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Obesity Risk Factors among School Children in Basrah, Iraq

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ABSTRACT

Background: Obesity, defined as the accumulation of extra body fat, has been extensively studied in all age categories, genders, and ethnic and geographic groups in relation to various risk factors. This study aimed to identify obesity risk factors for school children.

Methods: In schools of Basrah, Iraq, a cross-sectional study was conducted between February and October of 2024 using a non-probability (purposive) sampling method. A questionnaire was provided following a thorough review and reading of the pertinent literature. Three sections were in the questionnaire. First, it asked about children's sociodemographic characteristics, the second was about physical activity, and the third enrolled information about eating habits. The direct interview method was used to obtain the pattern.

Results: A total of 40.5% of participants were overweight, and 28.5% were underweight. We showed that 67% of urban females were overweight and 8% were underweight; while 65% of rural females were underweight and 5% were overweight. In rural areas, 64% of males were underweight and 36% had normal weight. A high percentage (53%) of children reported walking and a low percentage (47%) mentioned private services for transportation. Leisure time was 51.8% for watching television and 22.7% was for computer works. The favorite sport was football (78.8%) and 0.1% was for gymnastics. Totally, 74.5% of children reported receiving money from parents to buy food; while 25.1% did not.

Conclusion: Obesity and overweight were shown to be health to affect school children and the main risk factors were unhealthy eating patterns and a sedentary lifestyle.

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Introduction

Obesity, defined as the accumulation of extra body fat, has been extensively studied in all age categories, genders, and ethnic and geographic groups. An easy technique to evaluate body fat indirectly is to use body mass index (BMI), which classifies children and adolescents as either obese (95th percentile or higher) or overweight (>85th percentile to <95th percentile) (1-3). The frequency of overweight and childhood obesity has significantly increased worldwide since the 1990s revealing that 41 million children less than five years were overweight or obese in 2016, and 124 million children and teens aged five to nineteen

years old were obese (4). Although it shows a rise in underdeveloped nations, childhood obesity is more common in industrialized countries. Given the potential of long-term health consequences such as obesity that can last till adulthood and lead to an elevated risk of chronic diseases, this topic merits a greater consideration. There may also be immediate and long-term psychosocial health effects, such as depression and a decline in self-esteem (4). Obesity has been associated with genomic, behavioral, environmental, and metabolic factors (5). This complex connection can lead to a complex chronic illness with a variety of phenotypes and clinical symptoms. When taken as a whole, these factors can explain why management and treatment responses are challenging (6).

The main reasons behind the rise in obesity prevalence worldwide are behavioral and environmental variables. Larger portions, easy availability, high-calorie fast food, intake of sugar-sweetened drinks (SSBs), and a sedentary lifestyle are all associated with a higher incidence of obesity in children (7). Physical activity is another essential component, in addition to diet. Children and teenagers are becoming increasingly sedentary as a result of technological advancements. Watching television, using a computer, playing video games, and using a mobile phone are all considered forms of screen time. The most prevalent sedentary behavior at the moment, beginning even in infancy, is screen time (8).

Time spent on screen-based activities can take the place of physical activity and have an impact on young people's physical and mental health (9). The detrimental consequences of excessive screen usage on physical strength, weight, and sleep difficulties have been described before (10). A frequently disregarded risk factor linked to elevated blood pressure in kids and teenagers is usually a sleep disruption. Among the factors linked to poor sleep, lower parental education, consistent enforcement of caffeine-related regulations, and overnight use of devices in the child's bedroom can be mentioned (11). In addition to the well-known elements mentioned above, socioeconomic hardship, dysfunctional families, child distress, and junk food should be taken into account (12).

The influence of genetic factors and how it contributes to obesity has been determined. Individual differences in weight gain susceptibility point to a heritable component of obesity that can interact with environmental factors too (13). When genetic factors are taken into account, the majority of obesity cases are polygenic, meaning that several genes contribute little to the total phenotype. Genetic sensitivity may therefore affect weight when paired with other behavioral and environmental factors. Unlike monogenic obesity, which accounts for 3 to 5% of obese children, monogenic obesity is characterized by an early gain in weight, often in the first and second years of life. A mutation in the melanocortin 4 receptor gene (MC4R) is the most common genetic aberration associated with a severe, early form of pediatric obesity (14). Therefore, this study was undertaken to determine obesity risk factors among school children in Basrah, Iraq.

Materials and Methods

A descriptive cross-sectional study was carried out in schools of Basrah City, Iraq between February and October 2024. In this investigation, non-probability (purposive) sampling method was employed. The researcher created a questionnaire following a thorough review and reading of the pertinent literature. Three sections made up the questionnaire were first asking about children's sociodemographic characteristics; second, assessing their physical activity; and third, evaluation of their eating habits. The direct interview method was used to obtain the information. A total of 600 students were interviewed; while they were enrolled in classes in Basra city.

To analyze the data, SPSS statistical software (Version 20, Chicago, IL, USA) was used. A p value less than 0.05 was considered statistically significant. The participants' sociodemographic profile and potential risk factors were descriptively analyzed to determine overweight and obesity prevalence. Using common statistical tests like the Chi-square test, the association between each potential risk factor and the existence of obesity or overweight was determined. To find correlated factors, a suitable multivariate analysis was conducted. All subjects' heights and weights were measured using conventional tools (weight measuring device, tape measure) per standard protocols. WHO charts were used to compute BMI based on age.

Results

Socio-demographic data of the participants was presented in Table 1 and Table 2 demonstrates body mass index (BMI) of the participants. Table 3 reveals the body mass index (BMI) of the participants according to sex and residence. A total of 40.5% of participants were overweight, and 28.5% were underweight. We showed that 67% of urban females were overweight and 8% were underweight. Totally, 65% of rural females were underweight and 5% were overweight. In rural areas, 64% of males were underweight and 36% had normal weight.

Table 1: Socio-demographic data of the participants.

Variable	Frequency	Percent
Sex		
Male	400	66.6
Female	200	33.4
Age		
10-11 Years	517	86.3
12-13 Years	83	13.7
Mean±SD=22.8±5.977		
Class		
Fourth	67	11.2
Fifth	284	47.3
Sixth	249	41.5
Job of father		
Employee	314	52.4
Free business	274	45.6
Deceased	12	2
Job of mother		
Employee	151	25.1
Housewife	448	74.6
Free business	1	0.3
What are the means you use to go to school?		
Walking	318	53
Private care	282	47
Buses		
Spare time		
Housework	153	25.5
Television	311	51.8
Computer	136	22.7
Favorite sport		
Boxing	3	0.5
Football	473	78.8
Swimming	8	1.3
Basketball	22	3.6
Walking	5	0.8
Gymnastics	1	0.1
Run	79	13.5
Handball	2	0.3
Do not have a favorite sport	7	1.1
Do your parents give you money?		
Yes	592	98.7
No	8	1.3
How much money (Dinar)?		
2000	39	6.5
1000	439	74.5
500	108	18
250	6	1
Where do you spend your money?		
Buying food	592	100
Are your parents obese?		
Yes	200	33.4
No	400	66.6
Do you have a disease?		
Yes	44	7.3
No	556	92.7

Table 2: Body mass index (BMI) of the participants.

BMI	Groups	Frequency	Percent	Mean±SD
Underweight	<18.5	168	28	-
Normal	18.5-24.9	189	31.5	-
Overweight	25-29.9	243	40.5	-
Obese I	30-34.9	-	-	-
Obese II	35-39.9	-	-	-
Obese III	≥40	-	-	-
	Total	600	100	22.8±5.977

Table 3: Body mass index (BMI) of the participants according to sex and residence area.

Variable	Female		Male	
	Urban	Rural	Urban	Rural
Underweight	8	65	31	64
Normal	25	30	98	36
Overweight	67	5	171	-
Obese I	-	-	-	-
Obese II	-	-	-	-
Obese III	-	-	-	-
Total	100	100	300	100

Table 4: Activity of the children.

Variable			Degree of freedom (Df)	*P* value	Significance
Does the school provide sport time?					
Yes	501	83.5%	210	0.0001	High
No	99	16.5%	-	-	-
How many times does a school provide time for sport?					
Once	333	66.5%	105	0.0001	High
Twice	96	19.2%	-	-	-
Three times	72	14.3%	-	-	-
Who is the student's guide?					
Teacher	467	77.8%	315	0.0001	High
Sports teacher	35	5.8%	-	-	-
No one	98	16.4%	-	-	-
Are children's activities at school adequate?					
Yes	239	39.8%	210	0.0001	High
No	361	60.2%	-	-	-
Is the school providing games?					
Yes	205	34%	105	0.0001	High
No	395	66%	-	-	-
Do you enjoy a sport lesson?					
Yes	493	82%	210	0.01	High
No	107	18%	-	-	-
Movement within the school					
Prefer to walk	567	94.5%	210	0.0001	High
Sit in your place	33	5.5%	-	-	-

We showed that 66% of the 400 male participants and 34% of 200 female participants were between the ages of 10 and 11 (86.3%) and 12 and 13 (13.7%). A high percentage of father's occupation was to be employee (52.4%) and a lower percentage were deceased people (2.4%). The majority of mothers' occupation was to be a housewife (74.6%) and a low percentage was a free business (1.2%).

A high percentage (53%) of children reported walking and a low percentage (47%) mentioned private services for transportation. The leisure time was 51.8% for watching television and 22.7% was computer works.

The favorite sport was football (78.8%) and a low percentage (0.1%) was gymnastics. When asked if the school provides time for sport, the majority of respondents (83.5%) said "yes," while the lowest number (16.5%) answered "yes." In our population, a high percentage (66.5%) and a lower percentage (14.3%) said "yes" three times. There was a large percentage of students who choose to stroll (94.5%) and a low percentage to sit (5.5%), while a high percentage (77.8%) had student guide instructor and a low rate (5.8%) had a sport teacher (Table 4).

When they were asked to eat sweets, a large percentage (67.5%) responded "yes" and a low number (32.5%) answered "no". A high-percentage (41.6%) reported three times meals per day and a low-percentage mentioned four times meals per day. Totally, 61% of the children responded "yes" attending school without eating any meal and 39% of them answered "no" to intake of food when entering the school. A high percentage of children responded "yes," for lunch (83.8%) and a low percentage for breakfast (16.2%). The types of snacks or sweets that children preferred were cake and juice (47.5%), chips and juice (18.6%), and parents' foods (53.6%), or guardians' foods (2.1%). Totally, 55% of the times, they answered "yes" when asked if the school prepared food. If so, the highest percentage of food types was fatty foods (93.4%) and the lowest was healthy foods (6.6%). Totally, 74.5% of children reported receiving money from parents to buy food; while 25.1% did not (Table 5).

Discussion

We showed that 66% of the 400 male participants and 34% of 200 female participants were between the ages of 10 and 11 (86.3%) and 12 and 13 (13.7%). These findings are in agreement with two studies (15, 16) that stated the majority of the study participants were male. Also, our results agree with two more studies that reported most of the participants' age was between ten and eleven years old (17, 18). A high percentage of father's occupation was to be

Table 5: Nutritional status of the children.

Variable			Degree of freedom (Df)	*P* value	Significance
Do you eat sweets between meals?					
Yes	405	67.5 %	210	0.0001	High
No	195	32.5 %			
How many times do you eat per day?					
Once	129	21.6 %	240	0.0001	High
Twice	192	32 %	-	-	-
Three times	250	41.6 %	-	-	-
Four times	29	4.8 %	-	-	-
Do you go to school without a meal?					
Yes	365	61 %	210	0.994	Nigh
No	235	39 %	-	-	-
If the answer is yes	Breakfast	Lunch	-	-	-
	59	306	-	-	-
	16.2 %	83.8 %	-	-	-
Types of snacks or sweets preferred by children					
Cake and juice	285	47.5 %	420	0.0001	High
Chips and juice	108	18 %	-	-	-
Chips			-	-	-
Sandwich	207	34.5 %	-	-	-
Do you buy from outside restaurants?					
Yes	399	66.5 %	210	0.6	High
No	201	33.5 %			
Is a school preparing food?					
Yes	271	45 %	105	0.0001	High
No	329	55 %	-	-	-
If the answer is yes	Healthy food	Fatty food	-	-	-
	18	253	-	-	-
	6.6 %	93.4 %	-	-	-
Who chooses the snack or sweets?					
Parents	322	53.6 %	315	0.494	No
Children	265	44.3 %	-	-	-
Guardian	13	2.1 %	-	-	-

employee (52.4%) and a lower percentage were deceased people (2.4%). These results agree with other studies that revealed the majority of the population was employee (19, 20). The majority of mothers' occupation was to be a housewife (74.6%) and a low percentage was a free business (1.2%). These findings were in agreement with other studies that found the majority of the mothers were housewives (21, 22).

We demonstrated that a high percentage (53%) of children reported walking and lower percentage (47%) private services for transportation. These findings are in line with previous researches that observed the majority of the study participants used walking for transportation (23, 24). The leisure time, with a high percentage of 51.8% was watching television and a lower percentage (22.7%) worked with computer. Our present investigation aligns with previous studies that illustrated the majority of the participants to watch television in their leisure time (25, 26). The favorite sport with a high percentage (78.8%) was football and a low percentage (0.1%) was gymnastics. A high percentage (74.5%) of children reported receiving money from parents and a low percentage (25.1%) did not. Consistent with our results, others researchers demonstrated the majority of the participants to have a low income (27, 28).

A total of 243 (40.5%) participants were overweight, while 168 (28.5%) were underweight. These findings align with previous researches that indicated the majority of the participants to be overweight (29, 30). We showed that urban females were more likely to be overweight (67%) or underweight (8%), and rural females were more likely were underweight (65%) and less likely were overweight (5%). These results are identical to previous findings that depicted the majority of the participants to be overweight among urban females (31, 32). In rural areas of our study, males were more likely underweight (64%) and a low percentage (36%) had normal weight. Our investigation's results align with a previous research (33) that exhibited the majority of the participants to be overweight among urban females. When asked if the school provides time for sport, the majority of respondents (83.5%) said "yes," while the lowest number (16.5%) answered "yes." In our population, a high percentage (66.5%) and a lower percentage (14.3%) said "yes" three times. Consistent with our research, others stated the majority of the participants to conduct a sport field at school (34).

In our study, there was a significantly large percentage of students who choose to stroll (94.5%) and a low percentage to sit (5.5%), while a high percentage (77.8%) had student guide instructor and a low rate (5.8%) had a sport teacher. These findings agree with a previous research that described a majority of participants selected to stroll (35). When they were asked to eat sweets, a large percentage (67.5%) responded "yes" and a low number (32.5%) answered "no". A high-percentage (41.6%) reported three times meals and a low-percentage mentioned four times meals. Totally, 61% of the children responded "yes" attending school without eating any meal and 39% of them answered "no" to intake of food when entering the school. A high percentage of children responded "yes," for lunch (83.8%) and a low percentage for breakfast (16.2%). The types of snacks or sweets that children preferred were cake and juice (47.5%), chips and juice (18.6%), and parents' foods (53.6%), or guardians' foods (2.1%). Totally, 55% of the times, they answered "yes" when asked if the school prepared food. If so, the highest percentage of food types was fatty foods (93.4%) and the lowest was healthy foods (6.6%). These findings are in line with a previous research that noticed the majority of participants to eat lunch (36).

For children who went to school without taking any meal, nutritional quality, eating sweets between meals, times to eat each day and type of snacks or sweets were significantly important. In China in the Wannan region, the prevalence of obesity and overweight among 67956 Chinese primary school pupils aged 5-14 years was investigated and revealed 36664 of whom were male and 31292 were female and with an age range from 5 to 14 years. The overall prevalence of overweight and obesity among the participants was 17.85%, with male subjects having a prevalence of 22.9% and female subjects having a prevalence of 11.9%. A total of 3.7% of participants were obese; while among male subjects was 5.2% and among female subjects was 1.8% (37).

A research during 2002 in Saudi Arabia studied the prevalence of obesity and overweight among children Aged 1-18 years. Overweight prevalence was 10.7% in boys and 12.7% in girls; while obesity prevalence was 6.0% and 6.74% in both genders, respectively (38). In another study in China, the Eastern province had the highest prevalence and the Southern province had the lowest. Both boys and girls were most likely to be obese in the age range of 2-3 years. The prevalence declined in both sexes until the age of 8-13 years, after which it rose once again until the age of 18 years (39). A study in Sri Lanka among adolescent students in the Colombo educational zone showed no gender difference in the prevalence of overweight and obesity among these teenagers, which was 10.8% in boys (CI: 9.3-12.5) and 3.9% in girls (CI: 3.1-5.0). Adolescent obesity and overweight were significantly correlated with

attending an international or semi-government schools (40).

Conclusion

Obesity and overweight were shown to be health issues that could affect school children and the main risk factors were unhealthy eating patterns and a sedentary lifestyle.

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Authors' Contribution

HSE: Conseptulization, Data curation, Methodology. NSK: Writing original draft, resources. NSS: Writing and review, data collection

Conflict of Interest

None declared.

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