

**Prevalence of Childhood Obesity among the School Children of Sakaka, Aljouf.**

**Abdulsalam M Alanazi<sup>1</sup>, Haddaj A Alkurya<sup>1</sup>, Ahmed O Alruwaily<sup>1</sup>, Abdulelah M Alnusayri<sup>2</sup>,  
Ashokkumar T<sup>3</sup>, Saad A Mohamed<sup>3</sup>.**

**Affiliation:** 1 Medical Student, College of Medicine, Jouf university, 2 Demonstrator of Paediatric, College of Medicine, 3 Assistant professor, College of Medicine, Jouf university,

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**\*Author for correspondence:** Dr. Ashokkumar Thirunavukkarasu, Assistant professor of Community Medicine, College of Medicine, Aljouf University, SA. **Email:** jamlash@gmail.com

**ABSTRACT**

**Introduction:** Childhood overweight and obesity is one of the most common public health problems in the Kingdom of Saudi Arabia and the world. There is increasing trend of childhood obesity in the Kingdom. **Objectives:** To determine prevalence and risk factor for childhood overweight and obesity among primary school children of Sakaka. **Materials and Methods:** Primary school children from different schools of Sakaka were randomly selected by using stratified random sampling technique. World Health Organization Growth Chart for the children aged 5 – 19 years were used to assess overweight and obesity status. SPSS version 18 was used for data analysis. **Results:** Out of 166 studied population, the prevalence rate of overweight among primary school students was 9.7% and that for obesity was 19%. Children with parents of high education, Watching TV, using computer, or playing video games more than 4 hours per day, children of obese mother had significantly ( $p<0.05$ ) more risk of developing overweight and Obesity: **Discussion:** This study prevalence is support the previous findings which stated that the prevalence of overweight among male school children 6-12 years was 7.3% while that of obesity was 17.4%. **Recommendation:** We must plan to provide family-oriented, lifestyle and weight management programs for children and young people who are obese and overweight.

**Key word:** Obesity, school children, overweight, Sakaka, Aljouf.

**INTRODUCTION**

Childhood overweight and obesity is one of the most common public health problems in the Kingdom of Saudi Arabia and the world [1]. The World Health Organization (WHO) states that in 2014 there were around 41 million children under 5 years of age are obese [1]. Data from National Health and Nutrition Examination Survey (NHANES) surveys, which was done in different period of time (1976-1980 and 2003-2004) showed that the prevalence of overweight is increasing: For children of age group 2-5 years, the prevalence has increased from 5% to 18.8%. [2]

The prevalence of overweight and obesity among Saudi boys increased from 8.6% and 4% in 1994 [3] to 7.3% and 17.4% respectively in 2014 [4]. There are several studies [5 – 9] in the Kingdom of Saudi Arabia indicated the same trend in the past two decades.

Obesity and overweight is not a single disease but is a syndrome with multifactorial causes that includes metabolic, genetic, environmental, social, and cultural interaction. [10]

The World Health Organization (WHO) in their fact sheets [1] stated the following: The basic cause of obesity and overweight is due to an energy imbalance between calories intake and calories expended. Worldwide, there has been an increased intake of high caloric foods that are rich in fat; and an decrease in physical activity

contributed by increasingly sedentary lifestyle, change in modes of transportation.

These changes in nutritional and physical activity patterns are mainly the result of environmental and societal changes linked with development and lack of adequate policies in sectors such as health, agriculture, transport, urban planning, environment, food processing, distribution, marketing, and education.

The most important health consequences of childhood overweight and obesity, that mostly do not become noticeable until adulthood, include: cardiovascular problems (mainly heart disease and stroke); diabetes mellitus; musculoskeletal disorders like osteoarthritis; and some types of cancer (endometrial, breast and colon) [11]. Childhood is an important period for the origin of obesity and its associated morbidity. Obesity at any age may increase the persistence at subsequent ages; It was found in at least two studies [12, 13] The found more than half of all obese children remained obese as adults. The family and home environment are often implicated in the development of childhood obesity.

A number of studies highlighted the association between environmental factors, mainly factors related to sedentary lifestyle (like eating unhealthy food or physical inactivity) and childhood obesity. [14]

Low level of physical activity in children is also influenced by the amount of physical activity undertaken by parents. Children with active parents were six times more likely to be active compared with parents who are not active.[15]

Time spent on watching TV or computer screens and video games appears to be an important index of sedentariness which could increase the risk of obesity.[16,17] Reducing television viewing and computer use may have an important role in preventing obesity and in lowering body mass index (BMI) in young children.[18] Recent studies also showed that short sleep duration may be a risk factor for obesity in children.[19, 20]

Objectives of this study were to determine the prevalence of overweight and obesity among the primary school children of sakaka, Saudi Arabia and to identify the risk factors for the childhood overweight and obesity among them.

### MATERIAL & METHODS

This study was a cross Sectional Study and it was conducted among different schools of Sakaka city, Saudi Arabia. Study subjects were primary school children. Only male students were included in this study. The sample size calculated based study done by Al Dahi et al [4]. on prevalence of childhood obesity (17.8%). The sample size was calculated by using the formula  $n = (1.96)^2 pq/d^2$ . Here, p is the expected prevalence (17.8%) q is  $(100-17.8 = 82.2\%)$  and d is precision = 0.05 (95% confidence interval ). Sample size  $(n) = (1.96)^2 \times 0.178 \times 0.822 / 0.05 \times 0.05 = 224$ . Stratified sampling method was used to select the students. In the first stage, a sample of four primary schools from Sakaka were selected through simple random technique. In the second stage, stratified sampling technique was used. Each grade of a selected school was treated as stratum; the sample from each stratum were equally selected by systematic random technique from students list, i.e. by selecting the odd numbers from the students list. The selection of the students from that particular grade was stopped once they reach required sample from that grade.

**Tool for data collection:** Survey questionnaire were pre-tested before the survey through pilot study

**Study questionnaire:** It was translated into Arabic be given to students to get completed by their parents. It has several socio demographic factors

**Body Mass Index Assessment:** Height and Weight of the selected students were measured with standard and calibrated height and weighing scale.

$$\text{Formula for BMI} = \frac{\text{Weight (in Kgs)}}{\text{Height (in meters)}^2}$$

**Nutritional status assessment:** This was done based on World Health Organization Growth Chart for the children aged 5 – 19 years [21]

First step, the mean BMI of the study population were measured **Normal:** Students with BMI between –2 SD and +1 SD (from mean) were defined as normal.

**Overweight:** Students with BMI between +1 SD and +2 SD were defined as overweight.

**Obesity:** Students with BMI above +2 SD (from the mean) were defined as obese.

**Ethical approval:** This study proposal/synopsis was submitted to research committee of college of medicine. The data for this study were collected after necessary approval and consent.

**Analysis of data** Statistical Package for Social Science (SPSS), version 18 was used to enter and analyze data. Chi-square test was used to identify the significant factors associated with the prevalence of overweight and obesity. A P value less than 0.05 was considered statistically significant.

### RESULTS

This study was done among two randomly selected primary school of Sakaka. The total number of participants responded for this survey was 166 (Out of 224 selected sample size). Hence the response rate for this survey was 74.1%.

**Table 1: Socio – Demographic Details of study population (n = 165)**

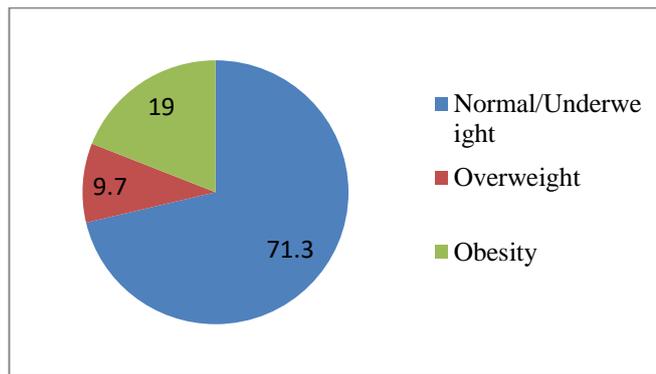
Characteristics	No	%
<u>Age group (in years)</u> (9.7±2.1)		
6 - 9	76	46.2
10 – 13	89	53.8
<u>Father's education</u>	82	49.5
Secondary school or lower	83	50.5
Bachelor or above		
<u>Mother's education</u>		
Secondary school or lower	99	59.8
Bachelor or above	66	40.2
<u>Family size</u>		
≤6	70	42.6
>6	95	57.4
<u>Watching TV, using computer, or playing video games per day</u>	65	39.6
≤4 hours	100	60.4
>4 hours		
<u>Duration of sleeping per day</u>		
≤8 hours	145	87.6
>8 hours	20	12.4
<u>Paternal obesity</u>		
No	122	73.7
Yes	43	10.3
<u>Maternal obesity</u>		
No	114	68.9
Yes	51	31.1

The mean age of the sample population is  $9.7 \pm 2.1$  years. Table 1 also presents the study participants' socio-demographic profile and lifestyle factors.

Regarding the age group, 53.8% of the students are 10-13 years. About half (50.5%) of the children were born to a

father who has completed bachelor degree or/and higher. But this proportion (40.2) was less regarding mothers' education. This study also found that 57% of study participants' family size is more than 6.

Figure 1. Nutritional status of study participants



In the sample studied, the prevalence rate of overweight among primary school students was 9.7% and that for obesity was 19% (Fig 1)

Table 2. Risk factors for overweight and Obesity

Characteristics	Overweight	Obesity	p value
	No (%)	No (%)	
Age group (in years)			
6 - 9	18 (11.8)	28 (18.3)	0.666
10 – 13	14 (9.6)	35 (15.1)	
Father's education			
Secondary school or lower	18 (11.0)	22 (13.4)	0.008
Bachelor or above	14 (8.4)	41 (24.6)	
Mother's education			
Secondary school or lower	18 (9.1)	34 (17.2)	0.018
Bachelor or above	14 (10.5)	29(21.8)	
Family size			
≤6	11(7.8)	37 (16.2)	0.07
>6	21(11.1)	26(13.7)	
Watching TV, using computer, or playing video games per day			
≤4 hours	23(12.3)	34(17.0)	0.005
>4 hours	9 (9.6)	29 (22.1)	
Duration of sleeping per day			
≤8 hours	29 (10)	56(19.3)	0.678
>8 hours	3(7.3)	7(17.1)	
Paternal obesity			
No	16 (8.4)	41(21.6)	0.477
Yes	16 (15.6)	22 (15.6)	
Maternal obesity			
No	26 (9.7)	48 (17.8)	0.01
Yes	6 (9.7)	15 (24.2)	

The present study revealed that the children with the following characteristics had significantly (p<0.05) more

risk of developing overweight and Obesity: Children with parents of high education, Watching TV, using computer, or playing video games more than 4 hours per day, children of obese mother. (Table 2)

DISCUSSION

The current study was aimed to assess the prevalence and risk factors for overweight and obesity among primary school children of Sakaka city of Aljouf.

The present study found there is considerable prevalence of overweight (9.7%) and obesity (19) among primary school children. This study prevalence is support the previous findings which stated that the prevalence of overweight among male school children 6-12 years was 7.3% while that of obesity was 17.4%. [4] Also this study findings are similar to study done in several part of KSA [5-8].

Alhazmi et al[3] conducted a cross-sectional national epidemiological household survey in different areas of Saudi Arabia from 1994 to 1998. In their study the prevalence of overweight among boys aged 6-12 years was 8.6%while the prevalence of obesity was 4.9%. This indicates there is alarming increase in childhood overweight and obesity from in last two decades.

In the present study, a significant association was observed between students' obesity and high paternal education. This is similar to study conducted in KSA and other parts of middle east [4-7].

But studies done in France and German by Brwonell et al[12] found that paternal education do not have significant impact on childhood obesity and overweight. This may be mostly due to difference in cultural factor.

Watching TV, using computer, or playing video games more than 4 hours per day is one of the important risk factors identified in our study. But it contradicts from study done by Alenzy et al [4].

Recommendations:

1. Health education sessions to be conducted for parents with the special focus on targeted group ( high risk group)
2. We must plan to provide family-oriented, lifestyle and weight management programs for children and young people who are obese and overweight.
3. Also, Integrate the guidance for non-communicable disease prevention in school curriculum
4. Students must be encouraged to play outdoor games and limit the time spent on watching TV, using computers or playing video games.

**Limitations:**

1. Dietary factors and physical activities are not collected (As they can be collected accurately from parents).
2. Paternal nutritional status (Height and Weight) are not measured directly (as we have taken only reported weight)  
These are not done in this present study due to time constraints. Attempt will be made in next academic year to collect the relevant data for further analysis.

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