Research Paper Education

# Comparative Study on Body Composition of B. P. ED. and B.A. General Students


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**ABSTRACT**

Background: Body composition refers to the makeup of lean tissue and fat tissue in the body. Lean tissue is composed of muscle, bone and organs. Fat tissue is composed of three different categories: essential fat, storage fat and non-essential fat. Essential and storage fat are both necessary for the body to function, while non-essential fat serves no real purpose. Aim: The aim of the study to compare the body composition of B.P.Ed. and B. A. general students. Methodology: For the present study 31 male residential B.P.Ed. and 40 male B.A. students were selected. Age group of the subjects was 18-27 years. For detection of body composition Age, Standing Height, Body Weight, Body Fat Percentage, Visceral Fat, Skeletal Muscle Percentage, Body Age, Resting Metabolism and BMI were measured by Body Composition Monitor of Omran Company Model no.HBF-212. Statistics: Independent t-test were done through excel and SPSS software. Result: Findings reveals that Body fat% (12.02+3.807), visceral fat % (1.95+1.484), Body age (18.60+3.036), Resting metabolism (1368.05+97.360) and B.M.I. (18.30+1.951) of B.A. general group are lower than B.P.Ed. students where as Skeletal Muscles % is higher than the B.P.Ed. students significantly at .05 level. Conclusion: It may be concluded that there is significant difference in body composition of B.A. General Student and B.P.Ed. Student.


**KEYWORDS** Body composition – B.P.Ed.- B.A.

**INTRODUCTION:** Body composition refers to the makeup of lean tissue and fat tissue in the body. Lean tissue is composed of muscle, bone and organs. Fat tissue is composed of three different categories: essential fat, storage fat and non-essential fat. Essential and storage fat are both necessary for the body to function, while non-essential fat serves no real purpose. **Mala L et. al. (2015)** identified and compared body composition (BC) variables in elite female athletes (age ± years): volleyball (27.4 ± 4.1), softball (23.6 ± 4.9), basketball (25.9 ± 4.2), soccer (23.2 ± 4.2) and handball (24.0 ± 3.5) players. Fat-free mass (FFM), fat mass, percentage of fat mass (FMP), body cell mass (BCM), extracellular mass (ECM), their ratio, the percentage of BCM in FFM, the phase angle (α), and total body water, with a distinction between extracellular (ECW) and intracellular water, were measured using bio-impedance analysis. MANOVA showed significant differences in BC variables for athletes in different sports. The results did not indicate any significant differences in FMP or α among the tested groups ($p > 0.05$). Significant changes in other BC variables were found in analyses when sport was used as an independent variable. Soccer players exhibited the most distinct BC, differing from players of other sports in 8 out of 10 variables. In contrast, the athletes with the most similar BC were volleyball and basketball players, who did not differ in any of the compared variables. Discriminate analysis revealed two significant functions ($p < 0.01$). The first discriminate function primarily represented differences based on the FFM proportion (volleyball, basketball vs. softball, soccer). The second discriminate function represented differences based on the ECW proportion (softball vs. soccer). Although all of the members of the studied groups competed at elite professional levels, significant differences in the selected BC variables were found. **Bach CW et. al. (2015)** assessed the anthropometric characteristics and performance capabilities of highly-trained MX athletes compared to age-matched physically active men (PA). They reported that there were no significant differences between groups in anthropometric or body composition measurements except android fat and biceps circumference. MX had significantly higher absolute and relative mean anaerobic power, relative anaerobic peak power, time to exhaustion (TTE) and extended arm hang duration. They suggested that highly-trained MX athletes possess certain physiological adaptations that likely result from sport-specific demands compared to PA. **Krzykala M and Leszczynski P (2015)** determined if a sport in which one side of the body is dominant, like field hockey, influences regional body composition and bone mineral density (BMD) distribution in particular body segments, and whether the sporting level is a determining factor. They found that bone mineral density in the lower extremity and of the trunk was significantly asymmetric in favor of the left side in the National Team. In the case of the Youth Team, only the trunk BMD indicated clear left-right difference with left side dominance. Both the lean mass and fat mass values were relatively higher on the left side of all body segments and it related to both analyzed groups of athletes. They reported that playing field hockey contributes to laterality in body composition and BMD and that the sporting level is a determining factor. In most cases the left side dominated. A greater asymmetry level was observed in more experienced female field hockey players. **Orhan O et. al. (2013)** compared the somatotype values of football players according to their playing positions. They showed that there were no statistically significant differences between Gençlerbirligi Sports Team and Gençlerbirligi Oftas Sports Team. The measurements indicated that, when all of the GB and GBO players were evaluated collectively, their average somatotypes were balanced mesomorph. The somatotypes of GBO goalkeepers were generally ectomorphic mesomorph; GB goalkeepers were balanced mesomorphic, although they were slightly endomorphic. **Carling C and Orhant E (2010)** examined variations in measures of body composition in elite soccer players.. To investigate inter seasonal changes, repeated measures were taken in players (n = 9) over 3 consecutive seasons. In relation to positional role,

a difference in average %BF and BM values was observed (p < 0.001), with substantial differences observed in goalkeepers, lateral midfielders, and forwards. Across all players, there were significant in-season variations in %BF and FFBM whereas BM remained unchanged. Further analysis of these fluctuations in %BF and FFBM at different points of the season showed that variations differed across the positional groups (p < 0.01), especially in defenders and midfielders. In contrast, no association was observed between measures and exposure time and no differences were reported across seasons. They concluded that practitioners should consider individual positional role when interpreting mean body composition data. **Sibila M and Pori P (2009)** tried to establish the main morphological characteristics of Slovenian junior and senior national handball team players. They showed that on average the wings differ the most from the other player groups in terms of their morphological bodycharacteristics. The values of their body height, body mass and the quantity of subcutaneous fat are statistically significantly lower than those of players in the other groups. Goalkeepers are relatively tall, with high values of body mass and low values of transuersal measures. Their skin folds are the most pronounced among all groups on average and their share of subcutaneous fat in total body mass is the highest. Consequently, their endomorphic component of the somatotype is pronounced. Pivots and back players are becoming increasingly similar in terms of their morphologicalbody characteristics. Pivots maintain greater robustness, have a higher quantity of muscle mass as well as more pronounced transversal measures and a mesomorphic component of the somatotype. The results of their study confirm that groups of handball players occupying different positions differ amongst themselves in terms of many measurements. **Beck BR and Doecke JD (2005)** observed the relationship of field hockey playing with bone, muscle and fat in young and older adult women. They found that College player BMD was higher than controls at the WB (p=0.02), PF (p=0.00004), RF (p=0.006) and LF (p=0.005), but not the LS. Seniorplayer BMD was higher than age-matched norms at the WB (p=0.001) and PF (p=0.006), but not the LS, RF or LF. There were no differences between on and off-season BMDs for either group. There were no differences between college player RF and LF BMD in either season, nor in the senior players during the off-season, however, during the season, senior players developed greater RF than LF BMD (p=0.02). College players had greater lean mass (p=0.00008) and lower fat mass than controls (p=0.003). Senior players lost fat (p=0.04) and gained lean mass (p=0.02) in season. Therefore so many people tried to find out the difference in body composition in respect of various characteristics. From this point of view present researchers intend to take this study.

**AIM:** The aim of the study to compare the body composition of B. P. Ed. and B. A. General students.

**Methodology:** For the present study 31 male residential B. P. Ed. students of Seva Bharati Mahavidyalaya, kapgari, Paschim Medinipur and 40 male B.A. first year general students of Vivekananda Satabarsiki Mahavidyalaya, Manikpara, paschim Medinipur were selected. Age group of the subjects was 18-27 years. For detection of body composition Age, Standing Height, Body Weight, Body Fat Percentage, Visceral Fat, Skeletal Muscle Percentage, Body Age, Resting Metabolism and BMI were measured by Body composition Monitor of Omran Company Model no.HBF-212.

**Procedure of Measurement:** In the machine we have to input age and height and select the mode as guest male or female then the subject stand up on the machine in bare foot and stand for few second up to the signal given by the machine. Then get down from the machine. After clicking the tab one by one Age, Height, Weight, Body Fat %, Visceral Fat %, Skeletal Muscle %, Body Age, Resting Metabolism and B.M.I. will be displayed.

**Result:** It is observed that Body fat% (12.02±3.807), visceral fat % (1.95±1.484), Body age (18.60±3.036), Resting metabolism (1368.05±97.360) and B.M.I. (18.30±1.951) of B.A. general group are lower than B.P.Ed. students where as Skeletal Muscles % is higher than the B.P.Ed. students significantly at .05 level.

Table no. 01 Group Statistics

| | Couse Studding | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Age | B.A. | 40 | 18.6000 yrs. | 1.10477 | .17468 |
| | B.P.Ed | 31 | 22.6129 yrs. | 1.74504 | .31342 |
| Height | B.A. | 40 | 167.1500 Cm. | 6.39531 | 1.01119 |
| | B.P.Ed | 31 | 163.5806 Cm. | 4.96504 | .89175 |
| Weight | B.A. | 40 | 51.3400 Kg. | 6.49421 | 1.02682 |
| | B.P.Ed | 31 | 58.5806 Kg. | 8.78808 | 1.57839 |
| Body fat % | B.A. | 40 | 12.0200% | 3.80790 | .60208 |
| | B.P.Ed | 31 | 19.1581% | 4.57368 | .82146 |
| Visceral Fat % | B.A. | 40 | 1.9500% | 1.48410 | .23466 |
| | B.P.Ed | 31 | 5.0645% | 2.64494 | .47504 |
| Skeletal Muscle % | B.A. | 40 | 42.8825% | 2.47944 | .39203 |
| | B.P.Ed | 31 | 37.8129% | 2.28513 | .41042 |
| Body age | B.A. | 40 | 18.6000 Yrs. | 3.03653 | .48012 |
| | B.P.Ed | 31 | 24.6452Yrs. | 6.70099 | 1.20353 |
| Resting Metabolism | B.A. | 40 | 1368.0500 Kal. | 97.63064 | 15.43676 |
| | B.P.Ed | 31 | 1452.7742 Kal. | 130.15291 | 23.37615 |
| B.M.I. | B.A. | 40 | 18.3075 $kg/m^2$ | 1.95151 | .30856 |
| | B.P.Ed | 31 | 21.8203 $kg/m^2$ | 2.72800 | .48996 |

**Table No.02 Independent Samples Test**

| Variables | Type of measurement | Levene's Test for Equality of Variances | | t-test for Equality of Means | | |
|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) |
| Age | Equal variances assumed | 5.266 | .025 | -11.818 | 69 | .000 |
| Height | Equal variances assumed | .698 | .406 | 2.564 | 69 | .013 |
| Weight | Equal variances assumed | 6.749 | .011 | -3.993 | 69 | .000 |
| Body fat % | Equal variances assumed | 1.617 | .208 | -7.174 | 69 | .000 |
| Visceral Fat % | Equal variances assumed | 14.475 | .000 | -6.287 | 69 | .000 |
| Skeletal Muscles % | Equal variances assumed | .061 | .806 | 8.839 | 69 | .000 |
| Body age | Equal variances assumed | 38.118 | .000 | -5.080 | 69 | .000 |
| Resting Metabolism | Equal variances assumed | 5.965 | .017 | -3.135 | 69 | .003 |
| B.M.I. | Equal variances assumed | 5.788 | .019 | -6.324 | 69 | .000 |

**Figure No. 01 Comparison of mean of height**

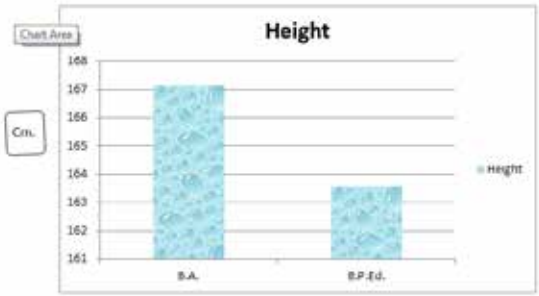



**Figure No. 02 Comparison of mean of weight**

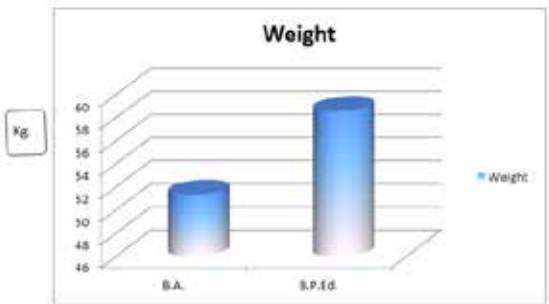



**Figure No. 03 Comparison of mean of age and body age**

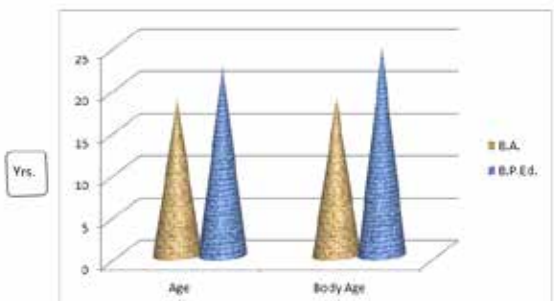



**Figure No. 04 Comparison of mean of percentage of Body Fat, Visceral fat and Skeletal Fat.**

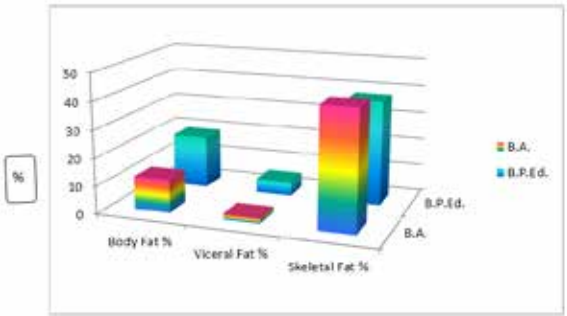
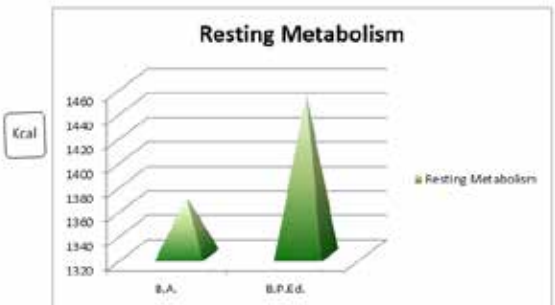



**Figure No. 05 Comparison of mean of resting metabolism**




**DISCUSSIONS:**

The finding of present study reveals that Body fat%, visceral fat %, Body age, Resting metabolism and B.M.I. of B.A. general group are significantly lower than B.P.Ed. students where as Skeletal Muscles % is higher than the B.P.Ed. students which may be due to significance difference in age, height and weight. **Conclusion:** It may be concluded that there is significant difference in body composition of B.A. General Student and B.P.Ed. Student.

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