ASSESSMENT OF NUTRITIONAL STATUS FOR PRESCHOOL CHILDREN REFUGEE IN EGYPT

S. S. Ragab[1], Nehad R. El-Tahan[1] and Margret G. Sadek[2]

[1] Nutrition & Food Science Dept., Home Economics Faculty, Menoufia University, Cairo, Egypt.
[2] Refugee Egypt, Zamalic

ABSTRACT: *Nutritional assessment could considers as a valuable tool for detecting growth abnormalities at early age of children and therefore help in designing the proper intervention programs for keeping health wellness. This study aimed to evaluate the nutritional status of 100 pre-school refugee children from different nationalities (Sudan, Eritrea, Ethiopia, Syria, Iraq and Ivory Coast) homed in Egypt. Children were divided into 2 groups which are healthy group and sick one. In this study, several factors that might influence the nutritional status and its related nutritional problems were assessed .Anthropometric measurements (weight, height, z score and body mass index "BMI"), food intake and some of laboratory investigation were evaluated. Obtained result showed that daily food intake of macronutrient and micronutrient over healthy group was higher than that of sick group according to Dietary Reference Intakes DRI. In sick group of examined children, 67% were generally healthy wasted, while 38% were suffered with growth stunting. No one was wasted or stunted in growth among the healthy group in addition to no current disease among them were observed. However, anemia, rickets and anemia with rickets there were detected in 26%, 12% and 62% of sick children group. The majority of sick group were African as 82% from Sudan,10% fromEritria,6% from Ethiopia and 2% from Ivory Coast. Eighty four percent of sick children had dark skin color, whereas healthy children were had fair skin with ratio 60% fair skin and 40% black skin. Rickets was most commonly in children with dark skins. Through laboratory investigations, it could be observed that decreasing in serum Ca (ionized), Ca (total), and phosphorus. Also, alkaline phosphatase was elevated among sick children with decreased haemoglobin and haematocrit levels. Whereas, most of laboratory tests of healthy children were within normal values. Daily food intake of vitamin D in sick children was very low (3.8% of DRI). In addition to their dark skin which acts as like a barrier to receive useful substance from sun light, they had no exposure to sun light well because most of them lived under ground. From the previous results, it could be concluded that increase awareness and educational status for parents must be taken into consideration of refugee supervisor. Encourage families of sick children to use family planning method for birth control as well as change certain of bad nutritional behavior like drinking of tea immediately after meals. Expose children to sunlight for enough time. Introduce of balanced diet and fortified food for these children category could involve strongly in improvement of sick children health status.*

Key words: *Nutritional assessment, Pre-school age, Refugee, food intake, anthropometric measurement.*

INTRODUCTION

Children in a structured daycare setting will reflect their health status. Children who have proper nutritional status are generally in better health and have a decreased risk for developing disease in the future. A nutritional assessment can detect any abnormal ranges at an early age by a complete assessment of nutritional status includes the collection of anthropometric data. This includes length or standing height, weight, and weight for length or BMI, all of which are plotted as percentiles on the Centers for Disease Control (CDC) growth charts. Other measurements that are less commonly used but that provide estimates of body composition include upper arm circumference and triceps or sub scapular fat folds (Story *et al.*, 2000).

Suggested intake proportions of energy are 45% to 65% as carbohydrates, 30% to 40% as fat, and 5% to 20% as protein for 1 to 3 year olds, with carbohydrates the same for 4 to 18 year olds, 25% to 35% as fat, and 10% to 30% as protein (Institute of Medicine, 2002).

Iron, one of the most abundant metals on Earth, is essential to most life forms and to normal human physiology. Iron is an integral part of many proteins and enzymes that maintain good health. In humans, iron is an essential component of proteins involved in oxygen transport. It is also essential for the regulation of cell growth (IMFNB, 2001)

Calcium is required for vascular contraction and vasodilatation, muscle function, nerve transmission, intracellular signaling and hormonal secretion, though less than 1% of total body calcium is needed to support these critical metabolic functions (Bailey *et al.*,2010).

Ascorbic acid is a sugar acid with antioxidant properties. One form of ascorbic acid is commonly known as vitamin C. Ascorbic Acid is used as an antioxidant and pH adjuster in a large variety of cosmetic formulations, over 3/4 of which were hair dyes and colors at concentrations between 0.3% and 0.6% (Mukhtar*et al.*, 1995).

Vitamin D is a group of fat-soluble responsible for enhancing intestinal absorption of calcium, iron, magnesium, phosphate and zinc (Calvo*et al.*, 2004; Holick, 2006 and Norman, 2008).

Iron-deficiency anemia is a common anemia (low hemoglobin levels) caused by insufficient dietary intake and absorption of iron, and/or iron loss from bleeding. Iron deficiency causes approximately half of all anemia cases worldwide. (Ramakrishnan and Yip, 2002).

Rickets is a childhood condition caused by serious vitamin D deficiency. This lacking in vitamin D results in weak, soft bones, along with slowed growth and skeletal development. Rickets is a disorder which begins in childhood (John, 1974 and Baroncelli*et al.*, 2000).

Vitamin D deficiency (rickets) still can occur, particularly when an infant is solely breastfed, is dark skinned, or has limited sunlight exposure. Dark-skinned persons require more sunlight exposure than others to produce the same amount of vitamin D because melanin acts as a neutral filter and absorbs solar radiation (Kreiter*et al.*, 2000).

MATERIALS AND METHODS:
Sample:
This study included a total of 100 preschool child of refugee in Egypt from Sudan, Eretria, Ethiopia, Syria, and co-devoir. They were between the ages of 3-5 years. These were divided into two groups: Normal children and abnormal children.

Period of the study:
This study was conducted in November month of 2012 and ended in September 2014.

Methods:
1-Assessment of Nutrient intake:
Food intake was recorded on four consecutive days. Energy and nutrients intake were calculated by using a computer program based on the food composition table (FIAS, 1996) of the National Institutes of Nutrition. Results were compared with the Recommended Dietary Allowance and Recommended Daily Intake (1989). In addition, a questionnaire for children's mothers was used to collect data about some dietary habits for their children.

A-The questionnaires:
Three forms of questionnaires were used: The first one was for social data it includes educational level. The second one for health history and measurements. It includes height and weight. The third one for the food habits it includes. Food likes, dislikes, all the characteristics related to the children meals, and the possible suggestion of the target for improvements meals served.

B-Socio-economic:
The socio-economic data include education level, total income sources food

were collected by questionnaire through an interview.

C- Health History:

Including current health complaints, and disease, besides parasites infections were collected.

D- Food Habits:

Including, method of meals cooking, number of daily meals, snacks, salt, sugar preference and source of nutritional information.

2-Anthropometric Measurements:

Height, body weight were measured while subjects wore light clothing and no shoes. Body mass index (BMI) was calculated as Body Weight (Kg)/ Height (m)^2. Measurement of Body Mass Index (BM1) and Z-Score were done three times (Passmore and Eastwood, 1986).

3- Laboratory investigation:

Serum ALP was determined according to Roy, 1970. Hemoglobin was determined according to Drabkin, (1949). Hematocrit was measured using a heparinized tube

according to Mcinory procedure (Mc-Inory , 1954) and White blood cells and Red blood cells were determined according to Van Kampen (1961). Serum calcium and phosphorus assessed by atomic absorption spectrophotometry (Fraser *et al.,* 1986).

4- Statistical analysis:

Statistical analysis was conducted using the SPSS package. Pearson's correlation coefficients were calculated between intake of nutrients and dietary variables and various health indices, such as anthropometric and blood chemical analysis data. Two –side P-values < 0.05 were considered significant (Snedecor and Cochran, 1972).

RESULTS
1- Main characteristic of samples

The results of Table (1) showed the characteristics of the study sample. It could be found that Syria and Iraq was free from sick children, Ivory Coast was free from healthy children. For the healthy children in Syria and Iraq, it was found that about (24 and 8%) respectively. The sick child of Ivory Coast was 2% from total tested sample.

Table (1): Frequency and percent of nationality, Skin color, father size and mother size of the sick and healthy groups.

Variable		Healthy group		Sick group	
		Frequency	percent	Frequency	percent
Nationality	sud	24	48%	41	82%
	Erit	5	1%	5	10%
	Ethio	5	10%	3	6%
	syr	12	24%	0	0%
	Iraq	4	8%	0	0%
	Ivory Coast	0	0%	1	2%
Skin color	black	20	40%	42	84%
	white	30	60%	8	16%
Father size	normal	33	66%	22	44%
	obese	12	24%	4	8%
	thin	5	10%	24	48%
Mother Size	normal	28	56%	24	48%
	obese	19	38%	8	16%
	thin	3	6%	18	36%

The black skins were (40 and 84%) of healthy and sick children respectively, whereas the healthy and sick children of white skin were (60 and 16 %) from total sample. Father size (normal, obese and thin) were (33, 12 and 5 from total sample) respectively from the healthy group, whereas father's size of sick children were (22, 4and 24 of) from total samples. While, mother size for the healthy children were 28 normal, 19 obese and 3 thin sizes however, sick children's mother were 24 normal size, 8 obese size and 18 thin size.

Data in Tables (2 and 3) recorded that the highest percentage for father and mother education was illiterate fathers for sick children and secondary school followed by fathers graduated from college for healthy children.

The highest percentages for the father's job were 78 and 94% worker fathers of the healthy and sick group respectively of the study sample. While, for the mother's job was 98% HW of the healthy and sick groups.

Also, It could be observed about (62 and 94%) of both healthy and sick children respectively didn't use any transportation way. Through whole sample found that no one was played any kind of sport. There was highly statistics significant difference between two groups (P< 0.001).The mean value of father income was (1556 and 1004 EL) of the healthy and sick group respectively. Mother's healthy children hadn't any source of income. The mean value of other income was (831 and 518EL) of healthy and sick group respectively with no statistics significant difference between two groups. Sick group included in big family, they consist of about 7 member while healthy group had ideal family size about 4 member with highly statistics significant (P< 0.001). There was no statistics significant difference between two groups for their age. There was highly statistics significant

difference between two groups (P< 0.001) for hours sleeping.

Finally, watching television hours was largely identical of both groups with mean value (3.4 and 4.2 h.) of healthy and sick group respectively.

From the obtained data in Table (4), it could be observed that past history of disease for the healthy group (anemia, asthma, and parasites) were (4, 3and 7 child) respectively and 32 child were free from any disease, also the children hadn't urinary tract infection in the past. For past history of disease among the sick group, it could be found that seven children had anemia, two had asthma, eighteen had parasites, seven had urinary tract infection and sixteen children free from any disease. With regard to present history of disease, it found whole healthy group free from diseases, whereas 26% of sick group had anemia, 12% had anemia plus rickets. 88 and 42% were of healthy and sick group respectively had good appetite whereas (12 and 58%) had bad appetite. As for chewing, it could be observed that the thirty four children chewed the food well and 16 children had bad chewing among the healthy children.

For Table (5), it could be observed that all children's mother washed fruits and vegetables before provided it to their children, but 28% of children which belonging to the sick group they let their children eating fruit and vegetables without wash. Wash hands before meals, it found that 45 children were washing their hand before meals that represent 90% of the healthy group but, in the other group, it was 48% of the sick group children were washed their hands before meals .As for exposure to sunlight it could be observed that (94 and 26%) of healthy and sick group respectively exposed to sunlight, whereas (6and 74%) they didn't exposed to sunlight.

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Table (2): Frequency and percent education level of father, education level of mother, father job, mother job, go to nursery, Transportation, sex and play sport of sick and healthy groups.

Variable		Healthy group		Sick group	
		Frequency	percent	Frequency	percent
Education level of father	college	18	36%	3	6%
	secondary	21	42%	3	6%
	preparatory	5	10%	3	6%
	primary	3	6%	6	12%
	read &write	2	4%	3	6%
	illiterate	1	2%	32	64%
Education level of mother	college	8	16%	0	0%
	secondary	17	34%	11	22%
	preparatory	6	12%	2	4%
	primary	6	12%	9	18%
	read &write	5	10%	9	18%
	illiterate	8	16%	19	38%
Father job	Engineer	0	0%	1	2%
	free works	9	18%	1	2%
	lost	1	2%	1	2%
	worker	39	78%	47	94%
	employee	1	2%	0	0%
Mother job	HW	49	98%	49	98%
	worker	1	2%	1	2%
Go tonursery	yes	19	38%	3	6%
	no	31	62%	47	94%
Transportation	no	31	62%	47	94%
	on foot	18	36%	2	4%
	public	1	2%	1	2%
Sex	male	29	58%	32	64%
	female	21	42%	18	36%
Playsport	no	50	100%	50	100%

Table (3): Mean and stander deviation of father income, mother income, other income, total income, pocket money, family member, room number, floor number, age, order of child, sleeping hour, watching TV hours of sick and healthy groups.

Variable	Healthy group Mean±SD	Sick group Mean±SD	T-test
Father income	1556±44.3	1004±37.7	7.008[***]
Mother income	0	11±77.8	1
Other income	831±14.5	518±10.5	1.85
Total income	2387±13	1533±34.2	4.38[***]
Pocket money	38.6±20.2	14±7.4	8.08[***]
Family member	5	7	7.49[***]
Room number	2	2	1.72
Floor number	4	0	7.425[***]
Age	35	33	1.434
Order of Child	2	4	6.172[***]
Sleeping hrs	12±1.8	10.4±1.3	5.207[***]
TV hours	3.4±1.1	4.2±1.7	2.522

[***] Significant p<0.001

Table (4): Frequency and percent of disease before, disease now, appetite, and chewing of sick and healthy groups.

Variable		Healthy group		Sick group	
		Frequency	percent	Frequency	percent
Disease before	anemia	4	8%	7	14%
	asthma	3	6%	2	4%
	no	32	64%	16	32%
	parasites	7	14%	18	36%
	UTI	0	% 0	7	14%
	gastroenteritis	4	8%	0	0%
Disease now	anemia	0	0%	13	26%
	anemia-rickets	0	0%	6	12%
	rickets	0	0%	31	62%
	no	50	100%	0	0%
Appetite	yes	44	88%	21	42%
	no	6	12%	29	58%
Chewing	yes	34	68%	23	46%
	no	16	32%	27	54%

Table (5):Frequency and percent for behaviors of sample.

Variable		Healthy group		Sick group	
		Frequency	Percent	Frequency	Percent
Wash hands	yes	45	90%	24	48%
	no	5	10%	26	52%
Wash fruit and vegetables	yes	50	100%	36	72%
	no	0	0%	14	28%
Exposure to sun	yes	47	94%	13	26%
	no	3	6%	37	74%
Eating during TV watch	yes	32	64%	46	92%
	no	18	36%	4	8%
Cooking way	mesabek	46	92%	49	98%
	grill	4	8%	1	2%
Water	yes	41	82%	28	56%
	no	9	18%	22	44%
Snacks	carbonate	11	22%	17	34%
	juice	26	52%	4	8%
	other	3	6%	4	8%
	tea	10	20%	50	50%
Pickles	yes	9	18%	19	38%
	no	41	82%	31	62%

Most of two groups preferred mesabek's cooking way, as A small percentage of both groups made their food grilled. 82 and 56% of the healthy and sick children respectively were drinking enough water, whereas (18 and 44%) of the healthy and sick children respectively were drinking a little water. In connection with taken snacks (carbonate, juice, other and tea) were (11, 26, 3 and 10) children respectively from the healthy group, whereas taken snacks of the sick children were (carbonate, juice, other and tea) were (17, 4, 4 and 50) children. As for pickles it could be observed that 9 children from healthy group and 19 children from sick group were eaten food with pickles as 41 children from healthy group and 31 children from sick group were eaten food without pickles.

Table (6) hemoglobin and haematocrit for the healthy children were higher than the sick children with mean value (11.75 and 10.33)for the healthy and sick group respectively, (P< 0.001), whereas white blood cells in the healthy children were lower than the sick children with mean value (5.11 and 6.89), (P< 0.001).

As well mean value of ca++ ionized, ca total, serum phosphorus higher than mean value of the sick group.

The mean value of alkaline phosphatase for the healthy children was 455.96 whereas the sick group was 1000.34 which were higher than the healthy group.

Table (6): Mean and stander deviation of hemoglobin, haematocrit, white blood cells, red blood cells, ca++ ionized, ca total, alkaline phosphatase and Serum phosphorus.

Variable	Healthy group Mean±SD	Sick group Mean±SD	Normal value	T-test
HB	11.75±.3.40	10.33±1.16	11.5-15.5	8.33***
haematocrit	35.34±.8.2	31.01±3.47	35-45	8.56***
WBC	5.11±0.93	6.89±2.00	4.3-13.5	5.58***
RBC	4.68±0.21	4.47±2.1	4-5.2	3.48**
Ca^{++}ionized	4.87±0.15	3.55±1.04	4.6-5.3	8.74***
Catotal	9.65±0.45	8.17±0.91	8.7-10.7	10.13***
Alkaline phosphatase	455.96±77.31	1000.34±42.48	Up to 800	8.94***
Serum phosphorus	5.09±0.52	4.01±0.43	7	10.08***

From data in Table (7), It could be noticed that the mean value of weight for the healthy children was significantly higher than the sick children (14.2 Vs 10.6), and when compared with the standard, the healthy children satisfied 88.75% and the sick children satisfied 66.3% with highly significant level. As for height, it could be observed that the healthy children height was 95.2 % of DRI but sick children height was 91.3% of DRI. Body mass index the mean value was (15.6 and 12.8) for normal and obese females respectively. There are found a difference significant (P< 0.001).

From Table (8) it could be noticed that calories intake by healthy children were higher than recommended dietary allowances (DRA) 105% of DRI and calories intake by sick children were less than DRI which were 65.7% of RDA(RDA, 1989).

The percentage of protein intake was very high for healthy children but for sick children total protein, animal protein, plant protein was (77.48%, 14.8, and 197.6%) of recommended allowance. For fat intake, there were significant differences between healthy and sick children (P< 0.001). Carbohydrate, water and fiber intake of healthy and sick children were nearly similar. The mean value of cholesterol was (184.8 and 42.4) for healthy and sick children respectively (P< 0.001). In healthy children ash content, the mean value was 5.26 in healthy diet but it was 5.11 in sick children diet (P< 0.001).

Table (7): Mean and stander deviation of weight, height and body mass index.

Variable	Healthy group Mean±SD	DRI% Healthy	Sick group Mean±SD	DRI% sick	DRI	T-test
Weight	14.2±2.53	88.75%	10.6±1.99	66.3%	16kg	7.87***
Height	95.2±7.48	95.2%	91.3±7.81	91.3%	100cm	5.53*
BMI	15.6±1.32	-	12.8±2.33	-	-	7.32***

*** Significant p<0.001   * Significant p<0.01

Table (8): Mean and stander deviation of water, energy, protein, fat, carbohydrate, fiber, ash, and cholesterol.

Nutrients		Healthy Group	DRI% healthy	Sick Group	DRI% sick	DRI	t-test
water		1334.60±79.47	88.9%	1202.32±72.18	80.1%	1500	8.713***
Energy (k.cal)		1052.70±302.43	105.2%	657.36±130.37	65.7%	1000	8.488***
Protein (g/dl)	Animal protein (%)	35.61±11.41	214.5%	2.47±3.41	14.8%	16.6	19.687***
	Plant protein (%)	14.30±6.05	170.2%	16.60±4.21	197.6%	8.4	2.212*
	Total protein	49.90±12.11	199.6%	19.37±5.12	77.48%	25	16.425***
Fat (g/d)	Animal fat (%)	19.80±11.38	178.3%	3.67±3.18	33%	11.1	9.655***
	Plant fat (%)	23.46±12.10	105.7%	12.26±2.92	55.2%	22.2	6.359***
	Total fat	43.29±14.60	130%	15.92±3.97	47.8%	33.3	12.789***
Carbohydrate (g/dl)		112.75±49.13	75.2%	109.39±23.88	72.9%	150	.435
Fiber (g/d)		5.87±3.92	26.7%	6.77±3.05	30.7%	22	1.284
Ash		5.26±1.63		3.11±1.89			6.111***
Cholesterol (mg/d)		184.8±78.7		42.4±35.2			11.675***

*** Significant p<0.001   * Significant p<0.01

Discussion

Through research in the cases of refugee children to assess their nutritional status it could be found that half of the studied sample had medical and nutritional problems and the other half were healthy free from current diseases or nutritional problems. As shown in Table (1), which was talking about nationality, skin color, father size and mother size of the sick and healthy groups found that, the majority of sick group were African: 82% from Sudan, 18% from other African country as Eritrea Ethiopia and Côte d'Ivoire,84% of the sick children had a dark skin color, whereas the healthy children were African and Asian, 48% Sudanese, 24% Syrian, 28% had other nationality as Iraqi, Eritreans and Ethiopian children, most of them had fair skin with ratio 60% fair skin and 40% black skin. Rickets is more common in children with darker skins; African children need to spend longer in the sun than children with fair skin to get the same amount of vitamin D Winzenberg and Jones, 2013 who found that big number of children had rickets among sick group which were the ratio of black skin 84%of this group. As shown in Table (1) for father and mother size, obese and normal size for both father and mother among healthy children were higher than sick children but the opposite for thin size. In Table (2) better-educated parents are more likely to understand disease-prevention measures such as vaccines and mosquito nets, and to use them. They are more likely to take a sick child to a clinic early and to follow treatment instructions. They are more likely to understand germ theory and sanitation and it was found that 78% of healthy children's fathers, 62% of healthy children's mothers had college and secondary certificates respectively although about 70% of the sick children's parents were illiterate, or they could read and write, but had no certificate so education had positive effect on nutritional and health status for children. These results are similar to the results study done by Abuya et al, 2011 on 5156 children in Nairobi which studied effect of mother's education on a child's nutritional status in the slums of Nairobi. As shown in Tables (2, 3) which were talking about fathers, mothers

jobs, and income it could be found that there was differences in education level but job opportunities are similar between two groups in Egypt. They were working as a worker even if they had college certificate because they didn't equate university degree in addition the lack of job opportunities so 99% of mothers were housewives. There were significant differences between both income and these differences for the following reason.

Different daily wages for certain races of Africans, most of healthy children's parents had relatives living in developed country send money to them, rich Iraqi and Syrian families came with their money, more of the UN donations are directed to Syrians than Africans. The same result found by Simon *et al*, 2004 who said children from poorer households have poorer health.

The data was shown in Table (4) Comparison between the two groups, there is no current disease among healthy children whereas there were 26% of sick children had anemia 12% anemia plus rickets and 62% had rickets because of :

1-Total income of sick children's families was lower than healthy children's families.

2- 52% of sick children didn't wash fruit, vegetable and their hands before meals which resulted in lead poisoning and anemia, similar result said that Low-income children are routinely screened for anemia and elevated blood lead levels (Kersey *et al*, 2011). As shown in Tables (6,7 and 8) sick children's mothers gave their children tea immediately after meal which decreased iron absorption causing anemia which appear in means of HB and heamatocrit level of sick children which were 10.33 and 31.01 respectively compared with means of HB and heamatocrit level of healthy children which were 11.57 and 35.34 respectively. Daily intake of iron was 65% of DRI for sick children but was 98.8% for healthy children; most percentage of iron intakes of sick group was from plant source(That was easy to

impedes it's absorption other materials such as calcium)with ratio 182.7% of DRI whereas percentage of iron intakes of sick group was from animal source with ratio 5.6%, drinking tannin-containing beverages such as tea with meals may contribute to the pathogenesis of iron deficiency if the diet consists largely of vegetable foodstuffs (Disler *et al,* 1975). A large percentage which represented 36% of sick children were had past history of parasite which affect on hemoglobin concentration in their blood compared with small percentage which represented 14% of healthy children were had past history of parasite this result similar to study demonstrated that lower mean Hb levels were significantly associated with parasites infection among African school children (Koukounari *et al*, 2008). Previous study found that Phosphorus and calcium are used in the body to create calcium-phosphate, which is the main component of bone. However, the combination of too much phosphorus with too little calcium in the body can lead to a degeneration of bone mass. Research suggests a statistically significant inverse relationship between consumption of carbonated beverages and bone mineral density in young girls, which places them at increased risk of suffering fractures in the future (McGartland *et al*, 2003), 34% of sick children's snacks were carbonate and their calcium intake were 27.2% of DRI so this explain the big number of rickets among sick children. Elevate alkaline phosphatase result more than normal range among sick children, alkaline phosphatase mean of healthy children were 455.96 this result within normal rang whereas alkaline phosphatase mean of healthy children were 1000.34 which elevated above normal rang, also means of ca++ ionized and serum phosphorus were (3.55 and 4.01) respectively lower than normal rang because of daily intake of phosphorus and Ca were 74.4% and 27.2%

respectively of DRI for sick children, alkaline phosphatase, Ca++ionized and serum phosphorus are the most important tools that define and diagnose rickets.

Serum alkaline phosphatase activity, serum phosphorus, and serum Ca have traditionally been used to screen for metabolic bone disease. Elevated alkaline phosphatase and decreased serum phosphorus have been shown to correlate with increased risk of rickets (McGartland *et al*, 2003).In addition to the majority of sick children lived under ground and they didn't go to nursery which decreased the chance of exposed to sun light so a high percentage of this group had rickets because they were not exposed to sun light enough time. These results are similar to the results study done by Kumaravel, 2003.

Also, it could be noticed that calories intake by healthy children were105% higher than dietary recommended allowance but lower in sick children 65% of DRI, The percentages of protein intake of healthy children was 199.6% more than sick children which was 77.48% compared with DRI with highly significant differences (P< 0.001).

Conclusion:

From the obtained results, It could be concluded that anthropometric measurements and nutrients intakes of sick children were worst than the healthy children, the most common disease among sick group were rickets and anemia .The intake of protein, fat, carbohydrate, for sick children were less than healthy children. Finally, the attention must be paid to introduce balanced diet and fortified food for these children. Chang bad health behavior, expose sick to sunlight for enough time.

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تقييم الحالة التغذوية للأطفال اللاجئين ما قبل المدرسة في مصر

شريف صبري رجب[1] ، نهاد رشاد الطحان[1] ، مارجريت جرجس صادق[2]

[1] قسم التغذية وعلوم الأطعمة – كلية الأقتصاد المنزلى – جامعة المنوفية

[2] لاجئ مصر – الزمالك

الملخص العربى

تقييم الحاله الغذائيه يمكننا من اكتشاف اي نطاقات غير طبيعية في سن مبكر لذلك تم تقييم الحاله الغذائيه لمئه طفل لاجئ في سن ما قبل المدرسه وهم من جنسيات مختلفه (السودان، إريتريا ، إثيوبيا ، سوريا،كوت ديفوار) مقيمين في مصر وتم تقسيمهم الي مجموعتين مجموعه اطفال اصحاء ومجموعه اطفال مرضي لدراسة العوامل التي قد تؤثر على الحالة التغذوية و الكشف عن مشاكل التغذية التي تتعلق بمرحلة ما قبل المدرسة للاطفال اللاجئين . ، تم حساب المأخوذ من الغذاء واجراء الاختبارات المعمليه و القياسات الجسميه (الوزن ، الطول ، z scoure ، BMI) وأظهرت النتائج أن الاستهلاك اليومي من المغذيات الكبري و المغذيات الصغري لمجموعة الاطفال الاصحاء أعلى من مجموعة الاطفال المرضى وفقا لمقررات الماخوذ اليومي . ووجد بين الأطفال المرضى 67 % منهم يعانون من فقدان في الوزن و 38 % يعانون من قصر القامه . وعلي العكس تماما لا يوجد حاله واحدة بين مجموعة الاطفال الاصحاء يعانون من مثل هذة المشاكل بالإضافة إلى خلوهم من اي امراض خلال فترة الدراسه وبعد التقييم وجد بين الاطفال المرضي 26 % يعانون من فقر الدم و 12% فقر الدم بالإضافة إلى الكساح و 62 % يعانون من الكساح . وكانت الغالبية العظمى من المرضى من القاره الأفريقية: 82 % من السودان ، وكان 84 % من الأطفال المرضى لون بشرتهم داكن و16% ذو بشره فاتحة ، في حين ان معظم الأطفال الأصحاء ذو بشره فاتحه بنسبة 60 % للبشرة الفاتحة و البشرة الداكنه 40 % .

الكساح هو أكثر الامراض شيوعا في الأطفال ذوي البشرة الداكنة .وهذا كان واضحا من خلال نتائج التحاليل المعملية ,وجد انخفاض في الكالسيوم المتأينة و الكالسيوم الكلي والفوسفور في الدم، و أيضا ارتفاع الفوسفاتيز القلوي الذين يدلون علي الكساح بين الأطفال المرضى وايضا انخفاض في حديد الدم و مستويات haematocrite بين هذه المجموعة الذين يدلون علي وجود انيميا في حين أن معظم الاختبارات المعملية لمجموعة الاطفال الاصحاء كانت واقعه في نطاق القيم الطبيعيه . وكان المتحصل اليومي من فيتامين (د) للأطفال المرضى منخفضة جدا 3.8 % مقارنة بمقررات المأخوذ اليومي. بالإضافة إلى البشرة الداكنة التي تكون بمثابة حاجز لاستقبال الاشعه المفيدة من ضوء الشمس بالإضافة الي عدم التعرض لأشعة الشمس بشكل جيد لأن معظمهم يعيشون في بدرونات. من خلال هذه الدراسة يمكن أن نستخلص الاتي:

أن زيادة الوعي و مستوي التعليم للآباء والأمهات , تشجيع اسر الأطفال المرضى على استخدام وسائل تنظيم الأسرة لتحديد النسل , تغيير السلوك السيئ مثل شرب الشاي مباشرة بعد الوجبة , تعرض الاطفال للشمس فترة كافيه ,إدخال نظام غذائي متوازن و الأغذية المدعمة لهؤلاء الأطفال سوف يؤدي الي تحسين الحاله الصحيه لهؤلاء الاطفال المرضي .