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Effect of Yogic Practices on Selected Biochemical Variables among Hypertensive Middle-Aged Women Working in Corporate Sector

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Abstract: The present random group study was designed to find out the effect of yogic practices on selected biochemical variables among hypertensive middle-aged women working in the corporate sector. It was hypothesized that there would be a significant difference in biochemical variables such as cortisol hormone among stressed middle-aged women due to the influences of yogic practices than the control group. To achieve the purpose of the study, 30 middle-aged women working in the corporate sector were selected randomly into an experimental group and a control group of 15 each. The experimental group underwent yoga practices for 12 weeks, six days a week for a maximum of one hour in the morning. The control groups were kept in active rest. The pre-test and post-test were conducted before and after the training for all the groups. Cortisol was measured through a blood test. The data collected from the groups before and after the training period were statistically analyzed by using Analysis of Co-Variance (ANCOVA). The test was carried out to determine the significant difference and tested at 0.05 level of significance. The result of the study showed that the cortisol hormone is balanced as a result of yogic practices. Hence, the hypothesis was accepted at a 0.05 level of confidence. The conclusion was that the yogic practices helped to reduce the levels of cortisol hormone among hypertensive middle-aged women working in the corporate sector.

Keywords: Yoga, Sympathetic and parasympathetic stress, Hypertension, Cortisol hormone

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Introduction

Stress is a conscious or unconscious psychological feeling of being under too much mental or emotional pressure. In the new-age Indian

economy, the corporate sector plays a significant role in transforming the country and the life of the middle-income group. Therefore, the

researcher identified this sector and studied stress levels and their causes before designing a solution through yoga practices and dietary changes that could potentially reduce stress in the target group. Employees who work in the corporate sector are prone to many health problems due to the constant physical and mental stress of their work. Disease is either induced, perpetuated, or exacerbated by stress (Chattopadhyay *et al.*, 2023).

The most common health problems due to stress are gastric acidity, alcoholism, asthma, diabetes, fatigue, tension headaches, hypertension, insomnia, irritable bowel syndrome, psychoneurosis, sexual dysfunction and skin diseases such as psoriasis, lichen planus, urticaria, pruritus, neurodermatitis, etc. Arterial Hypertension (AH) is sustained elevation of resting systolic blood pressure BP (≥ 120 mm Hg), diastolic BP (≥ 80 mm Hg), or both. AH with no known cause – primary; formerly, essential hypertension is most common in 95% of cases when a specific underlying cause of hypertension cannot be found. Only about 12% of people with hypertension in India have their blood pressure under control. Uncontrolled blood pressure is one of the main risk factors for cardiovascular diseases (CVDs) such as heart attacks and stroke are responsible for one-third of total deaths in India. However, primary hypertension has multiple risk factors which increase the likelihood of hypertensive disease which in turn increases the risk of cardiovascular disease. Exposure to chronic stress has been hypothesized as a risk factor for hypertension, and occupational stress, stressful aspects of the social environment, and low socioeconomic status have each been studied extensively (Nalbant *et al.*, 2020).

The importance of studying the impact of stress on middle-aged women working in the corporate sector will assist in identifying the right approach and practices and developing the right methodology that can help these professionals adopt better stress management which in turn reduces their risk of hypertension and leads to

better well-being and increased productivity. The impact of stress on Working in corporate sectors can be classified as Physiological and Psychological. The Physiological damage due to stress are-- Central Nervous and Endocrine Systems; Respiratory and Cardiovascular Systems; Digestive System; Muscular System; Sexuality and Reproductive System and Immune System. The Psychological damages due to stress are-- Depression; Bipolar Disorder; Anxiety Disorders; Decrease in Cognitive Functioning; and Changes in personality.

The present study was designed to find out the effect of yogic practices on selected biochemical variables among hypertensive middle-aged women working in the corporate sector. It was hypothesized that there would be significant differences due to yogic practices than the control group on selected biochemical variables among hypertensive middle-aged women in the corporate sector.

Materials and Methods

Along with the assistance of the HR Department we randomly selected eighty subjects who are in the middle-aged group as per the research criteria. Out of the eighty subjects, sixty were chosen and subjected to testing. After the testing process was over, the selected 30 subjects were assigned to an experimental group (Group 1) and a control group (Group 2), each consisting of 15 subjects.

The yogic practices given to the experimental group include loosening exercises Suryanamaskar, Parivritta trikonasana, Dwikonasana, Sasagasana, Yogamudrasana, Baddha Padmasana, Gomukhasana, Ardha Matsyendrasana, Bhujangasana, Dhanurasana, Januseerasana, Ardhsirasasana, Matysasana Pranayama, Meditation and Shavasana.

The data pertaining to the variables collected from two groups before and after the training period was statistically analysed by using analysis of covariance (ANCOVA) to determine the

Table 1: Analysis of covariance of the means of the experimental group and control group for cortisol ($\mu\text{g/dl}$)

Test	Yogic Practices Group	Control Group	Source of variance	Sum of squares	df	Means of Squares	Obtained F Ratio
Pre-Test	9.41	11.78	between	42.39	1	21.20	1.05
			within	848.12	28	20.19	
Post Test	8.07	12.06	between	157.35	1	78.68	4.50*
			within	734.36	28	17.48	
Adjusted Post Test	9.15	10.99	between	63.32	1	31.66	30.33*
			within	42.80	27	1.04	
Mean Gain	1.33	0.273					

* F- ratio at 0.05 level of confidence for 1 and 28 (df) = 4.21 & 1 and 27 (df) = 4.20

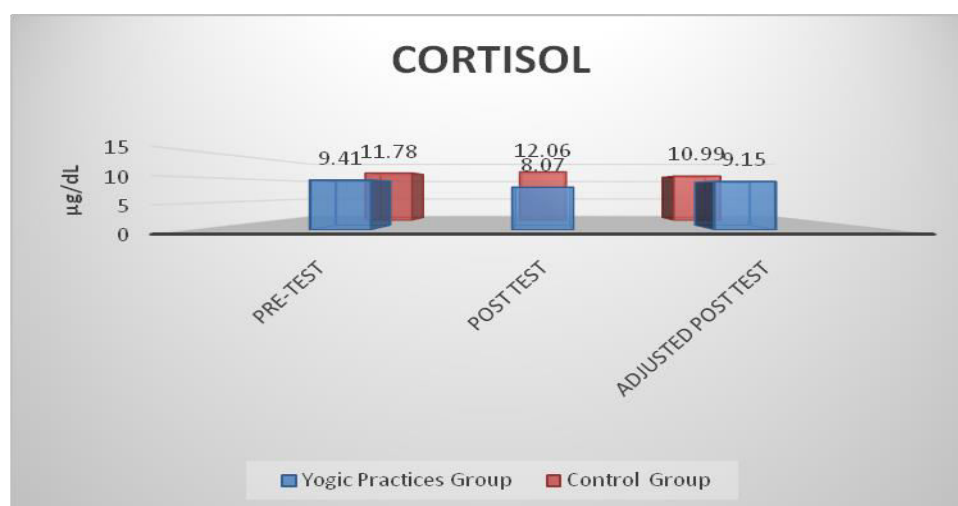


Fig. 1: Mean differences among yogic practices and control group for cortisol. * F- ratio at 0.05 level of confidence for 1 and 28 (df) = 4.21 and 1 and 27 (df) = 4.20

significant difference and tested at 0.05 level of significance.

Results and Discussion

The data about the variables collected from two groups before and after the training period was statistically analyzed (Table 1; Fig. 1) by using analysis of covariance (ANCOVA) to determine the significant difference and tested at 0.05 level of significance.

The obtained F value on pre-test scores 1.05 was lesser than the required F value of 4.50 to be significant at 0.05 level. The post-test scores analysis proved that there was a significant difference between the groups as the obtained F

value of 4.50 was greater than the required F value of 4.21. This proved that the difference between the post-test means of the subjects was significant. Taking into consideration the pre-test and post-test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The F value of 30.33 was greater than the required F value of 4.20. This proved that there was a significant difference among the means due to yogic practices on the biochemical variable of Cortisol.

Yogic practices reduced cortisol levels among middle-aged women after the training period. Hence, hypothesis was accepted at a 0.05 level of confidence.

Hagins *et al.* (2013) systematically reviewed and meta-analyzed the effectiveness of yoga for reducing blood pressure in adults with hypertension and assessed the modifying influences of type and length of yoga intervention and type of comparison group. Academic Search Premier, AltHealthWatch, BIOSIS/Biological Abstracts, CINAHL, Cochrane Library, Embase, MEDLINE, PsycINFO, PsycARTICLES, Natural Standard, and Web of Science databases were screened for controlled studies from 1966 to March 2013. Two authors independently assessed the risk of bias using the Cochrane Risk of Bias Tool. In the results, it was revealed that Yoga had a modest but significant effect on systolic blood pressure (SBP) (-4.17 [-6.35 , -1.99], $P = 0.0002$) and diastolic blood pressure (DBP) (-3.62 [-4.92 , -1.60], $P = 0.0001$). Subgroup analyses demonstrated significant reductions in blood pressure for (1) interventions incorporating 3 basic elements of yoga practice (postures, meditation, and breathing) (SBP: -8.17 mmHg [-12.45 , -3.89]; DBP: -6.14 mmHg [-9.39 , -2.89]) but not for more limited yoga interventions; (2) yoga compared to no treatment (SBP: -7.96 mmHg [-10.65 , -5.27]) but not for exercise. Therefore, it can be concluded that yoga can be preliminarily recommended as an effective intervention for reducing blood pressure.

Mei-Yan Liu *et al.* (2017) conducted a systematic review and meta-analysis on the association between psychosocial stress and hypertension. First, a review of recent advancements in our understanding of the relationship between psychosocial stress and hypertension. Second, a meta-analysis aims to assess the relationship between chronic psychosocial stress and blood pressure. They systematically searched and identified relevant studies from five databases, including PubMed, Cochrane Library, China National Knowledge Infrastructure (CNKI), CQVIP, and the Wanfang Database until April 2016. Eleven studies encompassing 5696 participants were included in the final analysis. Data showed that psychosocial stress was associated with an increased risk of

hypertension (OR = 2.40, 95% CI = 1.65–3.49), and hypertensive patients had a higher incidence of psychosocial stress compared to normotension patients (OR = 2.69, 95% CI = 2.32–3.11). Based on our meta-analysis, chronic psychosocial stress may be a risk factor for hypertension. The few cohort and case-control studies on the association between psychosocial stress and hypertension employed variable definitions of stressors and the responses, making the meta-analysis difficult. Although we found an association between chronic psychosocial stress and hypertension, more studies are needed to confirm this relationship.

Conclusion

It is concluded that yogic practices reduced cortisol levels in hypertensive middle-aged women working in the corporate sector. The yogic practices helped to reduce the levels of cortisol hormone among hypertensive middle-aged women working in the corporate sector. Yoga can be preliminarily recommended as an effective intervention for reducing blood pressure.

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