



EFFICACY OF YOGIC PRACTICES ON BODY MASS INDEX, SYSTOLIC BLOOD PRESSURE AND STRESS AMONG MIDDLE AGED WOMEN SUFFERING WITH HYPOTHYROIDISM

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ABSTRACT

The goal of the random group experimental study was to determine the effect of yogic practices on BMI, Systolic Blood Pressure and Stress in middle-aged women with hypothyroidism. It was hypothesized that yogic practices would result in significant differences in selected physiological variables and Psychological variables such as BMI, Systolic Blood Pressure and Stress between middle-aged hypothyroid women and the control group. For the purpose of the study, 30 middle-aged hypothyroidism women from Guntur were chosen at random using a random group sampling design, and they were divided into two groups A and B, each with 15 subjects. Before the start of the training program, the two groups (A and B) were given a pretest on the selected dependent variables. Group A received yogic practices, while Group B (Control Group) did not receive any treatment and was placed in active rest. After an eight-week experiment, the two groups (A and B) were retested on the same dependent variables as the posttest. The analysis of covariance (ANCOVA) method was used to determine the significant differences between the experimental and control groups. Demonstrated that the experimental group differed significantly from the control group. The study's findings demonstrated that yogic practices reduced both selected physiological variables such as BMI, systolic blood pressure and Psychological variable Stress in middle-aged women with hypothyroidism. At 0.05 level of confidence, the hypothesis was accepted. As a result, it was concluded that yogic practices can help middle-aged women with hypothyroidism maintain a healthy BMI, Systolic Blood Pressure and stress.

KEY WORDS: *Yogic practices, Body mass index (BMI), Blood Pressure, Systolic Blood Pressure, Stress, Middle age.*



INTRODUCTION

Thyroid diseases are common worldwide. In India too, there is a significant burden of thyroid diseases. According to a projection from various studies on thyroid disease, it has been estimated that about 42 million people in India suffer from thyroid diseases. (Ambika Gopalakrishnan, 2011). 30 percent of the Guntur people are having thyroid problems. The thyroid gland is located in the anterior neck, overlying the inferior border of the larynx; it is fixed to the anterior surface of the upper trachea by loose connective tissue. It consists of two lateral lobes – one on either side of the trachea – connected by a narrow isthmus. The gland is composed of spherical thyroid follicles that contain colloid surrounded by a layer of cubical follicular cells; these cells synthesize the thyroid hormones T4 and T3. Para follicular cells, located between the follicles, secrete the hormone thyrocalcitonin. (Straight A's in Anatomy & Physiology, 2007) The thyroid gland has an abundant supply of sympathetic and parasympathetic nerves. Some studies suggest that sympathetic stimulation or infusion of epinephrine or norepinephrine may increase secretion of thyroid hormone. (Goodman, H. Maurice, 2003) The thyroid hormones control the metabolism of cells, which is their speed of activity. If there is too little hormone, the body cells work too slowly; too much results in them working too fast. Thyroid hormones regulate the rate of oxygen consumption. This metabolic action influences the utilization of the main components of food: sugars, protein and fat. Although thyroid hormones have a similar effect and influence the proper working of all body cells, their action is particularly evident in certain tissues and for certain functions. For example, the physical and brain development of a baby growing in the womb depends on the presence of the correct amount of thyroid hormones in the mother until the twelfth week of the pregnancy when the baby's own thyroid gland begins to function. In a child, too little hormone will slow up growth, whereas too much may make the child grow faster than normal. Thyroid hormone balance is essential in order for the body to function properly. Some of the bodily functions that rely on thyroid hormone balance include energy regulation, growth, weight control, body temperature regulation, tissue restoration, carbohydrate, fat, and protein metabolism, digestion, blood flow, hormone secretion, and sexual function. Therefore, it is crucial for the thyroid to perform at an optimal level. Scientists now consider thyroid hormone one of the major "players" in brain chemistry disorders. And as with any brain chemical disorder, until treated correctly, thyroid hormone imbalance has serious effects on the patient's emotions and behavior. (Arem, Ridha, 2007).

Hypothyroidism, a thyroid disorder is more common in females and refers to an under active thyroid gland, whereby the thyroid gland cannot make enough thyroid hormone to maintain homeostasis in the body. Low thyroid hormone levels cause metabolic functions to slow down, resulting in a general symptomology that can include dry skin, fatigue, loss of energy, weight gain, depression or memory problems. Yoga is an excellent form of health care management that is well suited to the needs of thyroid patients. Before the development of Western Medical science, Yogis believed that the neuroendocrine system was vital to health and a set of practices were devised in order to maintain healthy glands and the body's metabolism

OBJECTIVES OF THE STUDY

The objective of the study was to find out whether there would be any significant difference on selected physiological and psychological variables due to yogic practices on middle aged hypothyroidism women.

PURPOSE OF THE STUDY

The purpose of the study was to find out “The Efficacy Of Yogic Practices On Body Mass Index, Systolic Blood Pressure And Stress Among Middle Aged Women Suffering With Hypothyroidism”.

HYPOTHESIS

It was hypothesized that there would be significant differences on selected risk factors among middle aged hypothyroidism women due to yogic practices than the control group.

DELIMITATIONS

- The subjects were middle aged hypothyroidism women only.
- The study was delimited to middle aged women from Guntur city only
- Age of subjects was ranged from 35 to 45 years only.
- Independent variable was yogic practices only.
- The dependent variables were restricted to BMI, BP(Systolic) and Stress only.



REVIEW OF RELATTED LITERATURE

Kumari, N Suchetha et. al., (2011) investigated a study on “Effect of yoga therapy on body mass index and oxidative status.” Forty obese male and female were selected as subjects. The changes in body weight, body mass index, blood sugar, MDA level and total antioxidant status was estimated before and after one month of yoga therapy. The data was analyzed using paired ‘t’ test at 0.05 level of significance. There was a significant decline in the body weight, body mass index, fasting blood sugar and post prandial blood sugar, MDA and significant increase in total antioxidant level after yoga when compared to that before the yoga therapy. Yoga therapy is beneficial in maintaining better health by regulating body mass index, oxidative status by improving the psychological functions of the body and helpful to overcome the complications of obesity.

Latha and KV Kalliappan (1991) conducted a study on Yoga, Pranayama, Thermal Biofeedback Techniques in the Management of Stress and High Blood Pressure. The sample of the study consisted of 14 essential hypertensive patients. Seven of these patients underwent training in yoga and thermal biofeedback technique for a period of six months. Other seven patients served as a comparison group. Results showed a significant reduction in the systolic blood pressure during treatment phases. Moderate reduction in the diastolic pressure was noticed, only when the thermal feedback was introduced. This also corresponded to significant reduction in the intake of anti-hypertensive drugs. Training in yoga and thermal biofeedback procedures were not effective in altering the perceptions associated with stressful experiences.

The Latin word ‘Stringere’ which means to be drawn tight is the root word for stress. Stress is a complicated, dynamic process of interaction between an individual and his or her life. Because of work related stress public face health issues and therefore solution strategies are mandatory (Kusluvan, 2003). Effects of some specific yogic practices have been extensively validated to manage stress (Della valle et al., 2020).

Lazarus and Folkman (1984) defines stress “a pattern of negative physiological responses occurring in situations where people perceive threats to their well-being which may be unable to meet.” It can manifest itself either as eustress or as distress. Eustress, translated as ‘good stress’, is a positive form of stress that motivates an individual to continue working while distress is the ‘bad stress’. Stress is caused by events or situations in our environment which are known as stressors which can



be of many kinds -psychological, physiological, environmental and social stressors. The most common are daily hassles, crowding, job stress, loss of loved ones and financial problems.

Perceived stress is not merely assessing stressful life events but assessing the degree to which life situations are considered stressful, which is the primary appraisal (Lazarus and Folkman, 1984). According to Lazarus and Folkman, this primary appraisal (i.e., perceived stress) determines the degree of confidence individuals possess regarding their ability to cope with stressful situations (i.e., secondary appraisal).

While stress is a negative physical and emotional experience, perceived stress is the feelings or thoughts that an individual has about how much stress they are under at a given point in time or over a given time period. Perceived stress incorporates feelings about the uncontrollability and unpredictability of one's life, how often one has to deal with irritating hassles, how much change is occurring in one's life, and confidence in one's ability to deal with problems or difficulties. It is not measuring the types or frequencies of stressful events which have happened to a person, but rather how an individual feels about the general stressfulness of their life and their ability to handle such stress. (Phillips A.C. (2013) Perceived Stress. In: Gellman M.D., Turner J.R. (eds) Encyclopedia of Behavioral Medicine. Springer, New York, NY) Perceived stress also has serious effects on health like tension, headaches, pain, anxiety, depression, eating disorder and sleep disorders. (Health Assured Team, 2019)

Stress is one of the major factors for cardiovascular disease (Sharma et al., 2018). In low and middle-income countries there are 25% of deaths caused by cardiovascular disease (Levenson et al., 2002). By 2030 it was predicted that it would be leading cause of death globally (Lopez et al., 2006). Stressful life in this dynamic and competitive world could be the reason for stress-related disorders (Marmot, & Wilkinson, 2003). Hans Selye (1936) first put up the term stress into life science.

METHODOLOGY

To achieve the purpose of the study, 30 hypothyroidism women were selected randomly for the study from Guntur, between the age group of 35 to 45 years and they are equally divided into two groups I and II with 15 subjects in each group. Preliminary test was taken for the two groups (I and II) on the selected dependent variable before the start of the training program. Group I was given yogic practices for 60 minutes 6 days for a total period of eight weeks. Group II (control group) was permitted to undergo their routine and normal life style during the course of experiment without any

specific training. After eight weeks, the two groups were rested again on the same selected dependent variable, the selected physiological variable and psychological variable such as BMI, Blood Pressure (systolic) and Stress. Analysis of co-variance (ANCOVA) was used to find out the significant differences between experimental groups and the control group. The test of significance was fixed at 0.05 level of confidence.

Consisting of 30 items, the PSQ was developed as an instrument for assessing the stressful life events and circumstances that tend to trigger or exacerbate disease symptoms.

YOGIC PRACTICES

1. Loosening the joints.
2. Surya Namaskar
3. Asanas
 - Navasana
 - Paschimottanasana
 - Nourkasana
 - Ardha matsyendrasana
 - Pawan mukatasana
 - Janusirsasana
 - Salabasana
 - Sarvangasana
 - Matsyasana
 - Ardha halasana
 - Bhujangasana
 - Savasana
4. Pranayama
 - Anulomvilom
 - Kapalapathi
 - Ujjai
5. Yoga Nidra

RESULTS AND DISCUSSIONS

- The data pertaining to the variable collected from the 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.
- The obtained F-ratio value for the body mass index, blood pressure(Systolic) and stress were greater than the table value, indicating that there was a significant difference among the post test

and adjusted posttest means of the yogic practice group than the control group on selected physiological and psychological variables.

TABLE 1. COMPUTATION OF MEAN AND ANALYSIS OF CO-VARIANCE(ANCOVA) OF BMI OF EXPERIMENTAL AND CONTROL GROUP

Test	Experimental Group – I (yogic practices)	Control group	Source of variance	df	Sum of square	Mean square	F
Pre-test mean	24.63	25.54	Between	1	0.69	0.344	0.11
			Within	28	262.47	3.02	
Post-test mean	22.49	24.96	Between	1	362.40	181.20	53.69*
			Within	28	293.60	3.37	
Adjusted mean	22.79	25.14	Between	1	360.72	180.36	53.22*
			Within	27	291.466	3.39	

* Significant at 0.05 level of confidence. (The table value required for significance at 0.05 with df 1 and 28 and 1 and 27 are 4.2 and 4.21 respectively)

The above Table 1 shows that the obtained F value on pre test scores 0.11 was lesser than the required F value of 4.2 to be significant at 0.05 level. This proved that there was no significant difference between the groups a pretest and posttest and the randomization at the pretest was equal. The post test scores analysis proved that there was significant difference between the groups, as obtained F value 53.69 was greater than the required F value of 4.21. This proved that the differences between the posttest means of the subjects were significant. Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment.

The results of the study on the selected physiological variables showed that group 1 has significant differences on BMI, due to yogic practices. Hence, the hypothesis was accepted at 0.05 level of confidence. The above findings were substantiated by the observations made by experts such as Kumari, N Suchetha et al. (2011)

Table 2. COMPUTATION OF MEAN AND ANALYSIS OF COVARIANCE OF SYSTOLIC BLOOD PRESSURE OF EXPERIMENTAL AND CONTROL GROUP

(mm/hg)

Test	Experimental Group (Yogic Practices)	Control group	Source of variance	Df	Sum square	Mean square	F
Pre-test mean	141.1667	141.87	Between	1	24.16	12.078	0.88
			Within	28	1193.00	13.71	
Post-test mean	126.5	140.63	Between	1	3275.02	1637.51	125.12*
			Within	28	1138.63	13.09	
Adjusted mean	126.58	140.63	Between	1	3250.66	1625.33	124.78*
			Within	27	1120.223	13.03	

* Significant at 0.05 level of confidence. (The table value required for significance at 0.05 with df 1 and 38 and 1 and 37 are 4.10 and 4.11 respectively)

The above table 2 shows that the obtained F value on pre test scores 0.88 was lesser than the required F value of 4.10 to be significant at 0.05 level. This proved that there was no significant difference between the groups a pre test and post test and the randomization at the pre test was equal. The post test scores analysis proved that there was significant difference between the groups, as obtained F value 125.12 was greater than the required F value of 4.11. This proved that the differences between the post test means of the subjects were significant. Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment.

the selected physiological variable showed that group 1 has significant differences on blood pressure (systolic), due to yogic practices. Hence, the hypothesis was accepted at 0.05 level of confidence. The above finding can also be substantiated by the observations made by experts such as **Nejati S. et.al, (2015)**

Table 3. COMPUTATION OF MEAN PERCEIVED STRESS CHANGES BEFORE AFTER YOGA INTERVENTION PROGRAM

Phase	Mean	SD
Pre test	23.44	5.823
Post test	20.97	4.523

After Yoga intervention program it showed that the significance of Mean Difference between pre experimental intervention and post experimental intervention with respect to perceived stress, It shows that the participants had much stress before yoga intervention. So we can say that the practice of yoga decreases the level of stress. The results of the study on the selected Psychological variables showed that group 1 has significant differences on Stress, due to yogic practices. Hence, the hypothesis was accepted at 0.05 level of confidence. The above findings were substantiated by the observations made by experts such as Latha and KV Kalliappan (1991)

DISCUSSION ON HYPOTHESIS

It was hypothesized that there would be significant differences on selected Physiological variable such as BMI (Body mass index), Blood Pressure(systolic) and Psychological Variable Stress due to yogic practices among middle aged women suffering with Hypothyroidism than the control group. The results proved that there were significant differences on Body mass index (BMI) ,Blood Pressure(Systolic) and stress levels (decreased) due to yogic practices than the control group among middle aged women suffering with Hypothyroidism.

CONCLUSION: It was concluded that yogic practices decreased Body mass index, Blood Pressure (Systolic)and Stress among middle aged hypothyroidism women. The study concluded that yoga is helping the maintenance of good levels of thyroid hormones. Yoga may be considered as supportive or complementary therapy in conjunction with medical therapy for the treatment of thyroid disorders.



REFERENCES

- Innes, Kim E., and Heather K. Vincent. "The influence of yoga-based programs on risk profiles in adults with type 2 diabetes mellitus: a systematic review." *Evidence-Based Complementary and Alternative Medicine* 4.4 (2007): 469-486.
- Lazarus, R., S., & Folkman, S. (1984). *Stress, Appraisal, and Coping*. In. New York: Springer Publishing Company.
- Latha and K.V. Kallapan , Department of Psychology , University of Madras, “ Yoga ,pranayama and thermal feedback techniques in the management of stress and high blood pressure”, *Journal of Indian Psychology*, 1991, vol.9, no. 1 & 2.
- Levenstein, S., Prantera, C., Varvo, V., Scribano, M. L., Berto, E., Luzi, C., & Andreoli, A. (1993). Development of the perceived stress questionnaire: a new tool for psychosomatic research. *Journal of Psychosomatic Research*, 37 (1), 19–32.
- M Hossain (2020). A study on perceived stress among young adults during social isolation. *International Journal of Indian Psychology*, 8(2), 331-339. DIP:18.01.040/20200802, DOI:10.25215/0802.040
- Phillips A.C. (2013) Perceived Stress. In: Gellman M.D., Turner J.R. (eds) *Encyclopedia of Behavioral Medicine*. Springer, New York, NY
- Shantakumari, Nisha, Sheifa Sequeira, and Rasha Eldeeb. c." *Journal of Advances in Internal Medicine* 1.2 (2012): 60-63.
- Straight A's in Anatomy and Physiology by Lippincott Williams & Wilkins
- Suchetha Kumari N , Damodara Gowda K.M , Sukesh N , Madhu L.N , Kathyayani, “Effect Of Yoga Therapy On Body Mass Index And Oxidative Status” *NUJHS Vol. I, No.1-3*, September 2011
- Ridha Arem, “The Thyroid Solution: A Revolutionary Mind-Body Program for Regaining Your Emotional and Physical Health Paperbac” – 26 December 2007 ballantine books new York

WEBSITES

- <http://www.jmidlifehealth.org/article.asp?issn=0976-7800;year=2018;volume=9;issue=2;spage=79;epage=84;aulast=Nagarkar>
- https://www.google.com/search?q=obesity+in+middle+aged+women+WHO&rlz=1C1CHBD_enI N880IN880&oq=obesity+in+middle+aged+women+WHO&aqs=chrome..69i57.32709j0j7&sourceid=chrome&ie=UTF-8