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Effect of power yoga on BMI, cardiac endurance and mental health in middle-aged obese females

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Abstract

Objectives

- To determine the effect of power yoga on BMI using BMI formula
- To determine the effect of power yoga on cardiovascular endurance using Queen College step test.
- To determine the effect of power yoga on mental health using Hamilton depression rating scale.

Methods: In this experimental study 30 females with overweight or grade 1 obesity having average age group between 30-50 years were selected for this study of six weeks. Power yoga was given 5 days in week for 6 weeks. A BMI formula was used to calculate the BMI, mental health was assessed using Hamilton depression rating scale and cardiac endurance was assessed using queen college step test. Data analysis was done at the end of 6th week.

Results: On pre post analysis, BMI, Queen College step test and Hamilton Depression rating scale showed a statistically significant improvement in both cardiac endurance and mental health, and reduction in BMI ($p < 0.0001$).

Conclusion: Power yoga is valuable in helping to reduce BMI, heart rate and reduce depression in middle-aged obese females.

Keywords: power yoga, BMI, cardiac endurance, mental health, Hamilton depression rating scale, queen college step test

1. Introduction

Obesity is defined as abnormal or excessive fat accumulation that presents a risk to health, the prevalence of obesity is increasing drastically and it is more likely to be seen in children and adolescent age group. Middle-aged overweight and obesity are increasing insignificantly leading to one of the global problems [1, 2].

The accumulation of excess fat is not just a simple balance of calorie intake and calorie expenditure, however, calorie intake and expenditure may be linked to opposing forces balance on the fulcrum of physiological and metabolic function that control fat storage and fat release. The balance can be altered by the lifestyle factor of diet and physical inactivity, but once the fulcrum of balance is displaced, the caloric balance between intake and expenditure may no longer be even. Excess dietary fat, sugar, and physical inactivity, in combination, are the lifestyle factors that contribute to the instability of caloric balance. Overweight in adults is categorized as Body Mass Index of 25kg/m^2 to 29.9 kg/m^2 and Obesity as Body Mass Index of more than 30kg/m^2 [3].

Epidemiological studies have shown that the increase in obesity leads to a progressive rise in the incidence of Hypertension, diabetes mellitus, coronary artery diseases, sleep panic syndrome. Other hazards associated with obesity are reflux esophagitis, and cancer of ovaries, breast, colon, depression and anxiety [4].

Power yoga = Empowering yoga practice [5].

Power yoga is a well-rounded physical class meant to include all aspect of physical fitness-tone, suppleness, balance, stamina and cardio while attempting to maintain every range of motion and enliven every nook and cranny through stimulation which facilitates circulation, the prerequisite for regeneration, like you are oiling the tin man [5].

Power yoga is a unique combination of dynamic breathing and strong flowing movements, which creates a high heat, high energy workout. Power yoga is choreographed in a sequence of posture that flow into one another, building strength, unwinding tight joints, and loosening muscles. Power yoga is complete mind and body workout that develops concentration and reduces stress, with its focus on breathing and body heat. Power yoga goes beyond the relaxation benefits of yoga to offer a root to health and fitness that athletes of all levels will embrace. It is based on 'SAID' principle which states that human body adapts specifically imposed demands [6].

The study was conducted to see the effect of power yoga on BMI, mental health and cardiovascular endurance in middle-aged obese females.

Objectives of the Study Included

- To determine the effect of power yoga on BMI using BMI formula
- To determine the effect of power yoga on cardiovascular endurance using Queen College step test.
- To determine the effect of power yoga on mental health using Hamilton depression rating scale.

2. Method

Participants

For the purpose of this study thirty (30) obese females who were willing participants in the power yoga program were considered as subjects. Their age ranged from 30 to 50 years

Inclusion criteria

- Overweight and Grade-1 Obesity
- Females
- An individual between 30 to 50 yrs

Exclusion Criteria

- Subjects not willing to participate in the study.
- Subject having neurological and cardiovascular impairments.
- Acute musculoskeletal conditions like fractures.

Material Used

- Paper
- Pen
- Stepper (41.25cm)
- Measuring tape
- Stopwatch
- Weight machine
- BMI formula
- Hamilton depression rating scale
- Metronome

Tools

Specific power yoga programs were implemented on subjects, designed for BMI and heart rate reduction and improvement in mental health. They have practice each Asana thrice for 30 seconds unilaterally or bilaterally whenever necessary and relaxation after each Asana.

Warm up include 5 rounds of sun solutions.

The power yoga protocol was

1. Big Toe Posture
2. Extended Triangle Posture
3. Extended Side Angle Posture
4. Extended Leg Intense Stretch
5. Intense Side Stretch Posture
6. Extended Hand To Big Toe Posture
7. Warrior I Posture
8. Intense West Stretch Posture A And B (Full Forward Bending)
9. Boat Posture
10. Seated Angle Posture
11. Marichyasana; C
12. Half Lord Of The Fish Posture
13. Bridge Posture
14. Locust Postures A And B
15. Frog posture

After that, there was stretching of the major muscle group and 'Shavasana' for two minutes.

Procedure

30 obese females having average age group between 30-50 years were selected for this study of a six weeks Power Yoga program held at Talegaon Dabhade in November 2017. Pre and post observations were employed for data collection and Power Yogic Program under study was intervened for six weeks among subjects. Through BMI formula, Queen College step test and Hamilton depression rating questionnaire, performed pre and post-test to measure change within the first and last day of Power Yoga.

Data Analysis

Mean, P-value And T-test was computed by using 'INSAT' software to examine significant discrepancy within the groups. The results have been presented in the following table.

3. Results

Results are evaluated by performing the paired T-test, by using 'INSTAT' software.

Table 1: Effect of Power Yoga to reduce BMI

	Pre	Post	difference	P value	Significance
BMI in kg/m^2	29.373	28.063	1.310	<0.0001	Extremely significant

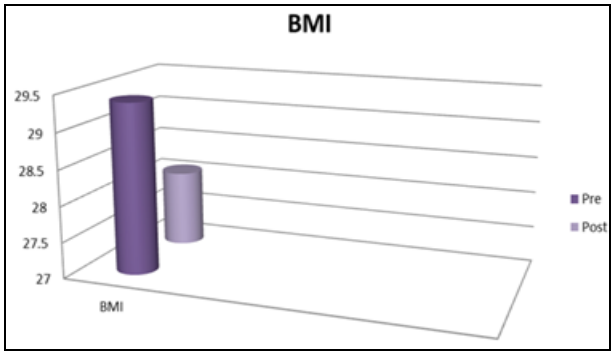

Fig 1: Graphical representation for BMI of Pre and Post result

Table 1 interprets the mean difference in BMI of the subjects before and after enforcing to power yoga program for the stipulated period of 6 weeks. The specific power yoga program for BMI reduction has effectively reduced 1.310kg/m^2 BMI within this period without any other restrictions and advice.

Table 2: Effect of Power Yoga to improve Cardiac Endurance

	Pre	Post	Difference	P value	Significance
Heart Rate in b/pm	100.83	86.800	14.033	<0.0001	Extremely significant

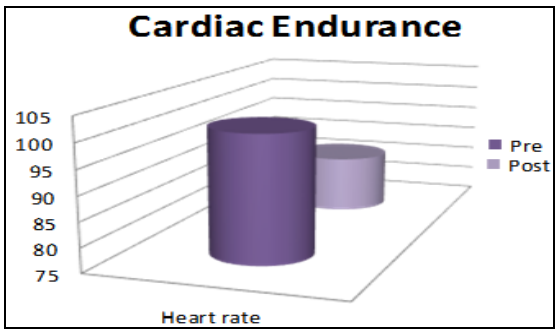

Fig 2: Graphical representation of a Cardiac endurance of Pre and Post result.

Table 2 demonstrates the mean difference in heart rate of the subjects before and after enforcing to power yoga program for the stipulated period of 6 weeks. It is found that the specific power yoga program for heart rate reduction has reduced by 14.033bpm which is very effective within 6 weeks without any other restrictions and advice.

Table 3: Effect of Power Yoga to improve mental health

	Pre	Post	Difference	P value	Significance
HAM –D	10.600	6.600	4.000	<0.0001	Extremely significant

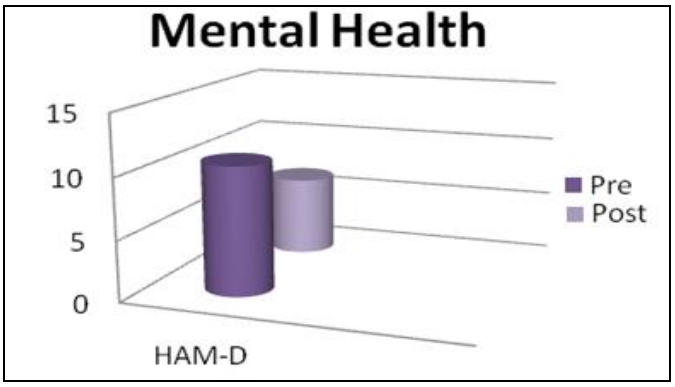

Fig 3: Graphical representation for HAM-D of Pre and Post result.

Table 3 interprets the mean difference in HAM-D of the subjects before and after enforcing to power yoga program for the stipulated period of 6 weeks. The specific power yoga program for reduction of depression level has reduced by 4.00 which are very effective within 6 weeks without any other restrictions and advice.

4. Discussion

The study was conducted to determine the impact of Power yoga on BMI, Cardiac endurance and mental health in the middle-aged obese female. 30 subjects with overweight and Grade-1 obesity within the age group of 30–50 were selected. These subjects were then assessed using BMI formula, Queen College step test and Hamilton depression rating scale before and after six weeks intervention.

The result of the study shows that there was a significant decrease in the BMI, heart rate and depression due to change in obesity from baseline to 6-week intervention.

From the study and statistical analysis, it was observed that power yoga is effective in reducing BMI and depression level.

Tapas Das and Dr. Sutapa Roy in their study found that excessive body weight or obesity is associated with chronic storage of excess fat and lack of physical activity. According to yoga, root causes of abnormalities are mental stress. Due to stress, the person habituates overeating leading to deposition of fat. Excessive fat leads to the development of metabolic dysfunction and promotes metabolic risk factor. To combat with overweight one has to reduce stress and increase physical activity. Yoga helps to reduce overweight and metabolic risk factors. There is a reduction in the body weight due to the reduction of deposited fat on adipose tissue [7].

S. Dhananjai, Sadashiv, and Rajjan Kumar in their study found that abdominal obesity associated with overstimulation of the hypothalamic-pituitary-adrenal (HPA) axis due to chronic stress and altering diurnal cortisol secretion. Abnormal regulation of the HPA axis and perceived stress-dependent cortisol level is strongly related to perturbation of endocrine axis as well as abdominal obesity with metabolic abnormalities. During the depression, there is a decrease in neurotransmitters such as serotonin and norepinephrine. Besides, an increased level of cortisol has a role in causing depression by regulating the function of serotonin and norepinephrine. Yoga helps in decreasing cortisol level leading to a counter-regulatory effect to reduce the depression level and obesity [8, 9, 10, 11, 12, 13, 14].

In this study, there also is a decrease in BMI and depression level. This is how power yoga is effective in reducing depression level.

From the study and statistical analysis, it was also observed that power yoga is effective in increasing cardiac endurance.

Caren Lau, Ruby Yu, and Jean Woo in their study found that yoga helps in reduction of heart rate may be mediated by, training-induced reduction of respiratory rate and improvement in the baroreflex sensitivity. It attributes to the relaxation and breathing techniques adopted in yoga training [15].

Eliška Sovová-et al in her study found that yoga helps in reduction of heart rate are likely to be parasympathetic predominance, increased baroreflex sensitivity and decreased the arterial tone and peripheral resistance [16].

This Study also affects the increase in cardiac endurance.

Thus power yoga is effective in reducing BMI and improves mental health and cardiac endurance.

5. Conclusion

Following the 6-weeks of power yoga practice, participants in the power yoga intervention showed significantly reduced in BMI level, heart rate and improvement in the mental health status. It can be concluded that power yoga is valuable in helping to reduce BMI, heart rate and reduce depression in middle-aged obese females.

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