COMPARATIVE STUDY OF BODY MASS INDEX, BASAL METABOLIC RATE AND WATER LEVEL BETWEEN FEMALE PLAYERS AND NON-PLAYERS

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Abstract

The aim of the study was to determine the significant difference in Body Mass Index, Basal Metabolic Rate and Water Level between the players and non-players. 20 female players, who had represented Sant Gadge Baba Amravati University and 20 female non-players, who had never participated regularly in any sports were selected as subjects. The data were collected on the selected subjects by administering the standard weighing machine, stadiometer and Meltron body composition analyser BF-907.The collected data were tabulated and statistically analysed by computing mean, standard deviation and independent t-test. The findings of statistical analysis revealed that the Basal Metabolic Rate and Water Level showed significant difference between the players and non-players, and there is no significant difference in Body Mass Index between the players and non-players.

Key words: Basal Metabolic Rate, Body Mass Index, Water Level.

Introduction

Body mass index (BMI) is a good way to check our body composition. The body mass index (BMI) is calculated from weight and height measurements using the formula BMI = weight (in kg) divided by height (in m^{-2}). The BMI was first introduced by Quetelet in order to eliminate the confounding effects of height on weight. In normal adults, the ratio of the weight to the square of height is roughly constant, and a person with low BMI is underweight for their height. BMI reflects protein and fat reserves, which in turn reflect functional reserves including the ability to survive nutritional deficit and some diseases.

Basal Metabolic Rate (BMR) is the minimal rate of energy expenditure per unit time by endothermic animals at rest (Mc Nab, B. K. 1997) on the utility of uniformity in the definition of Basal Rate of Metabolism. (Physiol. Zool. Vol.70); Metabolism refers to the process that needs to function. Basal Metabolic Rate is the amount of energy expressed in calories that a person needs to keep the body functioning at rest. Some of those processes are breathing, blood circulation, controlling body temperature, cell growth, brain and nerve function, and contraction of muscle.

Body water is all of the water content of the body. A significant fraction of the human body is water. In most individuals, approximately 70% of the total weight is water. This percentage varies between 50% and 70%, with the exact value primarily dependent on a person's fat content. Since fat has very low water, individuals with more fat will have a lower overall percentage of body weights as water.

Purpose of the Study

Main purpose of this study was to compare Body Mass Index, Basal Metabolic Rate and Water Level among female players and non-players.

Hypothesis

On the basis of literature, discussion with the experts and scholar's own understanding, it was hypothesized that there would be significant difference in Body Mass Index, Basal Metabolic Rate and Water level between the players and non-players.

Limitations

This study was limited to the following aspects-

1. Dietary habits of the subjects were not known to scholar.
2. Heredity of the subjects was not considered.
3. Socio-economic status and other factors were beyond the control of researcher.

Materials and Methodology

20 female players of Degree College of Physical Education those who represented inter-collegiate tournaments of Sant Gadge Baba University, Amravati and 20 female non-players who never participated regularly in any sports activity and tournaments from Engineering college of H.V.P.M. The age of the subjects was ranging from 18 to 22 years. All the subjects were selected by adopting purposive sampling method.

Selection of Test and Criterion Measures

The criterion measures chosen for the present study is given below-

The BMI was computed by using the following formula

BMI = Weight in kilogram / (Height in centimetre)^2

Body Weight was measured by using weighing machine.

Height was measured with the help of stadiometer, score was recorded in centimetre.

Basal metabolic rate and water level was measured by using Maltron Body Composition Analyzer. BF-907

Equipments

Standard weighing machine

Stadiometer

Maltron body composition Analyser BF-907

Collection of Data

The data were collected on the selected subjects by administering the appropriate tests. Before collection of data the research scholar had explained the purpose of the study to the subjects.

Statistical Treatment and Results

To compare the Body Mass Index, Basal Metabolic Rate and Water Level between players and non-players, Independent t-test was employed.

Table – 1

DESCRIPTION OF MEAN, STANDAND DEVIATION AND t-RATIO FOR THE DATA ON BODY MASS INDEX BETWEEN PLAYERS AND NON-PLAYERS

Group	Mean	Standard Deviation	Difference	Standard Error of M.D.	t-ratio
Players	21.5450	2.09	1.655	.468	1.785@
Non-Players	19.8900	3.57		.800	

@Not Significant 0.05 level   Tabulated $t_{.05\ (38)} = 2.025$

An analysis of table-1 reveals that there is no significant difference in Body Mass Index between the players and non-players, because calculated t-value of 1.785 is level than the tabulated t-value of 2,025 at 0.05 level for 38 degrees of freedom which indicated that no significant mean difference exists in between players and non-players. Mean difference is graphically shown in Fig. 1
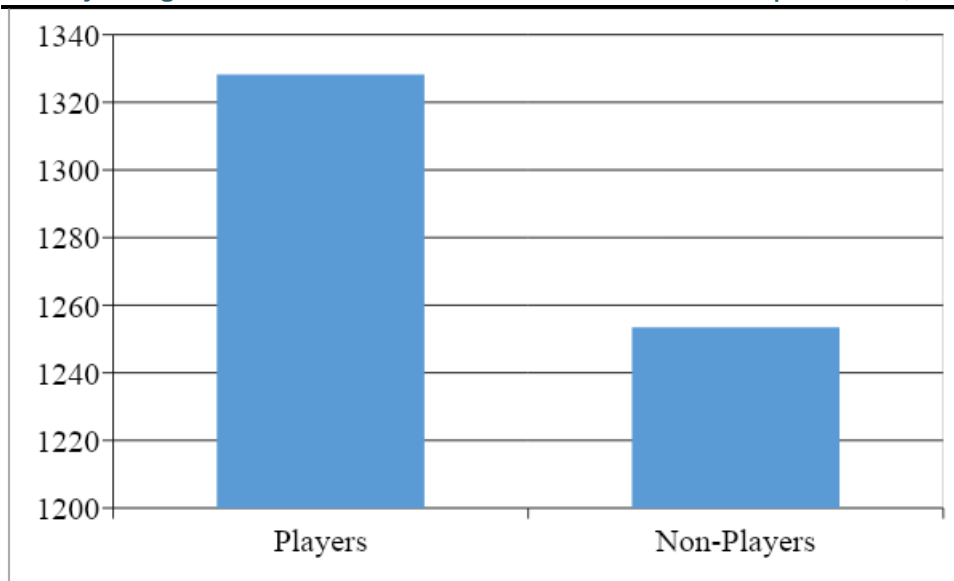
Fig-1: Difference of means in Body mass index between the female players and non-players.

Table – 2

DESCRIPTION OF MEAN, STANDAND DEVIATION AND t-RATIO FOR THE DATA ON BASAL METABOLIC RATE BETWEEN PLAYERS AND NON-PLAYERS

Group	Mean	Standard Deviation	Difference	Standard Error of M.D.	t-ratio
Players	1328.20	37.55	74.7	8.39	4.362*
Non-Players	1253.50	66.74		14.92	

@Not Significant 0.05 level   Tabulated $t_{.05\,(38)} = 2.025$

An analysis of table-2 reveals that there is significant difference in Basal Metabolic Rate between the players and non-players, as the calculated t-value of 4.362 is greater than that of Tabulated t-value of 2.025 at 0.05 level for 38 degrees of freedom. Hence the difference of means has been graphically shown in Fig. -2
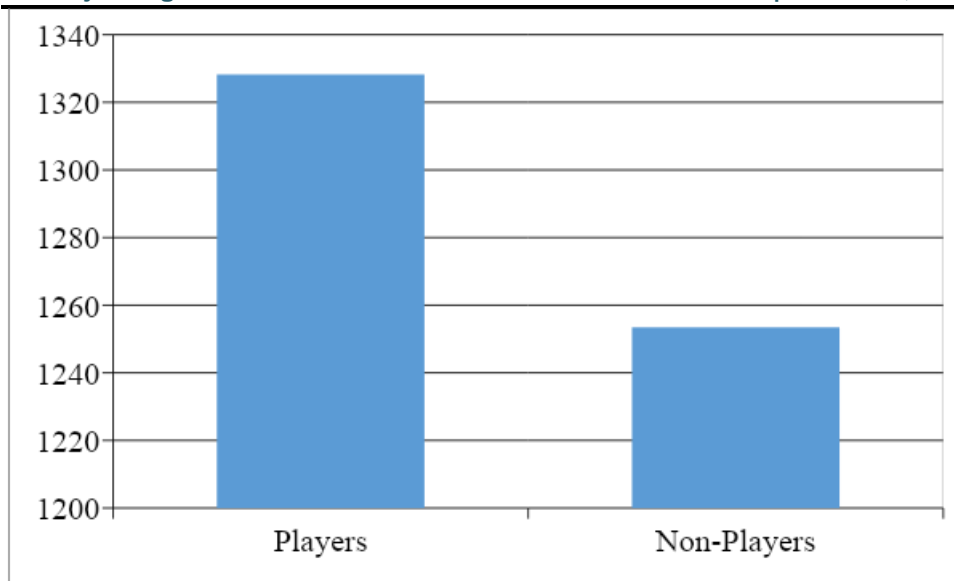
Fig-2: Difference of means in Basal Metabolic Rate between the female players and non-players.

Table – 3

DESCRIPTION OF MEAN, STANDAND DEVIATION AND t-RATIO FOR THE DATA ON WATER LEVEL BETWEEN PLAYERS AND NON-PLAYERS

Group	Mean	Standard Deviation	Difference	Standard Error of M.D.	t-ratio
Players	57.1400	3.09	8.015	.691	7.546*
Non-Players	49.1250	3.60		.805	

@ Significant 0.05 level   Tabulated $t_{.05(38)} = 2.025$

An analysis of table-3 reveals that there is significant difference in Water Level between the players and non-players, as the calculated t-value of 7.546 is greater than that of tabulated t-value of 2.025 at 0.05 level for 38 degrees of freedom. Hence the difference of means has been graphically shown in Fig. -3
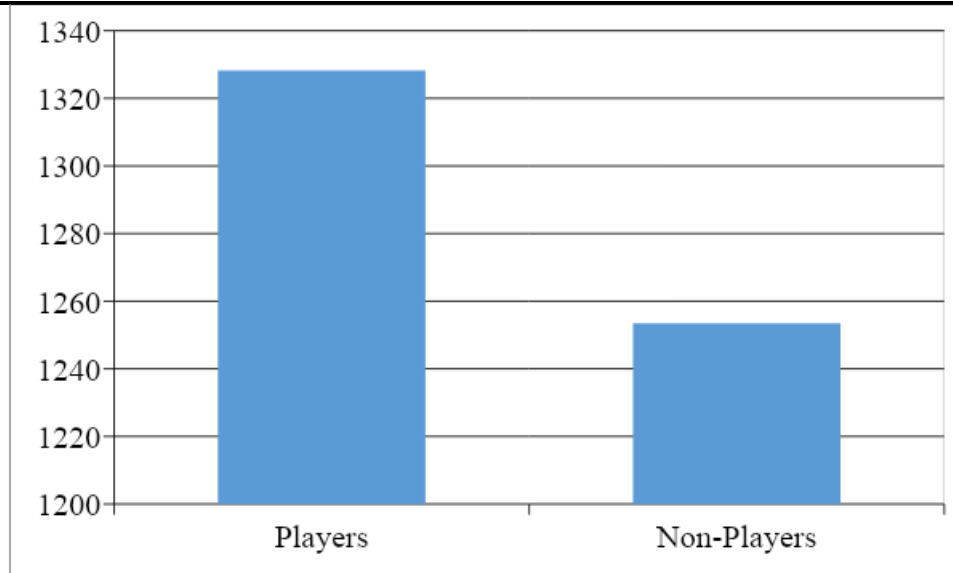
Fig-3: Difference of means in Water Level between the female players and non-players.

Conclusion

Considering the limitations of the study and on the basis of statistical findings the followings are concluded.

1. There was significant difference in Basal Metabolic Rate of female players and non-players.
2. There was significant difference in Water Level in between female players and non-players.
3. No significant difference was found in the variable of Body Mass Index in between female Players and non-players.

References

Adegokeolufeyi A. and Arogundade O., "The Effect of Chronic Exercise on Lung Function and Basal Metabolic Rate in some Nigerian Athletes", African Journal of Biomedical, Vol5, (2002)

Afridi A. K. and Khan V., "Prevalence and Etiology of Obesity" Pakistan Journal of Nutrition, Vol 3, No. 1, (2004)

Ambika G. Unnikrishan, Sanjay Kalra, and M. K. Garg, "Preventing Obesity in India: Weighing the Options", Indian Journal of EndocrinolMetab. Vol. 16, Issue 1, (Feb 2012).

Eason Julia Ellen, "Relationship of Height and Weight to the Performance of College Women in Selected Basketball Skill Test", Completed Research in Health, Physical Education and Recreation. Vol. 13, (1966).

LattyCorolan, Jocks and Weatherspoon et. A1, "The Relationship between Body Mass Index and Adolescent Well-Being", American Journal of Health Education. Vol. 38, Issue 5, (2007).

Molly Thomas, "Comparison of Body Composition between Two Elite Women's Volleyball Teams" Universities Palackiane Olomucensis, Gymnica. 2011, Vol.41.