

# OBESITY

## PREVALENCE AMONG BOYS IN PUBLIC AND PRIVATE SECONDARY SCHOOL CHILDREN

ORIGINAL  
PROF-1729

DR. FARHEEN UMAR QURESHI

DR. ANWAR SAOOD SAQIB

MBBS, DMJ

Assistant Professor Forensic Medicine  
Independent Medical College, Faisalabad.

DR. JAWAD HUSSAIN

**ABSTRACT...Background:** The problem of overweight and obesity is not confined only to developed countries but is also widely prevalent in developing countries. The study under report relates to determining prevalence of obesity and overweight in adolescent school boys. **Objective:** The objective of this study was to assess the prevalence of overweight and obesity in boys of public and private secondary schools, Faisalabad, and to relate it with their dietary style and physical activity. **Study Design:** Cross sectional and institutional based study. **Methods:** A total of 600 school boys of different age groups from the classes 6th to 10th were randomly selected and included for anthropometric measurements to categorize them into normal, overweight and obese individual. Their diet pattern and physical activity records were taken to correlate it with the obesity level. **Results:** The collected data revealed that 423 (70.5%) boys were normal. Whereas 98 (16.3%) were found to be overweight. Out of these, 72 (24.0%) were from private schools; while 26 (8.7%) were from government schools. Only 6 (2.0%) fell into obese category, and all belonged to private schools. No one was found to be obese in government schools. Mean  $\pm$  SD weights (kg) in government and private school boys were  $50.93 \pm 7.18$  and  $56.34 \pm 11.94$ , respectively whereas mean  $\pm$  SD heights (m) of government and private schools boys were found to be  $1.55 \pm 6.64$  and  $1.56 \pm 7.92$  respectively. The data was statistically analyzed which exhibited significant relation with weight and BMI value. **Conclusions:** The prevalence of overweight was significantly higher in boys who ate junk foods and spent more time in watching television and sitting before computers. The findings of this study was found in agreement with certain earlier studies that revealed prevalence of obesity is to be on the increase among the private school boys of the area. It is, therefore, emphasized that regular physical exercise, regulated television viewing, doing household activities, balanced diet and healthy eating habits should be motivated in school children to ensure control of overweight and obesity, in this class of children.

**Key words:** Obesity, overweight, school children, physical activity.

### INTRODUCTION

Overweight and obesity and their health consequences have been recognized as major public health problems worldwide. Significant increasing trend in the prevalence of overweight and obesity among children and adolescents have been documented over the last few decades in developed and developing countries<sup>1,2</sup>.

The prevalence of obesity and overweight is increasing worldwide because of major changes in the lifestyle. There are large differences in the prevalence of obesity within countries and population subgroups. It is more prevalent in high income countries such as USA and UK<sup>3,4</sup> than in low income countries like Brazil and China<sup>5</sup> and more widespread in urban versus rural populations<sup>2</sup>. Recent reports indicate that obesity in USA has increased by 61% during 1991 and 2000 and is becoming a major cause of morbidity and mortality in the United States<sup>6</sup>.

A person's body mass index (BMI) is used to determine obesity. This is calculated by taking an individual's weight in kilogram and dividing it by square of a person's height

in meters. This defines a BMI of 18.5 to 25kg/m<sup>2</sup> which is deemed normal. Over 25, is overweight and over 30 implies obese. Knowledge of child's weight is often necessary to enable accurate treatment. Many drugs doses, intravenous fluid therapy and direct current shocks are all calculated on weight basis<sup>7</sup>.

Genetics, nutrition, physical activity and family factors all contribute to obesity in children. If one of the parents is obese, there is 50% chance that the child will also be obese. Although genetics has significant impact on obesity, it is important that poor eating habits, over eating and lack of exercise contribute to the inability to maintain a normal weight<sup>8</sup>. Several cross-sectional studies in western countries have shown that overweight and obese adolescents are less physically active than non-obese subjects; and physical inactivity, high socioeconomic background and dietary transition were found to be the major factors<sup>9</sup>. However, in this study the role of factors such as participation in sports and games, physical inactivity, such as television viewing and playing computer/video games and consumption of junk foods were also studied.

Children normally need certain number of calories each day their bodies use during their activities. This range for boys is from 2000 calories for 7-10 years old, 2500 calories for 11-15 years old and 3000 calories for 15-18 years old. For girls, the ranges are from 2000 calories for 7-10 years old and 2500 calories for 11-18 years old. These are only estimates and some children need more or less calories according to their activities. If a child consumes more food and calories than required, all fat is converted to energy for the needed calories<sup>10</sup>.

Overweight and obese children and adolescents are at a higher risk of long- term mortality and morbidity, as well as facing the rise of immediate negative effects on physiological and psychological well being<sup>11</sup>. Overweight children are at higher risk of developing Type 2 diabetes, metabolic syndrome, high blood pressure, asthma and other respiratory problems, sleep disorders, liver disease, early puberty or menarche, eating disorders and skin infections<sup>11</sup>.

### IMPORTANCE OF THE STUDY

Overweight or obesity is the universal problem of children. It needs greater attention from the media and public. If a child is overweight, he is likely to have serious complications such as heart attack, type 2 diabetes, respiratory diseases and more others. Even he/she is less active in his /her social life, he/she cannot live a normal life. So the weight of children is very important for his/her social and cultural life.

Therefore, in the present study, the relationship of obesity with the life style and eating habits of the boys was determined and was compared with the obesity levels of boys of the public and private schools.

### MATERIALS AND METHODS

As per objectives of the study, two public and two private boys' secondary schools of district Faisalabad were

selected randomly out of the lists of government and private schools, available.

A systematic random sampling technique was adopted to include 600 students in all from all the sections of 6th-10th classes. It was a descriptive, institutional based cross - sectional study. The questionnaire included a semi - quantitative food frequency Performa in which the frequency of commonly consumed foods /drinks; especially the fast and junk/roasted foods were listed. From the food frequency questionnaire, the types and pattern of foods taken by the individuals were determined against their life style (physical activity) to relate the factors with their weight status. Anthropometric values like height and weight were used to calculate Body Mass Index (BMI) in each student. The BMI is used to determine obesity. It was computed by dividing the individual's weight (kg) by the square of the individual's height (meter). A Body Mass Index between 18.5 to 25 kg/m<sup>2</sup> is normal, over 25 is overweight and over 30 implies obesity. Frequency distribution and other tables were programmed and produced in SPSS syntax.

For data analysis, the tables were converted to SPSS version 10, and to EPI Info Version 5 (revised) for nutritional data analysis<sup>12</sup>. The student's t-test<sup>13</sup> was employed as test of significance to compare the means at 5% level of significance and at 95% confidence interval.

Different letters on means given in columns show highly significant ( $P < 0.01$ ) results, whereas same letters show non-significant results ( $P > 0.05$ ) as revealed by t-test.

Mean + SD weight of boys from private schools shows highly significant result, i.e.  $56.34 \pm 11.94$  as compared to government schools which was  $50.9317.18$ . (Table I)

### RESULTS

Table-I. Mean  $\pm$  SD Weight, Height and Z-score of boys from Government and Private Schools

Schools	Weight (Kg)	Z-Score	Height (m)	Z-score
Government	$50.93 \pm 7.18^a$	$-0.32 \pm 0.68^a$	$1.55 \pm 6.64^a$	$-5.12 \pm 0.89^a$
Private	$56.34 \pm 11.94^b$	$0.20 \pm 1.14^b$	$1.56 \pm 7.92^a$	$6.73 \pm 1.06^a$

Mean ± SD height of boys from private and government schools were almost the same i.e.1.55±6.64 and 1.56±7.92 that show a little difference. (Table I)

The trend of weight in children of private schools was higher with respect to age. It was partly due to eating habits and having extra money that was spent on eating junk foods.

On the basis of anthropometric values and BMI, the children were classified into normal, underweight, overweight and obese. 423 children were found normal; whereas 98 were found to be overweight. Only 6 were found to be obese. Out of 423 children, 241 were from government schools and 182 were from private schools. The number of obese children was 6, which belonged to private schools. No obese child was found in the government schools. (Table II)

When mean ±SD BMI of government and private schools

boys having different duration of playing outdoor games was calculated, it was seen that private school boys who played for more than 2 hours showed 22.67±2.78 result as compared to 20.91±2.13 of government school boys. (Table III)

Mean +SD of boys of government and private schools against foods most liked was fried /fast foods which came out to be 23.32±3.61 for the boys of private schools .The results of government schools boys came to be 21.44±2.48 (Table IV). Other foods most liked were soft drinks/juices, sweets and chips by the boys of private schools while government schools boys liked fast/fried foods, soft drinks/juices and sweets and chips but to a lesser extent. This was due to having more pocket money given to private school's boys.

Liking of fruits in private school boys is significantly higher as compared to government school boys. Private school children come from well off families and they take

**Table-II. Percent distribution of Government and Private Schools Boys into Different Body Mass Index (BMI) status with mean BMI value**

BMI Status	School Boys		Total (n=600)
	overnment Schools (n=300)	Private Schools (n=300)	
Below normal (BMI <18.5)	33 (11.0%)	40 (13.3%)	73 (12.2%)
Normal (BMI 18.5 - 24.9)	241 (80.3%)	182 (60.7%)	423 (70.5%)
Overweight (BMI 25.0 - 29.9)	26 (8.7%)	72 (24.0%)	98 (16.3%)
Obese (BMI>30)	-	6 (2.0%)	6 (10%)
Mean ± SD BMI	21.09±2.26	22.93 ± 3.50	22.01±3.08

**Table-III. Mean ± SD body mass index of Government and Private Schools boys having different durations of playing outdoor games daily.**

Duration of games	Mean ± SD BMI of schools boys		Mean ± SD
	Government Schools	Private Schools	
1 Hour	21.53±2.27 (n=23)	24.35±5.34 (n=20)	22.84±4.20 (n=43)
1.5 Hour	21.15 ± 2.36 (n=168)	22.80 ±3.58 (n=158)	21.95±3.12 (n=326)
>2 Hours	20.91±2.13 (n=106)	22.67 ± 2.78 (n=116)	21.83±2.64 (n=222)
Total	21.10±2.27 (n=297)	22.85 ± 3.46 (n=294)	21.97±3.00 (n=591)

Table-IV. Mean  $\pm$  SD body mass index of boys of Government and Private Schools against foods mostly liked by them

Foods mostly liked	Mean $\pm$ SD BMI of schools boys		Total
	Government Schools	Private Schools	
Fried / fast foods*	21.44 $\pm$ 2.48 (n=52)	23.32 $\pm$ 3.61 (n=120)	22.75 $\pm$ 3.41 (n=172)
Soft drinks*	21.15 $\pm$ 2.00 (n=171)	22.55 $\pm$ 3.67 (n=141)	21.78 $\pm$ 2.96 (n=312)
Fruits*	21.30 $\pm$ 2.68 (n=44)	23.48 $\pm$ 4.57 (n=30)	22.19 $\pm$ 3.70 (n=74)
Fruit Juices*	21.07 $\pm$ 2.46 (n=118)	22.75 $\pm$ 3.84 (n=119)	21.91 $\pm$ 3.33 (n=237)
Vegetables <sup>NS</sup>	19.70 $\pm$ 2.40 (n=11)	19.08 $\pm$ 2.34 (n=4)	19.53 $\pm$ 2.32 (n=15)
Milk*	20.75 $\pm$ 2.88 (n=17)	22.95 $\pm$ 4.05 (n=38)	22.27 $\pm$ 3.84 (n=55)
Sweets/Chips*	21.38 $\pm$ 2.29 (n=187)	22.51 $\pm$ 3.52 (n=184)	21.94 $\pm$ 3.01 (n=371)
	* <i>P</i> <0.05	** <i>P</i> <0.01	NS <i>P</i> >0.05

fruits, fast/fried foods more as compared to government school boys. More nutritious foods are taken by government school boys. However, this finding has no significant impact on the overall results of liking and disliking of boys of both categories.

## DISCUSSION

There is negligible obesity percentage among boys of government and private schools, however only 6 children were found to be obese out of 300 private school boys. The results are of the view that obesity is not the problem in our secondary school boys. (Table II). This is why BMI of government and private school boys is also not statistically different from each other.

Duration of games (Table III) in government and private boys is also not significantly different from each other. The results clearly revealed that regular physical activity was an important factor in reducing prevalence of overweight and obesity. The prevalence was significantly lower in the children who participated regularly in outdoor games and performed physical exercise.

Mean  $\pm$ SD of boys of government and private schools against foods most liked was fried /fast foods which came out to be 23.32 $\pm$ 3.61 for the boys of private schools. The results of government schools boys came to be 21.44 $\pm$ 2.48 (Table IV). Although eating of certain food

items (Table IV) is significantly different from government and private school boys, however, this finding has no significant impact on the overall results of liking and disliking of boys of both categories.

The diets of the children in the private schools are known for their higher fat contents and the subjects are involved in more sedentary activities. These observations are consistent with the results of previous studies<sup>14</sup>. This is also due to more pocket money given to the children of private schools as compared to the government school boys.

## CONCLUSIONS

1. Low levels of physical activity, watching television, and consuming junk foods are associated with a higher prevalence of overweight.
2. The mean weight for age of private school boys (56.35 kg) is highly significant ( $P < 0.01$ ) as compared to (50.93kg) of government school boys. Whereas Mean Z-score  $\pm$ SD weight is also highly significant ( $p < 0.01$ ).
3. The percent distribution of overweight in private school boys was 24% as compared to 8.7% of government school boys.
4. Only 2% were found to be obese in private schools. No one was found to be obese in

- government schools.
- The most liked foods by the private school boys were fast/fried foods. Vegetables were equally liked by both private and government school boys and showed non significant result (19.08 and 19.70 respectively).

Copyright© 15 July, 2011.

## REFERENCES

- Chinn, S., & Rona, R.J. **Prevalence and trends in overweight and obesity in three cross sectional studies of British children, 1974-94.** British Medical Journal, 2001;322, 24 -26.
- Martorell, R., Kettei Khan, L, Hughes, M. L., & Grummer-Strawn, L.M. **Overweight and obesity in preschool children from developing countries.** International Journal of Obesity Related Metabolic Disorder, 2000;24,959-967.
- Flegal, K.M., Carroll, M.D., Kuczmarski, R.J., & Johnson, C.L. **Overweight and obesity in the United States: prevalence and trends, 1960-1994.** International Journal of Obesity Related Metabolic Disorder, 1998;22, 39-47.
- Seidell, J.C. **The epidemiology of obesity,** in: Bjornorp P, (edi). International textbook of obesity 2001;(pp. 23- 29). Chi Chester: John Wiley & sons.
- Monteiro, C.A., D'A Benicio, M.H., Conde, W.L., & Popkin, B.M. **Shifting Obesity trends in Brazil.** European Journal of Clinical Nutrition, 2000;5,342-346.
- Mokdad, A.H., Marks, J.S., Stroup, D.F., & Gerberding, J.L.. **Actual causes of death in the United States.** Journal of American Medical Association, 2000;291, 1238-1245.
- Black, K., Peter, Barnett., Rory, Wolfe., & Simon, Young. **Are methods used to estimate weight in children accurate?** Royal Children's Hospital, Parkville. Alfred Hospital, Parham, Victoria, Australia 2002.
- Shahzadi, M. **Causes of overweight in school going children (5-11 years) in Faisalabad, Pakistan.** M.Sc.Thesis, Home Economics Department, Government College University, Faisalabad 2007.
- Eisenmann, J. C, Barteel, R. T., & Wang, M.Q. **Physical activity, TV viewing, and weight in US youth: 1999 Youth Risk Behavior Survey.** Obesity Research, 2002;10, 379 -385.
- Le, K., Haessok, Sohan., Sangycoup, Lee., & Jinkyong, Lee. (2004). **Weight and BMI over six years in Korean children: Relationship to Body image and Weight loss Efforts.** College of Medicine, Bussan National University, Bussan, Republic of Korea. Obesity Research, 12, 1959-1966.
- Afzal, M.N., & Naveed M. **Childhood Obesity and Pakistan. Journal of College of Physicians and Surgeons, Pakistan,** 2004;14(3), 189-192.
- Andrew, G.D. Epi Info, Version 5 (Revised Version 15): **A word processing data base and statistics programme for epidemiology on microcomputers.** USD incorporated, 2075, A-West Pak Place, Stone Mountain, Georgia, USA 1991.
- Steel, R.G.D. J.H. Torrie., & D.A. Dickey. **Principle and Procedure of Statistics: A Biometric Approach.** 3rd Ed. McGraw Hill Book Comp. Inc. New York, USA 1996.
- Patrick, K., Calfas, G.J., Zabinisk, M.F., & Cella, J. **Diet, physical activity, and sedentary behaviors as risk factors for overweight in adolescence.** Archives of Pediatrics and Adolescent Medicine, 2004;158, 385-390.

Article received on: 18/12/2010

Accepted for Publication: 15/07/2011

Received after proof reading: 12/08/2011

### Correspondence Address:

Dr. Farheen Umar Qureshi  
H.No.2, Old Social Security Hospital  
108-A, Peoples Colony No.1,  
Faisalabad.

### Article Citation:

Qureshi FU, Hussain J, Saqib AS. Prevalence of obesity among boys in public and private secondary school children. Professional Med J Sep 2011;18(3): 489-493.