A Study of the Fitness Levels of Physical Education Teachers

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ABSTRACT: Physical fitness factors have been widely and continuously studied by the experts since decades. Present study was undertaken as an innovative task to study the physical fitness trends amongst those who are responsible for imparting physical education to the masses and particularly in the schools. 40 male and 40 female physical education teachers of Hisar district schools were studied on height, body weight, waist hip ratio and BMI calculations were carried out to know about the health related physical fitness trends amongst them and simple statistical measures were computed and analyzed to know their current physical fitness levels.

I. INTRODUCTION

Physical fitness has been defined by many people in different ways. Hence today not just one but many definitions of physical fitness exist. It is generally defined as the sum total of the motor components like speed, strength, endurance, flexibility and body composition. Fitness is an important and valuable aspect of one's life and personality and paves the way of healthy habits and disease free life, thus making an individual an asset to the society rather than a liability. Physical fitness is broadly classified into two categories: Health Related Physical Fitness and Competition Related Physical Fitness. The present study focused on the selective components of health related physical fitness. Following apart from the body weight are considered as the components of health related physical fitness by the majority of experts and researchers:

a) Body mass index: Researches has shown that there is a clear link between body weight, or more specifically high body mass index (BMI; kg/m2) and the risk of morbidity and mortality. A high BMI is associated with several abnormalities now, collectively referred to as the metabolic syndrome, in which insulin resistance with excessive adiposity appears to be the central pathogenic factor. Adiposity is usually inferred from the BMI; however, this may not be sufficient to fully explore relations between body fat and alterations in human health. It would appear that the body composition, rather than body weight, determines the risk for diseases associated with ageing and other chronic diseases, as well as mortality. The BMI cut- off point that identifies the proportion of people with a high risk of non-communicable diseases (NCD) is a desirable indicator, because it could provide policy makers with information to initiate prevention programs for improving fitness,

Within the cause-effect paradigm of high body fat and propensity for disease, and bearing in mind the evidence indicating the increase in prevalence of cardiovascular disease and diabetes in Indians, it is necessary to demonstrate that Indians have a higher body fat for specific BMI when compared to other groups. It has been found that for a given BMI, Indians have more body fat than other ethnic groups, both within and outside Asia. This is important, because measures of overall obesity and the location of body fat are strongly associated with insulin sensitivity in Indians.

b) Waist Hip Ratio: The waist-hip ratio (the circumference of the waist divided by that of the hips) is used as a measure of central obesity. Intra-abdominal or visceral fat has a particularly strong correlation with disease. In a study of 15,000 people, waist circumference also correlated better with metabolic syndrome than BMI. Women with abdominal obesity have a cardiovascular risk similar to that of men.

The present study aimed to measure and analyze the body Weight, Body Mass Index and Waist to Hip ratio of the physical education teachers of Hisar District. Excessive body weight is associated with various diseases, particularly cardiovascular diseases, diabetes mellitus type 2, obstructive sleep apnea, certain types of cancer, and osteoarthritis. As a result, obesity has been found to reduce life expectancy. Knowledge of the health and fitness levels objectively helps the masses and the trainers plan the diet/nutrition and exercise schedules. The data also provides valuable feedback to the physical education professionals to introspect who are otherwise considered as role models in the society and can influence impressionable minds of the younger generation to take up physically active lifestyles. Following health related physical fitness variables were studied:

Variable No. 1. Body weight: Body weight comprises body fat i.e. essential and non essential fat (adipose tissue). Fat is present below the skin and the also present around the vital organs like kidneys, liver and other body organs. Minimum essential body fat that is required in males is 9 percent and among females it should be 11 percent of the total body weight. One must have adequate body weight in relation to one's height. Body weight alone is not the indicator of fitness and health status of an individual, however it can play an important role in determining the BMI, Basal Metabolic rate (BMR) and body fat percentage.

Variable No. 2. Body Mass index (BMI): BMI is a simple and widely used method for estimating body fat mass. BMI was developed in the 19th century by the Belgian statistician and anthropometristAdolpheQuetelet. BMI is an accurate reflection of body fat percentage in the majority of the adult population. It however is less accurate in people such as body builders and pregnant women. A formula combining BMI, age and gender can be used to estimate a person's body fat percentage to an accuracy of 4%.

Variable No. 3 WAIST TO HIP RATIO: A method of determining body fat distribution is the waist to hip ratio. Individuals who store a greater amount of fat abdominally are at increased risk for many diseases (eg hypertension, hyperlipidemia/high cholesterol, Type II diabetes and CHD). Lower WH ratios indicate more fat storage in the buttocks/thigh region: a pattern associated with difficulty in weight reduction. WH ratio can be reduced with loss of body fat. Recent indicate the pattern of fat distribution throughout the body is an important predictor of the health of obesity. Exercise scientists have classified where the fat is deposited on the body into two basic categories: male pattern (or apples) and female-pattern (or pears). Despite their names, each type of fat pattern can occur in both sexes, although men tend to be apples and women tend to be pears. Apples characteristically deposit high amounts of fat in the abdominal and trunk regions, while pears deposit high amounts of fat in the hip, buttocks, and thigh regions. The waist-to-hip ratio (WHR) is a simple, yet accurate, method for determining the body fat pattern. WHR is determined by dividing the waist circumference by the hip circumference. Waist circumference is defined as the smallest circumference between the rib cage and belly-button. Hip circumference is defined as the largest circumference of the hip-buttocks region. Men with WHR values exceeding 0.95 are considered to be apples. Women with WHR values above 0.80 are considered to be apples. Research has shown that apples are at a greater risk for developing a number of health-related problems, the most prominent being hypertension or high blood pressure, type II diabetes or non-insulin dependent diabetes, and hyperlipidemia-elevated levels of fat in the blood).

II. METHODOLOGY

Sample: The sample consisted of the 80 volunteers from different public and govt. school teachers (40 males and 40 females) in the age group of 20 to 38 years.

Tests and Tools: The health and fitness form was used to collect the information about Gender, Date of birth. The three variables namely Height (in meters), Body Weight (in Kilograms), Waist Circumference (in centimeters), Hip Circumference (in centimeters) were measured manually.

Procedure: The Basic health and fitness form was administered to the subjects, who had volunteered to participate in the study. The measurements for waist, hip and wrist circumferences were taken manually using the measuring tape, whereas the rest of the information regarding date of birth, height, body weight, lifestyle and gender was provided by the subjects themselves. Formulas were used to calculate the Body Mass index (kg/m2), Waist Hip Ratio and Fat percentage. Statistics: Mean, Standard Deviation and t-test on MS Excel was used for drawing inferences.

III. RESULTS

Table-1 shows the mean values of all the participants on different variables of Physical Fitness. The mean age of the subjects was 34 years.1.58 meters was the average height, the body weight (in kgs) was 65.07 kg on an average.

Table-1: Mean values of all the physical education teachers on different variables of Physical Fitness

S. No.	Variable	Mean	Standard Deviation
1	Age (in years)	34.0	11.78
2	Height (in years)	1.58	0.08
3	Body weight (in years)	65.07	12.07
4	Body Mass Index (in years)	22.76	3.90
5	Waist to Hip Ratio (in years)	0.815	0.09

The body mass index was found to be 22.76 i.e: on an average the subjects were BMI below 25, which is the desirable range and thus the probability of health risks is low. Waist to hip ratio was 0.81, which is in the desirable range as far as men are concerned; however, the W/H value is not satisfactory with regard to female subjects.

Table-2 shows the comparison of mean values of male & female participants on different variables of Physical Fitness. The male and female physical education teachers showed significant differences (t=3.65) in waist to hip ratio. The reason being the norms of W/H ratio also vary for both males and females. The BMI (t=0.27) did not show significant differences.

Table-2: Comparison of Male & Female subjects on different variables of Physical Fitness						
		Male		Female		
S. No.	Variable	Mean	Standard Deviation	Mean	Standard Deviation	Unpaired t-test result

1	Body weight (in kgs)	64.20	11.32	65.94	12.7	1.30 (NS)
2	Body Mass Index	21.52	3.46	24.00	4.25	0.27(NS)
3	Waist to Hip Ratio	0.86	0.06	0.77	0.09	3.65*

*=significant

NS=Not Significant

Table-3 shows the status among the male and female participants on body weight variable of Physical Fitness. Higher percentage of females (30%) as compared to the males (28%) was found to be overweight. However the greater percentages of males (19%) were found to be underweight. Higher percentages of females were found to be in the desirable body weight range in reference to their heights.

Table-3: Status among the male and female Male & Female subjects on Body weight variable of Physical Fitness

S. No.	STATUS	MALE (%)	FEMALE (%)
1	UNDERWEIGHT	19	16
2	OVERWEIGHT	28	30
3	NORMAL	53	54

Table-4 shows the status among the male and female participants on body mass index variable of Physical Fitness. Higher percentages of females (16%) as compared to the males (15%) were found to be at high risk for health related problems. However the greater percentages of males (76%) were found to be enjoying better health and had lowest risk on health related problems. Higher percentages of females were found to be in the moderate risk category on BMI in reference to their heights and body weights.

Table-4: Status among the male and female Male & Female subjects on Body Mass Index Variable of Physical Fitness

S. No.	STATUS	MALE (%)	FEMALE (%)
1	LOW (Desirable)	76	70

| 2 | MODERATE (Risk) | 09 | 14 |
| 3 | HIGH (Risk) | 15 | 16 |

Table-5 shows the status among the male and female participants on waist to hip ratio variable of Physical Fitness. Higher percentage of females (7%) as compared to the males (4%) were found to be at high risk for heart related complications. since W/H ratio is a good indicator of predicting such complications for which the Indians are more prone. However the greater percentages of males (48%) were found to be at moderate risk. Higher percentages of females (62%) were found to be in the low risk category on W/H ratio.

Table-5: Status among the male and female Male & Female subjects on Waist hip Ratio Variable of Physical Fitness

S. No.	STATUS	MALE (%)	FEMALE (%)
1	LOW (Desirable)	48	62
2	MODERATE (Risk)	48	31
3	HIGH (Risk)	4	7

The aim of this study was to highlight the health related physical fitness variables of physical education teachers. It was found that women were better on their health and physical fitness levels as studied in the present study as compared to the males. Although it is not relevant to conclude with such a small sample but keeping in mind the limited variables and size of the sample studied, it can be said in the context of the present study that the physical education female teachers were less prone to lifestyle related disorders like diabetes, bone related disorders and heart related complications as compared to their male counter parts, who may seem, in general, to take their health and physical fitness less seriously. One observation of the study was that the subjects were happy and surprised to know about their fitness levels and wanted counseling to improve/maintain their fitness levels. Future research recommendation is that greater number could be studied for improved generalization and results analyzed using improved inferential statistics.

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