Original Research Article

Variables of Old Age Women Participating Morning Walk Regularly

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ABSTRACT

Introduction: Old age person are now more health conscious and a numbers of them are participating exercise regularly. For them walking is an ideal exercise to maintain health and fitness.
Purpose: Present study was conducted to find out the anthropometric and physiological health status of middle aged women who participate walking regularly at morning.
Materials and Methods: A total of 17 old age women were agreed to take part in this study as volunteer. Body Mass Index (BMI) and Waist to hip ratio (WHR) were considered as anthropometric health variables and Resting Heart Rate (RHR) and VO_2 max was considered as physiological health variables in this study. Stadiometer, Weigh machine, steel tape, Stethoscope and Rockport 1-mile walk test were used as tools in this study. Mean and standard deviation were used as descriptive statistics. All calculations were done using standard statistical software.
Results: Result revealed that mean value for BMI (26.99 Kg/m2) and WHR (0.86) were slightly in overweight and obese zone. Result further revealed that the mean value of RHR (81.88 beats/min.) and VO_2 max (25.36 ml.Kg^{-1}.min^{-1}) were in normal and healthy zone as per ACSM recommendation.
Conclusion: From above results it was concluded that regular participation in walking at morning is more helpful to achieve good physiological health status than the anthropometric health status among old age women.

Key words: Morning Walk, Anthropometric health, Physiological health, Regular exercise, VO2 max, Old age women.

INTRODUCTION

Exercise has many health benefits for young as well as for old age. In old age aging induces several structural and functional alterations in the cardiovascular system (Lakatta and Levy, 2003). [1] Several studies have shown aerobic (endurance) exercise programs can have multiple beneficial effects on several health outcome in healthy elderly, including a reduction in the decline in cardiovascular performance associated with physiologic aging, an improvement in physical function (Giallauria et al.,2005; Hollmann et al.,2007). [2,3] Walking at morning is considered as a good healthy aerobic activity which promotes inner health and harmony by providing proper exercise and rhythm to every part of the body, especially for older age. Most of the older age people prefer to participate in walking as their morning exercise. It not only enables to maintain good health but regular participation in walking helps to tone up the blood circulation, digestion excretion and respiration. The whole body and mind thus becomes supply, light and full of vigor. Numbers of study worldwide reported significant correlation between physical activity and better physiological health and reduced rate of occurrence of cardio vascular diseases (CVD) in older age. [4,5]

Health as define by WHO includes complete wellbeing of many dimensions such as physical, psychological, social dimension etc. Among these, physical dimension of health can be assessed by measuring anthropometric as well as physiological parameters. This study measured the physical health of the old age women by assessing their BMI, WHR, RHR and VO_2max. First two are considered as anthropometric health and letter two are considered as physiological health of the subjects.

The body mass index (BMI) is a value derived from the mass (weight) and height of an individual. The BMI is defined as the body mass divided by the square of the body height, and is universally expressed in units of kg/m^2, resulting from mass in kilograms and height in metres. The BMI is an attempt to quantify the amount of tissue mass (muscle, fat, and bone) in an individual, and then categorize that person as underweight, normal weight, overweight, or obese based on that value. Commonly accepted BMI ranges are underweight: under 18.5, normal weight: 18.5 to 25, overweight: 25 to 30, obese: over 30. It is now considered as worldwide health status indicator for all age group. Detail of BMI classification have presented in Table-1 for easy understanding.

Table 1: Detail of BMI classification

BMI (kg/m²)	Health Category
Below 15.0	Very severely underweight
15.1 - 16.0	Severely underweight
16.1 - 18.5	Underweight
18.5 - 25.0	Normal (healthy weight)
25.1 - 30.0	Overweight
30.1 - 35.0	Obese Class I (Moderately obese)
35.1 - 40.0	Obese Class II (Severely obese)
Over 40	Obese Class III (Very severely obese)

Waist-hip ratio or waist-to-hip ratio (WHR) is the ratio of the circumference of the waist to that of the hips. The WHR has also been used as an indicator or measure of health, and the risk of developing serious health conditions. Research shows that people with "apple-shaped" bodies (with more weight around the waist) face more health risks than those with "pear-shaped" bodies who carry more weight around the hips. WHR is also used as a measurement of obesity, which in turn is a possible indicator of other more serious health conditions. The WHO states that waist hip ratio above 0.90 for males and above 0.85 for females are defined as abdominal obesity. [6] The National Institute of Diabetes, Digestive and Kidney Diseases (NIDDK) states that women with waist–hip ratios of more than 0.80, and men with more than 1.0, are at increased health risk because of their fat distribution (Table-2). [7]

Table 2: Details of WHR classification

	DGSP*		WHO#		NIDDK^	
	Women	Men	Women	Men	Women	Men
Under-weight						
Normal weight	< 0.80	< 0.90				
Over-weight	0.80-0.84	0.90-0.99				
Obesity	> 0.85	> 1.00	> 0.85	> 0.90	> 0.80	> 1.00

*Deutsche Gesellschaft fur Sportmedizin und Pravention, Luxemburg, # World Health Organisation, ^ National Institute of Diabetes, Digestive and Kidney Diseases, USA.

Heart rate is also considered as a health indicator because any irregularity in heart beats indicated some internal stress on body. Usually resting heart rate varies 60 to 100 beats/min in adult person and average resting heart rate (RHR) is 78 beats per minute. This RHR is considered as one physiological variable in this study. VO_2max is a measure of a person's aerobic fitness. VO_2max refers to the maximum amount of oxygen that an individual can utilize during intense or maximal exercise. It is measured as "milliliters of oxygen used in one minute per kilogram of body weight. This measurement is generally considered the best indicator of an athlete's cardiovascular fitness and aerobic endurance. Higher the VO_2 max lesser the risk of CVD in human being. [8] For this reason VO_2max is considered to assess the

physiological health of the older aged women in this study.

As exercise is considered as beneficial for health and wellbeing and walking is a good aerobic type exercise for older age thus the study was conducted to find out the anthropometric (BMI, WHR) and physiological health status (resting heart rate-RHR and VO$_2$max) of old age women who were participating in walking at morning on regular basis for at least last six months. Findings will be help full to consider the walking at morning is a beneficial exercise for attainment of better health status for the older aged women.

MATERIALS AND METHODS
Subject

A total of seventeen (N=17) middle aged women were agreed to take part in the study. Their age was in between 47 to 68 years (Mn=55.23 yrs). Every of them were practicing morning walk for last six months regularly.

Criterion Measure

Body Mass Index (BMI) and Waist to hip ratio (WHR) were considered as anthropometric health variables and Resting Heart Rate (RHR) and VO$_2$ max was considered as physiological health variables in this study.

Tools and Tests used

Standard tools and instruments were used to measure the variables of this study. Stadiometer and weigh machine was used to measure height and weight of the subject. Steel tape was used to measure waist and hip circumference. Stethoscope was used to measure the RHR and Rockport 1-mile walk test was used to measure the VO$_2$ max of the subjects.

Statistical Procedure

Single group design was used in this study. Mean and standard deviation were used to descriptive statistics. All statistical calculations were done by standard statistical software.

RESULTS AND DISCUSSION

The maximum value, minimum value, mean value and standard deviation (SD) of each selected variables have presented in Table-3. The findings of the present study for BMI, WHR, RHR and VO$_2$max have also presented in graphical form for easy understanding in Figure-1, Figure-2 and Figure-3 respectively.

Table 3: Descriptive statistics of selected variables

Variables	BMI	WHR	RHR (Beats/min)	VO$_2$max ml.Kg^{-1}.min^{-1}
Maximum	30.81	1.02	96	42.21
Minimum	20.36	0.60	64	11.59
Mean	26.99	0.86	81.88	27.37
SD	3.08	0.10	8.38	9.22
Remarks on Mean	Slight Overweight*	Obese zone*	Healthy zone^	Good/Healthy zone^

*WHO standard. ^ ACSM standard.

Present study found BMI of old aged women (26.99 Kg/m^2) was slightly higher than the normal zone i.e. over weight zone. The measured WHR (0.86) of the subjects was also in obese zone as per WHO, DGSP and NIDDK standard norm. [7] Result indicated that walking at morning in such intensity was not sufficient enough to reduce body weight or body fat. Thus the older age women had such anthropometric health status in this study. Sil and Mondal (2016) reported that participation in low intensity exercise like yoga etc. does not have or little contribution on maintaining good anthropometric health status among middle aged women. [8]

Normal RHR of the middle aged people was ranged from 70 to 100 b/m and present study found the mean RHR of the subject was 79.12 b/m (SD=5.41) which was also healthy and normal. Maximal oxygen uptake (VO$_2$ max) is widely accepted as the single best measure of cardiovascular fitness and maximal aerobic

power. Absolute values of VO_2 max are typically 40-60% higher in men than in women. [9] The average untrained healthy male will have a VO_2 max of approximately 35-40 mL/kg/min. [10,11] The average untrained healthy female will score a VO_2 max of approximately 27-31 mL/(kg·min). [10] These scores can improve with training and decrease with age. As per norm the minimum VO_2max value associated with lower risk of cardiovascular diseases for 50-59 years age group was 23.5 ml/kg/min [12] and present subjects were in superior position than that value. So, they were in healthy and fit zone in respect of suffering from cardiovascular diseases.
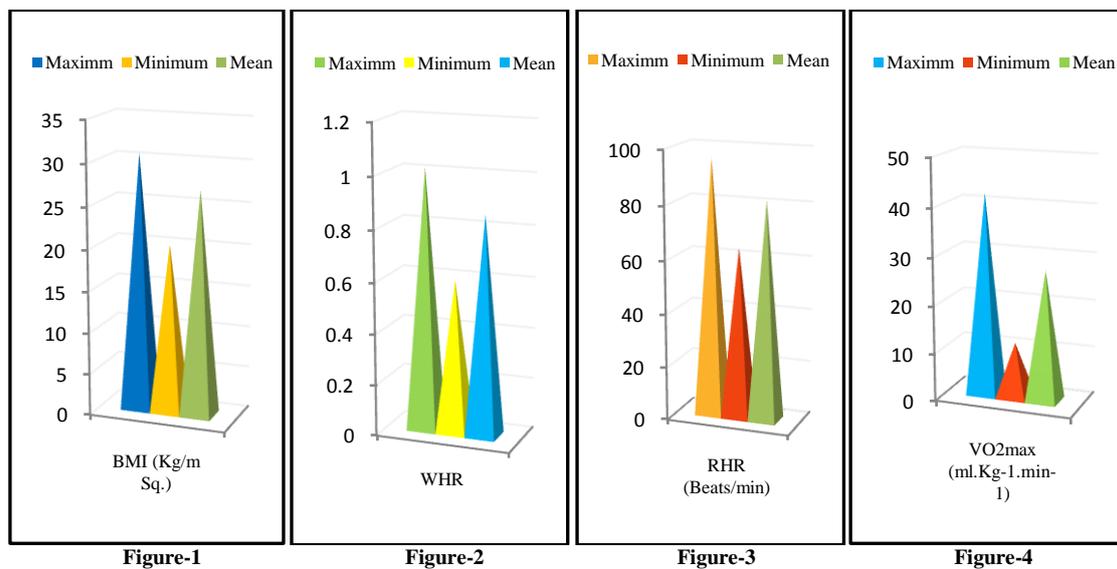

Figure-1: Graphical presentation of BMI of the subjects; **Figure-2:** Graphical presentation of WHR of the subjects; **Figure-3:** Graphical presentation of RHR of the subjects and **Figure-4:** Graphical presentation of VO_2max of the subjects.

Physical activity (PA) appears in general to have a positive effect on several health outcomes in the elderly: several epidemiologic studies have shown that the increase in the level of physical activities is associated to improved health outcomes (Sattelmair et al., 2009). [13] An experimental study provides support for the hypothesis that exercise, and in particular aerobic exercise, has positive effects on physiological health and well-being. [14] Several other studies have shown that aerobic exercise training improves measurements of cardiovascular performance in healthy elderly as expressed by an increase in peak VO_2max and an improvement of other functional parameters (Fujimoto et al., 2010). [15] Another review study reported that the risk of cardiovascular disease was lower in physically active individuals and that review found that physical inactivity was associated with double the risk of developing cardiovascular diseases. [16]

CONCLUSION

On the basis of above findings it was concluded that:

Regular participation in morning walk helps to keep physiological health status (Heart rate and VO_2max) in normal and healthy zone among old age women.

Participation in regular morning walk does not have or little contribution on maintaining good anthropometric health in respect of BMI and WHR among old age women.

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