

## THE PREVALENCE OF UNDER FIVE (2-5) YEARS CHILDHOOD OBESITY AT THE WELL BABY CLINIC OF NORTH WEST ARMED FORCES HOSPITAL (NWAFFH) AT TABUK CITY

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### ABSTRACT

**Background:** Childhood overweight and obesity are rapidly growing in developing countries, including Saudi Arabia. However it is challenging to know that overweight and obesity as well as related non communicable diseases are largely preventable.

**Aims & Objective:** To measure the prevalence of under-five (2-5) childhood obesity in children visiting the well-baby clinic in NWAFFH in Tabuk city in the month of the study as well as to determine some of the underlying factors.

**Materials and Methods:** This is a cross-sectional study included Saudi Children under five (2-5 years) attending the well-baby clinic in NWAFFH, Tabuk during March 2013. Obesity was determined by national growth charts and CDC body mass index charts. Data collection tools included check list filled by researcher, by interviewing the parents, growth parameters measured at well baby clinic and blotted on the CDC growth charts and reviewing of under-five children's files at well baby clinic.

**Results:** The study included 170 children who were from 2 to 5 years. Males were 54.11% while females were 45.99 %. The prevalence of childhood obesity (overweight) was 7.6%, while (63.5%) of the study subjects were in the healthy weight area. Working mothers showed higher significant prevalence of their childhood obesity compared to non-working mothers (27.3% versus 4.7%). This difference was statistically significant,  $p=0.002$ . Nutritional history, mother's education, family income, number of kids and duration of watching TV were not significantly associated with childhood obesity.

**Conclusion:** The prevalence was considerable, showing that obesity really is a health problem growing day after day in both children and adults and it needs more and more attention because it leads to a lot of health issues.

**Key Words:** Childhood; Obesity; Prevalence; Associated Factors; Saudi Arabia

### Introduction

Overweight is defined as excess of body weight, whereas obesity refers to an excess of fat.<sup>[1]</sup> Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health.<sup>[2]</sup>

The global epidemic of overweight and obesity - "globesity" - is rapidly growing in developing and under developing countries as well. Paradoxically coexisting with under nutrition in developing countries, the increasing prevalence of overweight and obesity is associated with many diet-related chronic diseases including diabetes mellitus, cardiovascular disease, stroke, hypertension and certain cancers.<sup>[3]</sup> The fundamental cause of childhood overweight and obesity is an energy imbalance between calories consumed and calories expended.<sup>[2]</sup>

Global increases in childhood overweight and obesity are attributable to a number of factors including a global shift in diet towards increased intake of energy-dense foods that are high in fat and sugars but low in vitamins, minerals and other healthy micronutrients and a trend towards decreased physical activity levels due to the

increasingly sedentary nature of many forms of recreation time (e.g. internet, play station), changing modes of transportation, and increasing urbanization.<sup>[2]</sup>

The prevalence of obesity among school-aged children (6 to 11 years) and adolescents (12 to 19 years) in the United States dramatically increased between 1976 to 1980 and 2003 to 2004 (from 6.5 to 18.8 percent in children, and from 5.0 to 17.4 percent in adolescents). In 2004, approximately 34 percent of children and adolescents in the United States were either overweight or obese. The prevalence of obesity also tripled for preschool-aged children (2 to 5 years) from 5 percent in 1976 to 1980 to 13.9 percent in 2003 to 2004. In 2004, approximately 26 percent of children between 2 and 5 years were either overweight or obesity.<sup>[4]</sup>

Childhood obesity is more common among Native Americans, non-Hispanic blacks, and Mexican Americans than in Caucasians. Having an obese parent increases the risk of obesity by two-to three folds.<sup>[4]</sup> In longitudinal studies, approximately 25 percent of obese preschool children remain obese as adults. Girls are more prone than boys to develop persistent obesity during adolescence.<sup>[4]</sup>

The body mass index (BMI) is the accepted standard measure of overweight and obesity for children two years of age and older. Other measures of childhood obesity, including weight-for-height which is particularly useful for the child younger than two years. In 2000, the National Center for Health Care Statistics and the Centers for Disease Control published BMI reference standards for children between the ages of 2 and 20 years.<sup>[4]</sup>

BMI-for-age weight status categories and the corresponding percentiles are shown in the table 1.<sup>[4]</sup>

**Table-1: Weight status category and percentile range**

Weight Status Category	Percentile Range
Underweight	< 5 <sup>th</sup> percentile
Healthy weight	5 <sup>th</sup> to < 85 <sup>th</sup> percentile
At risk of overweight	85 <sup>th</sup> to < 95 <sup>th</sup> percentile
Overweight	≥ 95 <sup>th</sup> percentile

Obese — Some experts, including the Institute of Medicine and the International Obesity Task Force, use the term "obese" to describe children whose weight is >95 percentile for age and sex. The CDC does not use the term "obesity" in describing childhood weight categories because they feel that the term obesity is interpreted by children to be pejorative.

Morbid obesity — the term morbid obesity is reserved for those children who have obesity-related comorbidities. The 99th percentile for BMI appears to be a useful cutoff to define a group with medically significant obesity in children and adolescents.<sup>[4]</sup>

Provision of high quality health care requires knowledge of normality that helps distinguish health from disease. Many countries including KSA have established their own comprehensive growth charts for their children and adolescents. However in the kingdom of Saudi Arabia, a study was conducted to establish reference growth charts for Saudi children and adolescents. The study was conducted over a two year period [2004-2005] as a cross section study in all 13 regions of the kingdom. So, now we have our national growth charts for our children and we can use them in our studies and evaluation of our children health.<sup>[5]</sup>

Finally, it is challenging to know that overweight and obesity as well as related non communicable diseases are largely preventable.<sup>[2]</sup> This study aimed to measure the prevalence of under-five (2-5) childhood obesity in children visiting the well-baby clinic in NWAFFH in Tabuk city in the month of the study as well as to determine some of the underlying factors.

## Materials and Methods

This is a cross-sectional study included Saudi Children under five (2-5 years) attending the well-baby clinic in NWAFFH, Tabuk during March 2013. Tabuk is located in the North West Region of Saudi Arabia. It covers about 116,400 Km<sup>2</sup>. It is considered to be one of Saudi Arabia's borders from the northern region. Tabuk contains about 62 primary health care centers and 10 hospitals. One of the largest hospitals is North West Arm Forces Hospitals which is about 600 beds capacity. Children on steroids or having pathological obesity were excluded from the study. Obesity was determined by national growth charts and CDC body mass index charts.

Sample size was calculated using EPI info version 6. It was 170 children. Simple random technique was applied to recruit participants. Data collection included check list filled by researcher, by interviewing the parents, growth parameters measured at well baby clinic and blotted on the CDC growth charts and reviewing of under-five children's files at well baby clinic.

Written permission from the hospital ethical committee to conduct the research was obtained, verbal consent were taken from parents of children visiting well baby clinic. Confidentiality was assured of all research information. Ethical considerations were taken through all research steps. Notification to the head nurse and well-baby clinic health providers was given.

Data were entered a computerized system and analyzed by SPSS (the statistical package of the social sciences) version 18. Chi-square test was applied to test for the association and/or difference between categorical variables.

## Results

The study included 170 children who were from 2 to 5 years. They were recruited from well-baby clinic in North West Arm Forces Hospital, Tabuk. Males were 54.11% while females were 45.99 %. The prevalence of childhood obesity (overweight) was 7.6%, while (63.5%) of the study subjects were in the healthy weight area (Figure 1).

Table 2 shows that childhood obesity was more reported among children who feed on bottles on mixed compare to those who breast fed (8.1%, 8.5% versus 6.1%). However, the difference was not statistically significant.

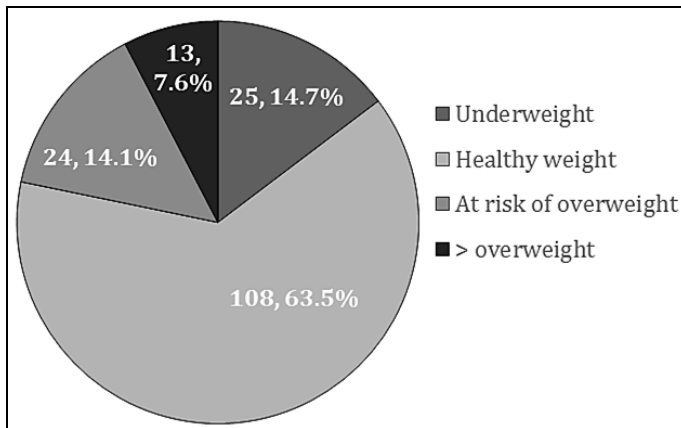


Figure-1: Distribution of children (2-5 years) according to their body mass index

Table-2: Nutritional history and childhood obesity

BMI Categories	Nutritional History			Total
	Breast N (%)	Bottle N (%)	Mixed N (%)	
Underweight	8 (16.3)	12 (16.2)	5 (10.6)	25
Healthy weight	34 (69.4)	45 (60.8)	29 (61.8)	108
At risk of overweight	4 (8.2)	11 (14.9)	9 (19.1)	24
>overweight	3 (6.1)	6 (8.1)	4 (8.5)	13

$\chi^2 = 3.42$ ;  $df = 6$ ;  $p=0.754$

Table-3: Mother's education and childhood obesity

BMI Categories	Mother Education			Total
	Low N (%)	Medium N (%)	High N (%)	
Underweight	11 (13.3)	14 (16.3)	0 (0.0)	25
Healthy weight	54 (65.1)	53 (61.6)	1 (100)	108
At risk of overweight	13 (15.7)	11 (12.8)	0 (0.0)	24
>overweight	5 (6.0)	8 (9.3)	0 (0.0)	13

$\chi^2 = 1.76$ ;  $df = 6$ ;  $p=0.940$

Table-4: Mother's job and childhood obesity

BMI Categories	Mother Job		Total
	Yes N (%)	No N (%)	
Underweight	2 (9.0)	23 (15.5)	25
Healthy weight	10 (45.5)	98 (66.2)	108
At risk of overweight	4 (18.2)	20 (13.5)	24
>overweight	6 (27.3)	7 (4.8)	13

$\chi^2 = 14.91$ ;  $df = 3$ ;  $p=0.002$

Table-5: Number of kids and childhood obesity

BMI Categories	Number of Kids			Total
	1-2 N (%)	3-4 N (%)	≥ 5 N (%)	
Underweight	11 (17.2)	10 (16.9)	4 (8.5)	25
Healthy weight	40 (62.5)	36 (61.0)	32 (68.1)	108
At risk of overweight	8 (12.5)	8 (13.6)	8 (17.0)	24
>overweight	5 (7.8)	5 (8.5)	3 (6.4)	13

$\chi^2 = 2.49$ ;  $df = 6$ ;  $p=0.870$

Table-6: Family income and childhood obesity

BMI Categories	Family Income		Total
	2000-5000 N (%)	>5000 N (%)	
Underweight	8 (17.4)	17 (13.7)	25
Healthy weight	28 (60.9)	80 (64.5)	108
At risk of overweight	9 (19.6)	15 (12.1)	24
>overweight	1 (2.2)	12 (9.7)	13

$\chi^2 = 4.18$ ;  $df = 3$ ;  $p=0.243$

Table-7: Watching TV and childhood obesity

BMI Categories	Hours of Watching TV		Total
	≤2 hours N (%)	≥3 hours N (%)	
Underweight	15 (12.6)	10 (19.6)	25
Healthy weight	77 (64.7)	31 (60.8)	108
At risk of overweight	15 (12.6)	9 (17.6)	24
>overweight	12 (10.1)	1 (2.0)	13

$\chi^2 = 5.00$ ;  $df = 3$ ;  $p=0.172$

From table 3, it is obvious that obesity was more reported among children whose mothers had medium education. This association between mother's education and childhood obesity was not statistically significant.

Working mothers showed higher significant prevalence of their childhood obesity compared to non-working mothers (27.3% versus 4.7%). This difference was statistically significant,  $p=0.002$  (Table 4).

As illustrated in Table 5, number of kids neither was nor significantly associated with childhood obesity. In table 6, high-income families showed higher rate of childhood obesity. However, it was not statistically significant. Watching TV for less hours appeared to be associated with childhood obesity. However, this was not statistically significant (Table 7).

## Discussion

The prevalence of childhood obesity in this study was larger than that study conducted by de Onis and Blossner in 2000 in developing countries estimated that 3.3% of preschool children (< 5 years) were overweight in 1995.<sup>[6]</sup> Comparing also our results to another study conducted also in developed countries in children < 5 years showed obesity increased from 2.8 to 3.1 % over a couple of years.<sup>[7]</sup> However, our results look to be similar to the prevalence of obesity in Ireland which is 7% mainly in females and males.<sup>[8]</sup> Comparing this result to a Saudi study done around the country, ours seems to be medium stage because Al-Hazzaa study showed that prevalence among primary school boys increased from 3.4% in 1988 to 24.5% in 2005, but here the comparison is not accurate because the difference in age.<sup>[9]</sup> Al-Othaimen et al in their study reported a prevalence of 25.2% of childhood obesity in Tabuk.<sup>[10]</sup>

The prevalence was considerable, showing that obesity really is a health problem growing day after day in both children and adults and it needs more and more attention because it leads to a lot of health issues as DM, HTN, as we mentioned in the introduction.

We studied here a lot of associated factors with obesity but the results was significant only regarding mother's job. The same has been reported by others.<sup>[11,12]</sup> In general overweight was more in children with bottle fed, medium educated mother, working mothers, family with high income, watching TV less than 2 hours.

## Conclusion

The prevalence was considerable, showing that obesity really is a health problem growing day after day in both children and adults and it needs more and more attention because it leads to a lot of health issues. We recommended the increasing awareness about children obesity which is important healthy issue, growing recently, encourage breast feeding, advice mothers postnatal specially, keeping an eye on what kind of food schools are given to children and increasing mothers awareness of healthy food and life style of children.

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