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Obesity in Children Attending School Health in Elkish Polyclinic Benghazi 2017

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ABSTRACT

Introduction: The prevalence of obesity is increasing in Libya as well as all over the world at an alarming rate. Obesity is rampant in Libya as 30.5% of Libyan adults16.9% of children aged 5 or younger, and 6.1% of children aged between 10 and 18 are obese. **Aim:** To determine the prevalence rate of obesity among Libyan children attending the school health unit Elkish polyclinic Benghazi. **Methodology;** Descriptive cross- section study. **Result:** The study showed that 20.6% were obese. Family history of obesity, Fast food, sedentary life and lack of physical activity had positive statistically significant with children obesity. **Conclusion;** The study found high-rate prevalence of obesity (20.6%) among Libyan children aged 4- 19 years, and alarming for both sexes. Libyan diet style which influenced by western food style (fast food, high energy, high sugar and saturated fat), with decreased physical activity, increasing television viewing time, play station games and exercise practice could be possible predictors of the development of obesity among the included school children. The finding showed that the children with positive family history of obesity more to being obese than negative history. Also, child's mother educational level was statistically significant that mothers with high education had obese children than with lower education level, interventions in family setting can be beneficial to change child's behavior of overeating and unhealthy food choices.

Key words: obesity, prevalence, fast-food.

Introduction

Obesity is a chronic condition characterized by an abnormal or excessive fat accumulation that may impair health. It is most often defined by the body mass index (BMI), which is highly correlated with body fat. BMI is weight in kilograms divided by height in meters squared (kg/m2) [1-2].

Obesity is now a global public health problem, with about 315 million people world-wide estimated to fall into the world health organization (WHO) defined obesity categories (having BMI of 30 or above); anyone with a BMI equal to or more than 25 is considered overweight. (See appendix 1) [1,3].

The prevalence of childhood obesity has increased at an alarming rate. Globally, in 2013, the number of overweight children under the age of five was estimated to be over 42 million. Almost 31 million of these were living in developing countries [1].The primary causes of the rapid global rise in obesity rates lie in the profound environmental and societal changes now affecting large parts of the world and creating societies in which physical activity is low and the availability of high-fat, energy-dense foods has increased [3].

The National Health and Nutrition Examination Survey (NHANES) indicates that the prevalence of obesity is increasing in all pediatric age groups, in both sexes, and in various ethnic and racial groups [4]. Pediatric obesity is defined as $\geq 95^{th}$ percentile of BMI for age and sex [5].

Higher body weight is associated with an increased incidence and prevalence of numerous conditions, including : hypertension, diabetes mellitus, dyslipidemia, certain cancers, musculoskeletal disorders, cardiovascular disease(CVD), and a higher risk of disability[4,6].The health effects of increased body mass index as a child may significantly impact obese youth as they age .Consequences of obesity include but are not limited to: an increased risk of developing the metabolic syndrome, cardiovascular disease, type 2 diabetes and its associated retinal and renal complications, nonalcoholic fatty liver disease, obstructive sleep apnea, polycystic ovarian syndrome, infertility, asthma, orthopedic complications, psychiatric disease, and increased rates of cancer. These disorders can start as early as childhood, consequently such early onset increases the likelihood of early morbidity and mortality [7].

Epidemiology and Prevalence

Overall

Rates of severe childhood obesity have tripled in the last 25 years, with significant differences by race, gender, and poverty [8].

Sex difference

In United States of America (USA) the prevalence of severe obesity amongst youth is increasing, especially amongst Hispanic boys and non-Hispanic black girls [9] .Extreme obesity was observed in 7.3% of boys and 5.5% of girls. The prevalence peaked at 10 years of age in boys and at 12 years of age with a bimodal distribution in girls [10]. In 2007-2008 almost 17% of children and adolescents aged 2-19 years were obese [11]. In the United Kingdom (UK) in 2008, it was estimated that 16.8% of boys and 15.2% of girls aged 2 to 15 years were obese, which was an increase from 11.1% in boys and 12.2% in girls in 1995, but a decrease from 19.4% in boys and 18.5% in girls in 2004 [2].

Race difference

Obesity prevalence was higher amongst non-Hispanic black and Hispanic children and adolescents than among non-Hispanic white youth [12-13]. Racial/ethnic patterning in the risk of obesity and overweight has been observed in early childhood [14] .

Socioeconomic factors

Studies have suggested that obesity is greater in the low-income population than in higher income individuals. This data briefly presents the most recent national data on childhood obesity and its association with Poverty Income Ratio (PIR) and educational level of household head [11]· The prevalence of severe obesity was 4.3% in youth with a poverty income ratio (PIR) of <1 and 2.5% in youth with a PIR >3. A PIR of <1 identifies individuals who are below the federal poverty level, and a PIR of ≥1 indicates relatively higher socioeconomic status [13].

In Libya the prevalence of obesity is increasing as well as all rest of the world. The earliest traceable report on obesity in the general Libyan population was by Rao et al. in 1984 from Tripoli**. The** prevalence of obesity in Libya is very high in both adults and children, and it has increased dramatically since 1984. Obesity is rampant in Libya as 30.5% of Libyan adults16.9% of children aged 5 or younger, and 6.1% of children aged between 10 and 18 are obese. The rate of obesity progressively increases with age, from 4.2% in those aged between 10 and 12 to 46% in those aged between 55 and 64 [15]

Obesity has reached epidemic proportions throughout the globe, and this has also impacted people of the Arabic-speaking countries, especially those in higher-income, oil-producing countries. Approximately one-third (26% male-41% female) of obese Arabic-speaking preschool children and half (42% male-63% female) of obese school-age children were also obese at adulthood, according to a survey of data collected between 1970 and 1992 [16].

Eating patterns

The home food environment (including food availability and parenting behaviors), was associated with overweight and obese children's dietary intake and weight [17]. Specific early parental (especially maternal) feeding practices have been proposed as important contributors to the development of obesity and obesogenic eating patterns (e.g., overeating) in children [18-19]. Severely obese adolescents are a vulnerable group who are highly likely to stay obese into adulthood. This persistent severe obesity increases risk for diabetes, cardiovascular disease, non-alcoholic fatty liver disease, and other related morbidities [20].

In Libya; breast -feeding is shown to be associated with a lower risk of overweight. Exclusive breast-feeding during the first 3 or more months of infancy reduces the risk of overweight in child. The rate of synthetic feeding is between 5.7% and 40.3%, and 47.88% of mothers breast-fed their infants for less than 1 month, whereas 28.18% breast-fed their children for 1- 3 months. This may partially explain the high rate of obesity in children aged 5 or younger in Libya. The increase in television viewing time, use of computers, and video games other possible contributors to the increasing prevalence of obesity in Libyan children and adults [15].

Cardiovascular Risks

A direct link has been suggested between obesity during childhood and adolescence and adult cardiovascular morbidity and mortality [13]. The rapid increase in the prevalence and severity of obesity in children is likely to lower the age of onset and increase the incidence of cardiovascular disease worldwide [21].

Metabolic Risks

An elevated BMI in adolescence is risk factor for obesity-related disorders in midlife. The risk of diabetes is mainly correlated with an increased BMI; the risk of coronary heart disease is associated with an elevated BMI both in adolescence and in adulthood [22].

Obstructive Sleep Apnea Syndrome

The likelihood of excessive daytime sleepiness for obese children is greater than that for non-obese children at any given level of obstructive sleep apnea severity and is strikingly reminiscent of excessive daytime sleepiness patterns in adults with obstructive sleep apnea. Obstructive sleep apnea syndrome (OSAS) has emerged as a highly prevalent condition in the pediatric age range, affecting 2% to 3% of school-aged children [23].

Psychosocial Problems

There is mixed evidence related to the prevalence and severity of psychosocial problems amongst severely obese children and adolescents - specific measures of emotional, social, and school functioning were significantly lower amongst severely obese children and adolescents [13]. Many extrapolate that severely obese adolescents will have higher levels of depressive symptoms and poorer overall psychological health [20].

Prevention of childhood obesity therefore needs high priority. Preventive guidelines could include: an increased consumption of fruit and vegetables, as well as legumes, whole grains and nuts; limit energy intake from total fats and shift fat consumption away from saturated fats to unsaturated fats; limit the intake of sugars; and to be physically active – at least 60 minutes of regular, moderate- to vigorous-intensity activity each day that is developmentally appropriate [1,24].The prevention of childhood obesity requires improving the family's ability to support a child in making changes, which in turn needs support from the school and community [25].

Participants and Method

Total of 209 all children attending the school health unit in Elkish polyclinic in Benghazi city from 15-July to 30- October 2017 with both sex and all ages.

All children were subjected to the following:

1. Clinical history taking with special emphasis on:

    a) Personal data: age, sex, and residence.

    b) Assessment of socioeconomic standard of family with questions about the father's education, mother's education and

2. Physical examination with special emphasis on anthropometric measurements including weight, height, and BMI.

3. Children's food and eating habits

4. Children's physical activities

5. Children's sedentary activities

Body Mass Index (BMI) was calculated by formula: BMI = Weight (kg)/ Height (m2). The BMI was calculated for each age (2- 20 years) and for each child gender, and the values were compared to standard growth charts instructed by National Research Center (2000 CDC BMI-age growth charts) as described below: see appendix 2

Underweight $< 5^{th}$

Normal $5^{th} - < 85^{th}$ percentile

Overweight $\geq 85^{th} - 95^{th}$

Obesity $\geq 95^{th}$ [33].

Data Analysis: - Statistical analysis was carried out by using SPSS statistical package version 23. Descriptive statistics were used as mean, stander division, frequencies and percentage .and the data were presented as table and figure. Analytical statistic like Chi square was used and regard significant when P < 0.05

Ethical principles, informed consent was obtained from the parents, so all the necessary steps for carrying out these (anthropometric measurement) were done in private place and giving them a briefing about the goal of the study.

Result

The study showed 116(55.5%) of children attending the school health unit were boys, and 93(44.5) were girls, majority of their age group between (4- 8) 190(90.9 %) ,with mean age 6.3 ± 2 . Figure 1, Table 1

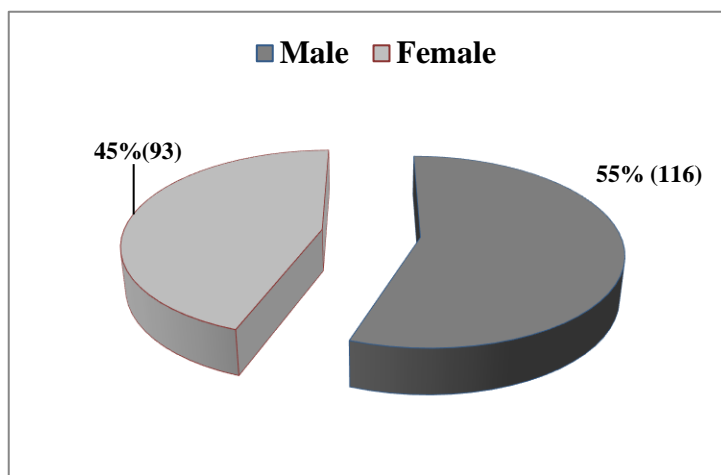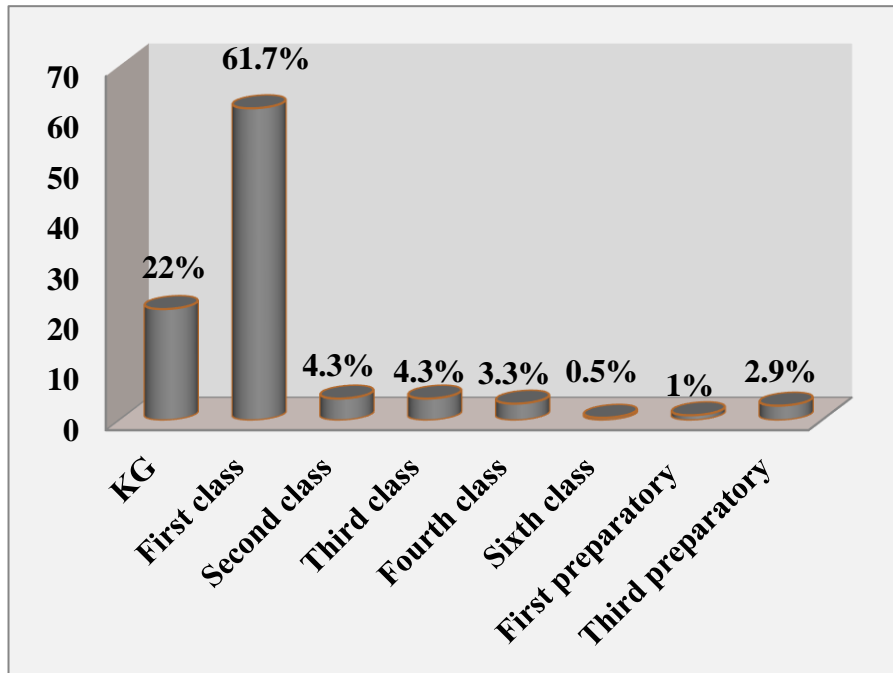**Figure 1: - Sex distribution of children.**

Table 1:-Distribution of child's age / years.

Age/years	No.	%
4 – 8	190	90.90
9 – 13	12	5.70
≥ 13	7	3.30
Total	209	100.00

Most of the children 129(61.7 %) in first class school level, and 46(22%) KG. Figure 2

Figure 2: - Distribution of child's school level.

The result showed that majority of children 148(71%) with birth weight 3 kilogram with mean 3.17 ±0.541, and about 48(22.9%) 4 kilogram. Table 2

Table 2: - Distribution of child birth weight.

Birth weight	No.	%
2	6	2.90
3	148	71.00
4	48	22.90
5	6	2.80
6	1	0.50
Total	209	100.00

In this study 62(29.7 %) of children the family size was 5 individuals, then 36(17.2%) was 6 individuals, about 34(16.3 %) was 7 individual and 32(15.3%) was 4 individuals. Table 3

Table 3: -Distribution of child's family size.

Family size	No.	%
5≤	104	49.80
6 – 10	102	48.62
11 – 15	3	1.50
Total	209	

The result was 71(34%) of children their order in the family was number 1, 60(28.7%) was number 2 and 33(15.8%) was number 3. Most of the children 44 (21.1%) of children attending the school health unit had family history of obesity in the family.

The children father had university education 54(25.8%), and 23.4(49) with collage degree, about 34(16.3%) with preparatory school 31(14.8%) secondary school. About third of children mother 67(32.1%) university educated followed by collage 54(25.8%), about 35(16.75) with preparatory school and 31(14.8%) with secondary school.

By measuring the children body mass index (BMI) the obesity depend on the growth chart classification of children obtained and the result was about 55(26.3) of children were underweight, 96(45.9%) were normal, 15(7.2%) were overweight, and 43(20.6%) were obese. Figure 3
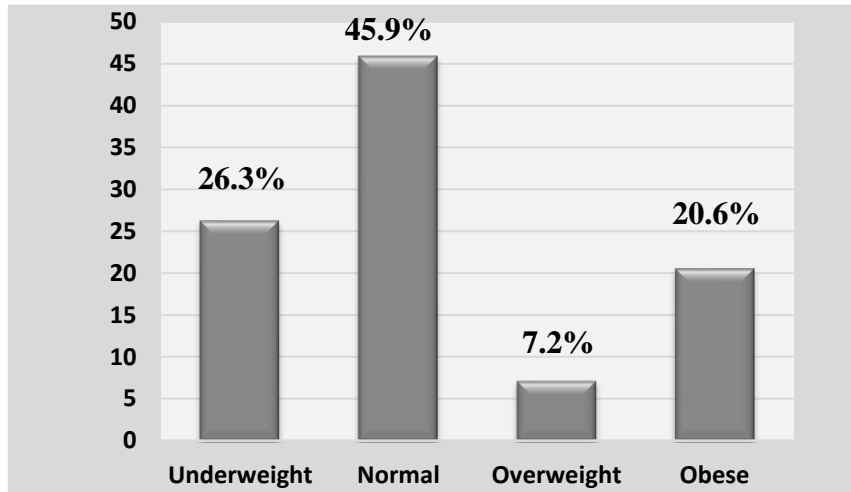

Figure 3: - Distribution of child's status according to growth chart.

By asking the child parents about fast food near half of children 106(50.8%) eat fast food, 68(32.5 %) eat it once per week, 92(44%) they eat vegetable and fruit once a day, 66(31.6%) twice a day, about 103(49.3%) eat sweets and 91(43.5 %) drink cola and juice once a day. Table 4

Table 4: - Distribution of children's food and eating habits.

Diet		No.	%
Fast food : -	Did not eat	103	49.20
	Once / week	68	32.50
	Twice/ week	13	6.20
	> one /week	12	5.70
	Once/month	13	6.20
Vegetable/fruit : -	Did not eat	20	9.50
	Once/ day	92	44.00
	Twice /day	66	31.60
	>one/ day	31	14.80
Sweets :-	Did not eat	4	1.90
	Once /day	103	49.30
	Twice / day	49	23.40
	> one /day	53	25.40
Coca-Cola/juice: -			
	Did not drink	18	8.60
	Once /day	91	43.50
	Twice / day	40	19.10
	>one/day	60	28.70

According to the children activity, the finding showed that around third of children 67(32.1 %) watching TV and 38(18.2%) playing station games for long time, The majority of children 164(78.5 %) of children not practice exercise, only 45(21.5%) practice exercise. Table5

Table 5: - Distribution of children's physical activities.

Activity		No.	%
Watching TV	- Not watching	7	3.3
	-For short time	13.5	64.6
	-For long time	67	32.1
Play station games	- Not playing	82	39.2
	-For short time	89	42.6
	-For long time	38	18.2
How child reach school	-Walking	49	23.4
	- By car	160	76.6
Dose child practice exercise	-Yes	45	21.5
	-No	164	78.5

The study showed that no significant association between the child's obesity and their sex, age, birth weight, family size and child's order in the family. There was highly positive statistically significant between the children obesity and their family history and child's mother educational level (p 0.000), and positive highly statistically significant difference (p = 0.000) between BMI and excessive fast-food consumption, and sugar-sweetened beverage. Table 6,7

Table 6: - Distribution of BMI category and child's Fast food.

Fast food	BMI category								Total	
	Underweight		Normal		Overweight		Obese			
	No.	%	No.	%	No.	%	No.	%	No.	%
Once per week	17	65.38	30	66.67	8	88.89	13	50	68	64.152.2
Twice per week	5	19.23	2	4.44	0	0	6	23.08	13	6
> one per week	3	11.54	5	11.11	0	0	4	15.38	12	11.32
Once per month	1	3.85	8	17.78	1	11.11	3	11.54	13	12.26
Total	26	100	45	100	9	100	26	100	106	100

Table 7: Distribution of BMI category and child's consumption of sweet and Coca-Cola.

Sweet + Coca-Cola	BMI category								Total	
	Underweight		Normal		Overweight		Obese			
	No.	%	No.	%	No.	%	No.	%	No.	%
Once/day	22	40	51	54.84	8	53.33	22	52.38	103	50.24
Twice/day	11	20	21	22.58	4	26.67	13	30.95	49	23.90
> One/day	22	40	21	22.58	3	20	7	16.67	53	25.85
Total	55	100	93	100	15	100	42	100	205	100

The child who having long time of television watching and who not practice exercise more obese with positive highly statistical significant (p = 0.000). Table 8,9

Table 8: - Distribution of BMI category and child's TV watching.

TV watching	BMI category								Total	
	Underweight		Normal		Overweight		Obese			
	No.	%	No.	%	No.	%	No.	%	No.	%
Not watching	2	3.63	3	3.1	1	6.6	1	2.3	7	3.3
For short time	37	67.27	68	70.8	7	46.7	23	53.4	135	64.6
For long time	16	29.1	25	26.0	7	46.7	19	44.1	67	32.1
Total	55	100	96	100	15	100	43	100	209	100

Table 9: - Distribution of BMI category and does child practice exercise.

BMI category	Does child practice exercise				Total	
	Yes		No			
	No.	%	No.	%	No.	%
Underweight	12	26.7	43	26.2	55	26.3
Normal	20	44.4	76	46.3	96	46
Overweight	6	13.3	9	5.5	15	7.1
Obese	7	15.6	36	22	43	20.6
Total	45	100	164	100	209	100

Discussion

Two hundred and nine child aged between 4 years and 18 of both sexes were studied and investigate for obesity prevalence and demographic factors identified that might be associated with obesity, as: sex, age, family size, family history of obesity, mother education and child order.

According to the children body mass index (BMI) and growth chart classification obesity was detected amongst 20.6% of the studying children ,which is consistent with study conducted in Saudi Arabia (Kate S Collisone, 2016) [34], but more than study done in United Arab Emirates by (A. Al Blooshi, 2016) [35], in US children with same age group(Joseph A. et al 2009) [8],(Ogden CL et al, 2012) [13], (Ogden CL et al 2018) [36] and in Southern California by (Corinna Koebnick et al 2010) [37] . However, this number is less than a study done in Kuwait by (Elkum N 2016) , which was 30.5% [38].

The result finding showed that 116(55.5%) of the children attending the school health unit were boys, while in similar Libyan study conducted in Tripoli (Fawzi Ammar 2015)[39] 62.0% were girls ,the result was in agreement with study done in Alexandria (Ali Mohamed El-Shafie 2014)[40] 54.3%, another study conducted in Egypt (Nayera E-. Hassan 2016) [41], (Wafaa Y. Abdel Wahed 2017) [42].

The study showed that there is no significant relation between the child's obesity and their sex (p value = .888) ,this is similar to Libyan study that also found no difference between female and male in obesity (Rafik R. Elmehdawi 2012) [16], while Libyan study performed in Tripoli (Fawzi Ammar Elabani 2015) showed that males had lower prevalence than females [39],and study conducted in Qatar (Josephine Mandeya 2014) [43] , while a study done in Saudi; females were more obese than males (Abrar Al Dhaifallah 2015) [44] , in Egypt two study revealed more obesity in female children than male (El-Shafie 2014 ,Mohamed H Bahbah 2015) [40, 45].

Most of participating children had mean age 6.3 ± 2 although age had not statistical significance (P value = .846) to being obese. However, results in Egypt (Nayera E-Hassan, 2016) showed a statistical significance with age [41].

 The study finding showed that the families size ranged between (4 -7), 29.7 % of children were obese but had no statistical significant (P value = 0.771) with the child obesity .This is unlike the study performed on Egyptian children (Nayera E. 2016) [41] and on Indian children (Dr.Shilpa Deshpande 2017) [46], were a positive statistical significant with risk of being obese was found.

    In present study showed that the child order in his family 34% of them was (No.1) which is not statistically significant (p value = 0.731) with the risk of being obese, the study (Dr.Shilpa Deshpande 2017) and (J.Ferdousi 2011) showed the maximum percentage of obese children were the first and second born child with statistical significant with risk of being obese [46- 47].

The present study showed statistical significant relation between family history of obesity with child being obese (P = 0.000), same finding in the study done in India (Dr.Shilpa Deshpande 2017) [46].

The study findings showed that the mother with high education their children had more obesity than low educated , this matches the study done in Egypt (Nayera E. 2016) [41] , while study done on Chinese children (Zhao Y 2017) showed that inferior maternal education was more likely to have obese children [48] .

The influence of western fast food could be the cause of obesity among studying children , ((Studies investigating associations between fast-food consumption in children and (BMI) have produced mixed results, some demonstrating small but significant associations between fast-food consumption and increased BMI while others have failed to demonstrate a significant association)) [49].The present study showed statistically significant association between excessive fast food consumption and the child to be obese which consistent with result study in Libya (Fawzi Ammar 2015) [39] and in Bangladesh (J.Ferdous 2011) [47] . While in contrast with study in China where there is no relation between fast food consumption and obesity (Zhao Y, 2017) [48] and study at the Massachusetts Institute of Technology (Thompson OM 2004) [50].

Also the excessive consumption of carbonated soft drinks; sweet-candy; could be possible predictors of the development of obesity amongst the included school children, where there was statistically significant association between excessive consumption of carbonated soft drinks and obesity ,this in agreement with study performed in Milan (Chiara Marabelli,2017) [51], study in Saudi Arabia (Tarek Tawfik Amin 2008) [52] .

Physical activity plays an important role in the prevention of obesity among the children , ((Several studies have found that decreases in physical activity and increases in sedentary behavior, such as TV viewing and video/computer use, blame on the secular trends in obesity among children))

(53).Our study showed that around third of children watching TV and playing computer games for long time , and 164 (78.5 %) of them not practice exercise , the finding could be related to children obesity among the studying school children ,also there was high statistical significant with obesity, the result are consistent with the result of study done in Banglades (J. Ferdousi,2011)(47),in Sudan (Abdulrahman O. Musaiger,2o16) (54) , in Ghana (Aryeetey R,2017) (55).

Conclusion

The study found high rate prevalence of obesity (20.6%) among Libyan children aged 4- 19 years attending the school health unit, and alarming for both sex. Libyan diet style which influenced by western food style (fast food, high energy, high sugar and saturated fat) , with decreased physical activity , increasing television viewing time ,play station games and exercise practice could be possible predictors of the development of obesity among the included school children.. Interventions in family setting can be beneficial to change child's behavior of overeating and unhealthy food choices. Urgent need of health education in community, school and the family about the life style modification including changing in food habits, performing physical activity could decrease the obesity and his complication of chronic disease.

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