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## A comparative study on body mass index, lean body mass percentage, body fat percentage among female physical education teachers and female non-physical education teachers

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### Abstract

The purpose of the study was to compare the Body Mass Index, Lean Body Mass %, Body Fat %, of female Physical Education teachers and non-Physical Education teachers in Malappuram District. There were 20 female physical education teachers and 20 female non-Physical education teachers from various institutions in Malappuram district participated in the study. To measure Body Mass Index, Lean Body Mass %, Body Fat %, matron body composition analyzer was used. To statistically examine the data related to selected variables independent t-test was performed using SPSS. The study revealed that there is no significance in terms of body mass index, and there is a significant difference exists in relation to lean body mass % and body fat % between female Physical Education teachers and female non-Physical Education teachers.

**Keywords:** Body mass index, lean body mass %, body fat %, teachers & gender

### Introduction

Maintaining a healthy body weight and level of body fatness is the key to healthier and longer life. Overweight and underweight individuals with body fat levels falling at or near the extremes of the fat continuum are likely to have serious health problems that reduce life expectancy and threaten the quality of life. At present, in large scale epidemiological studies, the body mass index (BMI; weight in kilograms divided by the square of height in meters) is used to identify persons who are overweight, obese, or underweight. There is, however, considerable variability in body composition for any given BMI. Older people, for example, have more relative body fat at any given BMI than younger people (Baumgartner *et al.* 1995). In addition, there are other important ways in which body composition measures may be used by professionals working in health/fitness, clinical, or school settings. In weight management clinics, estimates of body fat and lean body mass may be used to determine a healthy body weight, to formulate dietary recommendation and exercise prescription, and to monitor changes in body composition for client participate or weight gain programs. It refers to the amount of body fat a person carries, if a person has a relative low percentage of body fat. Body weight consists of many components, the relative proportions of which vary among individuals. Total body weight, which includes bone, muscle, fat, blood, and so on, is conveniently divided into the lean body mass and fat mass. Essential body fat is 3% to 5% for adult males and 11% to 14% for adult females of their total body weight, respectively. Women should have lean body mass percentage at least 70% and that of men should have 75% of their respective body weight.

The average college-age woman has between 20% and 25% of her total body weight made up of fat. The average college-age man has between 12% and 18% body fat. However, it must be indicated that persons who engage in strenuous physical activities on a regular basis tend to have lower body fat percentages. It is recommended that body fat percentage not go below 5% in men and 12% in women because a certain amount of body fat is necessary for good health. Calculating your body fat composition is a great way to get an indication of just how healthy you really are. The various methods to calculate the BMI are Bioelectrical Impedance

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Analysis, calipers, U.S. navy method hydro densitometry etc. The concept of body composition analyzing has become a point of attraction in the modern world.

**Purpose of the study**

The purpose of the study was to compare the Body Mass Index, Lean Body Mass %, Body Fat %, of female Physical Education teachers and non-Physical Education teachers in Malappuram District. It was hypothesized that there will be no significant difference between female Physical Education teachers and non-Physical Education teachers in their body mass index, lean body mass %, body fat % level. The study was useful for the female Physical Education teachers and non-physical education teachers to know about their body mass index (BMI), and to make changes in their life style in order to keep themselves fit.

**Materials and Methods**

**Selection of subjects**

For the purpose of the study 20 female physical education teachers and 20 non-Physical Education teachers from Malappuram district was selected. The subjects were from teachers of various schools and colleges in Malappuram district. The age group of the subject's ranged from 30 to 50 years.

**Instrumentation**

To compare the Body Mass Index, Lean Body Mass %, Body Fat % of female Physical Education teachers and non-Physical Education teachers, the body composition analyzer (BF-907) will be used.

**Data collection**

To obtain the data, the body composition analyzer was used. This test was administered to the teachers of various schools and colleges in Malappuram district. The authority and principles of various schools and colleges were personally requested and permission sought for getting their teachers to serve as subjects for the study. The necessary instructions were given to the subjects before the administration of the test. The confidentiality and the responses that were got for body composition analyzer were guaranteed, so that the subject was not hesitating for the test.

**Data analysis**

To test the difference between female Physical Education teachers and non-Physical Education teachers in relation to the selected variable independent t-test were calculated using SPSS or any other suitable software's. Based on the requirement of the study the level of significance was fixed at 0.05.

**Result**

**Table 1:** Analysis of Body mass index (BMI), Lean body mass%, Body fat % of female physical education teachers

Variables	N	Minimum	Maximum	Am	SD	Range
Body mass index	20	18	35.7	26.57	4.03	17.7
Lean body mass %	20	34.8	67.8	58.43	7.16	33
Body fat %	20	32.1	65.1	41.27	6.65	33

Table 1 shows that the minimum and maximum BMI of the subject was 18 and 35.7 with a range 17.7, Mean and SD of BMI of the subject was 26.57 and 4.03 respectively. The minimum and maximum Lean body mass % of the subject was 34.8 and 67.8 with a range 33, mean and SD of lean body

mass % of the subject was 58.43 and 7.16 respectively. The minimum and maximum Body fat % of the subject was 32.1 and 65.1 with a range 33, Mean and SD of body fat % of the subject was 41.27 and 6.65 respectively.

**Table 2:** Analysis of the Body mass index (BMI), Lean body mass%, Body fat% of female non-physical education teachers

Variables	N	Minimum	Maximum	AM	SD	Range
Body mass index	20	18.7	33.3	25.12	3.39	14.6
Lean body mass%	20	50.3	70.8	62.07	4.79	20.5
Body fat %	20	29.1	49.6	37.92	4.79	20.5

Table 2 shows that the minimum and maximum BMI of the subject was 18.7 and 33.3 with a range 14.6, Mean and SD of BMI of the subject was 25.12 and 3.39 respectively. The minimum and maximum Lean body mass % of the subject was 50.3 and 70.8 with a range 20.5, Mean and SD of Lean body mass % of the subject was 62.07 and 4.79 respectively. The minimum and maximum Body fat % of the subject was 29.1 and 49.6 with a range 20.5, Mean and SD of Body fat % of the subject was 37.92 and 4.79 respectively.

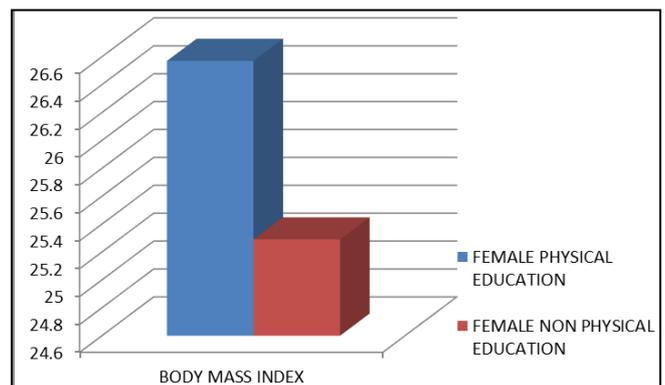
**Table 3:** Dependent t-test for Body mass index

Group	N	AM	t- (Cal)	p- value
PET	20	26.57	0.1295*	0.111909
Non-Pet	20	25.29		

\*at 0.05 level of significant with 58 degree of freedom t (critical value) is 1.6715

Table 3 reveals that the mean value of body mass index of female Physical Education teachers and female non-Physical Education teachers is 26.57 and 25.29 respectively. Since the t-

(Cal) value 0.1295 < t-(Critical) value 1.6715 at 0.05 level of significant with 58 degree of freedom. So we conclude that there is no significant deference exists on body mass index between female Physical Education teachers and female non-Physical Education teachers.



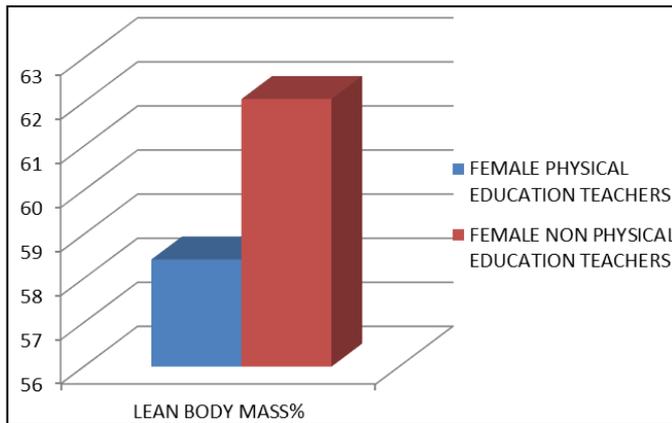
**Fig 1:** Body mass index

**Table 4:** Dependent t-test for Lean body mass %

Group	No	AM	t- (cal)	p value
PET	20	58.43	2.31415*	0.012111
Non-Pet	20	62.07		

\*at 0.05 level of significant with 58 degree of freedom t (critical value) is 1.671553

Table 4 reveals that the mean value of ideal body weight of female Physical Education teachers and female non-Physical Education teachers is 58.43 and 62.07 respectively. Since the t- (cal) value 2.31415 > t- (Critical) value 1.671553 at 0.05 level of significant with 58 degree of freedom. So we conclude that there is a significant difference exist on ideal body weight between female Physical Education teacher's female non-Physical Education teachers.



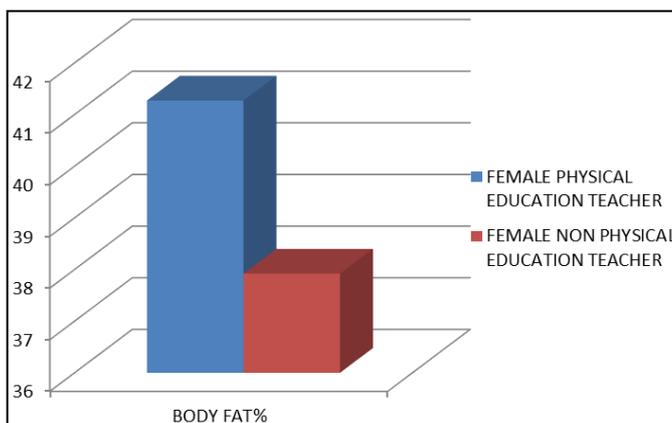
**Fig 2:** Lean body mass %

**Table 5:** Dependent t-test for Body fat percentage

Group	N	AM	t (cal)	p-value
PET	20	41.27	2.2373*	0.014559
Non-pet	20	37.92		

\*at 0.05 level of significant with 58 degree of freedom t (critical value) is 1.671553

Table 5 reveals that the mean value of body fat percentage of female Physical Education teachers and female non-Physical Education teachers is 41.27 and 37.92 respectively. Since the t- (cal) value 2.2373 > t- (critical) value 1.671553 at 0.05 level of significant with 58 degree of freedom. So we conclude that there is a significant difference exists on body fat percentage between female Physical Education teachers and non-Physical Education teachers.



**Fig 3:** Body fat percentage

**Conclusions**

The concept of body composition analyzing has become a point of attraction in the modern world. The government as well as the people is aware of its importance, as it is essential to increase the productivity power of labour and every aspects of development. Awareness of body composition level has to help to prevent the diseases and other risk factors of individual's life. Body composition of an individual is an important tool to evaluate the health of the individual.

Within the limitation of the study and on the basis of the obtained results the following conclusion may be drawn

1. The comparative study between female Physical Education teachers and female non-Physical Education teachers in relation to lean body mass % reveals that there is a significance difference between female Physical Education teachers and female non-Physical Education teachers.
2. The independent t-test for body fat % revealed that the calculated t-Value is greater than the t critical value at 0.05 level significance with 58 degree of freedom; we conclude that there is a significant difference exists between female Physical Education teachers and female non-Physical Education teachers in relation to body fat %.
3. In the case body mass index, independent t- test revealed that the calculated t- value is less than t- critical value at 0.05 level of significance with 58 degree of freedom; we conclude that there is no significance difference exists between female Physical Education teachers and female non-Physical Education teachers in relation to body mass index.

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