Research Paper

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Effect of Obesity on Self Esteem And its Consequential Effect on Academic Performance and Aerobic Capacity

Medical Science

KEYWORDS : self-esteem, academic performance, obese, normal weight, aerobic capacity.

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ABSTRACT

Overweight and obesity are emerging as a global health epidemic. Obesity negatively impacts both mental and physical health status. The purpose of the present study was to study the effect of obesity on self-esteem, academic performance and aerobic capacity of collegiate students. Randomly selected 300 college going students participated in the study. The subjects were further divided into normal weight group and obese groups. Self-esteem, academic performance and aerobic capacity were observed for all the participants to investigate for differences between the groups. Within groups, correlation test was employed to assess association between BMI and other variables. On inter-group comparison, obese students had significantly lower self-esteem score (p=0.001), aerobic capacity (p=0.001) and academic performance score (p=0.001) as compared to normal weight students. BMI was significantly negatively correlated with self-esteem, academic performance and aerobic capacity in the combined girls and boys group. It can be concluded that that normal weight boys, girls and combined boys and girls have greater self-esteem, academic performance and aerobic capacity than their respective obese counterparts.

INTRODUCTION

Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health. It is important to recognize that obesity is both a medical condition and a lifestyle disorder and both factors have to be seen within a context of individual, family and societal functioning. Attention has been drawn to the importance of childhood obesity for morbidity and mortality in adult life. Fitness and physical activity levels in childhood tend to track into adulthood, and are suggested to reduce the risk of different diseases in adulthood.

The Body Mass Index, BMI ($kg \cdot m^{-2}$) or Quetelet index, is used to assess weight relative to height and categorize individual into various weight categories. Although BMI fails to distinguish between total the body weight, fat mass and fat free mass, it does represent an improvement over the relationship between only weight and percent body fat (ACSM Guideline 8th ed).

Table 1. Classification of weight categories based on Body Mass Index (BMI)

Category	BMI
Under-weight	<18.5
Normal weight	18.5-24.9
Over-weight	25.0-29.9
Obese CLASS	
I	30.0-34.9
II	35.0-39.9
III	>40

Numerous studies have been conducted to observe the association between BMI and self-esteem, academic performance and aerobic capacity. Studies conducted by Carol et al, 1999 and Lowery et al, 2005 have demonstrated lower self-esteem with increasing weight. Tara et al, 2005 reported poor academic scores in overweight and obese individuals. But the results from other studies provide conflicting evidence across varied populations and across varied age groups. Hence, the purpose of our study was to examine relationships between BMI and self-esteem, academic performance and aerobic capacity in adult college going students.

METHODOLOGY

Randomly selected 300 collegiate students participated in the study. The study was approved by the Institutional Medical Ethics Committee of GNDU, Amritsar and was conducted in Government College (Amritsar) sports facility room. The students were asked to abstain from any vigorous training that might affect their fitness assessment. Following their informed consent, height was measured by Anthropometer rod to nearest 1mm and body weight was measured by weighing machine to nearest 0.1kg, following WHO guidelines. Consequently, BMI was calculated using the formula weight/height^2 ($kg \cdot m^{-2}$). Participants were then divided into the 2 groups.

Normal weight group, (n=150, BMI=18.5-24.9), mean age (21.95 years), mean height (166.92 cm) and mean weight (60.45 kg).

Obese group, OB (n=150, BMI≥30), mean age (22.09 years), mean height (171.82 cm) and mean weight (93.11 kg).

Heart rate monitor and Step with height of 16.25inch, and stop watch were used to calculate aerobic capacity, using Queen's college step test. Academic performance was obtained from their college academic records of the immediately previous year. Lastly, the Self-esteem questionnaire was filled by the subjects.

ANALYSIS: Statistical Package for Social Sciences (SPSS 14.0) software was used for data analysis. The dependent variables (academic performance, aerobic capacity and self-esteem) were analyzed using unpaired T test. Significant level was defined at ($p \leq 0.05$). Pearson product moment correlation was calculated to assess the relationship between BMI and academic performance, self-esteem and aerobic capacity across the groups.

RESULT

Self-esteem: On inter-group comparison, the results of our present study indicate that normal weight girls, boys and combined girls and boys had statistically significant higher self-esteem scores than their obese counterparts (t=18.266, p=0.001), (t=18.460, p=0.001) and (t=25.507, p=0.001), respectively. Furthermore, obese girls had greater self-esteem scores than obese boys (t=2.786, p=0.006). Using Pearson product moment correlation, in the girls and boys combined group, statistically significant correlation was observed between self-esteem and BMI (r=-0.782, p=0.001), academic performance (r=0.608, p=0.001) and aerobic capacity (r=0.672, p=0.001). Also, self-esteem was positively correlated with aerobic capacity in the combined normal weight group (r=0.188, p=0.021) and obese group (r=0.193, p=0.019).

Academic performance: On inter-group comparison, normal weight girls, boys and combined girls and boys had statistically significant higher academic performance scores than their obese counterparts, (t=15.362, p=0.001, t=11.372, p=0.001 and t=18.519,

p=0.001, respectively). Furthermore, girls had greater academic performance scores than their boys counterparts in both normal weight and obese group (t=3.143, p=0.002 and t=3.215, p=0.0016, respectively). In the girls and boys combined group, statistically significant negative correlation was observed between academic performance and BMI (r=-0.660, p=0.001) and statistically significant positive correlation was observed between academic performance and self-esteem and aerobic capacity, (r=0.608, p=0.001) and (r=0.520, p=0.001), respectively.

Aerobic capacity: Aerobic capacity was assessed using the Queen's college step test. On inter-group comparison, the results indicate that normal weight girls, boys and combined girls and boys had statistically significant greater aerobic capacity than their obese counterparts, (t=31.621, p=0.001, t=52.102, p=0.001 and t=25.884, p=0.001, respectively). Furthermore, obese girls had greater aerobic capacity than obese boys (t=5.263, p=0.001) and normal weight boys had greater aerobic capacity than normal weight girls (t=32.995, p=0.001). Pearson product moment correlation was calculated to assess the relationship between BMI and aerobic capacity. In the girls and boys combined group, statistically significant negative correlation was observed between aerobic capacity and BMI (r=-0.814, p=0.001) and statistically significant positive correlation of aerobic capacity was observed with self-esteem and academic performance, (r=0.672, p=0.001) and (r=0.520, p=0.001), respectively.

Table 2 demonstrates the correlation of BMI with other variables in both collegiate girls and boy students. Significant negative correlation was observed between BMI and all the variables, viz. self-esteem, academic performance and aerobic capacity in the combined girls and boys group (n=300).

Variable	Mean	SD	r-value	p-value
Aerobic capacity	33.41	5.47	-0.814	0.001
Self-esteem	57.37	22.38	-0.782	0.001
Academic performance	67.42	12.36	-0.660	0.001

Table 3 demonstrates the correlations of BMI with other variables in both girls and boys group in normal weight and obese categories.

Variable	Normal weight girls		Normal weight boys		Obese girls		Obese boys	
	r-value	p-value	r-value	p-value	r-value	p-value	r-value	p-value
Self-esteem	0.161	0.169	-0.080	0.497	-0.030	0.799	-0.077	0.514
Academic performance	0.050	0.668	-0.003	0.979	0.056	0.639	0.224	0.053
Aerobic capacity	-0.032	0.786	0.098	0.403	-0.067	0.571	0.169	0.148

Discussion

Human obesity results from a complex interaction of factors, including genetic, environmental, metabolic, physiologic, behavioral, social, and perhaps racial influences. The principal cause of obesity is an imbalance between energy intake and energy expenditure. Obesity is a risk factor for major causes of death, including cardiovascular disease, cancer, and diabetes, and is linked with markedly diminished life expectancy. Osteoarthritis, gall bladder disease, sleep apnea, respiratory impairment, diminished mobility, and social stigmatization are associated with obesity, (Mctique et al. 2009). Obesity is also linked with decreased self-esteem, poor academic performance and poor aerobic capacity.

Effect of obesity on self-esteem: The results of the study indicate that normal weight students had greater self-esteem than their obese counterparts. These results are support the research findings of Carol et al, (1999) who have demonstrated a negative relationship of self-esteem with the individual's BMI. Lowery et al (2005) concluded that self-esteem was consistently related to body image dissatisfaction for women and women consistently exhibited a more negative body image than did men. Even when both men and women were consistent exerciser, the women had poorer body image. Both men and women with more positive physical fitness were positively related to self-esteem and body image. Desai et al. 2008 said that physical inactivity disordered eating perception and disordered behaviors are associated with increase rate of over weight and obesity. Latner et al. 2005 concluded that internal stigmatization could help to explain the low self-esteem and poor body image among obese young adults.

Effect of obesity on academic performance: The findings of our study suggest that normal weight students had better academic grades than their obese counterparts. This is in agreement with the research conducted by Tara et al, 2009, who demonstrated that overweight and obesity are associated with poor levels of academic achievements. Overweight students report being teased more, have lower health-related quality of life in social and academic realms, and have more school absenteeism than their non-overweight students. Also, overweight adolescents are more likely to complete fewer years of formal education, generate lower incomes, and have a greater likelihood of living in poverty as adults than their non-overweight students. On the contrary, research conducted by Sharma A et al. 2014, failed to demonstrate any significant correlation between individuals body weight and their academic scores.

Effect of obesity on aerobic capacity: Our study results demonstrate that normal weight students had better aerobic capacity than their obese counterparts. Also, obese girls had greater aerobic capacity than obese boy and normal weight boys had greater aerobic capacity than normal weight girls. These results support the findings by Sharma A et al. 2014 and Vartanian et al. 2008 who concluded that weight stigma in the overweight and obese individuals could decrease physical activity levels. Patkar et al. 2011 reported that the ability to do exhausting work (VO_2max/kg body weight) was less in obese subjects (p=0.001) compared to non-obese subjects and especially in obese males (p<0.010) as compared to non-obese males, using Queen's College step test.

Conclusion

We conclude from our study that normal weight subjects (girls, boys and combined girls and boys) have greater self-esteem, academic performance and aerobic capacity than their obese counterparts, respectively. Furthermore, from the present study it maybe concluded that as the individual's level of body fatness increases (BMI) consequently his/her self-esteem, academic performance and aerobic capacity decrease.T

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