

Nutritional Assessment of Primary School Students in Essian Camp

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Abstract

Background and objective: Nutrition has the main field for health promotion of school -age children it is crucial that the increasing energy requirements forthcoming with this age group be met daily with foods of high nutritional value. The study was conducted to evaluate the nutritional status of students in Essian primary school.

Methods: All students in grades (4-6) in Essian primary school in in Essian Internally Displaced Person camp enrolled in this study. The nutritional status assessed through measuring of anthropometric measurements (weight, height, Mid Upper Arm Circumference and Bilateral pitting edema). Information on the foods that consumed by each student in last 24 hours was obtained by a specially constructed questionnaire. Data analysis was done by using WHO anthro plus software program and SPSS version23.

Results: 253 students are screened, their age ranged (10-15 years), 161 males and 92 females . Mean students age 12.05 years. Prevalence of stunting 25.69% {20.55% moderate stunting (<-2 z-score ≥-3 z-score) and 5.14% severe stunting (<-3 Zscore)}. Prevalence of overweight 11.46 % {8.70% overweight (>1 z-score and ≤ 2 z-score) and 2.77% obesity (>2 z-score) } . Prevalence of thinness 5.93% {5.14% moderate thinness (<-2 z-score ≥-3 z-score) and 0.79 % severe thinness (<-3 Z score)}. The mean individual dietary diversity score was 9.1.Up to 59.3% of students had a history of Acute Respiratory Tract Infections and 15.4% had a history of diarrhoea within two weeks prior to the study.

Conclusions: The prevalence rate of stunting and thinness among the primary school children in Essian camp is higher than national level while the prevalence rate of overweight/ obesity is lower. Local authorities to overcome causes of malnutrition should adopt a well-constructed program for all forms of malnutrition and treat the existing cases.

Keywords: Nutritional assessment; schoolchildren; Essian camp.

Introduction

Adolescence is one of the most accelerated stages of human growth and development. Many factors will effect this growth and development like internal factors (e.g. gender) and external factors (e.g. over or under -nutrition, abusive environment, security instability, wars). These factors can result in different adverse health sequelae, growth retardation or obesity and scholastic backwardness ¹.

In emergencies, weight loss among under-five year's children is usually taken as a proxy indicator for the general health and well-being of the whole community. The scientists assumed that under five years children are more sensitive than other population groups to extrinsic factors (such as food deficiency and diseases) and the nutrition status of these children is more sensitive to change than that of adults in many populations ². Although the prevalence of malnutrition in the under-five age group is critical. In 2002 the United Nation's Standing Committee on Nutrition launched to encourage research and interventions into the malnutrition of school-age children, on account of this age groups potential to experience "catch up" growth. For example, school-age children who were underweight early in childhood period can grow to have a normal weight for age if their nutritional status and environment improves ³. Internal and external conflicts have changed in complexity and nature over the last decades. Children and adolescence became direct victims in many places globally. Conflict affects children's health in four essential manners. First, conflict Compelling many people to displace either in their countries or across borders to other countries, which increases child death and injury, mainly through increased susceptibility to infectious disease from lacking essential health services including immunization and unsanitary living conditions. A case study on Southern Sudan illustrates that conflict reduces sanitation, clean water, and health services. Second, children have a higher risk of food insecurity and shortage, which may increase the prevalence of malnutrition during times of conflict. The country case of Chad illustrates that food insecurity is heightened by the resettlement of displaced people leading to higher rates of malnutrition. Third, adolescence, especially girls, are subjected to an increased risk of sexual abuse from armed fighters during the strife. Fourth, conflict induces long-term physical and psychological disability in children ⁴.

In 2014, the continuous escalation of the armed conflict in the Iraq has triggered the displacement of thousands of Iraqis across the Country .From the beginning of January through December 2014, the Displacement Tracking Matrix (DTM) identified 2,123,340 Internally Displaced Persons (IDPs) dispersed across 2,092 distinct locations in Iraq. The highest number of IDPs originated from Ninawa province with 996,828 individuals (47%), followed by Anbar with 576,774 individuals (27%), and Salah al-Din with 265,266 individuals (12%). Up to 45.8 % of total IDPs settled in Kurdistan Region, about 641,022 of them distributed throughout Duhok province districts. At the

initial stage of displacement, the IDPs settled in any place that could be dwell like schools, unfinished buildings, temporary camps, community canters, rented houses etc. About 199,000 of IDPs settled in 18 newly build camps throughout the Duhok province.^{5,6} There is a comparative deficient of available published information regarding the nutritional status of school attending children, especially who are living in camps. Taking into account this, the study objective 's was to assess the nutritional status of primary school children living in an IDP camp.

Subjects and Methods

The study conducted in Essian Primary school in Essian IDP camp, which is located east of Baadre town in Shekhan district. The total population of the camp at the time of the study was (14809), percentages of 6-11years and 12-17 years compared to total population are 17% and 20 %. Percentages of children who attend schools of these two subgroups are 78% and 66% respectively⁷. To achieve our objectives a cross-sectional design chosen. Inclusion criteria were all available students in grades (4-6) regardless of their ages. The students in grades (1-3) excluded because the researcher thought that they might not be able to answers accurately all questions in the questionnaire especially that related to items of food that they consumed daily. Information was gathered by direct interview with students in the classes through a structured questionnaire, after self-introduction by the researcher to the student.

Dietary diversity, defined as the number of different food groups consumed over a given period of time, provides information on household food security. While the individual dietary diversity score (IDDS) is used as a proxy measure of the nutritional quality of an individual's diet, the household dietary diversity score (HDDS) is used as a proxy measure of the socio-economic level of the household when to collect the data. To accurately capture changes in HDDS over time, data should be collected during the period of greatest food shortages (such as immediately prior to the harvest). Information on household or individual food consumption should be collected using the previous 24 hours as a reference period (24-hour recall). Longer reference periods result in less accurate information due to imperfect recall. When using the 24-hour recall method, the interviewer should first determine whether the previous 24-hour period was "usual" or "normal" for the household or individual.⁸ In this survey, a 24-hour recall period was used to estimate the frequency of the consumption of 11 food groups. Students were asked how many times they had eaten foods from each food group during the last 24 hour. Anthropometric measurements done through four steps: First by examining presence of bilateral feet pitting oedema . Second by measuring weight by using an electronic scale (Uniscale-Secca 874)- Mobile flat scales for mobile use with push buttons and

double display The double display lets the patient and medical personnel read the results from two different prospects at the same time. Third by measuring Height by using special device Adult Height Measuring Device (Microtoise) {UNICEF Height measuring instrument (0-2 m)}. Fourth by measuring Mid Upper Arm Circumference (MUAC) by using special tape adopted by United Nations Children’s Fund (UNICEF). MUAC was used as a proxy of thinness. It is also known as a good predictor of acutely malnourished children. Nutritional status was classified as normal, moderate or severe based on World Health Organization (WHO) cut-off point for age 10-14 years ⁹.

Data were analysed by using the Statistical Package for Social Sciences (SPSS, version 23) and WHO AnthroPlus software is a program for the global application of the WHO Reference 2007 for 5-19 years to monitor the growth of school-age children and adolescents. ¹⁰

WHO classification of nutrition conditions in adolescence based on anthropometric measurements and applying of WHO (2006) growth charts as follow: ¹¹ Overweight : > + 1SD , Obesity : > +2SD , Thinness : < -2SD , Severe thinness : < -3SD. Stunting : < -2SD , Severe stunting : < -3SD.

Results: A total of 253 students (161 male and 92 females) are studied. Their age ranged from 10-15 years. Students of age 12 years represents the highest percentages 29.6% followed by age 13 (18.6%) and the least of age 15 95.5%). As shown in Table.1.

Table1: Demographic Characteristics of Study Sample.

Students' age in years	Male		Female		Total	
	No.	%	No.	%	No.	%
10	27	16.8	18	19.6	45	17.8
11	22	13.7	21	22.8	43	17
12	51	31.7	24	26.1	75	29.6
13	30	18.6	17	18.5	47	18.6
14	19	11.8	10	10.9	29	11.5
15	12	7.5	2	2.2	14	5.5
Total	161	100	92	100	253	100

The study showed that up to 59.3% (150) of students had history of an attack of acute respiratory tract infection (ARI) while only 15.4% (39) had history of diarrhoea during last two weeks prior to the study as shown in Figures1 &2.

Figure 1: Number of cases of ARI during last two weeks

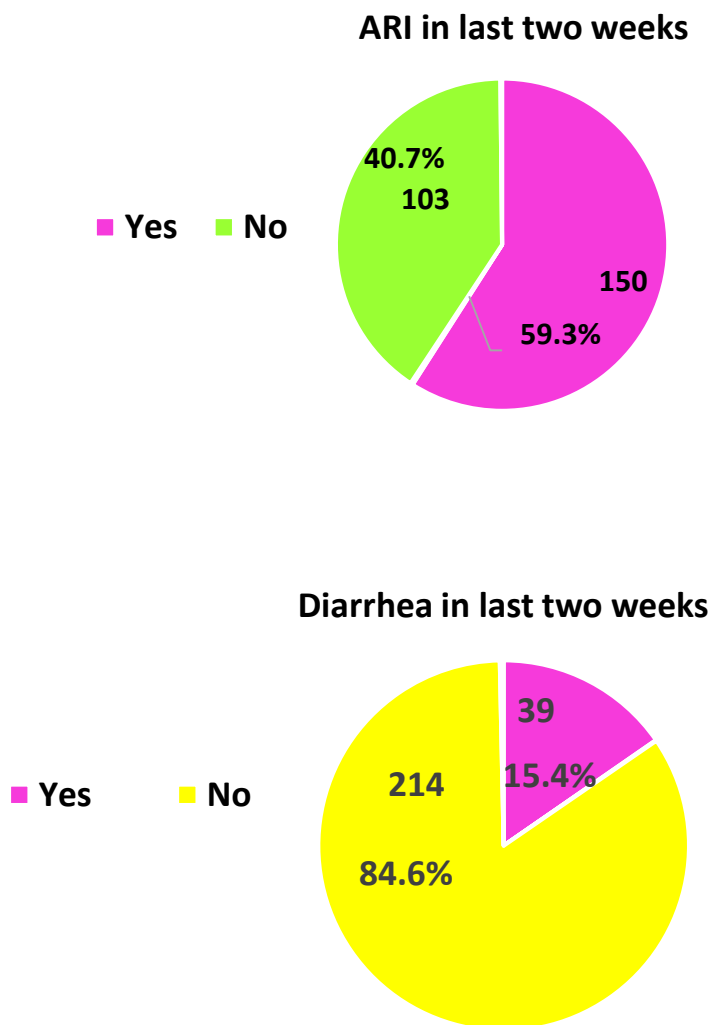


Figure 2: Number of diarrhoeal cases among studied students during last two weeks.

The study revealed that 25.69% of studied sample had stunting [20.95% of moderate type (<-2 z-score) and \geq -3 z-score, and 4.74% of severe type (<-3 z-score)]. Prevalence of stunting is slightly higher among males (26.06%) than females (25.00%) Table 2.

Table 2: Prevalence of stunting based on height-for-age Z-scores and by sex.

	All students	Male (161)	Female (92)
Prevalence of Stunting (< -2Z score) No. (%)	65(25.69)	42(26.06)	23 (25.00)
Prevalence of Moderate stunting (<-2 z-score and \geq -3 z-score) No. (%)	53(20.95)	33(20.50)	20(21.74)
Prevalence of Severe stunting (<-3 z-score) No. (%)	12(4.74)	9(5.59)	3(3.26)

Prevalence of thinness based on Body Mass Index (BMI) for age was 5.93% for all types of thinness [5.14% moderate thinness (<-2 z-score and \geq -3 z-score), and 0.79% severe thinness (<-3 z-score)]. Thinness is more among males (6.83%) than females (4.35%) Table 3.

Table 3: Prevalence of thinness based on BMI-for-age Z-scores and by sex.

	All students	Male (161)	Female (92)
Prevalence of Thinness (< -2Z score) No. (%)	15(5.93)	11(6.83)	4(4.35)
Prevalence of Moderate Thinness (<-2 z-score and \geq -3 z-score) No. (%)	13(5.14)	9(5.59)	4(4.35)
Prevalence of Severe Thinness (<-3 z-score) No. (%)	2(0.79)	2(1.24)	0(0.00)

Overall, the prevalence of thinness (\leq 185 mm) based on MUAC measurements is (25.69%) among which (22.53%) had moderate thinness (160-185mm) and (3.16%) severely thinness (< 165 mm). Males (27.95) are more affected by thinness than females (21.74) Table 4.

Table 4: Prevalence of Acute Malnutrition based on MUAC for-age and by sex.

	All students	Male (161)	Female (92)
Prevalence of Thinness (≤ 185 mm) No. (%)	65(25.69)	45(27.95)	20(21.74)
Prevalence of Moderate Thinness ($160 < 185$ mm) No. (%)	57(22.53)	39(24.22)	18(19.57)
Prevalence of Severe Thinness (< 160 mm) No. (%)	8(3.16)	6(3.73)	2(2.17)

Table.5 shows that (11.46%) of studied sample had overweight in all forms (>1 Z score) [8.70% moderate type of overweight (>1 z-score and ≤ 2 z-score) , 2.77% obesity (>2 Z score)].

Males(13.04%) are more affected by overweight than females(8.70%) .

Table 5: Prevalence of overweight and obesity based on BMI-for-age Z- scores and by sex.

	All students	Male (161)	Female (92)
Prevalence of all forms Overweight (>1 Z score) No.(%)	29(11.46)	21(13.04)	8(8.70)
Prevalence of Moderate overweight (>1 z-score and ≤ 2 z-score) No.(%)	22(8.70)	16(9.94)	6(6.52)
Prevalence of Severe overweight (obesity) (>2 z-score) No. (%)	7(2.77)	5(3.11)	2(2.17)

No cases of bilateral pitting oedema among students was reported in this study.

In this study, a 24-hour recall period was used to estimate the frequency of the consumption of 11 food groups. About all the sampled student consume eggs and sweet (100.0%),cereals (96.84%) , vegetables (94.86%) , Fruits (94.47%) , cooking oil/fats (97.2%) , meat , chicken and fish 219 (86.56%),Milk and dairy products 191 (75.49%) , white tubers and roots152(60.08%) , pulses 139 (54.94 %) and spices131 (51.78%) Table 6. The mean IDDS for this study was 9.1 out of a possible 11.

Table 6: Type of food groups that consumed by students in last 24 -hour.

Food item	Students consumed No. (%)	Food item	Students consumed No. (%)
Cereals	245 (96.84)	Vegetables	240 (94.86)
White tubers and roots	152(60.08)	Fruits	239 (94.47)
Meat , chicken and fish	219 (86.56)	Pulses	139 (54.94)
Cooking oil/Fats	230 (90.91)	Sweets	253 (100.00)
Milk and dairy products	191 (75.49)	Eggs	253 (100.00)
Spices and condiments	131 (51.78)		

Discussion

In this study, a high prevalence of stunting observed, (25.69%) of the studied sample are suffering from stunting including (4.74% of them had severe stunting). Stunting is reflected chronic malnutrition and is usually resulted from long-term nutritional deprivation. Stunting often leads to delayed mental development, poor school performance and reduced intellectual capacity.¹², which, is much higher than that found during National Micronutrient deficiencies: Assessment and Response (MNAR) survey which was done in Iraq in 2012; stunting prevalence was 8.9%¹³. Another study conducted in 2011 for the students of 25 primary schools in three Iraqi provinces (Sulimaniyah, Thi-Qar, and Salahaldin), the study results revealed that about 14% of the students were suffering from stunting¹⁴. The high prevalence of stunting may be due to the poor socioeconomic status of most of Essian camp population and, where they are originated from Sinjar area. According to Comprehensive Food Security and Vulnerability Analysis-CFSVA study done by World Food Program (WFP) in Iraq (2007), Sinjar district was one of 17 districts in Iraq classified as Cluster four “extremely vulnerable” area. This cluster characterized by the highest rates of food insecurity and poverty.¹⁵ In this study ,males are slightly affected by stunting more than females, while MNAR survey appeared that female students more affected (10.5%) than male students (7.6%)¹³. In 2016, a Nutritional survey among IDPs in Duhok province revealed that 15% of (6-59 months) aged children had stunting, which is higher than that found among IDPs in Erbil province 11.6% and in Sulaymaniah province 9.5%¹⁶. Hasan et al found that prevalence of stunting among school age children inn Azad Nagar and its surrounding areas of Bangalore was 40.4%. Which may be due to poor dietary habits and ignorance of balance diets among students and their parents¹⁷.

The study also showed that (5.93%) of students had thinness based on BMI for age Z score measurements, only (0.79%) had severe thinness. In MNAR survey and the study that conducted in three Iraqi provinces showed slightly fewer percentages of thinness and severe thinness (2.9%, 3%), respectively^{13, 14}. In spite of thinness, usually, reflect acute malnutrition conditions, and known to be associated with infections like diarrhoea or sudden food shortage. The thinness percentage is below

the emergency threshold as defined by the World Health Organisation.¹² The prevalence of wasting among (6-59 months) aged children of IDPs was very low (1.8%) which may be due to adequate food supplies and security at the time of the study. Although, the humanitarian situation in Iraq cannot be predicted and the possible escalation of food insecurity at any time.¹⁶ MUAC measurements showed the higher prevalence of thinness (22.53%) if it compared with that percentage detected by BMI for age Z score measurements (5.93%). This may be due to MUAC measurement is more sensitive than BMI for age measurement for detecting cases of undernutrition. Abrhame and Haidar did a large study among adults and they found that 35% of females and 48% of males have thinness based on MUAC, on another hand 29% female and 32% males had thinness based on BMI for age.¹⁸ Mramba team did two cohort studies among children and adolescents, they that

MUAC classified a larger number of children and adolescents as being severely undernourished (thinness) than did BMI, which may have interventional implications, although, MUAC a higher sensitivity for detecting mortality risks associated with malnutrition.¹⁹ Although MUAC is the keystone of nutritional assessment in other age groups, there no any internationally accepted reference or cut off points for MUAC prevail for school-age children and adolescents.^{19,20}

In addition to undernutrition cases, the present study found about (11.46%) of the studied sample are overweight including (2.77% obesity). This lower than the national level that recorded in MNAR survey, which found that 18.6% of students had overweight with 6% of them are obese.¹³ The incidence of overweight/ obesity rapidly increased worldwide among all age groups, in 2016, WHO estimated that more than 1.9 billion persons (18 years and older), were overweight and Up to 340 million children and juvenile aged 5-19 were overweight or obese.²¹

The mean IDDS for this Study was 9.1 out of potential (11), which indicate that on average a student in this study consumed nine food groups out of 11 food groups in last 24 hour. This reflects a good quality score, represents fair food consumption in the population and it means that food security at the acceptable level. This score is near to mean HHDS (10.6) that was calculated in last nutritional survey among IDPs in Duhok province in 2016.¹⁶

Conclusion: The prevalence rate of stunting and thinness among the primary school children in Essian camp is higher than national level while the prevalence rate of overweight/ obesity is lower. Local authorities to overcome causes of malnutrition should adopt a well-constructed program for all forms of malnutrition and treat the existing cases. It is important to invest in preventive interventions so that no gap in knowledge, practice or action paves way for any level of child malnutrition.

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