ANALYSIS ON RELATIONSHIP BETWEEN PHYSICAL FITNESS AND BODY MASS INDEX OF GRADE-VIII SCHOOL BOYS OF IMPHAL WEST, MANIPUR

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ABSTRACT

The purpose of the present study was to find out the relationship between physical fitness and body mass index of Grade VIII school boys, age ranging from 13 to16 years of Government and Private School of Imphal West District (Zone II) of Manipur. Five items of physical fitness test i.e. Vertical Jump, Sit-ups, Push ups, 300 m run and 1.5 mile run were conducted on 400 Grade VIII school children, i.e. 200 boys from Government School and 200 boys from Private School and BMI was calculated by using their body weight and standing height. By computing the data with statistical technique SPSS Software, it was found that Government School boys were older and heavier whereas lower in height than the Private School boys. Their age and weight averages were, 14.5 and 14 years and 44.6 and 43.9 kg and range between 13.0 - 16.0 years of similar age in both schools. Whereas in height 1.57 and 1.61 m with range of 1.45.00 - 1.76 m and 1.41 - 1.77 m respectively, in BMI 18.06 and 16.97 with range of 14.40 – 23.20 and 14.60 – 22.00 respectively. And, in respect of their physical fitness parameter like Vertical jump, Sit-ups, Push-ups, 300m run and 1.5 mile run were found as, 35.31 ± 2.64, 22.75 ± 4.6, 21.35 ± 3.95, 1.44 ± 0.23 and 12.43 ± 0.21 for Government School boys and for Private school boys 37.45 ± 3.38, 28.91 ±7.14, 27.34 ± 6.42, 1.07 ± 0.31 and 12.09 ± 0.32 respectively. Analysis of this score by using SPSS statistical technique found that physical fitness items of Government School boys' Sit-ups and 1.5 mile run have found relationship at 0.9 level with their BMI, followed by Vertical jump at 0.5 level. While Push-ups and 300 m run have less relationship with their BMI at 0.04 and 0.08 level respectively. In case of Private School boys, relationship between BMI and Vertical jump is at 0.12 level and has low relationship, while 1.5 mile run, 300 m run, Sit-ups and Push-ups has less relationship at 0.07, 0.001, 0.000 and 0.000 level respectively with their BMI.

The finding reveals that there is significant relationship between BMI and physical fitness parameters at different level on Government School boys and Private School boys of Imphal West (Zone II) of Manipur.

***Key words**: Body Mass Index, Vertical jump, Sit-ups, Push ups, 100 m run and 1.5 mile run*

INTRODUCTION:

Physical fitness plays a vital role in the life of a man since time immemorial. The progress of the nation lies in the hands of the people who are healthy and physically fit. Every individual should develop physical fitness for a happy and effective living.

Bucher and Prentice, 1985, defined physical fitness as the capacity of the heart, lungs, blood vessels and muscles to function at optimal efficiency. Calculated Body Mass Index (BMI) can be compared against the standard value to determine whether the individual has acceptable body weight, is overweight or is obese. Risk of increased mortality from high values of BMI is described by a J-shaped curved. BMI from 15 to 25 represents no excess mortality risk and over 40 a high risk of great mortality (**Brary, 1985**).

According to (**Centres for Disease Control and Prevention, 2008**), physical fitness prevents or reduces the risk of cardiovascular disease. Additionally, it decreases the number of children struggling from diseases including diabetes, hypertension, elevated blood cholesterol, lowers the risk of colon cancer, and depression (**Demo et al 2001**). All in all, physical activity leads to good health (**Young 2001).**

Youth's habitual involvement in physical activity can directly improve in their physical and psychological health (**Calfas and Taylor, 1994; Mc Kenzie and Sallis, 1996**). Moreover, children's physically active lifestyle can be carried on through their adulthood and thereby improve their lifelong health (**Baranowski et al, 1992; Ross at al, 1985**). Thus, it is important to establish habitual physical activity as early as possible (**Pate et al, 1996**).

One of the most basic benefits of physical activity is the development of motor skills. Children with low motor competence are likely to have poor physical fitness when compared to children with high motor competence (**Haga, 2009**). Physical activity helps children learn and develop their complex, fine and gross motor skills in order to be successful in being physically fit.

Physically fit youths are likely to have higher academic achievement than their inactive peers. National health surveys, including children from around the world, have reported significant positive relationships between physical fitness and academic achievement (**Trost, 2007**). Hence, the purpose of the present study was to analyse the relationship between BMI and physical fitness parameters of Imphal West (Zone II), Manipur.

MATERIALS AND METHODS:

Subject: For the present study 400 boys students who were studying in Grade VIII, age ranging between 13 to 16 years of 15 Government Schools (200 boys) and 15 Private Schools (200 boys) of Imphal West (Zone II) of Manipur was taken as subjects on random basis.

Selection of Tools:

Five items of physical fitness i.e. Vertical Jump, Sit-ups, Push-ups, 300m run and 1.5 mile run were selected to measure the fitness status of the subjects. Besides, height and weight were also measured to assess the BMI of the students.

Purpose of Tools:

Vertical Jump was assessed to measure the explosive strength of legs. Sit-ups was assessed to measure strength of the abdominal muscle, Push-ups to measure strength and endurance of the upper body and 300 m run and 1.5 mile run was assessed to measure speed endurance and cardio-vascular endurance respectively. And BMI was calculated by using the following formula:

[Body Mass Index = (Weight in kilogram)/(Height in metre)^2]

Statistical Approach:

Classical statistics like Mean, SD and the correlation between BMI with physical fitness parameters - Vertical Jump, Sit-ups, Push-ups, 300 m run and 1.5 mile run of the Government and Private School boys, were furnished by using Statistical Product and Service Solution (SPSS) Software.

Table: 1

BODY PARAMETERS' AND BMI'S - MEAN, SD AND 'R' VALUES OF THE STUDY SUBJECTS

Parameters	Government School (N=200)		Private School (N=200)		'r' values
	Mean	SD	Mean	SD	
Age	14.5	0.77	14	0.61	-0.324
Height	1.57	7.04	1.61	6.96	0.062
Weight	44.6	5.69	43.9	5.02	-0.183
BMI	18.06	1.81	16.97	1.68	-0.454

Table 1 shows the Mean**,** SD and 'r' values of the body parameters and BMI of Government and Private School boys of this study. The Private School boys (mean=14± .61) was found to be younger than Government School boys (mean=14.5 ± .77) with 'r' value = -0.324. The height of the Private School boys (mean=1.61±6.96) was higher than the Government School boys (mean=1.57±7.04) which was statistically significant at (P<0.05) with the correlation value of 'r' = 0.062. Whereas weight (mean 43.9±5.02) and BMI (mean 16.97±1.68) were lesser than the Government School boys' weight (mean=44.6±5.69) and BMI (mean=18.06±1.81) with 'r' value = -0.183 and -0.454 respectively.

Table: 2

PHYSICAL FITNESS PARAMETERS' MEAN, SD AND 'R' VALUES OF THE STUDY SUBJECT

Parameters	Government School (N=200)		Private School (N=200)		'r' values
	Mean	SD	Mean	SD	
Vertical Jump	35.31	2.64	37.45	3.38	0.055
Sit-ups	22.75	4.6	28.91	7.14	0.010
Push-ups	21.35	3.95	27.34	6.42	-0.058
300 m	1.44	0.23	1.07	0.31	-0.075
1.5 mile	12.43	0.21	12.09	0.32	-0.064

Table 2 highlight the Mean, SD and 'r' values of the physical fitness parameters of the Government and Private School boys. The Private School boys dominate in Vertical jump, Sit-ups and Push-ups from Government School boys which was significant at (P < 0.05) with 'r' value = 0.055, 0.010 and -0.058 respectively. Whereas in 300 m run and 1.5 mile run Private School boys consume less time than Government School boys with significantly at (P < 0.05) with 'r' values = -0.075 and -0.064 level of significance respectively.

Table: 3

CORRELATION OF BMI AND PHYSICAL FITNESS PARAMETERS OF GOVERNMENT SCHOOL AND PRIVATE SCHOOL:

Correlations	Government School (N=200)	Private School(N=200)
BMI Vs Vertical jump	0.5	0.12
BMI Vs Sit-ups	0.9	0.000
BMI Vs Push-ups	0.04	0.000
BMI Vs 300 m run	0.08	0.001
BMI Vs 1.5 mile run	0.9	0.07

Table 3 shows that physical fitness components of Government School boys' Sit-ups and 1.5 mile run have found relationship at 0.9 level with their BMI, followed by Vertical jump at 0.5 level. While Push-ups and 300 m run have less relationship with their BMI at 0.04 and 0.08 level respectively. In case of Private School boys, relationship between BMI and Vertical jump is at 0.12 level and has low relationship, while 1.5 mile run, 300 m run, Sit-ups and Push-ups has less relationship at 0.07, 0.001, 0.000 and 0.000 level respectively with their BMI.

RESULTS AND DISCUSSION:

Four hundred grade-VIII school boys' students consisting of 200 boys from Government and 200 boys from Private School were studied in this present study belonging to Imphal west (Zone II) of Manipur. Government School boys were older, heavier with lower in height than the Private School boys considering the population of the present study. Their age and weight averages were, 14.5 and 14 years and 44.6 and 43.9 kg and range between 13.0 - 16.0 years of similar age in both schools. Whereas in height 1.57m and 1.61 m with range of 1.45.00m - 1.76 m and 1.41m - 1.77 m respectively, in BMI 18.06 and 16.97 with range of 14.40 – 23.20 and 14.60 – 22.00 respectively. And, in respect of their physical fitness parameters like Vertical jump, Sit-ups, Push-ups, 300m run and 1.5 mile run were found as, 35.31 ± 2.64, 22.75 ± 4.6, 21.35 ± 3.95, 1.44 ± 0.23 and 12.43 ± 0.21 for Government School boys and for Private School boys 37.45 ± 3.38, 28.91 ±7.14, 27.34 ± 6.42, 1.07 ± 0.31 and 12.09 ± 0.32 respectively.

Analysis of this score by using statistical technique found that physical fitness components of Government School boys' Sit-ups and 1.5 mile run have found relationship at 0.9 level with their BMI, followed by Vertical jump at 0.5 level. While Push-ups and 300 m run have less relationship with their BMI at 0.04 and 0.08 level respectively. In case of Private School boys, relationship between BMI and Vertical jump is at 0.12 level and has low relationship, while 1.5 mile run, 300 m run, Sit-ups and Push-ups has less relationship at 0.07, 0.001, 0.000 and 0.000 level respectively with their BMI.

The statistical findings showed that correlation of selected physical fitness items i.e. Vertical jump, Sit-ups, Push-ups, 300m run and 1.5 mile run with BMI are significant at different level. There is significant relationship between BMI with Sit-ups and 1.5 mile run followed by Vertical jump and less relationship with BMI and Push-ups and 300 m run for Government School boys. And there is less relationship between BMI with Vertical jump followed by 1.5 mile run, 300 m run, Sit-ups and Push-ups at different level for Private School boys. The probable reason might be due to that BMI significantly or differentially influenced physical fitness. The Government School boys have more BMI than the Private School boys and so Government School boys have lower physical fitness than the Private School boys. In

other study, Kumar Sachin et al (2011) found significant relationship between BMI and WHR in 9 years boys but no significant relationship were obtained in 6, 7 and 8 years age group boys of West Delhi. Whereas, Dr. K.M. Valsaraj (2013) found no significant relationship between selected motor fitness variables and Body Mass Index of urban and rural high altitude boys of Uttarakhand State.

CONCLUSION:

Based on the above result, it can be concluded that there is significant relationship between BMI with Sit-ups, 1.5 mile run and Vertical jump and less relationship between BMI with Push-ups and 300 m run for Government School boys. On the contrary there is less significant relationship between BMI with Vertical jump followed by 1.5 mile run, 300 m run, Sit-ups and Push-ups for Private School boys. Higher BMIs were generally associated with lower physical fitness.

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