Comparative Study of Body Mass Index between Physical Active Students and Non-Physical Active Students in Kerala

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Abstract
This study aimed to investigate the differences in Body Mass Index (BMI) between physical active students and non-physical active students. A cross-sectional analysis was conducted among a sample of Four hundred school students, comprising two groups: physical active students (n=200) and non-physical active students (n= 200). Body mass index was calculated using standard formulae, and physical activity levels were assessed using self-reported measures. Descriptive statistics, including means and standard deviations, were computed a Body mass index for both groups. Additionally, inferential statistics, such as independent samples t-tests, were employed to compare Body mass index between the two groups. Preliminary findings revealed a significant difference in Body mass index between physical active students and non-physical active students (p < 0.05). Physical active student's demonstrated lower mean Body mass index compared to their non-physical active counterparts. This suggests a potential association between engagement in physical activity and Body mass index levels among school students. Further analyses examining the influence of various factors, including dietary habits, socio-economic status, and duration of physical activity, are warranted to better understand the observed differences. The implications of these findings for promoting healthier lifestyles and preventing obesity among school students are discussed.

Keywords: BMI, physical activity, physically active students, physically non active students

Introduction

A physical activity refers to any bodily movement produced by skeletal muscles that requires energy expenditure. These activities can range from structured exercises such as running, swimming, or weightlifting to more everyday movements like walking, climbing stairs. Physical activities contribute to overall health and well-being by promoting cardiovascular fitness, muscle strength, flexibility, and coordination. They are essential components of a healthy lifestyle and are recommended for people of all ages to maintain physical health and reduce the risk of chronic diseases. Importance of physical activities are Physical health, mental health, disease prevention, enhanced sleep, boosted immune system, improved quality of life, longevity.

Body Mass Index, is a numerical measure used to assess an individual's body weight relative to their height. It is calculated by dividing a person's weight in kilograms by the square of their height in meters. Body Mass Index provides a rough estimate of body fatness and is commonly used as a screening tool to categorize individuals into underweight, normal weight, overweight, or obese categories. While Body Mass Index can be a helpful indicator of potential health risks associated with weight, it has limitations, such as not accounting for muscle mass or body composition. Therefore,

it should be interpreted alongside other factors when evaluating an individual's overall health status.

The comparative study of Body Mass Index among school students engaged in physical activity and those not involved in physical activity offers valuable insights into the relationship between lifestyle and health. Body Mass Index, a widely used measure of body fat based on height and weight, serves as an indicator of overall health and susceptibility to various health risks, including obesity-related diseases. Given the rising concerns surrounding childhood obesity and its long-term health implications, understanding the impact of physical activity on Body Mass Index among school students becomes imperative. In this study, aim to investigate the disparities in BMI between two groups of school students: those actively participating in physical activities and those with minimal or no involvement in such activities. By analyzing and comparing the Body Mass Index data of these two groups, seek to discern the influence of physical activity on body weight and overall health outcomes among school-age individuals.

The significance of this study lies in its potential to inform educational institutions, policymakers, and healthcare professionals about the importance of promoting physical activity among school students as a means to combat obesity and foster healthier lifestyles. Additionally, the findings may

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contribute to the development of targeted interventions and programs aimed at encouraging and sustaining physical activity participation among youth, ultimately promoting better health outcomes and well-being across diverse student populations.

Literature Review

Haggstrom C, *et al*., (2019) in this study says that Obesity is an established risk factor for several cancers. Adult weight gain has been associated with increased cancer risk, but studies on timing and duration of adult weight gain are relatively scarce. We examined the impact of BMI (body mass index) and weight changes over time, as well as the timing and duration of excess weight, on obesity-and non-obesity-related cancers. Methods: We pooled health data from six European cohorts and included 221 274 individuals with two or more height and weight measurements during 1972-2014. Several BMI and weight measures were constructed. Cancer cases were identified through linkage with national cancer registries. Hazard ratios (HRs) of cancer with 95% confidence intervals (CIs) were derived from time-dependent Cox-regression models. Results: During follow-up, 27 881 cancer cases were diagnosed; 9761 were obesity-related. The HR of all obesity-related cancers increased with increasing BMI at first and last measurement, maximum BMI and longer duration of overweight (men only) and obesity. Participants who were overweight before age 40 years had an HR of obesity-related cancers of 1.16 (95% CI 1.02, 1.32) and 1.15 (95% CI 1.04, 1.27) in men and women, respectively, compared with those who were not overweight. The risk increase was particularly high for endometrial (70%), male renal-cell (58%) and male colon cancer (29%). No positive associations were seen for cancers not regarded as obesity-related. Conclusions: Adult weight gain was associated with increased risk of several major cancers. The degree, timing and duration of overweight and obesity also seemed to be important. Preventing weight gain may reduce the cancer risk. Alghadir A, *et al*., (2020) [2] in this study says that Physical activity (PA) has been shown to develop better fitness and body function in children. Various studies have shown that as the age of student's increases, its correlation with school achievement decreases. This study was conducted to evaluate physical activity and stress-related hormones, cortisol and serotonin, among school adolescents aged 12-18 years old and find their association with academic achievements. 300 students were invited to participate in this study. Physical activity of the participants was assessed in relation to the time spent performing various physical activities. End of the academic year grades were obtained from the school as a collective measure of academic achievement and executive function. The levels of cortisol and serotonin were measured using the competitive immunoassay techniques. Results There was a significant correlation between age, gender, BMI, cortisol, serotonin, physical activity score; and academic achievement, and executive functioning among participants. Academic achievement and executive functioning scores correlated positively with gender, serotonin, physical activity score, but negatively with age, BMI and salivary cortisol.

Stepwise regression analysis showed that physical activity and demographic parameters and stress-related hormones, cortisol and serotonin, explained around 61.9-77.9% of academic performance and executive functioning variation in school adolescents, especially females. Conclusions: Optimal physical activity and release of stress-related hormones could be the determining factor for performance in school and other activities. These results should be taken into consideration while planning the school curriculum.

Objective

This study was to conduct a comparative analysis of Body Mass Index (BMI) between physically active students and non-physically active students in Kerala, India.

Methodology

The purpose of the study was designed to investigate the differences in Body Mass Index (BMI) between physical active students and non-physical active students. A cross-sectional analysis was conducted among a sample of Four hundred school students, comprising two groups: physical active students (n=200) and non-physical active students (n= 200). BMI was calculated using standard formulae, and physical activity levels were assessed using self-reported measures. Inferential statistics, such as independent samples t-tests, were employed to compare BMI between the two groups. Preliminary findings revealed a significant difference in BMI between physical active students and non-physical active students ($p < 0.05$). Through a comprehensive analysis of body mass index data collected from both physical activity and non-physical activity groups within school settings, this study endeavors to shed light on the nuanced relationship between lifestyle choices, physical activity engagement, and body mass index outcomes among school students. Such insights hold the promise of informing evidence-based strategies to address the pressing public health issue of childhood underweight among the younger generation.

Analysis of Data

Table 1: Analysis of data on physically active students and physically non active students

			T ratio
Physically active students	Mean	19.91	7
	S D	1.646	
Physically non active students	Mean	17.54	
	S D	1.356	

Significant T = (df 1,398) (0.05) =1.97; (P ≤ 0.05)

The mean on physically active students is 19.91, and physically non active students is 17.54. The obtained T ratio of 7 for adjusted post-test mean is more than the table value of 1.97 required for significance at 0.05 level for df 1 and 398. The results of the study showed that there was a significant difference among two groups.
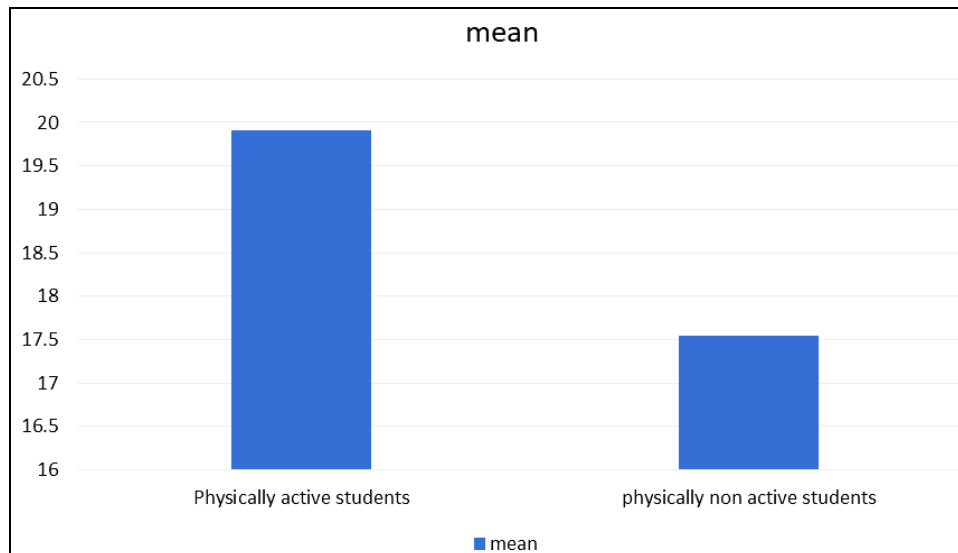
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Result of the Study

Fig 1: Mean difference between physically active students and physically non active students

The mean on physically active students is 19.91, and physically non active students is 17.54. Lack of physical activity can lead to decreased Body mass index.

Discussion and Findings
In today's era where the importance of physical activity is widely recognized, there's an increasing interest in understanding its effects on various aspects of health. One such area of interest is the Body Mass Index (BMI) and how it differs between physically active and non-physically active individuals. In this discussion, we'll delve into a comparative study of BMI in physically active students and non-physically active students, based on statistical values provided.

The t-ratio of 7 indicates a significant difference between the mean Body mass index of physically active and non-physically active students. This suggests that the observed difference in Body mass index is unlikely to have occurred due to random chance. Physically Active Students mean Body mass index of physically active students is 19.91, with a standard deviation of 1.646. This suggests that, on average, physically active students have a slightly higher Body mass index compared to non-physically active students. The standard deviation indicates the degree of variability within this group, showing that there might be some diversity in Body mass index among physically active students. On the other hand, the mean Body mass index of non-physically active students is 17.54, with a standard deviation of 1.356. This indicates that, on average, non-physically active students have a lower Body mass index compared to their physically active counterparts. Similarly, the standard deviation suggests some variability in Body mass index within this group. The significant difference in Body mass index between physically active and non-physically active students raises several points for discussion. Firstly, it suggests that engagement in physical activity might influence Body mass index. Physically active individuals tend to have a slightly higher Body mass index compared to those who are not physically active. This could be attributed to muscle mass, as physically active individuals often have more muscle mass, which can contribute to a higher Body mass index despite being healthy.

Secondly, the lower Body mass index observed in non-physically active students might indicate a higher prevalence of underweight or a lack of muscle mass. Lack of physical activity can lead to decreased muscle mass and overall lower Body mass index, which could potentially be associated with health risks such as decreased strength and increased susceptibility to certain health conditions. Understanding the relationship between physical activity and Body mass index has important implications for public health interventions and education. Encouraging physical activity among students can have numerous benefits beyond Body mass index, including improved cardiovascular health, mental well-being, and overall fitness levels.

Conclusion
In conclusion, the comparative study of Body mass index in physically active and non-physically active students highlights significant differences between the two groups. Physically active students tend to have a slightly higher Body mass index compared to non-physically active students. However, further research is needed to explore the underlying factors contributing to these differences and their implications for overall health and well-being. In this study non-physically active students more than eighty percentage students have under weighted and physically active students have less than five percentage have under weighted. Because the main reason unhealthy food habits and lack of physical activity.

This discussion underscores the importance of promoting physical activity as part of a healthy lifestyle and emphasizes the need for tailored interventions to address BMI disparities among students.

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