

# Prevalence and Factors Associated with Malnutrition Among Children Aged 6-59 Months in Badbaado Camp in Mogadishu Somalia

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## To cite this article:

Ali Sheikh Mohamed Omer, Abdirizak Mohamud Yusuf, Adan Yusuf Mahdi, Fardowsa Abdikarim Daud. Prevalence and Factors Associated with Malnutrition Among Children Aged 6-59 Months in Badbaado Camp in Mogadishu Somalia. *Central African Journal of Public Health*. Vol. 6, No. 3, 2020, pp. 136-143. doi: 10.11648/j.cajph.20200603.15

**Received:** March 4, 2020; **Accepted:** March 23, 2020; **Published:** April 21, 2020

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**Abstract:** The purpose was to determine the prevalence and factors associated with malnutrition among children age 6-59 months in Badbaado IDP camp in Mogadishu Somalia. Since 1990 in southern central Somalia, approximately 1.3 million people are internally displaced (IDP) due to war and famine, levels of malnutrition in children under five remain appallingly high at over 15%. Methods: The study was a cross-sectional. Sample size of 406 respondents was calculated using (Kish 1965) formula. Systematic sampling was used to select the households and a child aged 6-59 months. Pre-tested structured questionnaires were used to collect the socio- demographic characteristics of the children and their caretakers, feeding practices and health factors of the children. Anthropometric measurements of 406 children aged 6-59 months were undertaken. The data was captured using Epi Data version 3.0 and analyzed STATA 12. The anthropometric data were analyzed using ENA SMART. Results: The prevalence of stunting and under-weight was 66% and 59.9% respectively, the prevalence of wasting was high 41.6%. Children whose caretaker were employed by public were more likely to be stunted and underweight compared with the children whose caretaker were self-employed (p value=0.0407 and 0.0278) respectively. Children who were consumed inadequate food groups were at risk of being stunted adjusted OR 1.93 95%CI 0.97-3.84 (P-value=0.06). Conclusion and recommendation: There is high prevalence of malnutrition (wasting, stunting and underweight) among children in the internally displaced people's camps in Badbaado Mogadishu Somalia. Children who started complementary feeding after six months, suffered fever, and those who consumed inadequate food groups were more at risk of becoming stunted. The Ministry of Health of Somalia should create awareness sessions using mass media on prevention malnutrition.

**Keywords:** Prevalence, Malnutrition, Badbaado IDP Camp

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## 1. Introduction

Malnutrition is the cellular imbalance between the supply of nutrients, energy and the body's demand for them to ensure growth, maintenance and specific functions [1]. It is widely recognized as a major health problem in developing countries [2], and is high in the East, central and western

parts of Africa, with an estimated number of 111 million deaths among children under the age of five years [3]. Malnutrition is a major cause of poor health and increased mortality [4]. Poor nutrition contributes about 35% of the 9.2 million child-deaths each year globally across the world, about 178 million children younger than five years are stunted representing 32% of all children worldwide, and a further 19 million have Severe Acute Malnutrition (SAM) [5].

Protein energy malnutrition is a major cause of morbidity and mortality in children in sub-Saharan Africa, the prevalence of malnutrition is high in Africa with 38.6% of the children less than five years stunted, 28.4% underweight, and 7.2% wasted. In southern central Somalia, even outside times of crisis, levels of malnutrition in children under five remain appallingly high at over 15% in most areas; in the north of Somalia, in areas enjoying greater peace, stability and development, malnutrition rates have been consistently lower, with medium rates over the past seven years of about 10% in Somaliland and 14% reported in Puntland [6].

## 2. Materials and Methods

### 2.1. Study Design, Site and Population

The study was cross-sectional in nature that involved a descriptive quantitative method. Badbaado camp is located in the Xosh area of Dharkenley district in Mogadishu. Capital city of Somalia. The study area has 5 administrative units that make up the camp. According to the Mayor of Benadir, the camp is composed of approximately 85% women and children. Most are recently arrived drought/famine-affected IDPs hailing from southern Somalia, [7]. The study population included children aged 6-59 months and their caretakers living in Badbaado IDP camp.

### 2.2 Sample Size Calculation and Sampling Technique

Sample size of 406 respondents was used based on (Kish 1965 formula), using  $z^2 \times p \times q/d^2$  considering the following assumptions: 95% confidence level, estimated proportion (P) of GAM was 34.4. All the five sections of Badbaado IDP camp were sampled. Probability proportion to size sampling was used to select the number of households from each section/unit. Thus the section with a bigger number of households had more participants in the study. A systematic random sampling was used to select the households. To determine the random start (starting household) random numbers were used. At Household level one child aged 6-59 months was selected. In case the household had more than one child aged 6-59 months, simple random sampling was done to select one who would participate in the study.

### 2.3. Data Collection Tools

Quantitative method of data collection was employed to investigate the factors associated with malnutrition among children aged 6- 59 months in Badbaado IDP camp. Quantitative data was obtained using semi-structured questionnaire to obtain information on dietary feeding practices of the caretakers, health factors and socio-demographics characteristics of the caretaker and the children in the camp.

### 2.4. Data Quality Control

The questionnaires was pre-tested in Uganda on 20

mothers/caretaker in Nakavali refugee camp before adoption for actual data collection in Mogadishu camp with a purpose of checking clarity, suitability of questions. The supervisors and principal investigator did continuous supervision on daily bases.

### 2.5. Data Processing and Analyzing

The questionnaires were pre-coded before being administered and the same codes were used in data entry. Open-ended questions were post coded and the master coding sheets securely stored. Double data entry was done using Epi-data 3.2.1. Anthropometric data were entered for ENA SMART software. The WHO of malnutrition chart were used to interpret anthropometric measurements of the respondents such as the weight for height (wasting), height for age (stunting) and weight for age (underweight). The data was analyzed using STATA 12.0. Univariate analysis was done; findings were presented as proportions, means and frequencies for all variables. Bivariate analyses were done to determine factors that were significantly associated with wasting, stunting and underweight. Chi square test was used to ascertain statistical significance of the variables at P value  $\leq 0.05$ . All variables with p value less or equal to 0.2 were entered into logistic regression for father analysis to adjust confounds.

### 2.6. Ethical Considerations

Approval to conduct the study sought from the Makerere University School of Public Health, as guided by the Higher Degrees Research and Ethics committee. Only children whose parents consented were included in the study.

## 3. Results

### 3.1. Socio-demographic Characteristics of Caretakers

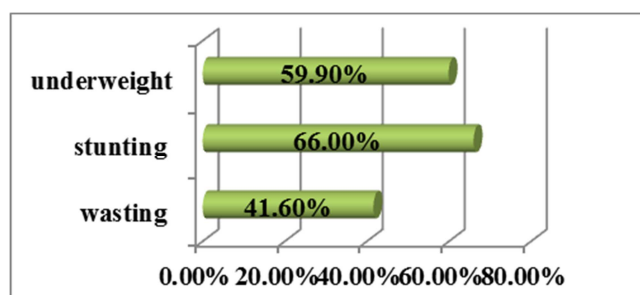
Results in Table 1 show that more than half (58.2%) of care takers were aged in between 18 and 30 years, while a few (7.8%) of the caretakers were less than 18 years, the mean age of the caretakers was 30 years. Majority (90.7%) of the care takers were female. The majority 324 (81.6%) of the respondents were married compared to those who were single 6 (1.5%). Majority of the caretakers 340 (85.6%) were not educated while very few 3 (0.8%) had at least acquired secondary level education. One third 132 (33.3%) of the respondents were civil servants and most of them 337 (84.9%) had lived in the camp for more than three years. Majority were 13-24 months of age 83 (30.7%) and small number were 49-59 months of age 32 (8.1%), the mean age of the children were 29.09 and the likelihood of the child being female was almost equal ratio of 1: 1 being a boy (51.4: 48.6, Males: Females). Majority of caretakers were mothers 319 (80.4%) while 7 (1.8) were antis or ankles. The mean number of people in the households was 6.76.

**Table 1** Socio-demographic characteristics of the Caretakers and children.

Care taker characteristic	Frequency (%)	Duration in camp	
Age		< 1 year	16 (4.0)
<18	31 (7.8)	2-3 years	44 (11.1)
18-30	231 (58.2)	>3 years	337 (84.9)
31-40	81 (20.4)	Occupation	
>40	54 (13.6)	Civil servant	132 (33.3)
Sex		Trader	55 (13.9)
Male	37 (9.3)	Other privately employed	44 (11.1)
Female	360 (90.7)	Artisan	27 (6.8)
Marital status		Food service	11 (2.8)
Single	6 (1.5)	Other	128 (32.2)
Married	324 (81.6)	Type of chronic illness	
Divorced/separated	37 (9.3)	No illness	320 (80.6)
Widowed	30 (7.6)	HIV/AIDs	5 (1.3)
Education level		Asthma	19 (4.8)
No education	340 (85.6)	Ulcers	10 (2.5)
Primary	12 (3.0)	Others	43 (10.8)
Intermediate	42 (10.6)	Sex of the child	
Secondary	3 (0.8)	Male	204 (51.4)
Age of the child		Female	193 (48.6)
6-12	83 (20.9)	Relationship with child	
13-24	122 (30.7)	Mother	319 (80.4)
25-36	86 (21.7)	Father	24 (6.1)
37-48	74 (18.6)	Other relatives	54 (13.6)
49-59	32 (8.1)		

### 3.2. Prevalence of Malnutrition

This study targeted children aged 6-59 months. The results in Figure 1 is showed prevalence of malnutrition that the prevalence of stunting was 66%, wasting 41.6 and under weight, 59.9% were severely. The prevalence of both global wasting and stunting were higher in the age groups 49-59 months compared to the rest of the age groups. The prevalence of sever wasting was found to be 28.1% among the children.

**Figure 1.** Prevalence of malnutrition.

### 3.3. Association Between Socio-demographic Factors with Wasting, Stunting and Underweight

The only significant factors were sex of the child, age of the child and employment of the care taker. Male children were more likely to be stunted than female children (OR 1.75, 95% CI 1.14 – 2.67,  $p=0.0088$ ).

Employment of the caretaker was found to be associated with both stunting and underweight and was not associated with wasting. Children whose caretakers were employed by public were more likely to be stunted and underweight compared to those whose caretakers were self-employed (OR 1.75, 95%CI 1.75 – 2.44,  $p=0.0407$  and OR 1.61, 95% CI 1.05 – 2.46,  $p=0.0278$ ) respectively. Children aged 6-24 months were more likely to be stunted compared with the children aged 25 -59 months (OR 1.55, 95% CI 1.02 - 2.36,  $p=0.0398$ ).

Other demographic factors such as; age of caretaker, sex of caretaker, marital status, education level, duration in the camp and relationship with the child, were not significantly associated with malnutrition. Results showing association of social demographics are presented in table 2 below.

**Table 2.** Socio- demographic factors associated with wasting, stunting and underweight.

Variables	Total N	Malnutrition		
		Wasting No % OR (CI)	Stunting No % OR (CI)	Underweight NO % OR (CI)
Age of caretaker				
< 25 years	151	60 (39.7) 0.89	96 (63.6) 0.84	89 (58.9) 0.93
>25 years above	246	105 (42.7) (0.59–1.34)	166 (67.5) (0.5 –1.29)	149 (60.6) (0.62–1.41)
Sex of caretakers				
Male	37	17 (45.9) 1.22	26 (70.3) 1.24	22 (59.5) 0.98
Female	360	148 (41.1) (0.62-2.41)	236 (65.6) (0.59–2.60)	216 (60.0) (0.49-1.95)
Sex of the child				
Male	204	92 (45.1) 1.35	147 (72.1) 1.75	131 (64.2) 1.44
Female	193	73 (37.8) (0.90–2.02)	115 (59.6) (1.14–2.67)**	107 (55.4) (0.96–2.16)
Marital status				

Variables	Total N	Malnutrition		
		Wasting No % OR (CI)	Stunting No % OR (CI)	Underweight NO % OR (CI)
Married	324	135 (41.7) 1.02	214 (66.0) 1.01	198 (61.1) 1.30
Not married	73	30 (41.1) (0.61–1.72)	48 (65.8) (0.59–1.73)	40 (54.8) (0.78–2.17)
Education level				
Educated	57	21 (36.8) 1.19	39 (68.4) 0.88	31 (54.4) 1.31
Non educated	340	144 (42.4) (0.4–3.36)	223 (65.6) (0.48–1.61)	207 (60.9) (0.74–2.30)
Duration in camp				
> one year	381	159 (41.7) 1.26	251 (65.9) 0.88	223 (58.5) 0.89
<one year	16	6 (37.5) (0.7–2.25)	11 (68.8) (0.30–2.58)	10 (62.5) (0.32–2.51)
Employment				
Self employed	265	109 (41.1) 0.95	184 (69.4) 1.75	169 (63.8) 1.61
Public employed	132	56 (42.4) (0.62–1.45)	78 (59.1) (1.02–2.44)**	69 (52.3) (1.05–2.46)**
Age of the child				
6-24 months	205	82 (40.0) 0.88	145 (70.7) 1.54	121 (59.0) 0.92
25-59 months	192	(8343.2) (0.59–1.31)	117 (60.9) (1.02–2.36)**	117 (60.9) (0.62–1.38)
Relationship with child				
Other caretaker	78	36 (46.2) 1.26	51 (65.4) 0.97	50 (64.1) 1.24
Biological mother	319	129 (40.4) (0.77–2.08)	211 (66.1) (0.57–1.63)	188 (58.9) (0.74–2.08)

\*\*=significant where P-value < 0.05.

### 3.4. Association Between Dietary Practices and Wasting, Stunting and Underweight

The results in table 3 below show the association between dietary feeding practices, wasting, stunting and underweight. Age of initiation of complementary feeding and dietary diversity scores were found to be associated with stunting. Children who started complementary feeding at six months

were less likely to be stunted than those who started after six months (OR 0.59, 95% CI 0.37–0.93, P=0.0219). Children who consumed inadequate food groups were more likely to be stunted than the children who consumed adequate food groups (OR 1.97, 95% CI 1.02–3.77, P=0.044).

Other feeding practices such as ever breast fed, still breast feeding, initiation of breastfeeding and age of stopping breast feeding were not associated with malnutrition.

Table 3. Dietary practices associated with wasting, stunting and underweight.

Variables	Total N	Malnutrition		
		Wasting No % OR (CI)	Stunting No % OR (CI)	Underweight NO % OR (CI)
Ever breast feed				
Yes	380	155 (40.8) 0.48	252 (66.3) 1.38	226 (59.5) 0.61
No	17	10 (58.8) (0.18–1.30)	10 (58.8) (0.51–0.71)	12 (70.6) (0.21–1.77)
Still breast feeding				
Yes	87	34 (39.1) 0.90	56 (64.4) 1.02	49 (56.3) 0.85
No	293	122 (41.6) (0.55–1.47)	194 (66.2) (0.61–0.70)	117 (60.4) (0.52–1.37)
Initiation of breast feeding				
Within one hour	312	127 (40.7) 0.85	206 (66.0) 1.01	186 (59.6) 0.94
After one hour	85	38 (44.7) (0.52–1.38)	56 (65.9) (0.61–1.67)	52 (61.2) (0.57–1.53)
Age of stop breast feeding				
< or equal 24 months	287	117 (40.8) 0.89	106 (71.8) 0.98	171 (59.6) 0.95
>24 months	110	110 (43.6) (0.57–0.39)	56 (50.9) (0.61–1.56)	67 (60.9) (0.60–1.48)
Age of initiation of complementary food				
At 6 months	107	40 (37.4) 0.79	61 (57.0) 0.59	61 (57.0) 0.85
>or equal 6 months	290	125 (43.1) (0.50–1.24)	201 (69.3) (0.37–0.93)**	177 (61.0) (0.54–1.33)
Timely introduction CF				
Dietary DDs				
In adequate	58	29 (50.0) 1.49	45 (77.6) 1.97	33 (56.9) 1.44
Adequate	339	136 (40.1) (0.85–2.62)	217 (64.0) (1.02–3.77)**	199 (58.7) (0.80–2.61)

Significant where P-value < 0.05=\*\*.

### 3.5. Association Between Health Factors and Wasting, Stunting and Underweight

The results in table 4 below show that diarrhea and immunization were significantly associated with wasting, fever was associated with stunting. Children who reported to have suffered from diarrhea two weeks prior data collection, were 1.64 more likely to be wasted than their counter parts

(OR 1.64, 95% CI 1.07–2.54, P=0.0232). Diarrhea was not found to be associated with stunting and underweight in this study. Children who did not experience fever in the last two weeks prior to the data collection were less likely to be stunted than the children who experienced with fever (OR 0.45, 95% CI 0.23 – 0.87, p value=0.0141). However fever was not associated with wasting and underweight in this study. The study also revealed that children who received

completely immunization were less likely to be wasted than children who were not immunized or those partially immunized (OR 0.76, 95% CI 0.45–1.01, P-value=0.05).

Other health factors such as; cough, measles, treat water, dispose faces and de-worming were not to significantly associated with malnutrition in this study.

**Table 4.** Health factors associated with wasting, stunting and underweight.

Variables	Total N	Malnutrition		
		Wasting No % OR (CI)	Stunting No % OR (CI)	Underweight NO % OR (CI)
Diarrhea				
Yes	122	61 (50.0) 1.64	81 (66.4) 1.03	77 (63.1) 1.21
No	275	104 (37.8) (1.07–2.54)*	181 (65.8) (0.65–1.61)	161 (58.5) (0.78–1.88)
Cough				
Yes	111	43 (38.7) 0.85	70 (63.1) 0.84	62 (55.9) 0.79
No	286	122 (42.7) (0.54–1.33)	192 (67.1) (0.53–1.32)	176 (61.5) (0.51–1.23)
Fever				
Yes	41	15 (36.6) 0.79	20 (48.8) 0.45	21 (51.2) 0.67
No	356	150 (42.1) (0.4–1.55)	242 (68.0) (0.23–0.87)**	217 (61.0) (0.35–1.29)
Measles				
Yes	227	89 (39.2) 0.80	142 (62.6) 0.88	130 (57.3) 0.77
No	170	76 (44.7) (0.53–1.19)	115 (67.6) (0.58–1.34)	108 (63.5) (0.51–1.16)
Treat water				
Treated water	290	120 (41.4) 0.97	189 (65.2) 0.87	170 (58.6) 0.81
Not treated water	107	43 (40.2) (0.62–1.53)	73 (68.2) (0.54–1.40)	68 (63.6) (0.51–1.29)
Dispose faces				
Community latrine/bush	366	153 (41.8) 1.14	189 (51.6) 0.78	220 (60.1) 1.09
Private latrine	31	12 (38.7) (0.54–2.41)	73 (235.5) (0.35–1.75)	18 (58.1) (0.52–2.29)
Immunization status				
Not or partially immunized	234	88 (37.6) 0.67	161 (68.8) 1.35	138 (59.0) 0.91
Completely immunized	163	77 (47.2) (0.45–1.01)**	101 (62.0) (0.89–2.06)	100 (61.3) (0.60–1.53)
De-worming last 3months				
Yes	121	51 (42.1) 1.04	78 (64.5) 0.91	71 (58.7) 0.93
No	276	114 (41.3) (0.67–60)	184 (66.7) (0.58–1.42)	167 (60.5) (0.60–1.43)

Significant where P-value < 0.05=\*\*.

### 3.6. Factors Associated with Wasting, Stunting and Underweight on Logistic Regression Analysis

Table 5 show results of logistical regression analysis. Variables with p value less or equal to 0.2 were selected and those which were reported significant in other studies. The selected variables for wasting included: sex of the child, relationship with child, ever breast fed, time initiation of breast milk, timely introduction of complementary feeding, diarrhea and fever, immunization status and de-worming. For stunting, the variables selected were sex of the child, employment, age of the child, ever breast fed, time of initiation of breast feeding, time of introduction of complementary feeding, dietary diversity scores, fever, diarrhea, cough and de-worming while for underweight; sex of the child, employment, ever breast fed, initiation of breast milk, age of initiation of breast feeding, dietary diversity scores, diarrhea, cough and fever were selected.

On logistic regression, diarrhea (adjusted OR 1.67, 95% CI 1.07–2.61, P=0.024) was significant associated with wasting. Children whose caretakers were employed by public

were more likely to be stunted and underweight compared to children whose caretakers were self-employed. (Adjusted OR 1.60, 95CI% 1.04–2.46, p=0.033).

Further analysis revealed that children who were not immunized or partially immunized were more likely to be wasted than child who completed immunization (Adjusted OR 1.67, 95% CI 1.07–2.61, P=0.024). Male children were more likely to be stunted than females (Adjusted OR 1.77, 95%CI 1.14–2.74, p=0.011). Children who started complementary feeding after six month were more likely to be stunted than children who started before six months (adjusted OR 0.60, 95%CI 0.37–0.98, p=0.041). Dietary diversity scores were associated with stunting; children who consumed inadequate food groups were more likely to be stunted than those who consumed adequate food groups (Adjusted OR 1.93, 95%CI 0.97–3.84, P-value=0.06). Children who experienced fever the last two weeks prior the data collection were more likely to be stunted than the child who did not experience with fever (Adjusted OR 0.44, 95%CI 0.22–0.89, P=0.22).

**Table 5.** Factors associated with wasting, stunting and underweight on logistic regression analysis.

Variables	Malnutrition		
	Wasting Adjusted OR (CI)	Stunting Adjusted OR (CI)	Underweight Adjusted OR (CI)
Sex of the child			
Male	1.13 (0.89–2.04)*	1.77 (1.14–2.74)*	1.44 (0.96–2.19)
Female			
Employment			

Variables	Malnutrition		
	Wasting Adjusted OR (CI)	Stunting Adjusted OR (CI)	Underweight Adjusted OR (CI)
Self-employer		1.59 (1.01–2.51)*	1.60 (1.04–2.46)*
Public employer			
Age of the child			
6-24 months		1.46 (0.94–2.28)*	
25-59 months			
Relationship with child			
Other caretaker	1.23 (0.73–2.08)		
Biological mother			
Ever breast feed			
Yes	0.40 (0.13–1.25)*	0.96 (0.30–3.02)	
No			0.52 (1.16–1.69)
Time put breast feed			
First one hour	1.07 (0.62–1.87)*	1.01 (0.56–1.83)	1.03 (0.60–1.79)
After one hour			
Age of initiation complementary feeding			
At 6 months	0.73 (0.45–1.18)*	0.60 (0.37–0.98)*	0.83 (0.52–1.32)
>or equal 6 months			
Dietary DD scores			
In adequate	1.42 (0.80–2.52)*	1.93 (0.97–3.84)*	1.42 (0.77–2.62)
Adequate			
Diarrhea			
Yes	1.67 (1.07–2.61)*	0.89 (0.55–1.43)	0.65 (0.33–1.27)
No			
Fever			
Yes	0.83 (0.41–1.66)	0.44 (0.22–0.89)*	0.72 (0.45–1.14)
No			
Cough			
Yes			1.17 (0.74–1.84)
No			
Immunization status			
Not/partially immunized	0.61 (0.39–0.94)		
Completely immunized			
De-worming			
Yes	1.51 (0.72–1.83)	0.79 (0.49–1.28)	
No			

Significant where P-value < 0.05=\*\*.

## 4. Discussion

The study shows an acceptably high prevalence of stunting and under-weight 66% and 59.9% respectively, the prevalence of wasting was also high 41.6% in Badbaado camp in Mogadishu. Our findings indicate high increment in the prevalence of malnutrition compared to those reported in previous studies [8]. This can explained more than two third 80% of the children did not exclusively breastfeed. In other hand, the fact that the study was conducted during drought season (Jilal) production of crops was less which would have resulted into high market prices of food thus not affordable to most people, so that low economic people could not buy everything they need from the market so, that they may end up to be malnutrition due to the price of the market. Stated that the rapid price hike seems to have evened out under nutrition in a way that deepens the Bangladesh malnutrition [10].

Children whose caretakers were employed by public were more likely to be stunted and underweight compared with the children whose caretaker was self-employed. This is because the caretakers who were self-employed was more likely to get daily income and properly feed her child compared to the

caretakers who were employed by the public, whose monthly income would probably not be enough. In Somalia civil servants do earn \$ 25-30 and this money is not enough to feed their families hence their children are more likely to be stunted or underweight. This confirms the findings of the study that the underweight and stunting were common in children whose mothers earn less salary in the month [11].

This study showed that children who were aged 6-24 months had a higher risk of suffering from stunting compared to the older age group (25-59 months). The findings are consistent with research that has been done among internally displaced population in northern Uganda.

In Badbaado setting, several factors including; early stopping of breast feeding, poor weaning practices, education of the mother and diarrhea may contribute to poor nutritional status of the younger children. Furthermore, one third of the caretakers were civil servants, they were away from their homes leaving the young children (less than 2 years) to feed with the older children. This might have been one of the factors which predisposed the younger siblings to under feeding, stated that Women's work is significantly associated with stunting and wasting during infancy, [12].

The study revealed that male children were more likely to be stunted than females. Our findings are consistent with the

study that was done in the IDP camp in northern Uganda [13]. The explanations could be that boys are rare at home. They tend to be active, running around in the neighborhood as compared to the female children who probably eat whatever small feeds that their mothers get since they are always with them at home. Furthermore, a study reported that boys are more stunted than girls in Sub-Saharan Africa [14].

Children who were started on complementary feeding after six months were more likely to be stunted than those who started at six months. Other feeding practices assessed in this study were not associated with malnutrition. Our findings were consistent with study that was stated starting complementary feeding late at seventh month or beyond could lead to macro and micro nutrient deficiency [15]. This would relate to the education level of the caretaker. Mothers who had educational level of secondary and above were 3.8 times more likely to timely introduce and practice appropriate complementary feeding than those mothers who had no education [16]. Indeed, more than two third (85.6%) of the caretaker of Badbaado setting were not educated.

Dietary diversity scores were associated with stunting. Children who consumed inadequate food groups were more likely to be stunted than the children who consumed adequate food groups. Our findings are consistent with previous studies. This could be attributed to maternal education in Badbaado setting due to lack of dietary diversity is a particularly severe problem among poor populations in the developing world, because their diets are predominantly based on starchy staples and often include little or no animal products and few fresh fruits and vegetables. These plant-based diets tend to be low in a number of macro and micronutrients [17]. Indeed Badbaado setting depends on humanitarian aids, which provide food with little or no animal products.

Children who suffered from diarrhea in the last two weeks prior to this study were 1.64 times more likely to be wasted than the children who did not suffer from diarrhea. Diarrhea was not associated with stunting and underweight in this research; our results are consistent with other studies [18]. This could be due to introduction of water or fluids at birth and before six months which may have increased exposure to contamination resulting in infant diarrhea. The introduction of water or other fluids alone was enough to increase the risk of diarrhea in breast-fed infants [19]. In addition, reported that exposure to diarrhea causing agents is frequently related to use of contaminated water and unhygienic practices in food preparation and disposal of excreta. This could be common in Badbaado setting.

The study revealed that children who experienced malaria two weeks before the study were more likely to be stunted than the children who did not experience malaria. Malaria was not associated with wasting and underweight in this research. Our study is consistent with previous studies. The reason could be that malaria affected their appetite hence food intake resulting in to poor nutritional status in these children [20].

This study also revealed that children who were not

immunized or partially immunized were more likely to be wasted than the children who completed immunization. This conforms to who stated that immunization status is significantly associated with the presence of under nutrition [21].

## 5. Limitations of the Research

The DD scores were constructed based on a simple count of the number of food groups consumed. No information on portion sizes and amount of intake was collected. The study lies in the uncertainty inherent in the fortnightly parental recall method for the diseases that the child experienced i.e. malaria, cough, and diarrhea. As well as to collect information about feeding practices were based on recall which create recall bias.

## 6. Conclusion and Recommendation

The study shows unacceptably high prevalence of stunting and under-weight 66% and 59.9% respectively, the prevalence of wasting was high (41.6%) in Badbaado camp in Mogadishu. Children whose caretakers were employed by public were more likely to be stunted and underweight compared to those whose caretakers were self-employed. Additionally, children who started complementary feeding after six month and those who consumed food groups inadequately were at risk of being stunted. Likewise, children who experienced fever the last two weeks prior to the date collection were more likely to be stunted than the child who did not experience with fever.

Somalia needs to set up policies on nutrition such as the food and nutrition policy and emphasis should be to put on people in camps due to the large population of children who are in camps in order to reduce the high levels of malnutrition. The stakeholders (local government and relief organizations) involved, encourage backyard farming to improve utilization of fruits and vegetables and emphasize and promoted key messages regarding infant- feeding should and its role to the child's growth. The Ministry of Health of Somalia should create awareness sessions using mass media on prevention malnutrition and water treatment and management, also promote routine immunization program.

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