GSC Advanced Research and Reviews

eISSN: 2582-4597 CODEN (USA): GARRC2

Cross Ref DOI: 10.30574/gscarr

Journal homepage: https://gsconlinepress.com/journals/gscarr/

(RESEARCH ARTICLE)

Check for updates

Influence of yoga practices and core exercises training on cardiorespiratory fitness of college females

Dibyendu B Samanta [1,*] and Sandeep Kumar [2]

[1] *Department of Physical Education, Swami Vivekanand Subharti University, Meerut, U.P, India.*
[2] *Department of Physical Education & Dean of Education, Swami Vivekanand Subharti University, Meerut, U.P, India.*

GSC Advanced Research and Reviews, 2024, 18(02), 017–021

Publication history: Received on 13 December 2023; revised on 29 January 2024; accepted on 01 February 2024

Article DOI: https://doi.org/10.30574/gscarr.2024.18.2.0031

Abstract

Background: Obesity is a major health issue in modern society. Regular physical exercise and healthy habits are some of the ways to get rid of it. In this study, researchers applied yoga and core exercises to overweight college females to find their effect on cardiorespiratory endurance.

Objectives: To find out the effect of yoga and core exercise training on the cardiorespiratory fitness of overweight college females and to compare the effect of yoga and core exercise training on the cardiorespiratory fitness of overweight college females.

Methodology: Through the purposive sampling method 30 overweight college females were selected and they were randomly divided into two groups the yoga group and the core exercise group. Both exercises were conducted three days per week for periods of 16 weeks, each exercise session was 40 minutes in duration. Cooper's 12 minute run/walk test was used to measure cardiorespiratory fitness. The t test was conducted to analyze the data, and the level of significance was set at $p<0.05$.

Result: It was observed that after yoga practice cardiorespiratory fitness measurements improved from 1396 ± 76.12 meters to 1476 ± 67.46 meters. After core exercise training, it improved from 1399.62 ± 82.83 meters to 1480.66 ± 135.72 meters. The statistical analysis has shown yoga and core exercise significantly improved cardiorespiratory fitness ($p<0.05$). When the effects of yoga and core exercise training were compared, it was shown that both had similar effects.

Conclusion: The study demonstrated that both yoga practice and core exercise significantly improved the cardiorespiratory fitness of overweight college females, and both yoga practice and core exercise had a similar effect on cardiorespiratory fitness among the subjects.

Keywords: Yoga practices; Core exercise; Cardiorespiratory fitness; Overweight; College women

1. Introduction

Physical exercise is the bodily movements that continue for a period through a rhythm where body energy burns and promotes health. A form of physical exercise that is performed by the use of body oxygen to produce energy is considered aerobic exercise, and some experts have manifested that aerobic exercise is the body movements through the skeletal muscles continued for a minimum of 10 minutes. Yoga is not only a concept of Sadhana or spiritual but also a form of Vyayama or physical exercise. Yoga is a different type of exercise, we cannot consider it aerobics. It is not only used for mental and physical purification, but it is also used for therapeutic purposes. Day by day, it becomes more

* Corresponding author: Dibyendu B Samanta

popular around the world. The study reported that yogic exercise interventions enhanced cardiac capacity among healthy men and women with normal body mass.[1] The Suryanamasker is a popular yogic posture consisting of twelve postures that was significant for cardio-respiratory function.[2] The lungs functions are the most affected organ in a human being in polluted society, the yogic practises had positive effects on pulmonary function.[3-6] The yogic asanas practices were beneficial for cardiovascular endurance and abdominal muscle endurance.[7] The core exercises are the movements of the core muscles that can strengthen and stabilize the core muscles. Without the use of gym and equipment's anyone can easily perform these exercises at home. Cardiorespiratory fitness is one of the most important components of overall physical fitness. It refers to the ability of the heart, lungs and blood vessels to supply a sufficient amount of oxygen and nutrients to the cells to meet the demands of activities, characterized by moderate contraction of large muscle groups over a prolonged or longer period of time. The maximum oxygen consumption during exercises and other important indications of cardiac fitness, like blood pressure and heart rate, have also enhanced after aerobic exercise among adult women.[8,9] Any physical exercise training continued for a sudden period with a controlled intensity level has been more significant.[10] The different forms of exercise training enhanced cardiorespiratory adaptation among both men and women..[11]

Objective of the Study

The study objectives were

- Effect of yoga practices on the cardiorespiratory fitness of overweight college females.
- Effect of core exercise training on the cardiorespiratory fitness of overweight college females.
- Compare the effect of yoga practices and core exercise training on cardiorespiratory fitness of overweight college females.

2. Methodology

The study was pre and post test experimental group designed and conducted at the department of physical education of Debra Thana Sahid Kshudiram Smriti Mavidyalaya, Debra, Paschim Medinipur, West Bengal. Total thirty (30) overweight female college students were purposefully selected as participants in the study, and they were randomly divided into a yoga group and a core exercise group. The number of participants in each group was fifteen. BMI value above 24.9 was used to identify overweight. Their ages ranged from 20 to 26 years. Before engaging, participants were verbally informed about the study and verbal consent was obtained from them. Dependent variable cardio-respiratory fitness was measured before and after the 16 weeks of core exercise training and yoga practices.

2.1. Core exercise protocol

The core exercise training was conducted for a period of 16 weeks, with 3 alternative days per week. Every training session was 40 minutes in duration and consisted of 10 minutes of warm-up exercises and 30 minutes of core muscle exercises. such as plank push-up hold, bird dog plank, opposite arm and leg (right leg & left arm), bird dog plank, opposite arm and leg (left leg & right arm), plank with knee drive (right knee), plank with knee drive (left knee), side plank (left elbow on floor), side plank (right elbow on floor), flutter kicks of leg flutters.

2.2. Yoga practices protocol

The only asanas were selected for yoga practices for a period of 16 weeks, with 3 alternative days per week. Every yoga practice session was 40 minutes in duration and consisted of Surysnamaskar – 6 minutes, Asanas 20 minutes such as Tadasana, Trikonasana, Vrkasana, Padahasthasana, Bhujangasana, Paschimottanasana, Ustrasana, Navasana, Dhanurasana, Halasana, Sabhasana – 4 minutes.

2.3. Measurement

Cardiorespiratory fitness was measured by Cooper's 12 minute run/walk test. The test was conducted in marked 200 meters square playground and measurement data was recorded in meter. The proper procedure was followed as described in (Johnson & Nelson 1988).[12]

2.4. Statistical procedure

The descriptive statistics and normality of the data were calculated by MS Excel 2007 software, values were shown as mean ± standard deviation. The pair t-test was used to find out the effect of physical exercises and yoga practices and independent t test was applied to compare the differences between groups. The significant level was set at $p<0.05$ for all cases.

3. Results

Table 1 Cardiorespiratory fitness before and after yoga practice

Variable	Yoga group			
Cardiorespiratory fitness	**Pre test**	**Post test**	**t-value**	**p-value**
	1396.33 ± 76.12	1476.66 ± 67.46	4.49	0.00

Table 1 shows the pre and post mean ± standard deviation of cardiorespiratory fitness of the yoga group. Before and after yoga practice cardiorespiratory fitness of overweight college females was 1396.33 ± 76.12 and 1476.66 ± 67.46 respectively. The t value was 4.49 and the p-value was 0.00, which indicates significantly improved after 16 weeks of yoga practices.

Table 2 Cardiorespiratory fitness before and after core exercise training

Variable	Core Exercise Group			
Cardiorespiratory fitness	**Pre test**	**Post test**	**t-value**	**p-value**
	1399.62 ± 82.83	1480.66 ± 135.72	3.10	0.00

Table 2 shows the pre and post mean ± standard deviation of cardiorespiratory fitness of the core exercise group. Before and after core exercise training cardiorespiratory fitness of overweight college females was 1399.62 ± 82.83 and 14580.66 ± 124.69 respectively. The paired t value was 3.10 and the p-value was 0.00 which indicates significantly improved after 16 weeks of core exercise training.

Table 3 Compare cardiorespiratory fitness pre and post intervention between yoga group and core exercise group

Variable		Yoga Group	Core Exercise Group	t-value	p-value
Cardiorespiratory fitness	Pre test	1396.33 ± 76.12	1399.62 ± 82.83	0.12	0.90
	Post test	1476.66 ± 67.46	1480.66 ± 135.72	0.10	0.91

Table 3 shows a comparison of cardiorespiratory fitness between groups. Cardiorespiratory fitness pre test values between the yoga group and the core exercise group were 1396.33 ± 76.12 and 1399.62 ± 82.83 respectively, and post test values between groups were 1476.66 ± 67.46 and 1480.66 ± 135.72, the p values in both cases were 0.90 and 0.91. That represents cardiorespiratory fitness between the yoga group and core exercise group before and after intervention was insignificant difference.

4. Discussion

The study found 3 days per week, 40 minutes of yoga practice continued to 16 weeks, had a significant effect on the cardiorespiratory fitness of overweight females. The yoga practices significantly improved the cardiorespiratory fitness of overweight females. Shiraishi et al, found 12 weeks yoga intervention significantly improved cardiorespiratory fitness in healthy adults.[13] Yoga had a positive effect on the maximum oxygen consumption per kilogram per minute of persons in both male and female age ranges of 37 to 70 years.[14] Bedekar et al, established that yoga improved health-related fitness components along with cardiorespiratory endurance in adult females.[15] In similar condition, intervention of core exercise training also significantly improved the cardiorespiratory fitness of overweight females. This result similar as past research of Multani GK et al, indicated that core exercise significantly improved the cardiorespiratory endurance of obese individuals.[15] The study was defined there was no significant difference in cardiorespiratory fitness measurement between yoga practices and core exercise training. This result was the same as in past studies, where researchers found similar effects of yoga practice, core exercise and combinations of yoga and core exercise on the core strength of females.[16] The study of yoga and aerobic exercise found similar effects on pulmonary function as well as

physical fitness Panchalet et al.[17] The result of yoga and core strength training was no significant difference in treating chronic, non-specific low back pain and functional disability.[18]

5. Conclusion

In today's society, obesity is becoming a significant health concern for all age groups, leading to various health hazards. Excess body fat generally builds up due to the consumption of more calories than expended. Physical exercise can burn calories and control excess fat accumulation in the body, which can prevent and control obesity. In our research, we found that yoga practices and core exercise both have a significant impact on cardiorespiratory endurance, and both exercises have a similar effect on cardiorespiratory endurance in overweight college females.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that they have no conflict of interest.

Statement of informed consent

The verbal consent of all individual participants was obtained before conducting the study.

References

[1] Akhani P., Banode S., Shah N. A study of cardiorespiratory efficiency following Yoga in healthy Indian medical students. Natl J Physiol Pharm Pharmacol 2019;9(5):411-417.

[2] Bhutkar PM, Bhutkar MV, Taware GB, Doijad V, Doddamani BR. Effect of suryanamaskar practice on cardio-respiratory fitness parameters: a pilot study. Al Ameen J Med Sci 2008;1:126-29.

[3] Benavides-Pinzon WF, Torres JL. Effects of yoga (pranayama) on lung function and lactate kinetics in sedentary adults at intermediate altitude. Rev Fac Med 2017;65:467-72.

[4] Hakked CS, Balakrishnan R, Krishnamurthy MN. Yogic breathing practices improve lung functions of competitive young swimmers. J Ayurveda Integr Med 2017;8:99-104.

[5] Thirupathi C, Subramaniam AK. Effect of yoga exercise on pulmonary function in young medical students. Int J Med Res Health Sci 2016;5(11):341-43.

[6] Karthik PS, Chandrasekhar M, Ambareesha K, Nikhil C. Effect of pranayama and suryanamaskar on pulmonary functions in medical students. J Clin Diagn Res 2015;8:08-06.

[7] Bhowmik A. Effect of Yogasanas practices on endurance of college students. Int J Yogic Hum Mov Sports Sciences 2018; 3(2): 924-925.

[8] Mustedanagic J., Bratic M., Milanovic Z., Pantelic S. The effect of aerobic exercise program on the cardiorespiratory fitness and body composition of female college students. FU Phys Ed Sport 2016;14(2):145-58.

[9] Abadi F.H., Elumalai G., Sankaraval M., & Mohd Ramli F. B. Effects of aqua-aerobic exercise on the cardiovascular fitness and weight loss among obese students. Int J Physiotherapy 2017;4(5):278-283.

[10] Hulke S.M., Phatak M.S., and Vaidya Y.P. Cardiorespiratory response to aerobic exercise programs with different intensity: 20 weeks longitudinal study. J Res Med Sci 2012 ; 17(7):649–55

[11] Schumann M., Yli-Peltola K., Abbiss C.R., Häkkinen K. Cardiorespiratory Adaptations during Concurrent Aerobic and Strength Training in Men and Women. PLoS ONE 2015;10(9): e0139279.

[12] Johnson, BL, and Nelson JK. (1988) Practical measurement for evaluation in physical education, 3rd edn. Delhi:Surjeet Publication.

[13] Shiraishi J C., Gadelha A B., Bezerra, L. M. A., & Porto, L. G. G. (2017). Effects of a 12-Week Systematized Yoga Intervention on Health-Related Physical Fitness in Healthy Adults. Advances in Physical Education. 2017;7: 27-37.

[14] Sovova E, Cajka V, Pastucha D, Malincíková J, Radová L, Sovová M. Positive effect of yoga on cardiorespiratory fitness: A pilot study. Int J Yoga 2015;8:134-8.

[15] Multani GK, Sutar A, Nikhade N, Ghodey S. Effect of core strengthening on cardiovascular fitness and flexibility in obese individuals: experimental study. Int J Community Med Public Health 2019;6:2235-40.

[16] Ram AB. Influence of Yoga Practice and Core Exercises on Core Strength of Women Physical Education Students. Journal of Emerging Technologies and Innovative Research 2023; 10(12): b67-b71.

[17] Panchal B, Tawadia B. Comparison between effects of yoga and aerobic exercise on pulmonary functions and physical fitness among young healthy females. J Soc Indian Physiother 2019;3(1):-1-5.

[18] Gosavi V, Jeswani K. A comparative study between effectiveness of yoga and core strength training exercises in chronic non-specific low back pain and functional disability in nurses. International Journal of Pharmacy and Biological Sciences 2018;8(11):401-407