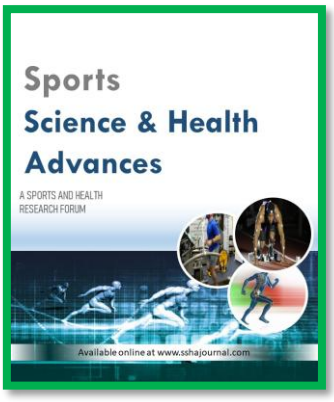
Original Article

Does the Way Children Travelled to School Affect the Body Fat Levels? A Study

Akwinder Kaur

Assistant professor, Department of Physical Education, Mehr Chand Mahajan DAV College for Women, Sector-36, Chandigarh, India.

***Correspondence**: akkusandhu@yahoo.com



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Abstract

Prevalence of obesity has increased significantly in the last two or three decades worldwide. The prevalence statistics shows that obesity pandemic is all-pervading even in the developing nations like India. In the present study an effort has been made to report the prevalence of obesity on the basis of body fat percent among school girls of Punjab, total 6000 students were selected with stratified random sampling technique, (2000 each from high, middle & low economic status) ranging in age from 10-17 years. Height and weight were measured in all participants and the body fat percent (BF %) of everyone was calculated. Body fat percent classes based on mode of conveyance (walking/bicycle & vehicle) (under fat, healthy fat, over fat & obese) were calculated according to the body fat percent cut offs lines by the manual of bio electrical impedance machine with scale HBF-361. The observations revealed that the overall mean value of walking/bicycle & vehicle was 18.55%, 26.04% respectively. The observations also revealed that the overall prevalence of under fat, healthy fat, over fat and obesity was 7.3%, 78.7%, 11.3% and 2.6% respectively. The total no. of 3222 subjects were taken as subjects which were coming to school by walking/bicycle and their body fat % category is under fat (13.5%), healthy fat (86.2%), over fat (.2%) & obesity (.0%) respectively. Whereas in the case of those girls which are coming to school by vehicle a total of 2778 school girls were taken and their body fat % category is under fat (.1%), healthy fat (70.1%), over fat (24.1%) & obesity (5.7%). Overweight was more prevalent among those girl students who came to school by using vehicle as a mode of conveyance.

Keywords: Prevalence, Mode of Conveyance, Obesity, Economic status, Body fat percent, under fat, healthy fat, over fat & Obese, by walking, by bicycle, by vehicle.

Introduction

Globally, overweight and obesity rates are rising, with a significant increase in both adults and children, posing a major public health concern, especially in low- and middle-income countries. Over 390 million children and adolescents aged 5–19 years were overweight in 2022, including 160 million living with obesity. Childhood obesity could more than double by 2035 (from 2020 levels) (WHO, 2024). Overweight /obesity existed more in private schools than public schools. Modes of transport were only

found to be strongly associated with overweight/obesity. There is a need to establish evidence-based strategies to inform policy on prevention of childhood overweight/obesity **(Twinomugisha, B. and Benedict, A.M., 2024). (Indian Express Article, 2024),** India could be facing an obesity epidemic with alarm bells ringing particularly for the young. A new global analysis, published by The Lancet, found that 12.5 million children (7.3 million boys and 5.2 million girls) in the country, aged between five and 19, were grossly overweight in 2022, up from 0.4 million in 1990. Statistics from 2022 indicate that around 1.25 crore children aged 5 to 19 years are overweight compared to normal. This number was 40 lakhs in 1990. **(Mizwar, M. et. al. 2022)** analysed that the subjects who used passive transportation mode had a risk of having obesity. Furthermore, passive transport duration >15 minutes increased the risk of obesity, while active transport >15 minutes was a protective factor. So, the research conclude that there were correlation between the type and duration of the transportation mode used with obesity in adolescent girls. **(Kaur, A., and Deol, N.S. 2020)** reveled that Skeletal muscle percent was more in those schoolgirls who came to school by walking or covered more distance as compared to their counterparts. **(Singh, P.S. et.al. 2020)** In univariate analyses, statistically significant associations were found between the risk of obesity and gender, socio-economic status (SES) and reported physical activity. According to an analysis, India is the third most obese country in the world. The prevalence of Obesity in Punjab is the highest at 33 percent. In India, 2.5 million people are obese. "Long considered a rich man's disease, obesity has quickly grown to become one of the most serious lifestyle diseases. With 41-million obese people presently living in India, the country ranks third in the world on the obesity index. According to a recent analysis, more than 40 percent of the population in Punjab is overweight or obese. Just less than half the population is at high risk of contracting kidney ailments, and the prevalence rate of diabetes is 5 percent greater than the national average." Obesity is further related to a host of medical problems like high cholesterol, diabetes, joint pain, arthritis, and heart diseases **(Punjab News Express, 2016).** Punjabis are the most obese people in the country, Health Minister J P Nadda told the Rajya Sabha today, while men from Tripura and women from Meghalaya are the thinnest. Men and women from Punjab followed by Kerala and Delhi are the most obese people. The findings of this study identified several behavioral and dietary factors that are related to overweight and obesity. Parents and teachers should encourage children to be physically active by limiting screen time and promoting active transport to and from school to promote health and reduce obesity. Ministry of education needs to formulate/enforce policies that encourage physical activities for school children and regulate quality of foods provided to children at schools **(Mwaikambo, S.A., 2015)**.

MATERIAL AND METHODS

Aim of the present study is to determine the prevalence of obesity in Punjab school girls by using body fat percent cut offs lines by the manual of bio electrical impedance machine with scale HBF-361. For this purpose, total 6000 girl students were selected as a sample and the age ranges from 10-17 years (2000 each from high, middle & low economic status). The data was obtained from different district schools of Punjab.

VARIABLE AND CRITERION MEASURES

Body Fat Percent:

Each subject was made to stand bare foot on bio electrical impedance machine with scale HBF-361. The subject's height, age, and gender were manually saved in the machine. System automatically calculates the actual values of Body fat percent and displayed the same machine. If the test performed systematically then it was saved otherwise test was repeated.

STATISTICAL CONSIDERATION

SPSS was utilized for interpretation of the data. The results were analyzed statistically by applying Chi-square test.

RESULTS

Different types of descriptive statistic such as mean and standard deviation was computed to describe each variable statistically. The level of significance was set at .05. Its results have been depicted in the following tables.

Table 1 significant mean differences of body fat % between mode of conveyance (walking/bicycle and vehicle)

GROUP	N	Mean	Standard deviation	Mean Diff	Std. Error Mean	Std. Error Diff	't'
WALKING/BICYCLE	3222	18.55	3.31		.05		
VEHICLE	2778	26.04	4.30	-7.48	.08	.09	-75.95*

Tabulated 't' value is (1.960) at .05 level of significance df=5998

Table - 1 depicts that the mean values of walking/bicycle and vehicle which were used as mode of conveyance by schoolgirls is 18.55 & 26.04 whereas the SD is 3.31 & 4.30 respectively for body fat %. The calculated t-value for walking/bicycle and vehicle for schoolgirls is -75.95*, which is more than the tabulated t-value (1.960) at .05 levels. So, it implies that there is a significant difference of body fat % based on mode of conveyance.

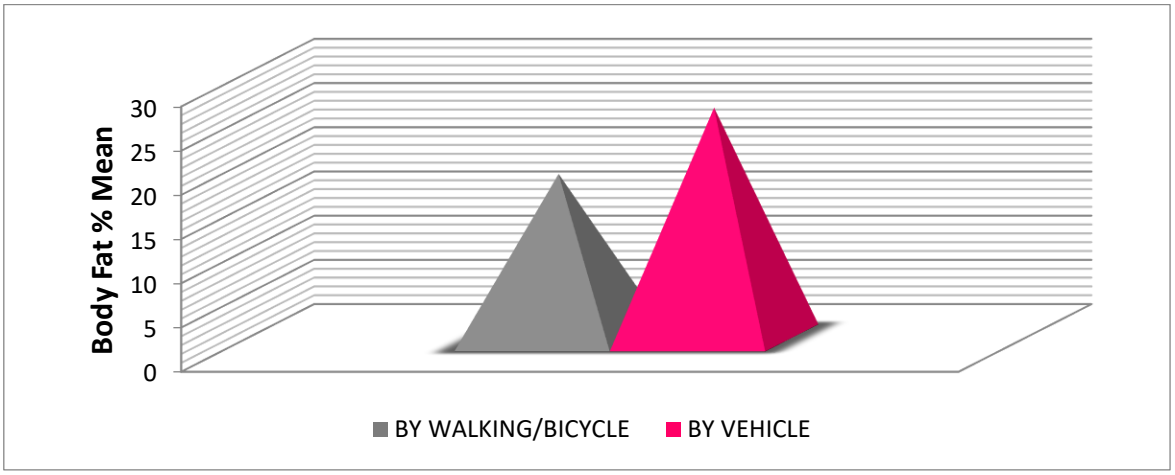

FIGURE 1: mean scores of body fat % between mode of conveyance (walking/bicycle and vehicle)

TABLE 2 crosstabulation among body fat % categories of mode of conveyance (walking/bicycle & vehicle)

GROUP		BODY FAT % CATEGORIES *UNDER FAT	*HEALTHY FAT	*OVER FAT	*OBESE	Total
WALKING/BICYCLE	Count	436	2778	8	0	3222
	Expected Count	236.3	2536.8	364.1	84.8	3222.0
	% of Total	13.5%	86.2%	.2%	.0%	100.0%
VEHICLE	Count	4	1946	670	158	2778
	Expected Count	203.7	2187.2	313.9	73.2	2778.0
	% of Total	.1%	70.1%	24.1%	5.7%	100.0%
Total	Count	440	4724	678	158	6000
	Expected Count	440.0	4724.0	678.0	158.0	6000.0
	% of Total	7.3%	78.7%	11.3%	2.6%	100.0%

*Body Fat % cut offs lines by the manual of bio electrical impedance machine with scale HBF-361

It is an evident from table-2 that various modes of conveyance (walking/bicycle & vehicle) of body fat % and their representation is under fat (7.3%), healthy fat (78.7%), over fat (11.3%) & obese (2.6%) respectively.The total no. of 3222 subjects were taken as subjects which were coming to school by walking/bicycle and their body fat % category is under fat (13.5%), healthy fat (86.2%), over fat (.2%) & obesity (.0%) respectively. Whereas in the case of those girls which are coming to school by vehicle a total of 2778 school girls were taken and their body fat % category is under fat (.1%), healthy fat (70.1%), over fat (24.1%) & obesity (5.7%).

TABLE 3 chi-square tests of body fat % categories of mode of conveyance (walking/bicycle & vehicle)

	χ^2 Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1350.00[a]	3	.000
Likelihood Ratio	1751.00	3	.000
Linear-by-Linear Association	1246.00	1	.000
N of Valid Cases	6000		

a. 0 cells (.0%) have been expected to count less than 5. The minimum expected count is 73.15.Tabulated χ^2 value is (124.34) at .05 level of significance.

Table - 3 demonstrated the test of body fat % which was computed on 6000 subjects between the modes of conveyance (walking/bicycle & vehicle) of schoolgirls. A chi square test was performed to determine the prevalence of under fat, healthy fat, over fat and obesity indicated a significant difference, χ^2= 1350.00[a], p = .000 which is less than p>0.05. It means the test results indicate that there is a significant difference among various categories of body fat % based on mode of conveyance (walking/bicycle & vehicle)**.**

As clear from the table - 3 that even among those who are using vehicle as means of transportation to reach school are over fat & obese and vice versa.

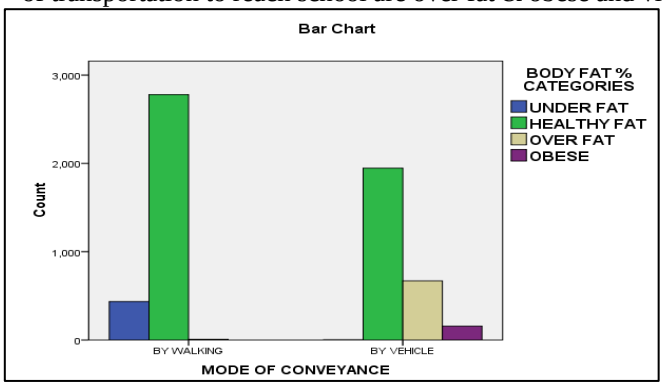

FIGURE 2: body fat % categories of mode of conveyance (walking/bicycle & vehicle)

DISCUSSION OF FINDINGS

While comparing the various mode of conveyance it has been observed that commuting by private modes or our own vehicles is associated with increased chances of getting overweight/obese. In contrast, a negative association is observed in the chances of getting overweight/obese if commuting by active mode like walk and by cycle. The results indicate that the over fat & obesity was greater in those students who board to school by vehicle as compared to those students who came by walking/bicycle but the under fat & healthy fat was found higher in those girls who came to school by walking/bicycle to their matching part. The outcome may be due to the fact that the girls who came by vehicle they are not performing any physical activity and live sedentary lifestyle, that's why they gain weight and most of the girls belongs to high income families & their parents provide the most of facilities to their offspring's and they live inactive lifestyle. The girls who come to school from less than and more than 2.5 km by walking/bicycle are not obese. The girls who came to school by less than 2.5

km walking/bicycle fall in the category of healthy fat and under fat but the girls who covered the more than 2.5 km distance by walking/bicycle they fall in the category of under fat, the reason behind it the girls who covered the more distance they spend more energy in comparison to their energy intake. These findings were like the results of **Patil, G.R. and Sharma G. (2021)** supported with my study because they indicate that commuting by private modes is associated with increased chances of getting overweight/obese. In contrast, a negative association is observed in the chances of getting overweight/obese if commuting by active mode. The study provides quantitative support on the relationship between commuting vehicle preferences and their chances of getting overweight/obese. Finding of this study also similar with results of Kaur**, A. (2016)** and **Kaur, A., and Deol, N.S. (2020)** studies.

CONCLUSION

It was detected that the schoolgirls who came to school by walking were having less body fat percent, as compare to those school girls who came to school by using mode of conveyance as vehicle like cars/cabs. So, the highest risk is observed for car/cab & two wheeler's users compared to other modes in all age categories. Changing the way children travel to school can have significant effects on their levels of physical activity.

Conflict of Interest: No Conflict of Interest Declared among authors

References

Kaur, A. (2016). Impact Of Economic Condition on Obesity, American Journal of Health Research; Vol- 4:6-2: 1-4 http://www.sciencepublishinggroup.com/j/ajhr doi: 10.11648/j.ajhr.s.2016040602.11 ISSN: 2330-8788 (Print); ISSN: 2330-8796 (Online)

Kaur, A., and Deol, N.S. (2020). Relationship of Mode of Conveyance and Skeletal Muscle Among School Girls of Punjab. Journal of Studies in Indian Place Names, ISSN: 2394-3114 Vol-40(60).

Mizwar, M., Astiti, D., Aji, A.S., Siswati, T., (2022). Transportation mode choice and obesity: A cross sectional study at senior high school female student in yogakarta Indonesia. Journal of Nutrition College, Vol-11(2).

Mwaikambo, S.A., Leyna, G., Killewo, J., Simba, A, Puoane, T. (2015). Why are primary school children overweight and obese? A cross sectional study undertaken in Kinondoni district, Dar-es-salaam. Journal of BMC Public Health, Vol- 15(1). DOI:10.1186/s12889-015-2598-0

Patil, G.R. and Sharma G. (2021). Overweight/obesity relationship with travel patterns, socioeconomic characteristics, and built environment. Journal of transport and health, Vol-22.

Punjab News Express February 12, (2016): India ranks 3rd in world on obesity index; Dr Chowbey.

Singh, D.S., Arya. A.,Kondepudi, K.K., Bishnoi, B., Boparai, R.K. (2020). Prevalence and associated factors of overweight/obesity among school going children in Chandigarh, India. Child Care Health Dev, Vol-46(5):571-575.

Twinomugisha, B and Benedict, A.M. (2024). Prevalence and Associated Factors of Overweight and Obesity among Primary School Children Aged 7–17 Years in Urban Mbarara, Uganda. Advances in Public Health, Vol-2024:1-12. DOI:10.1155/2024/5175550.

WHO (2024). Overweight and Obesity. https://www.who.int/news-room/fact-sheets/detail/obesity-and overweight#:~:text=In%202022%2C%201% 20in%208,who%20were%20living%20w ith%20obesity.

WHO(2024).https://www.livemint.com/science/health/ world-obesity-day-2024-crores-of- men-women-and-children-in-india-need-proactive-approach-11709448201365.html. http://indianpediatrics.net/june2012/june-475-477.htm.