Assessment of Nutritional Status of Children in Al Hilla City

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Abstract

The assessment of nutritional status of children is an essential part of monitoring health in developing countries. Early recognition of any nutritional problem is essential because community, family, teachers counseling and treatments intervention are more likely before malnutrition become worse. The present study was conducted to assess the nutritional status among children in the age group of 6-12 years also to evaluate influencing factors associated with nutritional status of the children. The study was a cross-sectional, included 211 children with ages ranging from 6-12 years randomly Household selection, Their height and weight were measured and body mass index (BMI) was calculated. The study group was classified as underweight, normal weigh, overweight and obese, using age- and sex-specific cut-off points for BMI for determined the nutritional state of the children. The nutritional status of 211 children (Boys 106 and girls 105) , 73 of them were underweight and100 were overweight and obese , the remaining were normal weight, there was a high prevalence of underweight in girls 66% than boys 34% and 73% of them report live with not enough family income and 70% of them had history of working mothers. 80% of obese group are inactive and 71% spent more time in watching television and time spent with computer, while full breast feeding report to be protect from childhood obesity with prevalence of 17%. This study found that sedentary life & Spending more time on television and Computer be considered as predisposing factor for childhood obesity while full breast in the first six months of life may be associated with reduced risk of obesity. There was also an association between underweight and girls resident in rural areas and working mothers.

Keywords: childhood obesity, body mass index

1. Introduction

Obesity is one of the most prevalent nutritional disease of children and adolescents in many developed and developing countries (WHO 1998).

The World Health Organization (WHO) has declared overweight as one of the top ten health risks in the world and one of the top five in developed nations (WHO 2000).

Existing WHO standards and data from 79 developing countries including a number of industrialized countries suggest that about 22 million children five years old are overweight worldwide(WHO 1998).

Once considered a problem of affluence, obesity is fast growing in many developing countries also(WHO 2000).

Under nutrition is also a major public health problem worldwide, particularly in developing countries(EOnis M, Monteiro C. *et al*. 1993).

The most common diagnosis of pediatric under nutrition in the USA is often termed failure to thrive and is estimated to have a prevalence of 5% to10% among young children. Psychosocial risk factors may develop as a result of medical problems or may be primary cause of under nutrition (Rober M. Kligman *et al.* 2006).

 Even of high prevalence of under nutrition in some developing countries , significant proportion of overweight and obese children now coexist with the under nourished.

Under nutrition impairs physical, mental and behavioraldevelopment of millions of children and is major cause of child death (World Development Report 1993).

Although definition of obesity and overweight has changed over time. ,it can be defined as an excess of Body Fat (Flegal KM *et al.* 2002).

 The anthropometric measurement refers to a comparative measurement of human body . the anthropometric measurement commonly used as indices growth & development. Typically, growth is evaluated by comparing individual measurements to reference standers, represented by percentile curves and a growth chart(Kuczmarski RJ *et al.* 2000, Timothy JC 2002).

Body mass index (BMI) is used to assess underweight , overweight . However , it is not a diagnostic tool, it should be used as guidance for further assessment. Children body fatness change as over the years as they grow .Also girls and boys differ in their body fatness as they mature. This is why BMI for children also referred to as BMI for age & gender specific charts contain a series of curved lines indicating a specific percentile(Pietrobelli A. 2004).

There is no consensus on a cutoff point for excess fatness of overweight or obesity in children and adolescents

The Center for Disease Control and Prevention defined overweight as at or above the 95th percentile of BMI for age and at risk for overweight. as between >85th to 95th percentile of BMI for age ,normal weight as between> 5th percentile to <85th percentile & underweight as BMI for age <5th percentile (Flegal KM *et al.* 2002, Himes JH *et al.* 1994).

BMI which seems appropriate for differentiating adults, BMI for age for boys and girls be useful in children because of their changing body shape as they progress through normal growth. In addition, BMI fails to distinguish between fat and fat-free mass (muscle and bone) and may exaggerate obesity in large muscular children(Flodmark CE I *et al.* 2004).

2. Patients and methods

A cross sectional randomized epidemiological study among (211) children in Hilla city , their aged 6-12 years.The current study conducted between February 2011 – July 2011 for assessment of nutritional status in children and factors affecting it .

any child with diseases like asthma or heart, kidney problem, endocrine causes of obesity, leukemia, or if they are on medication related to obesity like: Steroids (iatrogenic Cushing syndrome), Sodium valproate (epilepsy), Cyproheptadine (allergy), Antithyroid drugs&Insulin was excluded from the study.

At the time of the initiating the study the parents of each participant were informed about the study protocol, and gave the agreement to participate.

All participants completed questionnaire on their usual physical activity, habit of watching TV and time spent with computer and for hours of sleeping , history of feeding types in the first 6 months of life.

data were also collected in the form of working status of the parents.

resident, economic state of the family was taken from the mother and/or father of all participants.

2.1 Anthropometric measurement:

Assessment of obesity in children relies on plotting body mass index (BMI) ,in which a person's weight in kilograms divided by the square of their height in meters (kg/m2).

We have recorded body weight to the nearest 0.1 kg using a standard balance scale with subjects barefoot and wearing light indoor clothing. Frequent weighing, be recorded under similar conditions and at the same time of day as the original measurement. Body Height was measured to 0.1 cm with stadiometer, with Ankles at 90º Heels at board Knees straight , Shoes were removed and the child asked to stand with feet together and heels, buttocks and shoulder blades in contact with the vertical measure. &Average of 3 readings was taken. The mid arm circumference was not take as it only recommended for use with children between one and five years of age . Children with 95th Percentile of BMI were taken as cut-off point. Children with BMI more than this cut-off point with respect to age and sex were considered as obese, between 95% to 85% were considered overweight, 60-75% were consider normal weight children . Assessment of physical activity of children of the age of 6-12 years in a study groups was   undertaken. List of common physical activities performed by children was provided to each child. The activities were namely jogging, running, playing outdoor games (involve running), physical exercise and others like swimming, etc.

2.2 Statistical analysis :

Means (x), standard deviation (SD) and frequency (%) were calculated for the statistical analysis. Student's t test was used to compare the mean results of the analyzed variables. p value below or equal to 0.05 was considered to be statistically significant for a 95%CI. The data were analyzed through SPSS .

3. Results

In the present study, we have assessed the nutritional status of (211) children , Out of them, were (106) boys & (105) girls.

The anthropometric measures in weight, height ,body mass index(BMI), BMI/age chart for boys & girls tacked to all the participants , out off 211   children, 73 (34.5%) were underweight , 38(18%) were normal weight,65(31%) overweight& 35(16.5%) were obese, The mean BMI in all four groups with SD show in Table 1.

We found that there was a high prevalence of underweight in girls(66%) than boys(34%) while overweight & obesity were (34%), (43%) for girls & (66%) , (57 %) for boys respectively as show in Table 2.

Table 3 shows that there was a significant difference in resident between the study groups (p=0.004) , with high prevalence of underweight in rural area & obesity in urban area (67%,65%) respectively.

Of the 211 interviewed mothers , there was a statistical significant regarding the type of feeding in the first six months of life of their children between study groups(p=0.002). (17%) of obese children were full breast

feeders, 26% were mixed feeding, and (57%) were on infant formula feeding as show in Table4 ,also there was a statistical significant difference in physical activity between the study groups(p=0.008), with high prevalence of sedentary life in obese group (Table 5).

The time of watching TV and Computer found to be significantly differ between the study groups (p=0.003) , with high prevalence of spending more than 8 hours in obese group(71%) & sleeping for less than 8 hour in underweight group (73%) (Table 6) .

Regarding the distribution of four study groups by parents employment table7 show there was significant difference between all the participants(p=0.0003) with (70%) of underweight children reported working mother compare with (30%) housewife mother &in obese group (65%) their mother was working compare with (35%) house wife mothers & 52%, 47 % of underweight and obesity groups were father was unemployed .

 The economic state of families of the participants were differ with p-value =0.001, with high prevalence of not enough income in underweight group (73%) (Table 8)

4. Discussion

The goal of nutritional assessment in childhood is to prevent nutritional disorders and the morbidity and mortality that accompany them. To meet this goal, health care provider , families, teachers of children must know the risk factors for obesity and malnutrition and must understand the normal and abnormal patterns of growth and the changes in body composition during childhood and adolescence (Ogden CL 2006).

In 2005, the World Health Organization measured that 1.6 billion people were overweight and 400 million were obese. It estimates that by the year 2015, 2.3 billion people will be overweight and 700 million will be obese. Childhood obesity was considered aproblem of affluent countries. Today this problem is appearing even in developing countries .some call this trend the New World Syndrome(Kumar S *et al.* 2007).

In present study, The prevalence of combined overweight and obesity is more in Boys (60%) than in girls (35%), similar to results have been documented from other study (Chhatwal J *et al* 2004) and differ from the observation of Agarwal K.N. *et al.* 2001

Current study also showed that the prevalence of underweight is high (66%). This is much higher than prevalence seen in other studies in developing area 20.5% and 40.2 % (Verma M *et al.* 1998, Monga S. 2004).

Urban versus rural Children, in urban areas are more likely to be obese than those in rural area, while underweight children are more in rural area than in urban area. The children in developing countries presently suffer from double jeopardy of malnutrition- urban children are afflicted with problems of over-nutrition while rural and slum children suffer from effects of undernutrition(Chatterjee P. 2002).

The higher rate of girls among undernourished group may give the explanation which may related to position of girls compared to boys in some region in rural area , also the girls share in agricultural work over their capacity , delay in accessibility to primary health care center in any acute infection or disease occurred , the other studies reported a high prevalence of under nutrition among rural school children and children in urban slums(Sachdev HPS 2003, Bhargava SK *et al.* 2004)

In the current study , high rate of obese children recorded decline in physical activity all the day with increase hours spend on watching television and playing computer game (80%,71%) respectively , Similar findings have been reported earlier(Moayeri H *et al.* 2006, Kelishadi R *et al.* 2003)

Physical activity strongly influenced weight gain in a study of monozygotic twins50. Numerous studies have shown that sedentary behaviors like watching television and playing computer games are associated with increased prevalence of obesity(Swinburn B *et al* 2002, Tremblay MS *et al.* 2003)

Furthermore, parents report that they prefer having their children watch television at home rather than play outside unattended while keeping an eye on their children(Gordon-Larsen P *et al.* 2004)

In addition, increased proportions of children who are being driven to school and low participation rates in sports and physical activities.

Since both parental and children's choices fashion these behaviors, it is not surprising that overweight children tend to have overweight parents and are themselves more likely to grow into overweight adults than normal weight children(Carriere G 2003). The current study also show that the full breast feeding may be associated with reduced risk of obesity, with significant different from children with history of infant formula during the 1st six months of life, (17%,57%) respectively .The health benefits of breastfeeding to both mother and infant have been well established. In developing countries, where risks of infectious diseases and malnutrition are high, early introduction of infant formula increases the risk of serious illness that could lead to underweight (Paline P *et al.* 2001).

Regarding the socioeconomic status There is limited and inconclusive evidence that low socioeconomic status is associated with increased risk of childhood obesity in developed countries .In this study, (49%) of obese children families reported enough income while the rate of underweight was significantly higher in children that the

family income was not enough but there was no significant relationship between under nutrition and family income in other studies (Kapil U *et al*. 2002, Styne DM 2001)

There was also an association of nutritional state with the parent employment with (p=0.0003 , 0.007) for mother & father work respectively , (70%) of underweight children their mother was working, this may due to no care of type of feeding of their children and she depend on outdoor food supplies in feeding their children.

It should be noted that the results of our study were obtained from a relatively small sample of children age (6-12years old) in Hilla- Iraq ,and should therefore be further investigated larger size with different age groups of other regions or the rest of the country.

5. Conclusion

Inactivity in children, Spending more time on TV and Computer may be considered as predisposing factor for obesity. For low weight children, some causes could be found that comparatively high percentage of working mothers, low income were in underweight group. This might have affected the food habits of those children which in turn may be responsible for their under weight situation. Based on the findings of this study it is recommended Sedentary life style should be discouraged. Increase physical activity like playing outdoor games, walking; cycling should be encouraged in children.

Health education should be given to parents, teachers and children regarding dietary habit and sedentary life style.

6. Recommendation:

 Public health intervention is crucial to prevent or reduce underweight, overweight and obesity among children .more awareness and attention of health workers, families& teachers for possible signs and symptoms of nutritional deficiencies   &Health education should be given to parents, teachers and children regarding dietary habit and sedentary life style & to encourage the mother for breast feeding in the 1st six months of life.

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Table 1 : mean BMI in all four groups with SD

	Number (%)	BMI ± SD
Underweight	73(34.5%)	17.19 ± 0.8
Normal weight	38 (18%)	21.3 ± 0.7
Overweight	65(31%)	23.54 ±1.1
Obese	35 (16.5%)	26.94 ± 0.00
Total	211 (100%)	

Table 2 : the frequency of underweight , normal weight, overweight & obesity in study children according to gender.

Gender	Underweight NO.(%)	Normal NO.(%)	Overweight NO. (%)	Obese NO.(%)	Total NO.(%)	P-value
Girls	48(66)	20(53)	22(34)	15(43)	105(50)	0.003
Boys	25(34)	18(47)	43(66)	20(57)	106(50)	

Table 3 : shows the distribution of four study groups according to resident.

resident	Underweight NO.(%)	Normal NO.(%)	Overweigh NO.(%)	Obese NO.(%)	Total NO.(%)	
Urban	24(33)	21(55)	33(51)	22(65)	100(47)	P=0.004
Rural	49(67)	17(45)	32(49)	13(37)	111(53)	

Table 4 : shows the distribution of four study groups according to type of feeding in 1st 6 month of life .

	Underweight NO.(%)	Normal NO.(%)	Overweight NO.(%)	Obese NO.(%)	Total NO.(%)	
Full Breast feeding	17(23)	10(26)	24(37)	6(17)	57(27)	P=0.002
Mixed feeding	36(49)	15(39)	19(29)	9(26)	79(37)	
Infant formula	20(28)	13(35)	22(34)	20(57)	75(36)	

Table 5 : shows the distribution of four study groups according to physical activity.

	Underweight NO.(%)	Normal NO.(%)	Overweight NO.(%)	Obese NO.(%)	Total NO.(%)	P-value
Physical activity	37(51)	20(53)	23(35)	7 (20)	87(41)	0.008
Sedentary life	36(49)	18(47)	42(65)	28(80)	124(59)	

Table 6 : show the time spend with TV and computer as well as sleeping time in hour in all four groups.

TV/COMPUTR	Underweight NO. (%)	Normal NO. (%)	Overweigh NO. (%)	Obese NO. (%)	Total NO.(%)	P value
<8 hours	41(56)	22(58)	29(45)	10(29)	102(48)	0.003
≥8 hours	32(44)	16(52)	36(55)	25(71)	109(52)	
SLEEPING HOURS	Underweight	Normal NO. (%)	Overweigh NO. (%)	Obese NO. (%)	Total NO.(%)	0.001
≥ 8 hours	20(27)	17(45)	35(54)	20(57)	92(44)	
< 8 hours	53(73)	21(55)	30(46)	15(43)	119(56)	

Table 7 : distribution of four study groups by parents employment.

Maternal employment	Underweight NO.(%)	Normal NO.(%)	Overweight NO.(%)	Obese NO.(%)	
					P=0.0003
Employed	51(70)	10(13)	31(47)	22(65)	
House wife	22(30)	28(74)	34 (60)	13(35)	
Paternal employment	Underweight NO.(%)	Normal NO.(%)	Overweight NO.(%)	Obese NO.(%)	p-value
Self employment	20(27)	15(39)	40(62)	7(21)	P=0.007
Governorate employment	15(21)	14(37)	8(12)	11(32)	
unemployed	38(52)	9(24)	17(26)	16(47)	

Table 8 : distribution of four study groups by economic

Economic state	Underweight NO.(%)	Normal NO.(%)	Overweight NO.(%)	Obese NO.(%)	Total NO.(%)	P value
Not enough	53(73)	10(26)	22(34)	5(14)	90(43)	
enough	11(15)	17(45)	25(38)	17(49)	70(33)	o.oo1
Enough& more	9(12)	11(29)	18(28)	13(37)	51(24)	

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