Al-Razi University Journal for Medical Sciences

RUJMS

ISSN No. 2616-6143

Volume (2) Issue (2) December 2018

مرخصة من وزارة التعليم العالي والبحث العلمي
بقرار وزاري رقم (57) لسنة 2018م

RUJMS

Published by Al-Razi University

Bianual Refered Journal

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RUJMS

VOLUME (2) Issue (2),
DECEMBER 2018

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Original Research *Al-Razi Univ J Med Sci 2018; 2 (2)*

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Al-Razi University Journal of

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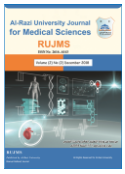

Nutritional Status and Associated Factors among Basic School children in Sana'a City-Yemen

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Abstract

Background: *Malnutrition is an increasing health problem among children in developing countries. Few studies were conducted about school students' malnutrition in Yemen but this study focused on children in this age group in Sana'a city.* ***Aim:*** *To assess the nutritional status of* basic *school children in Sana'a city.* ***.Methods:*** *A cross-sectional study was conducted from March 2017 to May2018. A multistage random sampling technique was applied to select 198 basic school students. .Data on demographic characteristics of students and their parents and anthropometric measurements of students were collected using structured questionnaire as face to face interview .Data was analysis using SPSS software program.. Statistical significance was considered when p-value <0.05.* ***Results :****The mean ± SD of students' age were 10.96 ± 2 .59 years with (50.5% to 49.5%) male to female percentage respectively. Out of 198 basic school children about 26.3% of them were underweight, 15.7% were healthy weight,* 3.5% *overweight and 2.5% obese based on CDC growth reference standard. The distribution of the children nutritional status based on their height for age showed that the majority of children were stunted 53.5%. There was strong statistically significant difference between children nutritional status and their sex, mother and father education, birth order.* ***Conclusion:*** *The most common form of malnutrition among basic school children in Sana'a city was underweight at the rate of (26.3%). Sex, mother and father education, birth order were key factors contributing to malnutrition in children. Nutrition education should be apply to community.*

Keywords: Malnutrition; Underweight, BMI, Basic School children; Sana'a.

Introduction

Malnutrition is one of the most important global health problems, affecting large number of children in developing countries[1]. It is responsible for the death of one third of children 7.6 million children in the globe every year[2]. The term malnutrition generally refers to both under nutrition and over nutrition this guide we use the term to refer solely to deficiency of nutrition[3]. However adequate nutrition is essential in early childhood to ensure healthy growth, proper organ formation and functions, a strong immune system and neurological and cognitive development[4].

According to WHO criteria, 52% of school going children in under developed countries are normal where 48% of them are malnourished.[5] More than 200 million school children are stunted and if no action is taken, and at this rate, about one billion stunted school age children will be growing up by 2020

with impaired physical and mental development[6].

In Yemen, the prevalence of acute malnutrition has continued to increase over the past three years. It is indicates higher rates in the densely populated northwest along with the Red Sea and followed by the Arabian Sea Coastline into Abyan Governorate[7]. More than half of school age children (59%) is stunted, almost half (47%) are underweight and (4%) are wasted[8]. With the worsening health, food security, water sanitation and hygiene situation, it is expected that nutrition situation in Yemen will deteriorate further taking into account the ongoing conflict.[7] Good nutrition are not only essential input but also important output of good quality .Children must be healthy and well-nourished in order to fully participate in education and gain its maximum benefits.

Aim of the study

To assess the nutritional status of basic school children in Sana'a city.

Subjects and Methods

A descriptive cross-sectional study was conducted to assess the nutritional status of basic school children in Sana'a city-Yemen from March 2017 to May 2018. 198 basic school students were selected to this study. A sampling frame of all public and private basic school at the different districts in Sana'a city were used for the purpose of sampling. A multi-stage random sampling technique was used. The first-stage sampling frame consisted of all schools in Sana'a city. 8 out of (562) schools were selected by simple randomly sampling involve 4 public and 4 private school. The second stage of sampling was selected (25 to 30) students from each selected school (grade one to grade nine) with a probability proportional to the school student's size. In third stage one class from each level were randomly selected using simple random simple sampling from each class (2 to 3) students.

The sample size has been calculated by using EpiCalc software, version 20.0 taking into consideration the following criteria; the proportion (4.90%) of those who were severely underweight (< -3 WAZ)[9]. A sample size (n) with 95% confidence interval was 198 students.

The demographic data and the anthropometric measurements were collected at schools by qualified and well-trained nurses. The questionnaire was consisted of demographic characteristics of students (sex, age, class, birth order and type of school) and demographic characteristics of parents (education, occupation, family size) and Anthropometric measurement in the form of BMI, height and weight. Weight was measured to the nearest kilogram using standard scale, according to standard weighing procedures. Children were totally undressed. The Student was asked to remove heavy clothing and the shoes.

To improve the reliability of the measurement, weight was taken twice, with the average of the two measurements used. Height of children was measured by using a strip size meter which. Measurement of height to the nearest centimetre using a standard tape. To improve the reliability of the measurement it was taken twice, with the average of the two measurements used. Before the commencement of the actual study, tools and methods were pre-tested. The pilot study was conducted over a period of one week and it included 20 students not included in this study.

Data was analysis using WHO Anthro program and SPSS (version 18.0). Before entering the data, a researchers checked each data sheet immediately after collecting the sheets. When he found any mistakes or blanks in the form he contacted the interviewee who was responsible for the interview and corrected the mistakes with them. All the data was recorded on questionnaire sheets. To avoid any mistakes the data entry was done by two persons for each sheet and the two sheets were compared. When a difference between the two data sheets was found, the data entry personnel referred the original data sheet.

Descriptive and inferential statistics were done and the data were presented as frequency and percentage. Relations between different categorical variables were tested using spearman correlation.

For the anthropometric measurement determination, Center for Diseases Control (CDC) charts 2000[10] were used as reference. There are separate growth charts for boys and girls aged 2-19 years. The charts contained standard growth curves and those denoted as percentiles were used to determine BMI-for-age and stature-for-age. BMI-for-age.

Children whose stature-for-age is less than the 5th percentile is stunted. BMI it is defined as a person's weight in kilograms divided by the square of the person's height in metres (kg/m^2)[10].

To assess nutritional status by BMI we used four anthropometric categories according to CDC[10]. Underweight defined as BMI-for-age less than the 5th percentile, Healthy weight defined as BMI-for-age ranged from 5th percentile to less than the 85th percentile، Overweight "is the term preferred for describing children 85th to less than the 95th percentile and obese define as BMI-for-age greater than or equal to the 95th percentile of BMI-for-age .

Statistical significance was considered when *p* value <0.05. The study was initially approved by the local health authorities in Sana'a city. Purpose and benefits of the study were explained to school managers and assured that their responses would not influence their care. Oral informed consent has obtained from all managers and students.

Results

Demographic characteristics of students

The male to female proportion was partly equal by the rate of (50.5% to 49.5%) respectively with aged ranged from 6-16 years. In the other hand, the majority of students were shown in the 6th primary class at percentage of 14.6%. Regarding birth order showed that most of children (41.4%) were fourth born. Also the private school demonstrate 50.5% whereas the public school was 49.5%. Table 1.

Demographic characteristics of parents

Table 2 shows that, nearly three quarter of mothers were educated. Among fathers, majority of them were educated and was employed (91.9% and 92.9%) respectively. family size of >5 persons represented about (60.1%).

Table 1: Demographic characteristics of school children (N =198)

Demographic characteristics	F	%
Sex		
• Male	100	50.5
• Female	98	49.5
Age range in year		
• 6-10	91	46.0
• 11-13	70	35.4
• 14-16	37	18.6
Class		
• Class 1	25	12.6
• Class 2	17	8.6
• Class 3	20	10.1
• Class 4	24	12.1
• Class 5	22	11.1
• Class 6	29	14.6
• Class 7	22	11.1
• Class 8	19	9.6
• Class 9	20	10.1
Birth order		
• 1^{st}	60	30.3
• 2^{nd} -3^{rd}	56	28.3
• 4^{th}+	82	41.4
Type of school		
• Public	98	49.5
• Private	100	50.5

Table 2: Demographic characteristics of parents of school children (n=198).

Demographic characteristics	F	%
Mothers education		
• Educated	148	74.7
• Uneducated	50	25.3
Fathers education		
• Educated	181	91.9
• Uneducated	16	8.1
Fathers occupation		
• Employee	184	92.9
• Un employee	14	7.1
Family size		
• 3-5 persons	79	39.9
• >5 persons	119	60.1

BMI for age by sex

The most common form of nutritional status among children was healthy weight 67.7% (31.3 % male vs 36.4% female) followed by underweight was 26.3% (16.2% male vs 10.1% female). More details presenting in table 3.

Height for age by sex

The distribution of the children nutritional status based on their height for age showed that the majority of children were stunted 53.5% (24.7% male vs 28.8 % female) while normal height was 46.5% (25.8 % male vs 20.7% female).. Table 4.

Table 3: BMI for age mong basic school children by sex

BMI	Male		Female		Total	
	F	%	F	%	F	%
• Underweight	32	16.2	20	10.1	52	26.3
• Healthy weight	62	31.3	72	36.4	134	67.7
• Overweight	3	1.5	4	2.0	7	3.5
• Obese	3	1.5	2	1.0	5	2.5
Total	100	50.5	98	49.5	198	100

Table 4: Height for age among basic school children by sex

Stunted	Male		Female		Total	
	F	%	F	%	F	%
• Yes	49	24.7	57	28.8	106	53.5
• No	51	25.8	41	20.7	92	46.5
Total	100	50.5	98	49.5	198	100

Nutritional status related to associated factors

The prevalence of underweight was significantly higher in male than female. The findings of the study showed that there was association in nutritional status and sex with p-value=0.004. Table 5 shows that most of underweight children were had 4 year preceding birth interval by the rate of 11.3% but significant relationship was present between nutritional status and the birth order of students (P-value=0.001). A significant relationship between nutritional status and mothers' education and father education was found (P-value=0.036 and 0.007) respectively. A significant relationship between nutritional status and fathers' occupation and family size was not found (P-value=0.458 and 0.868) respectively.

Table 5: Nutritional status related to associated factors

Demographic characteristics	BMI				*P*-value
	Underweight	Healthy weight	Overweight	Obese	
	%	%	%	%	
Sex					
• Male	16.2	31.3	1.5	1.5	0.004
• Female	10.1	36.4	2.0	1.0	
Birth order					
• 1^{st}	8.5	16.7	1.0.	0.5	0.001
• 2^{nd} -3^{rd}	6.5	17.3	0.5	0.5	
• 4^{th}+	11.3	27.7	2.0	1.5	
Mothers education					.
• Educated	17.2	53.7	2.5	1.5	0.036
• Uneducated	9.1	13.8	1.0	1.0	
Fathers education					
• Educated	24.1	63.8	2.5	0.5	0.007
• Uneducated	2.2	3.9	1.0	0.0	
Fathers occupation					
• Employee	23.2	63.2	3.5	2.5	0.458
• Un employee	3.1	4.5	0.0	0.0	
Family size					
• <5 persons	9.8	26.5	1.5	1.0	0.868
• >5 persons	16.5	40.1	2.0	1.5	

Discussion

Our study was aimed to assess the nutritional status and its associated factors among primary school students in Sana'a city from March 2017 to May 2018. The overall prevalence of malnutrition was (84.3%)of all studied population .The prevalence considered high when compare the results with other study done by Tunje .D.S on prevalence and determinants of malnutrition among primary school children in Kilifi district ,Kenya who found lower overall prevalence of malnutrition at (27.5%)[11]. This difference may be explained by the fact that the two countries are of different environments and the children in these areas are from different socio-economic status.

In the present study, the most common form of malnutrition was underweight and account for (26.3%).The prevalence was higher than that reported in Aden governorate which reported that (10.1%) of school children were underweight.[10] More recently, study done by Al-Mahdi E.M et al on assessment of nutritional status among primary school children in Amanat Al-Asema in Sana'a which reports that (12.2%) of students were underweight.[12]

The prevalence of overweight in the present study was very low and found to be (3.5%) only of all studied population. It was lower than prevalence reported in Aden which was found as the rate of (12.7%).[13] Similarly to the study done in Amanat Al-Asema Sana'a which found (10.2%) of students were overweight[14]. Whereas in Qatari children the rates found to be (18.7% and 24.3%) for girls and boys respectively[15]. In addition, rates of (14.2%) was found among

Emarati children and adolescents[16]. In Saudi Arabia,a cross sectional study in the Eastern province among children aged (2-18) years revealed a prevalence of (19.0%) for overweight based on CDC criteria[17]. Other result were reported in Omani children with rate of (11.3%) for overweight[18].

In relation of sex to prevalence rate of malnutrition in our study showed that underweight was more prevalent in males than in females in presence of statistical significance difference. .A significant relationship between nutritional status and mothers' education and father education was found. But no significant relationship between nutritional status and fathers' occupation and family size. Similar findings is reported among Qatari children with more prevalence of underweight among male children[15]. In conflict with the study done in Egypt in 2017, which report more prevalence of underweight among female children than male and they relate this difference to the cultural preference of boys over girls in rural areas which might translate into a better chance of adequate food[19]. Nutritional status based on their height for age showed that the majority of children were stunted 53.5% (24.7% male vs 28.8 % female) while normal height was 46.5% (25.8 % male vs 20.7% female). Besides, in the present study we found that there was statistical association between nutritional status of children and the preceding birth interval with p-value (0.001), but there was no studies found in the same variable.

Conclusion

The prevalence of underweight among basic school students was (26.3%). malnutrition is a major nutritional problem among basic school children in Sana'a cit. Sex and preceding birth interval and parents' education were a key risk factors contributing to malnutrition in children.

Recommendations

Cooperation between the Ministry of Public Health and Population, the Ministry of Education and local and foreign organizations to monitor special health cases directly related to nutrition of students.

References

1. Filiz ,E . ,Pýnar , O. , Gonca ,A. and Erdal , B.E. Nutritional status and risk factors of chronic malnutrition in children under five years of age in Aydýn ,a western city of turkey . Turkish journal of pediatrics. 2007; 49,2 83-289 .
2. The WHO .Communicable disease and severe food shortage technical note .Geneva: WHO; 2010.
3. M.Blooser, M.De .Onis .Malnutrition quantifying the health impact at national and local levels.Geneva. 2005.
4. M.De. Onis, M. Blooser, E. Borgi, D.Brown. WHO, UNICEF,-The World Bank .levels and trends of child malnutrition.
5. UNICEF .Food and nutrition bulletin supplement. 2006 .21(3) :6-17.
6. World food program .overview of Bangladesh .2013.
7. Yemen nutrition cluster Bulletin, Issue 1 .Jan-march 2017.[cited on 2017]available from :https://reliefweb.int/report/yemen/yemen-nutrition-cluster-bulletin-issue-1-january-march-2018
8. WHO. Physical Status: The Use and Interpretation of Anthropometry: Report of a World Health Organization (WHO) Expert Committee. Geneva, Switzerland: World Health Organization; 1995.

9. Raja'a, Y.A., Sulaiman, S.M., Elkarib, S.A. & Mubarak, J.S. Nutrition status of Yemeni School children in Al-Mahweet Governorate. Eastern Mediterranean Health Journal, 2001; Vol 7(1-2), 204-210.
10. Centers for Disease Control (CDC) About BMI for Children and Teens: Division of Nutrition, Physical activity and Obesity. CDC, USA, 2009.
11. Raja.Y.A et al. Nutritional status of Yemeni schoolchildren in Al- Mahweet governorate. Le Revue de santde la Mditerrane orientale . 2001; 7, 1-2.
12. The World Bank .Foucsing resource on effective school health: a FRESH start to improving quality and equity of education .2000.
13. M.A.Badi et al. Overweight /obesity and socioeconomic status in children from Aden Governorate, Yemen. Revista Habanera de Ciencias Medicas.2013; 12(3):364-373.
14. Al-Mahdi, E.M et al. Assessment of nutritional status of primary school students in Amanat Alasema Sana'a.Yemen.2017.
15. Bener, A. and Kamal, A. Growth pattern of Qatari school children and adolescents aged 6-18 .J health, popul, nutr. 2005; 23(3):p.p 250-258.
16. Al-Junaibi, A., Abdulla, A., Sabri, S., Hag –Ali, M., and Nagelkerke, N. The prevalence and potential determinants of obesity among school-children and adolescents in Abu Dhabi, United Arab Emirates. International journal of obesity .2013; 37, 68-74.
17. Al-Dossary, S. Obesity in Saudi children: A dangerous reality. Eastern Mediterranean health journal .2010; 16(9):1003-1008.
18. Al-Harthy, S. Prevalence of obesity among Pediatrics (0-15years) at sultan Qaboos University hospital: A retrospective chart review. University of Chaster, United Kingdom .2013.
19. Wafaa Y. Abdelwahed, Safaa K. Hassan, and Randa Eldessouki. Malnutrition and Its Associated Factors among Rural School Children in Fayoum Governorate , Egypt .Journal of Environmental and Public Health .volume. 2017; 3(1)

الحالة التغذوية والعوامل المرتبطة بها بين أطفال المدارس الأساسية في مدينة صنعاء، اليمن.

ملخص

خلفية: تُعد سوء التغذية مشكلة صحية متزايدة بين الأطفال في البلدان النامية. على الرغم من إجراء بعض الدراسات حول سوء التغذية بين طلاب المدارس في اليمن، إلا أن هذه الدراسة تركزت على الأطفال في هذه الفئة العمرية في مدينة صنعاء. **الهدف**: تقييم الحالة التغذوية للأطفال في المدارس الأساسية في مدينة صنعاء. **الطرق**: أُجريت دراسة مقطعية من مارس 2017 إلى مايو 2018. تم تطبيق تقنية العينة العشوائية متعددة المراحل لاختيار 198 طالباً في المدارس الأساسية. تم جمع البيانات حول الخصائص الديموغرافية للطلاب ووالديهم والقياسات الجسمانية للطلاب باستخدام استبيان منظم كحوار وجهًا لوجه. تم تحليل البيانات باستخدام برنامج SPSS. اعتبرت القيمة الإحصائية ذات دلالة عندما تكون قيمة $P < 0.05$. **النتائج**: كان متوسط العمر + الانحراف المعياري للطلاب 10.96 + 2.59 سنة بنسبة (50.5% للذكور مقابل 49.5% للإناث). من بين 198 طفلاً في المدارس الأساسية، كان حوالي 26.3% منهم يعانون من نقص الوزن، 15.7% كانوا في وزن صحي، 3.5% يعانون من زيادة الوزن و2.5% يعانون من السمنة بناءً على معيار مرجعي لنمو CDC. أظهرت التوزيعات القائمة على طول الأطفال بالنسبة للعمر أن الغالبية منهم كانوا يعانون من التقزم بنسبة 53.5%. كان هناك فرق ذو دلالة إحصائية قوية بين الحالة التغذوية للأطفال وجنسهم، تعليم الأم والأب، وترتيب الولادة. **الاستنتاجات**: كان الشكل الأكثر شيوعًا لسوء التغذية بين أطفال المدارس الأساسية في مدينة صنعاء هو نقص الوزن بنسبة (26.3%). كانت الجنس، تعليم الأم والأب، وترتيب الولادة من العوامل الرئيسية التي تسهم في سوء التغذية لدى الأطفال. يجب تطبيق التوعية التغذوية على المجتمع.