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## EFFECTIVENESS OF YOGA VERSUS AEROBIC EXERCISES IN CONTROLLING OBESITY IN YOUNG ADULTS

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## RESEARCH ARTICLE

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**EFFECTIVENESS OF YOGA VERSUS AEROBIC EXERCISES IN CONTROLLING OBESITY IN YOUNG ADULTS****ABSTRACT**

Yoga and aerobics are the two main protocol used widely for reduction of weight in obesity management. This study has taken these two as the main variables in analysing their efficiency in reducing weight. Methodology- Only male subjects with age of 15 to 25 years and BMI value more than 26 participated in this clinical trial. Subjects were randomly assigned to two groups namely group A and B. Group A subjects received a set of aerobic exercises that included elliptical exercises, tread mill walking, cycling in magnetic stationary cycling, floor exercises like squats, jumps and lunges. Group B subjects received a set of kriya, asana, pranayama, mudras and bandha. Observation - Outcome measures used in this study are lipid profile variables namely Triglycerides, Total cholesterol, Low density lipoprotein, High density lipoprotein. Results - of this study concluded that both yogic practice and aerobic training are effective in reducing the lipid profile abnormalities. Though there is no significant difference between the two groups at the end of the 6th week, the results suggest that yoga practice results in a constant and steady correction of lipid profile value in obese young adults. So this study concludes that yoga is an effective way of normalising the lipid profile values in obese young adults.

**Keywords:** Obesity, weight reduction, yoga exercises, young obese

**INTRODUCTION**

Yoga has turned out to become one of the commercial aspect of modern India. A cult and tradition once upon a time have become mere exercises. The basics and the values of *yogic* practice have not been thoroughly learnt by practitioners and neither being taught by most of the *yoga* gurus. In contrary the western population have adopted Yogic practice and have started to practice it holistically and preach it systematically. One wing of *yoga* is therapeutic *YOGA* which explains that *yoga* is not only for the normal individuals but also for people who are facing some ailments. We have taken Obesity as a matter of concern and tried to find out whether yogic practice are good enough in tackling it effectively like modern exercise protocols of Aerobic training.

**REVIEW OF LITERATURE**

The prevalence of obesity is increasing with about half of the population in developed countries currently being overweight <sup>[1]</sup>. A study done by Ramachandran et al, highlighted the high prevalence of overweight in adolescent children in urban India. Life style factors influenced BMI in adolescent age <sup>[2]</sup>.

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According to Spector T.D. his Case control studies have consistently demonstrated a strong association between knee osteoarthritis and obesity <sup>[3]</sup>. Framingham longitudinal study high body mass index (BMI) predicted development of the disease in later life <sup>[4]</sup>. Childhood overweight and obesity are associated with an increased risk of CVD risk factors early in life <sup>[5]</sup>. Aristimuno et al reported that adverse levels of CVD risk factors are associated with adiposity in children <sup>[6]</sup>. The increasing numbers of obese children and adolescents all over the world demand an investment in the primary and secondary prevention of obesity and overweight in this age group <sup>[7]</sup>. The rationale for this is that several studies indicated that many children who are obese or have high blood pressure or dyslipidaemia are likely to retain these risk factors as adults <sup>[8]</sup>. Indeed, longitudinal studies of children followed into young adulthood suggest that overweight children may become overweight adults, particularly if obesity is present in adolescence <sup>[9]</sup>. Among overweight children and adolescents, 60% had at least one heart disease risk factor <sup>[10]</sup>. Despite widespread concern about obesity, the development of standard definitions of obesity for screening and intervention remains problematic <sup>[11]</sup>. However, the need to estimate overweight and obesity in children to assess preventive measures, monitor secular trends, and identify high-risk groups has been stressed <sup>[12]</sup>. Despite some authors concluding that BMI is not a reliable index of body fatness for the individual child and suggesting caution against its clinical use for

obesity screening <sup>[13]</sup>. A 13-year follow-up study showed that overweight and obese people presented an increased risk of mortality compared with those who are normal weight <sup>[14]</sup>. BMI is the most commonly used index to determine obesity <sup>[15]</sup>. Studies support the traditional view that physical activity is inversely associated with being overweight <sup>[16]</sup>. Other studies have failed to support the idea that participation in physical activity is associated with a lower BMI <sup>[17]</sup>. Overall, the association between physical activity and obesity has been shown to range from fair to moderate and to some extent depends on the method used to assess activity levels <sup>[18]</sup>. Because levels of BMI increase with age among youths, simple correlations may overestimate the magnitude of the associations. Furthermore, the BMI pattern is different in boys and girls <sup>[19]</sup>. Thus there is a strong need for the framing of new protocols to curb obesity. Hence there should be more and more research work taken up to find out the most effective, in the sense cost effective, time conserving and result oriented approach towards obesity which is a main cause for mortality and morbidity in India.

### AIM

This study aims to compare the effectiveness of aerobic exercises and yoga practices in normalising the lipid profile values of obese young adults.

### HYPOTHESIS

This study hypothesises that YOGA practices are less effective than Aerobic exercises in reducing the lipid profile abnormality in obesity in young adults.

### Methodology

A total of 10 subjects were selected and were allotted randomly in to two different groups namely Group A (Control group) and Group B (Experimental group). Each group were allotted 5 patients by simple random sampling by lottery method. The subjects were recruited into the study if they fulfil the following criteria.

### Inclusion Criteria

- Subjects age – 15 to 25 years
- Only male subjects were selected
- Subjects whose BMI was more than 26 were selected
- Subjects who did not have any other medical ailments.

- Subjects who accepted to follow the routine and treatment sessions regularly and signed the informed consent

### Exclusion Criteria

Subjects who fall under the following category were excluded

- Subjects who had any joint pain
- Subjects who had type 1 diabetes mellitus
- Subjects who were irregular in the session.
- Subjects who had thyroid abnormality

### Procedure

- Sampling type – simple random
- Number of subjects – 10
- Research design – double blinded randomised clinical trial

### Protocol for group A (Aerobic group)

The subjects in this group received a set of aerobic exercises that included elliptical exercises, tread mill walking, cycling in magnetic stationary cycling, floor exercises like squats, jumps and lunges. All the subjects were taught exercises as a group and were taught until they fully comprehended the exercises. Every day they exercised for 45 min for 5 days a week and for a total of 6 weeks

### Protocol for group B

The subjects in this group received a set of *kriya, asana, pranayama, mudras and bandha*. They were explained and demonstrated and monitored for a period of three days before they were recruited into the study. Every day they exercised for 45 min for 5 days a week and for a total of 6 weeks

The list of *Asanas* that were included in Group B were –

- *Soorya namaskara* – 15 repetitions, synchronised with proper breathing pattern.
- *Sarvangasana* – 3min
- *Matsyasana* – 3min
- *Bhujangasana* – 3 min
- *Salabhasana* – 3min
- *Dhanurasana* – 3min
- *Paschimottanasana* – 3min
- *Mayurasana* – 3min

### Pranayama

- *Kapalabhati* – 3min
- *Nadi shudhi* – 3min
- *Soorya bedana or soorya nadi* – 3min
- *Basthrika* – 3min



**Bandhas**

Pranayamas were practiced with *Bandhas*

- *Moola bandha*
- *Udyana bandha*
- *Jalandara banda*
- *Maha bandha*

**Outcome measures used**

Lipid profile was taken as the outcome measure. It contains

- Triglycerides
- Total cholesterol
- LDL – low density lipoprotein
- HDL – high density lipoprotein

The outcome measures were used before and after the study. The subjects were analysed with lipid profile on the day one of the session before exercises begin in empty stomach (fasting). Later the subjects were assessed for lipid profile at the end of 2<sup>nd</sup> week and then at the end of 6<sup>th</sup> week. The results were analysed later.

**Results**

**The between group analysis of the pre test values shows the following results.**

**TGL** - The two-tailed P value equals 0.0522, which is considered to be not quite statistically significant

**TCL** - The two-tailed P value equals 0.0512, which is considered to be not quite statistically significant

**LDL** - The two-tailed P value equals 0.5766, which is considered to be not quite statistically significant

**HDL** - The two-tailed P value equals 1.000, which is considered to be not quite statistically significant.

This shows that the groups were similar at the time of assigning protocols.

**The within group analysis of the pre test and post test values shows the following results**

**Group A**

**TGL** - The two-tailed P value equals 0.0096 which is considered to be very statistically significant.

**TCL** - The two-tailed P value equals 0.0040 which is considered to be very statistically significant

**LDL** - The two-tailed P value equals 0.0729 which is considered to be very statistically significant

**HDL** - The two-tailed P value equals 0.0093 which is considered to be very statistically significant

**Group B**

**TGL** - The two-tailed P value equals 0.1867 which is considered to be not statistically significant.

**TCL** - The two-tailed P value equals 0.0001 which is considered to be very statistically significant

**LDL** - The two-tailed P value equals 0.0293 which is considered to be very statistically significant

**HDL** - The two-tailed P value equals 0.0007 which is considered to be very statistically significant

The within group analysis of the pre and post test values of both groups shows that there is statistically significant difference between these two values in both the groups proving that both modalities were effective in normalising the lipid profile.

**The between group analysis of the post test values shows the following results.**

**TGL** - The two-tailed P value equals 0.1647 which is considered to be NOT statistically significant.

**TCL** - The two-tailed P value equals 0.1798 which is considered to be NOT statistically significant

**LDL** - The two-tailed P value equals 0.1182 which is considered to be NOT very statistically significant

**HDL** - The two-tailed P value equals 0.2759 which is considered to be NOT statistically significant

**Limitations of the study**

- The number of subjects
- Duration of follow up is less
- One subjective or functional outcome measure could have been included

**Strengths of the study**

- It attests to a most common problem
- It have ruled out the conventional procedures less effective
- It have got a reasonably long follow up
- It sends a clear message to the reader
- Double blinded
- Randomisation

**DISCUSSION**

From the present study it's clearly understood that both the techniques are effective in reducing the lipid profile abnormalities. There have been a significant difference in pre and post test values of both the groups in both first 2<sup>nd</sup> week and at the end of 6<sup>th</sup> week. There are two major things to be noted from the study. There is a significant difference between the improvement gained in between the two groups in the first 2<sup>nd</sup> week and the results are in favour of the aerobic training group. Though there is an improvement in the *yoga* group the improvement is not so pronounced. This may be because of the fact that there is a fair amount of skill factor associated with the performance of the *yoga* which is not the same in case of aerobics.

Later in the end of 6<sup>th</sup> week the improvement gained in the *yoga* group has shown a sharp raise and there is no

significant difference between group A and group B. The notable thing is there is no significant difference between the 2<sup>nd</sup> week results and the 6<sup>th</sup> week results in aerobic group. This clearly demonstrates that the results (improvement) have plateaued after the initial improvement in aerobic group. Where as in the *yoga* group though the improvement were marginal in initial 2 weeks the improvement was steady and improved with *yogic* skill development.

## CONCLUSION

In conclusion both *yogic* practice and aerobic training are effective in reducing the lipid profile abnormalities. But *yoga* practice results in a constant and steady correction of lipid profile value in obese young adults. So this study concludes that *yoga* is an effective way of normalising the lipid profile values in obese young adults.

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Table 1: Lipid profile value of Group A

Subjects	TGL Pre/2 <sup>nd</sup> /6 <sup>th</sup> wk	TCL Pre/2 <sup>nd</sup> /6 <sup>th</sup> wk	LDL Pre/2 <sup>nd</sup> /6 <sup>th</sup> wk	HDL Pre/2 <sup>nd</sup> /6 <sup>th</sup> wk
1	222, 190, 185	188,172,168	152,144,142	28,30 ,31
2	276, 223, 210	178,172,166	168,158,156	31,33 ,34
3	310,278,265	150, 144,143	155,143,141	41,44 ,44
4	259,230,224	166,156,152	112,110,110	41,47 ,48
5	234,212,210	189,172,170	152,132,130	42,48 ,49

Table 2: Lipid profile value of Group B

Subjects	TGL Pre/2 <sup>nd</sup> /6 <sup>th</sup> wk	TCL Pre/2 <sup>nd</sup> /6 <sup>th</sup> wk	LDL Pre/2 <sup>nd</sup> /6 <sup>th</sup> wk	HDL Pre/2 <sup>nd</sup> /6 <sup>th</sup> wk
1	278,220,184	212,198,187	155,143,122	40,41,48
2	330,240,202	231,221,198	112,110,103	41,42,51
3	309,259,202	245,219,190	152,132,118	43,45,50
4	301,240,185	178,165,150	152,144,124	28 ,30,41
5	288,249,210	180,171,156	168,158,132	31,33,41

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