IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

EFFECT OF YOGIC PRACTICES ON BASAL METABOLIC RATE IN OBESE WOMEN

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Abstract

The current study sought to evaluate and contrast the basal metabolic rate among individuals who regularly practice yoga and a control group. A total of 30 ladies were selected at random. Among a group of 30 women, half of them (15) regularly practiced yoga while the other half served as control subjects. The individuals' ages ranged from 30 to 45 years. Information was collected via a body composition analyzer machine. The data was analyzed using Analysis of Covariance (ANCOVA). The findings demonstrated a notable impact of Yoga on the basal metabolic rate. Ultimately, the present investigation determined that Yoga yielded positive result.

Key words: basal metabolic rate, house wives, yoga, obese, women.

Introduction

Scientific study has demonstrated that practicing yoga enhances dexterity, strength, and musculoskeletal coordination in individuals. A sequence of yoga poses enhances stability, muscular power, physical endurance, flexibility, anaerobic capacity, greater coordination between nerves and muscles, and increased ability to tolerate standing positions (Bera et.al., 1993; Hart and Tracy, 2008). In their study, Ray et al. (2001) examined the impact of training in hatha yogic activities on aerobic capacity. They found that participants who underwent this training saw a decrease in perceived effort scores, suggesting that yoga can enhance aerobic capacity. Yoga practices were found to decrease the basal metabolic rate, possibly due to decreased arousal (Chang et.al., 2006). Additionally, it led to enhanced hip extension, increased stride length, and reduced anterior pelvic tilt in elderly individuals without any health issues (DiBenedetto et.al., 2005). According to Sharma et.al. (2008), even short interventions can have a significant impact on overall performance, work capacity, and physical fitness. Oken et al. (2006) discovered that engaging in hatha yoga among individuals aged 65-85 led to notable enhancements in both quality of life and physical parameters, when compared to a control group that engaged in walking exercise.

Obesity is a widespread global health problem that impacts a large number of individuals, resulting in the development of cardiovascular illnesses, diabetes, and metabolic disorders (Tiwari and Balasundaram, 2023). Basal Metabolic Rate (BMR) is a fundamental physiological indicator that plays a significant role in obesity by impacting essential bodily functions such as respiration, blood circulation, and cellular growth (Li et.al., 2023). Basal metabolic rate (BMR) is affected by various factors such as age, gender, genetic predisposition, and body composition. Yoga, an age-old Indian discipline, has being investigated as a viable substitute for weight control (Vybornaya et.al., 2017). Yoga combines physical asanas, pranayama, and meditation to enhance overall well-being and mental wellness (Woodyard, 2011). Research indicates that yoga can have a beneficial impact on metabolic processes, assisting in the management of body weight (Na Nogkhai et.al., 2021). Nevertheless, there is a scarcity of empirical studies investigating the influence of yoga on basal metabolic rate (BMR) in women who are obese. The objective of this study is to examine the impact of a well-organized yoga program on Basal Metabolic Rate (BMR) in women who are obese. The study will focus on analyzing the changes in BMR that occur as a result of consistent participation in the program. The research seeks to add to the increasing amount of evidence that supports the use of yogic practices into traditional approaches to treating obesity.

The main purpose is to find out the effect of Yogic Practices Basal Metabolic Rate in Obese Women. It will help the Obese Women to control the obesity and know the other benefits of Yogic practices. It is hypothesized that, there may be significant effect of Yogic Practices on Basal Metabolic Rate in Obese Women. The study was delimited to the obese female, age ranging from 30-45 years. Total 15 subjects were selected from Nagpur, M.S. The study was further delimited to Basal Metabolic Rate only. Medial background of the subject was unknown. No motivational techniques were adopted while collection of data. Climatic variations during the study were out of control for the study

Methodology

The research was carried out in Nagpur, Maharashtra, India. A total of fifteen (15) women who were obese and aged between 30 and 45 years were selected for this study after obtaining their informed consent. In addition to the selected research group, a total of fifteen control individuals (non-practitioner group) were evaluated at the beginning and end of the session to observe the impact of extraneous variables. The yoga group consistently engaged in a diverse range of yoga practices on a daily basis for a minimum of 6 weeks. These practices included asana (postures), pranayama (breathing techniques), and meditation. The asana postures commenced with stretching exercises, subsequently progressing to standing, supine, prone, and sitting poses. The standing postures included the trikonasana (side bending triangle position), padahastasana (front bending), ardha chakrasana (backward bending), and ardhakati chakrasana (side lateral bending) techniques. The supine poses included straight leg raising and shoulder stand posture (sarvangasana), while the prone postures consisted of locust (shalabhasana), serpent (bhujangasana), and bow (dhanurasana) postures. The sitting postures included the moon pose (shasankasana), the tough pose (vajrasana), and the half matsyendra pose (ardha matsyendra). After completing the asanas, a profound relaxation technique was practiced for a duration of 6 minutes. This technique involved closing the eyes and following particular directions to enhance awareness and relaxation of various body areas.

The pranayama phase included vigorous breathing techniques such as forceful exhalation (kapalabhathi), and breathing through the mouth with the tongue folded (shithali and shithkari), as well as segmented breathing that targets the lower, middle, and upper lobes of the lungs (vibhagiya pranayama), and a slow breathing technique known as alternate nostril breathing (nadishuddhi pranayama). After completing the pranayama, the practitioner adopted a supine posture, commonly known as the corpse posture or shavasana, with closed eyelids. This posture was maintained for a duration of 3-6 minutes, with the goal of attaining a heightened sense of relaxation across the entire body. The meditation practices involved assuming a seated position and commencing with the focus on one's breath and the induction of calm.

Women who were menstruating engaged only in pranayama and meditation. The non-yoga group abstained from engaging in any asana, pranayama, meditation, or specialized techniques, but otherwise led a lifestyle that closely resembled that of the yoga group. The control subjects adhered to a vegetarian diet and abstained from consuming alcohol and tobacco. The basal metabolic rate (BMR) was evaluated and compared before and after six weeks of yoga activities.

To draw the meaningful conclusion descriptive (measure of central tendencies such as mean, and standard error) and inferential (ANOVA) was adopted.

Result

Table 1: Showing the comparison (factorial design) of basal metabolic rate between housewives and control subjects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	6923890.467[a]	3	2307963.489	327.153	.000
Intercept	303995600.133	1	303995600.133	43091.205	.000
Groups	5829139.200	1	5829139.200	826.277	.000
Treatment	510385.633	1	510385.633	72.347	.000
Groups * Treatment	584365.633	1	584365.633	82.833	.000
Error	818345.400	116	7054.702		

Total	311737836.000	120			
Corrected Total	7742235.867	119			
a. R Squared = .894 (Adjusted R Squared = .892)					

Table 1 presents the comparison and interaction effect of basal metabolic rate in housewives (pre and post data) and control individuals (pre and post data). The table 1 above shows a statistically significant ($p<0.05$) interaction impact between the groups being researched, namely housewives (pre and post) and control (pre and post) groups. A statistically significant difference ($p<0.05$) was observed between the experimental group and control subjects. When analyzing the impact of six weeks of Yoga training on basal metabolic rate in a study group, a significant difference was observed in the experimental group when comparing pre and post data.

Table 2: Showing the comparison of basal metabolic rate between housewives and control subjects.

Housewives	**Control Subjects**	**ANOVA**
Mean ± SE	Mean ± SE	F- (Significance)
1812.03 ± 10.84	1371.23 ± 10.84	826.28 ($p<0.05$)

Table 2 presents a comparison of the basal metabolic rate between housewives who practice yoga and control subjects. The average basal metabolic rate for housewives was determined to be 1812.03 ± 10.84, while for control subjects it was found to be 1371.23 ± 10.84. The inferential analysis (ANOVA) showed a statistically significant difference ($p < 0.05$) among the groups that were studied. The basal metabolic rate of housewives was observed to be considerably greater than that of control subjects.

Table 3: Showing the comparison of basal metabolic rate between pre and post training.

Pre-Training	Post-Training	ANOVA
Mean ± SE	Mean ± SE	F- (Significance)
1526.42 ± 10.84	1656.85 ± 10.84	72.35 ($p<0.05$)

Table 3 presents a comparison of the basal metabolic rate between housewives who underwent training and control individuals, both before and after the training. The average basal metabolic rate before training was determined to be 1526.42 ± 10.84, while the average basal metabolic rate after training was found to be 1656.85 ± 10.84 for the subjects under study. The inferential analysis (ANOVA) indicated a statistically significant difference ($p < 0.05$) among the groups that were studied. The basal metabolic rate of the post-training group exhibited a considerable increase following the 6-week yoga training period.

Table 4: Showing the multiple comparison of basal metabolic rate amongst all studied groups (pre and post training) of housewives and control subjects.

Groups	**Training**		**ANOVA**
	Pre-Training	**Post-Training**	**F-value (Sig)**
Housewives	1677.03 ± 15.93	1947.03 ± 15.93	143.57 ($p<0.05$)
Control Subjects	1375.80 ± 15.17	1366.67 ± 14.23	0.193 (*NS*)

Table 4 displayed the multiple comparison (interaction effect) of basal metabolic rate. The comparative analysis using ANOVA revealed that the F-value of the interaction effect (group x treatment) was determined to be 82.83, indicating statistical significance ($p<0.05$). The study demonstrated a statistically significant difference in basal metabolic rate between pre-training (1677.03 ± 15.93) and post-training (1947.03 ± 15.93) for housewives ($p<0.05$). The basal metabolic rate experienced a significant increase after the training session. However, when comparing the basal metabolic rate of control subjects before training

(1375.80 ± 15.17) and after training (1366.67 ± 14.23), there was no significant variation observed. A statistical analysis was conducted to compare the pre-training basal metabolic rate of housewives (1677.03 ± 15.93) with the pre-training basal metabolic rate of control subjects (1375.80 ± 15.17). The results showed a statistically significant difference ($F = 187.44$, $p<0.05$) between the two groups. Similarly, a significant difference ($F = 737.82$, $p<0.05$) was seen in the post-training basal metabolic rate when comparing housewives (1947.03 ± 15.93) and control subjects (1366.67 ± 14.23).

Findings

1. A statistically significant difference is observed in the basal metabolic rate of housewives before and after.
2. There is a negligible disparity observed between the before and post basal metabolic rate of the control participants.
3. A statistically significant difference was seen between the experimental group and the control subjects.

Conclusion:

The present investigation demonstrated a statistically significant interaction impact in basal metabolic rate.

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