Research Paper E-ISSN NO : 2455-295X | VOLUME : 9 | ISSUE : 2 | SPECIAL ISSUE FEBRUARY-2023

YOGIC TRAINING AND ITS INFLUENCE ON CARDIOVASCULAR HEALTH INDICATORS IN OBESE ADULTS

BHAGWAN SINGH RAJPUT RESEARCH SCHOLAR, DEPARTMENT OF PHYSICAL EDUCATION, SWAMI VIVEKANAND UNIVERSITY, SAGAR, MADHYA PRADESH, INDIA – 470228

ABSTRACT:

present study examines how yoga training affects important physiological parameters in obese participants. Participants in the study included 200 obese people who underwent evaluations for heart rate, systolic and diastolic blood pressure, double product, and pulse pressure before and after yoga training. ANOVA and other statistical analyses were used to assess how pre- and post-training measures differed. The results show a significant decrease in diastolic blood pressure (72.41 ± 0.29 to 67.11 ± 0.23, $p<0.05$) and heart rate (80.15 ± 0.30 to 75.42 ± 0.29, $p<0.05$). In contrast, there were no significant changes in systolic blood pressure or double product, but there were mixed results for systolic blood pressure (114.4 ± 0.54 to 115.79 ± 0.45, $p>0.05$), double product (86.39 ± 0.49 to 87.13 ± 0.47, $p>0.05$), and pulse pressure (39.99 ± 0.35 to 42.68 ± 0.29, $p<0.05$). These results imply that yoga training may help improve cardiovascular health by successfully lowering heart rate and diastolic blood pressure in obese people. To investigate the long-term impacts and underlying mechanisms of yoga practices on cardiovascular parameters in obese populations, more research is necessary.

KEYWORDS:

OBESE INDIVIDUAL, CARDIOVASCULAR HEALTH, SYSTOLIC PRESSURE, DIASTOLIC PRESSURE, DOUBLE PRODUCT, PULSE PRESSURE.

INTRODUCTION

A major contributor to the global burden of non-communicable diseases, obesity affects over 650 million adults worldwide and is one of the most urgent global health issues of the twenty-first century (World Health Organization [WHO], 2021). Obesity is defined by excessive fat accumulation and is strongly linked to a number of metabolic syndromes, hypertension, cardiovascular diseases, and type 2 diabetes (Bray et al., 2017). Elevated blood pressure and heart rate are two physiological signs of obesity that raise the risk of cardiovascular morbidity and death (Lavie et al., 2009).

A key component of managing and preventing complications related to obesity is still changing one's lifestyle. Of these, yoga training has drawn a lot of interest because of its all-encompassing method that incorporates meditation, breathing techniques (pranayama), and physical postures (asanas). Yoga has been shown to decrease sympathetic overdrive, increase parasympathetic activity, and balance the autonomic nervous system, all of which lower blood pressure and heart rate (Innes et al., 2005; Cramer et al., 2014). Additionally, it has been discovered that regular yoga practice enhances vascular function and lowers stress levels, both of which are essential for controlling obesity-induced hypertension (Patil et al., 2015).

Despite these advantages, there is still a dearth of empirical research explicitly looking at how yoga practices affect cardiovascular parameters in obese people. The purpose of this study is to evaluate how an organized yoga training program affects the heart rate, double product, systolic and diastolic blood pressure, and pulse pressure of obese participants. It is anticipated that the results will offer proof in favor of yoga's inclusion as an adjunctive intervention in programs aimed at managing obesity.

METHODOLOGY

In the present study two hundred obese subjects were selected. Mainly all subjects were classified into two groups namely experimental group and control subject. Out of two hundred obese subjects each group consist of hundred subjects namely yoga experimental group (hundred subjects), and control subjects (hundred subjects). All the subjects for this study were selected after their inform consent from Bhopal, Madhya Pradesh, India. All the experimental subjects were regularly participated in the training given by the research scholar. The concept of fitness is different from the participating in the sports. Sports participation required combination of magnitude of factors. The study was taken on the basis analysis of scientific literature available on Cardiovascular profile such as heart rate, systolic blood pressure, diastolic blood pressure, double product, and pulse pressure, as well as on the basis of tests findings of the related research studies. Purposive Sampling method was adopted for the present study.

ANALYTICAL PROCEDURE

All statistical analysis was performed in computer in MS Excel and SPSS-27. Analysis of data was done by using descriptive method where mean, standard error, and standard deviation (SD) for each group was calculated. The inferential analysis or Comparative analysis (one way ANOVA) was applied to observe differences between

pre-test and post-test data for all studied variables in both experimental and control groups. The level of significance was set at 0.05 to validate the difference, if any.

RESULTS

TABLE 1: SHOWING THE COMPARISON OF HEART RATE OF OBESE SUBJECTS BETWEEN PRE AND POST YOGIC TRAINING.

Pre Test		Post Test		ANOVA	
Mean ± SE	SD	Mean ± SE	SD	F-value	P-value
80.15 ± 0.30	2.16	75.42 ± 0.29	2.83	8.14	*p<0.05*

The table 1 demonstrated the comparison of heart rate between pre yogic training and post yogic training heart rate of obese subjects. The mean value for heart rate for pre training was found to be 80.15 ± 0.30 and 75.42 ± 0.29 for post training data for studied subjects. The inferential analysis (ANOVA) revealed statistically significant (p<0.05) difference amongst the studied groups.

TABLE 2: SHOWING THE COMPARISON OF SYSTOLIC BLOOD PRESSURE OF OBESE SUBJECTS BETWEEN PRE AND POST YOGIC TRAINING.

Pre Test		Post Test		ANOVA	
Mean ± SE	SD	Mean ± SE	SD	F-value	P-value
114.4 ± 0.54	5.47	115.79 ± 0.45	4.57	3.807	*NS*

The mean value for systolic blood pressure for pre training was found to be 114.4± 0.54 and 115.79 ± 0.45 for post training data for studied subjects. The inferential analysis (ANOVA) revealed statistically (p>0.05) insignificant difference amongst the studied groups. The systolic blood pressure of both the groups were found to be in normal range.

TABLE 3: SHOWING THE COMPARISON OF DIASTOLIC BLOOD PRESSURE OF OBESE SUBJECTS BETWEEN PRE AND POST YOGIC TRAINING.

Pre Test		Post Test		ANOVA	
Mean ± SE	SD	Mean ± SE	SD	F-value	P-value
72.41 ± 0.29	2.97	67.11 ± 0.23	2.37	6.383	*p<0.05*

The mean value for diastolic blood pressure for pre training was found to be 72.41± 0.29and 67.11 ± 0.23 for post training data for studied subjects. The inferential analysis (ANOVA) revealed statistically (p<0.05) significant difference amongst the studied groups. The post yogic training diastolic blood pressure is found to be significantly lower as compare to that of pre training.

TABLE 4: SHOWING THE COMPARISON OF DOUBLE PRODUCT OF OBESE SUBJECTS BETWEEN PRE YOGIC TRAINING AND POST YOGIC TRAINING.

Pre Test		Post Test		ANOVA	
Mean ± SE	SD	Mean ± SE	SD	F-value	P-value
86.39 ± 0.49	4.92	87.13 ± 0.47	4.70	1.175	*NS*

The table 4 demonstrated the comparison in double product between pre and post double product of obese subjects. The mean value for double product for pre training was found to be 86.39± 0.49 and 87.13 ± 0.47 for post training data for studied subjects. The inferential analysis (ANOVA) revealed statistically (p>0.05) insignificant difference amongst the studied groups.

TABLE 5: SHOWING THE COMPARISON OF PULSE PRESSURE OF OBESE SUBJECTS BETWEEN PRE AND POST YOGIC TRAINING.

Pre Test		Post Test		ANOVA	
Mean ± SE	SD	Mean ± SE	SD	F-value	P-value
39.99 ± 0.35	3.50	42.68 ± 0.29	2.98	4.246	*p<0.05*

The mean value for pulse pressure for pre training was found to be 39.99± 0.35 and 42.68 ± 0.29 for post training data for studied subjects. The inferential analysis (ANOVA) revealed statistically (p<0.05) significant difference amongst the studied groups. The post yogic training pulse pressure is found to be significantly higher as compare to that of pre training.

DISCUSSION

The purpose of the current study was to assess how yoga training affected different cardiovascular parameters in obese people. Following the yogic intervention, the results showed a significant decrease in heart rate and diastolic blood pressure, but no significant change in systolic blood pressure or double product. But after training, there was a noticeable rise in pulse pressure.

Regular yoga practice has been shown to improve autonomic regulation by reducing sympathetic tone and increasing parasympathetic activity, as evidenced by a significant decrease in resting heart rate (from 80.15 to 75.42 bpm) (Pal et al., 2004). The vagus nerve is activated and the hypothalamic-pituitary-adrenal axis is modulated by yogic practices like pranayama and meditation, which lower heart rate and increase cardiovascular efficiency (Sarang & Telles, 2006; Tyagi & Cohen, 2016).

Additionally, there was a significant decrease in diastolic blood pressure (from 72.41 to 67.11 mmHg), which is consistent with earlier research that found yoga enhances endothelial function and vascular compliance, which in turn promotes improved diastolic function (Cramer et al., 2014). These modifications might aid in lowering peripheral resistance, which is important for controlling hypertension in obese people (Innes & Selfe, 2010).

On the other hand, there were no statistically significant changes in the double product or systolic blood pressure. This might be explained by the yoga training's brief duration or moderate intensity, which might not have been enough to produce discernible changes in these metrics. According to some research, longer or more rigorous yoga practices are necessary to have a significant effect on myocardial oxygen demand and systolic blood pressure (Patil et al., 2015; Chaddha et al., 2019).

It's interesting to note that pulse pressure rose sharply

after training. This result is consistent since pulse pressure is determined by subtracting the diastolic pressure from the systolic pressure, which in this study was slightly higher than the diastolic. Although arterial stiffness has historically been linked to elevated pulse pressure, this result could also have been influenced by increased stroke volume brought on by improved cardiac efficiency (Khaw et al., 2000). To comprehend this relationship in the context of yoga, however, more targeted research is required.

Overall, these results add to the increasing amount of evidence showing that yoga training, even for brief periods of time, can improve cardiovascular and autonomic health, especially by reducing diastolic pressure and resting heart rate in obese individuals. The lack of discernible changes in other parameters emphasizes the necessity of longer-term research using a variety of yoga techniques in order to fully assess their therapeutic potential.

REFERENCES

1. Bray, G. A., Kim, K. K., & Wilding, J. P. H. (2017). Obesity: a chronic relapsing progressive disease process. Obesity Reviews, 18(7), 715–723. https://doi.org/10.1111/obr.12551

2. Chaddha, A., Kline-Rogers, E., Braverman, A. C., & Ghosh, D. (2019). Yoga for primary prevention of cardiovascular disease: A review of the evidence. Journal of Cardiovascular Medicine, 20(6), 425–432. https://doi.org/10.2459/JCM.0000000000000782

3. Cramer, H., Lauche, R., Haller, H., & Dobos, G. (2014). A systematic review and meta-analysis of yoga for hypertension. American Journal of Hypertension, 27(9), 1146–1151. https://doi.org/10.1093/ajh/hpu078

4. Innes, K. E., & Selfe, T. K. (2010). Yoga for adults with type 2 diabetes: A systematic review of controlled trials. Journal of Diabetes Research and Clinical Metabolism, 2(1), 1–17. https://doi.org/10.1186/1758-5996-2-1

5. Innes, K. E., Bourguignon, C., & Taylor, A. G. (2005). Risk indices associated with the insulin resistance syndrome, cardiovascular disease, and possible protection with yoga: a systematic review. The Journal of the American Board of Family Practice, 18(6), 491–519. https://doi.org/10.3122/jabfm.18.6.491

6. Khaw, K. T., Luben, R., Bingham, S., Wareham, N., Welch, A., & Day, N. (2000). Predictive value of blood pressure measurements taken in the clinic and at home for mortality and cardiovascular risk. BMJ, 320(7236), 1239–1243. https://doi.org/10.1136/bmj.320.7236.1239

7. Lavie, C. J., Milani, R. V., & Ventura, H. O. (2009). Obesity and cardiovascular disease: risk factor, paradox, and impact of weight loss. Journal of the American College of Cardiology, 53(21), 1925–1932. https://doi.org/10.1016/j.jacc.2008.12.068

8. Pal, G. K., Velkumary, S., & Madanmohan. (2004). Effect of short-term practice of breathing exercises on autonomic functions in normal human volunteers. Indian Journal of Medical Research, 120(2), 115–121.

9. Patil, S. G., Dhanakshirur, G. B., Aithala, M. R., Naregal, P. M., & Das, K. K. (2015). Modulation of cardiovascular parameters in obese adults by 12-week yoga-based lifestyle intervention. Journal of Family Medicine and Primary Care, 4(4), 559–563. https://doi.org/10.4103/2249-4863.174273

10. Sarang, P., & Telles, S. (2006). Immediate effect of two yoga-based relaxation techniques on performance in a letter-cancellation task. Perceptual and Motor Skills, 103(3), 965–975. https://doi.org/10.2466/pms.103.3.965-975

11. Tyagi, A., & Cohen, M. (2016). Yoga and heart rate variability: A comprehensive review of the literature. International Journal of Yoga, 9(2), 97–113. https://doi.org/10.4103/0973-6131.171710

12. World Health Organization. (2021). Obesity and overweight. https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight