



ISSN: 2456-0057

IJPNPE 2019; 4(1): 144-148

© 2019 IJPNPE

www.journalofsports.com

Received: 13-11-2018

Accepted: 15-12-2018

**Shomi Anand**Department of Physiology, R.D  
Gardi Medical College Ujjain,  
Surasa, Madhya Pradesh, India**Dr. JJ Makwana**Department of Physiology, R.D  
Gardi Medical College Ujjain,  
Surasa, Madhya Pradesh, India**Dr. Parveen Kumar Sharma**Tantia University, Sri  
Ganganagar, Rajasthan, India

## Effect of 12 weeks of specific exercise regime training program on the BMI of obese individuals

**Shomi Anand, Dr. JJ Makwana and Dr. Parveen Kumar Sharma**

### Abstract

Obesity has gripped both the developed and the developing countries and has a deleterious impact on health. Obesity sluggish the body movement and affects routine physical activities. Exercise improves body compositions. Hence the study was undertaken to check the influence of planned exercise on the BMI of obese individuals. Objective: To evaluate the effect of 12 weeks of specific exercise regime programme on the BMI of experimental and control group obese subjects. Material and Methods: 120 healthy obese subjects (n=60 male and n= 60 female) were recruited in study; experimental group [30 male +30 female] were exposed to 12 weeks of supervised exercise regime training programme; whereas subjects of control group [30 male +30 female] did not perform any functional gym training. Pre and Post test data was collected and T-test and two way ANOVA with post-hoc analysis were applied for analyzing differences between experimental and control group. Influences of experimental protocol as well as of gender were evaluated during the analysis keeping the level of significance at  $p < 0.05$ . Results: Experimental group of both gender showed statistical significant changes in BMI at the end of 12 weeks of supervised physical training. In terms of percentage changes of individual participant's; subjects of experimental groups showed a negative individual percentage changes with low pre-test BMI; while, negative changes were highly prominent particularly in the female experimental group. Result of ANOVA had shown significant alterations in the Post- Test study of BMI, whereas gender influence was observed between pre and the post-test for the BMI respectively. Conclusion: Meticulously designed exercise protocol could be an important tool to fight against obesity by keeping an check on BMI.

**Keywords:** Obesity, exercise, BMI

### Introduction

Obesity, a global epidemic and a haunting truth that is curbing not only the nation but also entire world. Obesity has gripped both the developed and the developing countries. Despite of knowing the alarming fact that obesity is deleterious for health, we are in the phase of discerning the profound impact of obesity on various aspects of health and disease processes. Obesity and its associated complications have compromised the quality of life and undermined life expectancy globally. Obesity is a Condition characterized by excessive storage of fat in body to such an extent, which finally has negative impact on health. Obesity is expressed in terms of body mass index (BMI). International criteria defines obesity when BMI is either  $\geq 27.5\text{Kg/m}^2$  or  $\geq 30\text{ Kg/m}^2$ , but for Asian Indian, a person is an obese when  $\text{BMI} \geq 25\text{Kg/m}^2$  (Mahajan and Batra 2018) [13].

It has been estimated that nearly 100 million people globally are obese and figure will further multiply (Lal *et al.* 2014) [11]. WHO data revealed that above 1.9 billion adult population, 18 years and older were categorized under the bracket of overweight, of these over six hundred million male and female were confirmed as obese (Park 2017) [18]. Morbidity for various health conditions escalates as BMI hikes above 20 (Afridi *et al.* 2003) [13].

Obesity sluggish the body movement and thus affects routine physical activities. Due to this, sedentary habit is maintained which further leads to declination of physical fitness. Exercise besides improving body compositions: BMI and waist circumference also regulates parameters of lipid profile (Trabka *et al.* 2014) [25]. Habit of regular physical training provides protection from chronic diseases and improves quality of life (Arazi *et al.* 2012) [3]. Losing weight vide various method leads to weight regain (Animesh *et al.* 2015) [2]; hence there is a need to design a safe exercise regime which helps in curbing obesity by keeping check on body composition.

### Correspondence

**Shomi Anand**Department of Physiology, R.D  
Gardi Medical College Ujjain,  
Surasa, Madhya Pradesh, India

Hence this study was undertaken to check the influence of planned exercise programme on the BMI of obese individuals.

**Objectives**

To evaluate the effect of 12 weeks of specific exercise regime programme on the BMI of experimental and control group obese subjects.

**Material & Method**

After obtaining ethical clearance and informed consent 120 healthy obese subjects (n=60 male and n= 60 female) according to Body Mass Index Standards for Indians: Indian Council of Medical Research and National Institute of Nutrition (Dietary Guidelines for Indians 2011; Singh *et al* 2008) were selected for study purpose. The age of subjects ranged from 26 years to 40 years. Subjects were divided into two equated groups of 60 each: Experimental and Control. Subjects of experimental group [30 male + 30 female] were exposed to 12 weeks of planned exercise programme under supervision; whereas control Group [30 male +30 female] were not exposed to any functional gym training programme

throughout 12 weeks respectively. During 12 weeks of exercise training, subjects were trained for 5 days per week; 60 minutes a day excluding 5 minutes of dynamic warming up and 5 minutes of cooling down. Major components of fitness regime were cardio-respiratory endurance, core, muscle strength and stretching. Training load was progressively increased after two weeks respectively. Pre – test data on BMI (Quetelet’s index) of 120 healthy obese subject were collected prior to the treatment program and later Post test data was collected after 12 weeks of planned and supervised exercise regime training.

**Data Analysis**

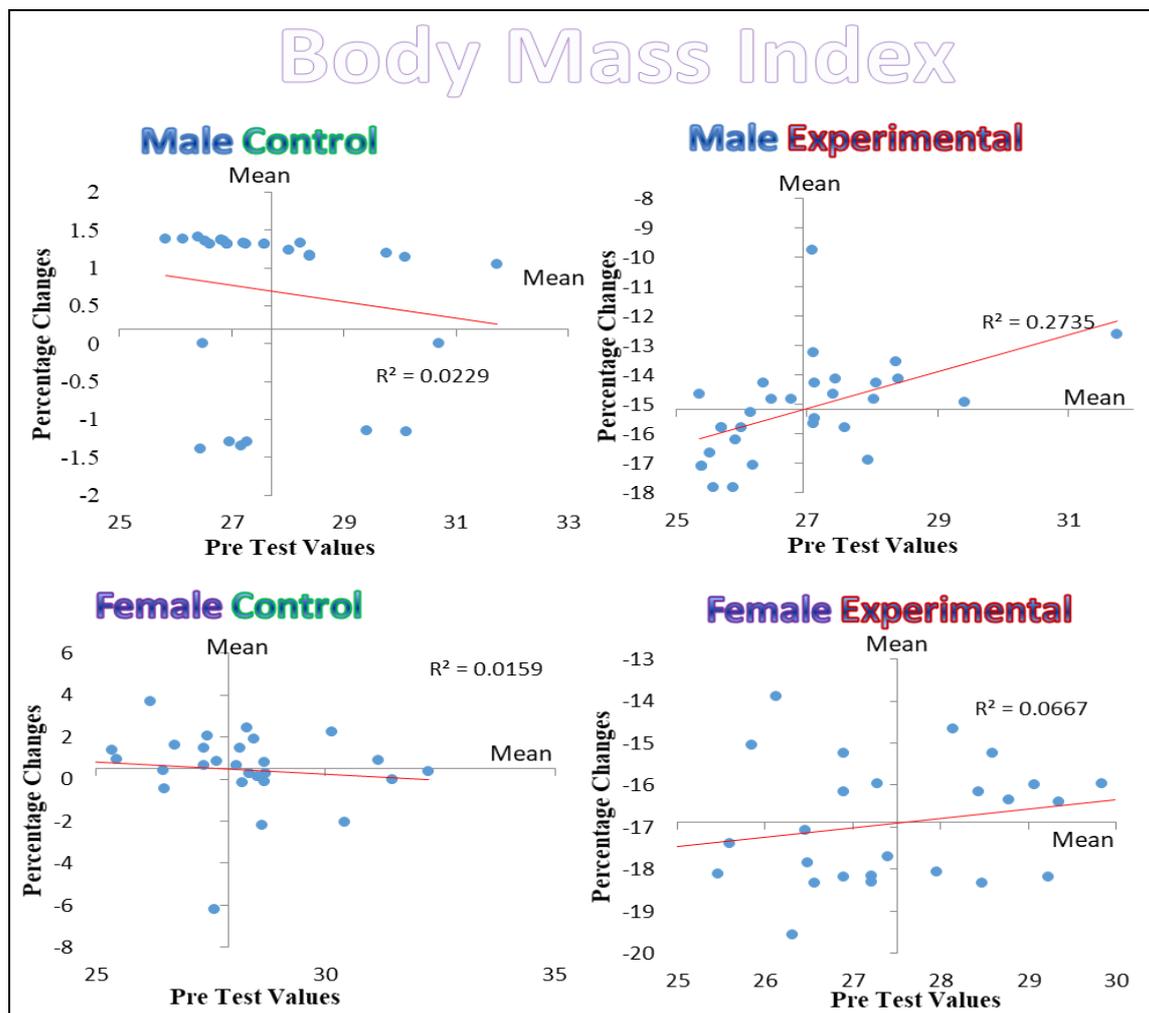
T-test analysis and two way ANOVA with post-hoc analysis were applied for analyzing differences between experimental and control group. Influence of experimental protocol as well as of gender were evaluated during the analysis keeping the level of significance at  $p < 0.05$ .

**Results**

**Table 1:** Descriptive statistical analysis of BMI for obese participants in the study as members of control and experimental group.

Body Composition Variable		Pre-test	Post-test	r value	t-value
Male Control Group	BMI	27.72 ± 1.46	27.92 ± 1.49	0.9808	3.5781
Male Experimental Group	BMI	26.94 ± 1.38	22.86 ± 1.46	0.967	58.593
Female Control Group	BMI	27.89 ± 1.90	28.03 ± 1.91	0.968	1.491
Female Experimental Group	BMI	27.52 ± 1.63	22.87 ± 1.50	0.970	61.821

Values are mean ± SD of 30 individuals. Bold font t-values are indicating that the difference between the pre-test and post-test values are statistically significant with probability (p) is less than 0.05. Critical t-value (p = 0.05) is 2.0452



**Fig 1:** Distribution of percentage changes of individual participant’s Body Mass Index [BMI] after the test period against their respective pre-test values.

On the other hand figure1, indicative of percentage alteration of body mass index during the test period, showed that the control groups of both the genders did not exhibit major changes in the post study body mass index. With lower pre-test body mass index, more positive changes are observed

particularly in the female control group. Nevertheless, male experimental and female experimental group showed a negative individual percentage changes with low pre-test BMI; while, negative changes were highly prominent particularly in the female experimental group.

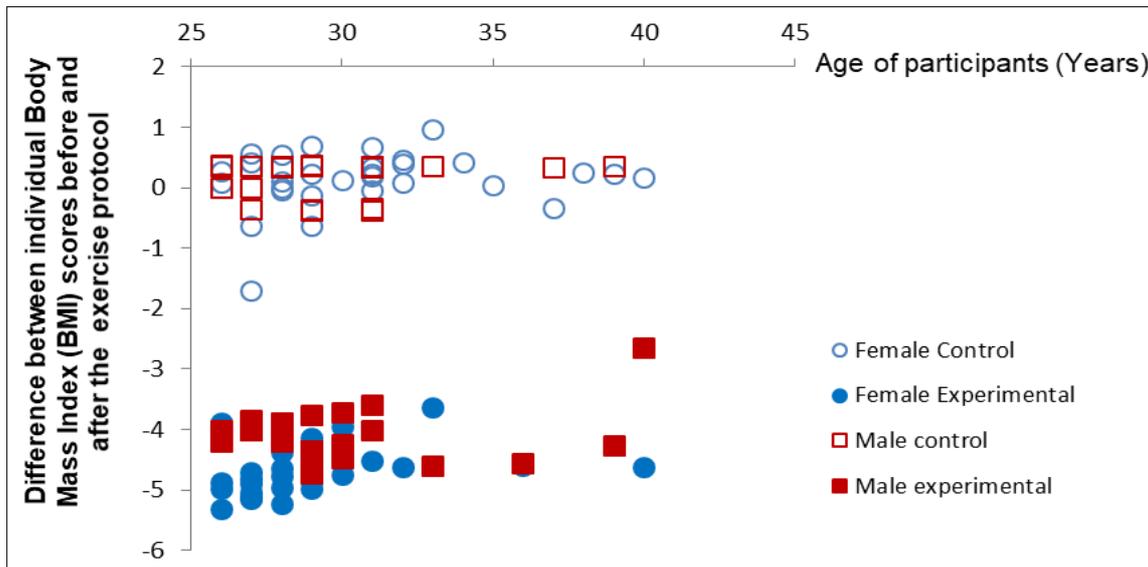


Fig 2: Scatter plot of changes (during period of study) in BMI scores of participants against their age

When changes in individual Body Mass Index (BMI) score throughout the treatment protocol were plotted against their respective ages (Figure 2); Notable decrement in BMI scores

was exhibited by the experimental groups irrespective of their age and genders.

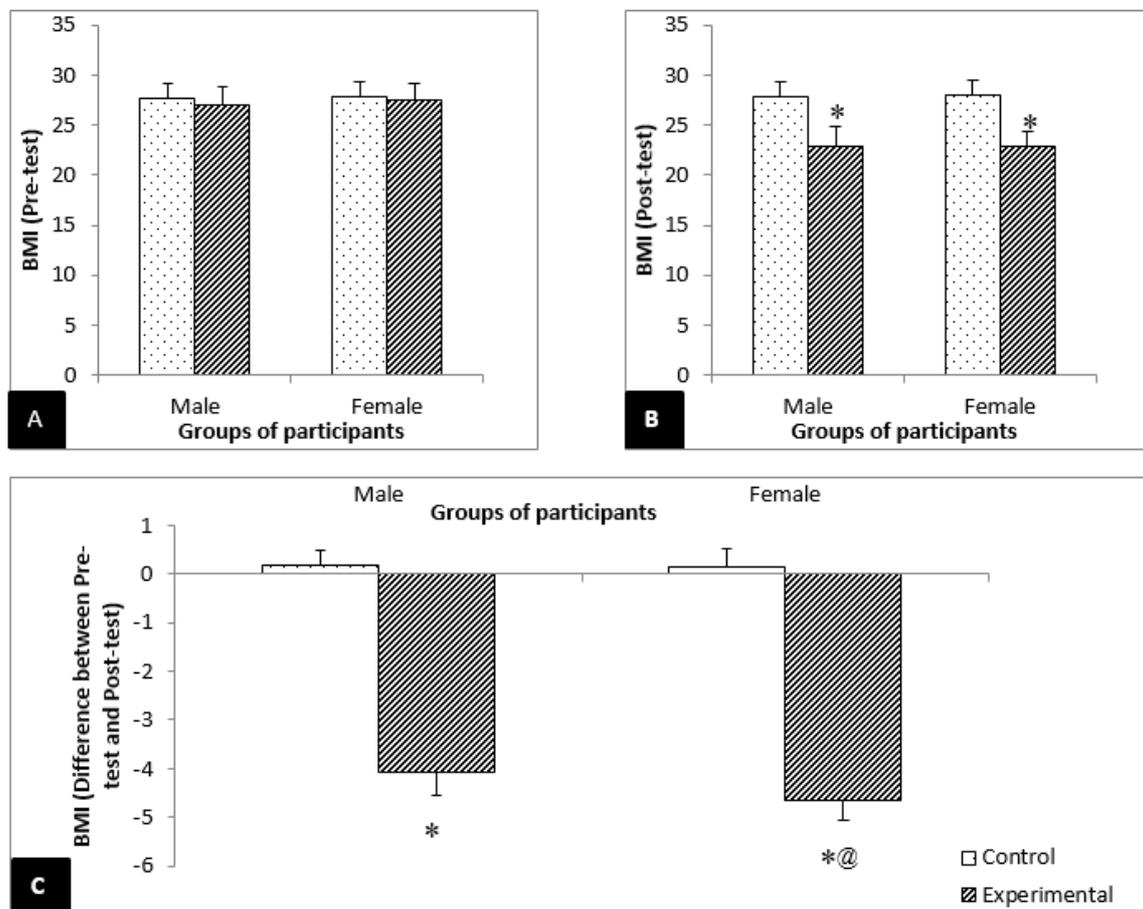


Fig 3: [A] Group-wise average values of pre-test body mass index (Scores) of participants, [B] Group-wise average values of post-test body mass index (Scores)of participants and [C] Group-wise average of differences in body mass index (Scores)between pre-test and post-test values of participants. Each column represents mean values for 30 participants and line with cap indicates the SEM. \* indicates statistically significant difference in comparison to the respective control group. @ indicates statistically significant difference between the gender-wise groups.

As indicated in Figure 3 A, no significant influence of gender for the pre-test value for BMI was observed by two-way ANOVA test. Accordingly, the difference between control and experimental groups of male participants was found to be statistically insignificant for the pre-test value of BMI. This also holds true for the female control and female experimental participants (Figure 3 A). At the same time, their control and experimental group did not show any statistically significant difference between the genders. On the other hand, influence of gender, current treatment protocol as well as interaction between the gender and treatment protocol was found to be statistically significant by two-way ANOVA test in the post-test value of BMI (Figure 3 B). Statistically significant difference was also noted when experimental groups were compared with control groups of respective gender. Influence of gender, current treatment protocol as well as interaction between the gender and treatment protocol was found to be statistically significant when difference between pre and the post-test for the BMI was noted in Figure 3 C. However Female experimental group also showed significant response in comparison with male experimental group. Whereas the experimental groups of both the gender revealed statistically significant difference when compared with their control groups respectively.

### Discussion

Obesity is a problem encountered by individuals and most of the time it is originated from non-healthy life styles. The current study was aimed to provide fitness benefit for the obese individuals. Towards this goal, the subjects were recruited for the present study are with higher BMI scores. As it is expected, obese individuals of experimental group, irrespective of gender, showed significant reduction in BMI scores and in all eventuality, the used exercise protocol has helped them to achieve this goal. There are many studies which already discuss the benefit of exercise protocol in maintenance of BMI scores; however, some studies are also there which indicates the benefit in terms of reduction in BMI scores. The current result is supported by observations of Meucci *et al.* (2013) <sup>[14]</sup> which also demonstrated reduction in BMI scores though their result was statistically insignificant. Therefore, important point to be noted here was that study groups of Meucci *et al.* (2013) <sup>[14]</sup> and current study were different in age groups in addition, there was difference in exercise duration. Moreover, current study did not find influence of age on changes in BMI as shown in figure 2. Studies by Wong *et al.* (2008) <sup>[26]</sup>; Leite *et al.* (2009) <sup>[12]</sup>; Padmanathan and Jhonjoseph (2011) <sup>[17]</sup>; Saygin and Ozturk (2011) <sup>[20]</sup>; Bhaskar and Srinivasan (2015) <sup>[4]</sup> reported evidences of significant reduction in BMI scores in the treatment group in comparison to that of the pre-test value, like the present study; nevertheless, they also reported the influence of age on BMI scores as the individuals of their study groups were too of adolescent age group as that of Meucci *et al.* (2013) <sup>[14]</sup>. Current study further showed that higher pre –test value in control groups was more beneficial; but in the experimental groups lower pre-test value had an upper edge. Moreover, the influence of gender, current treatment protocol as well as interaction between the gender and treatment protocol was found to be statistically significant. The effect of exercise on BMI parameter of current study was similar to that of Nagashima *et al.* (2010) <sup>[16]</sup>; Arazi *et al.* (2012) <sup>[3]</sup> Daftari *et al.* (2015) <sup>[6]</sup>; Hatekar *et al.* (2015) <sup>[8]</sup> and Skrypnik *et al.* (2015) <sup>[22]</sup>; the only difference with Saif and Alsenany (2015) <sup>[19]</sup> was that their study also

involved dietary measures apart from exercise which the current study lagged. Therefore, the exercise protocol used in the current study is better than the used by Saif and Alsenany (2015) <sup>[19]</sup> as it could achieve the same result without dietary restriction. On the other hand, results of female experimental group of present study showed significantly better response than male counterpart which was in contrast with that of Sorate (2015) <sup>[23]</sup> where male participant had higher reduction in BMI than female counterpart. The overall reduction in BMI observed in current study might be due to progression in planned exercise protocol like that of Mohamed (2016) <sup>[15]</sup> and Stefanov *et al.* (2013) <sup>[24]</sup> which would have enhanced energy expenditure and lipolysis. Chaudhary *et al.* (2010) <sup>[5]</sup>; IBIS (2012) <sup>[10]</sup>; Hosiso *et al.* (2013) <sup>[9]</sup>.

### Summary

Individual percentage changes in post study BMI score depicted nominal alteration in control groups, where as experimental groups of both gender showed remarkable changes with lower pre-test BMI score along with more negative changes were noticed in female experimental groups.

### Conclusion

The result demonstrated appropriateness of planned exercise protocol when executed under supervision for 12 weeks produced substantial improvement in BMI of obese individuals and helped in the prevention and management of obesity.

### Acknowledgement

I express my gratitude & heartfelt thanks to Mr. Sanjay Malviya ji owner of Geetanjali gym and fitness centre, Ujjain; M.P. who permitted me to conduct my research study in his gym without which this study was not possible

### References

1. Afridi AK, Safdar M, Khattak M, AK M, Khan A. Health risks of overweight and obesity - An over view. *Pakistan Journal of Nutrition*. 2003; 2(6):350-360
2. Animesh H, Kalyan CB, Swatik M. Effect of aerobic exercise training on body composition and heart rate recovery in overweight and obese sedentary Indian women. *Journal of Medicine and Pharmaceutical Sciences JMPS*. 2015; 5(1):1-6.
3. Arazi H, Farzaneh E, Gholamian S. Effects of morning aerobic training on lipid profile, body composition, WHR and VO<sub>2max</sub> in sedentary overweight females. *Acta Kinesiologica*. 2012; 6(1):19-23.
4. Bhaskar A, Shrinivasan MV. Effects of aerobic training and yogic practices on health related physical fitness, basal metabolic rate and lipid profiles of obese adolescents. *International Journal of Engineering and Sports Science (IJERSS)*. 2015; 2(9):1-4.
5. Chaudhary S, Kang MK, Sandhu JS. The effects of aerobic versus resistance training on cardiovascular fitness in obese sedentary females. *Asian Journal of Sports Medicine*. 2010; 1(4):177-184.
6. Daftari S, Retharejar S, Bedekar N, Shyam A, Sancheti P. Effects of aerobic exercise training on respiratory muscle strength in overweight and obese individuals. *International Journal of Therapies and Rehabilitation Research*. 2015; 4(5):305-311.
7. Dietary Guidelines for Indian - A Manual National Institute of Nutrition Hyderabad, 2011.
8. Hatekar R, Jakhotia KA, Mhendale P, Rairikar SA,

- Sancheti PK, Shimpi AP *et al.* Suryanamaskar: An equivalent approach towards management of physical fitness in obese females. *International Journal of Yoga*. 2015; 8(1):27-36.
9. Hosiso M, Rani S, Rekoninne S. Effects of aerobic exercise on improving health related physical fitness components of Dilla University sedentary female community. *International Journal of Scientific and Research Publications*. 2013; 3(12):1-5.
  10. IBIS Serkan. The effects of exercise program based on OMNI scale on metabolic syndrome criteria and C-reactive protein in males. *African Journal of Microbiology Research*. 2012; 6(12):3011-3018.
  11. Lal S, Adarsh, Pankaj. *Textbook of community medicine: Preventive and social medicine*. 4<sup>th</sup> Edition. CBS Publishers & Distributors Pvt. Ltd, 2014, 594-598.
  12. Leite N, Milano GE, Cieslak F, Lopes WA, Rodacki A, Radominski RB. Effects of physical exercise and nutritional guidance on metabolic syndrome in obese adolescents. *Rev Bras Fisioter*. 2009; 13(1):73-81.
  13. Mahajan K, Batra A. Obesity in adult Asian Indians –The ideal BMI cut off. *Indian Heart Journal*. 2018; 70(1):195.
  14. Meucci M, Cook C, Curry CD, Guidetti L, Baldari C, Collier SR. Effects of supervised exercise program on metabolic function in overweight adolescents. *World J Pediatr*. 2013; 9(4):304-311.
  15. Mohamed MHH. Assessment of a physical education program on health-related fitness and selected biochemical variables of obese male university students. *Indian Journal of Science and Technology*, 2106, 9(10).
  16. Nagashima J, Musha H, Takada H, Takagi K, Mita T, Mochida T *et al.* Three month exercise and weight loss program improves heart rate recovery in obese persons along with cardiopulmonary function. *Journal of Cardiology*. 2010; 56:79-84.
  17. Padmanathan V, Jhonjoseph K. *Effect of Aerobic Exercise on Select Health Related Physical Fitness Variables of Adolescents*, Facts of Sports Science, Krishna Publications, Triunelveli, India, 2011.
  18. Park K. *Park's textbook of preventive and social medicine*. 24<sup>th</sup> Edition. Publisher: Banarasidas Bhanot, 2017, 415-419.
  19. Saif A Al, Alsenany S. Aerobic and anaerobic exercise training in obese adults. *J Phys. Ther. Sci*. 2015; 27(6):1697-1700.
  20. Saygin O, Ozturk MA. The effect of twelve week aerobic exercise programme on health related physical fitness components and blood lipids in obese girls. *African Journal of Pharmacy and Pharmacology*. 2011; 5(12):1441-1445.
  21. Singh SP, Sikri Surg G, Garg MK. Body Mass Index and Obesity: Tailoring “cut-off” for an Asian Indian Male Population. *MJAFI*. 2008; 64:350-353.
  22. Skrypnik D, Bogdanski P, Madry E, Karolkiewicz J, Ratajczak M, Krysiak J *et al.* Effects of endurance and endurance strength training on body composition and physical capacity in women with abdominal obesity. *Obes Facts*. 2015; 8:175-187.
  23. Sorate BA. The relationship of aerobic exercises and body weight reduction among regular physical fitness participants. *Turkish Journal of Sport and Exercise*. 2015; 17(2):48-53.
  24. Stefanov T, Vekova A, Bonoval I, Tzvetkov S, Kurktschiev D, Blüher M *et al.* Effects of supervised vs non-supervised combined aerobic and resistance exercise programme on cardiometabolic risk factors. *Cent Eur J Public Health*. 2013; 21(1):8-16.
  25. Trabka B, Zubrzycki IZ, Ossowski Z, Bojke O, Clarke A, Wiacek M *et al.* Effect of a MAST exercise program on anthropometric parameters, physical fitness, and serum lipid levels in obese postmenopausal women. *Journal of Human Kinetics*. 2014; 42:149-155.
  26. Wong PCH *et al.* Effects of a 12-week exercise training programme on aerobic fitness, body composition, blood lipids and C- reactive protein in adolescents with obesity. *Annals Academy of Medicine Singapore*. 2008; 37(4):286-288.