Prevalence of Overweight and Obesity among Private and Government School Children

Ms.K.Subashini[1], Ms. D.Sunmathi[2], Dr. SD.Nalinakumari[3]

[1]Tutor, Department Of Anatomy ,Chennai Medical College Hospital And Research Centre
gkvalli85@gmail.com

[2]Pre Final Year MBBS, Chennai Medical College Hospital And Research Centre
sunmathi.mbbs@gmail.com

[3]Professor &Head ,Department Of Anatomy Chennai Medical College Hospital And Research Centre
drnalindas@gmail.com

Abstract*— *This paper presents a detailed study on overweight and obesity. The main aim of the paper is to find out the prevalence of overweight and obesity among private and government school children. Obesity is a chronic disease, prevalent in both developed and developing countries. Childhood obesity is associated with several risk factors for later heart disease and other chronic diseases including dyslipidemia, hyperinsulinemia and hypertension. The ideal definition based on percentage body fat is impracticable for epidemiological use. The contributing factors have been charted out and comparison of the prevalence of overweight and obesity among government and private school children has been done

Keywords*— *overweight, obesity, private, government, school children

I. INTRODUCTION

Today as standards of living continue to rise, weight gain and obesity are posing a growing threat to health of the world. Obesity is a chronic disease, prevalent in both developed and developing countries [1]. In many developing countries including India it co-exists with nutrition. This constitutes a double burden for those countries [2]. The problem of obesity is confined not only to adults but also among the children and adolescents [3,4].Data from National Health And Nutrition Examination Survey (NHANES) showed that 17% of children in the age group of 12 to 19 years are overweight or obese[5] In India, the data which is available from urban school children in cities like New Delhi, Chennai, Hyderabad etc. where prevalence of obesity was found to be between 6 to 8 % and overweight between 9 to 12%.

2.1OBESITY:

Obesity is a health problem that has reached epidemic proportions [10]. In many developing countries including India, it coexists with nutrition [2]. Secondly in addition to being a disease inits own sight, obesity substantially increases the risk of several fatal & nonfatal, but highly debilitating, non-communicable diseases particularly cardiovascular diseases, non-insulin dependent diabetes mellitus, endocrine & metabolic disturbances [11].

2.2OBESITY WORLD WIDE AND INDIAN STATUS:

Obesity has become a global threat. Recently WHO acknowledged an urgent need to examine child obesity across countries, using a standardized international standard. The prevalence of obesity and overweight was 11.1% and 14.3% respectively in US, and 10.0 % in Russia ,3.6% and 3.4% China [12]. Data from NFHS(National Family Health Survey) allowed for examining the trends at national level. It shows overweight of 12.6% in women and 1.5% in children in 2005-2006 [13].

2.3RISK FACTORS OF OBESITY:

The following factors in early life are associated with an increased risk obesity in childhood. parentral obesity, more than eight hours spent in watching tv at age 3years, weight gain in first year, shoetsleep duration at age 3years [14].

2.4 CO-MORBIDITIES:

Psychological impairment is the most significant condition[15], visceral adiposity is associated with morbidity and mortality through endocrine and mechanical process, clinical manifestations due to effects of obesity on

cardiovascular diseases, respiratory , gastrointestinal, musculoskeletal, immune and integumentary system have been described [16].

II. OBJECTIVES

To find out the prevalence of overweight and obesity among school children. To chart the contributing factors. To compare the prevalence of overweight and obesity among govt and private school children.

3.1MATERIALS AND METHODS:

This cross sectional observational study is carried out by department of anatomy over a two month period of june and july 2014. The study has been approved by institutional ethics committee and informed consent was obtained from the school administration and parent of each student.

School children from both the sexes in the age of 16 belonging to government and private schools were studied. The children attending government school were considered to represent LSES while those attending private school were considered to represent HSES. Of the above 1000 students 500 belonged to LSES and 500 to HSES.

The cut off values of BMI, is obtained from Cole, et al [9] were used to classify children as normal, overweight and obese. Prevalence of overweight and obesity was assessed for LSES and HSES for both the sexes. Finally, a comparison of the prevalence of overweight and obesity in LSES and HSES was done for both sexes.

Subjects fulfilling the inclusion and exclusion criteria were interviewed with a questionnaire assessing the food habits, physical activity and stress among the subjects.

3.2Statistical analysis:

The statistical analysis were performed using the SPSS software

III. OBSERVATION AND RESULTS

In this study group, 500 (females- 230, males- 270) LSES and 500 (females- 230, males 270)HSES(Fig 1) , of which 46% were female and 54% were male(Fig 2a). Both the groups belonged to rural set up. Out of them skipping regular mealsis highly prevalent among government school children(Fig.2b), But the percentage of students eating fast foods is almost equals on both the sectors(Fig.3a), the activity of having beverages many times is higher among private school children (Fig.3b),And in case of eating fruits most of the government school children are eating sometimes and most private children are having fruits many times.(Fig.4a), a significant amount of government school children were never taking milk(Fig.4b), private children are taking non-vegetarian in diet many times than the government children.(Fig.5a), most of the government school children are eating on compulsion(Fig.5b) there is no significant difference in eating sweets among private and government school children(Fig. 6a),almost 25% of the government school children were never taking eggs(Fig.6b),the percentage of government children taking vegetables are more than the private children(Fig.7a), snacks in between meals- here both never and many times are higher among private school children,(Fig.7b) . And the physical activity of the government and private school children are compared in the TABLE 1, stresses due to psychological and social causes are shown in the TABLE 2 and TABLE 3 respectively and graphical representation is shown in figure 8.

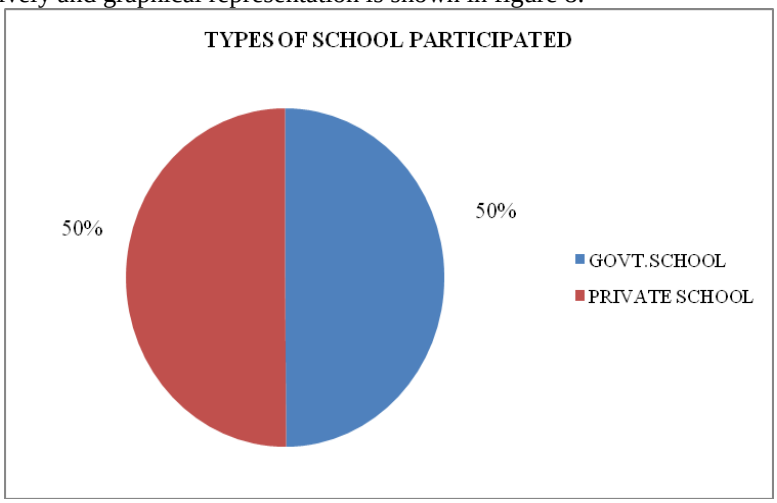
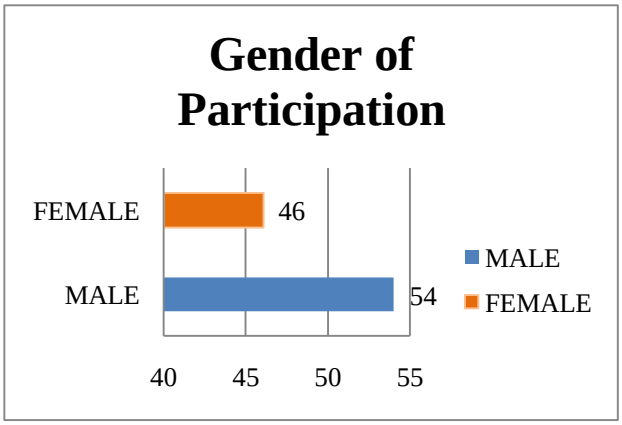
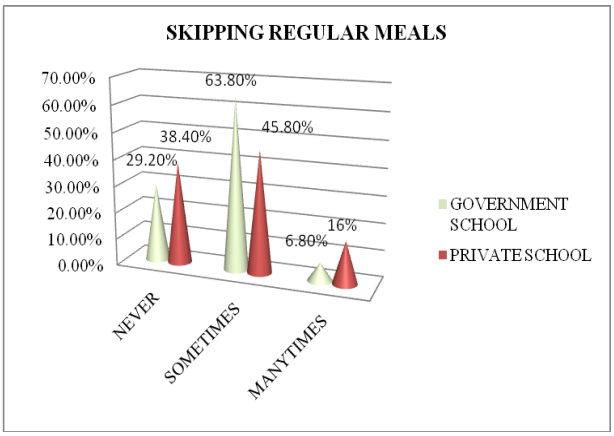


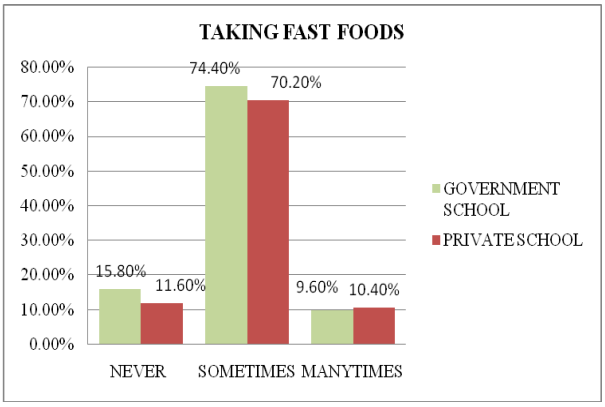
Fig. 1: Analysing the collected data shows 500(50%) participants from government and 500(50%) from private schools

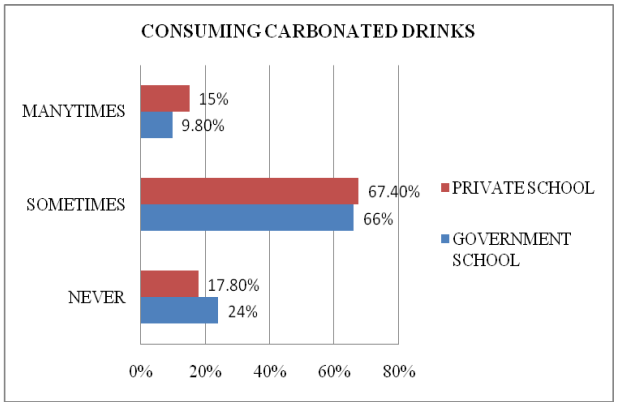




(a) (b)

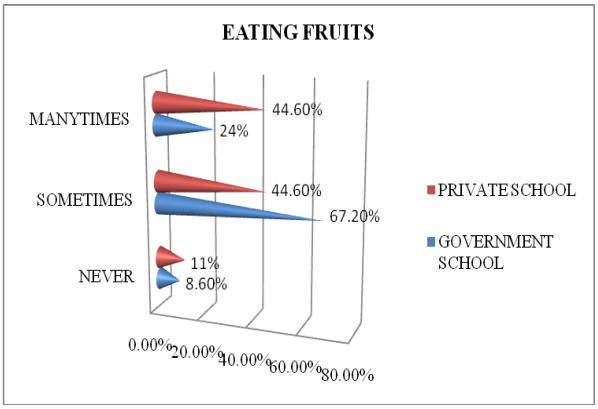
Fig . 2a: Among the total survey population 1000 46% were female and 54% were male participants. 2b. Our survey shows 16% of the private school students are skipping regular meals frequently, 38.40% never skips and 45.80% private students were skipping meals sometimes

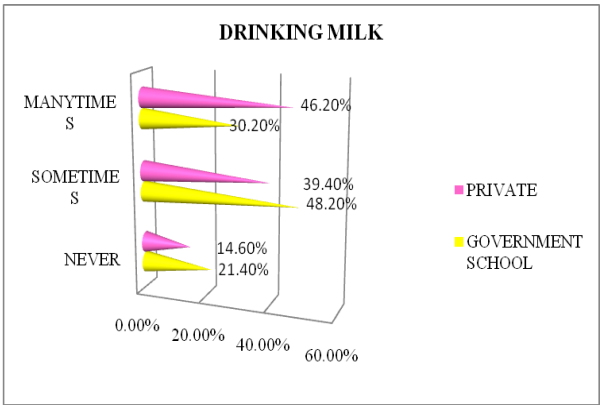




(a) (b)

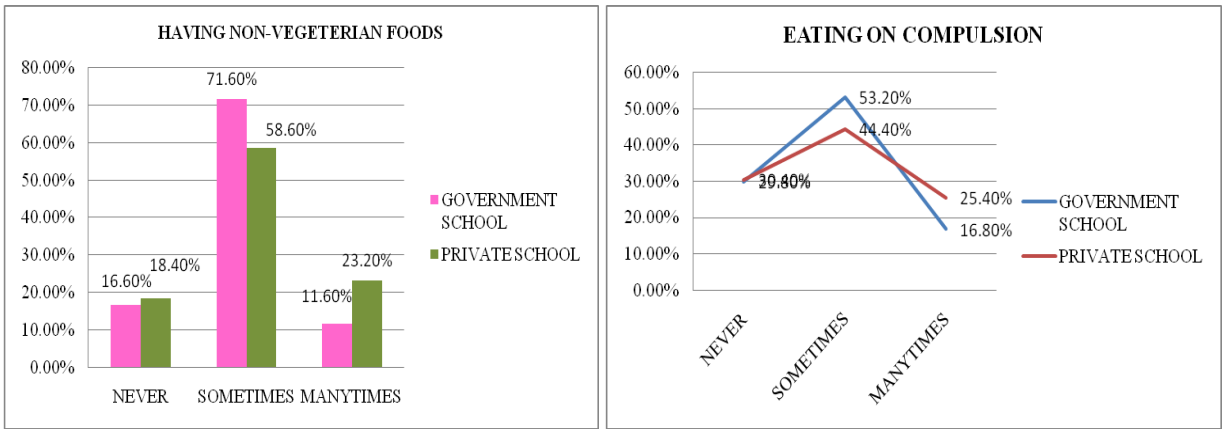
Fig. 3a: From the statistical analysis it is evident that 70.2%,74.4% 0f private and government school children were taking fastfoods sometimes respectively 3b: Questionnaire survey reveals that 15% 0f students take beverages manytimes and 67.4% and 17.8% take sometimes and never respectively from the private schools





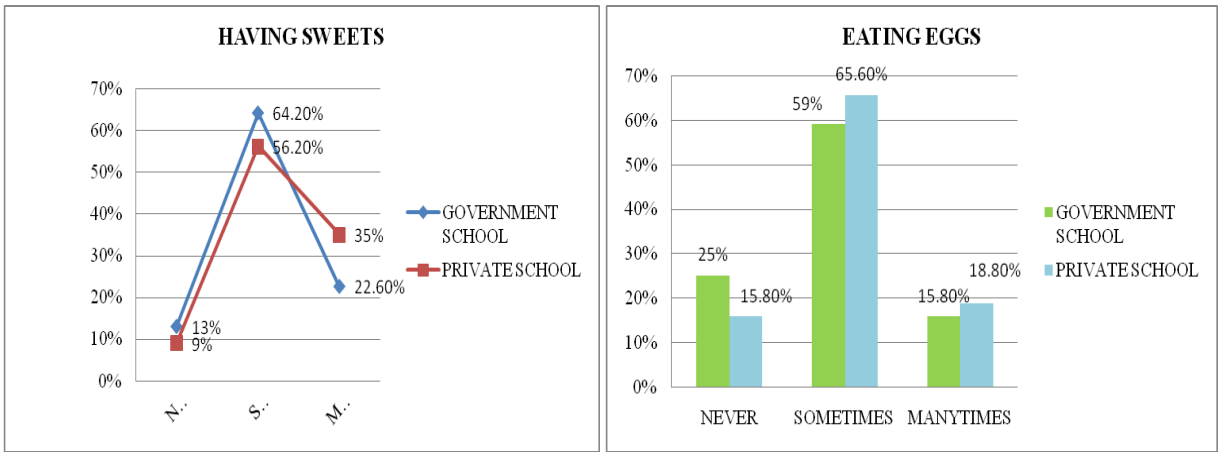
(a) (b)

Fig. 4: a) The above chart indicates that 67.20% , 44.60%, 11% are eating fruits sometimes, many times and never respectively from the government school children b) It is clearly shown that the percentage of never drinking milk is higher in the government school children(21.4%) than the private children (14.6%)



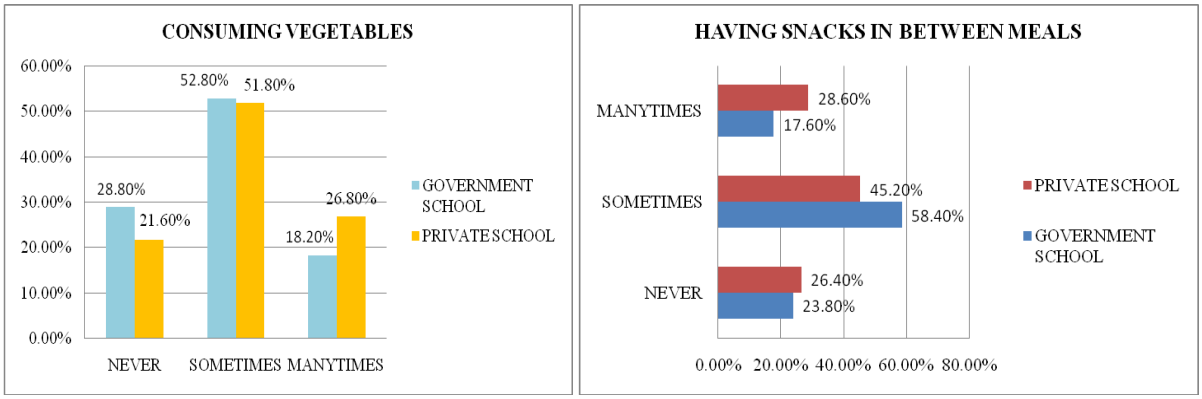
(a) (b)

Fig 5: a) 58.6%, 23.2%,18.4% of students are taking non-veg diet sometimes, manytimes and never respectively from the private schools and 71.6%, 16.6%, 11.6% are taking non-veg diet sometimes, never and many times from the government schools b) The outcome of our survey implies that sometimes most of the children from government school are eating their foods under compulsion



(a) (b)

Fig. 6: Only 9% from the private schools were never taking sweets and 35% are taking sweets many times, which is seen on analysing the data b) The study shows that among the government school children 59%, 25%, 15.80% were taking eggs sometimes, never and many times respectively



(a) (b)

Fig. 7: a) The result of our survey shows that 52.80% of government students were eating vegetables which is more than the private school children, 51%. B) The bar chart compares the percentage of students having snacks in between meals between government and private schools, which shows more government school children(58.40%) are taking than the private students(45.20%).

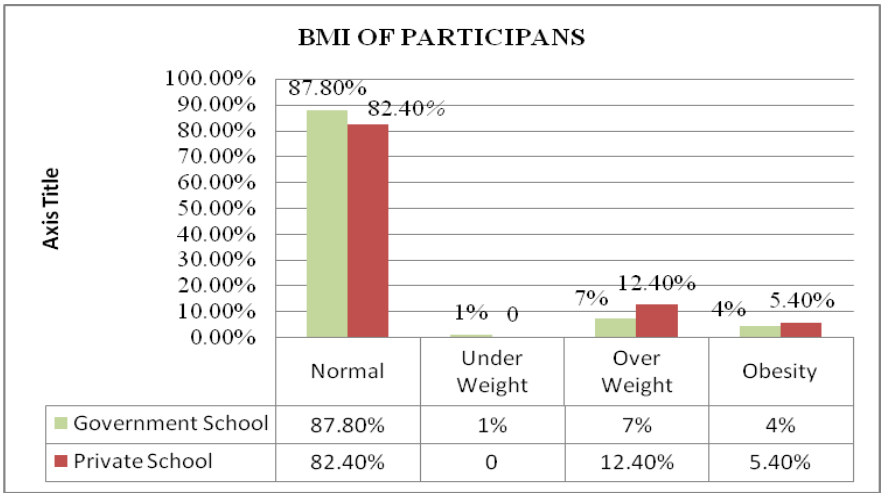


Fig. 8: When analysed the obesity among government and private school children, it was foundout that overweight and obesity were more in private school and the diffence of overweight and obesity among govt school and private is more significant(p< 0.05).

Table. 1: Physical Activity Results shows the descriptive statistics of the variables of physical activity in school children

Category	GOVERNMENT SCHOOL	PRIVATE SCHOOL
WALKING TO SCHOOL		
NEVER	48%	49.40%
SOMETIMES	33.60%	65.40%
HABITUAL	18.20%	37.20%
DOING SKIPPING/ JUMPING ROPE		
NEVER	23.60%	41.40%
SOMETIMES	67%	50.60%
HABITUAL	9.20%	8.20%
PLAYING OUTDOOR GAMES		
NEVER	23.60%	26%
SOMETIMES	51.80%	48.20%
HABITUAL	24.40%	26%
PLAYING INDOOR GAMES		
NEVER	23.20%	16.80%
SOMETIMES	52.80%	59%
HABITUAL	23.80%	24.40%
STERNOUS PHYSICAL ACTIVITY		
NEVER	33.40%	24.60%
SOMETIMES	50.40%	50.60%
HABITUAL	16%	24.40%
PARTICIPATING IN INTER SCHOOL COMPETITIONS		
NEVER	23.60%	25.20%
SOMETIMES	53.60%	51%
HABITUAL	22.60%	46.40%
PLAYING / OUTDOOR ACTIVITES DURING WEEKENDS		
NEVER	16%	19.40%
SOMETIMES	43.60%	42.80%
HABITUAL	40.20%	38.40%
WATCHING TV IN THE EVENING HOURS		
NEVER	13%	12.80%
SOMETIMES	51%	48.40%
MANYTIMES	35.80%	39%
PLAYING MOBILE OR VIDEO GAMES		
NEVER	23.60%	19.40%

SOMETIMES	51%	49.20%
HABITUAL	25.20%	31.60%
HAVING DEEP SLEEP IN THE NIGHT		
NEVER	24.60%	16.60%
SOMETIMES	50.60%	42.40%
HABITUAL	24.80%	40.80%

Table. 2: Psychological Causes For Stress: represents the Descriptive statistics for the variables of the psychological causes of stress in the subjects.

Category	GOVERNMENT SCHOOL	PRIVATE SCHOOL
STRESS DUE TO TESTS/ EXAMS		
STRONGLY AGREE	38.6%	24%
AGREE	39.8%	32.5%
NO OPINION	7.6%	18%
DIS AGREE	6%%	13%
STRONGLY DIS AGREE	7.8%	12.4%
STRESS DUE TO DIFFICULTY IN UNDERSTANDING SUBJECTS		
STRONGLY AGREE	19%	14.4%
AGREE	29.2%	35%
NO OPINION	12.2%	21%
DIS AGREE	24.6%	17.2%
STRONGLY DIS AGREE	14.8%	12.6%
STRESS DUE TO HOMEWORKS		
STRONGLY AGREE	34%	18.8%
AGREE	31.8%	28.4%
NO OPINION	12.8%	20.8%
DIS AGREE	9.2%	17.6%
STRONGLY DIS AGREE	12%	14.6%
STRESS DUE TO TUTIONS		
STRONGLY AGREE	24.8%	9.2%
AGREE	22.2%	14%
NO OPINION	35.4%	43.2%
DIS AGREE	15.2%	14.4%
STRONGLY DIS AGREE	22.2%	19.4%
STRESS DUE TO SELF EXPECTATION		
STRONGLY AGREE	37%	30%
AGREE	35.6%	30.2%
NO OPINION	9.6%	17.2%
DIS AGREE	7.2%	9.2%
STRONGLY DIS AGREE	10.4%	13.6%
STRESS DUE TO HEAVY WORK LOAD		
STRONGLY AGREE	24.6%	25.8%
AGREE	29.6%	22.6%
NO OPINION	18.4%	20.2%
DIS AGREE	16%	16.8%
STRONGLY DIS AGREE	11%	14.8%
STRESS DUE TO POOR MARKS		
STRONGLY AGREE	26.8%	19.2%
AGREE	22.6%	20%
NO OPINION	15%	24.4%
DIS AGREE	21.4%	21%
STRONGLY DIS AGREE	14%	15.6%

Table. 3: Social Causes For Stress: represents the Descriptive statistics for the variables of the social causes of stress in the subjects.

Category	GOVERNMENT SCHOOL	PRIVATE SCOOL
PARTIALITY IN GRADING PROCESS		
STRONGLY AGREE	27.2%	28.2%
AGREE	10%	21.4%
NO OPINION	12.4%	29.2%
DIS AGREE	16%	12.2%
STRONGLY DIS AGREE	34.2%	14.2%
POOR MOTIVATION TO LEARN		
STRONGLY AGREE	16.2%	16%
AGREE	22.2%	18.2%
NO OPINION	14.8%	27.6%
DIS AGREE	30%	20.6%
STRONGLY DIS AGREE	16.6%	17.8%
LACK OF TIME FOR FRIENDS AND FAMILY		
STRONGLY AGREE	30.4%	31.2%
AGREE	24.4%	24.2%
NO OPINION	13.2%	15.8%
DIS AGREE	17.8%	19.4%
STRONGLY DIS AGREE	14.2%	9.6%
FREQUENT INTERUPTION OF WORK BY OTHERS		
STRONGLY AGREE	30.4%	31.2%
AGREE	24.2%	24.2%
NO OPINION	13.2%	15.8%
DIS AGREE	17.8%	19.4%
STRONGLY DIS AGREE	14.2%	9.6%
COMPARING WITH OTHER STUDENTS BY PARENTS AND TEACHERS		
STRONGLY AGREE	26.4%	28%
AGREE	28.6%	20.4%
NO OPINION	18%	20%
DIS AGREE	11%	14%
STRONGLY DIS AGREE	15.8%	17.8%

IV. DISCUSSIONS

Our study aims to give updated charts for LSES(government school children) and USES (private school children)children. Our data shows about 12.4% are overweight and 5.4% are obese among HSES, 7% are overweight and 4% are obese. These charts clearly show a secular trend when compared to ICMR charts and Agarwal charts for various percentiles.

Our study aims to give updated charts for LSES(government school children) and USES (private school children)children. Our data shows about 12.4% are overweight and 5.4% are obese among HSES, 7% are overweight and 4% are obese. These charts clearly show a secular trend when compared to ICMR charts and Agarwal charts for various percentiles.

V. CONCLUSIONS

There are many factors that contribute to the poor performance of children in school, one among them being obesity, that too mostly among HSES. This cross sectional observational study was therefore carried out to compare the prevalence of overweight and obesity among HSES and LSES school children using anthropometric measurements for calculating BMI, and questionnaire survey to assess the food habits prevailing among school children, and to assess their physical activeness and also the stress experienced by them and various causes for their stress. A total of 1000 students (500 from each, HSES and LSES) were participated in our study. The analysis of the data received shows 12.4% and 5.4% of overweight and obesity among HSES respectively and 7% and 4% of overweight and obesity among LSES respectively. From the above study it is significant that the prevalence if overweight and obesity among HSES is more than the LSES children. It is also associated with poor food habits and

lack of physical activity more among the HSES children. In the view of increasing prevalence of overweight and obesity among children, these have to be considered, evaluated and proper preventive measure should be taken to prevent the children from going into metabolic disorders in later life

REFERENCES

[1] Obesity : preventing and managing the global epidemic. Report of WHO consultation.Geneva , world health organisastion.2000 WHO technical series no. 894

[2] Reducing risk and preventing and promoting healthy life, the world health report; world health organisastion 2002.

[3] Agarwal, Bhatia RC, Sing D, Sobti PC. Prevalence of obesity and over weight in affluent adolescents Indian pediatrics 2002; 39; 449; 52

[4] Prevalence of risk factor for childhood overweight and obesity CMAJ 2005 ;173:607-13

[5] Cynthia O, Katherine HF, Margret DC, Margret AM, Peter RC, CarolyJT..Prevalence of overweight and obesity in the U.S. JAMA 2006; 295(13) ; 1549-55

[6] Lobstein T, Baur L, Uauy R for the IASO International Obesity Task Force. Obesity in children and young people: a crisis in public health. Obes Rev 2004; 5 (Suppl 1): 4-85.

[7] Ramachandran A, Snehalatha C, Vinitha R, Thayyil M, Kumar CK, Sheeba L, et al. Prevalence of overweight in urban Indian adolescent school children. Diabetes Res ClinPract 2002; 57: 185-190.

[8] Ogden CL, Flegal KM, Carroll MD, Johnson CL. Prevalence and trends in overweight among US children and adolescents, 1999-2000. JAMA 2002; 288: 1728-1732.

[9] Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity worldwide: International survey. BMJ 2000; 320:1240-1243.

[10] Annak.Dhal, Linda B Hassing. Obesity and cognitive aging , 22-32.doi:10.1093/epirev/mxs002.

[11] Carlos A. Monteiro, Erly C Moura, socio economic status and obesity in adult population of developing countries: a review, http://dx.doi.org/10.1590/s0042-96862004001200011.

[12] Youfa Wang , cross- national comparision of childhood obesity: the epidemic and the relationship between obesity and socio economic status, doi:10.1093/ije/30.5.1129.

[13] Y Wang, H.J.Chen, S.Shaikh, P.Mathur,is obesity becoming a public health problem? Examine the shift from under to over nutrition problems over time.doi:10.1111/j.1467-789x.2009.00568.x.

[14] JJ. Reilly, early life risk factors for obesity in childhood , cohort study. BMJ:2005;330doi:http://dx.doi.org/10.1136/bmj.38470.670903.

[15] Mohamed R. Ali.MD, Mary Beth Maguire MSN, Assesment of obesity related co-morbidities, a novel scheme for evaluating bariatric surgical patients, doi:10.1016/j.jam

[16] primary care clinics in office practice, june 2009, vol.36(2):271-285, doi:1016/j.pop. Sinha R, Fisch G, Teague B, Tamborlane WV, Banyas B, Allen K, et al. Prevalence of impaired glucose tolerance among children and adolescents with marked obesity. N Eng J Med 2002; 346: 802-810.

[17] Vikram NK, Tandon N, Misra A, Srivastava MC, Pande RM, Mithal A, et al. Correlates of type 2 diabetes mellitus in children, adolescents, and young adults in north India: A multisite collaborative case-control study. Diabet Med. 2006; 23: 293-298.

[18] Growth and physical development of Indian infants and children. Technical Report Series No. 18, New Delhi.ICMR; 1989.

[19] Agarwal DK, Agarwal KN, Upadhyay SK, Mittal R, Prakash R, Rai S. Physical and sexual growth pattern of affluent Indian children from 5 to 18 years of age. Indian Pediatr 1992; 29:1203-1282.

[20] Banerjee I, Ghia N, Bandopadhyay S, Sayed HN, Mukherjee D. Body mass index in Bengali adolescents. Indian Pediatr 2005; 42: 262-267.

[21] Subramanyam V, Jayshree R, Rafi M. Prevalence of overweight and obesity in affluent adolescent girls in Chennai in 1981 and 1998.Indian Pediatr 2003; 40: 332-336.

[22] Kapil U, Singh P, Pathak P, Dwivedi SN, Bhasin S. Prevalence of obesity amongst affluent adolescent school children in Delhi. Indian Pediat.2002; 39: 449-452.

[23] Khadilkar VV, Khadilkar AV. Prevalence of obesity in affluent school boys in Pune. Indian Pediatr 2004; 41:857-858Jonathan A. Kropski, Paul.H.Keckley, Gordon L. Jensen.School based obesity prevention programs: an evidence based review. Obesity (2008)16, 1009-1018. Doi; 10.1038