

ORIGINAL RESEARCH

IJPHY

EFFECT OF AEROBIC EXERCISES ON CARDIOPULMONARY FITNESS IN COMPUTER USING SEDENTARY INDIVIDUALS

¹P. Chinna Reddemma²Dr. K. Madhavi

ABSTRACT

Background: A sedentary life style is a type of life style with no or irregular physical activity. It is a leading cause for reduced cardio - respiratory fitness and physical activity. The most of the employees working as computer personnel's for more than five hours in a day is leading to altered physical activity and fitness. To study the effect of aerobic exercise programme on the cardio - respiratory fitness in computer using sedentary individuals.

Methods: As per the inclusion criteria the thirty subjects were selected for the study, all the selected subjects were given aerobic protocol for 12 weeks. Pre and post therapeutic outcome measures were assessed for Body Mass Index was calculated using weight (kg)/ height (m²). Waist- hip ratio was measured using inch tape in centimeters, pre and post therapeutic values of Body Mass Index, Waist Hip Ratio, VO₂ peak were assessed.

Results: According to the data analysis, a significant difference was found between the pre and post test values of Body Mass Index, Waist- hip ratio and Vo₂peak in both experimental and control groups (p<0.05), but comparatively more significant changes were found in the experimental rather than the control group(p<0.05).

Conclusion: Aerobic exercise had significant influence in computer using sedentary individuals. There was a significant change in physical factors like body mass index, waist-hip ratio, and functional factors like vo₂peak. Hence, it is concluded that 12weeks of aerobic exercises is effective in improving cardio vascular factors computer using sedentary individuals.

Key words: Sedentary behavior, Physical inactivity, Computer users, sitting.

Received 14th July 2014, revised 19th March 2015, accepted 25th March 2015



www.ijphy.org

DOI: 10.15621/ijphy/2015/v2i2/65247

CORRESPONDING AUTHOR

¹P. Chinna Reddemma

MPT, College of physiotherapy,
Sri Venkateswara Institute of Medical
Sciences (SVIMS),
Tirupati, Andhra Pradesh, India.

²Principal
College of physiotherapy,
Sri Venkateswara Institute of Medical
Sciences (SVIMS)
Tirupati, Andhra Pradesh, India.

INTRODUCTION

Sedentary behavior is the major health hazard in the recent years. It is an epidemic of 21st century. Sedentary behavior is defined as the activities which consume low levels of energy expenditure that occur while sitting, lying down, watching television, computer use and travel.^{5,6} Sedentary behavior is an independent health risk factor^{5,6,7} leading to altered metabolism, obesity, hypertension, diabetes, cardiovascular diseases, decreased cardio respiratory fitness.

The 40% risk is higher among those that sit still more than 5 hours per day. However, those that exercise at least 4 hours per week are as healthy as those that sit fewer than 4 hours per day. Number of studies reveal that exercise has significant effect is maintaining good health. Physical health is determined by body mass index, waist-hip ratio and capacity.

Aerobic exercise, practiced for more than 30 minutes in a day helps to maintain physical fitness. Number of studies was done on the effect of exercises in regulating the physical activity in sedentary behavior individuals

Apart from regulating the physical activity in sedentary behavior individuals, sustaining of physical capacity is important. Hence, the aim of the study is to find out the effect of aerobic exercises on cardiopulmonary fitness in computer using sedentary individuals.

MATERIALS AND METHODOLOGY

Subjects were randomly divided into two groups (experimental and control groups) and all the participants were provided with informed consent.

- Ethical clearance: Approval granted by ethical committee of college of physiotherapy, Sri Venkateswara Institute of Medical Sciences.
- Place of study: Sri Venkateswara Institute of Medical Sciences, Tirupati, Andhra Pradesh, India.
- Study design: Experimental study – prospective randomized clinical trial
- Study set-up: Sri Venkateswara Institute of Medical Sciences, College of physiotherapy (outpatient department).
- Type of data : Quantitative data
- Sources of data : subjects (normal individuals) who are working in Sri Venkateswara Institute of Medical Sciences
- Nature of sample collection: Probability sampling.

- Sample size: 30 subjects were selected for this study and randomly selected into experimental and control group using lottery method.
- Sampling method: Simple random sampling.

Inclusion criteria

Age: 24 to 40 years, Gender: women & men, Personnel working on computers continuously for more than 5 hours in a day Waist hip ratio more than 0.7 in females and more than 0.8 in males

Exclusion criteria

Personnel who are working less than four hours in a day, Pregnant women, Cardiac diseases Respiratory problems, Musculoskeletal problems, Neurological problems.

INTERVENTION

Experimental group: Aerobic exercises programme with supervision.

Control group: Aerobic exercises programme without supervision.

Both groups received intervention for 12 weeks (5 times in a week).

EXPERIMENTAL GROUP

The graduated supervised aerobic exercise protocol is implemented to the participants starting with medium phase exercise involving upper limbs, lower limbs and trunk. In the second phase, medium fast exercises are taught and in the third phase, faster exercises are taught.

Aerobic Exercises

Table.1: The detailed descriptions of exercises are given below:

Medium phase
1. Spot walking with hands on hip
2. On the spot walking with arm swing
3. Spot walking and arms rotating over head
4. Knee elbow touch.
5. Shift weight side move left and right.
6. Shift weight left move, stretch right hand over the head; shift weight right move, stretch left hand
7. Side lunge with arm stretch up
8. Side lunge with arm stretch forward
9. Hops - hop forward and back
10. Hops – hop side to side
11. Hand press to knee (chest to thigh).
12. Step touch and hands on hip
13. Two step side move.
14. Forward backward move with crossing hands.
15. Two steps side move, squat press.

Medium fast phase
16. Double steps side move and jumping with arms up & down
17. Shift weight left & right with single arm curl
18. Shift weight left & right with double arm curl
19. Step touch with arms butterfly movement
20. Step and touch arm swing
21. Front Kick (forward leg) - one foot forward Lift knee to highest position and extend leg, return foot to forward position
22. Front Kick (rear Leg) - one foot forward Lift rear knee to highest position and extend leg, return foot to rear position
23. Side step and kick
24. double side steps and kick
25. step touch and punch
26. double side steps and punch
27. Walk forward & backward with forward kick
28. Walk forward & backward with kick
29. March forward & backward with elbow up& down
30. Rocking Horse - moving forward and backward with bent knees, forward knee rising to the chest
31. Two steps side move with arm rotation.
32. Two steps side move with arm rotation and squat press
33. Grapevine – step to the side with left foot, bring right foot behind left; back to position with right & left

Faster phase
34. Boxer - jump twice with the left and then twice with the right foot, knees kept soft
35. Bob - jump with both feet simultaneously, knees kept soft
36. Bent Leg Jump - jump from one foot to the other and back as in modern dance
37. Jumping Jacks (front) – raise alternating knees waist high

38. Star Jump [jumping Jacks (side)] -raise legs simultaneously to each side and return
39. Scissor Jump - jump with a move of one leg forward and other back and alternating arms.
40. Walk forward & backward and squat press
41. Walk forward & backward with arm rotation
42. Press up Kick Knee.
43. Jumping with alternate elbow & knee touch
44. Side move with arm stretching up & down
45. Side move with arm stretching up & down with squat press
46. Walk forward & backward and jumping jack
47. Double steps side move and Scissor jump
48. Two steps side move with double arm curl
49. Walk forward & backward and side move with arm stretching up & down.
50. Double steps side move and press up kick knee.

STATISTICAL ANALYSIS

Statistical analysis has been carried out to analyze the significant impact of the treatment issued to the subjects of both control and experimental groups by using IBM SPSS Inc.20.0 version for this purpose the data was entered into Microsoft excels spreadsheet, tabulated and subjected to statistical analysis.

Of the 30 subjects 15 were randomized into control group and 15 were randomized into experimental group. All the 30 subjects completed entire protocol as defined by 6 weeks of treatment. The outcomes of the study were BMI, WHR and VO₂ PEAK.

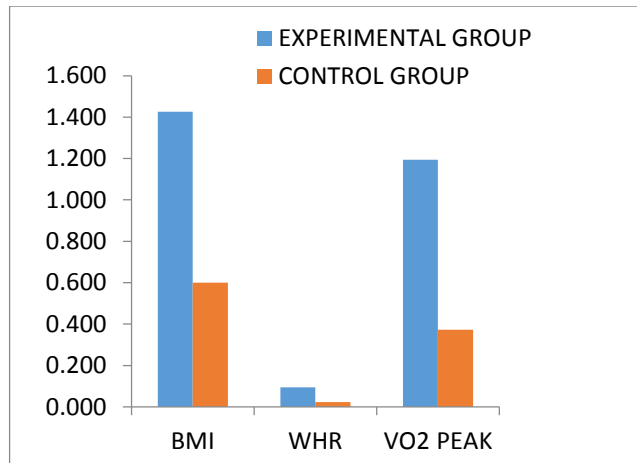
Statistical tools unpaired t-test has been applied for parameters in between groups and paired sample t-test for parameters within group.

Descriptive measures like mean, standard deviation have been reported along with p-value.

Table No. 2: Mean difference of Body Mass Index (BMI), Waist-Hip ratio (WHR) and Vo2 peak between the experimental and control group

	GROUPS	N	Mean	Std. Deviation	Std. Error Mean
BMI	EXPERIMENTAL GROUP	15	1.427	0.687	0.177
	CONTROL GROUP	15	0.600	0.655	0.169
WHR	EXPERIMENTAL GROUP	15	0.094	0.026	0.007
	CONTROL GROUP	15	0.023	0.012	0.003
VO2 PEAK	EXPERIMENTAL GROUP	15	1.193	0.557	0.144
	CONTROL GROUP	15	0.373	0.191	0.049

Table No. 3: Mean difference of Body Mass Index (BMI), Waist-Hip ratio (WHR) and Vo2 peak between the experimental and control group



RESULTS

The t-value and the sig (2-tailed) level (the p-value) will clarify whether the difference between experimental group and control group as significant. Now the p-value is less than 0.05 in all cases indicating that there is significant difference between Experimental group and Control group.

DISCUSSION

The results of the present study show that subjects in experimental group showed there is a significant change in Body Mass Index, Waist Hip Ratio and VO_2 peak when compared to control group.

According to the data analysis, a significant difference was found between the pre and post test values of WHR, BMI, and VO_2 PEAK in both experimental and control groups ($p < 0.05$), but comparatively more significant changes was found in the experimental rather than the control group ($p < 0.05$).

As the studies done by Andrew lepp et al reveals that activities associated with sedentary behavior like computer professionals, sitting activities, watching television, playing video games are associated with altered physical and cardio respiratory fitness.

Barkley and lepp concluded that computer using sedentary individuals have a risk for multitude of health issues.² Andrew lepp et al stated that cardio respiratory fitness deteriorates in sedentary individuals.¹ Must & Tybor revealed that sedentary behavior leads to elevated body weight and adiposity levels.³ Sarh J Denlon mail proposed that increased physical activities increases cardio respiratory fitness. Amano et al concluded that aerobic exercises practiced for 3 months series of 30 minute sessions; three day per week with obese subjects had significant effect on BMI, fat body percentage.²

CONCLUSION

Aerobic exercise had significant influence in computer using sedentary individuals. There was a significant change in physical factors like body mass index, waist-hip ratio, and functional factors like vo_2 peak. Hence, it is concluded that 12weeks of aerobic exercises is effective in improving cardio respiratory fitness in computer using sedentary individuals.

LIMITATIONS

- Sample size is small.
- Subjects could not be followed up after the study.
- Duration of the study was short.

RECOMMENDATIONS

- Long term effects of study can be studied further
- Further more studies are needed to done use of this sedentary behavior
- Studies with longer duration are recommended with longer follow-up period to assess long term benefits.
- Conduct the study with larger sample size

REFERENCES

1. AmanoM. KandaT, Maritani T Exercise training and autonomic nervous system activity in obese individuals. *Med Sci Sports Exercise*. 2001; 33(8); 1287 – 1291.
2. Andrew Leap, Jacob E Barkley, Gabriel J Sanders Michael Rebdd and peter Gates. The relationship between cell phone use, physical and sedentary activity and cardiorespiratory fitness in a sample of U.S.college students. *Int J Behav Nutr phys act*. 2013; 10:79
3. A Must and DJ Tybor. physical activity and sedentary behavior a review of longitudinal studies of weight and adiposity in youth. *International journal of obesity*. 2005; 29:S84 – S96.
4. Dorgra S, Stathokostas L. Sedentary behavior and physical activity are independent predictors of successful aging in middle – aged and older adults. *J.Aging Res*.2012:1-8.
5. Katzmarzyk P. Physical activity, sedentary behavior and health, paradigm paralysis or paradigm shift? *Diabetes*. 2010; 59(11):2717-2725.
6. Mathews CE, Chenky, Freedson PS, Buchowski MS, Beech BM, pati RR, et al. Amount of time spent in sedentary behaviors in the united states. *Am. J. Epidemid*. 2008;167(7): 875-81.
7. Thorp AA, owen N, Neuhaus M, dunstan D.W. Sedentary behaviours and subsequent health outcomes in adults. *Am. J.prev. med*. 2011;41(2):207-215.

Citation

P. Chinna Reddemma, Dr. K. Madhavi. (2015). EFFECT OF AEROBIC EXERCISES ON CARDIOPULMONARY FITNESS IN COMPUTER USING SEDENTARY INDIVIDUALS. *International Journal of Physiotherapy*, 2(2), 429-433.