Original Article

Assessment of Nutritional Status of Under 5-Year-Old Children in Banadir Hospital, Mogadishu, Somalia

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Abstract

Background: Nutritional status of children is a proxy indicator for assessing the entire population health status and one of the major predictors of child survival. Despite the various efforts, malnutrition among children is remaining as a major public health problem in Somalia. The study objective was to assess the nutritional status of under 5-year-old children in Banadir Hospital, Mogadishu, Somalia. **Methodology:** A descriptive cross-sectional study was conducted among 150 under-five children. Sociodemographic characteristic, usual dietary intake and assess adequacy, breastfeeding and complementary feeding pattern of the mothers, and anthropometric index of the children were collected by using semi-structured questionnaire. **Results:** Age categorized into 0–1 years old were 52.7%, 32.0% were 1–2 years old, 8.7% were 3–4 years old, and 6.7% were 4–5 years old. With mean and standard deviation of 17.44 ± 13.096, the age was the most critical variable because it was one of the scales of the Mental Adjustment to Cancer (MAC) measurements and target objective of the study. MAC test showed that 49.3% of the children were severe, 16.0% of the children were mild malnourished, and 34.7% of the children were well-nourished children. Based on height-for-age chronic malnutrition, 16.0% of the respondents were severe, 14.7% of the respondents were moderate, 24.0% of the respondents were mild, and 45.3% of the respondents were normal. According to the weight-for-height acute malnutrition, 30.7% of the respondents were severe, 19.3% of the respondents were moderate, 10.7% of the respondents were mild, and 39.3% of the respondents were normal. **Conclusion:** The findings showed that the nutritional status of under-five children was quite poor. Also from the results, it is evident that malnutrition is still a major public health problem among young children due to the poor socioeconomic status (poverty and poor educational background) of their parents, and thus, there is a need for better nutrition of the Somali child.

Keywords: Anthropometrics, malnutrition, nutrition, stunting, wasting

Introduction

Nutritional status is the balance between the intake of nutrients and the expenditure of these in the processes of growth, reproduction, and health maintenance. Undernutrition, especially in children, can lead to substantial problems in mental and physical development. Undernourished children can also suffer several diseases from nutrient deficiencies. Although the overall pattern of growth is genetically determined, it is significantly affected by nutrition. Socioeconomic status, nutritional knowledge, and feeding practices among others are some of the reasons why children may be undernourished. Female head porters who care for their children, due to the low wages they earn, may not be able to afford healthy meals and provide the necessary care for these children.[1]

Nutrition plays the most important part in the growth.[2] It influences growth before and after the birth.[3] Proper nutrition and control are important in promoting the normal growth and development of children. Rapidly growing infants, children, and maturing adolescents have specific but not necessarily fixed requirements for macronutrients and micronutrients. It plays a central role in the growth and changing body composition.[4]

Children are considered as the future of a nation. The health and nutritional status of the child population is a true reflection of the overall health and economic development of a country. Child malnutrition is a widespread public health problem

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having national and international consequences, as adequate nutrition is an essential input for the well-being of children. It is well-documented that undernutrition, particularly among children under the age of 5 years, is the most tragic form of human deprivation. Malnutrition in its several forms of undernutrition, namely wasting, stunting, and underweight has been coined as the "silent emergency" by the United Nations children's fund. It has been associated with endangering the health of women and children across the world.[5]

Children below the age of 5 years constitute the most vulnerable segment of the community. Their nutritional status is a sensitive indicator of community health and nutrition, and undernutrition among them is one of the greatest public health problems in developing countries.[6]

According to the WHO, malnutrition is associated with about half of all child deaths worldwide. Malnutrition among under-five children has serious consequences. Malnourished children have lowered resistance to infection; they are more likely to die from common childhood ailments such as diarrheal diseases and respiratory infections and for those who survive, frequent illness absorbs their nutritional, locking them into a vicious cycle of recurring sickness, faltering growth, and diminished learning ability.[7]

The nutritional status of any person is his/her health as dictated by the quality of nutrients consumed, and the body's ability to utilize them for its metabolic needs.

Thus, being nutritionally vulnerable, under-five children's nutritional status is generally accepted as an indicator of the nutritional status of any particular community.[8] This is due to their easy susceptibility to malnutrition and infection.[9] It has been estimated that approximately one out of every three under-five children is chronically malnourished and thereby subjected to a pattern of ill health and poor development in early life,[10] with malnutrition being associated with more than half of all deaths of children worldwide.[11]

Early childhood starts from in the uterus to new birth and then through postnatal life. In intrauterine life, the nutritional status of the unborn fetus depends largely on the adequacy of the dietary intake of the mother and this determines the outcome of birth of the newborn. Postnatal life is a continuum in human development. Normal growth and development depend largely on the nutritional status of the newborn which is, in turn, related directly to the nutrition of the mother and inherited characteristics and to the dietary intake of the infant.

In early childhood, nutritional status is of paramount importance for a child's later physical, mental, and social development.

The inadequate or excessive intake of nutrients may result from disease factors that affect digestion, absorption, transport, and utilization of nutrients.[12]

Malabsorption of nutrients may result from genetic cum environmental conditions or illness. The most critically vulnerable groups are the developing fetus, preschool children, women before and during pregnancy, and lactating women. Malnutrition affects all levels of development physically, mentally, socially, psychologically, and physiologically. It thus multiplies the effect of prevailing disease or mortality in children and infants.[10]

Anthropometric measurements, though difficult to apply to young children, are commonly used to determine the prevalence of protein–energy malnutrition [Figure 1]. They provide the most valid indicator of a population's nutritional status and the most reliable indices for determining nutritional status, especially in rural African settlements. This technique is usually preferred because it is noninvasive, relatively simple, and can be easily carried out and interpreted without requiring professional expertise. It deals with techniques highly useful on widespread field basis and rests on well-adopted classification. It is the readily available method of assessing nutritional status. Through proper assessment, it can be employed to determine how well or how poor a particular group or individual feeds.[12]

Whatever knowledge gathered from such an assessment will help the group or individual to step up or lower food intake for better health. The aim of this study was to assess the nutritional status of under 5-year-old children in Banadir Hospital, Mogadishu, Somalia.

Methodology

A descriptive cross-sectional study was conducted to assess the nutritional status of under 5-year-old children in Banadir Hospital, Mogadishu, Somalia. The study was carried out from June 2017 to November 2017. The total sample size for the study was 150 participants who were available and willing to participate in this study.

A semi-structured questionnaire and face-to-face interview with the mothers and anthropometric measurements were used for this study and it was divided into four sections: sociodemographic section, usual dietary intake and assess adequacy, breastfeeding and complementary feeding of the participants, and anthropometric index of the children. The questionnaire included a range of close-ended questions as well as some open questions.

All the data collected were coded numerically and entered into the SPSS version 22.0 software (IBM, New York, United States) program for the analysis. Descriptive statistical analysis

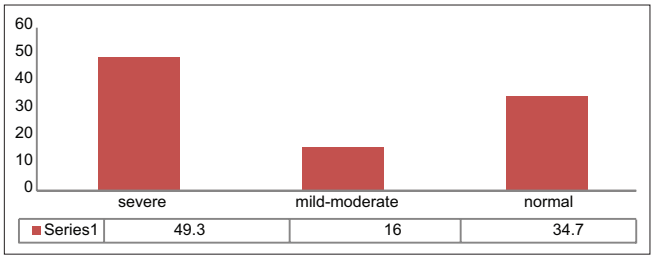

Figure 1: Malnutrition status based on middle upper arm circumference

was used to calculate the frequencies and percentages. The descriptive analysis of data was presented as tables and graph format. For some analyses, Pearson Chi-square test was also done; $P \leq 0.05$ was considered statistically significant.

Informed written consent was obtained from the participants, as well as from the hospital authority, and confidentiality of the participant's information was maintained properly where the participant had the choice to refuse and withdraw from the interview. The study obtained permission for data collection from the Department of Public Health under the faculty of Allied Health Sciences, Daffodil International University.

Anthropometric measurements

The age of each child was recorded with the help of the mother/caregiver. The ages of children of illiterate mothers were calculated by asking them to name traditional festivals/ceremonies that took place around the period they gave birth to their children.

Mid-upper arm circumference

Normal mid-upper arm circumference (MUAC) for a child between 1 and 5 years of age is >13.5 cm. If the MUAC is 12.5–13.5, the child has mild-to-moderate malnutrition, and if it is <12.5 cm, it is suggestive of severe malnutrition. This is useful for screening a large number of children but less useful in long-term growth monitoring. The techniques to measure mid-arm circumference include accurate measurement with a tape and a simple bangle test. Bangle test was done using plastic bangles with an inner diameter of 3.7 cm red bangle) and 4 cm yellow bangle); the bangle was passed up the forearm and the upper arm to decide if the upper mid-arm circumference was below or above 12.6 cm.

Results

Sociodemographic characteristics

Gender: Under 5-year-old male and female children were respondents of the study [Table 1]. The populations were male (60%), while the female percentage of the study was 40%.

Age of child

Among the respondents, 52.7% were 0–1 years old, 32.0% were 1–2 years old, 8.7% were 3–4 years old, and 6.7% were 4–5 years old. With mean and standard deviation (SD) of 17.44 ± 13.096, the age was the most critical variable because it was one of the scales of the mental adjustment to cancer measurements and target objective of the study.

Mother age

These categories were used in the study; 15–30 years old were 63.3%, 31–40 years old were 30.7%, while 40 years above were 6.0%.

Number of family members

Number of the children in the family or the family size was one of the most important characteristics; 1–4 individuals were 44.0%, 5–8 individuals were 40.7%, 9–13 individuals were 14.0%, and 13 individuals and above were 1.3%; obviously in sub-Sahara Africa, there is a high fertility rate and Somalia is playing a major role.

Occupation of head of the family

Self-employed of the respondents were 46.0%, unemployed were 10.0%, looking work were 16.%, retired were 4.0%, only 5.3% ware workers, 6.0% were students, and others were 12.0%.

Primary source of water of household

Respondents who use pipe water were 26.7%, filtered water were 4.0%, borehole were 6.7%, well were 56.0%, and others were 6.7%.

Educational status of the mother

It was found that the educational level of the respondents around 70.7% of the respondents had no formal education,

Table 1: Sociodemographic characteristic of the study population (n=150)

Variable	Frequency (n=150; 100%), n (%)
Gender	
Male	90 (60)
Female	60 (40)
Total	150 (100.0)
Age of child (years)	
<1	79 (52.7)
1-2	48 (32.0)
3-4	13 (8.7)
5	10 (6.7)
Total	150 (100.0)
Mean±SD	17.44±13.096
Mother age (years)	
≤30	95 (63.3)
31-40	46 (30.7)
41 and above	9 (6.0)
Number of the family members	
1-4	66 (44.0)
5-8	61 (40.7)
9-13	21 (14.0)
13 above	2 (1.3)
Occupation of head of the family	
Self employed	69 (46.0)
Unemployed	15 (10.0)
Looking work	25 (16.7)
Retied	6 (4.0)
Worker	8 (5.3)
Student	9 (6.0)
Other	18 (12.0)
Primary source of water of household	
Pipe water	40 (26.7)
Filtered water	6 (4.0)
Borehole	10 (6.7)
Well	84 (56.0)
Other	10 (6.7)
Total	150 (100.0)

SD: Standard deviation

16% of the respondents had primary education, 8.0% of the respondents had secondary education, only 2.7% of the respondents had college graduate, and 2.7% of the respondents had university level education [Figure 2].

Family income

Those families who use 50 US dollar/month were 32.0%, 51–100 US dollar were 22.7%, 101–150 US dollar were 20.7%, 151–200 US dollar were 12.7%, 201–250 US dollar were 10.0%, and 251–300 US dollar were 2.0%. Moreover, the mean ± SD was 2.52 ± 1.4 [Figure 3].[13]

Table 2: Dietary intake of respondents (*n*=150)

Variable	Frequency, *n* (%)
Nuts and seeds	
One time per day	29 (19.3)
Twice per day	61 (40.7)
Three times per day	10 (6.7)
Four times and above	2 (1.3)
None	48 (32.0)
Vegetable and green vegetable products	
One time per day	35 (23.3)
Twice per day	49 (32.7)
Three times per day	19 (12.7)
Four times and above	3 (2.0)
None	44 (29.3)
Fruits	
One time per day	35 (23.3)
Twice per day	50 (33.3)
Three times per day	12 (8.0)
Four times and above	4 (2.7)
None	49 (32.7)
Meat, fish, and egg products	
One time per day	54 (36.0)
Twice per day	49 (32.7)
Three times per day	28 (18.7)
Four times and above	13 (8.7)
None	6 (4.0)
Oils and fats	
One time per day	47 (31.3)
Twice per day	59 (39.3)
Three times per day	22 (14.7)
Four times and above	4 (2.7)
None	18 (12.0)
Total	150 (100.0)

Dietary intake among the respondents was consuming one time is 19.3%, two times 40.7%, three times 6.7%, four times 1.3 and 32.0% for none users [Table 2].

Vegetable and green vegetable products

Respondents who use this one time were 23.3%, those use two times were 32.7%, 12.7% those use three times, those use four above were 2.0%, and finally, none users are 29.3%.

Fruits

Fruits are micronutrients which carry an important nutrient for the body; in our study, respondents used fruits one time within their day were 23.3%, those use two times were 33.3%, 8.0% those use three times, there is another portion use four times and above with 2.7%, and last none user fruits were 32.7% in all my study.

Meat, fish, and eggs

Meat, fish, and eggs are very nutritive foods which human being should consume and take enough amount in their daily life. From what I found in my study is 36.0% used one time, while those used two times is 32.7%, another part three times users 18.7%, four and above users was 8.7%, and nonusers were 4.0%.

Oils and fats

Respondents who use for one time is 31.3%, two times are 39.3%, three times, 14.7%, four above were 2.7%, and none users state amount 12.0%.

Time initiating breastfeeding

About 34.0% the mothers gave their baby breastfeeding within the 1st h of the birth, 31.3% gave breastfeeding within 1–2 h, and another group of 34.7% gave breastfeeding after 2 h from the birth.

Other liquids given to the infant before breastfeeding

About 19.3% of the respondents were given their infants water only, 12.0% water and sugar, those gave tea or herbal water was 29.3%, there is a group which was given a milk formula 5.3%, 23.3 was given others, and 10.7% was given none only direct the breast.

Period after breastfeeding baby will be given food

Normally, baby feeds breast within period after the baby stomach became ready to digests. mothers will start give

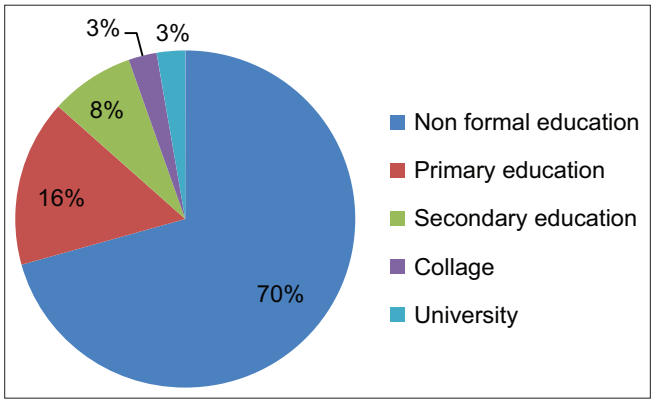

Figure 2: Educational status of the mother

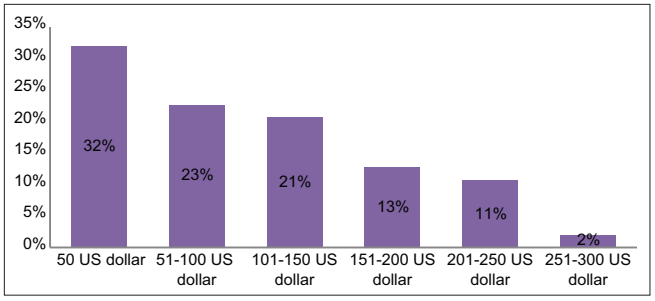

Figure 3: Family income

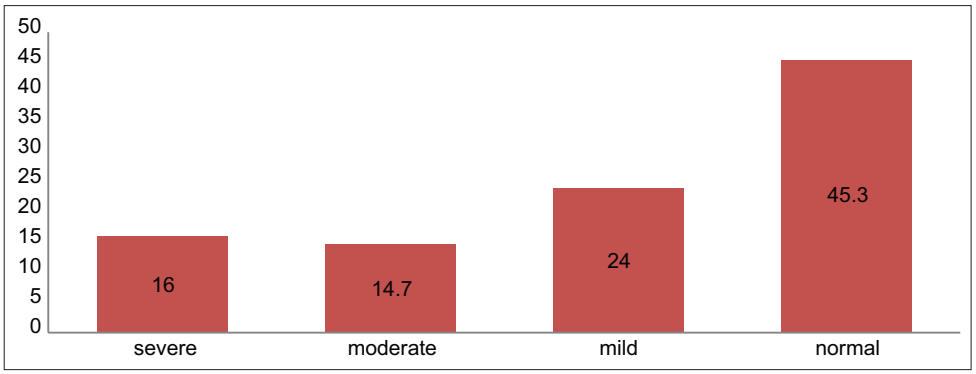

Figure 4: Chronic malnutrition

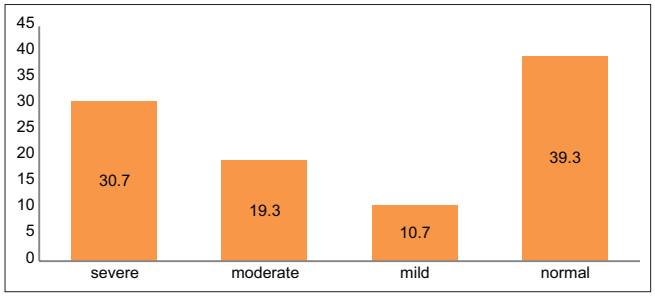

Figure 5: Acute malnutrition

normal food to their baby is about 9.3% where in the study subject was given normal food after 1–30 days, 1–2 months were 33.3%, those 3–4 months were 10.0%, 5–6 months were 11.3%, and above 6 months were 36.0%.

During breastfeeding

Among the respondents, 26.0% were giving breastfeeding for 0–6 months, 32.0% were 6–9 months, 26% were 9–11, while 8% were 11–14 months, and 8% were 14–24 months [Table 3].

Anthropometric index of children

The MUAC is used to measure malnutrition. MUAC cutoff ≥12.5 cm reflected a well-nourished child, between 11.6 and 12.4 cm reflected mild malnutrition, and that with <11.5 cm severely malnourished. The mean MUAC was 1.85. About 49.3% of the children were severe, 16.0% of the children were mild malnourished, and 34.7% of the children were well-nourished children.

Height-for-age (HFA) is used to measure chronic malnutrition (stunting) [Figure 4]. HFA cutoff <85% reflected severe, <90% reflected moderate, <95% reflected mild, and >95% reflected normal. The mean HFA was 95.49. Among the respondents, 16.0% were severe, 14.7% of the respondents were moderate, 24.0% of the respondents were mild, and 45.3% of the respondents were normal.

Weight-for-height (WFH) is used to measure acute malnutrition (wasting) [Figure 5]. WFA cutoff <70% reflected severe, <80% reflected moderate, <90% reflected mild, and >90% reflected normal. The mean WFH was 87.66. Among the respondents, 30.7% were severe, 19.3% of the respondents were moderate, 10.7% of the respondents were mild, and 39.3% of the respondents were normal.

Table 3: Breastfeeding and complementary feeding of the participants (*n*=150)

Variable	Frequency, *n* (%)
Time of initiating breastfeeding	
Within the 1st h after birth	51 (34.0)
Between 1 h and 2 h	47 (31.3)
>2 h	52 (34.7)
Other liquids given to infant before breastfeeding	
Water only	29 (19.3)
Water and sugar	18 (12.0)
Tea or herbal water	44 (29.3)
Milk formula	8 (5.3)
Other	35 (23.3)
None	16 (10.7)
Period after breastfeeding baby will be given food	
1-30 days	14 (9.3)
1-2 months	50 (33.3)
3-4 months	15 (10.0)
5-6 months	17 (11.3)
Above 6 months	54 (36.0)
Duration of breastfeeding (months)	
0-6	39 (26.0)
6-9	48 (32.0)
9-11	39 (26.0)
11-14	12 (8.0)
14-24	12 (8.0)
Total	150 (100.0)

Discussion

This descriptive cross-sectional study was conducted with a view to determine the nutritional status of under 5-year-old children from Mogadishu. A total 150 children were studied. The age of the children was ranging between <1 and 5 years. The mean age of the children was 17.44 months with SD ± 13.096. This result was consistent with the study done in India by Sahu *et al*.[5]

In the study of Halder B (2000), male and female were 59% and 41%. According to the statistical pocket Book of

Bangladesh- (2004), the male and female were 51.2% and 48.0%, respectively, which was almost similar to our present study where male and female were 60% and 40%, respectively. In A study conducted by Yasmeen S in Bangladesh, male and female were found as 44% and 56%, respectively.

Maternal education has been stressed as a factor of great importance in the etiology of malnutrition. The same studied has indicates that the prevalence malnutrition among children is based on different of the education level of the mother (secondary or higher) than among children of mothers with no or primary education; this is probably because more education provides the knowledge of the rules of hygiene, feeding, and weaning practices and the interpretation of symptoms and enhances timely action childhood illness. In this study, majority of the mother's respondents according to their occupation are self-employed has stated 46.0%, un-employed were 10.0%, looking for work is 16. %, retired are 4.0%, 5.3% ware workers, 6.0% are students, and 12.0% were others.

Family income is one of the most important determinants of the standard of the living and economic and social welfare. The study showed that 75.3% were low income <150 dollar/month, while 24.7% were moderate income 150–300 dollar, so there was a significant difference between the forms of Malnutrition and family income.

The same study conducted Nigeria Morly (1969) found that insufficient money was the biggest single factor in the etiology of malnutrition, and he found that there is a correlation between low income and growth retardation; on the other hand, Behar (1966) found that poor diet given to children in Central America is not primarily economic or the result of limited availability of food, but it is due to ignorance of the child nutritional needs.

A study conducted by Food Security and Nutrition Analysis Unit (2013–2014) found that Global Acute Malnutrition (12.0%) and median Severe Acute Malnutrition (1.9%) rates are lower, compared to 6 months ago (14.9% and 2.6%, respectively) as well as 1 year ago (14.2% and 2.6%, respectively),[11] whereas our study shows that in chronic malnutrition, 16.0% were severe, 14.7% of the respondents were moderate, 24.0% of the respondents were mild, and in acute malnutrition, 30.7% were severe, 19.3% of the respondents were moderate, and 10.7% of the respondents were mild. According to the MUAC assessments, our study showed that 49.3% were severe, 16.0% of the children were mild malnourished, and 34.7% of the children were well-nourished children. Child nutrition SURVEY-2000 (ages 1–5 years)[11,12] found in their survey that 51% of the children were moderately underweight and 13% severely underweight, 49% moderately stunted and 19% severely stunted, and 12% moderately wasted and 1% severely wasted. According to the Demographic and Health Survey 1990–2000 (ages: 0–59 months),[11] it was found that 48% of the children were moderately underweight and 13% severely underweight, 45% moderately stunted and 18% severely, and 10% moderately wasted and 1% severely wasted. These findings are similar to the current study findings.

Conclusion

In this study, wasted and stunted were 30.7% and 16%, respectively (severe form), and mild/moderate wasted and stunted were 37% and 38.7%, respectively. This study with small sample size cannot represent the national nutritional status of under-five children. A large-scale study is required to obtain the real situation.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the legal guardian has given his consent for images and other clinical information to be reported in the journal. The guardian understands that the children name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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