



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2019; SP7: 126-128

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(Special Issue-7)

**“International Conference on Science and Education:
Problems, Solutions and Perspectives”**

(3rd June, 2019)

A comparative study of body composition anthropometric measurement and flexibility in college students

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Abstract

The earliest anthropometric studies were undertaken to find one part of the body which can become a common measurement of all other body parts.

Temperament pertains to individual differences in reactions toward emotions, exercise that are present from birth and continue throughout one's lifetime. A person whose temperament is characterized by high extraversion, high openness, and low neuroticism has higher peak energy expenditures (Terracciano *et al.*, 2013), which can be explained by higher resting metabolic rates and levels of activation and reactivity. Neuroticism and emotional instability are negatively associated with self-confidence. Various studies on physical and psychological traits have been conducted in the physical science field with temperament as the focus. In fact, this technique is called as somatotyping approach, it was introduced in 1940.

By Sheldon. Shield on method of somatotyping was extensively used in physical education for differentiating the physiques of different categories of sports persons.

Keywords: Psychological, neuroticism

Introduction

According to sports psychology there are twenty-two different measures which could be included under the heading Anthropometric Measures but, among all these twenty-two measures the two measures are most important that is, body weight and height. To enlist the twenty two different types of body measurements we have to classify them into four categories; the first category is general body measurements; under this heading body weight, standing height, and sitting height are measured. The second type is skeletal diameters, there are seven different measures, which include shoulder width, abdominal width, hip width, elbow width, wrist diameter, knee width and ankle diameter. The third category is called circumferences, in this category there are five different body measures. They are chest circumference, upper arm circumference, fore arm circumference, thigh circumference, and calf circumference. The fourth category relates to skin-fold measurements, here there are seven different body measurements namely biceps skin-fold width, triceps skin-fold width, fore arm skin-fold width, sub scapular skin-fold width, suprailiac skin-fold width, thigh skin-fold width, and skin-fold width.

For measuring all these body measurements some instruments are developed and, with the help of these instruments different types of body measurements are taken.

After understanding what are the difference body measurements incorporated under the heading, anthropometric measures, it is now necessary to understand the factors responsible for developing physical characteristics. If you take an account of factors responsible for developing the physical characteristics then, we can find that the role of heredity is very important.

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Of course, in addition to the role of heredity the role of environment is also greatly important. For example, the body built of the persons belonging to different races vary greatly in different cultures and, it can be attributed to the genes and the chromosomes we acquire from our parents, this is called heritability. It is already scientifically proved that the body built of individuals are closely associated. Commenting on the genetics and health, Plomin (1988), said that DNA is coming to a neighbourhood. The term heritability is the extent to which genetic inheritance is responsible for the variability of a physical characteristic in a population. The foetus starts life as a single cell which contains all the inherited information from both parents that will determine its characteristics. The genetic code regulates such factors as, eye and hair colour as well as behavioural factors. Genetic material for inheritance lies in the nucleus of the cell in the form of 46 chromosomes, 23 from the mother and 23 from the father, 2 of these 46 are sex chromosomes, which are an X from the mother and either an X or Y from the father. The knowledge produced by genetic studies has provided valuable information about the inheritance of susceptibility to disease (Hannon, 2004).

Scientists perform several experiments on animals, especially on rats and monkeys. In humans, several types of research help demonstrate whether a characteristic is genetically acquired. Studies of families for example, can reveal whether members of the same family are statistically more likely to develop a disorder such as heart disease than are unrelated individuals within a similar environment. If a factor is genetically determined family members would be expected to show it more frequently than would unrelated individuals. Twin research is another method for examining the genetic basis of a characteristic, if a characteristic is genetically transmitted, identical twin share it more commonly than fraternal twins or other brothers and sisters. This is because identical twins share same genetic makeup whereas other brothers and sisters have partially overlapping genetic makeup. Examining the characteristics of twins reared together as opposed to twins reared apart is also informative regarding genetics. Attributes that emerge for twins reared apart are suspected to be genetically determined especially, if the rate of occurrence between twins reared together and those reared apart is the same. Finally studies of adopted children also help identify which characteristics are genetic and which are environmentally produced. Adopted children should not manifest genetically transmitted characteristics from their adopted parents but, they would very likely manifest environmentally transmitted characteristics. For example obesity which is a risk factor for a number of disorder including coronary artery disease and diabetes. If research indicates that twins reared apart show highly similar bodyweight, then we would suspect that bodyweight has a genetic component. If weight within a family is highly related, and adopted children show the same weight as parents than their natural off springs, then we would look for family diet as a potential cause of obesity. For many attributes, including obesity. Both environmental and genetic factors are involved.

Genetic contributions to obesity and alcoholism have emerged in recent years and even some personality characteristics, optimism which is believed to have protective health effects appear to have genetic underpinnings (Plomin et al. 1992) ^[6]

In this study we have considered both the physical as well as psychological wellbeing in sports and games. Not only physical strength and skills are necessary but, psychological factors do contribute to the success in sports and games. Studies conducted by psychologists have shown that, psychologists have important roles to play with respect to the genetic contribution to disorders (Patenaude, Guttmacher and Collins, 2002). Research had shown that individuals who have a history of genetic disorders in their family, those who have already given birth to a child with a genetic disorder or those who have repeated reproductive problems often seek psychological counselling. In some cases technological advances have made it possible for some of these problems to be treated before birth. For example, drug therapy can treat some genetically transmitted metabolic defects. However, when a prenatal diagnosis reveals that the foetus has an abnormal condition that cannot be corrected then, it is the job of the parents to decide whether the child should be given birth or it should be aborted. Psychologists have an important role to play in Genetic counselling, to help people modify their risk status. In addition to this. Some of the behavioural characteristics will be attributed to the factor of genetics in sports and games. In addition to the accuracy and speed, patience is necessary. If the sport persons lose his or her patience on the play field the she is likely to make errors in the performance and these errors or mistakes in the performance might lead to defeat.

In some cases, genetic risks are magnified because they interact with the environmental factors. For example, some smokers have a genetic susceptibility to lung cancer, consequently if they are identified early encouraging them not to begin smoking or to stop smoking, if they are already smokers may substantially reduce the likelihood of their going to develop cancer (Likpus et al. 2004).

To achieve skills and supremacy in sports and games, in addition to the physical strength and skill, intelligence is also necessary. It is intelligence which helps us in, which kind of decision is to be taken and at what time. The decision is to be taken very quickly because on sports field nobody gives you time to think. Those who are having relatively more intelligence they take correct decision within the shortest period and hence, their performance is relatively better than those who cannot take right decision at the right time.

Among the modified techniques of measurement there is lung functioning testing. Lung function is an important determinant of one's exercise capacity. Body exchanges oxygen and carbon dioxide with the environment in the lungs. Therefore, it is important to measure the size and distensibility of the lungs, the ventilatory capacity and air way resistance, and the strength and endurance of the respiratory muscles. All these testing can be done with the help of modern medical devices.

In addition to them aerobic power testing, anaerobic power testing, and performance testing are done for measuring various physical abilities of the sport person. For example, to measure muscle endurance Bent Arm-Hang is used; for measuring power and coordination, shuttle-run test is used; to measure stamina that indicates cardiovascular endurance run-walk test is used; with the help of angular and linear flexibility different kinds of flexibilities are measured. Thus, it could be seen that for physical fitness, several scientific techniques are used. Till now, we have considered the

physical fitness and the mental fitness of the sport persons, since, the study deals with the anthropometric measures it is necessary to give a brief account of the various body measurements which are included in anthropometric measures.

Methodology

Methodology of any research study is considered as the back bone of research. This statement is applicable especially to the empirical as well as applied research. While studying the relationship between anthropometric measures and three main other factors namely; reaction time, intelligence and agility, one has to be very scientific in approach. Anthropometric measures were considered as important factors in the study and for measuring them weighing machine and meter scale were used. So, the maximum possible accuracy could be brought in the measurement. The other factors were also measured with the help of instruments or with the help of techniques suggested by the experts in the field. In this way, all the eight major factors were measured. Right from the selection of sample, scientific techniques were used and in the sample both males and females were included. However, while treating the data the group of females were treated independently, and the group of males was treated independently. Even for treatment of collected data appropriate statistical techniques were used, and the results were discussed in the light of statistical values and possible reasons for getting such results. After completion of heuristic survey seven colleges were selected. Both the girls and the boys were studying in them. Once the colleges were finalized, lists of male and female students studying in the colleges were fetched from the offices of the colleges. On the basis of these lists two different lists were prepared. One was for the males and other was for the females. Random number tables were used, and total 265 subjects were selected. Of the 265 subjects, 135 were females and 130 were males. Their age was 20 years to 24 years, and educational standard was under graduates. Male female ratio was approximately 1:1. Each of the subjects is tested individually, for measuring reaction time the subject was called in the laboratory. The apparatus was kept on the table and the subject was introduced to the apparatus, and the functions of different parts of the apparatus. He was given a few trials with the Morse key and then, he was instructed as follows. "You have to press Morse key with index finger. First, you will be given ready signal, and then the stimulus of light will be shown to you. The moment you see, the light, quickly withdraw, the index finger from the Morse key. A few test trials were taken and then the actual experiment was started. Fifteen. Trials were taken and every time reaction time was measured. Afterward, average of the middle 10 trials was considered as the simple reaction time of the subject". "Here are metal rods, what you have to do is pick up one metal rod and insert it in a hole on the apparatus. You have to work as fast you can, because your score on the test will depend upon the number of metal rods inserted in the holes within a period of 60 seconds only".

Discussion

This study examined differences of body composition, anthropometric measurements, In the development of human being both heredity as well as environment play significant role. There are many characteristics which are

mostly dependent on heredity. For example, body built, colour of hair, skin colour etc. even though, importance of heredity has been 3 recognized human being does not develop in vacuum. Physical built up is an important factor in sports and games. For example, to be a basketball player and achieve excellence in this game the important characteristic needed is the height. The other abilities such as flexibility, agility, reaction time etc. are also important. In every game of sport, ability to take proper decision quickly is a must and for this intelligence is required. Even though, the physical characteristics play important role in almost all sports and games the other factors also have more or less equal or sometimes more importance in achieving the supremacy in the game or sports.

Conclusion

In Sport Psychology importance of heredity is recognized. Researchers believed that body-built, skin colour, colour of hair etc. are inherited. If the body built is inherited then naturally most of the anthropometric measures are also inherited. Likewise, regarding intelligence also, it is believed that to a great extent, it is inherited. In other words, it could be stated that various aspects of body structure and some of the abilities to a considerable extent are inherited. Even if it is true, still the importance of environment cannot be ignored, because development of the individual and various abilities depend upon the environmental factors. Both, the anthropometric measures as well as different abilities are important in sports psychology. One such important factor is flexibility. In general, flexibility means, "The range of movements around skeletal joints of the body".

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