

## The role of nutrition in physical fitness and talent development among students of physical education

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### ■ ABSTRACT

The study was carried out by selecting 120 boys of B.P. Ed. from B. K. Patil College of Physical Education, Malkapur, Dist. Buldana (M.S.) for three consecutive academic years from 2008-2011. Nutritional status was assessed by computing BMI (Body Mass Index) using height and weight parameters. Physical fitness was assessed by the performance of respondents in track and field events *viz.*, 100 m, 800 m and 1500 m track events and long jump, high jump and shot put as field events. Nutritional status of student respondents using BMI as recommended by WHO revealed that about 13.33 per cent of the respondents were below (<20) normal. 85.00 per cent were in normal (20-23) and about 1.66 per cent only were overweight. The Spearman's correlation co-efficient was computed to see the relation between BMI and sport events such as track events and field events. The results revealed that, there was a positive correlation between all events except 100m run and BMI. Talent identification using frequency and percentage showed 28.33 per cent in 100 m, 48.33 per cent in 800 m and 70.83 per cent in 1500 m track events. While talented students in field events were as 62.50 per cent in long jump, 54.16 per cent in high jump and 76.66 per cent in shot put. The study proved that the nutrition has played a vital role in performance of track and field events for identification of talent.

■ Key Words : Nutrition, Physical fitness, BMI

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B.K. Patil College of Physical Education, Malkapuri in Buldana district is under the jurisdiction of Sant Gadage Baba Amaraovati University, Amaraovati. This college is offering one year degree course of B.P. Ed. in Physical Education. The students undergo vigorous physical activities through sports and games. During this process, the real talent of the students in sports and games performance is evaluated in academic year. They have to score a minimum 40 per cent to get through these courses. The main purpose of offering these courses is to identify the talents as well as to cultivate the healthy life styles among the future generation. As it is found that, in the modern society, inactivity or low level of physical activity combined with changes in eating habits are believed to be the main reasons for the increased prevalence of overweight/

obesity among adolescents, because physical activity is an important component in weight control and also associated with other major health benefits, its role in youth health is fundamental. Health, nutrition and physical development go hand in hand.

Nutritional anthropometry is concerned with the measurement of variations of the physical dimension and the gross composition of the human body at different age levels and degrees of nutrition. Body composition is an important indicator of health status in children and adolescents (Immink *et al.*, 1992; Rolland-Cahera, 1995; Malina *et al.*, 1998). Some useful information about the relationships between body composition and physical fitness in children from developed countries have been published (Malina, 1975; Beunen *et al.*,

1983). These studies revealed that excessive fatness has a negative impact on performance tasks in which the body is projected through space as in long jump, sprint and on tasks in which the body must be lifted in space as in bent arm hang. In contrast with developed countries, little is known about the relationship between body composition and physical fitness in children, adolescents and adults also in developing countries. This relationship is relevant for public health because in developing countries low fatness can be seen as a result of undernutrition (Spurr, 1988; Malina and Roche, 1983). Under nutrition likely is an important risk factor for general health outcomes. From a public health perspective, improvement of both nutritional status and physical fitness can be seen an important tool for the improvement of the well being of the population and for preventing diseases. Although the improvement of nutritional status is the most important, improving physical fitness can play an important additional role. As a result, it is important to investigate the determinants of physical fitness. Data on the interrelationship between BMI and physical activity are limited. A clear understanding of the effect of physical activity on BMI is lacking. Thus, the present study aimed at the following objectives-to assess the fitness of students of physical education in terms of track and field events, to assess the BMI using the weight and height parameters, to see the relationship between the BMI and performance of the students in track and field events to identify the talents among the students in sports and games.

## ■ METHODOLOGY

This was a cross sectional study carried out of 120 boys of B.P.Ed. form B.K. Patil College of Physical Education, Malkapur, Dist. Buldana (M.S.). For the study, 40 students from each year for three consecutive years ( 2008-2009, 2009-2010 and 2010-2011) were taken. The age group of the students was 21-25 years. During the study, they were assessed for anthropometric measurements such as height and weight. These parameters were recorded for all the respondents. Though purposive sample was done, respondents were selected from normal population excluding those who were suffering from any disease and medical treatment.

### Body mass index:

Nutritional status of the respondents was assessed by computing the body mass index (BMI). Height and weight were recorded for each participant to determine their BMI.

Body mass index was derived by Quetelet's index from body weight/(height)<sup>2</sup>. It is one of the useful tools for diagnosing obesity or malnutrition. Height was measured on a scale marked to a wall and rounded down to nearest centimeter. Weigh balance, subject standing on it with minimum clothing and bare feet and was rounded up to nearest kilogram. Cut-off points according to WHO were used to define the prevalence of overweight.

The body weight indicates the body mass and gives a rough estimate of body volume, while height gives a picture of nutritional status and deficit in height indicates chronic and prolonged under nutrition resulting often in permanently stunted physical status.

### Measurement of physical fitness:

The physical fitness was assessed by measuring the performance of the respondents in track and field events. The field events such as long jump, high jump, shot put and track events such as 100 m, 800 m and 1500 m were conducted. The norms for evaluation of performance of the athletic events for I year students of physical education using 1/100 stop watch and steel tape. The norms developed and standardized by Wilson (1995) was used. Norms measured the performance and identified the students as talented. This tool was developed using the data from 15 years based on the performance of UAS, Dharwad students. These norms were standardized for each track and field events. These measurements were related to well nourished population and was standardized including 1200 students in the age group of 18-19 year boys and these measurements were taken on a cross sectional population, sampling procedures were reproducible and measurements were carefully made and recorded by trained people in anthropometric techniques using well tested, designed and calibrated equipments.

### Statistical analysis:

The results were analysed using suitable statistical treatments using MS- Excel software. Descriptive statistics (averages, range, minimum and maximum) were computed. Karl Pearson's Correlation co-efficient was computed for assessing the relation between BMI and performance of students in track and field events.

## ■ OBSERVATIONS AND DISCUSSION

Table 1 reveals that the students has an average height

Table 1: Descriptive statistics of the parameter									
Descriptive statistics	Height (cm)	Weight (kg)	BMI	100 m (sec.)	800 m (min.)	1500 m (min.)	Long jump (m)	High jump (m)	Shot put (m)
Avg.	171.41	60.03	20.37	13.77	2.73	4.82	5.23	1.30	7.14
Max.	188.00	73	22.72	14.00	2.80	4.97	5.55	1.44	8.80
Min.	156.00	45	17.36	12.90	2.57	4.62	5.11	1.21	6.69

**Table 2: Classification of student's nutritional status of adults using BMI ( WHO)**

BMI	Nutritional grade	No. of students	% of students
<20	Under weight	16	13.33
20-23	Normal	102	85.00
23-30	Overweight	2	1.66
30-35	Obesity I	-	-
35-40	Obesity II	-	-
>40	Obesity III	-	-
	Total	120	100

**Table 3: Classification of student's nutritional status of adults using BMI**

BMI	Nutritional grade	No. of students	% of students
<16	III degree CED	-	-
16-17	II degree CED	-	-
17-18.5	I degree CED	3	2.50
18.5-20	Low normal	37	30.80
20-25	Normal	80	66.70
25-30	Overweight	-	-
>30	Obesity	-	-
	Total	120	100

**Table 4: Percentage of students identified as talented**

Event	Criteria	No. of students qualified	Per cent
100 m run	<13.7 seconds	34	28.33
800 m run	< 164 seconds	58	48.33
1500 m run	<296 seconds	85	70.83
Long jump	>5.15 m	75	62.50
High jump	>1.26 m	65	54.16
Shot put	>6.90 m	92	76.66

of 171.41 cm, weight 60.03 kg and BMI 20.37. The average time taken to complete 100 m run by the students was 13.77 sec., 800 m run was 2.73 min, 1500 m run was 4.82 min., long jump was 5.23 m, high jump was 1.30 m and shot put was 7.14 m. In general, the trend indicated that, the average performance was nearly equal to the norms and some time slightly higher than norms. But averages are not exclusive indicators of the performance and there was need for further research.

Majority of the students (85.01%) were in category of normal as per the WHO classification as shown in Table 2. It was depicted that only 2 per cent of the students were overweight but not obese. As per the data of Table 3 also show that only 2.50 per cent of the students were suffering from chronic energy deficiency while 97.5 per cent students were either low normal or normal categories. This indicates that most of the students of physical education were oriented for proper nutrition and exercise for physical fitness. Their

nutritional status was optimum.

When the results were analysed and compared with the norms for identification of talents, it was found that, 28.33 per cent of the students has talent in 100 m run while highest per cent of the talented students was in shot put 76.66 per cent followed by in long jump 62.50 per cent students were found talented. Broadly, the students of physical education were better in field event than in track events in their college level (Table 4).

The correlation between track and field events with BMI revealed that, BMI was negatively correlated with 100 m run while with all other events the correlation was positive (Table 5). This indicates that, the events which required strength and endurance needed better BMI, while 100 m run was short time and distance event was not much depending upon the BMI. With the better BMI showing talent in 100 m run was not possible as they find difficulty with heavy body weight.



**Table 5: Correlation between field and track events and BMI of the students**

BMI with	Correlation co-efficient
100 m	-0.006
800 m	0.105
1500 m	0.176
Long jump	0.023
High jump	0.140
Shot put	0.173

**Conclusion:**

The students were having normal height and weight with average BMI. Hence, their performance in track and field events was satisfactory. Most of the students were belonged to low normal and normal category. They were better in field events than track events. This indicated that, the students were better BMI who were fed with nutritious food and were able to perform better in all these events field and track events. Influence of nutrition is very obvious in development of talent as well as identification.

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