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**EFFECT OF FIBER SUPPLEMENT ON WEIGHT LOSS AND BODY COMPOSITION IN YOUNG ADULTS FROM  
MUMBAI, INDIA**

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**Abstract**

**Introduction:** Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. Dietary fiber is Obesity is preventable.

**Objective:** To study the effect of fiber supplementation on weight loss and body composition.

**Methodology:** An intervention study was conducted in 150 (75 males) adults aged 26.3±3.0 years. Dietary data, anthropometry and body composition were analyzed at baseline. Patients were then supplemented with 10 g of dietary fiber (Isabgol) daily for 2 months. After 2 months, anthropometry and body composition was assessed. Percentage change in anthropometry and body composition was calculated. Analyses were performed using SPSS software for Windows (version 16.0, 2007, SPSS Inc, Chicago, IL). Independent Sample T Test was used to analyse P-value < 0.05 was considered to be statistically significant.

**Results:** Weight (64.5±4 kg), BMI (25±0.8 kg/m<sup>2</sup>) and body composition (body fat 28.5±6.1%, muscle mass 36.2±6 &, trunk fat 22.8±1.9% and limb fat 21.7±1.9%) at pre-intervention was significantly different as compared to post-intervention (weight 61.5±4.1kg, BMI 23.8±0.8 kg/m<sup>2</sup>, body fat 24.5±6%, muscle mass 39.3±6 %, trunk fat 21.7±1.9% and limb fat 13.3±1.8%)(p<0.05). Even when classified according to gender, post intervention values were significantly different from pre-intervention values (p<0.05). Percentage change in parameters post intervention was 4.96±1.84% for weight, 4.91±2.83% for BMI, 17.56±9.56% for body fat, 7.90±4.65% for muscle mass, 5.31±3.73% for trunk fat and 6.82±4.78% for limb fat. Males reduced significantly higher percentage of trunk fat as compared to females (p<0.05).

**Conclusion:** Significant change in body composition occurred post supplementation of isabgol(10g) on the study group. There was statistically significant decrease in truncal fat in males as compared to females due to fiber consumption level indicating better effect of intervention in males.

**Keywords:** Overweight, Dietary Fiber, Weight loss, Body composition, Physical Activity, Body Mass Index.

**Introduction:**

Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. (Cynthia L, 2014). Over-weight is associated with severe health problems and early death due to diabetes, hypertension, cardiovascular diseases and many other non communicable diseases (Snehalatha C, 2014). Dietary fiber is Obesity is preventable. a term that reflects to a heterogeneous group of natural food sources, processed grains and commercial supplements(Ramachandran A,2012

). A sedentary lifestyle plays a significant role in obesity and overweight. Worldwide there has been a large shift towards less physically demanding work (Zephier E, 2014). Physical and mental illnesses and the pharmaceutical substances used to treat them can increase risk of overweight. (Rosner B, 2012). Smoking has a significant effect on an individual's weight (Kaur N, 2013). In young individual who are physically active and consume high fiber has maintain their weight as compare to the individuals who has sedentary life style. (June M, 2012). Overweight and obesity, as well as their related non communicable diseases, are largely preventable. Supportive environments and communities are fundamental in shaping people's choices, making the healthier choice of foods and regular physical activity the easiest choice (accessible, available and affordable), and therefore preventing obesity (2010, Wiley-Liss Inc). Weight gain was inversely associated with the intake of high-fiber food, which indicated the importance of fiber intake for weight control.(Simin Liu,2011). Whole-grain consumers had significantly better nutrient profiles and maintained body weight than non consumers, jain community were studied who its cereals for specific period that study show such as weight loss ( Linda E, 2014).

**Objective:** To study the effect of fiber supplementation on weight loss and body composition.

### **Methodology:**

An intervention study was conducted in 150 (75 males) adults aged  $26.3 \pm 3.0$  years. Dietary data, anthropometry and body composition were analyzed at baseline. Patients were then supplemented with 10 g of dietary fiber (Isabgol) daily for 2 months. After 2 months, anthropometry and body composition was assessed. Percentage change in anthropometry and body composition was calculated. Analyses were performed using SPSS software for Windows (version 16.0, 2007, SPSS Inc, Chicago, IL). Independent Sample T Test was used to analyse P-value  $< 0.05$  was considered to be statistically significant.

### **Results:**

Data on intervention study conducted on 150 (75 males) adults aged  $26.3 \pm 3.0$  years is presented in the current study.

**Table 1: Baseline anthropometric and dietary intake of the study population**

	Males (n=75)	Females (n=75)
Age (years)	26.7 $\pm$ 2.9	25.9 $\pm$ 3.0
Weight (kg)	64.7 $\pm$ 3.9	64.3 $\pm$ 4.0
Height (cm)	166.5 $\pm$ 4.8	167.6 $\pm$ 5.1
BMI (kg/m <sup>2</sup> )	25.0 $\pm$ 0.7	25.0 $\pm$ 0.8
Energy (kcal/day)	1876 $\pm$ 484	1731 $\pm$ 424
Carbohydrates (g/day)	216.6 $\pm$ 251	189.4 $\pm$ 48.6
Proteins (g/day)	54.7 $\pm$ 21.4	49.8 $\pm$ 19.5
Fats (g/day)	92.3 $\pm$ 29.7	89 $\pm$ 31.1
Fiber (g/day)	6.7 $\pm$ 2.1	6.8 $\pm$ 2.2

Data presented as Mean $\pm$ SD

At baseline, the mean weight was  $64.5 \pm 4$  kg, height was  $167 \pm 5$  cm, and BMI was  $25 \pm 0.8$  kg/m<sup>2</sup>. The dietary intake was  $1803 \pm 459$  kcal/day, carbohydrates were  $203 \pm 180.7$  g/day,  $52.2 \pm 20.1$  g/day, fats was  $90.6 \pm 29.8$  g/day and fiber was  $6.7 \pm 2.2$  g/day. **Table 1** presented baseline anthropometric data and

dietary intake of study population when classified according to gender. As seen in **Table 1**, there was no significant difference in baseline characteristics of the study population ( $p>0.05$ ).

**Table 2: Weight, BMI and body composition pre and post intervention:**

	Males (n=75)		Females (n=75)	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Weight (kg)	64.7±3.9	61.7±4.2*	64.3±4.0	61.3±4.0*
BMI (kg/m <sup>2</sup> )	25±0.7	23.8±0.8*	25±0.8	23.8±0.7*
Body fat (%)	24.7±4.1	20.6±4.0*	32.4±5.2	28.5±4.9*
Muscle mass (%)	39.8±4.7	42.8±4.7*	32.6±4.8	35.7±4.9*
Trunk fat (%)	22.7±1.8	21.6±1.7*	22.9±2.1	21.8±2.1*
Limbs fat (%)	13.3±1.6	12.5±1.5*	15.1±1.9	14.1±1.8*

Data presented as Mean±SD. \* $p<0.05$  for comparison between pre-intervention and post-intervention

At baseline the mean body fat was 28.5±6.1%, muscle mass was 36.2±6%, trunk fat was 22.8±1.9% and limb fat was 21.7±1.9%. Post supplementation, there was a significant change in weight, BMI and body composition with mean post intervention weight of 61.5±4.1kg, BMI 23.8±0.8 kg/m<sup>2</sup>, body fat 24.5±6%, muscle mass 39.3±6%, trunk fat 21.7±1.9% and limb fat 13.3±1.8% ( $p<0.05$ ). **Table 2** describes pre and post intervention weight, BMI and body composition parameters of the study population when classified according to gender. Even when classified according to gender, post intervention values were significantly different from pre-intervention values ( $p<0.05$ ) (**Table 2**).

**Table 3: Percentage change in body composition post intervention**

	Males (n=75)	Females (n=75)
Percentage change Weight	4.79±1.80	5.14±1.88
Percentage change BMI	4.86±3.07	4.96±2.59
Percentage change Body fat	16.86±9.57	18.26±9.59
Percentage change Muscle mass	7.99±5.31	7.80±3.91
Percentage change Trunk fat	6.00±3.85	4.63±3.50*
Percentage change Limbs fat	6.47±4.68	7.17±4.89

Data presented as Mean±SD. \* $p<0.05$  for comparison between gender

Percentage change in parameters post intervention was 4.96±1.84% for weight, 4.91±2.83% for BMI, 17.56±9.56% for body fat, 7.90±4.65% for muscle mass, 5.31±3.73% for trunk fat and 6.82±4.78% for limb fat. Table 3 presents percentage change in parameters when classified according to gender. Males reduced significantly higher percentage of trunk fat as compared to females ( $p<0.05$ ) (**Table 3**). There was no significant difference in percentage weight loss in other parameters between males and females ( $p>0.05$ ) (**Table 3**).

### **Discussion:**

This study demonstrated that an increase of dietary fiber consumption led to decrease in body fat percentage in overweight individuals. The changes are significantly higher in males than females. Significant change in body composition occurred after post supplementation of isabgol (10g) on the study group. Weight loss were seen in women's who consumed isabgol consistently (Asha K, 2012).

There was statistically significant decrease in truncal fats in males as compared to females due to increased in physical activity and fiber consumption level indicating better effect of intervention in males. At baseline, the mean weight was  $64.5 \pm 4$  kg, height was  $167 \pm 5$  cm, BMI was  $25 \pm 0.8$  kg/m<sup>2</sup>. The calories intake was  $1803 \pm 459$  kcal/day, carbohydrates were  $203 \pm 180.7$  g/day,  $52.2 \pm 20.1$  g/day, fats was  $90.6 \pm 29.8$  g/day and fiber was  $6.7 \pm 2.2$  g/day. At baseline the mean body fat was  $28.5 \pm 6.1\%$ , muscle mass was  $36.2 \pm 6\%$ , trunk fat was  $22.8 \pm 1.9\%$  and limb fat was  $21.7 \pm 1.9\%$ . Post supplementation, there was a significant change in weight, BMI and body composition with mean post intervention weight of  $61.5 \pm 4.1$ kg, BMI  $23.8 \pm 0.8$  kg/m<sup>2</sup>, body fat  $24.5 \pm 6\%$ , muscle mass  $39.3 \pm 6\%$ , trunk fat  $21.7 \pm 1.9\%$  and limb fat  $13.3 \pm 1.8\%$  ( $p < 0.05$ ). Even when classified according to gender, post intervention values were significantly different from pre-intervention values ( $p < 0.05$ ). Percentage change in parameters post intervention was  $4.96 \pm 1.84\%$  for weight,  $4.91 \pm 2.83\%$  for BMI,  $17.56 \pm 9.56\%$  for body fat,  $7.90 \pm 4.65\%$  for muscle mass,  $5.31 \pm 3.73\%$  for trunk fat and  $6.82 \pm 4.78\%$  for limb fat. Males reduced significantly higher percentage of trunk fat as compared to females ( $p < 0.05$ ). There was no significant difference in percentage weight loss in other parameters between males and females ( $p > 0.05$ ). Weight ( $64.5 \pm 4$  kg), BMI ( $25 \pm 0.8$  kg/m<sup>2</sup>) and body composition (body fat  $28.5 \pm 6.1\%$ , muscle mass  $36.2 \pm 6\%$  & trunk fat  $22.8 \pm 1.9\%$  and limb fat  $21.7 \pm 1.9\%$ ) at pre-intervention was significantly different as compared to post-intervention (weight  $61.5 \pm 4.1$ kg, BMI  $23.8 \pm 0.8$  kg/m<sup>2</sup>, body fat  $24.5 \pm 6\%$ , muscle mass  $39.3 \pm 6\%$ , trunk fat  $21.7 \pm 1.9\%$  and limb fat  $13.3 \pm 1.8\%$ ) ( $p < 0.05$ ). Even when classified according to gender, post intervention values were significantly different from pre-intervention values ( $p < 0.05$ ). The prevalence of Overweight among adults is very high in India. Consequences of overweight increase the risk of other diseases in adults. Overweight and obesity and their health consequences have been recognized as major public health problems worldwide (Lobstein T, et al. 2010). To reduce the prevalence of overweight dietary fiber intake and physical activity is very important. Health education should be given to parents, teachers and children regarding dietary habit and sedentary life style (John J, 2011). BMI is one of the most useful tool for eliciting the data on prevalence and tracking of overweight. The study showed that weight, BMI, Body fat percentage, was significantly changed in males as compare to females. Males were significantly more physically active than males.

There was a significant difference in dietary fiber intake in males than females. There was a significant higher intake of fats in males and females both as compare to protein intake. Milk, dairy products, pulses and legumes are moderately consumed by the study group that led to less amount of protein intake. But there was a higher intake of meat poultry and fish along with that fat intake was also higher in males and females. Subjects were seen to consume cereals in high quantities in their daily diets. The subjects were seen to consume rice on a daily basis and thus, the subjects were very much susceptible to increase lipid profile. Through the current research it is found that the eating habits of overweight people includes less vegetables and fruits in their daily diet. There were very few people who included vegetables and fruits in their daily consumption of food which led to less dietary intake of dietary fiber. The subjects were seen to be more frequently eating fast foods as well as eating out which led them to increased risk of obesity and cardio vascular disease and bad health effects.

The present research would like to suggest that increased awareness about bad effects of fast food consumption must be given to the people to help them avoid the consequences of the same. The danger of consumption of energy and caffeinated drinks in subjects are many. In the present research the subjects Males and Females both were seen to be at equal probability of hazards of consumption of beverages.

This study clearly highlights the effect of dietary fiber and physical activity on overweight. Evidence also shows that targeted study group and their lifestyle pattern is positively affected by the nutritional

counseling. poor nutrition is associated with poor healthy lifestyle. People who have good amount of fiber and physical activity are more likely to lose their weight and body fat percentage.

**Conclusion:**

Significant change in body composition occurred post supplementation of isabgol(10g) on the study group. There was Statistically significant decrease in truncal fat in males as compared to females due to increased in fiber consumption level indicating better effect of intervention in males.

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