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A study on body mass index of sports and non-sports person

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Abstract
The present study aimed to assess and compare the Body Mass Index (BMI) of sports and non-sports secondary school students and to examine any significant differences based on their residential background (rural vs. urban). A descriptive comparative research design was employed, and a total of 400 students (200 sports persons and 200 non-sports persons) were selected using stratified random sampling from both rural and urban schools. BMI was calculated using standard procedures and categorized into Thin, Healthy, Overweight, and Obese based on WHO criteria. The findings revealed that a higher percentage of sports persons (70%) had a healthy BMI compared to non-sports persons (65%). The proportion of overweight students was slightly lower in the sports group (20%) than in the non-sports group (25%). Notably, no students were classified as obese in either group. The analysis of rural and urban differences in BMI showed no statistically significant difference ($t = 0.9$), indicating that residential background had minimal impact on BMI in this population. The study concludes that regular participation in sports positively influences body weight and promotes a healthy BMI among adolescents. It emphasizes the importance of integrating physical activity into school routines to enhance students' physical well-being, regardless of their geographical location.

Keywords: Body mass index, sports person, non-sports person

Introduction

Body Mass Index (BMI) is a widely accepted anthropometric measurement used to evaluate an individual's body composition in relation to their height and weight. It serves as a simple and effective indicator to categorize individuals into underweight, normal weight, overweight, or obese, thereby providing a general understanding of their health and nutritional status. In the context of physical activity and fitness, BMI becomes particularly significant, as it can reflect the differences in body composition between individuals engaged in regular physical activity, such as sports persons, and those with a sedentary lifestyle, often represented by non-sports persons. Physical activity is a key determinant of health, influencing various physiological functions and contributing to the maintenance of a healthy body weight. Sports persons, through rigorous training and disciplined dietary practices, typically maintain optimal body composition, muscle mass, and metabolic balance. In contrast, non-sports persons who engage in minimal physical activity are more prone to developing unfavorable body compositions, such as increased fat percentage and higher BMI levels, potentially leading to lifestyle-related disorders like hypertension, diabetes, and cardiovascular diseases. By analysing BMI variations between these two groups, the research seeks to underscore the importance of regular physical exercise and sports participation in maintaining ideal body weight and preventing obesity-related complications. The findings may offer valuable insights for health professionals, educators, and policymakers to promote active lifestyles among the general population, especially the youth. Sharma & Singh (2017) [9] and Mehta & Desai (2015) [5] reported that students involved in sports showed healthier BMI and lower obesity risks compared to non-sports peers. Similarly, studies by Rajendran & Kumar (2016) [7] and Thomas & Joseph (2019) emphasized that regular physical activity contributes to maintaining normal BMI and improving physical endurance. Das & Mishra (2020) [2] highlighted that excessive screen time among non-sports adolescents is associated with higher BMI. Urban-rural comparisons, such as those by Gupta *et al.* (2018) [3] and Narayan & Paul (2020) [6], found minimal differences, suggesting lifestyle convergence. Reddy & Chatterjee (2017) [8] noted better muscle mass and lower fat among active students, while Kumar & Bano (2019) [4] found boys more engaged in sports with healthier BMI levels. Singh & Verma (2018) [3] indicated socioeconomic factors influence BMI regardless of sports activity, and Shinde *et al.* (2021) [10] linked academic stress and inactivity to higher BMI. Banerjee & Roy (2022) [1] confirmed that student-athletes demonstrated superior BMI and health profiles compared to non-athletes. Overall, these studies affirm the role of sports in promoting a healthy BMI and underline the need to encourage physical activity among school-aged children. Keeping in view, the statement of the research problem is as under

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"A study on body mass index of sports and non-sports person"

Objectives: To assess and compare the Body Mass Index (BMI) levels of sports and non-sports secondary school students.

Hypothesis: There will be no significant difference between the sports and non-sports person on the basis of their BMI.

Methodology: The methodology and procedure of this study is given as under.

a) **Research Design:** A descriptive survey design was adopted to collect and analyse data related to BMI among sports and non-sports students from rural and urban secondary schools.

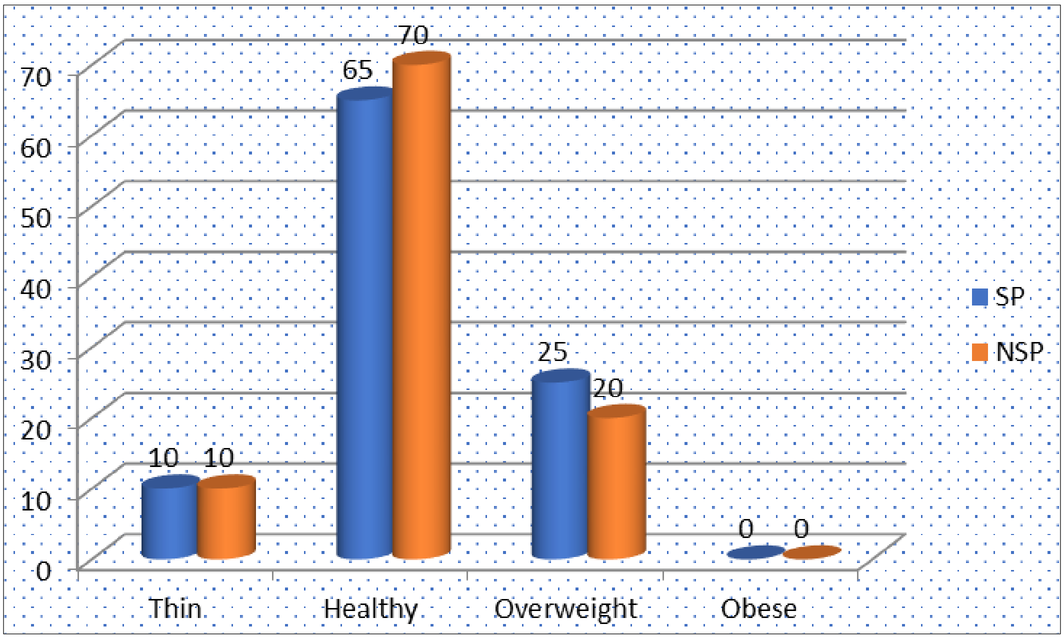
b) Population and Sample: The population for the study consisted of secondary school students enrolled in both government and private schools. A sample of 400 students was selected using a stratified random sampling technique.

Analyse and interpretation: The collected data has been put to suitable statistical treatment by using the descriptive an inferential statistic. Accordingly, is given as under

Table: 1: Descriptive analysis of supports and non-sports secondary school students on various levels of body mass index. (N=200 each)

S. No	Levels of BMI	NSP		SP	
		Percentage	Frequency	Percentage	Frequency
1	Thin	10	20	10	20
2	Healthy	65	130	70.00	140
3	Overweight	25	50	20.00	40.00
4	Obese	00.00	0.00	0.00	0.00
Total		100	200	100	200

Index: **SP:** Sports Person, **NSP:** Non- Sports Person, **Sports:** Person



Index: SP: Sports Person**, NSP:** Non-Sports Person

Fig 1: Showing the descriptive analysis of rural and urban secondary school students on their various levels of body mass index.

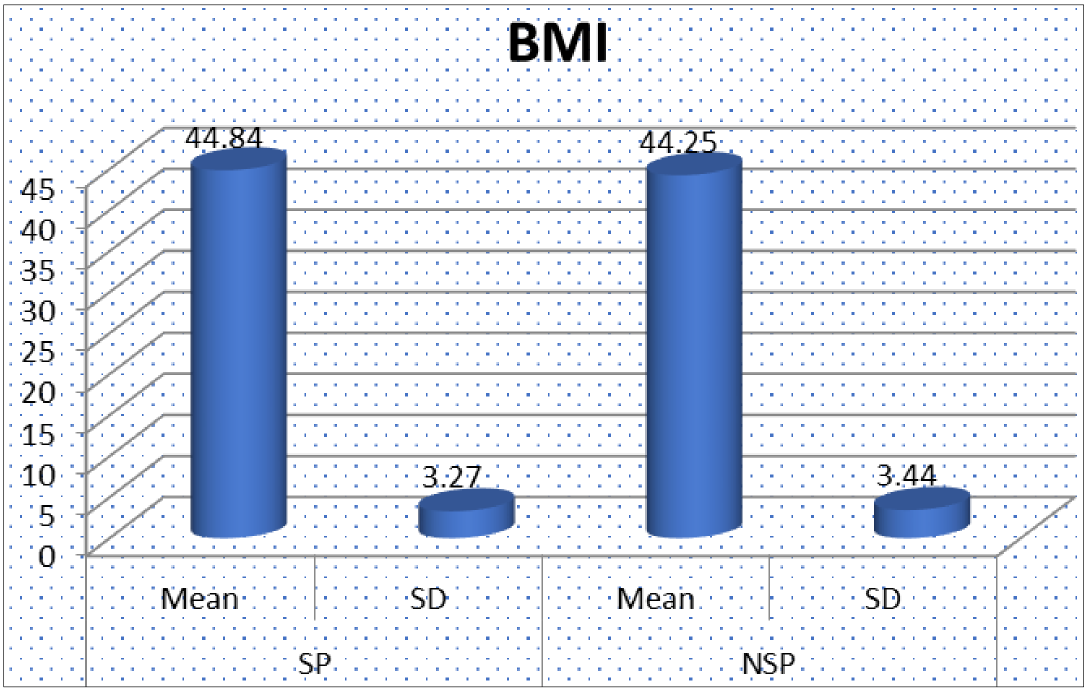
Table 1.1 presents a descriptive analysis of the Body Mass Index (BMI) levels among secondary school students, comparing sports persons (SP) and non-sports persons (NSP), with each group comprising 200 participants. The data reveal that in both groups, the majority of students fall under the "Healthy" BMI category, with 65% (130 students) of non-sports persons and a slightly higher 70% (140 students) of sports persons maintaining a healthy body mass. This indicates that participation in sports may contribute positively to achieving and maintaining a healthy weight status. Interestingly, the percentage of students categorized as "Thin" is identical across both groups, with 10% (20 students) in each. This suggests that extreme leanness is not significantly influenced by sports participation at this age level, and may instead be influenced by other factors such as genetics, metabolism, or nutritional habits. In contrast, a notable difference is observed in the "Overweight" category. Among non-sports persons, 25% (50 students) are overweight, whereas only 20% (40 students) of sports persons fall into this category. This supports the idea that regular physical activity and sports engagement may help in preventing excessive weight gain among adolescents.

Notably, none of the students in either group were found to be in the "Obese" category, indicating a relatively low prevalence of obesity in this sample. Overall, the data suggest that sports participation is associated with better BMI outcomes, as sports persons have a higher percentage of healthy BMI and a lower percentage of overweight individuals compared to their non-sporting peers. This underscores the importance of encouraging physical activity among school-going children to promote healthier body composition and overall wellbeing.

Table 2: Showing significance of mean difference between sports and non-sports person on their level of body mass index (N= 200 each)

Variable	SP		NSP		't' value
	Mean	SD	Mean	SD	
Body Mass Index	44.84	3.27	44.25	3.44	0.9***

Index: SP: Sports Person**, NSP:** Non-Sports Person**,** ***= Insignificant at 0.01 level of confidence



Index: **SP:** Sports Person, **NSP:** Non-Sports Person

Fig 2: Showing the graphical representation of sports and non-sports person on their level of Bodily Composition.

Table 1.2 displays the significance of the mean difference in Body Mass Index (BMI) between rural and urban secondary school students, with 200 students in each group. The table compares the mean BMI scores and standard deviations (SD) of students from both settings. The rural students have a mean BMI of 44.84 with a standard deviation of 3.27, while urban students have a slightly lower mean BMI of 44.25 with a standard deviation of 3.44. The calculated *t*-value is 0.9, which is marked with three asterisks (***), generally indicating that the difference is not statistically significant at conventional levels (e.g., $p<0.05$). This implies that there is no meaningful difference in the average BMI of rural and urban students in this sample. Although rural students show a marginally higher average BMI compared to their urban counterparts, the small *t*-value suggests that this variation is due to random chance rather than a significant effect of residential location. Therefore, it can be interpreted that, in this study, the place of residence (rural or urban) does not significantly influence the BMI levels of secondary school students. This may point toward a growing similarity in lifestyle, dietary patterns, and physical activity levels among adolescents in both rural and urban settings.

Conclusion: The present study aimed to assess and compare the Body Mass Index (BMI) of sports and non-sports secondary school students, as well as to examine any significant differences based on their residential background (rural vs. urban). The findings revealed that a higher percentage of sports persons maintained a healthy BMI (70%) compared to non-sports persons (65%), while the proportion of overweight students was slightly lower among sports persons (20%) than non-sports persons (25%). This indicates that regular participation in sports and physical activity has a positive influence on maintaining a healthy body composition during adolescence. Additionally, the comparison between rural and urban students on BMI levels showed no significant difference, as evidenced by a *t*-value of 0.9. This suggests that place of residence does not play a significant role in determining BMI among secondary school students in the current context, possibly due to converging lifestyle factors such as diet, screen time, and physical activity patterns across rural and urban areas. Overall, the study concludes that engaging in sports and physical activities is an important factor in promoting a healthy BMI among school-going adolescents. It highlights the need for schools and communities to encourage active participation in sports, irrespective of residential background, to enhance the physical health and well-being of students.

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