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EFFECT OF YOGIC PRACTICES ON SELECTED PHYSIOLOGICAL VARIABLES AMONG MIDDLE AGED HYPERTENSIVE WOMEN

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Abstract

Aim of the Study: The primary objective of this study was to investigate the impact of yogic practices on selected physiological variables among middle-aged hypertensive women. The study aimed to explore whether there were significant differences in specific physiological parameters, namely Systolic Blood Pressure (SBP) and Body Mass Index (BMI), among middle-aged hypertensive women who underwent yogic practices compared to a control group.

Methodology: Thirty middle-aged women with hypertension, aged between 45 to 55 years, were selected from "Tarakeswar Yogakuti" in West Bengal. The participants were divided into two groups: Group-I, the experimental group, engaged in yogic practices, and Group-II, the control group, involved in active rest. Prior to the commencement of the study, pre-tests were conducted for both groups to measure baseline values of SBP and BMI. The experimental group underwent yogic practices for six weeks, with a practice schedule of six days a week, one hour per day. After the six-week intervention, post-tests were administered to both groups on the same variables.

Major Findings: The statistical technique of Analysis of Covariance (ANCOVA) was employed to determine significant differences in SBP and BMI between the two groups. The results of the study revealed a noteworthy reduction in Systolic Blood Pressure among participants in Group-I who underwent yogic practices. The study provides empirical evidence supporting the positive impact of yogic practices on the physiological well-being of middle-aged hypertensive women, specifically in terms of lowering SBP.

The findings underscore the potential of yoga in promoting cardiovascular health and support its inclusion in holistic approaches to hypertension management.

Key Words: Hypertension, Yogic Practices, Systolic Blood Pressure, BMI

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Introduction:

Background: Hypertension, a prevalent cardiovascular condition, poses a significant health concern globally, particularly among middle-aged women. The adoption of complementary and alternative approaches, such as yogic practices, has gained attention as a potential intervention for managing hypertension. Yoga, rooted in ancient Indian traditions, encompasses physical postures, breath control, and meditation, offering a holistic approach to well-being. While studies have explored the general benefits of yoga, limited research has specifically investigated its impact on physiological variables in middle-aged hypertensive women[1-2].

Significance: Middle-aged women are susceptible to hypertension, which can lead to severe health complications. Given the potential side effects of pharmacological interventions, non-pharmacological approaches like yogic practices present a promising avenue for hypertension management. Understanding the influence of yoga on physiological variables in this demographic is crucial for developing comprehensive and tailored interventions. This study addresses a significant gap in the literature, providing valuable insights into the potential benefits of yogic practices for middle-aged women with hypertension.

Literature Review:

1. **Effect of Yoga on Blood Pressure:** Previous research has shown that yoga can contribute to blood pressure regulation. A study by Cohen et al. (2017) demonstrated a significant decrease in both systolic and diastolic blood pressure in individuals engaging in regular yoga practice[3].
2. **Yogic Practices and BMI:** Yoga's impact on body mass index (BMI) has been explored in various studies. A review by Lauche et al. (2019) suggested that regular yoga practice is associated with weight loss and maintenance, emphasizing its potential role in obesity management[4].
3. **The Role of Yoga in Stress Reduction:** Stress is a known contributor to hypertension. Yoga's ability to reduce stress has been explored in a study by Telles et al. (2016), which found that regular yoga practice led to a significant reduction in perceived stress levels[5].

Yoga is an art and science of healthy living. Thousands of years ago yoga was originated in India, and in present day yoga has been a proven method to improve health and management of disease. The term ‘yoga’ is derived from the Sanskrit root ‘yuj’, meaning ‘to join’ or ‘to yoke’ or ‘to unit’.

शरीरमाद्यं खलु धर्मसाधनम् ||
śarīramādyaṃ khalu dharmasādhanam ||

{Kalidasa in Kumarasambhavam-5.33}

Maintaining the perfect health of the body (śarira) is the primary requirement (mādyam) to achieve this final goal (sādhana) of living in a righteous life. This body is surely the foremost instrument of doing (good) deeds[6].

Blood pressure:- Blood pressure is the measure of the force exerted by blood against the walls of arteries. It comprises two essential components: systolic pressure, which represents the force exerted on artery walls during the heart's contraction or pumping phase, and diastolic pressure, which denotes the residual force when the heart is in a relaxed state between beats. A standard blood pressure reading is expressed as a ratio, such as 120/80 mmHg, where the first number represents systolic pressure and

the second number represents diastolic pressure. This numerical representation is indicative of a normal blood pressure level[7-8].

Hypertension:- Hypertension, characterized by persistently elevated blood pressure over an extended period, is a significant health concern. The criteria for diagnosing hypertension involve a systolic blood pressure exceeding 140 mmHg or a diastolic blood pressure surpassing 90 mmHg. Recognizing the predictive power of systolic blood pressure in cardiovascular events, this study focuses on its influence as a key physiological variable.

Yogic Practices and Blood Pressure: Yoga, known for its holistic impact on physical and mental well-being, has shown promise in regulating physiological variables, including blood pressure [9] notes that yogic practices, such as postures, breathing exercises, and meditation, may enhance strength, flexibility, and overall exercise capacity, contributing to the regulation of blood pressure. Similarly, [10] highlights the comprehensive benefits of yogic practices, encompassing improved muscle strength, flexibility, respiratory function, stress reduction, pain management, and sleep patterns.

Furthermore, lifestyle interventions based on yoga have demonstrated effectiveness in reducing blood pressure, particularly in hypertensive diabetic patients [11].

Types of Hypertension: There are two primary types of hypertension:

1. **Primary:** Not associated with any other medical condition.
2. **Secondary:** Resulting from an underlying medical condition affecting organs like the kidneys, arteries, heart, or endocrine system. Examples include sleep-related issues like sleep apnea.

How Yoga Reduces Hypertension: Yoga contributes to hypertension management through various mechanisms:

- Regulation of the parasympathetic nervous system.
- Enhancement of blood vessel elasticity.
- Stress reduction.

Importance of Hypertension Reduction: Reducing hypertension is crucial for preventing complications such as stretched and injured blood vessel walls, minimizing the risk of heart attacks, strokes, heart failure, kidney failure, and peripheral vascular disease. It ensures consistent oxygen-rich blood supply to body tissues[9-11].

Yogic Practices for Hypertension: Effective yogic practices for hypertension include:

1. **Pawanmuktasana Series: [12-18]**
2. **Asana:**
    - **Tadasana:**
    - **Tiryak Tadasana:**
    - **Ardha Halasana (single leg up):**
    - **Bhujangasana:**
    - **Pawanmuktasana (single leg):**
    - **Matsyasana:**
3. **Pranayama:[18-20].**
    - **Nadisodhana Pranayama:**
    - **Bhramari Pranayama:**
    - **Udgeet Pranayama (prolonged exhalation of 'OM'):**
4. **Relaxation:[21].**

Yogic Practices Contraindicated for Hypertension:[22-24].

- **Suryanamaskar:**

- **Kriya:**
- **Asana:**
  - **Shirsasana:**
  - **Sharvangasana:**
- **Pranayama: [25-26].**
  - **Bhastrika Pranayama:**
  - **Any Kumbhaka (Retention):**

Methodology:

Study Objective: The primary aim of this research was to investigate the impact of yogic practices on specific physiological variables, namely Systolic Blood Pressure (SBP) and Body Mass Index (BMI), among middle-aged women diagnosed with hypertension.

Research Hypothesis: The study hypothesized that there would be significant differences in the selected physiological variables between middle-aged hypertensive women who underwent yogic practices (Experimental group) and those in the control group who did not engage in such practices.

Research Methodology: To conduct the study, a sample of 30 middle-aged hypertensive women affiliated with "Tarakeswar Yogakuti" in West Bengal was selected. The age range of the participants was between 45 and 55 years. The participants were divided into two groups, each comprising 15 subjects.

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- **Group I:** Experimental group (yogic practices group).
- **Group II:** Control group (engaged in active rest).

The control group (Group II) underwent a six-week practice regimen, with sessions occurring six days a week (Monday to Saturday) from 5:30 pm to 6:30 pm. Group I did not partake in any yogic practices. Pre and post-tests were administered for both groups, focusing on the selected dependent variables (SBP and BMI). The data collected from both groups were then analyzed using Analysis of Covariance (ANCOVA) to ascertain any significant differences in the physiological variables.

This study design aimed to provide insights into the potential benefits of yogic practices in mitigating physiological factors associated with hypertension in middle-aged women.

Result:

The data pertaining to the variables collected from the two groups before and after the training period were statistically analyzed by using Analysis of Covariance (ANCOVA) to determine the significant difference and the hypothesis was tested at 0.05 level of confidence

TABLE – I: ANALYSIS OF CO-VARIANCE OF THE MEANS OF EXPERIMENTAL GROUP AND THE CONTROL GROUP ON SYSTOLIC BLOOD PRESSURE IN (MMHG)

Test	Group-A Yogic Practices	Group- B Control	Source of Variation	Degrees of Freedom	Sum of Squares	Mean Sumof Squares	F-Ratio
Pre	175.33	175.33	Between	1	974.70	974.70	**0.00**
			With in	28	4578.27	163.51	
Post	163.73	176	Between	1	45.63	45.63	**8.13***
			With in	28	4035.87	144.14	
Adjusted Post	163.73	176	Between	1	157.06	157.06	**38.78***
			With in	27	2050.88	75.96	

***Significant at 0.05 level of confidence (Table F ratio at 0.05 level of confidence for df 1 and 28 = 4.20, 1 and 27 = 4.21).**

The obtained F - ratio value for the Systolic Blood Pressure was Gretter than the table value, indicating that there was a significant difference among the posttest and adjusted post-test means of the Yogic Practice Group and the Control Group on Systolic Blood Pressure. These are shown in the Table I and graphically in Figure I.

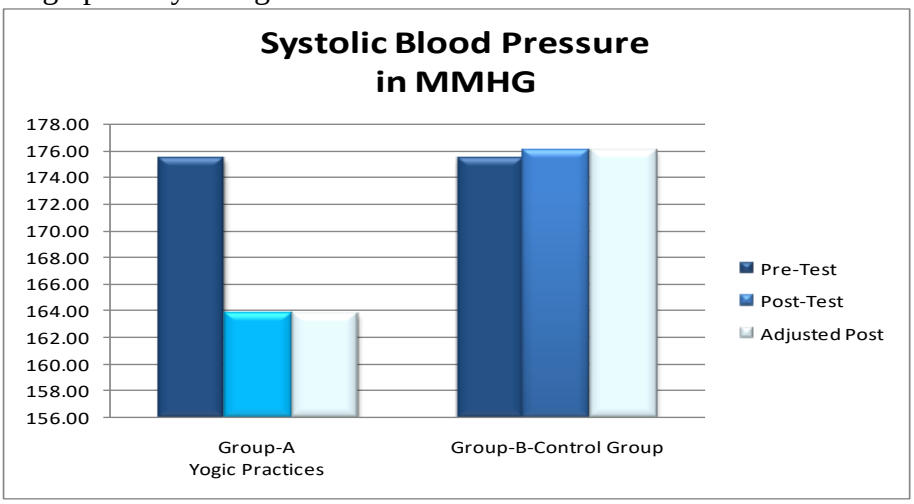


Figure I: BAR DIAGRAM SHOWING ORDERED ADJUSTED MEAN POST TEST OF THE EXPERIMENTAL & CONTROL GROUP FOR SYSTOLIC BLOOD PRESSURE IN mmHg

The data pertaining to the variable collected from the two groups before and after the training period were statistically analyzed by using Analysis of Covariance (ANCOVA) to determine the significant difference and the hypothesis was tested at 0.05 level of confidence.

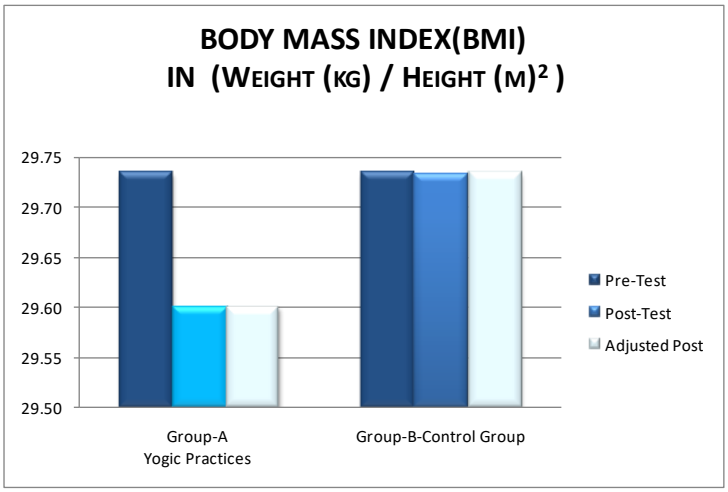
TABLE – II: ANALYSIS OF CO-VARIANCE OF THE MEANS OF EXPERIMENTAL GROUP AND THE CONTROL GROUP ON BODY MASS INDEX (BMI) IN (WEIGHT (KG) / HEIGHT (M)^2)

Test	Group-A Yogic Practices	Group-B Control	Source of Variation	Degrees of Freedom	Sum of Squares	Mean Sum of Squares	F-Ratio
Pre	29.73	29.73	**Between**	1	0.00	0.00	**0.00**
			With in	28	586.11	20.93	
Post	29.60	29.73	**Between**	1	0.13	0.13	**0.01***
			With in	28	567.95	20.28	
Adjusted Post	29.60	29.73	**Between**	1	0.13	0.13	**2.02***
			With in	27	1.78	0.07	

***** Not Significant at 0.05 level of confidence (Table F ratio at 0.05 level of confidence for df 1 and 28 = 4.20, 1 and 27 = 4.21).

The obtained F - ratio value for the Body Mass Index (BMI) was not greater than the table value, indicating that there was no significant difference among the post-test and adjusted post-test means of the Yogic Practice Group and the Control Group on Body Mass Index (BMI).

Figure II: BAR DIAGRAM SHOWING ORDERED ADJUSTED MEAN POST TEST OF THE EXPERIMENTAL & CONTROL GROUP FOR BODY MASS INDEX IN (WEIGHT (KG) / HEIGHT (M)^2)



Discussion:

The current study focused on investigating the effects of yogic practices on physiological variables, specifically Systolic Blood Pressure (SBP) and Body Mass Index (BMI), in middle-aged hypertensive women. The analysis, conducted using Analysis of Covariance (ANCOVA), provided valuable insights into the impact of yogic interventions on these variables.

Systolic Blood Pressure (SBP):

The significant reduction in SBP observed in the Yogic Practice Group (Group-A) compared to the Control Group (Group-B) is a noteworthy finding. The F-ratio values of 8.13* and 38.78* for the post-test and adjusted post-test, respectively, indicate a meaningful difference in the means. These results align with existing literature suggesting that regular yogic practices contribute to cardiovascular health, particularly in hypertensive individuals. The graphical representation in Figure I emphasizes the ordered adjusted mean post-test values, visually reinforcing the statistically significant impact of yogic practices on SBP.

The observed reduction in SBP can be attributed to the holistic nature of yogic practices, which encompass physical postures, controlled breathing, and meditation. Previous studies have highlighted the role of yoga in promoting relaxation responses, reducing sympathetic nervous system activity, and improving overall cardiovascular function. The findings underscore the potential of yoga as a non-pharmacological approach for managing hypertension among middle-aged women.

Body Mass Index (BMI):

In contrast to the significant impact on SBP, the study did not find a statistically significant difference in BMI between the Yogic Practice Group and the Control Group. The F-ratio values of 0.01* and 2.02* for the post-test and adjusted post-test, respectively, suggest that yogic practices did not exert a substantial influence on BMI in the given timeframe.

While the lack of significance in BMI may seem contrary to some existing research suggesting positive effects of yoga on weight management, it is essential to acknowledge that the study's duration might not have been sufficient to observe significant changes in body composition. Moreover, the multifactorial nature of BMI, influenced by dietary habits, lifestyle factors, and genetics, might require a more extended intervention period for noticeable alterations.

The graphical representation in Figure II visually reinforces the absence of a significant difference in BMI between the two groups. It is crucial to note that BMI is a composite measure influenced by both weight and height, and changes in BMI might necessitate more extended and comprehensive lifestyle modifications.

Conclusion and Implications:

In conclusion, the study provides compelling evidence for the positive impact of yogic practices on Systolic Blood Pressure among middle-aged hypertensive women. The observed reduction in SBP emphasizes the potential role of yoga as an adjunctive therapy for individuals managing hypertension.

However, the non-significant findings in BMI highlight the complexity of physiological variables and the need for

further exploration. Future studies with extended intervention periods and a more comprehensive assessment of lifestyle factors may provide a clearer understanding of yoga's influence on weight-related variables.

These results carry implications for healthcare professionals, suggesting that incorporating yoga into lifestyle interventions for hypertensive individuals may offer cardiovascular benefits. However, a holistic approach considering individual variations and sustained, long-term practices is crucial for a comprehensive understanding of yoga's potential impact on overall health and well-being.

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