

# Risk Factors for Development of Obesity in Children

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## ABSTRACT

**Aim:** To determine whether mother and father's obesity, low physical activity and watching TV>4hr/day are risk factors for development of obesity in children.

**Settings:** Department of Pediatrics, Jinnah Hospital, Lahore: during the year 2013,

**Results:** In this study, frequency of risk factors for obesity was recorded as 147(42%) in cases and 53(15.14%) in controls had mother's obesity, odds ratio was 4.0579, 92(26.29%) in cases and 44(12.57%) in controls had low physical activity, odds ratio was 2.4799, 48(13.71%) in cases and 33(9.43%) in controls had watching TV>4 hours, odds ratio was 1.5268 while 76(21.71%) children in cases group and 67(19.14%) in control group had father's obesity, odds ratio was calculated as 1.1716.

**Conclusion:** Mother and father's obesity, low physical activity and watching TV>4 hour daily are potential risk factors for obesity in children which may be modified and persistence of obesity may be avoided.

**Keywords:** Obesity in children, risk factors, mother and father's obesity, frequency

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## INTRODUCTION

Recently, various countries are facing a higher frequency of obesity in children<sup>1</sup>. Around 42 million under 5 years of age children are overweight, while out of these 35 million are reported from developing countries<sup>2</sup>. In our country, 6% cases are obese while 19.35% are having risk of overweight<sup>3</sup>. Childhood obesity is likely to remain continue in adulthood also while it may cause various medical problems i.e. higher risk of chronic disease. The rat of metabolic syndrome (MS) is increasing, especially those cases with obesity whether children or adolescents<sup>4</sup>. Diabetes, hypertension, dyslipidemia, obstructive sleep apnea syndrome, non-alcoholic fatty liver disease, low self-esteem etc are commonly prevalent in obese children<sup>5,6</sup>. Parallel to its overall impact on health, the financial and time resources burden for its prevention and management is also a considerable factor. It is a multifactorial disorder which is influenced by behavioral, genetic, cultural and environmental factors. It is revealed that early childhood obesity, genetic factors, dietary habits such i.e., fast-food consumption and excessive energy intake, lack of any physical activity, parental obesity, TV viewing time, mother's education level, mother's employment, socioeconomic level, and lack of responsibility of parent all affect in development childhood obesity<sup>5</sup>. Various previous trial determine that physical activity may protect from obesity, while spending hours in watching TV predisposes obesity in childhood<sup>6,7</sup>.

Very limited data<sup>8</sup> is found in our local population to determine the prevalence of obesity among the school-going children (6th and 7<sup>th</sup> grade) of Lahore and ascertain the associated factors but only food consumption items were determined as risk factor of obesity while the other potential risk factors like mother's and father's obesity, low physical activity of the children and watching TV for more than four hour is still lacking to be published in our population, on the other hand, international data is variant in the results, while, another benefit of the current study is to control the obesity in children by focusing on modifiable factors like habitual low physical activity and watching TV for longer duration by creating awareness in the general public through this case control study.

## MATERIAL AND METHODS

It is a case control study, conducted at Department of Pediatrics, Jinnah Hospital, Lahore during the year 2013. We enrolled 700 children in two groups Cases and Controls (350 each) were formed, obese children were cases and controls had normal weight i.e. normal BMI ( $15 \leq \text{BMI} \leq 85^{\text{th}}$  centile). We excluded Syndromal obesity including Beckwith-Wiederman syndrome, Prader-Willi syndrome, having history of taking steroids, delayed milestones and mental retardation and those with physical handicap which interfere with physical activity. An informed consent was taken from the parents of the children to include their data in the study. History was taken from the children/parents of the children by the researcher herself to determine the risk factors.

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## RESULTS

Age distribution was done which shows that 147(42%) in cases and 173(49.43%) in controls were recorded between 5-10 years, 203(58%) in cases and 177(50.57%) in controls were recorded between 11-15 years, mean and sd was calculated as  $10.72\pm 3.07$  in cases and  $10.39\pm 3.06$  in controls (Table 1). Gender distribution of the patients was done which shows that 193(55.14%) in cases and 179(51.14%) in controls were male while 157(44.86%) in cases and 171(48.86%) in controls were females (Table 2). Frequency of risk factors for obesity was recorded which shows 147(42%) in cases and 53(15.14%) in controls had mother's obesity, odds ratio was 4.0579, 92(26.29%) in cases and 44(12.57%) in controls had low physical activity, odds ratio was 2.4799, 48(13.71%) in cases and 33(9.43%) in controls had watching TV>4 hours, odds ratio was 1.5268 while 76(21.71%) children in cases group and 67(19.14%) in control group had father's obesity, odds ratio was calculated as 1.1716 (Table 3).

Table 1: Age distribution (n=700)

Age (years)	Cases (n=350)	Controls(n=350)
5-10	147(42%)	173(49.43%)
11-15	203(58%)	177(50.57%)
Mean±SD	10.72±3.07	10.39±3.06

Table 2: Gender distribution (n=700)

Gender	Cases (n=350)	Controls(n=350)
Male	193(55.14%)	179(51.14%)
Female	157(44.86%)	171(48.86%)

Table 3: Frequency of risk factors for obesity (n=700)

Risk factors	Cases	Controls	Odd ratio
Mother's obesity	147(42%)	53(15.14%)	4.05
Low physical activity	92(26.29%)	44(12.57%)	2.47
Watching TV>4 hour	48(13.71%)	33(9.43%)	1.52
Father's obesity	76(21.71%)	67(19.14%)	1.17

## DISCUSSION

Overweight and obesity is becoming an increasingly potential problem in developing and developed world, and considered to be the most serious public health issue of the 21st century<sup>11</sup>. More than 75% of obese and overweight children are those living in countries with low- and middle-income<sup>12</sup>.

We planned this study to determine the prevalence of obesity among the school-going children (6th and 7<sup>th</sup> grade) of Lahore and ascertain the associated factors is recorded where the potential risk factors like mother's and father's obesity, low physical activity of the children and watching TV for

more than four hour was not recorded, however, the current study was conducted on modifiable factors like habitual low physical activity and watching TV for longer duration by creating awareness in the general public through this case control study.

We recorded, 147(42%) in cases and 173(49.43%) in controls were recorded between 5-10 years, 203(58%) in cases and 177(50.57%) in controls were recorded between 11-15 years, mean and sd was calculated as  $10.72\pm 3.07$  in cases and  $10.39\pm 3.06$  in controls, 193(55.14%) in cases and 179(51.14%) in controls were male while 157(44.86%) in cases and 171(8.86%) in controls were females, frequency of risk factors for obesity was recorded as 147(42%) in cases and 53(15.14%) in controls had mother's obesity, odds ratio was 4.0579, 92(26.29%) in cases and 44(12.57%) in controls had low physical activity, odds ratio was 2.4799, 48(13.71%) in cases and 33(9.43%) in controls had watching TV>4 hours, odds ratio was 1.5268 while 76(21.71%) children in cases group and 67(19.14%) in control group had father's obesity, odds ratio was calculated as 1.1716.

Our findings are consistent with Marja Vanhala and colleagues who reported that factors associated with obesity are mother's obesity (31.9% with  $\geq 30$  BMI), low physical activity (21.1%--inactive), father's overweight (12.8% with 30 BMI) and watching TV >1 hours 24.3%<sup>5</sup> while another study reveals mother's obesity (18.75% with  $\geq 25$  BMI in obese and 9.42% in normal weight children), while positive physical activity was 31.25% in obese and 28.13% in controls, father's overweight >25 BMI was 25.65% in obese and 17.80% in controls while watching TV >2 hours 42.2% in obese and 37.70% in controls.<sup>9</sup> In another study, low physical activity was 24% in obese and 13.5% in normal, while watching TV  $\geq 4$ hr/day was 35% in obese and 20.5% in normal<sup>10</sup>.

In our study, father's obesity and watching TV>4 hours were not statistically significant but the most important factor i.e. low physical activity was significantly higher in obese children which actually is the reason for obesity in children.

Mejbah Uddin Bhuiyan and colleagues<sup>14</sup> in a recent survey, are also of the view that having at least one overweight parent (p value 0.001) and engaging in sedentary activities for more than 4 hours a day (p value 0.02) were independent risk factors for childhood overweight and/or obesity while exercising  $\geq 30$  minutes a day at home was a protective factor (p=0.02). There were no significant associations between childhood overweight and sex, maternal education or physical activity at school likely to the findings of the current study. In our study, more boys were overweight than girls but the association was not statistically significant, however, obesity

prevalence was significantly higher among boys than girls in line with the results reported in urban India and Asian-Americans in US<sup>15</sup>.

A possible explanation for higher body fatness among boys might be the socio-cultural matrix in our country where parents prioritize sons, especially in the younger age children, in feeding practices. Parents are less likely to encourage sons to lose weight, possibly because of the more muscular ideal shape of male body<sup>16</sup>. In our study, higher prevalence of overweight with high socio-economic-status was observed, in contradiction to higher prevalence of overweight with low socio-economic-status observed previously in the developed countries like US and developing countries e.g., Brazil<sup>17,18</sup>.

However, in light of the above it is pertinent to mention here that other risk factors i.e. dietary habits such as excessive energy intake like fast-food consumption and soft drinks, skipping breakfast, habitual overeating and lack of parental responsibility which affect for the development of obesity in childhood are not evaluated in this study being the limitations of the study.

## CONCLUSION

We concluded that mother and father's obesity, low physical activity and watching TV>4 hour daily are potential risk factors for obesity in children which may be modified and persistence of obesity may be avoided.

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