



ISSN: 0975-833X

## RESEARCHARTICLE

### EFFECT OF EXERCISES ON HEALTH RELATED PHYSICAL FITNESS OF COLLEGE GIRLS

<sup>1</sup>Nilima Gayen, <sup>2</sup>Dr. Asish Paul and <sup>3</sup>Dr. Debasish Ray

<sup>1,3</sup>Department of Physical Education, Gangadharmahavidyalaya, Mugberia, Purba Medinipur

<sup>2</sup>Department of Physical Education, Jadavpur University, Jadavpur, Kolkata-32, West Bengal, India

#### ARTICLE INFO

##### Article History:

Received 06<sup>th</sup> April, 2015  
Received in revised form  
23<sup>rd</sup> May, 2015  
Accepted 09<sup>th</sup> June, 2015  
Published online 28<sup>th</sup> July, 2015

##### Key words:

Health related physical fitness,  
Exercise,  
Cardiorespiratory endurance,  
Flexibility,  
Muscular strength endurance,  
Movement Programme.

#### ABSTRACT

To be a productive people with maximum potentialities it demand the health related physical fitness. The effect of exercise on such health related physical fitness variable has been well established by different scientists in variety of health related field. The present study was intended to find out the effect of regular exercises in the form of low intensity movement oriented programme consisted with general warm up, stretching, long distance run, strength and flexibility exercises on health related physical fitness factors. Some suitable team game, minor game and relaxation exercises were also included. The experimental subjects were of 09 college girls of age ranged between 21-25yrs., height  $1.56 \pm 0.06$  mtr. and weight  $45.50 \pm 6.09$  kg. and the control group was also of 09 subjects age between 21-25yrs., height  $1.50 \pm 0.04$  mtr. and weight  $45.88 \pm 7.35$  kg. The health related physical fitness variables were the cardio respiratory endurance, upper body strength endurance, muscular strength endurance, flexibility and body composition. The results showed the significant positive changes in all the fitness variables except the B.M.I. in case of the experimental group. There were no significant changes occur in case of the control group. It may be concluded that the regular participation in movement oriented programme has some positive benefit towards the better living as a consequence of the development of the health related physical fitness factors.

Copyright ©2015 Nilima Gayen et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

**Citation:** Nilima Gayen, Dr. Asish Paul and Dr. Debasish Ray, 2015. "Effect of exercises on health related physical FITNESS of college Girls", *International Journal of Current Research*, 7, (7), 18030-18033.

#### INTRODUCTION

'Fitness' is the ability to perform work satisfactorily under specific condition. Physical fitness is the ability to perform muscular work in full enjoyment with minimum effort and having some extra energy for emergency. This physical fitness can be dichotomized into health related and performance related physical fitness. Most authorities agreed that health related physical fitness consists of cardiovascular endurance, muscular strength, muscular endurance, flexibility and body composition. These factors are for better living, for fuller enjoyment of life, for add life in years and years in life. The inactive lifestyle invites different type of Hypo kinetic diseases, some psychic problem, and some physical imbalance in to our body. It is very urgent to find out the direct effect of regular physical activity and its consequences upon different functions of our body parts. Anaerobic exercise is responsible for trigger anaerobic metabolism. Athletes use this type of non-endurance sports to develop speed, strength and power. In anaerobic energy systems the muscles develop differently compared to aerobic exercise, leading to better performance in high intensity short duration activities, which last from mere seconds up to about 2 minutes.

In contrast, aerobic exercise includes lower intensity activities performed for longer periods of time. Activities such as walking, running (including the training known as an interval workout), swimming, and cycling require a great deal of oxygen to generate the energy needed for prolonged exercise (i.e., aerobic energy expenditure). The amount of percentage of fat of an individual is closely related to physical activity of the individual concern (Shahana *et al.*, 2010). It has seen from the study of the relationship between habitual physical activity and components of health-related physical fitness in 274 boys and 254 girls that the physical activity index was significantly associated with the mile run, skinfold tests, pull-ups, sit-ups and sit-an-reach test [Sallies *et al.*, 1993]. The weight training programme has an effect in children and adolescents to gain strength (Faigenbaum *et al.*, 1996). Body fatness was inversely related to running speed, standing high jump, leg lift speed and maximal oxygen uptake. Physical activity was positively related to leg lift speed and maximal oxygen uptake and only in females to the standing high jump (Mink *et al.*, 2000). The validity of 2 field tests of abdominal endurance in a sample of 22 female college students was examined. Scores on the modified trunk curl and the 90 sec. bench trunk curl were correlated with isometric trunk flexion strength and endurance measured on a cybex TEF machine. There were no significant correlation ( $-0.21 < r < 0.36$ ) between the field tests and abdominal strength.

**\*Corresponding author: Dr. Asish Paul,**  
Department of Physical Education, Jadavpur University, Jadavpur,  
Kolkata-32, West Bengal, India.

Only the bench trunk curl was significantly correlated ( $r = 0.46$ ,  $P < 0.05$ ) with abdominal muscle endurance (Knudson, 2001). It has suggested that among various interventions, the nutritifit program was recently conducted in Thailand and found to improve health related fitness in children. The development of more effective interventions and approaches is a major challenge in this field today (Kuboonchoo, 2001). The findings regarding the assessment of dimensions of health related quality of life (HRQL) in women attending an obesity clinic and to rate differences in HRQL in those with the highest and lowest levels of Physical activity (PA) indicated that a higher level of PA in an obese female clinical population was positively associated with diverse dimensions of HRQL. However, it was not possible to determine if these favorable aspects of HRQL are the cause or the consequence of a higher PA level (Faigenbaum *et al.*, 1996).

A pilot study was conducted to compare the effectiveness of home and community based physical activity interventions that target mothers and daughters to increase physical activity and improve health related fitness (Ransdell *et al.*, 2003). Studies were done over 71 severely obese patients (18 male and 53 females aged  $29.3 \pm 0.8$  years, with a mean weight of  $113.8 \pm 2.2$  kg and a mean BMI of  $41.3 \pm 0.5$  kg/m<sup>2</sup>) to assess the effects on performance and work capacity of a short term (3 week) integrated body weight reduction programme consisting of an energy restricted diet, nutritional education, psychological counselling and aerobic exercise training at a constant metabolic load (Sartorio *et al.*, 2003). So there was enough evidence regarding the search behind the effect of training through different corner on the health related physical fitness variables.

#### The purposes of this study were:

- To observe the present health related physical fitness status of college girls.
- To observe the present physical status of college girls.
- To observe the effect of exercise on health related physical fitness variables.
- To observe the effect of exercise on physical characteristics of collage girls.

In this present study the researchers were moved in search of some hindered effect of low intensity movement oriented programme that can be easily conducted in the sub-urban area and has thrown some light to enhance the knowledge regarding this matter and thus can motivated the youth to engage them in regular activity.

## MATERIALS AND METHODS

### Subjects

Nine (9) college girls were considered as the subject of this study. The age of the subjects ranged between 21-25yrs. and they were considered as the experimental subjects as they have participated in an exercise programs and another group of nine (9) homogeneous students were acted as the subjects of control group.

## Criteria

I. Anthropometric measures: - Height and Weight

II. Health Related Physical Fitness Components: - The Health Fitness Award (HFA) tests of President's Council on Physical Fitness & Sports in U.S.A. were considered, which are as follows: -

- The cardio-respiratory endurance; One-mile run/walk (in min. & sec.)
- Flexibility; V-Sit & Reach (in cm.)
- Abdominal Strength Endurance; Partial Curl Ups (in no.)
- Upper Body Strength Endurance; Right Angle Push Ups (in no.)
- Body Composition; B.M.I.- Weight(Kg.)/Ht.<sup>2</sup>(mtr.)

## Design

With 05 subjects a pilot study was conducted for 2 weeks to finalize the whole programme. The actual experimental period was of 48 days. Pre-test of all the subjects was conducted on the onset of the experimental period. The exercise program was conducted for 8week and after that the post-tests were conducted. The exercise program was of 45 min. daily for 3 days in a week, consisting of general warm up, stretching, long distance run, strengthening and flexibility exercises. Some team game, minor game and relaxation exercises were also included to avoid monotony, to create interest but that was of target oriented and relevant. The exercises fulfilled the individual need of the subjects. The exercise-program intensity was increased gradually with very low degree. The very basic target was to improve the fitness status for better living through some graded movement culture. No such specific fitness training programmes were considered for the development of very specific fitness parameter. For each criterion the standard tests and measurements according to the standard literature were conducted for evaluation. All the tests were valid according to the prescribed literature.

## RESULTS AND DISCUSSION

The following tables are showing the results after statistical calculation on different collected data taken through the tests and measurements before and after the training. The descriptive and inferential statistics both are given here, only the statistics provided the level of significance of the change occurs due to the exercises are given here. Table 1 shows the mean and S.D. of two anthropometric measures in pre and post phases of training for both the experimental and control group. In case of height both the group of experimental and the control there is no significant difference between the pre and post training measurement. Considering the weight both the group of experimental and the control there is also no significant difference between the pre and post training measurement. Table 2 shows the mean and S.D. of different health related physical fitness variables in pre and post phases of training. Significant differences were found in cardio respiratory endurance, upper body strength endurance, abdominal strength endurance and flexibility in the experimental group only due to training but in case of control group there was no significant changes occur. In case of B.M.I., there were no significant changes occur both in case of the experimental and control group.

**Table 1. Difference in means and S.D. of two anthropometric measures in Pre and Post-test condition**

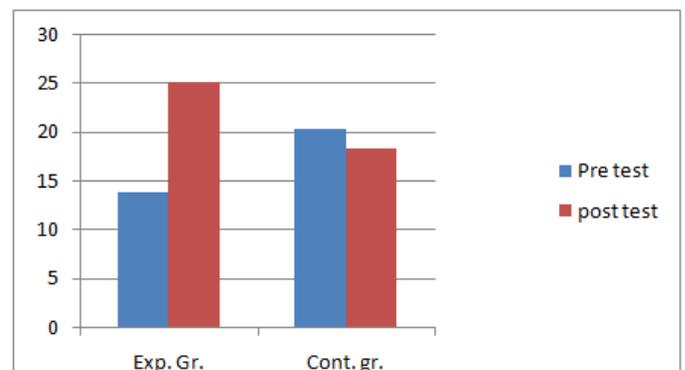
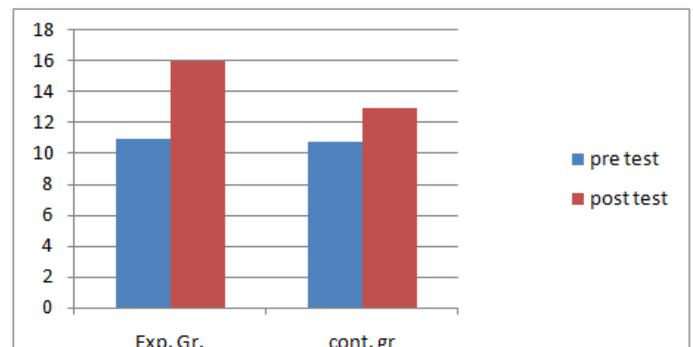
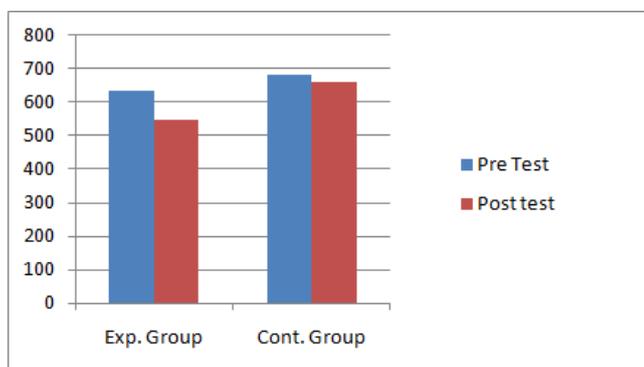
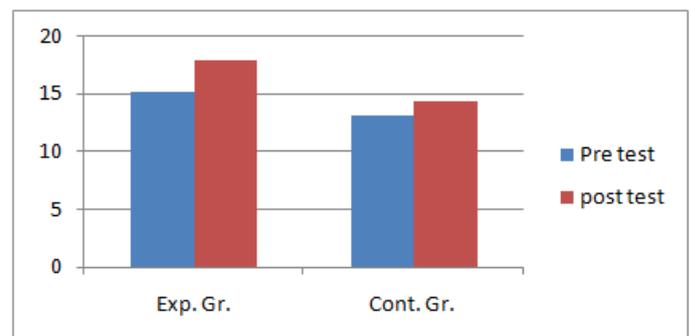
Anthropometric Variables		Pre Test		Post Test		p-value	Alpha
		Mean	S.D.	Mean	S.D.		
Height(mtr.)	Exp. Group	1.56	0.06	1.56	0.05	0.59	0.05
	Cont. group	1.50	0.04	1.50	0.04	1.00	
Weight(Kg.)	Exp. Group	45.50	6.09	46.09	6.05	0.09	0.05
	Cont. group	45.88	7.35	45.83	6.80	0.92	

**Table 2. Difference in means and S.D. of different Fitness Variables in Pre and Post-test conditions**

Physical Fitness Variables		Pre Test		Post Test		p-value	Alpha-
		Mean	S.D.	Mean	S.D.		
Cardio Respiratory Endurance (Sec.)	Exp. group	633.22	87.51	546.22	67.40	0.00*	0.05
	Cont. group	682.00	107.88	661.56	89.53	0.23	0.05
Push-ups (no.)	Exp. group	13.78	11.41	25.00	10.86	0.00*	0.05
	Cont. group	20.22	9.86	18.22	9.17	0.19	0.05
Curl-up (no.)	Exp. group	10.89	9.01	15.89	10.48	0.03*	0.05
	Cont. group	10.67	8.08	12.89	10.22	0.16	0.05
V-sit (cm.)	Exp. group	15.11	6.25	17.78	4.99	0.00*	0.05
	Cont. group	13.11	7.85	14.22	5.51	0.59	0.05
B.M.I.[Weight(Kg.)/Ht. <sup>2</sup> (mt.)]	Exp. group	18.74	1.99	18.96	2.01	0.13	0.05
	Cont. group	20.24	2.64	20.21	2.39	0.94	0.05

## DISCUSSION

At the age of 18/19 yrs. The bony ossification of the adult female became almost completed and thus there was a very little chance of increase in height due to training. The present data support this view since no increase in height was found. In case of weight and BMI there were also no changes. It has found the increased cardiorespiratory endurance, flexibility, muscular strength endurance and decreased skin fold thickness (body fat %) among the experimental group of middle-aged women after 12 weeks of aerobic training (Shahana *et al.*, 2010). It has reported that an increase in duration (min/week) of physical activity had a significant association with the reduction of total fat, and a review has suggested that an increase ( $\geq 1500$  kcal/week) in physical activity for a short period ( $\leq 16$  week) was associated with a reduction in total fat mass in a dose-response manner (Irwin *et al.*, 2003). It has found that less amount of physical activity deposit greater amount of body fat in the subcutaneous layer (Blair *et al.*, 1981). Here due to very moderate intensity of exercise the result does not support these findings. Another finding showed that moderate-intensity aerobic exercise programs of 6-12 months induce a modest reduction in weight and waist circumference in overweight and obese populations but in case of general people no such changes occur (Thorogood *et al.*, 2011).

**Fig. 2. Comparative graphical representation of effect of training on Push-ups of experimental and control group****Fig. 3. Comparative graphical representation of effect of training on curl-ups of experimental and control group****Fig. 1. Comparative graphical representation of effect of training on cardio respiratory endurance of experimental and control group****Fig. 4. Comparative graphical representation of effect of training on flexibility of experimental and control group**

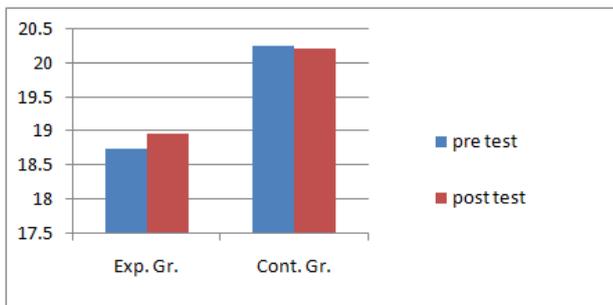


Fig. 5. Comparative graphical representation of effect of training on B.M.I. of experimental and control group

Significant changes occur in case of cardio respiratory endurance, flexibility, abdomen strength endurance and upper body strength endurance due to training. Research findings indicated that regular participation in a resistance training program improve strength and power in adults (Chu, 1998). The active children appear to engage in a sufficient variety of activities to enhance multiple components of health relationship fitness (Sallies *et al.*, 1993). The body fatness is inversely related to most fitness items, while physical activity is positively related to only several fitness items (Mink *et al.*, 2000). It has found that home based physical activity programming is a cost-effective means to increase physical activity and improve health-related fitness in these groups (Ransdell *et al.*, 2003). The tracking of BMI from adolescence into adulthood was substantial changes in Leisure time physical activity between adolescence and adulthood predicted the risk of adult overweight, suggesting that the foundation for adult body weight is laid during adolescence. Implications of this would be to emphasize physical activity among youths (Kvaavik *et al.*, 2003). Decreased daily physical activity level cannot be excluded as a contributing factor to the decreased aerobic fitness (Westerstahl *et al.*, 2003). The absence of regular exercise and weight-loss diet, relatively small amounts of routine physical activity within a normal lifestyle, slight increases in fitness and less body fatness are associated with a better health-related quality of life and mood (Stewart *et al.*, 2003). The changes in exercise capacity induced by the present programme offer significant advantages for obese patients that can be quantified in terms of an improvement in their ability to perform everyday activities (Sartorio *et al.*, 2003). The exercise, training as a form of high intensity activity, affects the physical activity level more in younger subjects than in elderly subjects (Westerterp, 2003).

## Conclusion

Regular participation in physical movement oriented programme whatever the intensity and type may be there is some development of different health related physical fitness factors. Considering the ability of the participants, the goal and the feasibility of the facilities the programme should be consider. In case of adult participants there is no question of increase of height and the weight which influences the Body Mass Index may be reduced due to training for the overweight persons not the below weight persons.

## REFERENCES

Blair, S. N., Blair, A., Pate, R. R., Howe, H. G., Rosenberg, M. and Parker, G. M., 1981. Interactions among dietary

- pattern, physical activity and skinfold thickness. *Research Quarterly*, 52(4): 777-782.
- Chu, D.A. 1998 *Jumping into plyometrics*, 2nd edition. Human Kinetics, Champaign, IL.
- Faigenbaum, A.D., Kraemer, W.J., Cahill, B., Chandler, J., Dziados, J., Elfrink, L.D., Forman, E., Gaudiose, M., Micheli, L., Nitka, M. and Roberts, S. 1996. Youth resistance training: Position statement paper and literature review. *Strength and Conditioning Journal* 18, 62-75.
- Irwin, M.L., Yasui, Y., Ulrich, C.M., Bowen, D., Rudolph, R.E., Schwartz, R.S., Yukawa, M., Aiello, E., Potter, J.D. and McTiernan, A. 2003. Effect of exercise on total and intra-abdominal body fat in post-menopausal women: a randomized controlled trial. *JAMA*, 289: 323-330.
- Knudson, D., 2001. The validity of recent curl-up tests in young adults, *J. strength cond. res.*, 15(1): 81-5.
- Kuboonchoo, K., 2001. Energy balance and physical activity, *Biomed Environ. Sci.*, 14(1-2): 130-6.
- Kvaavik, E., Tell, G.S., and Klepp, K.L. 2003. Predictors and tracking of body mass index from adolescence into adulthood: follow-up of 18 to 20 years in the OSLO youth study.
- Mink, M.R., Ruiter, L.M., Van Mcchelen, W., Kemper, He., and Twisk, J.W. 2000. Physical fitness, body fatness and physical activity: The Amsterdam Growth and health study., *Am. J. Hum. Biol.*, 12(5): 593-599.
- Ransdell, L.B., Taylor, A., Oakland, D., Schmidt, J., Moyer-Mileur, L., and Shult, Z.B. 2003. Daughters and mothers exercising together: effects of home and community based programs, *Med Sci. Sports Exerc.*, 35(2): 286-96.
- Sallies, J. F., Mckenzie, T. L., and Alcaraz, J.E. 1993. Habitual physical activity and health related physical fitness in fourth- grade children. *Am. J. Dis. Child*, 147 (8): 890-896.
- Sartorio, A., Ottolini, S., Agosti, F., Massarini, M., and Lafortuna, C.L. 2003. Three week integrated body weight reduction programme markedly improves performance and work capacity in severely obese patient., *Weight Disord*; 8(2): 107-13.
- Shahana, A. Usha S. Nair, Hasrani, S. S. 2010. "Effect of aerobic exercise programme on health related physical fitness components of middle aged women", *British Journal of Sports Medicine*, 2010, Vol. 44, Supply 1, p.i19 doi:10.1136/bjism. 078725.60.
- Stewart, K.J., Turner, K.L., Bacher, A.C., De Regis, J.R., Suny, J., Tay Back, M. and Owyang, P. 2003. Are Fitness activity and fatness associated with health related quality of life and mood in older person? *J. Cardio. Pulm. Rehabi.*, 23(2): 115-21.
- Thorogood, A., Mottillo, S., Shimony, A., *et al.* 2011. Isolated Aerobic Exercise and Weight Loss: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *The American Journal of Medicine*, 124(8):747-55.
- Westerstahl, M., Barnkow- Bergkvist, M, Hedberg, G. and Jansson, E. 2003. Secular trend in body dimensions and physical fitness among adolescents in Sweden from 1974-1995., *Scand J. Med Sci. Sports*, 13(2): 128-37.
- Westerterp, K.R. 2003. Impact of vigorous and non-vigorous activity on daily energy expenditure., *Proc. Nutr. Soc.*, 62 (3): 645-50.