Reasons Behind Malnutrition in Elementary School Girls in Dammam

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Abstract:
During the past two decades we have ben witnessing a major problem threatened our children health, which is malnutrition in its two type. Because this age grope is critical we choose to search about the reasons behind malnutrition and identify the most important factor.

Key Words:
Malnutrition_Obesity_Underweight_Overweight_Weight loss_Dammam_ nutritional risk_food intake_children_pediatrics_ nutritional assessment_nutrition screening_malnutrition screening

Introduction

In recent years, most physicians and nutritionists are trying to do as much efforts as they can to find out the reasons behind malnutrition in the pediatric population to stop the acute clinical disease which affects the children's ability to live normally physically and mentally as the way they deserve.
Malnutrition is defined as "A term used to refer to any condition in which the body does not receive enough nutrients for proper function. Malnutrition may range from mild to severe and life threatening. It can be a result of starvation, in which a person has an inadequate intake of calories, or it may be related to a deficiency of one particular nutrient (for example, vitamin C deficiency). Malnutrition can also occur because a person cannot properly digest or absorb nutrients from the food they consume, as may occur with certain medical conditions. Malnutrition remains a significant global problem, especially in developing countries" such as the Middle East countries (1)

Therefore, when essential minerals, vitamins, proteins or fatty acids are not available in the child's diet; he/she might have any of these diseases for e.g. iron deficiency anemia (IDA), (Scurvy) from vitamin C deficiency, (xerophthalmia, blindness) from vita- min A deficiency, Thyroid abnormalities (goiter and cretinism) from iodine deficiency, thiamin or vitamin B1 deficiency will cause (beriberi) and vitamin B3 deficiency will cause niacin (pellagra).

WFP defines malnutrition as "a state in which the physical function of an individual is impaired to the point where he or she can no longer maintain adequate bodily performance process such as growth, pregnancy, lactation, physical work and resisting and recovering from disease." (2)

Objectives:

The aim of this study is to recognize the nutritional states of elementary school children in Dammam, and to identify the association between malnourished child with the following factors: daily activity, socioeconomic state, chronic illness and food habits.

Methodology:

Cross sectional study was conducted at the first elementary school at nabiah for girls at Dammam Saudi Arabia. Measuring height and Wight by calculating BMI and questionnaire filling by their parents.

$$\text{BMI} = \frac{weight\ (kg)}{height\ (m^2)}$$

Collected data: 200 school girls in the 2nd and sixth grade. Only malnourished girls were considered.

4-Literature review

[1] Childhood Overweight, Obesity, and the Metabolic Syndrome in Developing Countries:

This study examined the prevalence of overweight/obesity between school children and preschoolers in developing countries. Considering the big differences between the Middle Eastern countries and others especially in the sociocultural contexts; there is huge differences in childhood overweight/obesity across countries.

As a result of this research, they found out that most overweight and obese children being concentrated in urban areas like in developing countries such as the Middle Eastern countries, in these regions they still believe that childhood obesity is a sign of healthiness and high social class. There is also rapid progress of urbanization associated with demographic trends that lead to “lifestyle syndrome” or the “New World syndrome.” Which is unhealthy lifestyles and it is the most important etiology for the very high rates of obesity and its consequent morbidity and mortality in developing nations. (3)

[2] The effect of chronic childhood malnutrition on pubertal growth and development.

This research focused on the effect of malnutrition in childhood on the pubertal growth and development. They compared Measurements of height, weight, upper arm circumference, and triceps skinfolds; as a result, their study showed high differences between the two study groups just before the onset of sexual maturation. There was a delay in early stages of sexual maturity seen in 3 years in malnourished boys with a 2.1-years lag in the age of onset of menarche in rural girls. (4)

[3] Prevalence Of Malnutrition In Saudi Children: A Community Based Study

The aim of this research was to establish the national prevalence of nutritional indicators (underweight, wasting and stunting) in children in Saudi Arabia. The sample was pediatric population from 5 years old and younger. The result was compared to data from other countries; there are higher prevalence rates than other countries with less economic resources, therefore, more efforts must be done to improve the nutritional status of the children in Saudi Arabia. (5)

[4] Effects of Fast-Food Consumption on Energy Intake and Diet Quality Among Children in a National Household Survey

The purpose of this study to examine the effects of fast-food consumption on any nutrition or health-related outcome and to confirm that fast-food consumption is a high risk for obesity.

The method of this study was a survey that included 6212 children and adolescents 4 to 19 years old in the United States.

The result was most children who are consuming Fast food in the United States are in a great risk for having adverse effect from dietary pattern and obesity. (6)

[5] Malnutrition, Cell-mediated Immune Deficiency, and Diarrhea: a Community-based Longitudinal Study in Rural Bangladeshi Children

A community-based longitudinal study was conducted in a rural area of Bangladesh, The reason behind this study was to examine the associations among malnutrition, cell-mediated immune deficiency and the incidence of diarrhea in children under age 5 years. Then for 1 year, a cohort study of 705 children was followed and cell-mediated immune status was assessed by a multiple antigen skin test at baseline and every 3 months.

The result proved that malnutrition and cell-mediated immune deficiency were important risk factors for the occurrence of diarrhea in children in (Matlab) a rural area in Bangladesh. (7)

[6] Simple pediatric nutritional risk score to identify children at risk of malnutrition

The aim of this study was to develop a simple routine screening tool of nutritional status to evaluate the pediatric nutritional risk score to be used for children who are admitted in the hospital in which, it will help to identify patients at risk of acute malnutrition during hospitalization.

The population sample was 296 children. Anthropometric measurements, food intake, ability to eat and retain food, medical condition, and symptoms interfering with feeding (pain, dyspnea, and depression) were evaluated within 48 h of admission.

Results: “Weight loss during hospitalization occurred in 65% of the children and was >2% of admission weight in 45% of patients. Multivariate analysis indicated that food intake <50%, pain, and grade 2 and 3 pathologic conditions (P = 0.0001 for all) were associated with weight losses of >2%. The nutritional risk score ranged from 0 to 5 and was calculated by adding the values for the significant risk factors as follows: 1 for food intake <50%, 1 for pain, 1 for grade 2 pathologic condition, and 3 for grade 3 pathologic condition. A score of 1 or 2 indicated moderate risk and a score ≥3 indicated high risk of malnutrition. This simple score is suitable for routine use to identify patients at risk of malnutrition during hospitalization. Implementation may prevent hospital-acquired malnutrition.” (8)

Results:

It is found that 43.5 % of second grade girls and 21.5 % of sixth grade girls are malnourished, 8.5% of the sixth grade girls and, 3% of 2nd grade girls were obese. We found that 40.5% of second grade girls and 13% of sixth grade girls were under weight. Also we found that 42.5% sometimes have breakfast at home before going to school. 58.1 % always have their breakfast at school .80% always have lunch at home .51.7% eat 3 meals per day. 54% they don’t eat vegetables everyday. 37.7% drinks at least 1 can of soft drinks daily .51.2 % they eat while watching TV. 57.8% they don’t practice exercises. 11.9% they have chronic medical illness like: sickle cell anemia, thalassemia and bronchial asthma. More than 50% were Lowe in socioeconomic states. 36.4%sleep about 8houres at night ,15.7% sleep less than 8 hours at night.

Discussion :

This study show the majority of student sleep 8 hours at night witch is the idol sleeping hours in other study about (*Associations between Sleep Loss and Increased Risk of Obesity and Diabetes)* they found that reduction in sleep is the majority. Reduce sleep duration may increase the risk of weight gain and obesity via decrease the liptin and increase ghrelin. Which is differ from our study. It may due to exercise habits which is the majority is for girls who doesn't do regular exercise or it may due to type of food.

This study shows that the majority of the students they had their breakfast twice at home and school. About one fourth sometimes skip their breakfast. All of the students eat lunch, and tenth of them sometimes skip the lunch meals. According to the study was carried out among school going urban adolescents in the sample of 1440 student (Dietary pattern of school going adolescents in urban Baroda, India), nearly 60% of adolescents had their breakfast daily. The result is similar to the study that the majority had breakfast regularly.

This study shows that about the half of the students they were eating while using electronic device or watching TV. According to the study done in united states in children 9 to 12 years old (Television watching increases motivated responding for food and energy intake in children) the continuous television group spent more time eating and consumed more energy than the no television and the repeated segment groups. The result is similar to the study that the majority of children who do have their meals and/or their snacks while using electronic device or watching TV. This has very bad impacts in their health and lifestyle in general.

In this study most of students they don't eat fruits and vegetables daily. While, many of the students was eating fast food frequently. In the study of malnutrition of elementary students between 7 to 12 years in south khorasan represent that high percent of malnourished child eating fruits and vegetables daily and eating fast food frequently. In other study in California on elementary school represent most of malnourished students was eating fast food daily and rarely eating vegetables and fruits. In comparison of these studies, eating fast food frequently has a very high effect in increase malnutrition prominently than the effect of fruits and vegetables in decrease malnutrition.

In this study, the majority of students are eating rice more than salad, chicken, vegetable, fruit or drinking juice. This one contributing cause of overweight among students. Therefore, they need to balance with other food contents. Similar to this, there was study done in USA about the effect of competitive foods in increasing risk of student obesity. It was conduct that foods like chips and cookies was contribute to risk of obesity among students.

In this study, it was found that the majority of students are eating three meals daily with family. In a study that was done by the national center at Columbia University over the last 10 years, it was conduct, the most children (6-11) years are eating three meals also which is healthy.

In this study, it was found that the majority of students are drinking on can of soft drinks daily. In a study that was done in United States, it was conduct, the prevalence of soft drink consumption among young ages 6 to 17 years increased 48%, from a prevalence of 37% in 1977/1978 to 56% in 1994/1998. Mean intake of soft drinks more than doubled, from 5 to 12 per day.

In this study it was found that the students tend to eat less food when they are angry. In their study which was done in 2002 by batsell in Kalamazoo College, They found when the child forced to eat some food he doesn't like in his childhood lifetime, he will refuse to eat it when he became an adult as well. Even though the two studies was done

in two different cultures, but in both study's there was found a close relationship between psychological state and eating habits

The study calculated the number of active girls according to their exercising days and found that one fourth of the girls exercised daily; one third of them exercised 3 times a week; the other one third exercised less than 3 times a week. According to prevalence and correlation of physical activity behaviors among elementary schoolchildren in multiethnic, low income, inner-city neighborhoods in Montreal, Canada, 33.3% of the girls participated in school sports teams; 74.7% of them participated in organized sports outside school. On another study of sociocultural determinants of physical activity among children, showed that specific multivariate findings included higher levels of television viewing and vigorous exercise among children from single parent home; less habitual activity among girls; higher sports team participation among older yet physically immature children.

The study revealed that more than half of the malnourished girls had their fathers in low socioeconomic status. According to height, weight an menarche in Swedish urban school children in relation to socioeconomics and regional factors, claims there's no significant difference between socioeconomic strata defined by father's occupation and family income were found either for height and weight or for ages at peak height velocity, peak weigh velocity and menarche. Girls in the lowest social group (III)had more weight for height during puberty than had girls in social groups (I) and (II). On another study, elementary girls nutrition in relation to father occupation, showed that the prevalence of overweight girls is 22.03%; higher odds ratio for overweight was observed in children whose fathers had only an elementary or middle school education than those whose fathers had a high school or college education; children whose fathers' occupation were service workers or shopkeepers or had no occupation had a greater risk of overweight than those whose fathers were professionals or office workers.

In this study the majority of malnourished students were living with their families. In other study of different age groups ranging from 6 to 11 years drawn from different schools of Patna, it was found that one third of students were living with their families. While, more than one third slightly weren't living with their families. In comparison it was found that there is no effect of type of family on the nutritional status of students. Therefore, this is in contradiction to the general belief that students without families are less cared or not cared for their nutrition as compared to the students with their families.

According to this study it was found that the majority of the malnourished girls don't have chronic diseases. According to the study that was done among children in public primary schools in Dagoretti, Nairobi, Kenya, conducted from June to December 2012, they found that "the presence of a disease can result in reduced bioavailability, increased needs, nutrient losses or loss of appetite and can thus be an immediate cause of malnutrition. And this variation between the two studies could be due to the differences in eating habits.

Conclusion:

As a conclusion of our study, it is clear that more than half of the sample population is malnourished due to unhealthy dietary habits, mostly they are obese due to fast food consumption at school and carbohydrates rich food at home for lunch, dinner and while watching T.V shows or playing.

Unfortunately, most of the elementary school girls were not interested in eating healthy diet such as fruits and vegetables! Also, their daily meals are not well balanced for daily nutritional body requirements for appropriate health and growth.
As a result of all of that, they don't have the desirable energy to do exercises and they might end up with low immunity for diseases.

Recommendations:
We advise both children and their parents to try to follow healthy balanced diet of proteins, carbohydrates, fibers, dairy products and the required nutrients in their daily meals. Our recommendations summarized in these points:

1. Always eat breakfast before going to school and don't start the day with simple sugars such as (candies or processed juice); to keep the energy level steady eat complex carbs which contain vitamins, minerals and antioxidants; such as oatmeal, whole-grain breads, corn flakes, beans, peas and lentils and if needed, eat small healthy snacks at school such as (oatmeal bar, yogurt, cheese with vegetables sandwich, fruits and salads).

2. Lunch in our culture is always eaten at home not at school, so it is the parent's responsibility to focus on the dietary behavior because eating healthy food helps children concentrate and learn. Families should try to reduce the carbohydrates in the lunch meal, because most of the tradition dishes contain large amounts of rice with pieces of protein ending up with less fibers and salads.

3. Try to eat dinner at least 3 hours before going to bed and it should be not heavy meal. Try to make I as simple as possible to be digested fast and for better sleep.

4. Parents are advised to keep their children from consuming soft drinks and junk foods such as fast food, candies, chocolates, potato chips, because it only contain high calories without any nutritional value.

5. The required amount of sleep must be at least 8 hours a day for better growth and learning abilities.

6. Exercising must be included in daily life routine and there are a lot of simple workouts for children to be followed every day.

7. Parents should teach their children to express their anger in right way instead of eating less or more.

8. Pediatrics with chronic diseases such as anemia "which is the commonest illness in our region", they should be under supervision for appropriate diet which suits their condition. Their meals should include food that is beneficial to their children's immune system state.

References:

(1) Book: Oscar Zaldaña Paredes "**Obesity Public Enemy #1 or Death**" page (80) Malnutrition (242). 2011 – printed in USA.

(2) Website: World Food Programme **"Publications A Manual: Measuring and Interpreting Malnutrition and Mortality" 2005.** http://www.wfp.org [ONLINE] Available at: http://www.unhcr.org/45f6abc92.pdf

(3) Website: Roya Kelishadi *Epidemiologic Reviews*, Volume 29, Issue 1, 1 January 2007, Pages 62–76, **Published:** 03 May 2007 https://doi.org/10.1093/epirev/mxm003

(4) Website: H E Kulin, N Bwibo, D Mutie, and S J Santner. The American Society for Clinical Nutrition "**The effect of chronic childhood malnutrition on pubertal growth and development.**" http://ajcn.nutrition.org/content/36/3/527.short

(5) Website: El Mouzan et al. **"Prevalence of malnutrition in Saudi children: a community-based study".** Ann Saudi Med 2010 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2941251/

(6) Website: Shanthy A. Bowman, Steven L. Gortmaker, Cara B. Ebbeling, Mark A. Pereira, David S. Ludwig. January 2004, VOLUME 113 / ISSUE 1 "**American Academy of Pediatrics**" http://pediatrics.aappublications.org/content/113/1/112

(7) Website: Abdullah H. Baqui et al. *American Journal of Epidemiology*, Volume 137, Issue 3, 1 February 1993, Pages 355–365, https://doi.org/10.1093/oxfordjournals.aje.a116682

(8) Isabelle Sermet-Gaudelus et al. "**Simple pediatric nutritional risk score to identify children at risk of malnutrition**" Accepted December 9, 1999 **The American Journal of Clinical Nutrition.** http://ajcn.nutrition.org/content/72/1/64.full