children were randomly selected from public primary schools. Data was collected from 30 March to 5 May, 2019 using interviewer administered questionnaire. Descriptive analyses such as percentages and frequencies were used to describe the study participants. Bi-variate and multivariable logistic regression analyses were done to isolate independent predictors of malnutrition among public primary school children in Hargeisa.

Results: A total of 482 primary school children participated in the study. More than half (56.2%) study participants were females. Most of the respondents 55.2% were in the age group of 8-10 years. The prevalence of stunting, underweight and thinness were 10.8%, 19.7% and 39.2%, respectively.

Family size and age category were significantly associated with stunting. Having family members between 9-10 members were 0.274 times more likely to be stunted compared to those family members less than nine members [(AOR = 0.274 95%CI = 0.082 - 0.919)], where children whose age group between ten to eleven years were 2.19 times higher in stunting compared the other age groups. [(AOR = 2.19) 95%CI = 0.923 - 5.204)].

Mothers' occupation was significantly associated with underweight. Children whose mothers are civil servants were 0.121 times more likely to be underweight compared to those house wives and merchants (AOR = 0.121 (95%CI = 0.019 - 0.7)]. Being a female (AOR = 1.98, 95% CI: 1.349; 2.91, $p < 0.005$) and having civil servant mother (AOR = 1.24, 95% CI: 0.077; 1.782, $p < 0.005$) were significantly associated with thinness

Conclusion: The prevalence of some indicators of malnutrition was found to be high. Thinness and underweight was highly prevalent compared to stunting. Mothers' occupation was significantly associated with underweight; sex and mothers' occupation were significantly associated with thinness where family size and age category were significant associated with stunting.

Keywords: *Malnutrition; Primary School; Children; Somaliland*

Abbreviations

IDPs: Internally Displaced People; WASH: Water and Sanitation Hygiene; FSNAU: Food Security and Nutrition Analysis Unit; MUAC: Mid Upper Arm Circumference; HAZ: Height for Age Z-Score; WAZ: Weight for Age

Introduction

Malnutrition refers to deficiencies, excesses or imbalances in a person's intake of energy and/or nutrients [1]. Malnutrition is one of the major public health problems in Africa and other developing nations and major contributors to the global disease burden. Globally, approximately 151 million children under 5 suffer from stunting. These children begin to face learning difficulties in school, do not reach their full growth potential, and face barriers to participation in their communities [2] the effects of stunting continue in adulthood, with reduced work capacity and, in women, increased risk of mortality during childbirth and adverse birth outcomes [3].

More than 200 million school age children are stunted and underweight and it has been estimated that nearly one billion children will be mentally and physically impaired by 2020, if suitable interventions are not done [4]. According to the growth and assessment surveillance unit of the World Health Organization (WHO) 2010, the global prevalence of malnutrition among school-aged children (5 - 14 years old), as indicated by the prevalence of stunting, was approximately 28% (171 million children), with Eastern Africa suffering a higher rate of 45% [3].

Malnutrition in Somalia is multifaceted affecting mothers, infants, young children, school age children, adolescent girls and women. It restricts inclusive development and overall prosperity of the nation and constitutes a violation of basic children's rights to survival and development and the highest attainable standard of health. Although there have been improvements in the nutrition status in the last five years, children in Somalia suffer from multiple nutritional deprivations [5].

According to world food program, May 2018, 2.7 million people cannot meet their daily food requirement to day and require urgent humanitarian support, with more than half million on the brink of famine. Another 2.7 million Somalis need livelihood support to ma keep from sliding into crisis. An estimated 300,000 children under five years are malnourished, including 48,000 who are severely malnourished and face a high risk of disease and death [6].

The nutritional status of Somali children has been among the worst in the world. Child under-nutrition remains a huge public health concern. In addition to the existing chronic food insecurity, there is poor access to facilities and services for health and for water, sanitation and hygiene (WASH) - and all these problems are exacerbated by a continuously insecure environment [7].

A child suffers from stunting if their 'height for age' is two standard deviations below the median height for age of the relevant population [7].

Stunting in children results over a long term in diminished cognitive and physical development reduced productive capacity and poor health conditions [8]. According to FSNAU situational analysis, children in Somalia and their mothers continue to undergo from multiple nutritional deprivations, which refute them the opportunity to thrive and reach their full developmental potential [9-16].

Malnutrition is more common in southern and central regions in Somalia because of civil conflicts, droughts and Puntland than in Somaliland, and more prevalent in populations of IDPs and those with rural livelihoods [9]. Although malnutrition among children in Somaliland is not prevalent as compared to southern and central regions of Somalia but it is still a public health problem and common in public primary schools in Somaliland and in particular in hargeisa. Therefore, this study aims to assess the prevalence of indicators of malnutrition and associated factors among public primary school children in Hargeisa, Marodi Jeh Region, and Somaliland.

Materials and Methods

Study design, setting, and area

The study was conducted in Hargeisa Somaliland from 30-March 2019 to 5 May 2019. Hargeisa is the capital city of Somaliland; the city is located at the centre of Somaliland and near the border with Ethiopia. It is situated in a valley with the Marodi-jeh River passing through the city, although it is currently dry. It is the largest city in Somaliland and estimates using a GIS survey in 2007 placed the population somewhere between 350,000 and 850,000 people. However, based on rural-urban migration and the city growth in general, officials believe that the current population is actually now more than 1.5 million people. It currently consists of 5 main districts, 3 small districts and 4 villages [18,19].

The study design was institution based cross sectional study design was used. Source Population was all public primary school children from grade1 to grade 4 and Study Population was all public primary school children grade 1 to 4 registered in the randomly selected schools included in the study. The study unit was all children from grade 1 to grade 4 randomly selected for the study.

Inclusion and exclusion criteria

Inclusion criteria

All children in grade 1 to grade 4who were enrolled in the sampled public primary schools.

Exclusion criteria

All children who had physical deformity like (kyphosis, lordosis and scoliosis) and have no ability to speak were excluded from the study.

Sample Size Determination

$$n = \frac{(Z\alpha/2)^2 P\ (1-P)}{d^2} * DE$$

P= prevalence of malnutrition in primary school children 27.5% [20-25]

Z= level of confidence at 95% certainty (1.96)

d= 5% margin of errors

DE = design effect

Non-response rate, 5%

$(1.96)^2\ 0.275(1-0.275)/\ (0.05)^2$

= 3.84*0.275*0.725/0.0025

=306+ 15= 321*1.5 = 482.

Sampling technique

Multi-stage random sampling was used. Four schools were randomly selected from the two districts which were selected from the five districts in Hargeisa. This accounts for thirty percentages of all districts in Hargeisa. Two public primary schools were randomly selected from each district. Students in each selected school were randomly selected from grade 1 to grade 4 until required sample size is reached. Each class had equal proportion of students to be included. Simple random sampling was used to select study participants in each class.

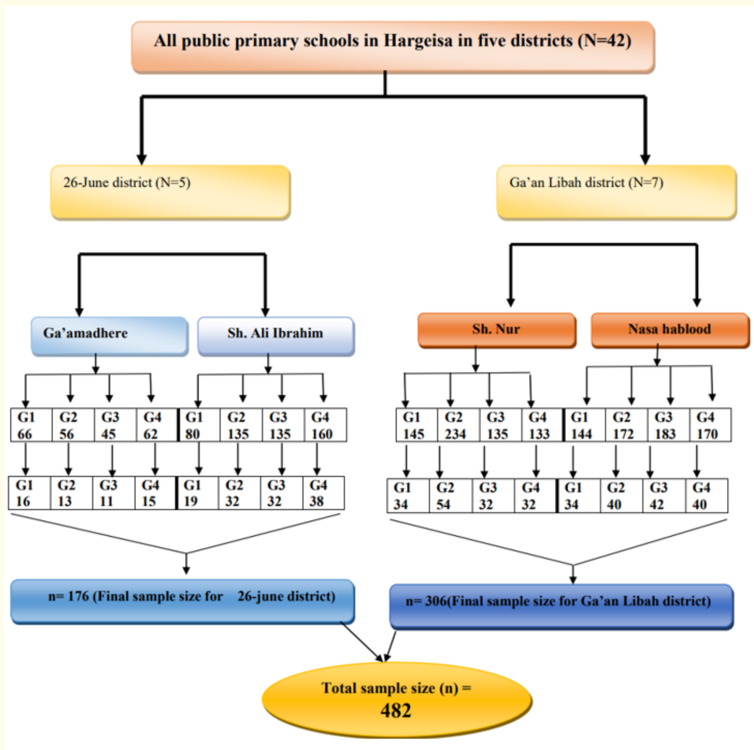

Figure 1: *Schematic diagram of sampling procedure.*

(N represents the number of schools in each district, G represents grade level and numbers within each box beneath grade level are size of each grade level).

Data collection procedures

Structured questionnaires prepared in English language was used and translated in to Somali language then translated back to English to check for consistency. Anthropometric measurements including weight and height were measured. A wooden measuring board (also called sliding board) was used for measuring the height of child. Shoes were taken off, the head was in the Frankfurt plane during measurement, knees was straight and the Heels, Calf muscle, buttocks and, the shoulders blades, were touched the vertical surface of the stadiometer (anthropometer) or wall. a well-trained data collectors performed the procedure of measurements. Weight was measured using sensitive digital scale. The scale was placed on a flat surface and the scale was calibrated to zero before measurement. Shoes were taken off and data collectors should be trained.

Data analysis procedures

Data were checked manually for the completeness during data collection and before data entry. Then data were entered for SPSS for windows version 20 for cleaning and analyses. The descriptive analysis such as proportions, percentages and measuring of central tendency were used. After descriptive statistics, bivariate and multivariable logistic regression analyses were performed. All variables having $p < 0.25$ on bivariate analysis was used for multivariable model to identify factors significantly associated with malnutrition among primary school students. Model fitness was checked using Hosmer Lemeshaw test at $P > 0.05$. Multicollinearity was checked using standard error of > 2. All tests was two sided and statistical significance was declared at $P < 0.05$.

Data quality management

Quality control measures and good practices including, training of data collectors, pre-testing of tools and materials and field monitoring of data collection was made before and during data collection process. Anthropometric indices were calculated using the new World Health Organization Child Growth Standards, WHO, 2007AnthroPlus software Statistical analysis of the data was performed using the statistical package for Social Sciences for Windows SPSS (version 20). Z-score for stunting, underweight and thinness for age was calculated by WHO 2007 Anthro-Plus software.

Results and Discussion

Results

A total of 482 primary school children participated in the study. More than half of participants (56.2%) were females. Most of the respondents (55.2%) were in the age group of 8 - 10 years. 21% of the school children were grade-one, 28.8% were grade-Two, 24.3% were grade-three while 25.9% were grade-four. Majority of the respondents (79.7%) of the children were living with their parents both mother and father. In mothers occupation, 61.6% were house wife, 30.6% were merchants with small business owner where only 7.8% of mothers were civil servants. Majority of the mothers (57.7%) were illiterate. Nearly same numbers of fathers (52.9%) were also illiterate. Majority 45.6% (220) had a family size of 6-8 members (Table 1).

Characteristics of Study Participants	Frequency		Percentage
Sex			
Female	271		56.2%
Male	211		43.8.3%
Age category	Female	Male	
5-7 years	51	64	23%
8-10 years	121	145	55.2%
11-13 years	39	62	21%
Grade	Female	Male	
1	44	57	21%
2	61	78	28.8%
3	49	68	24.3%
4	57	68	25.9%
Family size			
3-5	17		3.5%
6-8	220		45.6%

9-10	196	40.7%
≥11	49	10.2%
Mother's Occupation		
House wife	297	61.6%
Merchant	147	30.6%
Civil servant	38	7.8%
Mothers educational level		
Cannot read /write	278	
Primary level	158	32.8%
Secondary	38	7.9%
University level	8	1.7%
Father's educational level		
Cannot read/write	255	52.9%
Primary	108	22.4%
Secondary	75	15.6%
University level	44	9.1%

Table 1: *Socio-demographic characteristics of primary school children, Hargeisa Somaliland, 2019.*

House hold related factors

Majority 72% of the respondent used electricity in their homes while only 28% have no access to electricity. Ninety five percent of households have at least one member who uses telephone while only 5% have no any cell phone. Ninety five percent of the respondents have had a bed with cotton or at least a sponge in their house while only 5% of the children have neither bed nor sponge in their house. Nearly 54% of the children had no television in their homes where 46% have had television in their homes. Above 90% of the primary school children have cemented floor where only 19.7% have no cemented type of floor. Nearly 14% of the children have small Somali huts made up of clothes, plastic sheets and sticks only, 41% have houses made up of sheets woods and cemented floor, where 43% have normal houses made up of cement, bricks, flat sheets and wood (Table 2).

Property		Female	Male	Total	Percentage
Electricity	No	47	88	135	28%
	Yes	164	183	347	72%
Mobile	No	9	15	24	5%
	Yes	202	256	458	95%
Bed with cotton/ sponge	No	11	12	24	5%
	Yes	200	258	458	95%
Television	No	101	160	261	53.9%
	Yes	110	111	221	45.1%
Cemented type of floor	No	33	62	95	19.7%
	Yes	209	178	387	90.3%
Type of housing	Hut	22	45	67	13.9%
	Flat sheet	87	112	199	41.3%
	Normal house (cement, sand, bricks...)	102	106	208	43.2%
	Others	0	8	8	1.7%

Table 2: *House hold related factors (household wealth).*

WASH related factors

Majority of the students (51.6%) use soap for hand washing, 43.7% of students use only water for washing hands where only 4.5% use ash and other substance for hand washing. 43% of the respondents use pipe water, 33% use protected wells where only 24% use other sources of water. 44.4% of families dispose their liquid wastes in liquid waste pits, 31.7% dispose their liquid waste around their houses where only 23.8% use different disposal mechanism like their toilets, their near roads and others. 94% of the respondents feeds thermites per day, 5% two times per day where only 1% of the primary school children feeds four times and above per day 53.5% of the primary school children had no any illness in the last two weeks where 46.5 had had different types of illness in the last two weeks. 76% of the children have no diarrheal disease in the last two weeks while only 24% have diarrheal diseases (Table 3).

Characteristics of study Participants	Frequency	Percentage
Washing hands		
Water only	211	43.8%
Using soap some times	249	51.7%
Using ash some times	22	4.6%
Source of drinking water		
Pipe water	208	43.2%
Protected well	257	32.7%
Other sources	117	24.3%
Solid waste disposal		
Temporary bags	224.6	46.6%
Open field	150.8	31.3%
Burning	94.1	19.5%
Others	12.5	2.6%
Liquid waste disposal		
Liquid waste pit	214	44.4%
Open field	153	31.7%
Others	115	23.9%
Toilet facilities		
Yes	477	99%
No	5	1%
Feeding habit per day		
Two times	27	5.6%
Three times	452	93.8%
Four times	3	0.6%
Illness for the last two weeks		
Yes	224	46.5%
No	258	53.5%
Diarheal illness for the last 2 weeks		
Yes	119	24.7%
No	363	75.3

Table 3: *WASH related factors.*

The prevalence of stunting, underweight and thinness in the study participants were 10.8%, 19.7% and 39.2% respectively. In underweight and thinness females are slightly higher than males where stunting females are lower percentage than males.

Characteristics	Mean ± SD
Height	151 ± 12.8
Weight	21.2%
WAZ	-0.9237 ± 1.334
BAZ	-1.629 ± 2.299
HAZ	-0.6877 ± 1.1604

Table 4: *The mean height, weight, WAZ, BAZ and HAZ of primary school children in Hagreisa Somaliland.*

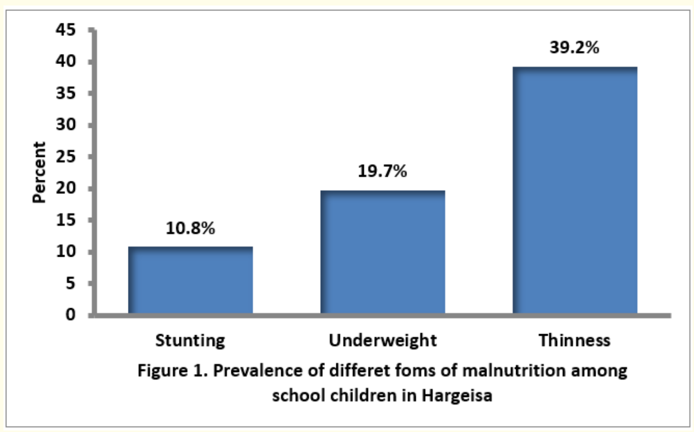

Figure 2

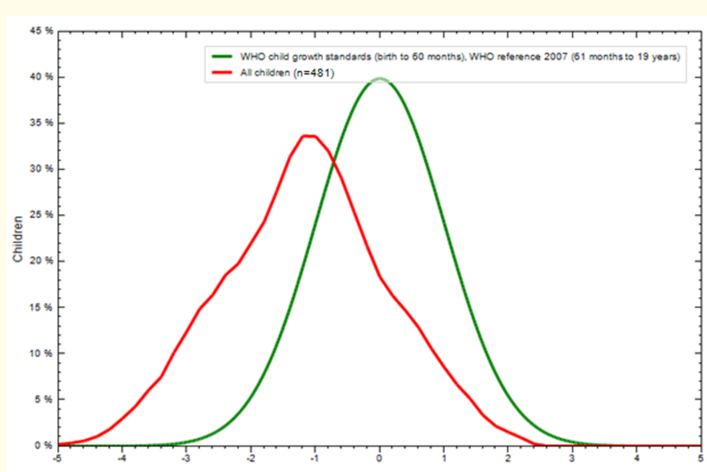

Figure 3: *Weight for age z- scores of primary school children in Hargeisa, Somaliland. Compared to the WHO references by sex of the children.*

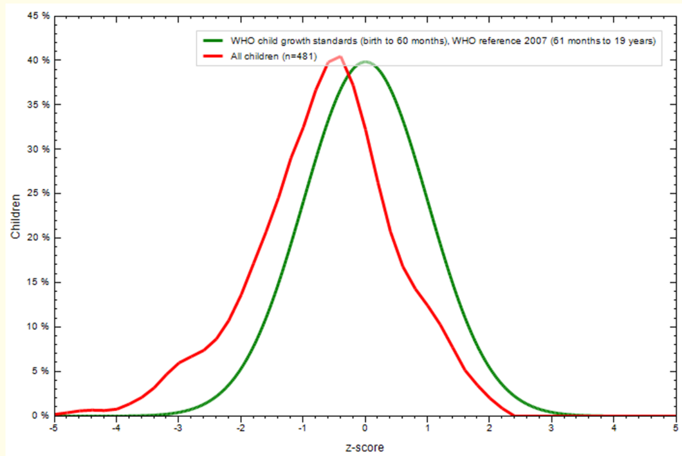

Figure 4: Height for age Z-scores of primary school children in Hargeisa Somaliland compared to the WHO references.

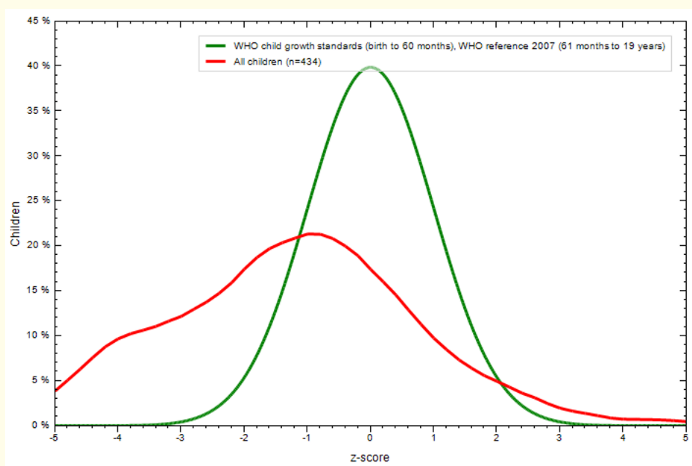

Figure 5: BMI for age Z-scores of primary school children in Hargeisa Somaliland compared to the WHO references.

Factors associated with stunting among public primary school children in Hargeisa

In multivariable logistic regression family size and age category were significantly associated with stunting. Families whose members between 9 - 10 members were 0.274 times more likely to be stunted compared to those family members less than nine members. [(AOR = 0.274 95%CI = 0.082 - 0.919)] where children whose age group between ten to eleven years were 2.19 times higher in stunting compared the other age groups. [(AOR = 2.19) 95% CI = 0.923 - 5.204)].

Variables	B	P	COR	AOR	95% C.I.	
					Lower	Upper
SEX						
Male			1.00	1.00		
Female	-.522-	0.117	0.536**	0.593	0.309	1.140
FATHERS EDUCATION						
University level		0.037	1.00	1.00		
Illiterate	1.292	0.121	2.28	3.639	0.711	18.630
Primary level	1.971	0.019	4.48**	7.180	1.387	37.161
Secondary level	.960	0.273	1.82	2.612	0.469	14.561
AGE CATEGORY						
5-7 years		0.121	1.00	1.00		
8-10 years	.162	0.691	1.08	1.176	0.528	2.619
11-13 years	.785	0.075	2.12	2.191	0.923	5.204
FAMILY SIZE						
3-5 members		0.213	1.00	1.00		
6-8 members	-1.128-	0.063	0.29**	0.324	0.098	1.063
9-10 members	-1.294-	< 0.05	0.24**	0.274	0.082	0.919
≥11	-1.215-	0.100	0.27*	0.297	0.070	1.263

Table 5: *Multivariable logistic regression model predicting the likelihood of stunting among primary school children in Hargeisa Somaliland, 2019.*

Maximum S.E. = 9.495, Hosemer Lemeshaw test (P = 0. 30).

**p-value < 0.25 ** p-value < 0.05.*

Factors associated with underweight among public primary school children in Hargeisa

In multivariable logistic regression mothers' occupation was significantly associated with underweight. Children whose mothers are civil servants were 0.121 times more likely to be underweight compared to those house wives and merchants. (AOR = 0.121 (95% CI = 0.019 - 0.7)].

Model	B	P	COR	AOR	95% C.I	
					Lower	Upper
SEX						
Male			1.00	1.00		
Female	0.338	0.159	0.713*	1.403	.876	2.245
AGE CATEGORY						
5-7 years		0.290	1.00			
8-10 years	0.069	0.819	1.04	1.072	0.591	1.942
11-13 years	0.475	0.169	1.73*	1.608	0.817	3.163
MOTHER'S EDUC						
Illiterate		0.328	1.00			

Primary	0.127	0.652	1.22*	1.136	0.652	1.978
Secondary	0.889	0.089	1.38	2.432	0.873	6.772
University	1.431	0.276	0.63	4.185	0.318	54.984
MATHER'S OCCUP.						
House wife		0.05	1.00			
Merchant	0.119	0.657	1.28	1.126	0.667	1.899
Civil servant	-2.197	< 0.018	0.22**	0.121	0.021	0.7
FATHER'S EDUC						
Illiterate		0.246	1.00			
Primary	.516	0.079	1.844**	1.675	.943	2.974
Secondary	-.140	0.720	0.913	.869	.405	1.868
University	.236	0.609	1.233	1.266	.514	3.120
Care givers						
Parents				1.00		
Relatives	.666	.062	1.68*	1.946	.967	3.914

Table 6: *Multivariable logistic regression model predicting the likelihood of underweight among primary school children in Hargeisa Somaliland, 2019.*

Maximum S.E. =3.227, Hosemer Lemeshaw test (P=0. 104).

**p-value <0.25 ** p-value <0.05.*

Factors associated with thinness among public primary school children in Hargeisa

In multivariable logistic regression sex and mothers' occupation were significantly associated with thinness. Females were1.98 times more likely to be thinness compared to males (AOR = 1.98, 95% CI: 1.349; 2.91, p < 0.005).

Primary school children whose mothers were civil servant were 1.24 times more likely to be thinness compared to children whose mothers were housewives and merchant (AOR=1.24, 95% CI: 0.077; 1.782, p< 0.005).

Model	B	P	COR	AOR	95% C.I	
					Lower	Upper
SEX						
Male				1.00		
Females	0.685	<0.001	2.05**	1.984	1.349	2.919
Age category						
5-7 years		0.952	1.00			
8-10 years	0.044	0.856	0.874	1.045	0.652	1.675
11-13 years	0.092	0.754	0.954	1.096	0.618	1.946
Mother's education						
University level		0.491	1.00	1.00		
Illiterate	-.253	0.282	4.866*	0.776	0.490	1.231

Primary level	.337	0.480	4.060*	1.400	0.550	3.564
Secondary level	-.306	0.799	5.091*	0.736	0.069	7.819
Mothers' occupation						
House wife		<0.003				
Merchant	.388	0.082	3.32**	1.473	0.952	2.281
Civil servant	-1.408	<0.018	4.71**	1.245	0.077	1.782
Fathers' Education						
University level		.253	1.00	1.00		
Illiterate	.304	0.225	0.661	1.356	0.829	2.217
Primary level	-.029	0.925	0.84	0.971	0.533	1.772
Secondary level	0.638	0.095	0.54	1.893	0.895	4.005
Care givers						
Parents			1.00	1.000		
Relatives	0.050	0.879	0.85	1.051	0.555	1.990

Table 7: *Multivariable logistic regression model predicting the likelihood of thinness among primary school children in Hargeisa Somaliland, 2019.*

*Maximum S.E. =4.091, Hosemer Lemeshaw test (P=0. 849) *p-value <0.25 ** p-value <0.05.*

Discussion

A total of 482 primary school children participated in the study. The gender of the study participants were fairly distributed (271) 56.2% and (211) 43.8% female and males, respectively. Most of the respondents are in the age group of 8 - 10 years (55.2%). 21% of the school children were grade-one, 28.8% were grade-Two, 24.3% were grade-three while 25.9% were grade-four.

Majority of the respondents 79.7% of the children were living with their parents both mother and father, 16.2% the children live with their mothers' only while their fathers had already passed away. Only 4.1% live with their fathers only where their mothers already passed away. 10% of the children were living their relative. In mothers occupation, 61.6% were house wife, 30.6% were merchants with small business owner where only 7.8% of mothers were civil servants.

Majority of the mothers (57.7%) were illiterate who cannot read and write, 32.8% were primary level, 7.9% were secondary level while only 1.7% of mothers were university level.

Nearly same numbers of fathers (52.9%) were also illiterate who cannot read and write. 22.4% were primary level, 15.6% were secondary level where only 9.1% were university level. Majority 45.6% (220) had a family size of 6 - 8 members, 40.7% (196) had a family size of 9 - 10 members, 10.2% (49) had 9 - 10 members where only 3.5% [17] the members were between 3-5 members.

In Household wealth, Majority 72% of the respondent used electricity in their homes while only 28% have no access to electricity. Ninety five percent of households have at least one member who uses telephone while only 5% had no anyone who use telephone in the house.

95% of the respondents have had a bed with cotton or at least a sponge in their house while only 5% of the children have neither bed nor sponge in their house.

Nearly 54% of the children had no television in their homes where 46% have had television in their homes.

Above 90% of the primary school children have cemented floor where only 19.7% have no cemented type of floor. Nearly 14% of the children have small Somali huts made up of clothes, plastic sheets and sticks only, 41% have houses made up of sheets woods and cemented floor, where 43% have normal houses made up of cement, bricks, flat sheets and wood.

The mean height and weight of primary school children in Hargeisa were 151cm with standard deviation of 12.8 with standard deviation 5.2 respectively. The mean weight for age (WAZ), Body mass index for age (BAZ) and height for age (HAZ) with standard deviation were - 0.9237 ± 1.334, -1.629 ± 2.299, -0.6877 ± 1.1604, respectively.

The malnutrition among public primary school children in Hargeisa was found to be high.

The prevalence of stunting, underweight and thinness were 10.8%, 19.7% and 39.2% respectively.

The findings of this study showed that the prevalence of stunting and underweight were substantially lower while prevalence of thinness was slightly higher as compared with a study done among rural primary students in Fogera District, Northwest Ethiopia which indicated that the prevalence of stunting, underweight and thinness were 243 (30.7%), 96 (59.7%) and 294 (37.2%) [11]. This difference may be partly explained by the fact that the two areas are different in environment, culture and religion.

The results of this study revealed that the prevalence of stunting and underweight were lower when compared with a study done in Kawangware peri-urban slum, low-income urban community**;** Nairobi, Kenya showed that 14.9% underweight and 30.2% stunted [17]. The variations could be due to geographical and racial and cultural differences. The findings of this study showed that the prevalence of stunting and underweight were lower while prevalence of thinness was higher compared to a study done in Uttar Pradesh, India which was found to be that the prevalence of stunting and underweight and thinness were 29%, 12% and 22%, respectively [28]. The most common type of malnutrition among primary school children in Hargeisa was thinness. In this study about 39.2% of the primary school children in Hargeisa were thin. This finding is much higher than the finding reported from Ghana (19.4%) [26] and the prevalence reported by the study from Fogera District, Ethiopia (21.4%) [11].

In this study, although male are higher in percentage but there was no significant association between sex and stunting. This study was in line with the study done in Kilifil District, Kenya [20]. However, the findings were differ from a study done in Nairobi peri-urban slum which showed that sex of the target children was also a significant predictor of their nutritional status. The female children were more wasted than the male children, but a higher proportion of the male children were stunted than females [27]. Similar study done in Arba Minch southern Ethiopia showed that the children who were male were higher stunted than females [23].

According to the result of this study there was no significant association between sex and underweight but mothers' occupation was found to be significantly associated with underweight. Children whose mothers are civil servants were 0.121 times more likely to be underweight compared to those of house wives. This result was comparable to the study done in Addis Ababa, age, family size, and having no hand washing facilities was significantly associated with underweight [29]. Similar study done in study done in kilifi district, Kenya was found that there were no factors associated with underweight [20].

In multivariable logistic regression sex and mothers' occupation were significantly associated with thinness. Females were1.98 times more likely to be thinness compared to males.

Primary school children whose mothers were civil servant were 1.24 times more likely to be thinness compared to children whose mothers were housewives. On the other hand family size and age category were significantly associated with stunting families whose members are between 9 - 10 members were 0.274 times more likely to be stunted compared to those family members less than nine members. [(AOR = 0.274 95% CI = 0.082 - 0.919)] where children whose age group between ten to eleven years were 2.19 times higher in stunting compared the other age groups. [(AOR = 2.19) 95% CI = 0.923 - 5.204)]

Conclusion

The result of this study indicated that the overall prevalence of some indicators of malnutrion namely stunting, underweight and thinness among primary school children in Hargeisa was found that 10.8%, 19.7% and 39.2%, respectively.

Mothers' occupation was significantly associated with underweight; Sex and mothers' occupation were significantly associated with thinness where family size and age category ware significantly associated with stunting.

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Conflict of Interest

The authors declare that they have no conflict of interest.

Ethical Consideration

Ethical approval was obtained from the Institutional Review Board of Jimma University.

Permission to undertake the study was obtained from Ministry of Education and science of Somaliland. The teachers, pupils, and parents were well-informed of the scope and extent of the survey and consents of the parents, care givers and pupils was also obtained.

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