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An assessment and comparison of body fat percentage among government and private school boys

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Abstract

The objective of the study was to assess and compare body fat percentage among government and private adolescent school boys. Two hundred government school boys (n=200) and two hundred private school boys (n=200) were selected randomly with age ranging between 14 to 17 years. The subjects were taken from different government and private schools of Delhi and were assessed for body fat percentage using skinfold caliper. Triceps and calf skinfold sites were selected and slaughters equation for calculating body fat percentage was used. The data was analysed by using descriptive statistics and independent sample 't' test. There was a significant difference in body fat percentage between government and private school boys. It was concluded that private school boys have more body fat percentage than government boys. The level of significance was set at 0.05.

Keywords: Triceps skinfold, calf skinfold, body fat percentage

1. Introduction

Excess bodyweight is the sixth most important risk factor contributing to the burden of diseases worldwide. The International Obesity Task Force (IOTF) estimates at present 1.1 billion adults overweight, including 312 million who are obese. With the new Asian BMI criterion of overweight at a lower cut-off 23.0 kg/m, the number is even higher (1.7 billion). Excess body fat is associated with risk factors such as diabetes, hypertension, and elevated triglyceride and cholesterol levels in children and adolescents. Consequently, obesity is associated with the early onset of cardiovascular diseases, and increased risk of morbidity and mortality in adulthood (Cali & Caprio 2008; Guimarães *et al.*, 2008; Ribeiro *et al.*, 2006; Terres *et al.*, 2006; McCarthy *et al.*, 2001) [2, 6, 9, 12]. During the growth stage, there is some variability in body fat percentages, meaning subcutaneous and abdominal fat distribution change with age (McCarthy *et al.*, 2001).

Many adult diseases have their origin during childhood, and excessive weight gain is a precursor to a wide variety of physiologic aberrations. Adolescence is a decisive period in human life with multiple changes that take place between childhood and adulthood and when body composition changes dramatically with differential changes between boys and girls. The definition of excess body fat is somewhat arbitrary and there is no consensus about fat percentage cut-off for obesity in adolescents (Rodríguez *et al.*, 2004). BMI is the parameter most frequently used for the screening of excess body fat because it is easy to determine and it tends to correlate well with body fat. In children and adolescents, based on BMI centile curves, IOTF - BMI cut-off points have been recently proposed for each half-year of age, which corresponds to the adult BMI values of 25 and 30 kg/m² at the age of 18 years (Cole *et al.*, 2000) [3] BMI does not distinguish between weight associated with muscle weight and weight associated with fat. At any particular BMI, body composition varies greatly in children depending on gender, age, maturity, race, height, and body fat distribution. The extent to which BMI percentile changes may or may not reflect corresponding changes in body fatness (or leanness) in children is not known (Demerath *et al.*, 2006) [4].

2. Procedure and Methodology

The study involved four hundred school boys reading in different government and private schools of Delhi. These 400 subjects with age ranging from 14-17 years old were divided into two groups.

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First group was of government school boys which was labelled as government (n=200) and second group was of private school boys which was labelled as private (n=200). The data was collected from the selected subjects by using skin fold caliper. Triceps and calf skinfold sites were taken and slaughter's equation for calculating body fat percentage was used.

$$\% \text{body fat} = (0.735 \times \text{sum of skinfolds}) + 1.0$$

Table 1: Group Statistics & Independent Sample Test

Variable	Group	N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig.
Body Fat Percentage	Government	200	11.22	3.97	.28	8.135	398	0.001
	Private	200	17.27	9.75	.68			

The results indicate that there was significant difference in body fat percentage between government and private school boys, $t(398) = 8.135$, $P = 0.001$, which is less than 0.05. That is the average score of government school boys ($M=11.22$, $SD=3.97$) was statistically different from that of private school boys ($M=17.27$, $SD=9.75$). Thus, it could be concluded that there was a significant difference in body fat percentage between government and private school boys. The graphical representation of mean values are shown in figure 1.

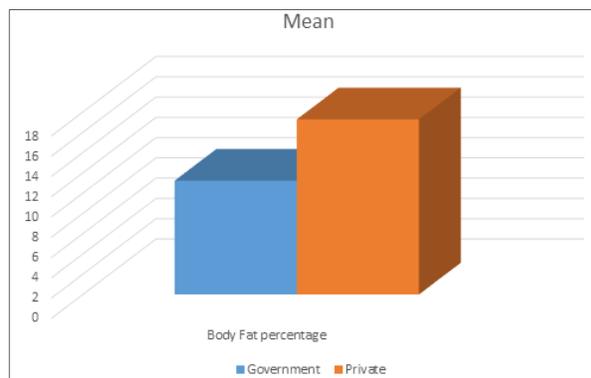


Fig 1

4. Discussion

There was a significant difference in body fat percentage between government and private school boys. In a study conducted Ramachandran *et al.* (2002) [8] in a Delhi based school with tuition fees more than 2500 per month, the prevalence of overweight was 31% of which 7.5% were frankly obese. Lack of physical activity was another culprit in our study which resulted in high rates of overweight and obesity. Sedentary activities like TV watching, playing video games etc. were the main causes of obesity in this category. In a study by Eberstadt (2003) [5], dramatic increases in the number of people are overweight or obese has also been reported in Canada, Australia and many European countries. While studying on Physical activity and dietary behaviour in a population-based sample of British 10-year old children the results indicate that almost 70% of children meet national PA guidelines, indicating that a prevention of decline, rather than increasing physical activity levels, might be an appropriate intervention target (van Sluijs *et al.*, 2008) [13]. Promotion of daily fruit and vegetable intake in this age group is also warranted, possibly focussing on children from lower socioeconomic backgrounds. According to Centres for Disease Control

The data was analysed by using descriptive statistics and independent sample 't' test. The level of significance was set at 0.05.

3. Result and Analysis

The result of the present study is displayed in the table no. 1 after applying descriptive statistics and independent sample 't' test.

(CDC) several environment factors have contributed to rising rates of obesity among youth, including more hours spent in sedentary activities such as watching TV and playing computer or video games and the availability of fast foods that lead to diets high in fat and sugar. In a study by Anderson *et al.* (2003) [1], it was found that children who are unsupervised when they come home from school may eat less nutritious snacks and spend more time watching television or playing computer games. All the studies are in accordance with our present study which clearly shows decreased physical activity as one of the causes of obesity in children. Therefore, it is necessary to increase the physical activity levels of children to decrease the growing rates of obesity which was also depicted in a study by Tanson (2003) [1]. Unless we get our children moving, we will be unable to make any significant progress in terms of weight management.

5. Conclusion

Owing to this increasing trend of obesity in school children it is necessary to take an early step toward this issue so that it may not become any health hazard for the future generation. Physical exercise is the main treatment for obesity. Moreover, it is important to improve diet quality by reducing the consumption of energy dense foods such as those high in fat sugars and by increasing the intake of dietary fibre. There was a significant difference in body fat percentage between government and private school boys. It was concluded that private school boys have more body fat percentage than government boys.

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