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Unveiling the combined effect of brisk walking with recreational activities on the physiological parameters of middle-aged women

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Abstract
Introduction: The purpose of the study was to assess the effect of a twelve-week exercise protocol on middle-aged women's physiological parameters. Practical limitations such as time, budget, and availability of subjects, along with estimates based on previous studies or preliminary data, led researchers to determine that 40 subjects would be an appropriate sample size.
Materials and Methods: Researchers recruited forty middle-aged women, aged 35 to 65 years, who were randomly assigned as subjects. The participants were divided into an experimental group and a control group. Reliable instruments were used to assess the physiological variables heart rate (HR), respiratory rate (RR), blood pressure (BP), and cardiorespiratory endurance (CRE) before and after the exercise program. The 't' test was employed to determine the significant effect of the exercise program on these variables before and after the intervention.
Results: After the twelve-week exercise program, the experimental group showed significant changes in their physiological parameters. The results indicated that the exercise regimen, which included walking followed by recreational activities, effectively improved HR, RR, BP, and CRE among middle-aged women.
Conclusion: The study's findings corroborate that engaging in a structured exercise program, consisting of walking and recreational activities, is an appropriate and effective protocol for eliciting favorable changes in the physiological variables of middle-aged women.

Keywords: Middle-aged, heart rate, respiratory rate, respiratory rate, cardiac endurance, blood pressure

Introduction
At present, India has an abundance of stories about women, all unique and complicated. However, inserted through this variation is an often ignored thread in the health of Indian middle-aged women? This article dives into the complicated nature of their lives, showing the difficulties and accomplishments they confront as they enter the middle phase of their lives. Middle age, the period of life between youth and old age, has been defined as an age of transformation in women's lives. Researchers considered middle-aged women aged 40 to 65, who face a variety of social, psychological, and biological issues, including the menopausal transition [1].

The rise of industrialization impacted the social, economic, and cultural components of society. Modern life has driven men to lead a frantic lifestyle. Science and technology have had an important influence on modern life. In such cases, people require extra exercise to keep their bodies and minds healthy. Modern science gives us leisure luxuries and makes our material existence less complicated, but it does not provide us with peace of mind. Advances in science have erased physical activity from every aspect of our lives. Sedentary lifestyles have a deleterious impact on the human body and are connected to many different kinds of major health issues [2]. Disease is a common factor in our day-to-day lives. Illness has become a companion in our lives, along with bacterial viruses. A sedentary lifestyle is one of the major causes of illness in our bodies. A middle-aged woman in her middle age is busy with her family work or her own professional work; at that time, she pays less attention to herself. They rarely get a chance to engage in exercise.

Due to a lack of physical activity, a person's physical or mental capacity will decrease day by day. Most non-working middle-aged women in India handle housework; if they are working women, their work does not become too much physical work. Middle-aged women cannot perform any vigorous exercise or activities, so yoga, walking, and recreational activities are the best exercises for maintaining their physical and mental health. Regular 30- to 40-minute walks enhance the physical and mental health of middle-aged women; thus, health practitioners and the government should encourage people to walk [3]. Walking enhances health through minimising hypertension, high cholesterol, discomfort in the joints, diabetes, and enhancing blood circulation. It also enhances cardiovascular fitness and muscle strength while decreasing body fat, lipids, and cancer risk [4].

Assistance may be necessary for middle-aged women to enhance their health, ensuring that the latter part of their lives maintains a high quality. Effective health-promoting measures during middle age significantly impact the overall quality of life thereafter [5]. It was seen as desirable for individuals to participate in frequent recreational activities in order to get away from the stresses of life and live a life that is enjoyable and satisfying. Recreation activities help an adult or older woman live a life that is more prosperous [6]. Therefore, in this article, we look into the combined effect of walking followed by recreational activities on middle-aged women's health.

Methodology

Study Location

The present study was carried out in the Balagarh Block, Hooghly, West Bengal, India.

Subject: The subject was selected from Balagarh, Hooghly, West Bengal. This was a semi-urban area. After screening criteria, sixty middle-aged women willingly participated in our study. Subject ages range from 35 to 55 years. The socioeconomic condition of the subject was almost the same. Before the training programme, they were not engaging in any type of exercise activity. The participants who were not taking any medication were considered for the study.

Study Design

A quasi-experimental and convenient sampling method was adopted for this study. This quasi-experimental study employed a pre- and post-test design using a control group. This method was selected to allow the researchers to identify the effects of a particular intervention by comparing the results for the intervention and control groups with each other. Pre- and post-test designs with a control group were used in this quasi-experimental study. This method has been selected because it allowed the researchers to compare the outcomes of the control and experimental groups, respectively, in order to determine the impacts of a specific intervention on middle-aged women.

Criteria Measurement

On the day of Enrollment, demographic data and the professional status of participants were recorded. In this study, on the basis of a literature review and consulting with experts in this field and its feasibility, especially the availability of equipment and subjects, the following physiological variable was selected as a criterion measurement:

1. Blood Pressure (mm / hg).
2. Resting Heart Rate beats per minute (bpm).
3. Respiratory Rate (Breaths per minute).
4. Cardio Respiratory Endurance.

Tools & Technique

With the guidance of a physical education expert, the investigators pick up the following test instruments to serve as criteria. The following tests were used to measure the highly standardised, suitable, and ideal test items that were chosen to assess the specified variables.

Test

1. Blood Pressure (mm/hg).
2. Resting Heart Rate beats per minute (bpm).
3. Respiratory Rate (Breaths per minute).
4. Cardio Respiratory Endurance.

Treatment / Training Protocol

Week	Exercise	Duration (Minute)	Total Exercise duration (Minute)
First & Second	Brisk Walking & Recreational Activities	20+10	30
Third & Fourth	Brisk Walking & Recreational Activities	20+12	32
Fifth & Six	Brisk Walking & Recreational Activities	30+14	44
Seven & Eight	Brisk Walking & Recreational Activities	30+16	46
Nine & Ten	Brisk Walking & Recreational Activities	35+18	52
Eleven & Twelve	Brisk Walking & Recreational Activities	35+20	55

Statistical Analysis

A 't' test was implemented to statistically analyse the physiological data gathered as a result of Brisking walking followed by recreational activities in order to determine whether or not there was a significant difference between the pre- and post-training. The significance criteria in this case were established at the 0.05 level of confidence ($p<0.05$).

Result

All the subjects finished following previous described training protocol. The twenty participants averaged 95% attendance on training programme and there were no program-related injuries. Table No-1 show that mean age of the subject mean age, Hight, weight of experimental group was 42.1 years $\pm$ 5.41, 146.35$\pm$6.99, 56.2$\pm$6.98 respectively and Control Groups mean Age, Hight, weigh was 44.25$\pm$5.1, 4, 147$\pm$.75, 3.93, 54.6$\pm$7.76 respectively.

Table 1: Demographic characteristic of experimental and control group

Variable	Group	Mean	SD	't'
Age	Experimental Group	42.1	5.41	----------
	Control Group	44.25	5.15	
Height	Experimental Group	146.35	6.99	-0.7806.
	Control Group	147.75	3.93	
Weight	Experimental Group	56.2	6.98	-0.6852.
	Control Group	54.6	7.76	

Table 2: Significance of mean between experimental and control group on respiratory rate

Variable	Group	Test	Mean	SD	't'
Respiratory Rate (Breaths per minute)	Experimental Group	Pre	25.45	1.63	3.36 *
		Post	23.9	1.25	
	Control Group	Pre	24.25	1.97	1.61
		Post	23.35	1.53	

Significant at 0.05 level required table value 2.093

Table No- 2 shows the calculation of the experimental and control groups' respiratory rate ' mean, standard deviation, and "t" ratio. The respiratory rate generated a "t" ratio 3.36* and 1.61, correspondingly. For the degrees of freedom 1 and 19, the threshold required table value at the 0.05 level of significance was 2.093. It was determined that the experimental group's "t" values were statistically significant as the calculated value above the table value was 2.093. The control group's "t" value was determined to be statistically insignificant since it is smaller than the table value of 2.093.

Table 3: Significance of mean between experimental and control group on resting heart rate beats per minute (bpm)

Variable	Group	Test	Mean	SD	't'
Resting Heart Rate beats per minute (bpm)	Experimental Group	Pre	77.00	2.02	2.984*
		Post	75.15	1.59	
	Control Group	Pre	76.35	2.41	1.196
		Post	72.65	12.6	

Significant at 0.05 level required table value 2.093

Table No- 3 shows the pre and post training calculation of the experimental and control groups Resting Heart Rate' mean, standard deviation, and "t" ratio. The Resting Heart Rate indicated a "t" ratio 2.984* and 1.196, correspondingly. For the degrees of freedom 1 and 19, the threshold required table value was 2.093 at the 0.05 level of significance. It was determined that the experimental group's "t" values were statistically significant, as the calculated value above the table value was 2.093. The control group's "t" value was determined to be statistically insignificant since it is smaller than the table value of 2.093.

Table 4: Significance of mean between experimental and control group on systolic blood pressure

Variable	Group	Test	Mean	SD	't'
Blood Pressure (Sys) (mm/hg)	Experimental Group	Pre	145.5	14.31.	1.414
		Post	140.0	9.86.	
	Control Group	Pre	145.5	14.40	0.676
		Post	142.25	13.81	

Significant at 0.05 level required table value 2.093

Table No. IV shows the pre- and post-training calculations of the experimental and control groups' systolic blood pressure's mean, standard deviation, and "t" ratio. The systolic blood pressure generated a "t" ratio of 1.414 and 0.676, correspondingly. For degrees of freedom 1 and 19, the threshold required table value at the 0.05 level of significance was 2.093. It was determined that the experimental group and control group "t" values were statistically insignificant as the calculated value was below the table value of 2.093.

Table 5: Significance of mean between Experimental and Control Group on Diastolic Blood Pressure

Variable	Group	Test	Mean	SD	't'
Blood Pressure (Dia) (mm/hg)	Experimental Group	Pre	86.00	4.75	0.953
		Post	84.75	3.43	
	Control Group	Pre	83.75	5.09	0.162
		Post	83.50	4.61	

Significant at 0.05 level required table value 2.093

Table No. 5 shows the calculation of the experimental and control groups' diastolic blood pressure's mean, standard deviation, and "t" ratio. The diastolic blood pressure generated a "t" ratio of 0.953 and 0.161, respectively. For degrees of freedom 1 and 19, the threshold required table value at the 0.05 level of significance was 2.093. It was determined that the experimental group and control group "t" values were statistically insignificant as the calculated value was below the table value of 2.093.

Table 6: Significance of mean between experimental and control group on cardio respiratory endurance

Variable	Group	Test	Mean	SD	't'
Cardio Respiratory Endurance	Experimental Group	Pre	961	71.61	8.223*
		Post	1103.5	68.30	
	Control Group	Pre	1023	124.94	1.057
		Post	1447.25	1790.20	

Significant at 0.05 level required table value 2.093

Table No. 6 shows the calculation of the experimental and control groups' cardiorespiratory endurance' mean, standard deviation, and "t" ratio. The cardiorespiratory endurance generated a "t" ratio of 8.223* and 1.057 correspondingly. For degrees of freedom 1 and 19, the threshold required table value at the 0.05 level of significance was 2.093. It was determined that the experimental group's "t" values were statistically significant, as the calculated value above the table value was 2.093. The control group's "t" value was determined to be statistically insignificant since it is smaller than the table value of 2.093.

Discussion

Ensuring equality for women in both the familial and societal realms involves granting autonomy over one's body and fostering broader opportunities for personal growth. Incorporating walking and recreational activities into our fitness routines offers an excellent means of staying active and promoting overall health. These pursuits are gentle on the

body and accessible to individuals of all ages and fitness levels. Supplementing a walk with recreational activities aids in calorie burning, enhancing physical fitness, and maintaining a healthy BMI. While many individuals in middle age gravitate towards continuous walking or jogging, such repetitive activities can lead to muscle tone and calorie burning and become monotonous. Fortunately, neither walking nor recreational activities require specific skills or expensive equipment, yet committing to both yields numerous health advantages. This approach appeals to those seeking a fit, toned body without excessive muscle bulk. Lack of physical activity and an uncontrolled diet cause excessive weight gain, which leads to obesity and other metabolic disorders.

Melam *et al*. (2016): Studies have indicated that brisk walking and aerobics are the best methods for controlling and reducing weight and body mass composition. The body mass index, waist and hip circumference, and skin fold thickness of the abdomen, subscapular area, biceps, and triceps were decreased [7].

Hamila *et al*. (2018), designed walking programmes with moderate intensity (50–70% of maximal speed), which was better than self-paced walking for overweight or obese youth. These regimens enhanced exercise tolerance, weight, body composition, and heart health as compared to self-pacing or no programme [8].

When comparing the two different types of walking, Nemoto *et al*. (2007) observed that high-intensity interval walking improved thigh muscle strength, peak aerobic capacity, and lowered blood pressure more than moderate-intensity continuous walking. The investigation indicates that high-intensity interval walking may also provide protection against increases in blood pressure related to ageing [9].

The findings of Murphy *et al*. (2002) suggest that three short bouts (10 min) of brisk walking accumulated throughout the day are at least as effective as one continuous bout of equal total duration in reducing resting arterial blood pressure. Nordic walking and XCO walking improve cardiovascular efficiency in older people [10].

According to research by Morat *et al*. (2017). By providing efficient endurance exercise, these training techniques may compensate for the decreases in cardiovascular function brought on by ageing and a sedentary lifestyle [11].

Murmu and Saha (2020) found that regular recreational games can improve overall health,heart risk factors, resting heart rate, and blood pressure in middle-aged tribe women [13].

In accordance with Schneider *et al*. (2021), recreational sports participation is a beneficial and practical strategy for decreasing blood pressure in middle-aged and older persons. The heart rate of formerly sedentary women is favorably correlated with brisk walking.

Previous studies have shown that the RR, HR, and CRE of formerly sedentary women were favourably correlated with brisk walking. Consequently, each of the above-mentioned components is very essential for the elderly to remain fit. This study aimed to explore whether brisk walking followed by recreational activities improves respiratory rate, heart rate, and cardiorespiratory endurance among middle-aged women.

In summary, the study examining the effect of a twelve-week exercise programme involving brisk walking followed by recreational activities indicates a positive effect for respiratory rate, heat rate, and cardiorespiratory endurance. These findings suggested that brisk walking with recreational activities significantly enhances cardiorespiratory endurance, heart rate, and respiratory rate as per established evaluation criteria. While evidence supporting the improvement of blood pressure through brisk walking with recreational activities was limited, the majority of studies suggested that high-intensity exercise yields greater benefits compared to low- to medium-intensity exercise on blood pressure. However, it's worth noting that certain health considerations for healthy elders may necessitate moderate exercise intensity, and future research in this domain is warranted.

Conclusion

The study was conducted on middle-aged women, mean age 42 years. As mentioned above, establishing an exercise schedule and walking with recreational activities could help improve the overall health of middle-aged women. Walking followed by recreational activities can be an effective training modality to stimulate a decrease in resting HR. However, it was also beneficial in improving respiratory rate, and it can also improve one's cardiorespiratory endurance. However, this study shows that walking followed by recreational activities three days per week can give meaningful benefits to middle-aged women. This is of great importance considering that women with limited physical activity time can practice recreational games three times per week, which improves overall health.

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