

# Comparative Study on Health Status, Cardiovascular Efficiency and Visual Reaction Time between Active and Sedentary Young Women

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## ABSTRACT

Exercises have beneficial effect on health and well being. Purpose of the study was to compare the health status of young women who have participated exercise and physical activities regularly with the young women who were sedentary in nature. A total of fifty subjects (N=50) have been selected randomly for the present study of which 25 were actively participated in regular exercise and 25 were sedentary in nature. The age of the subject was in between 21 to 30 years. Body weight, BMI, Cardio Vascular Efficiency and Reaction time were the criterion measured of the study. BMI was calculated by measuring height and weight with the universal equation  $[BMI = \text{Weight (Kg)} / \text{Height (m)}^2]$ . Queens College Teat was used to measure cardiovascular efficiency. Visual Reaction Time (VRT) was measured by Nelson hand reaction test. Mean and Standard deviation were used as descriptive statistics and t-test was done to find out the difference between two group means. Only 0.05 level of significance was considered in this study. All calculation was done by standard statistical software. Result revealed that active young women have lower mean value of body weight and BMI than sedentary women. The mean difference of body weight ( $t=4.19$ ) and BMI ( $t=4.02$ ) between two groups of women was statistically significant ( $p<0.05$ ). The mean value of CVE was higher in active women group than sedentary women and this difference of mean was statistically significant ( $t=2.75$ ;  $p<0.05$ ). The lower mean value of reaction time for active group than sedentary group represented their superior fitness status but the difference was not significant statistically ( $t=1.37$ ;  $p>0.05$ ). From the above findings it was concluded that active women have superior health status in respect of body weight, BMI and CVE. Lower value of reaction time also indicated that active women possessed higher fitness and they were healthier than sedentary young women. Findings proved that regular participation in exercise is much more helpful to attain better health in young women.

**Key Words:** Exercise effect, Health and Fitness, Young Women, Active and Sedentary

## INTRODUCTION

A sedentary lifestyle is one of the major risk factors for obesity, high blood pressure, high blood lipids, and cardiovascular diseases. Worldwide there has been a large shift towards less physically demanding work and currently at least 60% of the world's population gets insufficient

exercise. As a result, population were suffering from different hypo kinetic diseases like obesity, hypertension, Diabetes, cardio vascular disease etc. Numerous scientific reports have examined the relationships between physical activity, physical fitness, and cardiovascular health and reported that more active or fit

individuals tend to develop less coronary heart disease (CHD) than their sedentary counterparts. Regular exercise has a favorable effect on many of the established risk factors for cardiovascular disease. For example, exercise promotes weight reduction and can help reduce blood pressure. Exercise can reduce “bad” cholesterol levels in the blood (the low-density lipoprotein [LDL] level), as well as total cholesterol, and can raise the “good” cholesterol (the high-density lipoprotein level [HDL]). Reaction time is an important component of physical fitness and plays a vital role in swift decision making. It is the time discrepancy between the moment of change in the environment and the beginning of your response. Purpose of the study was to compare the health status in respect of body weight and BMI, cardiovascular efficiency (CVE) and visual reaction time (VRT) between the active and sedentary young women. This active group of women was participating in physical exercise regularly at list five days in a week. Findings will be helpful to judge the significance of physical exercise to maintain good health, better cardiovascular efficiency and physical fitness among young women.

## MATERIALS AND METHODS

**The Subject:** A total of fifty subjects (N=50) was selected randomly for the present study of which 25 were from B.P.Ed college and 25 were from B. Ed College. The age of the subject was in between 21 to 30 years.

**Criterion Measure:** Weight, BMI, Cardiovascular efficiency (CVE) and visual reaction time (VRT) were the criterion measure in this study.

**Tests And Tools Used:** BMI was calculated by measuring height and weight with the universal equation  $[BMI = \text{Weight (Kg)} / \text{Height (m)}^2]$ .

Queens College Test was used to measure cardiovascular efficiency. [1] Visual Reaction Time (VRT) was measured by Nelson hand reaction test [1]

**Design of the Study and Statistical Procedure Used:** Mean and Standard deviation were used as descriptive statistics and t-test was done to find out the difference between two group means. Only 0.05 level of significance was considered in this study. All calculation was done by standard statistical software.

## RESULT AND FINDINGS

Mean and standard deviation of body weight, BMI for active and sedentary young women have been presented in Table-1. The Mean values of weight and BMI were higher for sedentary group young women than the active group (presented in Figure-1 and Figure-2 respectively). These mean differences for body weight and BMI between two groups were found significant statistically as per Table-1 in this study.

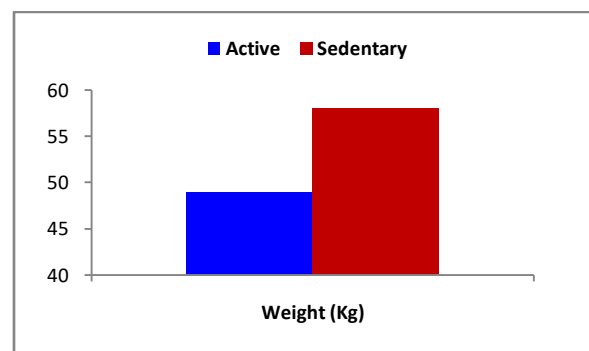


Figure-1: Body weight of active and sedentary women

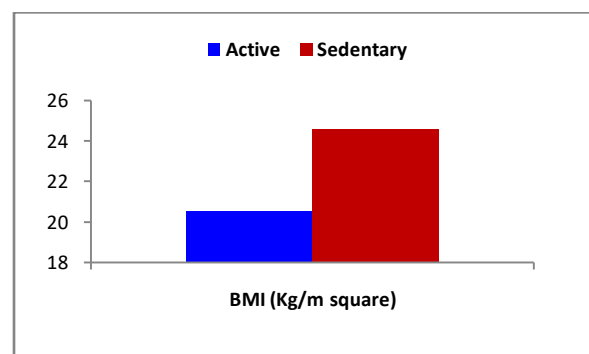


Figure-2: BMI of active and sedentary women

**TABLE -1: Mean and SD of the weight and BMI and computed t-value**

| Variables | Active Group |      | Sedentary Group |      | SED   | Mean Difference | t-value |
|-----------|--------------|------|-----------------|------|-------|-----------------|---------|
|           | Mean         | SD   | Mean            | SD   |       |                 |         |
| Weight    | 48.92 Kg     | 5.84 | 58.02 Kg        | 9.17 | 2.17  | 9.1             | 4.19*   |
| BMI       | 20.54        | 2.66 | 24.62           | 4.33 | 1.016 | 4.04            | 4.02*   |

\*Significant at 0.05 level as CR=2.02

**TABLE -2: Mean and SD of the CVE and VRT and computed t-value**

| Variables                 | Active Group |       | Sedentary Group |       | SED   | Mean Difference | t-value |
|---------------------------|--------------|-------|-----------------|-------|-------|-----------------|---------|
|                           | Mean         | SD    | Mean            | SD    |       |                 |         |
| Cardiovascular Efficiency | 149.28 beats | 10.52 | 150.08 beats    | 11.64 | 3.2   | 8.8             | 2.75*   |
| Reaction Time             | 0.1960 Sec   | 0.029 | 0.2056 Sec      | 0.030 | 0.007 | 0.0096          | 1.37    |

\*Significant at 0.05 level as CR=2.02

Mean and standard deviation of CVE and VRT for active and sedentary young women have been presented in Table-2. The Mean value of CVE was higher for active group young women than the sedentary group (presented in Figure-3). The Mean value of VRT was higher for sedentary group young women than the active group (presented in Figure-4). As per Table-2 the mean difference for CVE between two groups was found significant statistically but the mean difference for VRT between two groups was found not statistically significant in this study.

Lower body weight and BMI for active women group indicated that they possessed higher health status than sedentary women. Because as per WHO recommendation which has mentioned below the BMI value for active women was in normal range when we considered the additional cut-off points (18.5-22.99) but BMI value for sedentary women was almost in overweight zone as per additional cut-off points (23.00-24.88) which indicated that they were at the door of the health risk zone.

**TABLE -3: Classification of BMI for related health risk**

| BMI       | Classification    | Health risk level |
|-----------|-------------------|-------------------|
| <18.5     | Under Weight      | High              |
| 18.5–24.9 | Normal Weight     | Low               |
| 25.0–29.9 | Over Weight       | High              |
| 30.0–34.9 | Class I Obesity   | Higher            |
| 35.0–39.9 | Class II Obesity  | Great             |
| ≥ 40.0    | Class III Obesity | Severe            |

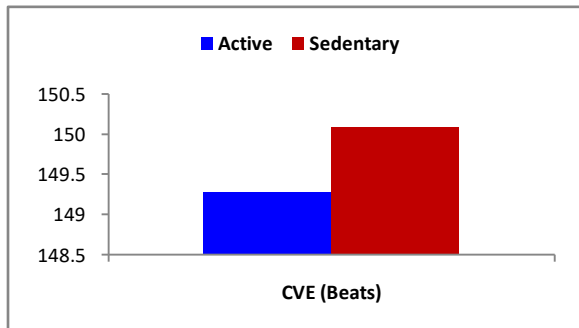


Figure-3: CVE of active and sedentary women

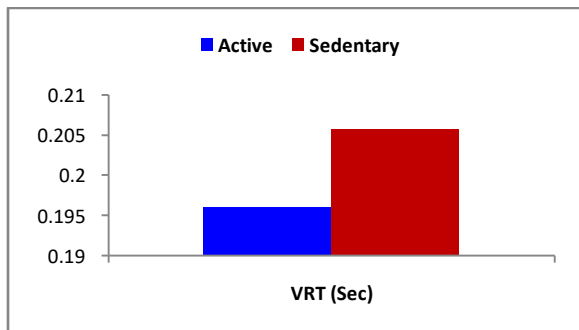


Figure-4: VRT of active and sedentary women

Several study reported over weight and obesity for sedentary women throughout the world especially in developed and developing country. [2,3] Obesity leads to excessive body weight which is associated with various diseases, particularly cardiovascular diseases, diabetes mellitus type 2, high blood pressure, high blood cholesterol, and high triglyceride levels, obstructive sleep apnea, certain types of cancer, and osteoarthritis. [4,5,6] Obesity may be developed as a result of sedentary lifestyle. Present study found the same trend in young sedentary women. This trend might be prevented and enjoyable life can be lead

by participating in few hour regular exercises. Present study found absence of obesity for active young women and they had normal body weight and lower health risk (as per Table-3). This might be due to the regular participation of exercise. Several study reported exercise help to reduced excess body weight and obesity. [7,8,9]

Cardiovascular efficiency (CVE) considered as good aerobic health in exercise physiology. More CVE of a person indicated better cardiac health. Present study found significantly higher mean value of CVE for active women which mean they have good physiological as well as cardiac health than the sedentary young women. This might be the due to the regular participation of exercise; because participation in regular exercise helps to increase CVE. Similar findings have been reported by several other studies. [10,11,12]

Present study also found higher VRT for active women than their sedentary counterpart. In this study VRT measured in seconds and lower time of VRT indicates higher status in this variable. Higher reaction time as a result of exercise participation was reported by Welford (1980), [13] Nakamoto and Mori (2008), [14] Davranche et al. (2006), [15] Snowden et al. (2011) [16] etc. But t-value in Table-2 indicated that difference between two groups was not statistically significant. Some studies also found no difference in reaction time as a result of exercise participation. [17,18,19]

Thus present study found that the active group of women was more physically fit and participation in physical exercise regularly helps women to develop physical fitness components and thus help to enjoy life better than the sedentary women.

## CONCLUSIONS

1. Active young women had good health status in respect of body

weight and BMI and had lesser health risk than the sedentary young women.

2. Active young women also had superior CVE and VRT in compare to the sedentary young women.

## REFERENCES

1. Johnson, B.L. and Nelson, J.K. (2007), Practical measurement for evaluation in physical education, 3<sup>rd</sup> edition, Surjeet Publication, Delhi. pp 197 and 227-228.
2. Caballero, B. (2007). "The global epidemic of obesity: An overview". *Epidemiol Rev* 29: 1–5.
3. Tsigosa C. Hainer, V. Basdevant, A. Finer, N. Fried, M. Mathus-Vliegen, E. Micic, D. Maislos, M. (2008). "Management of Obesity in Adults: European Clinical Practice Guidelines". *The European Journal of Obesity* 1 (2): 106–16.
4. Bray, G.A. (2004). "Medical consequences of obesity". *J. Clin. Endocrinol. Metab.* 89 (6): 2583–9.
5. Peeters, A, Barendregt, J.J, Willekens, F. Mackenbach, J.P. Al Mamun, A. Bonneux, L. (2003), "Obesity in adulthood and its consequences for life expectancy: A life-table analysis". *Ann. Intern. Med.* 138 (1): 24–32.
6. Grundy, S.M. (2004). "Obesity, metabolic syndrome, and cardiovascular disease". *J. Clin. Endocrinol. Metab.* 89 (6): 2595–600.
7. Slentz, C.A. Duscha, B.D. Johnson, J.L. Ketchum, K. Aiken, L.B. Samsa, G.P. Houmard, J.A. Bales, C.W. Kraus, W.E. (2004), Effects of the amount of exercise on body weight, body composition, and measures of central obesity: STRRIDE--a randomized controlled study, *Arch Intern Med.* 12; 164(1):31-9.
8. Slentz, C.A. Aiken, L.B. Houmard, J.A. Bales, C.W. Johnson, J.L. Tanner, C.J. Duscha, B.D. Kraus, W.E. (2005), Inactivity, exercise, and visceral fat. STRRIDE: a randomized, controlled

- study of exercise intensity and amount. *J Appl Physiol* : 99(4):1613-8.
9. Vissers, D. Hens, W. Taeymans, J. Baeyens, J.P. Poortmans, J. Van Gaal, L. (2013), the effect of exercise on visceral adipose tissue in overweight adults: a systematic review and meta-analysis. *PLoS One*. 8(2):e56415. doi: 10.1371/journal.pone.0056415.
  10. Pollok, M.I. (1973), Quantification of endurance training programme, *Sports Science Review*, Vol. 1, P-155-188.
  11. Darren, E.R. W. Nicol, C.W. Shannon, S.D.B. (2006), Health benefits of physical activity: the evidence; *CMAJ* ; Vol.174, No. 6; doi: 10.1503/cmaj.051351
  12. Gormley, S.E. Swain, D.P. High, R. Spina, R.J. Dowling, E.A. Kotipalli, U.S. Gandrakota, R. (2008), Effect of intensity of aerobic training on VO2max. *Med Sci Sports Exerc*. 40(7):1336-43.
  13. Welford, A. T. (1980), Choice reaction time: Basic concepts. In A. T. Welford (Ed.), *Reaction Times*. Academic Press, New York, pp. 73-128.
  14. Nakamoto, H. and Mori, S. (2008), Sport-specific decision-making in a go/no go reaction task: difference among non athletes and baseball and basketball players. *Perceptual and Motor Skills* 106(1): 163-171.
  15. Davranche, K. Audiffren, M. and Denjean, A. (2006), A distributional analysis of the effect of physical exercise on a choice reaction time task. *Journal of Sports Sciences* 24(3): 323-330.
  16. Snowdon, M., L. Steinman, K. Mochan, F. Grodstein, T. R. Prohaska, D. J. Thurman, D. R. Brown, J. N. Laditka, J. Soares, D. J. Zweiback, D. Little, and Anderson, L.A. (2011), The effect of exercise on cognitive performance in community-dwelling older adults: Review of intervention trials and recommendations for public health practice and research. *Journal of the American Geriatric Society* 59(4): 704-716.
  17. McMorris, T., J. Sproule, S. Draper, and R. Child. (2000), Performance of a psychomotor skill following rest, exercise at the plasma epinephrine threshold and maximal intensity exercise. *Perceptual and Motor Skills* 91(2): 553-563.
  18. Pesce, C., Tessitore, A. Casella, R. Pirritano, M. and Capranica, L. (2007), Focusing on visual attention at rest and during physical exercise in soccer players. *Journal of Sports Sciences* 25(11): 1259-1271.
  19. Lord, S., Matters, R.B. St George, R. Thomas, M. Bindon, J. Chan, K. Collings, A. and Haren, L. (2006), the effects of water exercise on physical functioning in older people. *Australasian Journal on Ageing* 25(1): 36-42.

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