

*Research Article***Assessment of the Nutrition status of Preschool children in Saada Governorate Republic of Yemen****Khaled Hussein M. El-Dessouki***, **Mahmoud A. El-Sherief***, **Ebtesam E. Hassan***, **Ameen A. M. Sallam****.

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Abstract

Background: The nutritional status of the child is affected by a number of factors, including food consumption. When the child's food consumption is below the proper nutritional rate, this will lead to a growing lack of growth in the child leading to disease, especially between the ages of 24 months and 59 months. Malnutrition in children is particularly serious and its effects intensified, putting children at greater risk of death than adults if left untreated. About half of the children in Yemen are affected by chronic malnutrition. Nutritional status of preschool children in urban and rural areas depend on various factors that affect positively or negatively the nutritional status of preschool children. **The aim of this study:** was to assess the nutritional status of preschool children in rural and urban areas in the Saada Governorate Republic of Yemen. **Methods:** during the period from May 2017 to July 2017 and using cross-sectional community-based study on 424 children (aged 24- 59 month) selected randomly through the house to house interview. The quantitative data were analyzed using SPSS for windows version (19). **Results:** this research showed that: 80.7% of preschool children were underweight, 23.3% were wasted and 15.6% were severely wasted. Stunting represents 8.5%. There was a significant difference between male and female regarding wasting. Also, (82.2%) of males and (78.1%) of the females were severely underweight, but these difference were statistically insignificant. **Conclusion:** There is little surveillance and the trained personnel are less motivated due to poor facilitation and issues of early warning systems are not well addressed. Nutritional status should be improved at international, national and ministerial levels.

Keywords: assessment, nutrition, preschool, Saada, Yemen**Introduction**

Yemen is a country located south-west of the Arabian Peninsula in Western Asia. An area of about 555,000 square kilometers, a population of 26,687,000 people, according to the population projection for 2015, Yemen including 22 governorates and Saada, is one of these governorates (Burrowes, 2010). Childhood is a critical period in which dietary and lifestyle patterns are initiated. Preschoolers tend to worry about new foods. One reason is that their taste buds are more sensitive than those of adults (Whitney et al., 2005).

At home and prior to school age, children's experiences of food are going to be limited to the family, and as a rule, parent's eating habits will be the eating habits copied by their children (Boobier et al., 2008).

In the second year of life, most children begin to walk independently, highly active fearless infant tend to walk earlier. Between two and five years of age children learn to walk, run and feed them independently. By the end of two years somatic and brain, growth slows with corresponding decreases in nutritional requirement and appetite. Between the age of two and five years, the average child gains approximately 2 kilograms in weight and 7 centimeters in height per year. The body becomes leaner, physical energy peaks and the need for sleep declines to 11 -13 hr/24 hr. Visual acuity reaches 20/30 by age 3 years and 20/20 by age 4 years. All 20 primary teeth have erupted by 3 years of age (Needlmen et al., 2009).

At a more detailed level, certain nutrients can affect brain cell integrity and structures, signal transduction and neurotransmission as well as brain energy supply and metabolism (Thomas and Grant, 2010).

Nutritional status of preschool children in urban and rural areas depend on various factors that affect positively or negatively the nutritional status of preschool children. Child nutrition indicators in Yemen are some of the worst among low to middle-income countries. The reported national prevalence of stunting in Yemen was the second highest in the world following Afghanistan in 2010 (UNICEF, 2014).

With the escalating political crisis in Yemen, since late 2014, food insecurity has increased because of the sporadic availability of essential food commodities, of markets and trade. Conflict-related damage to infrastructure, shortages, and a lack of staff are among the causes of the collapse of basic health services in Yemen insufficient fuel, lack of income or employment opportunities, and the disruption. A report by UNICEF estimated that about 146 million children under five years of age are underweight in the developing world. The independent variables including data for the study come from the most recent Yemen Demographic and Health Survey, levels of child malnutrition in Yemen. The prevalence of stunting and underweight is so widespread that almost every other child under the age of five is either stunted (UNICEF, 2016).

Iodine deficiency is anticipated to lower the IQ on average by 10-15 points at a general population level. Zinc plays a role in a multitude of molecular and physiological mechanisms, so even mild to moderate forms of Zinc deficiency in children have been associated with reduced development and growth as well as impaired immune function (Brown and Ogden, 2004). Vitamins especially the water-soluble vitamins also play a role in brain development and function, with all B-vitamins shown to be essential for the normal functioning of the brain (Gale et al., 2009).

The aim of the study:

Assessment of the nutritional status of preschool children in rural and urban areas in Saada governorate Yemen

Methods

Study Designs: A descriptive cross-sectional study was conducted among preschool children age (24m-59m) in Urban and rural of Saada Governorate in Yemen, during the period from May 2017 to July 2017

Study population: All preschoolers aged from (24-59) months in the urban and rural were included in the study through the house to house survey. The total number of 424 children participated in the study, 200 children from rural areas and 224 from urban areas.

Ethical Considerations: The aim of the study was explained to child parents and a verbal consent was taken to participate in the study. The study group was informed about the nature and the purpose of the study ensuring confidentiality.

Data collection: By designed well-structured interview questionnaire, every participant in the study was interviewed during a home visit. The questionnaire was filled by the researcher and includes Sociodemographic, Sanitary condition, history of acute and chronic diseases, the Feeding pattern of a child, Assessment of nutritional status, Anthropo-metric measures and Clinical examination.

Data analysis: Data entry and analysis were all done with IBM compatible computer using software SPSS version 19. Graphics were done using Excel. Quantitative data were presented by mean and standard deviation, while qualitative data were presented by frequency distribution. The probability of less than 0.05 was used as a cut off point for all significant tests.

Results

The Mean age of the studied children was 38±10.5 months; males represent (62.3%) while (37.7%) were females. it was found

that 47.4% of the children fall in the first and second birth order and 43.2% in third and fifth order. More than two third (78.6%) of urban children had nuclear family compared to 44% of rural children ($P= 0.001$). Family size was higher among rural (8.64 ± 4.3 person) than urban (8.13 ± 3.1 person). Crowding index was higher among urban (2.6 ± 0.9) than rural children (2.5 ± 0.8).

41.7% of fathers of studied children had read and write education and (61.8%) of them were farmers. Half (50.5%) of mothers of studied children had read and write education (66.7%) of the studied children categorized as a very low socio-economic state which was significant ($p=0.003$) higher among rural (74%) than urban (60.3%). Only (4.2%) of children fall in the high socio-economic standard.

Table (1) Shows that: 80.2% of studied children had breast feeding and this was higher (83.%) among rural than urban (77.7%). About (87.5%) of urban children receive food including all food groups daily compared to (67%) of rural children and differences were statistically significant ($p=0.001$). (76.7%) of children receiving snacks between meals.

The study shows that: there was a statistically significant difference between urban and rural children regarding height, weight and middle upper arm circumference. Both preschool children. The mean body height was 77.71 ± 7.204 cm among urban children compared to 79.14 ± 7.582 cm among rural children, the mean weight was 8.693 ± 1.4830 kg among urban compared to 9.217 ± 1.6680 kg among rural and the mean arm circumference was 12.05 ± 1.480 among urban compared to 12.78 ± 1.860 among rural.

From this study, we found that (80.7%) of children were severely underweight ($\leq -3SD$) and (12.7%) were underweight and there were significant differences between

rural and urban regarding WAZ in which (85.3%) of urban children were severely underweight compared to (75.5%) of rural. Table (2)

Regarding weight for age, we found that (80.7%) of children categorized as ($WAZ \leq -3SD$) weight for age severely underweight. (12.7%), were had ($WAZ \leq 2SD$) underweight and (6.6%), had ($\pm 2SD$) normal.

In our study there was statistically significant differences between urban and rural regarding weight for height, (28.6%) of urban children were wasted ($\leq -2SD$) compared to (17.5%) of rural children. (67%) of rural children were normal which was higher than that of urban children (55.4%). Table (3)

Table (4) shows that: there were statistically significant differences between males and females regarding weight for age, that (26.1%) of males were wasted ($\leq -2SD$) compared to (18.8%) of females and (75.6%) of females were normal which higher than of males (51.9%).

Figure (1): Shows (60.80%) of the children categorized as a normal weight for height, (23.30%) were wasted and (15.6%) were severely wasted.

The study Shows that (88.7%) of the studied children were severely stunted. (8.5%) were stunted and only (0.2%) were tall. Figure (2)

About 50% of the children categorized severely malnutrition (34%) were malnutrition and (16%) were normal. Figure (3)

There were statistically significant differences between males and females regarding weight for age, that (26.1%) of males were wasted ($\leq -2SD$) compared to (18.8%) of females and (75.6%) of females were normal which higher than of males (51.9%).

Figure (1): Distribution of the studied preschool children according to their weight for height (Z score): Saada, Yemen (March-August 2017)

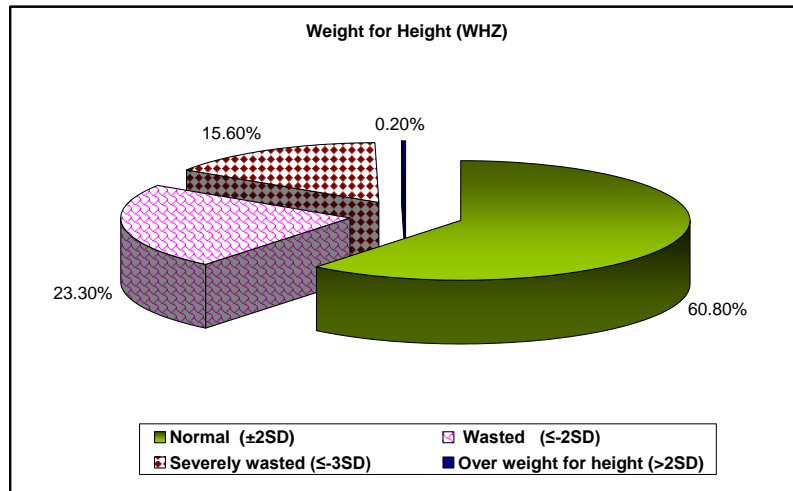


Figure (2): Distribution of the studied preschool children according to their height for age (Z score): Saada, Yemen (March-August 2017)

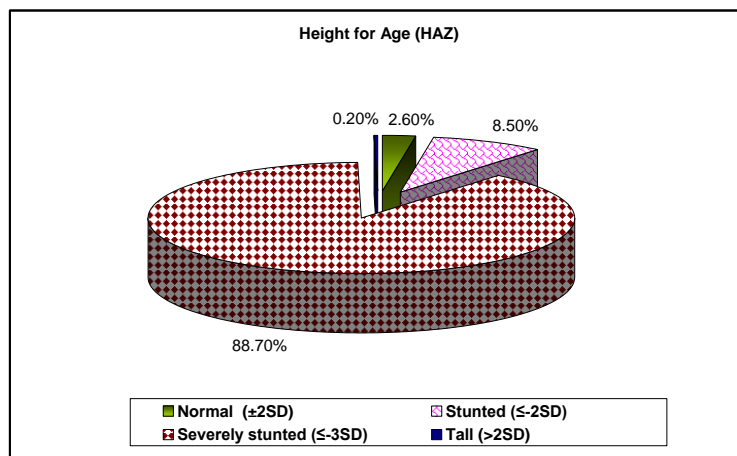


Figure (3): Distribution of the studied preschool children according to their middle upper arm circumference (Z score): Saada, Yemen (March-August 2017):

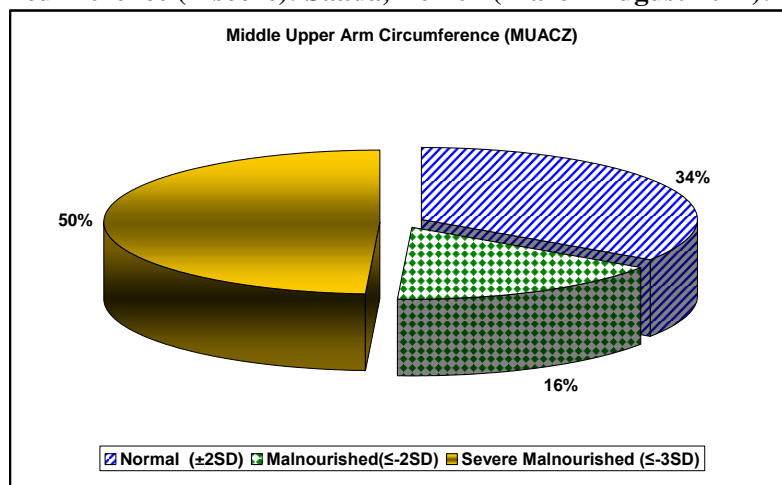


Table (1): Distribution of the studied preschool children according to their feeding habits: Saada, Yemen (March-August 2017):

Data	Urban N=224	Rural N=200	Total N=424	t [#] X ² (DF) z [†]	p
Breast feeding	174(77.7%)	166(83.0%)	340(80.2%)	1.8	0.1
Artificial feeding	50(22.3%)	34(17.0%)	84(19.8%)	(1)	
Number of basic meals per day					0.001*
Range	3-4	3-5	3-5	4.3 [#]	
Mean ±SD	3.88±0.326	3.69±0.572	3.79±0.469	(422)	
Receiving food including all food groups daily					0.001*
Yes	196(87.5%)	134(67.0%)	330(77.8%)	25.7	
No	28(12.5%)	66(33.0%)	94(22.2%)	(1)	
Snacks provision between meals	197(87.9%)	128(64%)	325(76.7%)	5.8 [†]	0.003*

Table (2): Distribution of the studied preschool children according to their weight for age (Z score): Saada, Yemen (March-August 2017):

Weight for age (WAZ)	Urban N=224	Rural N=200	Total N=424	X ² (DF)	p
Normal (±2SD)	9(4.0%)	19(9.5%)	28(6.6%)	7.5(2)	0.02*
under weight(≤-2SD)	24(10.7%)	30(15%)	54(12.7%)		
Severely underweight (≤-3SD)	191(85.3%)	151(75.5%)	342(80.7%)		

Table (3): Distribution of the studied preschool children according to their weight for height (Z score): Saada, Yemen (March-August 2017):

Weight for height (WHZ)	Urban N=224	Rural N=200	Total N=424	X ² (DF)	p
Normal (±2SD)	124(55.4%)	134(67%)	258(60.8%)	8.7(3)	0.02*
Wasted (≤-2SD)	64(28.6%)	35(17.5%)	99(23.3%)		
Severe wasting (≤-3SD)	35(15.6%)	31(15.5%)	66(15.6%)		
Over weight for height (>2SD)	1(0.4%)	0	1(0.2%)		

Table (4): Comparison between the studied males and females regarding their weight for height (Z score): Saada, Yemen (March-August 2017):

Weight for height (WHZ)	Males N=264	Females N=160	X ² (DF)	p
Normal (±2SD)	137(51.9%)	121(75.6%)	31.6(3)	0.001*
Wasted (≤-2SD)	69 (26.1%)	30(18.8%)		
Severe wasting(≤-3SD)	58(22%)	8(5%)		
Over weight for height (>2SD)	0	1(0.6%)		

Discussion

In this present study found that: Mean age of the studied children was 38 ± 10.5 months; males represent (62.3%) while (37.7%) were females and we declared that 80.2% of studied children had breast feeding and this was higher (83%) among rural than urban (77.7%). About (87.5%) of urban children receive food including all food groups daily compared to (67%) of rural children ($p=0.001$). Also, (76.7%) of children receiving snacks between meals. This in agreement with Farag et al., 2014. study conducted in Egypt on 358 children under five years (186 were males and 169 were females) which found that: More than half of the studied children were breast fed from 6 to 12 months and about (31%) only breast fed more than a year, regarding the feeding pattern of the studied children according to counseled mothers, we found that, only 10% consumed more than 3 meals, and nearly a quarter of them consumed only one meal per day.

In our present study, it was found that: (9.9%), of children had GIT infection during the past 2 weeks, this was lower than a study done in Damanhur City, the Capital of El-Behera Governorate, Egypt by Hegazy et al., 2014 to detect the prevalence of intestinal parasitic infection among preschool-aged children and to find out its effect on their nutritional status. Five-hundred children aged between 2-6 years. The study revealed that 51.8% of preschool children were infected. Significantly lower weight for age z-score (WAZ) and weight for height z-score (WHZ) were found among infested children compared to non-infested ones ($P < 0.05$). Moreover, stunting was found in 44.1%, underweight in 39.1% and wasting in 11.5% of infested children Hegazy et al., 2014.

In our present study it was found that (80.7%) of children were severely underweight ($\leq -3SD$) and (12.7%) were underweight and there were significant differences between rural and urban regarding WAZ in which (85.3%) of urban children were severely underweight compared to (75.5%) of rural. This in agreement with a study conducted in Egypt which found that:

78.2% of the children were normal, 14.2% were underweight, and 6.3% were severely underweight Eladawi et al., 2014.

In our current study, it was found that 28.6% of urban and 17.5% of rural children were wasted, this in contrast with another study in Nigeria which was found that 2% of urban and 17% of rural children were wasted. Lemchi, et al., 2012. Also in contrast with study conducted in Egypt on 358 children under 5 years (186 were males and 169 were females) which found that: most of the children were normal, 3.6% were wasted, 2.2% were severely wasted, 5% were overweight and only 0.8% were obese Farag et al., 2014.

Our present study shows that: there were statistically significant differences between males and females regarding weight for age, that (26.1%) of males were wasted ($\leq -2SD$) compared to (18.8%) of females and (75.6%) of females were normal which higher than of males (51.9%). This in contrast with a study conducted in Egypt on 358 children under 5 years which found that, 3.6% of the children were wasted and 2.2% were severely wasted Eladawi et al., 2014. Also, Lodhi et al. declared that according to weight for height Z-score, 13% of children were wasted and 4% were severely wasted. This higher percentage in our present study may be caused by lower economic status and lack of mother's knowledge concerning adequate and valuable diet. (Lodhi et al., 2010). But, our present study was in agreement with another study in Rajasthan, 2015 which was found lower than 3.2% of males and 4.9% of females children were wasted and 10.9% of males and 12.5% of females children were severely wasting. Sanjeev SK et al., 2015.

Conclusions

- 1- Socio-economic state among the studied preschool children was very low.
- 2- Education status of fathers and mothers was characterized by a low level
- 3- Family size was high
- 4- There were infections during the past 2 weeks preceding the study and majority of children treated in rural health unit or general hospitals.

- 5- Nutritional status of children as assessed by anthropometric measures were low.
- 6- Underweight, stunting and wasting were highly prevalent.

Recommendations

health education of mothers about the use of the growth chart and take appropriate action if the child's growth flatters, this can decrease the size of the problem. Improvement the preschoolers housing conditions use tap water in drinking, use sewage network in sewage disposal. Primary health care centers in urban and health units, in rural areas, should promote nutritional education in schools through health posts, women's groups about feeding during pregnancy and lactation, and improving health services to protect children against infections and parasitic diseases. Appropriate food should be available for all people with proper prices, especially children. Preschoolers in urban and rural areas who are at risk of malnutrition can be identified before they reach their second year of life through growth monitoring.

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