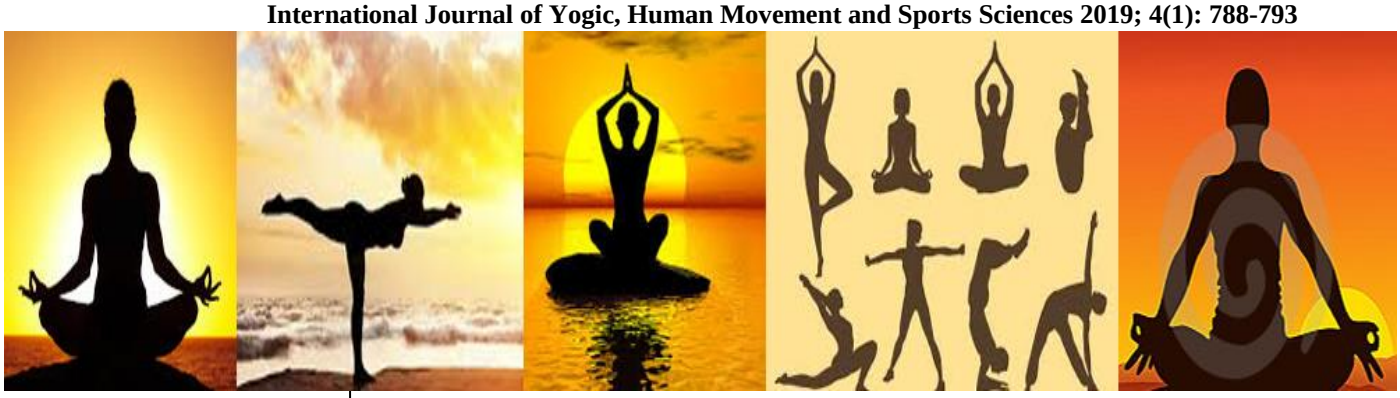
International Journal of Yogic, Human Movement and Sports Sciences 2019; 4(1): 788-793



ISSN: 2456-4419
Impact Factor: (RJIF): 5.18
Yoga 2019; 4(1): 788-793

www.theyogicjournal.com
Received: 14-11-2018
Accepted: 16-12-2018

Jassim AJ
MPhil Scholar, Physical Education Department, SRM University, Chennai, Tamil Nadu, India

Dr. C Jubilet Gnanachellam
Assistant Professor, Physical Education Department, SRM University, Chennai, Tamil Nadu, India

Correspondence
Jassim AJ
MPhil Scholar, Physical Education Department, SRM University, Chennai, Tamil Nadu, India

Effects of body mass index and a body shape index of young healthy sedentary men and women

Jassim AJ and Dr. C Jubilet Gnanachellam

Abstract
It is health that is real wealth and not pieces of gold and silver". It is important to an individual, a group, a nation, and indeed the whole world. There are more nations competing in the Olympic Games. The popularity and importance of performance in sports have increased rapidly in the last few decades. The increase in popularity and importance is not only due to the fact that performance sports are glamorous and spectacular to watch. Sports perform multifarious functions for the human society. The popularity of sports is still increasing at a fast pace and this happy trend is likely to continue in the future also. With all round advancement in the science of sports new disciplines are emerging with super specializations. The purpose of study was to analyze the effect of body mass index and a body shape index of young healthy sedentary men and women. One thousand (N=1000) sedentary young men and women studying schools and colleges in Kerala state were selected as subject for the study. Their age ranged from 17-23 year.

Keywords: BMI, ABSI, height, weight, waist circumference, sedentary, men, women

Introduction
The element of scientific basis of selection is being inducted in the procedures of selection of athletes at various levels in some advanced countries. The knowledge from many scientific disciplines is being used for improving the criteria for selection of talent. The physical educationalists have designed test procedures for evaluating the fitness of young children. Volleyball has its origins in the small town of Holyoke, Massachusetts. William G. Morgan, a physical education director at a Young Men's Christian Association (YMCA) invented the sport in 1895, when he welded elements of baseball, tennis, basketball and handball to create a game for his male students. The game's net came from a tennis court. He named the sport mintonette. His players suggested he call the game volleyball as they were "volleying" the ball across the net. The sport quickly spread to other countries in North America, Latin America and Asia. (Wikipedia 2016) [24]

At present obesity is recognized as the main cause of type 2 diabetes, cardiovascular disease and an important contributing factor to some cancers. In consequence, precise obesity criteria and diagnosis are of special importance in medical practice. There is a wide range of methods for body fat determination, which are suitable in laboratory practice (BIA, DEXA, CT, and MRI); however, they require costly equipment, which is not always available. Much simpler skinfold measurements are time-consuming and have to be performed by experienced technicians. Thus, they are not suitable either for everyday medical practice or in population-based studies. (Wikipedia 2016) [24]

Recently a new simply calculated index of body composition- a body shape index (ABSI) has been introduced as an index more reliable than BMI of association between body composition and all cases of mortality. According to WHO recommendations, the body mass index. (BMI) calculated from body weight and height and waist circumference (WC) is a valid indicators of fatness and this assumption has been supported by many studies concerning their associations with health risk. On the other hand, there are data questioning BMI reliability indicating that it provides a false diagnosis of body fatness. There are also data indicating that regional fat distribution, but not total body fat stores, are related to metabolic disturbances and health risks. Furthermore, it has been demonstrated that WHO standards of BMI are not suitable for the evaluation of body fat with respect to ethnicity. (Pubmed.com, 2016)

Similarly, many doubts exist with respect to associations between BMI and mortality. Assuming that BMI provides reliable information concerning body fatness and taking into account detrimental effects of fat excess on health and mortality, it is not clear why the BMI-mortality relationship is U-shaped, suggesting high mortality in both lean and obese humans. Moreover, it is worth noting that in young healthy adults not only BMI, but also other surrogate indices of fatness (e.g. waist-to-height ratio, body adiposity index) provide poor prognosis of fat mass since they reflect mostly skeletal muscle mass. (Pubmed.com, 2016)

BMI is reasonably well correlated with fat mass and percent body fat in heterogeneous samples of youth, but has limitations (Goran *et al*., 1995); it also is related to fat-free mass. Among youth aged 8-18 in the Fels Longitudinal Study, age-specific correlations between BMI and components of body composition ranged from 0.37 to 0.78 for percent body fat, 0.67 to 0.90 for fat mass, and 0.39 to 0.72 for fat-free mass in girls, and from 0.64 to 0.85 for percent body fat, 0.83 to 0.94 for fat mass, and 0.25 to 0.78 for fat-free mass in boys (Maynard *et al*., 2001) [22]. When chronological age was statistically controlled in five samples of boys and girls aged 8-18, correlations for BMI were a bit lower: percent body fat, 0.28 to 0.61; fat mass, 0.46 to 0.81; and fat-free mass, 0.27 to 0.64 (Malina and Katzmarzyk, 1999) [21]. Correlations for fat mass and fat-free mass were similar in four of the five samples, but those for BMI and percent body fat were variable. In a nationally representative sample of American children aged 2-19 in NHANES III, BMI was better than other anthropometric indicators (Rohrer index and weight-for-height) in predicting underweight and overweight when percent body fat or total fat mass based on DXA was the criterion measure (Pubmed.com, 2016)

Nevertheless, youth with the same BMI can differ considerably in fat mass and percent body fat, so care is essential when interpreting BMI as an indicator of fatness in youth. BMI is, more appropriately, an indicator of heaviness and, indirectly, of adiposity; at the extremes of heaviness, BMI is probably a reasonable indicator of fatness in general population surveys, but its limitations must be recognized (Pietrobelli, 1998).

Limited evidence supports higher intra- and inter observer reliability for BMI and waist circumference than for skinfold thicknesses (Artero *et al*., 2011). Beyond the debate about what the measurement of BMI actually represents (body composition, body fat, body weight, etc.),

Waist circumference is an emergent measure of body composition. Its use as a dimension of body composition is justified for various reasons. First, it is an indicator of abdominal fat as opposed to waist -to-hip circumference ratio.

BMI is reasonably well correlated with fat mass and percent body fat in heterogeneous samples of youth, but has limitations (Goran *et al*., 1995); it also is related to fat-free mass. Among youth aged 8-18 in the Fels Longitudinal Study, age-specific correlations between BMI and components of body composition ranged from 0.37 to 0.78 for percent body fat, 0.67 to 0.90 for fat mass, and 0.39 to 0.72 for fat-free mass in girls, and from 0.64 to 0.85 for percent body fat, 0.83 to 0.94 for fat mass, and 0.25 to 0.78 for fat-free mass in boys (Maynard *et al*., 2001) [22]. When chronological age was statistically controlled in five samples of boys and girls aged 8-18, correlations for BMI were a bit lower: percent body fat, 0.28 to 0.61; fat mass, 0.46 to 0.81; and fat-free mass, 0.27 to 0.64 (Malina and Katzmarzyk, 1999) [21]. Correlations for fat mass and fat-free mass were similar in four of the five samples, but those for BMI and percent body fat were variable. In a nationally representative sample of American children aged 2-19 in NHANES III, BMI was better than other anthropometric indicators (Rohrer index and weight-for-height) in predicting underweight and overweight when percent body fat or total fat mass based on DXA was the criterion measure. (Pubmed.com, 2016)

Methodology

This chapter describes the methodology and procedure adopted. It includes selection of subjects, selection of variables and administrational statistical techniques.

Selection of the subjects

One thousand (N=1000) sedentary young men and women studying schools and colleges in Kerala state were selected as subject for the study. Their age ranged from 17-23 year.

Selection of variables

A) Body Mass Index

(Derived from standing height and body weight)

B) A Body shape Index

(Derived from standing height, BMI and Waist Circumference)

Collection of data

The collection of data will be administrated in the following method. The selected variables or test items are height, weight and waist circumference. Each variables will be tested on the subjects by the help of standard equipment like standard stadio meter, electronic weighing machine and anthropometric tape. Each subjects height, weight and waist circumference will be measured one by one. All measurements are recorded in an order. When all measurements are completed, it is being analyzed statistically.

Derived variables

Body Mass Index (BMI)

Body Mass Index (BMI) is calculated using this formula

$$BMI = \frac{\text{Weight (kg)}}{\text{Height2 (m2)}}$$

A Body Shape Index (ABSI)

A Body Shape Index (ABSI) is calculated using this formula

$$ABSI = \frac{WC}{(BMI2/3 * H ½)}$$

Statistical techniques

In order to examine the hypothesis of the study, descriptive statistics such as mean, standard deviation were employed.

Analysis of Data and Interpretations of the Study

Statistical Analysis of Data

The descriptive statistics such as mean, standard deviation, minimum and maximum scores are analysed using SPSS-PC software.

Findings

Descriptive statistics between mean score of Body Mass Index and A Body Shape Index of sedentary men and women presented in the table 1

Descriptive Statistics of Body Mass Index and a Body Shape Index of Sedentary Men and Women

Table 1: Descriptive statistics of BMI and ABSI of sedentary men and wome

Category	Nos.	Minimum	Maximum	Mean	Std. Deviation
BMI (men)	500	14.22	31.67	21.68	2.58
BMI (women)	500	13.78	31.84	20.41	2.41
ABSI (men)	500	.05	.09	.067	.006
ABSI (women)	500	.05	.10	.069	.005

It is observed from table 1 that a minimum value (14.22) maximum value (31.67) & a mean (21.67±2.58) of BMI in men. And that a minimum value (13.78) Maximum value (31.84) and mean (20.41±2.41) of BMI in women

It is observed from table 1 that a minimum value (0.05) and maximum value (0.09) and a mean (0.067±0.006) of ABSI in men. And that a minimum value (0.05) and maximum value (0.10) and a mean (.069±0.005).

Comparison of mean score on Body Mass Index value of men and women is illustrated in Figure 1

Comparison of Mean Scores on BMI Values of Men and Women

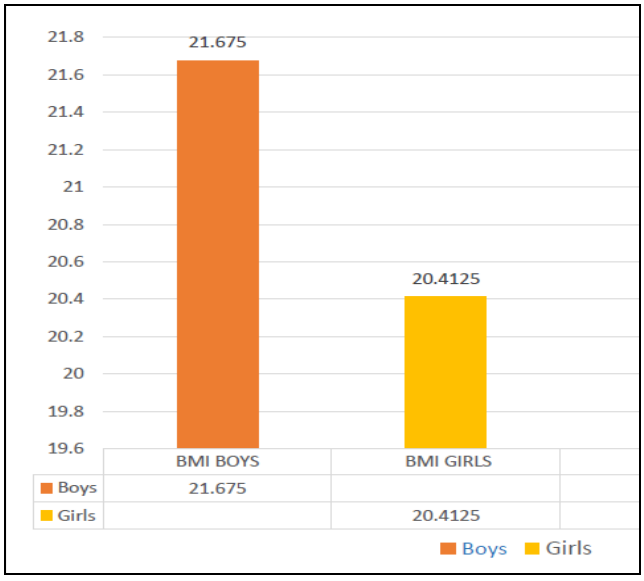


Fig 1: Comparison of mean scores on BMI values of men and women

The mean score of body mass index (BMI) in men was 21.67 and in women was 20.41. These values are also within the normal ranges.

Comparison of mean scores on A Body Shape Index values of men and women is illustrated in figure 2

Comparison of Mean Scores on ABSI Values of Men and Women

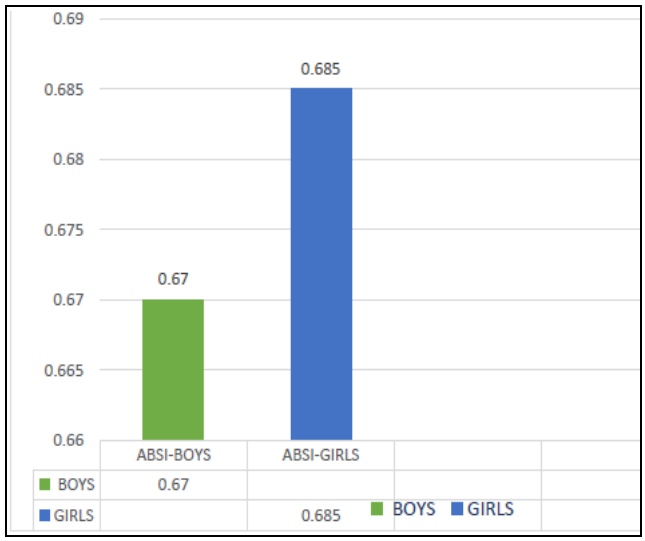


Fig 2: Comparison of mean scores on ABSI values of men and women

The mean scores of a body shape index (ABSI) in men is 0.67 and in women is 0.68.These values are also within the normal ranges.

Body Mass Index Distribution of Healthy Sedentary Men and Women

Table 2: BMI distribution of healthy sedentary men and women

Sl. No	Category	Men (N=500) ey_e)	Cumulative (%)	Women (N=500) ey_e)	Cumulative ey_e)
1	Very severely underweight (<15)	0.2	0.2	0.2	0.2
2	Severely underweight (15-16)	0.2	0.4	0.4	0.60
3	Underweight (16-18.5)	8.8	9.20	19	19.60
4	Normal (18.5-25)	80.6	89.80	77	96.60
5	Over weight (25-30)	9.6	99.40	2.8	99.40
6	Obese I (moderately) (30-35)	0.6	100	0.6	100
	7 Obese II (Severely (obese)) (35-40)	0	100	0	100
8	Obese III (very severely obese) (>40)	0	100	0	100

Body Mass Index Score Distribution among Men Group

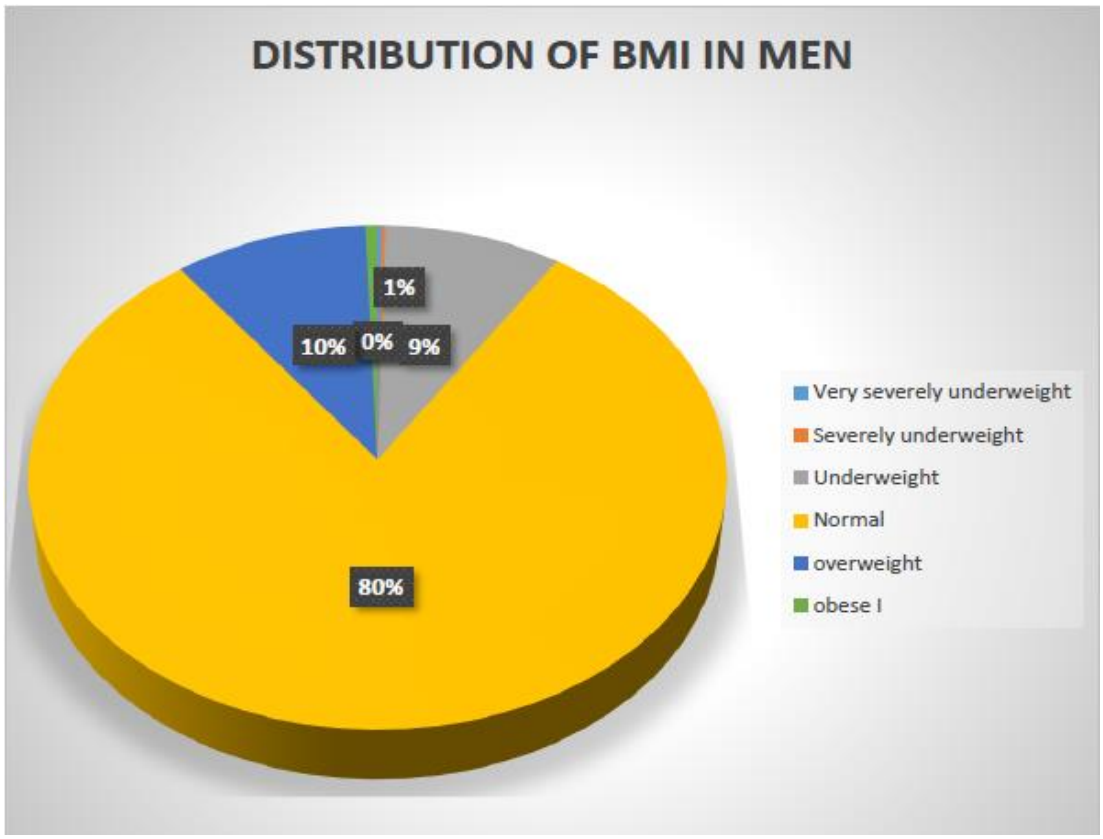


Fig 3: BMI score distribution among men group

The above pie diagram representation shows that the score distribution among men group are in normal values approximately 80%.

Body Mass Index Score Distribution among Women Group

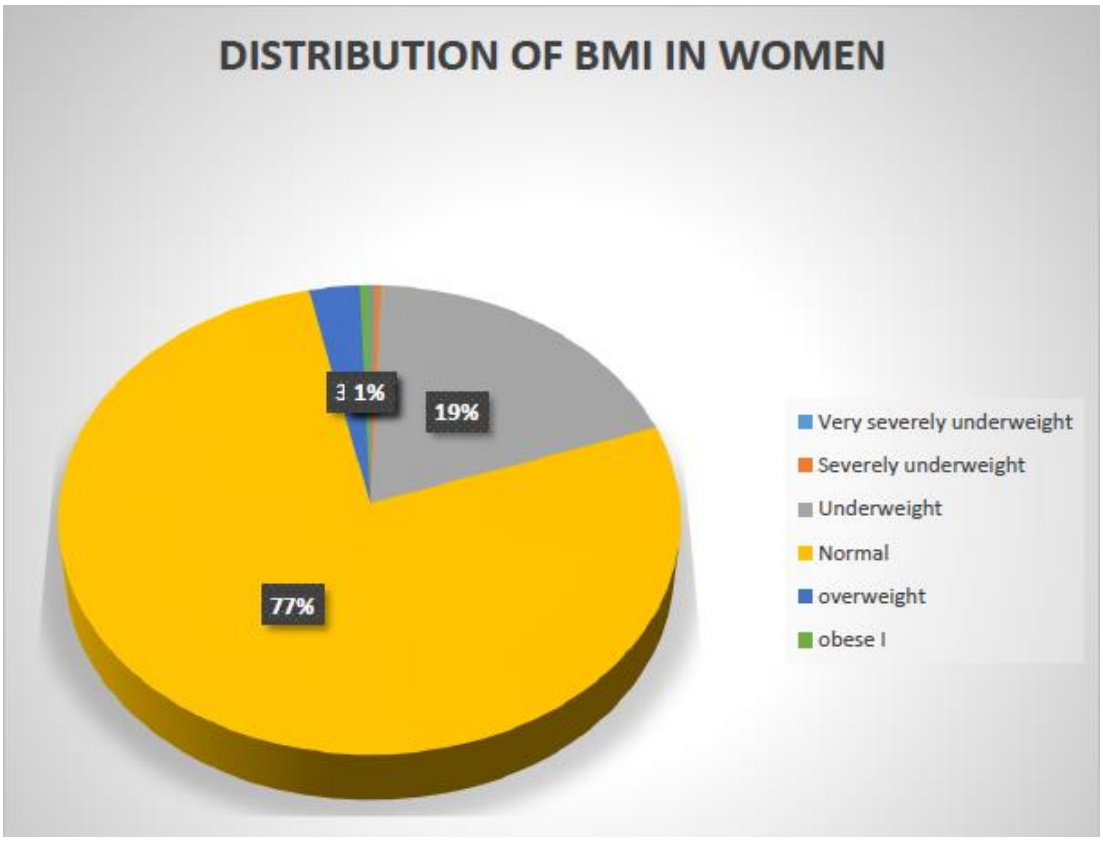


Fig 4: BMI score distribution among women group

The above pie diagram representation shows that the score distribution among women group are in normal values approximately 77%.

Discussion of Findings

The findings of the study revealed that mean score on Body Mass Index (BMI) and A Body Shape Index (ABSI) are well within the normal ranges for both men and women. Mean score of Body Mass Index (BMI) in men is 21.67 and in women are 20.41. The mean score of A Body Shape Index (ABSI) in men is 0.67 and women are 0.68. These values are also within the normal ranges.

The frequency of the very severely underweight is 0.2% in men and women respectively. 0.2% and 0.4% men and women respectively are in severely underweight category. 8.8% and 19% men and women respectively are in underweight. Majority of subjects men 80.6% and women 77% are under normal values. 9.6% and 2.8% men and women respectively are under overweight. 0.6 men and women are moderately obese. Nobody is found in severe obese and very severe obese category.

Summary, Conclusion and Recommendation

Summary

The purpose of the study was to assess the Body Mass Index (BMI) and Body Shape Index (ABSI) of young healthy sedentary men and women. The study was conducted on 1000 subjects both men and women from different schools and colleges in Kerala state. The age of the subject ranged from 17 to 23 respectively years.

The variables for this study were standing height, body weight, and waist circumference. Derived variables were Body Mass Index (BMI) and A Body Shape Index (ABSI). Body Mass was recorded is nearest half of kilogram (kg) and stretch stature were recorded in centimeters (cm) and the Waist circumference is recorded in centimeters (cm).

The findings of the study revealed that mean score on Body Mass Index (BMI) and A Body Shape Index (ABSI) are well within the normal ranges for both men and women. Mean score of Body Mass Index (BMI) in men is 21.67 and in women is 20.41. The mean score of A Body Shape Index (ABSI) in men is 0.67 and women is 0.68.

The frequency of the very severely underweight is 0.2% in men and women respectively. 0.2% and 0.4% men and women respectively are in severely underweight category. 8.8% and 19% men and women respectively are in underweight. Majority of subjects men 80.6% and women 77% are under normal values. 9.6% and 2.8% men and women respectively are under overweight. 0.6 men and women are moderately obese. Nobody is found in severe obese and very severe obese category.

Conclusion

The following conclusions are drawn on the basis of results obtained

1. In the present study the investigator, made an attempt to study the effect of body mass index a body shape index of among sedentary men and women.
2. The result of the study reveals that there is a significant effect among sedentary men and women on body mass index and a body shape index.
3. The result of the study reveals that men are more dominant among body mass index.
4. The result of the study reveals that women are more dominant among a body shape index.

Recommendation

In the light of conclusions drawn, the following recommendations are made,

1. Further research may be done by using elite athletics/players
2. Similar studies may be under taken for different age groups and sex other than this study.
3. Further research can be done in different games also.

References

1. Ferrera A, Linda, Pasquale Abete. Body mass index and health, nova Science publishers, New York, 2005.
2. Lynn Ammanda. Relationship between BMI and Health related physical fitness knowledge, Arkansas, 2006.
3. Philips, Allen, James. Measurement and Evaluation in Physical Education, John Wiley and sons publication, New York, 1942.
4. Hardayal Singh. Silence of sports Training, New Delhi, PVS Publication, 1991, 191.
5. Bompa TO. Periodization: Theory and Methodology of Training (4th ed), Champaign, Illinois: Human Kinetics. 1999; 54(8):202-209.
6. Bouchers C, Malina RM. Genetics of Physical Fitness and Moor performance, Exercise and Sports Sciences Reviews, 1999; 11:3206.
7. Shaver, Larry G. Essentials of Exercise Physiology, Delhi Surject Publication, 1982, 6-10.
8. Garrett E. Exercise and Sports Sciences (Philadelphia: East Washington Lippingcott Williams and Wilkins, 2002.
9. Hardayal Singh. Sports Training General Theory and Methods (Patiala: Nethaji Subash National Institute of Sports, 1984.
10. Harold. A Practical Approach to Measurement in Physical Education 2nd ed. (Philadelphia: Lea and Febiger, 1971.
11. Willmore. Strength, Power and Muscular Endurance in Athletic Training and Physical Fitness (Boston: Allgn and Batter Inc, 1997.
12. Hoffman. Physiological Aspects of Sports Training and Performance (Newyork: Simon and Schuster, 1992.
13. Foss ML. Fox's Physiological Basis for Exercise and Sport (Newyork: United States, Edward E. Barteell, 1998.
14. Komi PV. Strength and Power in Sport (Oxford: United Kingdom: Blackwell Scientific Publications, 1991.
15. Chen Y, Copeland WK, Vendanthn. Association between body mass index and cardiovascular disease mortality in east Asians and south Asians: pooled analysis of prospective data from the Asia Cohort Consortium, 1999.
16. Duncan MJ, Mota J, Vale S, Santos MP, Ribeiro. Associations between body mass index, waist circumference and body shape index with resting blood pressure in Portuguese adolescents. Am J Hum Biol. 2013.
17. Feller KM, Rexorde. Body mass index, waist circumference, and risk of coronary, 2006
18. Chen X. Could the new body shape index predict the new onset of diabetes mellitus in the Chinese population, 1989.
19. Krakauer JC. A new body shape index predicts mortality hazard independently of body mass index, 2004.
20. Ben y. A new body shape index predicts mortality hazards independently of body mass index. PLUS ONE. 2011, 2012; 7: doi:10.1371/journal.

21. Malina RM. Validity of the body mass index as an indicator of the risk and presence of overweight in adolescents. American Journal of Clinical Nutrition. 1999; 70(1):131S-136S.
22. Maynard LM. Childhood body composition in relation to body mass index. Pediatrics, 2001.
23. McCarthy. The development of waist circumference percentiles in British children 5.0-16.9 y. European Journal of Clinical Nutrition. 2001; 55(10):902-907.
24. "Body mass index" Wikipedia, the free encyclopedia Source: https://en.wikipedia.org/wiki/Body_mass_index Visited on 30/3/16
25. "Anthropometry", June 2014 Source: https://biobank.ctsu.ox.ac.uk/crystal/docs/Anthropometry.pdf visited on 22/03/16
26. Sports difenition. 2011. Retrieved September 06, 2015, from http://www. Google.com
27. Sports journals. 2004. Retrieved March 12, 2012, from http://www. Pubmed.com
28. Sports introduction, 2004. Retrieved January 20, 2007, from http:// merriam-webster.com
29. Resistance_training retreived from http://www.betterhealth.vic.gov.au/bc2/
30. Sports training retreived from http://education.yahoo.com/reference/dictionary/
31. Anaerobic capacity retrieved from http://ww w.webmd.com/heart-disease/
32. bodymassindex/Measurement from http://www.webmd.com/