

## **Effects of Health –related Physical fitness programme on Physiological efficiency on Sedentary Students**

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### **Abstract**

The Primary aim of the study was to determine the effects of Health –related Physical fitness programme on Physiological efficiency on Sedentary Students. Seventy five sedentary students from various colleges of Marathwada region of Maharashtra, has been selected for the study. Exclusion criteria were the presence of chronic disease such as asthma, heart disease or any other condition that would put the subjects at risk when performing the experimental tests. The subjects were free of smoking, alcohol and caffeine consumption, antioxidant supplementation and drugs during the programmers. The age, height, weight, resting heart rate, respiratory rate, and breath holding capacity, of all subjects were measured. Psychological tests were also carried out by distributing questionnaires, which measured personality characteristics, emotional intelligence and sports competitive anxiety. All 75 acted as experimental group and two times tests were taken namely before and after health related physical fitness, no control group had include in the study. The training programme was planned as 05 days a week and 60 minutes a day. Exercises that use large muscles groups were given to the students. Result reveals that .Health related physical fitness programme decrease the heart rate among sedentary students. Result reveals that .Health related physical fitness programme decrease the RR among sedentary students. Result reveals that. Health related physical fitness programme increase the vital capacity among sedentary students. Result reveals that Health related physical fitness programme increase the Breath holding capacity among sedentary students.

### **Introduction**

A sedentary lifestyle can contribute to, many preventable causes of death. A lack of physical activity is one of the leading causes of preventable death worldwide. Many studies have proven sedentary lifestyles and lack of physical activity to be the risk factors for anxiety, cardiovascular disease, depression, diabetes, colon cancer, high blood pressure, obesity, osteoporosis, lipid

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disorders, kidney stones and many more diseases. Health-related physical fitness programme increase is currently under study as a possible prevention strategy for diabetes, obesity, blood pressure and cardiovascular disease. In scientific studies it is revealed that participation to physical activities is rapidly decreased especially in the periods of high school and university education (Kwak et al., 2009; Sinclair et al. 2005). In Turkey, also depending on the high percentage of young people in the population, and as a result of new universities, the number of university students increase day by day. Academic education in the universities focuses on the specialization in preferred fields; hence Rona and Gokmen (2005) implied that physical education and sport lessons in universities are not represented effectively enough in program schedules. Physical activity has an important role in the education of new generation in the frame of physical and mental health, and nowadays it is placed as a piece of education in the developed societies' education programs (Turkmen et al. 1995). In the light of the above, the investigators become interested in determining the effects of health related physical fitness with respect to heart rate, Respiratory rate Vital Capacity, breath holding capacity, taken up to assess the level of familiarity of these subjects among sedentary students.

**Methods:**

Seventy five sedentary students from various colleges of Marathwada region of Maharashtra, voluntary to participate in this study. Exclusion criteria were the presence of chronic disease such as asthma, heart disease or any other condition that would put the subjects at risk when performing the experimental tests. The subjects were free of smoking, alcohol and caffeine consumption, antioxidant supplementation and drugs during the programmers. The age, height, weight, resting heart rate, respiratory rate, and breath holding capacity, of all subjects were measured. All 75 acted as experimental group and two times tests were taken namely before and after health related physical fitness, no control group had include in the study. The training programme was planned as 05 days a week and 60 minutes a day. Exercises that use large muscles groups were given to the students. These exercises includes walking, jogging, dancing, stair climbing, jumping rope and cross country.

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Warm - up period was approximately 10 min., this was combine callisthenic – type stretching, exercise and progressive physical activity. However cool down period was 5 to 10 min. Heart rate was measured by counting radial pulse for a min. The respiratory rate was taken by keeping palm on the stomach and counting the total number of breath for a period of 60 sec. and doubled later on the get the respiratory rates per min. The subjects were instructed to blowout air only through the mouth not through nose. Each subject was provided a trail before the final tests Breath holding capacity after expiration of students was tested by an electronic watch. The subjects were instructed to stand erect with legs bended, after getting signal the students exhale air through his nostrils. The total time of air holding of the students was measured in seconds. Similarly breath holding capacity after inspiration of the student was measured by also measured by electronic watch. The subject was instructed to stand erect with legs bended after getting signal the students inhale air through his nostrils. The total time of air holing capacity after inspiration of the students was measured in seconds.

### **Results and discussion**

The results and discussion have been represented in concise and comprehensive manner that is easy to comprehend starting with selected physiological parameters.

**Table – 1**

**Morphological Characteristics of sedentary students**

Sr. No.	Components	Means Scores	Standard Deviations
	Age (Year)	22.43	7.44
	Weight (Kg)	67.30	13.21
	Height (cm)	169.04	20.33

Table-1, shows that the mean scores and standard deviations of sedentary students. Mean Score (S.Ds.) age of sedentary students was 22.43 (7.44) years, mean score (S.Ds.) weight was 67.30 (13.21) Kg., mean score (S.Ds.) height was 169.04 (20.33) cm.,

**Table 2**

**Statistical comparison of Heart rate in before and After-test of sedentary students.**

Variable	Test	Number	Mean	S.D.	t-ratio
Heart Rate	Before Test	75	78.54	7.34	7.40*
	After Test	75	75.80	7.12	

*\* Significant at .05 level.*

Table -2 illustrates the statistical comparison of heart rate of sedentary students in before and after health related physical fitness programme.

With regards to heart rate of before and after health related physical fitness programme of sedentary students have obtained the mean value of **78.54** and **75.80** respectively which are given in the Table -2 reveals that there was significant effects of health related physical fitness programme was found in ( $t=7.40^*$ ,  $p<.05$ ) HR. Health related physical fitness programme decrease the heart rate among sedentary students.

**Table 3**

**Statistical comparison of Respiratory rate in before and After-test of sedentary students**

Variable	Test	Number	Mean	S.D.	t-ratio
Respiratory Rate	Before	75	19.23	3.22	3.14*
	After Test	75	17.66	3.01	

*\* Significant at .05 level.*

Table -3 illustrates the statistical comparison of RR of sedentary students in before and after health related physical fitness programme.

With regards to Respiratory Rate of before and after health related physical fitness programme Sedentary students have obtained the mean value of **19.23** and **17.66** respectively which are given in the Table -3 reveals that there was significant effects of health related

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physical fitness programme was found in ( $t=3.14^*$ ,  $p<.05$ ) RR. Health related physical fitness programme decrease the RR among sedentary students.

**Table 4**

**Statistical comparison of Vital Capacity in before and After-test of sedentary students.**

Variable	Test	Number	Mean	S.D.	t-ratio
Vital Capacity	Before	75	21.89	74.78	<b>44.53*</b>
	After Test	75	23.56	75.22	

*\* Significant at .05 level.*

Table -4 illustrates the statistical comparison of Vital Capacity of sedentary students in before and after health related physical fitness programme. With regards to vital Capacity of before and after health related physical fitness programme they have obtain the mean value of **21.89** and **23.56** respectively which are given in the Table -2 reveals that there was significant effects of health related physical fitness programme was found in ( $t=44.53^*$ ,  $p<.05$ ) VC. Health related physical fitness programme increase the vital capacity among sedentary students.

**Table 5**

**Statistical Analysis of select physiological variable with respect to breath holding capacity inspiration in before and After-test of Experimental group.**

Variable	Test	Number	Mean	S.D.	t-ratio
BHC(Inspiration)	Before Test	75	38.22	4.23	4.46 *
	After Test	75	41.30	4.32	

*\* Significant at .05 level.*

Table -5 illustrates the statistical comparison of BHC (Inspiration) of sedentary students in before and after health related physical fitness programme. With regards to BHC (Inspiration) of before and after health related physical fitness programme they have obtain the mean value of **38.22** and **41.30** respectively which are given in the Table -5 reveals that there was significant

effects of health related physical fitness programme was found in ( $t=4.46^*$ , $p<.05$ )BHC (Inspiration) . Health related physical fitness programme increase the BHC (Inspiration) among sedentary students.

**Table 6**  
**Statistical comparison of breath holding capacity expiration in before and After-test of sedentary.**

Variable	Test	Number	Mean	S.D.	t-ratio
<b>B. H. C. Expiration</b>	Before Test	75	28.90	3.43	<b>6.03*</b>
	After Test	75	32.34	3.56	

*\* Significant at .05 level.*

Table -6 illustrates the statistical comparison of BHC (expiration) of sedentary students in before and after health related physical fitness programme.

With regards to BHC(expiration) of before and after health related physical fitness programme they have obtain the mean value of **28.90** and **32.34** respectively which are given in the Table -6 reveals that there was significant effects of health related physical fitness programme was found in ( $t=6.03^*$ , $p<.05$ )BHC (expiration) . Health related physical fitness programme increase the BHC (expiration) among sedentary students.

### Discussion

The decrease in resting heart rate after health- related fitness programme is in conformity with a study of Jyoti (2010), Chavan (2010), Dbubbert PM (2002), Salmern J, Owen N, Growferd D, Baumam A, Sallis JF (2003) who concluded that the endurance training can influence on heart rate. This result is also supported by (Cluse J, Trap-Jenesen J, and Lassen N 1970), if heart rate is much less, then the individuals would not get fatigue(Fringer, M N, and Stull GA 1974). There will be less pressure on the heart due to this; they can work efficiently (Clusen J P 1977). Expenditure promotes fat loss, and increases lean body mass (Horton's Es 1998, Maynard 1991)

The importance of physical fitness programmes is linked to a higher quality of life as well as academic achievements. It is well- documented that regular physical activity in childhood and adolescence improve strength & endurance, health build, healthy bones & muscles, hips control weights, reduce

anxiety and stress, increases self-esteem and may improve cardio reparatory function. Physical fitness is recognized as an important component of health (limb et.al 1998; Twisk et.al. 2002) and it may be important for the performance of functional activities and quality of life (Noreau and Shepherd 1995; Stewart et.al. 1994). Low physical fitness may result in high physical strain during the performance of activities (Bruining et. al. 2007). As a consequence, activity levels may decrease due to fatigue and discomfort, exacerbating low physical fitness.

Keeping in view the fact that student's physical fitness has important health consequences during their study, a large number of studies on physical fitness have been reported from different countries of the world. Data on the physical fitness students from Turkey (Oner N, Vatan Sever U, Sari A, Ekuklue, Guzel A, Karasalihoglus, Boris NW 2004), America (Ogden CL, Flegal KM, Carroll MD, Johnson CL 2000, Malina RM 2007), South Africa (Slon 1966), Taiwan (Huang YC, Malina 2007), Japan (Onokuchi M, Matasuo N, Takayamaji, Hasegwa T 2007, \*Hayashif, Takimotoh, Yoshita K, Yoshilike N. Singapore L Wang MC, HOTF, Anderson JN, Sabry ZI, 1999), Brazil, Ching, Russia (DoakCM, Adair LS, Monteiroc, Popkin BM 2000, Shiz, Lier N, Nirmal Kumar, Holmboe, Offesary 2007), Europe (Ortega FB, Artero EG, Ruliz JR, Vicente-Rodriguez, Bergman P, Hogstromer M, Otte Vaer C, Nagg E, Konstao, ray Lopez, JP, Polito A, Dietrict S, Palada M, Begnin L, Manios Y, Sjostrom M, Castillo MJ 2008) are available in the literature, all these reports made the health planners realize the importance on contribution of health education & physical fitness in the development of total fitness.

With regards to Respiratory Rate of before and after health related physical fitness programme Sedentary students have obtained the mean value of 19.23 and 17.66 respectively which are given in the Table -3 reveals that there was significant effects of health related physical fitness programme was found in ( $t=3.14^*$ ,  $p<.05$ ) RR. Health related physical fitness programme decrease the RR among sedentary students. Thus the hypothesis of the study was accepted. In the study, it is found that there was significant decrease in respiratory rate after health-related fitness programme. The result shows similarities of (Jyoti 2010, Fringer, M N, and Stull GA 1974, Gettman L R, Pollock M L, Durstine J L, Ward A. Ayres J and Linnerud, A.C. 1976). They found a significant decrease respiratory rate due to endurance training period. If respiratory rate

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is less in the sedentary, students will avoid excess load on heart and decrease fatigue (Milesis C., Pollock M L, Bah M D, Aryes J J, Ward A and Linnerud, A.C. 1976).

With regards to vital Capacity of before and after health related physical fitness programme they have obtain the mean value of 21.89 and 23.56 respectively which are given in the Table -4 reveals that there was significant effects of health related physical fitness programme was found in ( $t=44.53^*$ , $p<.05$ )VC . Health related physical fitness programme increase the vital capacity among sedentary students. Thus the hypothesis of the study was accepted. Depending on the health- related fitness programme, significant increase vital capacity of the sedentary students, Milesis C., Pollock M L, Bah M D, Aryes J J, Ward A and Linnerud, A.C. 1976 and Jackson J, Sharkey B, and Johnston, L 1968) also found that vital capacity increased due to physical training if the vital capacity of the player is high then more amount of oxygen could be inhaled and maximum of CO<sub>2</sub> could be exhaled (Fringer, M N, and Stull GA 1974, Clusen J P 1977). This will thus purify the blood and this give more energy to the sedentary students and more capacity of the sedentary students to hold breath in itself will certainly increase the cardio vascular efficiency of the students. (Culos – Reed S. et. al. 2006).With regards to BHC(Inspiration) of before and after health related physical fitness programme they have obtain the mean value of 38.22 and 41.30 respectively which are given in the Table -5 reveals that there was significant effects of health related physical fitness programme was found in ( $t=4.46^*$ , $p<.05$ )BHC (Inspiration) . Health related physical fitness programme increase the BHC (Inspiration) among sedentary students. With regards to BHC(expiration) of before and after health related physical fitness programme they have obtain the mean value of 28.90 and 32.34 respectively which are given in the Table -6 reveals that there was significant effects of health related physical fitness programme was found in ( $t=,6.03^*$ , $p<.05$ )BHC (expiration) . Health related physical fitness programme increase the BHC (expiration) among sedentary students.

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