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**Original Research Article**

# TO ASSESS THE EFFECT OF PHYSICAL ACTIVITY (JOGGING / WALKING) ON CARDIO RESPIRATORY PARAMETERS

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**Abstract**

**Background & Methods:** The aim of the study is to assess the effect of physical activity on cardio respiratory parameters. Medical students aged between 17 to 25 years will be included in the study to test their nutritional assessment and study cardio respiratory variables.

**Results:** After 30 day of jogging out of 60, 08 subjects (13.33%) had the 500-1000 ml of ERV, 30 subjects (50%) had 1001-15000 ml of ERV, 20 subjects (33.34%) subject had 1501-2000 ml of ERV and 02 subject (3.33%) had 2001-2500 ml of ERV.

**Conclusion:** There is increased in energy (calories) intake of subjects. Pulse reduced after one month of jogging. However, it is concluded and suggested that further studies need to be done to make that facts as the scientifically accepted document. The Mean Energy (calories) intake before the jogging was 2108.80 kcal and after the 30 days of the jogging was 2408.50 kcal..

**Keywords:** physical, cardio & respiratory parameters.
**Study Design:** Observational Study.

## 1. Introduction

Lifestyles, nutrition habits and physical training have positive influence on the risk factors of the heart disease. The poor physical fitness of an individual is due to the poor body composition and inadequate supplementation of diet and lack of physical exercise[1]. For the proper growth of an individual exercise is necessary, as it increases the plasma somatotrophin level.

The studies on the cardiorespiratory variables and anthropometric parameter in the Medical college students are very scanty in Indian populations. So, the purpose of the present study is to fulfill the lacuna of knowledge in these aspects in young healthy adults especially in the Indian context[2].

Concept of fitness is being defined as good condition, good health, and individual with cardio respiratory fitness able to cope with the general demands of living. Cardio respiratory fitness is the ability to perform dynamic exercise using large muscle groups at moderate to high intensity for prolonged periods. VO2 max is considered to be the most valid measure of

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cardio respiratory fitness. It measures the capacity of the heart, lungs, and blood to transport oxygen to the working muscles, and measures the utilization of oxygen[3].

Physical activity is composed of various components (the type of movement, purpose of the activities, behavior, etc) and can be expressed in several ways (energy cost of activities, analysis of movement, work productivity, etc).

Indices of nutritional status (weight) definitely influence lung function independent of isotropic growth, and weight represents an important and convenient surrogate marker of nutritional status. After puberty major divergence between boys and girls occur, with males ultimately having substantially greater lung volumes for height than females[4].

## 2. Material and Methods

Present study includes 60 medical students aged between 17 to 25 years will be included in the study to test their nutritional assessment and study cardio respiratory variables. It is measured by pulmonary function test and using Ganshorn LT8 computerized pulmonary function testing machine. Students are instructed to come the department (PFT) in the morning for lung test .It will measured before and after the physical activity (jogging) for the standard period of times (4 week) following parameter will be considered in the study.

**Inclusion Criteria:** Only those subjects will be included in the study that does not have any respiratory, cardiac, neuromuscular or endocrine disease.

**Exclusion Criteria:** Subjects who developed any kind of discomfort during test.

**Weight:** Body weight will be measured (to the nearest 0.5kilograms).Weighing scale will be standardized before taking measurement. Subject will be made to stand erect on the centre of platform of the weighing machine and reading is taken in kilograms.

**Height:** Using stature meter, Height will be measured without shoes and subject made to stand on the flat floor with feet parallel .The head is held perfectly erect with lower border of orbit in the same planes as the external auditory meatus and arm hanging at the sides in a natural manner. Scale is gently lowered to make contact with pressure just to crush the hair and reading is taken

## 3. Result

**Table No.1 Characteristics of study population**

| **Number of subject** | **60** |
|---|---|
| Age (years) | 18-22 |
| Mean Weight (kgs) with SD | 58.1 ± 9.6 |
| Means Height (cms) with SD | 168.37 ± 5.5 |
| Means BMI( kg/m2) with SD | 21.91 ± 2.5 |
| Mean Energy intake(kcal) With SD | 1786.80 ± 503 |

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**Table No.2: Show Weight Prejogging and Postjogging**

| Weight (kilogram) | Pre Jogging | | Post Jogging | |
|---|---|---|---|---|
| **Range** | **Number of cases** | **Percentage (%)** | **Number of cases** | **Percentage (%)** |
| **45-55** | 24 | 40 | 24 | 40 |
| **56-65** | 18 | 30 | 18 | 30 |
| **66-75** | 14 | 23.33 | 14 | 23.33 |
| **76-85** | 04 | 6.67 | 04 | 6.67 |
| **TOTAL** | 60 | 100 | 60 | 100 |

After the 30 day of jogging, 24 subjects (40%) had in the range of 45-55 kgs, 18 subjects (30%) had in the range of 56-65 kgs, 14 subjects (23.33%) had in the of range 66-75 kgs, and 04 subjects (6.67%) had in the range of 76-85 kgs.

**Table No.3: Energy Intake Prejogging and Postjogging**

| Range of Energy intake(calorie) | Pre Jogging | | Post Jogging | |
|---|---|---|---|---|
| | **Number of cases** | **Percentage (%)** | **Number of cases** | **Percentage ( %)** |
| **1500-1800** | 16 | 26.67 | 02 | 3.33 |
| **1801-2100** | 18 | 30 | 14 | 23.33 |
| **2101-2400** | 12 | 20 | 10 | 16.67 |
| **2401-2700** | 10 | 16.67 | 22 | 36.67 |
| **2701-3000** | 04 | 6.67 | 12 | 20 |
| **TOTAL** | 60 | 100 | 60 | 100 |

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After the 30 day of jogging, 02 subjects (3.33%) had in the range of 1500-1800, 14 subjects (23.33%) had in the range of 1801-2100, 10 subjects (16.67%) had in the range of 2101-2400, 22 subjects (36.675%) had in the 2401-2700 and 12 subjects (20%) had in the range of 2701-3000 kilocaries.

**Table No. 4: Expiratory Reserve Volume (ERV) Prejogging and Postjogging**

| E.R.V(ml) | Pre jogging | | Post Jogging | |
|---|---|---|---|---|
| **Range** | **Number of cases.** | **Percentage (%)** | **Number of cases** | **Percentage (%)** |
| **500-1000** | 12 | 20 | 08 | 13.33 |
| **1001-1500** | 38 | 63.33 | 30 | 50 |
| **1501-2000** | 08 | 13.33 | 20 | 33.34 |
| **2001-2500** | 02 | 3.33 | 02 | 3.33 |
| **TOTAL** | 60 | 100 | 60 | 100 |

After 30 day of jogging out of 60, 08 subjects (13.33%) had the 500-1000 ml of ERV, 30 subjects (50%) had 1001-15000 ml of ERV, 20 subjects (33.34%) subject had 1501-2000 ml of ERV and 02 subject (3.33%) had 2001-2500 ml of ERV.

## 4. Discussion

Physical inactivity, a primary risk factor for cardiovascular disease. Unfortunately, only a few investigators have documented the effects of exercise training on cardiovascular variables Therefore, the purpose of this study was to examine the effects of a four-week jogging (aerobic exercise) on B.M.I, Nutritional Status, Cardio respiratory parameters and Psychological well-being of subjects and involve these subjects in physical activity. All parameters were recorded pre- and post-training[5].

There are numerous morphological and physiological differences between men and women connected to cardiorespiratory fitness. Women have lower blood volume, lower count of red blood cells, lower haemoglobin, which all leads to lower oxygen capacity and hence ability to increase arterial and vein differences in O2. Despite number of physiological differences, it seems that aerobic training contributes significant increase in VO2max levels in both men and women. Women show similar level of adaptation to one stimulus as elderly men[6-8]. Similar adaptive response (increase in VO2max) to endurance training in men was prescribed to increase in maximum minute volume (2/3) and increase in arterial-vein oxygen difference (1/3). On the other hand, women expressed no central adaptation, but only peripheral, due to

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the fact that increase in VO2max levels was caused by increase in arterial-vein O2 difference, whereas the increase of arterial-vein O2 difference was caused by capillarisation of skeletal muscles and activity of mitochondrial enzymes [9-13]. It seems that hormones may influence lack of increase of minute and stroke volume, because women in post-menopause develop no hypertrophy of left chamber. Changes contributing reduction in VO2max level are numerous. VO2max is very sensitive to changes in individual's lifestyle (active/ sedentary). Cardio-vascular system oxygen transport capacity reduces with reduction in physical activity, and it increases as response to endurance training. Niederseer et al. [14] performed research on influence of skiing to cardio-respiratory system of healthy elderly participants. In the research they applied training program in duration of 12 weeks where daily activity lasted for 3.5 hours twice or three times a week[15].

## 5. Conclusion

There is increased in energy (calories) intake of subjects. Pulse reduced after one month of jogging. However, it is concluded and suggested that further studies need to be done to make that facts as the scientifically accepted document. The Mean Energy (calories) intake before the jogging s was 2108.80 kcal and after the 30 days of the jogging was 2408.50 kcal.

## 6. References

1. Ciolac EG, Bocchi EA, Bortolotto LA, Carvalho VO, Greve JM, Guimarães GV.Effects of high-intensity aerobic interval training vs. moderate exercise on hemodynamic, metabolic and neuro-humoral abnormalities of young normotensive women at high familial risk for hypertension Hypertens Res. 2010 Aug;33(8):836-43. Epub 2010 May 7
2. Davy Humphrey (1800), Cited by Anne Kiraly. History of Spirometry. Journal for Pre-Health Affiliated Students 2005; 4(1) Deb Prasanta, Deb Samir Khan, Dhara Prakash Chandra, evalution of anthropometric charactertics and cardiopulmonary function of college students in Tripura.,india journal of physiology and allied science 2009 vol 63 ;no; 4, page-101-106
3. Deshmukh P.R ,Gupta S.S,Danger .A.R, Bharmbe M.S, Maliye C, Kaur .S And Garg B.S, relationship of anthropometric indicators with blood pressure levels in rural wardha,2006 ,Indian journal of medicine research ,may 2006 page 657-664.
4. De Arun Kumar. Peak Expiratory Flow Rate in Adolescents male swimmers of all India rural swimmers meets. Indian Journal of Physiology and Pharmacology 1992 ; 36 (2) : 118-120.
5. Spina RJ, Ogawa T, Kohrt WM, Martin W, Holloszy J, Ehsani A. Differences in cardiovascular adaptations to endurance exercise training between older men and women. Journal of Applied Physiology. 1993; 75(2): 849–855.

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE12, 2023

6. Coggan AR, Spina RJ, King DS, Rogers MA, Brown M, Nemeth P, Holliszy J. Skeletal muscle adaptations to endurance training in 60-to 70-yr-old men and women. Journal of Applied Physiology. 1992; 72(5): 1780–1786.
7. Chen Y.H., Wu T.N. and Liou S.H. Obstructive Pulmonary Function Defects among Taiwanese firebrick workers in a 2 year follow-up study. Journal of Occupational & Environmental Medicine 2001; 43(11):969-975.
8. Liberatia A, Altman DG, Tetzlaff J, Mulrow C, Gotzsche PC, Ioannidis JP, Clarke M, Devereaux PJ, Kleijnen J, Moher D. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. Annals of Internal Medicine. 2009; 151(4): 65–94.
9. Atcharaporn L, Nadine MF, Atif BA, David RP. The Respiratory Exchange Ratio Is Higher in Older Subjects, but Is Reduced by Aerobic Exercise Training. International Journal of Endocrinology and Metabolism. 2011; 1: 264–270.
10. Belman MJ, Gaesser GA. Exercise training below and above the lactate threshold in the elderly. Medicine and Science in Sports and Exercise. 1991; 23(5): 562– 568.
11. Braith RW, Pollock ML, Lowenthal DT, Graves JE, Limacher MC. Moderate-and high-intensity exercise lowers blood pressure in normotensive subjects 60 to 79 years of age. The American Journal of Cardiology. 1994; 73(15): 1124–1128.
12. Chmelo EA, Crotis CI, Newman JC, Brinkley TE, Lyles MF, Leng X, et al. Heterogeneity of physical function responses to exercise training in older adults. Journal of the American Geriatrics Society.2015; 63(3), 462–469.
13. De Vito G, Bernardi M, Forte R, Pulejo C, Figura F. Effects of a low-intensity conditioning programme on VO2max and maximal instantaneous peak power in elderly women. European Journal of Applied Physiology and Occupational Physiology. 1999; 80(3): 227–232.
14. Niederseer D, Ledl-Kurkowski E, Kvita K, Patsch W, Dela F, Mueller E, Niebauer J. Salzburg Skiing for the Elderly Study: changes in cardiovascular risk factors through skiing in the elderly. Scandinavian Journal of Medicine & Science in Sports. 2011; 21(1): 47–55.
15. Predovan D, Fraser SA, Renaud M, Bherer L. The effect of three months of aerobic training on stroop performance in older adults. Journal of Aging Research. 2012; 1–7.