International Journal of Physical Education, Sports and Health 2019; 6(6): 01-03

P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (ISRA): 5.38
IJPESH 2019; 6(6): 01-03

www.kheljournal.com
Received: 01-09-2019
Accepted: 03-10-2019

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Correlation between socio-economic status and body mass index

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Abstract
The research study entitled "correlation between socio-economic status and body mass index" has been carried out in Basmat taluka of Hingoli district of Maharashtra state. The major objects of the study are measurement, categorization of BMI, socio-economic status and its correlationship with BMI. Thirty (30) boys and thirty (30) girls based on their own social strata identification who represent various sports competition have been selected. Frequency, percentage, coefficient of correlation as statistical tools have been applied. Regarding social stratification and categorization of body mass index, the results reflecs not much differentiation between these two variables. The co-efficient of correlation reveals that education (0.423), educational status (0.398), social participation (0.392) and education to children (0.560) in boys and family education status (0.593) in 91815 as a social variable shows positive and significant relationship with the body mass index. The economic variables in both the boys and girls did not show any significant impact.

Keywords: Socio-economic status, body mass index, physical education and sports

Introduction
Indian society suffers from serious maldistribution and of opportunities and income. The socio-economic status of the differential hierarchical status position of sports person are responsible for their differential and availment of benefits of different development. Shoemaker generalized that wealth and innovativeness go hand in possession of resources by the socio-economic status of an individual in existing class structure. The socio-economic variables of the group and the status of an individual in the group influence competitive and co-operative behavior. An individual from a lower class competes for different reasons and for different things from those motivating people in the middle and upper economic groups. It may be observed that socio-economic status of an individual which is determined by such factors as occupation, education, attainment, income, type of house he/she lives and his/her material possessions may provide a fair idea of the choice of his/her participation in physical education activities.

Concepts
Socio-economic status
The socio-economic status is a composite socio psychological variable comprised of a number of individual variables such as wealth, income, caste, occupation, education, etc. Various sociologists and thinkers pointed out the factors which form the strata in the society such as economic factor (marx), power and prestige (marx weber), status, occupation, social mobility, wealth, education, income (Battamore) and division of labour (vabelon).

Body mass index (BMI)
A key index for relating weight to height. BMI is a person's weight in kilograms (kg) divided by his or her height in meters squared. The national institute of Health (NIH) defines normal weight, overweight and obesity according to BMI rather than the traditional height/weight charts.

Importance of the study

It is increasingly realized that besides physique and possession of skill relating to an activity there are many other factors, such as attitude, aptitude, interest, intelligence, adjustment, socio-economic status and personality characteristics which contribute to the successful participation in physical education and sports activities. It is only recently that physical education has speculated upon the possible inter-relationship between physical activity and various socio-economic factors.

Objectives of the study

1. To measure and categorize the body mass index.
2. To know the correlation between socio-economic status and body mass index.

Review of literature

Bhatnagar *et al.* (2007) [2] observed that the children of upper socio-economic groups are all the time having more weight as compared to the children of lower socio-economic group. The more heavier children of upper socio-economic group attributable to the better nutritional and hygiene conditions. Takale (2011): While analyzing the effect of socio-economic status and constraints faced by the women volleyball players in their participation reveals that social and economic factors show positive and significant relationship with the participation of women volleyball players. Faldu (2015) studied influence of socio-economic condition on physical fitness of tribal and non-tribal college male students of North Gujrat university 480 male college students were randomly selected. AAHPERED Youth fitness test for physical fitness and Questionnaire for socio-economic data have been used. The results reveal that socio-economic conditions variables like sports achievements of the sample, family size, parent literacy level, parent occupation, agricultural land of the family and yearly income of the family does not significantly affect physical fitness socio-economic conditions variables like sports achievement by the member of the family and education level of the family significantly affect physical fitness of triable students at 0.05 level. Socio-economic conditions variables like sport achievement by the member of the family and social status of the family members significantly affect physical fitness of non triable students at 0.05 level confidence. And socio-economic conditions variables like family literacy rate and total worth of property of the family significantly affect physical fitness of the non-tribal students at 0.01 level. William (2016) [5] evaluated the effect of currently existing physical education programs in US elementary schools by following a nationally representative cohort of kindergartners in the United States. The longitudinal data reveals that whether increases or decreases in physical education over time affect changes in body mass index (BMI).

Research methodology

Local of the study

The study has been carried out in Bahirjee College in Basmat taluka of Hingolidistrict of Maharashtra state. The college has rural background representing social strata having sufficient sports infrastructure.

Sample selection

Based on their identified social strata identifications, Thirty (30) boys and Thirty (30) girls who represent various college sporting events have been randomly selected.

Measurement of variables

Measurement of dependent variable

Body mass index (Index)

BMI (body mass index) is a calculated number representing a person's level of fat or obesity level. According to the Centres for Disease Control and Prevention (CDC), a BMI of 30 or above indicates obesity. BMI levels are broken down by weight range and are as, underweight: BMI<18.5, normal weight: BMI 18.5 – 24.9, overweight: BMI 25-29.9, obesity: BMI 30-39.9, morbid obesity: BMI > 40.

Formula to calculate Body mass Index (BMI)

The formula to calculate BMI requires information about a person's height in meters and weight in kilograms or weight in pounds and height in inches. The BMI formulas are:

$$\text{Body Mass Index (BMI)} = \frac{\text{Weight (kg)}}{\text{Height (metres)}} \text{ or } \frac{\text{Weight (pounds)}}{\text{Height (inches)}}$$

Special consideration for calculating BMI

Mostly have to do with the fact that fat and lean muscle tissue are not considered. The extra height of the individual comes with extra weight. This might skew the BMI and make it appear high even if the person is relatively lean. Also as a person ages they may lose height, so the BMI may be increased without any significant change in the person's weight.

Desirable body weight

A simplified formula for desirable body weight is a men at 5 feet weights 55 kg whereas women at 5 feet weight 52 kg add 2 kg per extra inch of the body weight.

Socio-economic status

The socio-economic status scale standardized by Bhatnagar (2007) [2], Bawazir (2012) and Faldu (2015) have been necessarily modified and used. The social variables include age, education, family type, social participation, food consumption, clothing, house and housing condition, furniture and utensils, education to children and health. The economic variables consist of annual income, land, livestock, material possession, agricultural implements, credit source and saving. Survey method of research with the application of questinnarie has been used.

Statistical test used

The frequency, percentage, mean and co-efficient of correlation have been applied.

Result

Table 1: Measurement and categorization of body mass index

Sr. No.	Socio-economic status	Body mass index									
		Under weight		Normal weight		Over weight		Obesity		Morbid obesity	
		F	%	F	%	F	%	F	%	F	%
I	**Boys**										
	1. Lower strata (10)	3	30	6	60	1	10	0	-	0	-
	2. Middle strata (10)	2	20	5	50	2	20	1	10	-	-
	3. High strata (10)	1	10	4	40	3	30	2	20	-	-
II	**Girls**										
	1. Lower strata (10)	2	20	4	40	2	20	1	10	1	10
	2. Middle strata (10)	3	30	3	30	2	20	1	10	1	10
	3. High strata (10)	3	30	3	20	3	20	1	10	1	10

Source: Survey analysis, F = frequency and % = percentage.

Table 1 indicates that among lower strata boys, 30%, 60%, 10% belong to underweight, normal weight and over-weight respectively. Inc case of middle strata, 20%, 50%, 20% and 10% boys belong to underweight, normal weight, over weight and obesity. Similarly, 10%, 40%, 30% and 20% boys of higher strata represent underweight, normal weight, over weight and obesity respectively. In case of girls, 20%, 40%, 20%, 10% and 10% lower strata girls belong to underweight, normal weight, overweight, obesity and morbid obesity respectively. Among middle strata, 30%, 30%, 20%, 10% and 10% girls represent underweight, normal weight, overweight, obesity and morbid obesity respectively. Similarly, 30%., 20%, 30%, 10% and 10% higher strata girls belong to underweight, normal weight, overweight, obesity and morbid obesity respectively.

Table 2: Coefficient of correlation between socio-economic status and body mass index

Sr. No.	Socio-economic status	Co-efficient of correlation (r)	
		Boys	Girls
	Social aspects		
1	Age	0.081 NS	0.022 NS
2	Education	0.423 *	0.038 NS
3	Family educational status	0.398 *	0.593 **
4	Family type	0.023 NS	0.065 NS
5	Social participation	0.392 *	0.090 NS
6	Food consumption	0.013 NS	0.003 NS
7	Clothing	0.003 NS	0.032 NS
8	House and housing condition	0.029 NS	0.039 NS
9	Furniture and utensils	0.032 NS	0.053 NS
10	Education to children	0.560 **	0.029 NS
11	Health	0.019 NS	0.028 NS
	Economic aspects		
1	Annual income	0.119	0.103
2	Land	0.025	0.049
3	Live stock	0.009	0.012
4	Material possession	0.035	0.046
5	Agricultural implements	0.083	0.010
6	Credit source	0.029	0.041
7	Saving	0.011	0.091

*: Significant at 0.05 level **: Significant at 0.01 level

The co-efficient of correlation between socio-economic status and body mass index have been presented in Table No. 2. The table reveals that among boys education (0.423), family educational status (0.398), social participation (0.392) and education to children (0.560) show positive and significant correlation. Among the girls, family educational status (0.593) had positive and significant relationship. In both the boys and girls, none of the economic variables show any significant relationship.

Conclusion

The social strata of the students has no significant effect on the body mass index. Education, family educational status social participation as a social variables show positive and significant correlation with body mass index whereas economic variables did not show any effect.

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