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## Effect of yoga on the reduction of Body mass index

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### Abstract

The aim of the study was to evaluate the effects of yogic exercise on the reduction of weight and body mass index. The total number of sample was 30. In which there were 20 male 10 female subjects aged 35 to 45 years. Height, weight and body mass index have been recorded. Food habit and exercise did not take in to consideration and there was no control group. For a statistical analysis these numbers were not sufficient. As part of the program participants were taught yogic exercise. Given training for three days one hour each. They were given advice to practice at least one time in a day systematically and regularly, preferably in the morning hours. Evaluation was done after a period of 65 days. There was remarkable decrease in the weight and thus body mass index on reduction from obese to overweight, 71.4% participants with obesity have achieved reduction in their obesity to overweight. Though statistically not significant. Chi-square =7.04 with 'p' value =0.048 fisher's Exact test).

**Keywords:** obesity, body mass index, yogic exercise, yogic breathing

### Introduction

The fundamental cause of obesity and over weight is an energy imbalance, that is between consumption and expenditure of calories. Worldwide there is an increase in the consumption of calorie. (Joule). The main cause is trans fat foods that are high in dense and very low physical inactivity is the cause. Changing modes of transportation and especially sedentary habits leads to obesity. It is all again because of rapid urbanization. WHO has also developed the "Global Action Plan for the prevention and control of Non communicable Diseases 2013-2020" which aims to achieve the commitments of the UN political Declaration Non communicable diseases (NCDs) which was endorsed by heads of State and Government in September 2011. The "Global Action Plan" will contribute to progress on 9 global NCD targets to be attained by 2015.and a halt in the rise of global obesity to match the rates of 2010. According to the World Health Organisation (WHO), obesity is one of the most common, yet among the most neglected, public health problems in both developed and developing countries (WHO 2012). In 2016 the World Health Assembly welcome the report of the Commission on Ending Childhood Obesity and its 6 recommendations to address obesogenic environment and critical periods in the life course to tackle child hood obesity. For the implementation Assembly requested the director general to develop a plan for action. Yoga has been shown to be a simple and economical therapeutic modality that may be considered as a beneficial adjuvant for many of the health problems. Yogic exercise is a system that can prevent and cure various diseases. It can do the purification of the body and mind. It is an integrated holistic approach. It is physical exercise with low impact. The most important in Hathayoga is not flexibility and the ability to do difficult postures, but awareness- awareness of the body and the breath. (David Coutler. H). Yogasana has been practicing in India from Vedic period and was coordinated and organised in a systematic way by Sage Patanjali.

### Need of the study

Obesity, a major risk factor for heart disease, obesity and diabetes is a leading public health concern today. National surveys have measured the BMI(Body Mass Index), the ratio of weight to height periodically since 1980.First fully representative survey showed that the majority was of normal weight or underweight (BMI under 25) and 6% of men and 8% of women were obese (BMI above 30).

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Globally 41% of BMI –related deaths and 34% of BMI –related disability- adjusted life years were due to cardiovascular disease among obese persons. (Massachusetts Medical Society, 2017.)

**Objective**

To study the effect of yogic exercise on the reduction of weight and body mass index.

**Method and material**

Participants with obesity having normal health is included in the study. Body weight measuring instrument and stadio meter were used to measure weight and height. And participants BMI were calculated and recorded. Participants were taught yogic exercise and breathing for three days one hour each. Instruction and advise was given to follow all the regulation related with yogic exercise and breathing. And they were told the advantages of yogic exercise and breath if they practice preferably in the morning. Participants were restricted to consume red meat, trans fat food and junk food. Yogic exercise is scheduled for one hour daily preferably in the morning hours. Intervention program was for 45 days.

**Sample**

Study consisted of thirty participants from different offices in a civil station. In which there were 20 male and 10 female. Among participants 7 participants with obesity 21 participants with overweight and 2 participants having normal weight. participants were in the habit of taking non-vegetarian food. Some factors in the study was omitted because that the data was insufficient for a statistical analysis.

**Statistics**

Chi-Square (Fisher’s Exact Test), t-test for equality of means, and group statistics were used.

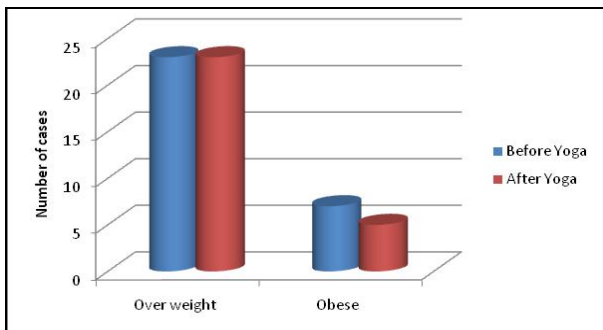
**Data Analysis**

**Table 1:** Percentage of obese and overweight participants before and after doing yogic exercise

BMI before	BMI After		
	Over weight	obese	Total
Over weight Obese	23 199.0%	0 0%	23 100.0%
	5 71.4%	2 28.6%	7 100%
Total	28 93.3%	2 6.7%	30 100%

Chi-square-7.04, p-value = 0.048 (Fisher’s exact test.

Percentage of obese and overweight participants before and after doing yogic exercise



**Table 1:** Chart.1

Table 1. The data above shows there is 23 participants with overweight. After doing yogic exercise all of them are remaining in the same range of overweight value. In the basic data it can be seen there is a considerable weight reduction among participants with overweight but not statistically significant enough. On the other hand, the data reveals 71.4% obese participants have achieved weight reduction and they have come down to the range of overweight values. Again the data shows it has a chi-square value of 7.04 and the ‘p’ value is 0.048 from Fisher’s Test. The value has not any statistical significance.

**Table 2:** Comparison of reduction in BMI (w/m2) between male and female.

Gender	N	Mean kg		T test for equality of means	
male	20	0.43	0.32	t value	sig
Female	10	0.64	0.88	-0.993	

Not significant

Table 2. Regarding comparison of reduction in BMI between male and female participants, it can be seen in the data that the reduction of mean BMI of male participants is 0.43 and their standard deviation is 0.32. Whereas the reduction in BMI of female participants is 0.64 and having a standard deviation of 0.88. Calculated ‘t’ value for the same is -0.993 with ‘p’ value as 0.329, which is not significant. Keeping all the instructions intact the data reveal there is no significant difference in weight loss with respect to gender.

**Table 3:** Comparison between vegetarian and non-vegetarian participants in the reduction of BMI

Food habit	N	Mean	Std deviation	Std error
Reduction in BMI				
Non veg	21	0.54	0.65	0.14
veg	9	0.41	0.27	0.09

Table 3. Data shows the mean BMI of non-vegetarians is 0.54 with a standard deviation of 0.65 whereas vegetarian it is 0.41 and having a standard deviation of 0.27. No significant difference seen.

Table 4. The data shows mean decrease in the BMI for male participants is 0.54 with standard deviation of 0.65 and for females the mean decrease is 0.41 with a standard deviation of 0.27.

**Table 4:** ‘t’ test for equality of means.

Gender	N	BMI mean	BMI sd	T –test for equality of means	
Male	21	0.54	0.65	0.561	0.579
female	9	0.41	0.27		

The test for equality of means ‘t’ value shows it is 0.561 with ‘p’ as 0.579.

**Findings**

1. After the practice of yogic exercise for a period of 65 days participants achieved a noticeable reduction in the weight and thus their body mass index. Though statistically not significant.
2. 71.4% participants with obesity have achieved a reduction in their weight come down from obesity to overweight.
3. Can not seen any difference neither between gender nor between non-vegetarians and vegetarians.

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