PREVALENCE OF OBESITY AND RELATED FACTORS IN SCHOOL GOING CHILDREN OF AFFLUENT SCHOOLS OF KOLHAPUR AND NOTE ON THE EFFECT OF DIETARY HABITS AND PHYSICAL ACTIVITY IN OBESE CHILD

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Abstract: Background and objectives: the WHO refers obesity as a global epidemic because of rapid increase in the number of overweight and obese individuals in last 20 years. As childhood obesity can lead to various diseases later on in life. Aim of this study is to find out prevalence of obesity in school going children between 5 to 15 yrs in different schools and effect of dietary habits and physical activity in obese child. **Method**: the age was obtained from school records. The height was measured using sliding stadiometer with an accuracy of 0.1mm.weight was recorded using spring balance calibrated to 0.5 kg accuracy. **Result**: out of 3300 children 2746(83.211) were Normal-weight, 350(10.611) were-Over weight & 204(6.181) were obese. The obese group had mean calorie excess of 177.44 kcal p value <.001 compared to non obese group 55.96kcal. mean duration of physical activity was 50.27 min in obese and TV/Video games was 113.40 min as compared to control 66.62min & 90.47min respectively

Interpretation and conclusion: the prevalence and childhood obesity 6.18% among the affluent schools of Kolhapur city in these children high calorie consumption and less physical activity. Regular physical activity can play a significant role in reducing obesity. Thus timely intervention will result in decrease adulthood morbidity and mortality.

Keywords: Childhood Obesity, Diet Pattern, Physical activity.

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Introduction:

The WHO refers Obesity as a global epidemic because of rapid increase in the number of overweight and obese individuals in last 20 years[1] Overweight and Obesity in children and adolescent is defined by CDC and American medical association as BMI between 85-95centile and BMI > 95thcentile respectively for children aged 2-15 years[2]. Prevalence of obese children age 5 to 15 years has more than doubled since 1960. The first problem to occur in obese children is usually emotional and psychological. Studies have shown that overweight children are more likely to grow up to be the overweight adults. Childhood obesity is a single marker of the child at a risk for development of various non-communicable diseases later in.

Material and method:

A cross sectional study was conducted in 3 schools of Kolhapur city from age group 5-15 years after taking clearance from Dr.D.Y.Patil Medical college ethical committee and permission from authority of schools.

The age of the children was obtained from the school records. The height was measured by making the child to stand upright, barefoot on the ground with heels, head in Frankfurt plane. The height was measured using sliding stadiometer (Johnson and Johnson) with an accuracy of 0.1mm. Weight was recorded using spring balance (bathroom scale) calibrated to 0.5kg accuracy children were categorized based on BMI as per NCHS guidelines with respect to their age and sex in cases (overweight and obese) and control (normal weight) groups. To analyze the life style factors and dietary habits in obese and non-obese groups, each individual parent

Life3.The fundamental causes of obesity epidemic are sedentary life style; high fat and energy dense diets[4] apart from other pathological causes. Body mass index (BMI) expressed as weight in kilogram divided by height in meters squared (kg/m2):is commonly used to classify Obesity among adults and is also

recommended in children. The normal ranges of BMI in children vary with age and sex[5].Due to the rising prevalence of obesity in children and its many adverse health effects it is being recognized as a serious public health recognized as a serious public health concern. The term overweight rather than obese is often used in children as it is less stigmatizing.
was asked to collect data regarding the child's

Dietary pattern including food given in between meals and snacks for a period of 3 days, when the child was healthy. Later, the mean calorie intake of each child was calculated and compared with normal calorie requirement of the child for age and sex and was entered in the proforma as calorie excess or calorie deficit. Childs's physical activity (outdoor activity) and T.V viewing/video games/computer games were also recorded in minutes per day for 3 consecutive days. The number of hours of T.V viewing was compared between cases and controls. Parents of overweight and obese children were divided into groups and explained about hazards of obesity if not taken care now. Later on they were educated regarding proper dietary management.

Statistical Methods applied

.Chi-square test
.Anova one way classification
."Z" value Test
.Linear Regression Test
.Karl Pearson's Correlation Coefficent

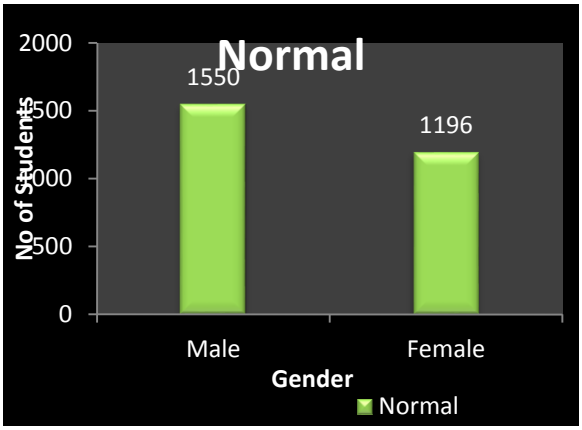
Results:

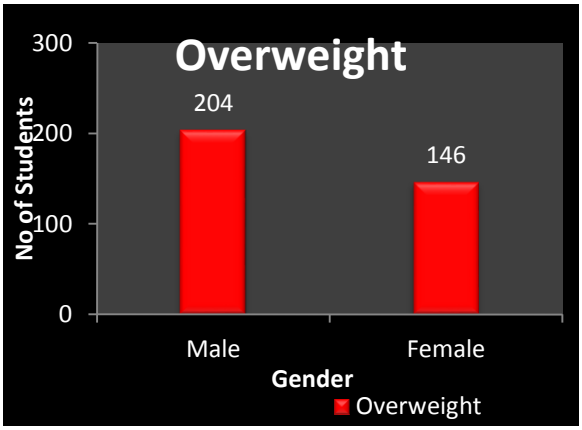
To study the occurrence of obesity among children, we included total number of 3300 children both male and female from group 5-15 years. Each age group included 300 children.
Out of 3300 children 1878 (56.91%) were males and 1422 (43.09%) were females.

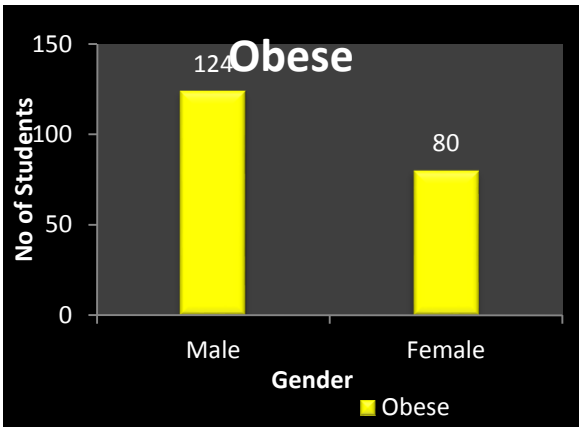
Table 1: The distribution of prevalence of overweight and obesity according to age of children under study.

Age	Normal	Over weight	Obese	Total
5	272	19	9	300
6	271	18	11	300
7	266	23	11	300
8	260	26	14	300
9	259	25	16	300
10	254	28	18	300
11	249	33	18	300
12	240	38	22	300
13	237	39	24	300
14	226	46	28	300
15	212	55	33	300
Total	2746	350	204	3300

Out of 3300 children 2746(83.21%) were normal, 350 (10.61%) were overweight and 204 (6.18%) were obese. Table 1 indicates that as age increases from 5 years to 15 years, the % of children with normal weight decreases and those with overweight and obesity increases.







Graphs Gender wise distribution of prevalence of Overweight and obesity in the study population.

In this study the incidence of obesity was more among male children (60.78%) as compared to female children (39.21%).p=0.23 for chi-square test, no association is observed in sex and obesity.

Table 2: Mean calorie excess in cases and control

Ow=overweight, Ob=obese, Nw=normal weight

The males and

Group	Sex	Mean calorie excess in kcal
Cases (Ow and Ob)	Male	171.26
	Female	183.62
	Total	177.44
Control (Nw)	Male	51.94
	Female	59.98
	Total	55.96

females, both in cases and control groups differ significantly (p <0.001) in mean excess calories. While there is no significant difference (p <0.50) in excess mean calories between males and females in both cases and controls.

Table-3: Comparison of physical activity and Sedentary in Cases and Control.

Group		No.	Mean duration in mins
Physical activity	Case(Ow and Ob)	544	50.27
	Control (Nw)	544	66.62
TV/Video games	Cases(Ow and Ob)	544	113.40
	Control (Nw)	544	90.47

BMI is increasing with less physical activity P value<.010 r=0.089, poor positive correlation between BMI & physical activity. and more usage of Television & Computer.r=0.146,poor positive correlation between BMI & TV watching.

as proven statistically by Karl Pearson"s Correlation Coefficient.0.2019.

Discussion:

Overweight and obesity represent a rapidly growing threat to the health of population in an increasing number of countries. Indeed, these are now so common that they are replacing the traditional problems such as under nutrition and infectious diseases as the most significant causes of ill health .Childhood obesity is a single marker of the child at a risk for development of various non-communicable diseases later in life. Childhood obesity is associated with many long term complications like Coronary heart disease, Hypertension, Stroke, certain types of cancer, NIDDM, Gallbladder disease, Dyslipidemia, Osteoarthritis, Gout, Pulmonary diseases including Sleep apnea etc. The present study was under taken in 3 schools of Kolhapur city. Using BMI as criteria and based on NCHS guidelines, prevalence of obesity was evaluated.

Table 4: Prevalence of obesity in children in various studies

Study done by	Age group	Total	Prevalence of obesity	
			Ow	Ob
G.Kapoor et al,Delhi (1991)6	11-18	253	-	2.7%
Subramanyam .v et al,1998.chennai 7	10-15	610 (Girls)	9.67%	6.23 %
Kapil U et al (2000-2001),Delhi 7	10-16	870	24.7%	7.4%
NFI 2002,Delhi 9	4-18	5000	27.3%	1.7%
Khalidilkar V.V.et al,2004.Pune 10	10-15	1228 (Boys)	19.9%	5.7%
Ambily . G Unnithan et al ,Kerala (2008) 11	10-15	3886	17.73 %	4.99 %
Preetam B Mahajan et 12 al.Pondicherry(2011)	6-12	2940	4.41%	2.12 %
Present study in Kolhapur	5-15	3300	10.61 %	6.18 %

The age group included in the study was between 5-15 yrs. The present study (2010-2012) was conducted in schools catering to children belonging to affluent society of Kolhapur city based on Kuppaswamy's scale-upper-class. The age group included in the study was between 5-15 years. Here the prevalence of over-weight and obesity was 10.61% and 6.1% respectively. Overall, males (59.2%) were slightly more overweight & obese than females (40.8%).Our study shows less number of overweight and obese children when compared to other studies. This may be due to fact that in India, the available studies were done in metro cities, where there was total adoption of western culture, availability of fast food centers and sedentary life style behaviors.

Calorie Excess and Obesity:

Calorie excess, as a cause of obesity, has not been documented in many studies. However, Kapil U et al[8] found that 17% of all adolescent boys and girls included in their study had their energy intake 100% or more as compared to their RDA. Birch Lee et al[13]showed that children consuming diet with more than 30% of energy from fat showed significantly greater gains in BMI and skin fold thickness from age 5 to 7 years. Brunch et al[14] in their investigatory study, using direct observation, found a positive correlation between weight gain and dietary intake. It was found that 78% of boys and 68% of girls seen in obesity clinic were large eaters. In the present study, total calorie consumption was more than RDA, in obese group and non-obese group. The obese group had mean calorie excess of 177.44Kcal compared to non-obese group 55.96Kcal.

Physical Activity:

In the Framingham children study[15], pre-school children with low physical activity levels, as measured by double labeled water technique, gained more subcutaneous fat than more active children. Intervention studies to decrease obesity with physical activity component have produced positive but modest short term results in terms of reduction of obesity. A recent examination of Department of Education Early Childhood Longitudinal Survey (ECLS-K) found that a 1 hour increase in physical activity per week resulted in 1.8% drop in BMI among over overweight .In the present study, there was significant difference found between number of hours spent for physical activity between obese and non-obese children.

Conclusion:

Childhood obesity is in increasing trend from past 20 years. The prevalence of childhood obesity in school children in Kolhapur city is 6.18% and overweight 10.61%. The obese children had higher calorie consumption and were engaged in less physical activity when compared to non obese children in the present study. Hence Proper dietary habits counseling and regular physical activity can help to reduce obesity.These children being at a higher risk of "childhood onset of adult diseases" , timely

intervention will result in decreased obesity related adulthood morbidity and mortality.

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