

Body composition and Aerobic capacity among the Volleyball players of the University: An assessment

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ABSTRACT

Health is wealth, "The first wealth is health" wrote in 1860 by American Philosopher- Ralph Waldo Emerson. Health is the most valuable wealth in life. It is beginning of happiness in life which is priceless and cannot be purchase with money. A person without physical and mental health, it is difficult for him/her to enjoy his/he daily life as well as it is the big burden of the Government of a country to making a healthy Nation. The present study was carried out in the various university of India. The data has been collected from the adult male volley ball players. The research design was characterized by a cross sectional quantitative survey, and the data was collected through different techniques to achieve the stated specific objectives. The anthropometric variable like Height, weight, BMI, Bicep, Arm length, Leg length and upper thigh were measured. The physiological variable or Body composition variables: Biceps skinfold, Triceps skinfold, subscapular skinfold, supiliac also been measured. This study included 92 male volleyball players aged between 20 to 26 years were selected for the study on the basis of simple random sampling. The present study revealed that the anthropometric variable shows a significant difference between mean value of the study population and ICMR recommended standard. According to WHO BMI classification shows that most of the participant's nutritional status is normal very few are under weight and overweight. About 61 percent players are belonging into the normal blood pressure level and about 31 percent are elevated category or intend to be high.

Keywords: BMI, Body Composition, ICMR, Aerobic capacity, Obesity, Blood pressure

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1. Introduction

Health is wealth, "The first wealth is health" wrote in 1860 by American Philosopher- Ralph Waldo Emerson. Health is the most valuable wealth in life. It is beginning of happiness in life which is priceless and cannot be purchase with money. Health is the level of functional and metabolic efficiency of a living organism. In humans it is the ability of individuals or communities to adapt and self-manage when facing physical, mental or social changes. The World Health Organization (WHO) defined health in its broader sense in its 1948 constitution as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. This definition has been subject to controversy, in particular as lacking operational value, the ambiguity in developing cohesive health strategies, and because of the problem created by use of the word "complete". Other definitions have been proposed, among which a recent definition that correlates health and personal satisfaction.

According to the World Health Organization mental health as "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community.

Fitness is the very important term for human health. Body composition refers to lean tissue mass and fat mass. Lean tissue mass is composed of muscles, bones and organ. Fat mass is the essential fat and storage fat of human body. The fat mass and tissue mass depend on age, sex, location and race. It is measured by the skinfold caliper to know the thickness.

Aerobic capacity refers to ability to sustain exercise tolerance. it is an important physical fitness factors. Athletes who have lower fat percentage, good exercise capacity and normal blood pressure. Blood pressure depends on various factors like condition of blood vessel, aerobic capacity, body fat percentage, dietary factors . The association among aerobic capacity, body fat percentage and blood pressure has been studied in diseased individual.

Obesity and overweight across the lifetime is a significant public health issue. It has been recommended that they track from childhood and adolescent to adulthood and it is also related with various diseases. The obesity prevention sports is one of the most reliable phenomenon, the relevant research has revealed controversial result. The association between body mass index (BMI), fat percentage and physical fitness. BMI is used worldwide to assess the humans are normal, overweight and obesity. It is associated with fat mass as well as fat free mass, BMI is increase use of high amount both fat and fat free mass.

2. Literature Review

The studies on nutritional status of pre-adolescent and adolescent tribal children aged between 5 to 19 years have rarely been carried out at a national level. In 1998-1999, the National Nutrition Monitoring Bureau (NNMB) had extensively studied the nutritional status of tribal adolescent children from nine Indian states mainly from southern India. [1]

According to National Family Health Survey about 45.5 per cent of children are malnourished in India. After India become independent in 1947, several steps were taken for the improvement of the health situation and well-being of the children. But malnutrition continues to be a major problem in India and at present, 46 percent of India's children under the age of three are underweight. India has the highest percentages of undernourished children in the world. [2]

Traumatic injury remains a significant problem and ranges from the trivial to the fatal. Common causes of fatal injury include rock fall, fires, explosions, mobile equipment accidents, falls from height, entrapment and electrocution. Less common but recognized causes of fatal injury include flooding of underground workings, wet-fill release from collapsed bulkheads and air blast from block caving failure. The systematic application of risk management techniques has contributed to a substantial decline in injury frequency rates in developed nations. Further improvement, however, is required to reach rates tolerable to the broader community. [3]

Barometric pressure is elevated in deep underground mines and reduced at high altitude mines in South America. Chronic intermittent hypoxia at altitude has been reported to induce physiological adaptations and symptoms of benign acute mountain sickness (AMS) in mine workers. High altitude pulmonary oedema (HAPO) and high altitude cerebral oedema (HACO) were not seen. Increased barometric pressures in deep mines increase air temperatures, increase convective heat exchange and reduce sweat evaporation rates [4].

A study has been found Volleyball is a sports branch which requires advanced physical fitness and anthropometrical characteristics. Volleyball is a sport in which the most prominent body characteristic, besides physical abilities such as agility, reaction speed, movement speed, or aerobic and alactic power, is longitudinally (Palao et al., 2014).

Such relationship has not yet been identified in female volleyball. If BMI was in strong correlation with BF, it would offer to coach, trainer or other health allied professional engaged in volley ball training and important tool to develop proper exercise programme. In addition to their implications for health, BF & BMI are associated with reduced physical fitness as it has been indicated by research conducted chiefly on young populations. The comparison between the groups with different BMI has revealed the groups with lower or normal BMI perform better in physical fitness tests than over weight/ Obese or those with higher BMI.[7]

Ball games require comprehensive ability including physical, technical, mental and tactical abilities. Among them, physical abilities of players exert marked effects on the skill of the players themselves and the tactics of the team. Therefore, players must have the physical abilities to meet the demand of the sport. Volleyball is one of the most popularly played games in the world. [8]

Ostojic[^], S.M., S. Mazic, and N. Dikic (2006) conducted a study on Profiling in basketball; Physical and physiological characteristics of elite players. The purpose of this study was to describe structural and functional characteristics of elite Serbian basketball players and to evaluate whether players in different positional roles have different physical and physiological profiles. Five men's basketball teams participated in the study and competed in the professional First National League. [9]

Search of literature through internet we have not found any article among the University Volley ball players. So to know the impact of body composition and anthropometric characteristics among the University level Volley ball players.

3. Methodology

The present study was carried out in the various university of India. The data has been collected from the adult male volley ball players. The research design was characterized by a cross sectional quantitative survey, and the research data was collected from the study participants through different techniques to achieve the stated specific objectives. The anthropometric variable like Height, weight,

BMI, Bicep, Arm length, Leg length and upper thigh were measured. The physiological variable or Body composition variables: Biceps skinfold, Triceps skinfold, subscapular skinfold, suprailiac also been measured. This study included 92 male volleyball players aged between 20 to 26 years were selected for the study on the basis of simple random sampling.

4. Result of the study

In the present study, the anthropometric variables of inter university volley ball players are described in the following tables and figures. It revealed that the mean body weight or the Body Mass Index (BMI) are 65.39 and 21.1 respectively. The mean Height, Weight and BMI of the studied volley ball players are higher than the ICMR recommended cut-of-value (Table. 2,3,4). According to WHO classification the level of BMI has been found that most of the players are belonging into the normal category (83.69 %) and rest of them are moderate thinness, mild thinness and overweight which are about 5 %, 6% and 7% respectively. The leg length is the important indicator of body stature. Leg length depend on femur + tibia. The distance between the proximal end of the greater trochanter and the distal lateral femoral condyle is upper thigh. The upper thigh length is measured from the midpoint of the inguinal ligament to the proximal edge of the patella.

Table 1. Statistical Value of Anthropometric variables

Anthropometric Variables	Mean	SD	SE
Height	175	6.26	0.65
Weight	65.39	9.1	0.95
BMI	21.1	2.21	0.23
Arm Length	58.12	3.51	0.36
Leg Length	94.55	5.77	0.6
Chest Grith	87.78	5.31	0.55
Bicep	30.35	1.88	3.82
Upper Thigh	54.57	3.82	0.4

Table 2. Mean weight and ICMR standard weight between age group 19-29 years

	Mean Weight	ICMR Standard Weight
Weight	65.39	60

Figure. 1

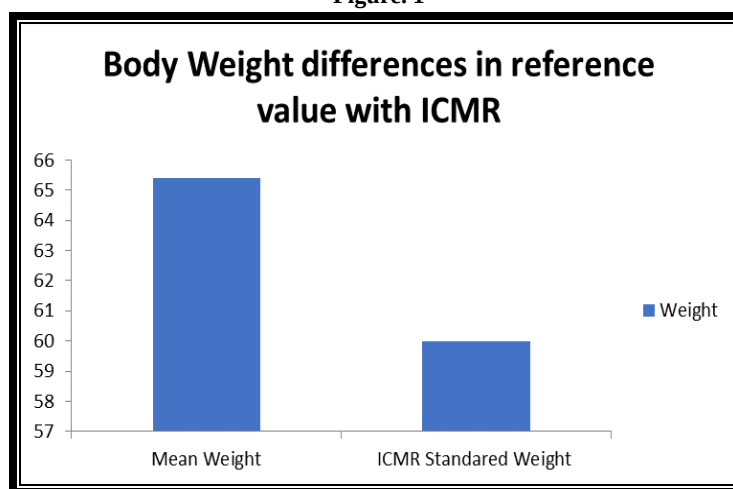


Table 3. Mean body height and ICMR standard height between age group 19-29 years

	Mean height	ICMR Standard height
Height	175	173

Figure. 2

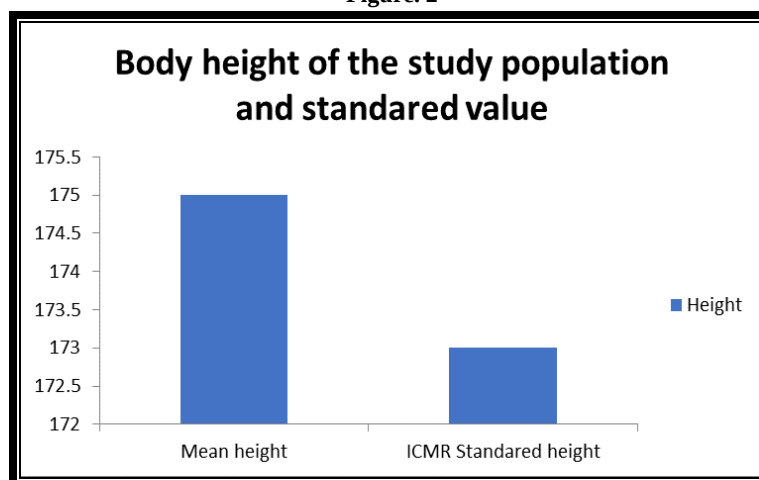


Table 4. Mean body Mass index and ICMR standard BMI between age group 19-29 years

	Mean BMI	ICMR Standard BMI
BMI	21.1	20.3

Figure. 3

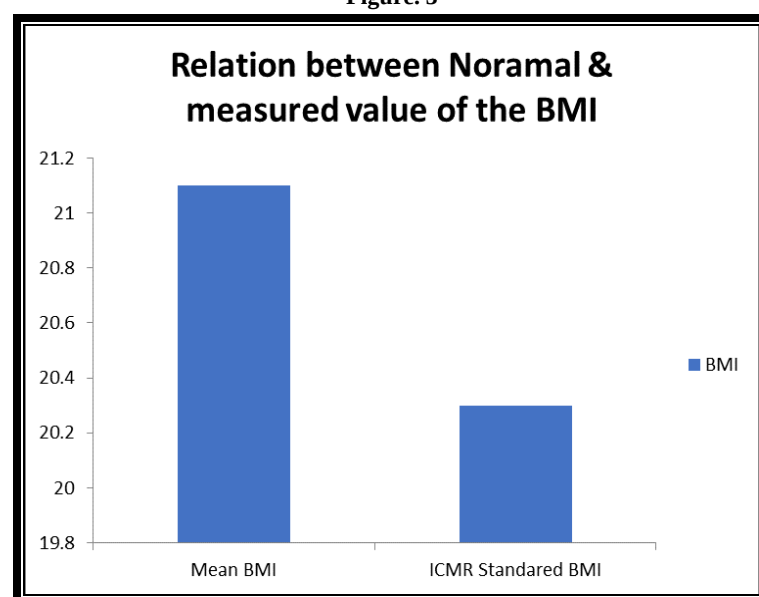


Table 5. According to WHO slandered different categories of Body Mass Index among the 92 students

Grading of BMI	Frequency	Percentage
Severe thinness	0	
Moderate thinness	4	4.34782609
mild thinness	5	5.43478261
Normal	77	83.6956522
Over Weight	6	6.52173913
Obase	0	0
Total	92	100

Figure. 4

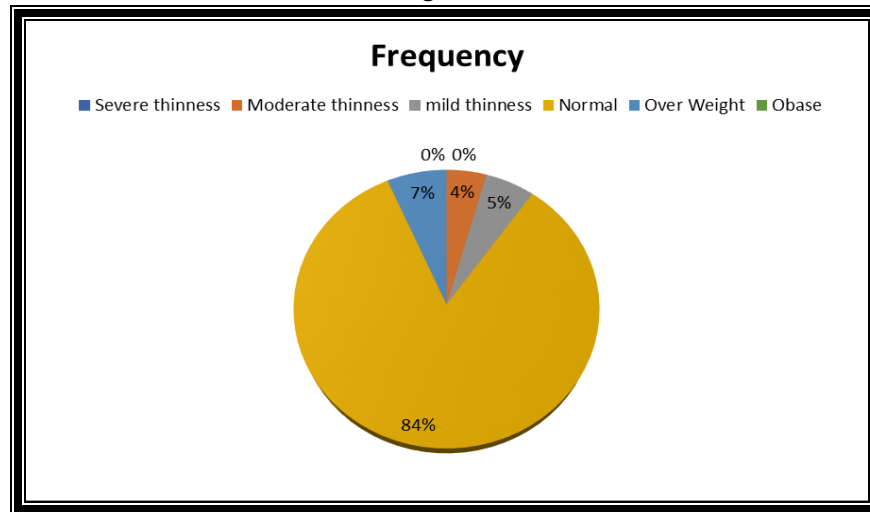


Table 6. Statistical Value of Physiological variables

Physiological variables	mean	SD	SE
Pulse rate	67.29	4.41	0.46
DBP	76.99	6.26	0.65
SBP	116.32	7.43	0.77

Figure 5

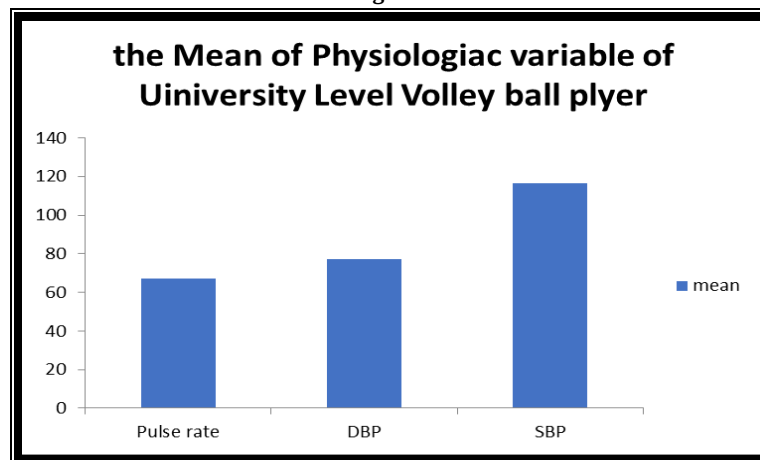


Table 6. Level of DBP and SBP of the Volley ball Players

Blood pressure category	DBP	Studied Frequency (%)	SBP	Studied Frequency
Normal	Less than 80	56 (60.87)	Less than 120	56(60.87)
elevated	Less than 80	56(60.87)	120-129	31(30.71)
High blood pressure (stage 1)	80-89	31(30.71)	130-139	5(5.43)
High blood pressure (stage 2)	90 or higher	5(5.43)	140 or higher	
Hipertensive crisis	higher than 120		higher than 180	

The normal blood pressure level is 80/120. Over 80/120 up to 89/139 are in the normal to high range. High blood pressure is one of the most common health conditions affecting the heart and blood vessels. The players should have normal condition. In the study

population we have found most of them are below 80/120 level. But only 5 are belonging in high blood pressure (Stage 2) level. The normal pulse rate is 60-100. In the study population all of them are normal position, Some times their pulse rate is increased due to exercise.

Table 7. Relation through Correlation

Mean Pulse rate/minute	Mean BMI	Correlation (r)	Mean body height (cm)	Mean body weight (kg)	Correlation (r)
67.29	21.1	0.03	175.79	65.39	0.67

A correlation has been made between pulse rate and BMI among the all student, the mean value of pulse rate and BMI are 67.29 and 21.1. after analysis through statistical software the correlation (r) is 0.03. t is $r/sr = 3$, $df=90$. As the computed ' t ' is higher than the critical ' t ' at the 0.05 level of significance. So, the probability level is low. In the result we have found a negative correlation between pulse rate and BMI. If the BMI is level is above normal or over weight pulse rate also increase.

Similarly, another correlation has been made between body weight and height (cm) among the student, the mean value of weight and height are 65.39 kg and 175.79 cm. after analysis through statistical software the correlation (r) is 0.67. where is Sr . Is 0.078. ' t ' = 8.38. df is 90. Here we have found a between body height and weight of the sample at the 0.05 significant level.

The mean pulse rate, SBP and DBP of the volley ball player's shows the normal value. But height, weight and BMI are shows higher than the normal value of the sample. (table 6 & fig. 5)

5. Conclusion

The present study revealed that the anthropometric variable shows a significant difference between mean value of the study population and ICMR recommended standard. According to WHO BMI classification shows that most of the participant's nutritional status is normal very few are under weight and overweight. About 61 percent players are belonging into the normal blood pressure level and about 31 percent are elevated category or intent to be high. Only five percent are high blood pressure level. A positive relation has been found between body weight and height through correlation ' t ' test. So, further study should be need to know the level of significant pulse rate and heart rate, BMI with WHR, leg length with body stature, limb length with sitting height and relation between body fat with pulse rate, HB, BP among the university level volley ball players.

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