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Association of Body Composition, Heart Rate and Aerobic Fitness of Mid-Age Males with Active Lifestyle

Prof. Sagarika Bandyopadhyay[1] Mr. Sujoy Birbanshi[2] Dr. Arkapal Bandyopadhyay[3]

[1]*Professor, Department of Physical Education, Visva-Bharati, Santiniketan, India*
[2]*Research Scholar, Department of Physical Education, Visva-Bharati, Santiniketan, India*
[3]*Junior Resident, Department of Pharmacology, Moti Lal Nehru Medical College, Allahabad, U.P., India*

Abstract:
Background: *Mid-age people are very susceptible to lose baseline fitness while active life-style is a key to prevent ageing-related hypokinetic and degenerative diseases. Awareness of such scientific facts and application of these in practice are essential in the grass root level. Hardly research works in this area on apparently healthy people are conducted on mid-age people in India. Therefore it deems reasonable to investigate the status of aerobic fitness of morning walker mid-age people in relation to their body composition and resting heart rate.*
Objective: *The purpose of the study was to establish the relationship among body mass index, resting heart rate and aerobic fitness of mid age males.*
Materials and Methods: *60 middle-aged males who undergo regular physical activities and ranging the age from 36-45 years participated as subjects of the study. Selected parameters for the study were body composition (BMI), resting heart rate (HR), aerobic fitness (AF) and age of subjects. BMI was calculated by using standard method in kg/m^2; resting heart rate (HR) was measured by palpation at the radial artery in beats/min.; and aerobic fitness (AF) was measured by '3-min step in place' test in beats/min. Pearson's Product Moment Correlation was used to find out the relationship among the variables. The level of significance was set at 0.05.*
Findings: *BMI and AF 'r' = 0.266 (<0.05); BMI and HR 'r' =* -0.256 *(<0.05); AF and HR 'r'= 0.035 (>0.05).*
Result & Conclusion: *In this study, statistically significant result is observed between BMI and Aerobic fitness and negative correlation is found between BMI & HR while no significant relationship of resting Heart rate is established with Aerobic fitness of the mid-age subjects.*
Key Words: *Active life style, Aerobic fitness, Body Composition, Heart Rate, Mid Age Men*

I. Introduction:

Middle aged people are a vulnerable group of population where ageing begins to show its effect. It is also the age where a large number of other diseases set to start. A healthy and physically fit middle aged man leading an active life style has a better outcome on ageing-related health problems than a person with sedentary life style, obesity and other co morbid factors. Hence physical fitness has a better effect in these individuals.

Ageing is a variable process and is characterized by decreased physical fitness which in turn leads to decreased ability to work (Shvartz and Reibold 1990). It can occur at different age in different individuals and also vary within different individuals of same age. Studies have revealed that after age of 35 yrs ageing starts deteriorating the functional capacities of the body. Shephard, Roy J. (1998) studied that yearly mortality begins to increase more noticeably from age of 40 yrs onwards due to ageing related health problems.

Aerobic fitness is considered as the most important health fitness component. It is an ability of the body to the utilization of oxygen during exercise (L. Chaddock et al., 2011) which gradually decreases with ageing. Variation in heart rate is also a predictor of mortality, independent of major cardiovascular risk factors (European Heart Journal, 1997).

In India research work in this area of concern in middle age group people are limited, therefore it was deemed reasonable to undertake this study.

Objective of the study

To establish the inter-relationship amongst body mass index, resting heart rate, aerobic fitness, age, height and weight of mid-age men.

II. Materials and Methods

Subjects: The study was conducted on 60 mid age males, ranging the age between 36 and 45 years. Study area: The subjects were chosen from different districts namely, Birbhum, Bardhaman and West-Medinipur of West-Bengal, India. Criterion measures: BMI was calculated by standard formula in kg/m^2; Resting HR was counted by a palpation of radial artery and aerobic fitness was recorded from '3-minute Step in place test' in beats/minutes. Pearson's Product Moment Correlation was adopted to establish relationships among selected variables.

III. Findings and Result

The descriptive statistics of personal data and selected parameters of mid-age subjects is presented in Table I:

Table 1: Descriptive Statistics of Personal data of Subjects and Selected Parameters

Parameters	Mean	SD
Height (mt)	**1.60**	**0.08**
Weight (kg)	**56.58**	**7.06**
Age (year)	**39.61**	**3.02**
BMI ($kg.mt^{-2}$)	**22.22**	**3.22**
Heart Rate ($beats.min^{-1}$)	**76.10**	**3.75**
Aerobic Fitness ($beats.min^{-1}$)	**122.55**	**13.71**

Table I depicts that the mean height and weight of mid-age subjects were 1.60±0.08 meters and 56.58±7.06 kilograms respectively. Further, the mean and standard deviation of scores in selected parameters of chronological age, body mass index (BMI), heart rate (HR) and aerobic fitness (AF) were 39.61±3.02, 22.22±3.22 $kg.mt^{-2}$, 76.10±3.75 beats/min, 122.55±13.71 beats/min respectively.

Figure 1: Graphical representation of Selected Parameters

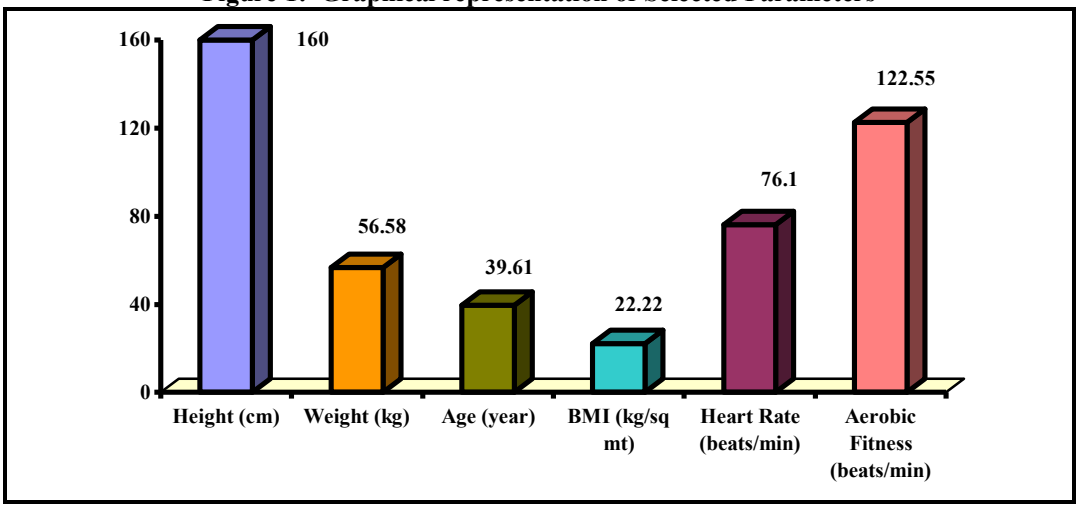


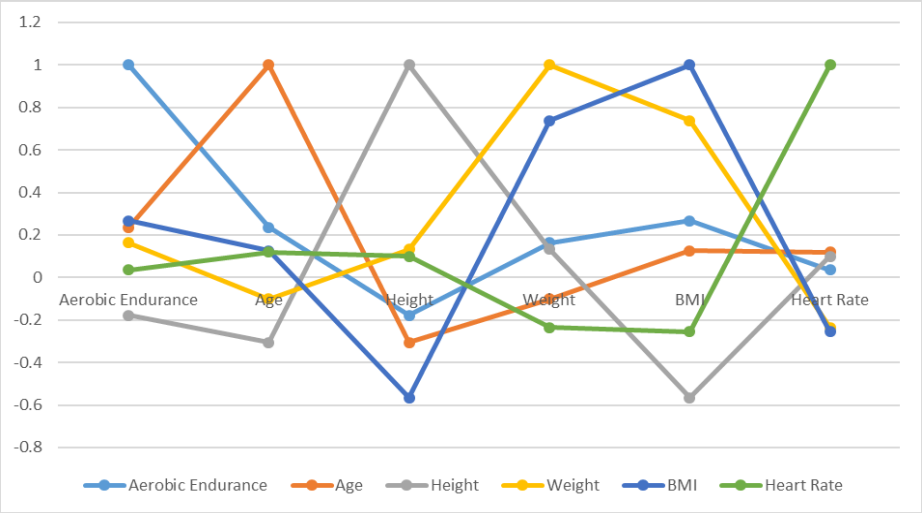
Table 2 Relationship among Selected Variables of Mid-age Men

	Aerobic Fitness	Age	Height	Weight	BMI	Heart Rate
Aerobic Fitness	1	.237	-.178	.164	**.267***	.035
Age	.237	1	**-.306**	-.101	.125	.120
Height	-.178	-.306	1	.132	**-.565**	.099
Weight	.164	-.101	.132	1	**.739**	-.236
BMI	.267	.125	-.565	.739	1	-.256
Heart Rate	.035	.120	.099	-.236	**-.256**	1

***Significant at 0.05 level; r (df=58) = 0.25**

The r-value (0.267) between aerobic fitness and BMI is found significant at 0.05 level as the tabulated value is greater than the critical value. Negative and significant relationship are observed between age & height (-.306) and height & BMI (-.565), while correlation is positively significant between BMI and weight (.739) of the subjects. Further, the BMI is observed significantly negative with heart rate (-.256) of the mid-age men. However, no significant relationship are established between aerobic fitness and heart rate (0.035); age and BMI (0.125), height and weight (0.132), aerobic fitness and age (0.237), height and heart rate (0.099), aerobic fitness and height (-0.178), weight and age (-0.101), aerobic fitness and weight (0.164), heart rate and age (0.120), heart rate and weight (-0.236) of the mid-age subjects.

Figure 2: Graphical representation of relationship amongst selected variables



IV. Discussion:

The finding of the study indicates BMI has positive correlation with the body weight and negative relationship with the height. It means the striking effects of weight and height ratio on BMI. Further, the study shows positive relationship between BMI and aerobic fitness. This observation is in the line with the findings of Laxmi C.C. et al (2014) who found a significant positive correlation between BMI and QCT pulse rate during Queen's college step test ($r=.63$ & $p<0.01$) on younger subjects. However, this study contradicts with the observation of Bandyopadhyay A. et al (2003) who worked on "Body composition, morphological characteristics and their relationship with cardio-respiratory fitness" and observed a significant negative correlation between BMI and VO_2max (ml/kg/min) ($r= -0.48$, $p<0.01$).

V. Conclusion:

Within the limitations of the study, it may be concluded that the Body Mass Index (BMI) play a vital role in health and fitness of mid-age population which is significantly related to their aerobic fitness. However, negative correlation is observed between body mass index and heart rate of subjects in this study.

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