PREVALENCE OF OBESITY AND IT IS RELATED FACTORS CHILDREN FROM EARLY AND LATE CHILDHOOD IN LIBYA

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ABSTRACT

Background: Childhood overweight (OW) and obesity (OB) is the global public health problem since it increases the risk of premature death, as well as developing Diabetes, cancer, heart diseases, and many other physical or social diseases and complications in adulthood. It also causes undesirable psychological consequences, such as anxiety, depression, sleep disorders and low self-esteem, which affect the social and educational relationships of children.

Aim and objectives: to evaluate the Prevalence of Obesity and It Is Related Factors Children from Early and Late Childhood in Libya.

Subjects and methods: This is a cross sectional study was conducted at department of pediatrics, Faculty of Medicine – Benha University on two groups of children: Preschool age group from 0-5 years & School age group from 6-12 years.

Result: There was a statistically significant difference between the studied groups as regard (Distribution of nutritional status according to packaged market chips intake) and (Comparing feeding patterns between normal and obese children except in Preferred Unhealthy Food). There was no statistically significant difference between the studied groups as regard (Association of child nutritional status with shopping practices for unhealthy foods), behavioral patterns and (processed food advertisements and marketing and shopping practices).

Conclusion: the prevalence of overweight and obesity are high in early and late childhood. The results of the present study indicate that unhealthy behaviors and lifestyles are prevalent in children and their mothers. This problem could be a major risk to children's weight loss programs.

Keywords: Obesity, Early and Late Childhood, Childhood overweight.

INTRODUCTION

Childhood overweight (OW) and obesity (OB) is the global public health problem since it increases the risk of pre mature death, as well as developing diabetes, cancer, heart diseases, and many other physical or social diseases and complications in adulthood **(1)** it also causes undesirable psychological consequences, such as anxiety, depression, sleep disorders and low self-esteem, which affects the social and educational relationships of children **(2, 3)**.

Researchers believe that the increased prevalence of obesity is the result of changes in the lifestyle of societies, such as the inactivity, collapse of energy balance, increased use of fast food and animal proteins, and increased use of technology **(4)**.

Health professionals recognize children's lifestyle as a function of parents behavior. Parents are considered to be the causes of the child's BMI in the community, considering the rules for watching TV, computer games, nutrition and using the car instead of walking **(5)**.

Children that have low levels of physical activity are more likely to watch TV than the others and much – watching TV may cause to increase snacking and using up of high-fat, high sugar, or high – calories foods and the decrease of fruit and vegetable consumption and this lifestyle may cause to greater BMI among children **(6)**.

The world health organization (WHO) recommends that all babies should receive exclusive breastfeeding for two years of age or more with adequate complementary foods after 7 months of age **(7)**.

In most development settings, formula milk-fed infants are heavier and grow faster than breastfed infant. Indeed, these early growth differences from the rationale for (WHO) international growth standard for 0-5 years old children, which is based on predominantly breastfed children **(8)**.

Obesity risk at school age is 15-20% lower in breastfed compared to formula Milk-fed infant **(9)**.

The aim of this work was To assess prevalence of overweight and obesity in children aged (0-5 years

Eur. Chem. Bull. 2023,12(issue 8), 8429-8435

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and 6-12 years) in Tripoli governorate, Conduct a case control study to examine associations between overweight and obesity and unhealthy foods in children from 6-12 years and under five years of age (0-5 years), Assess the development and behavioral disorders linked to feeding in the children who are obese, Assess related health problem and Assess the role of mothers in increase or decrease risk of obesity and overweight.

PATIENTS AND METHODS
This is a cross sectional study targeting two groups of children: Preschool age group from 0-5 years and School age group from 6-12 years
The study was carried out in two phases: Phase 1: survey of 250 mother child pairs from nurseries, and 250 children from school in the 4 districts of Tripoli and Phase 2: case control study (100 obese children and 100 non-obese children selected randomly as follows: 25 from Ain Zara, 25 from Qasar Bin Ghashir, 25 from Binachour and 25 from Gargarsh.
Inclusion Criteria: Age (preschool age group 0-5 years of age) School age group 6-12 years of age), Healthy children and Mother is available
Exclusion Criteria: Sick and handicapped children, Children with any chronic diseases and Children with inborn errors of metabolism.

Methods
Design a questionnaire sheet to assess epidemiological data early feeding practices, breastfeeding, formula feeding and dietary practices / attitudes of child, General examination of the Child, Systemic examination and Investigations.
Behaviors and other factors that influence obesity Parental obesity, exercise, sleep, hours of watching TV commercialism visiting fast food outlets, purchase of ready – made juices meats, carbohydrates, fatty, sweet and salted food (HFSS).
Procedures:
All children were selected randomly in the districts under study were subjected to anthropometric measurements.
A detailed questionnaire was taken from the mothers of obese children in preschool age group (0-5 years) and from children itself in school age group (6-12 years) with an equal age and sex matched, Control group of non-obese heathy children according to the inclusion and exclusion criteria mentioned.
Anthropometric measurements: Weight in kilograms, Height in centimeters, Body Mass Index (BMI), Waist circumference (cm), Hip circumference (cm) and Waist to hip ratio
All children in the study were assessed for: Weight measured to the nearest gram with clothes using a standardized weight scale, Height measured

as standing height using standardized method **(10)**, The body mass index (BMI) was estimated by the formula BMI= Wt. in Kg/height^2 in meters, Waist circumference to the nearest cm measured above the public bone and cross the umbilicus in all children and Mid arm circumference measured midway between the shoulder and elbow at the insertion of deltoid muscle.
Ethical considerations: The study was approved by the ethical committee of Benha University, Faculty of medicine, The data that were obtained from participants are confidential, The study participants will not be identified by name in any report or publication concerning this study, Before the participants were admitted in this study, the purpose and nature of the study, as well as the risk–benefit assessment was explained to them and An informed consent was obtained.
Statistical analysis: All data were presented with suitable tables and graphical presentation and were analyzed by suitable statistical methods using SPSS program, All data were compiled in a master sheet for statistical analysis and Data were expressed as number and percentage for qualitative variables and mean + standard deviation (SD) for quantitative one.
Level of significance: P value of > 0.05 indicates non-significant results. P value of < 0.05 indicates significant results.

RESULTS
There was a statistically significant difference between the studied groups as regard Weight, kg, BMI, kg/m2, Weight-for-age and BMI-for-age. There was no statistically significant difference between the studied groups as regard Gender, Age, years, Height, cm and Height-for-age [Table 1]
There was a statistically significant difference between the studied groups as regard Distribution of nutritional status according to packaged market chips intake (Frequency and meal) [Table 2]
There was no statistically significant difference between the studied groups as regard child nutritional status with shopping practices for unhealthy foods. [Table 3]
There was a statistically significant difference between the studied groups as regard feeding patterns except in Preferred Unhealthy Food. [Table 4]
There was no statistically significant difference between the studied groups as regard child activity or behavioral disturbance. [Table 5]
There was no statistically significant difference between the studied groups as regard processed food advertisements, marketing and shopping practices except in Food Advertisements. [Table 6]

Table 1. Comparing age, gender, and anthropometrics between normal and obese children

	Normal	Obese	P value
Gender			1.000
Male	59 (59)	59 (59)	
Female	41 (41)	41 (41)	
Age, years	7.2 ± 2.76	7.2 ± 2.76	1.000
Weight, kg	23.7 ± 7.02	36.7 ± 13.85	0.001
Height, cm	120.1 ± 16.26	119.8 ± 16.38	0.878
BMI, kg/m^2	16.1 ± 1.20	25.1 ± 5.28	0.001
Weight-for-age	-0.20 ± 0.71	2.13 ± 1.28	0.001
Height-for-age	-0.18 ± 0.81	-0.33 ± 0.65	0.133
BMI-for-age	-0.03 ± 0.61	2.82 ± 1.81	0.001

Table 2. Distribution of nutritional status according to packaged market chips intake

		Normal		Overweight		Obese		P
		N	%	N	%	N	%	
Frequency	**None**	25	83.3	5	16.7	0	0	< 0.001
	Once a day	60	56.6	31	29.2	15	14.2	
	Twice a day	10	15.6	24	37.5	30	46.9	
Meal	**At breakfast**	1	100	0	0	0	0	< 0.001
	At lunch	0	0	0	0	0	0	
	At dinner	0	0	0	0	0	0	
	At snacks	59	56.2	31	29.5	15	14.3	

Table 3. Association of child nutritional status with shopping practices for unhealthy foods

	Participants (N= Total 300, Analyzed 200)						P
	Normal		Overweight		Obese		
	N	%	N	%	N	%	
From your daily shopping	55	44.4	39	31.5	30	24.2	0.525
In your shopping during the past 24 hr	36	50.7	20	28.2	15	21.1	
Both	4	80	1	20	0	0	

Table 4. Comparing feeding patterns between normal and obese children

		Normal		Obese		P value
		No.	%	No.	%	
Breast Feeding	None	2	2	19	19	0.001
	Less than 1 yr	29	29	58	58	
	More than 1 yr	69	69	23	23	
Formula Feeding	None	12	12	3	3	0.001
	Since Birth	33	33	81	81	
	6 months	45	45	16	16	
	6 - 12 months	10	10	3	3	
Preferred Unhealthy Food	Fast Food	40	40	50	50	0.115
	Sweet/Chocolate	56	56	67	67	
	Canned Drinks	31	31	20	20	
Vegetables and Fruits	Breakfast	8	8	1	1	0.001
	Lunch	52	52	26	26	
	Dinner	18	18	10	10	
	Snacks	23	23	16	16	
Chips	Breakfast	1	1	3	3	0.001
	Snacks	69	69	32	32	
	Two Times	3	3	57	57	
Fast Food	Breakfast	0	0	0	0	0.001
	Lunch	2	2	31	31	
	Dinner	7	7	33	33	
	Snacks	15	15	20	20	
Home Food	Breakfast	13	13	15	15	0.001
	Lunch	85	85	73	73	
	Dinner	61	61	18	18	
	Snacks	1	1	1	1	

Table 5. Comparing behavioral patterns between normal and obese children

		Normal		Obese		P value
		No.	%	No.	%	
Child Activity	None	23	23	30	30	0.549
	Walking	9	9	7	7	
	Football	41	41	31	31	
	Running	4	4	5	5	
	Biking	20	20	14	14	
	Gym	2	2	1	1	
	Dancing	6	6	12	12	
Aberrant Behavior	None	64	64	65	65	0.585
	Thumb sucking	6	6	3	3	
	Nightmares	14	14	15	15	
	Head hitting	4	4	2	2	
	Nocturnal enuresis	8	8	8	8	
	Diurnal enuresis	2	2	3	3	
	Neurological Condition	2	2	4	4	

Table 6. Comparing processed food advertisements and marketing and shopping practices between normal and obese children

		Normal		Obese		P
		N	%	N	%	
Food Advertisements	Streets	13	13	19	19	0.033
	TV	20	20	23	23	
	Social	37	37	17	17	
	Internet	28	28	38	38	
	Others	2	2	3	3	
Food Marketing	Streets	46	46	40	40	0.185
	TV	16	16	8	8	
	Social	6	6	10	10	
	Internet	17	17	18	18	
	Others	15	15	24	24	
Food Advertisement at previous 24 hr	Streets	25	25	20	20	0.218
	TV	15	15	29	29	
	Social	30	30	22	22	
	Internet	19	19	19	19	
	Others	11	11	10	10	
Most Frequent Food Advertisement	Snacks	47	47	40	40	0.096
	Fast Food	24	24	11	11	
	Milk	8	8	4	4	
	Beverages	10	10	4	4	
	Healthy Foods	18	18	10	10	
Shopping Practice	Daily shopping	55	55	62	62	0.103
	Shopping past 24 hr	41	41	38	38	
	Both	4	4	0	0	

DISCUSSION

The main results of the study were as following:

A total of 300 children from four districts of Tripoli were enrolled in the first stage of our study. The mean age of participants was 8.1 ± 1.4 years, ranging from 3 to 11 years old. The mean weight of participants was 31 ± 10.9 kg, ranging from 14 to 71 kg. The mean height of participants was 125 ± 15 cm, ranging from 30 to 153 cm. The mean BMI was 19.3 5.1 kg/m2, ranging from 13.7 to 37.8 kg/m2. 17.3% of them were obese and 23.3% of them were overweight. 59.3% of them were normal weight.

The prevalence of obesity in our study was higher than that reported by study of Al-Lahham et al., as they conducted the study to determine the current prevalence of underweight, overweight and obesity among Palestinian school-age children and to assess the role of dietary and sociodemographic factors. They found that the prevalence of overweight and obesity were 14.5 and 15.7% respectively **(11)**. This is similar to the prevalence in the USA and some neighboring Middle Eastern countries such as Jordan. Nevertheless, it is still lower than the prevalence of other Middle Eastern countries such as Saudi Arabia (20–28%) **(12)**.

The current study showed that the overall prevalence of overweight was 18% and was highest for the 3 – 5 age group. There was a statistically significant difference regarding weight-for-age among different age groups. The overall prevalence of obesity was 23%. It was highest in the younger age groups, 55% in the 3 – 5 age group, 5.7% in the 7 – 9 age group, and 21% in the 10 – 11 age group. There was a statistically significant difference regarding BMI-

for-age among different age groups. There was a statistically significant difference regarding height-for-age among different age groups. The obese group had significantly larger values for weight, weight-for-age, BMI, and BMI-for-age. However, no statistically significant difference was found between groups regarding height and height-for-age. No statistically significant association was found between gender and nutritional status.

Our results were supported by an Egyptian study of Osei Bonsu & Addo, **(13)** as they reported that there was a significant association between childhood overweight or obesity and the age; children aged 19 to 37 months (OR = 1.39, CI = 1.25–1.55, p = 0.001). In USA; Cunningham et al. revealed that at kindergarten entry, at average age 6 years, not only had a higher proportion of children in the more recent cohort already entered overweight and obesity, but a higher proportion had already reached severe obesity: 3.9% (3.3%–4.5%) in 2010, compared with 2.9% (2.2%–3.5%) in 1998. In both cohorts, the prevalence of severe obesity increased with increasing age **(14)**.

In the study in our hands, 53% of our studied group Child prefers fast food. Regarding Food reported to be seen by the studied children in the market; 43% of them reported Snacks for children (sweets / chips / chocolate). 62% of them, from their daily shopping, they spend on snacks as fast foods. The overall prevalence of obesity was highest (33%) in children who eat sweet and chocolate, followed fast food and canned drinks, reported in 22.6%. A statistically significant association was found between nutritional status and consumption of fast food and sweets. No statistically significant association was found between canned drinks and nutritional status. A statistically significant association was found between nutritional status and frequency of consumption of vegetables and fruits. No statistically significant association was found between nutritional status and type of meals. A statistically significant association was found between nutritional status and frequency of consumption of chips. All children reported chips intake at snacks except one child consumed chips at breakfast.

These results agree with the results of Karki et al. who illustrated the dietary characteristics of children. 1 in every 5 children consumed hot chips, fries, and potato crisps 3–4 times a week. About 17% of them ate confectionaries and ice cream more than 5 times a week. Nearly, 83% of the children took homemade food to school. Likewise, more than 56% drank more than 250 ml of soft drinks a week **(15)**.

In the study in our hands, the highest prevalence of obesity was 29.7%, reported among children whose mothers do a governmental work, whereas the lower prevalence of obesity was found in children whose mothers were housewives (17.4%) or did any academic work (11.1%). A statistically significant

association was found between nutritional status and mother's occupation. Prevalence of obesity was also higher in children whose mothers had university education (23.4%) compared to secondary education (17.2%). However, no statistically significant association was found between nutritional status and level of mother's education. The highest prevalence of obesity was reported in children whose fathers were not employed (57.1%), whereas the lowest prevalence was reported in children whose fathers worked as civil servants (20.9%). However, no statistically significant association was found between nutritional status and father's employment. The maternal age was significantly larger in obese than normal children. A statistically significant difference was also found between groups regarding mother's and father's occupation and level of education. The majority of mothers of normal children (87%) had normal weight, while the majority of mothers of obese children (56%) needed weight reduction. The difference was statistically significant. No statistically significant difference was found between groups regarding maternal comorbidities.

Our results were in line with study of Badawi et al. showed a strong positive correlation between child BMI and mother's and father's BMI (p value < 0.05), (OR = 10.2, 95% CI: 6.2- 16.6) **(16)**. Talat and El Shahat, in Urban Sharkia Governorate, Egypt concluded that the prevalence of overweight and obesity was high in children whose parent level of education was low **(17)**.

CONCLUSION

Our results indicated that the prevalence of overweight and obesity are high in early and late childhood. The results of the present study indicate that unhealthy behaviors and lifestyles are prevalent in children and their mothers. This problem could be a major risk to children's weight loss programs. It seems necessary to have suitable intervention programs to help mothers understand the serious risk of childhood obesity and the importance of creating a healthy lifestyle by them in childhood.

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