

# Find out the gender difference in the effectiveness of nutrition and complete lifestyle modification package on overweight adult people

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■ **ABSTRACT** : Worldwide, approximately 1.5 billion adults are overweight, including approximately 500 million who are obese . By gender, it has been reported that 19% of males and 22% of females are obese. This study was conducted to find out the gender difference in the effectiveness of nutrition and complete lifestyle modification package on overweight adult people. 180 Overweight participants (90 male and 90 female) in the age group of 30-40 year attending a private weight control clinic enrolled in a 12 month programme Aiming to find out the gender difference in the effectiveness of combined nutrition and complete lifestyle modification package (NCLMP) on overweight adult people In NCLMP we combined electronic Devices, diet and physical exercise programs with at least 12 months of follow-up, conducted in overweight and obese adults (body mass index  $\geq 25$ ). Results revealed that effect of electronic devices, physical exercise and nutritionally balanced weight loss diet on body composition of males were showed body Fat (%) before intervention was  $31.10 \pm 3.2$  and after intervention  $29.26 \pm 4$  and decrease after intervention  $-1.84$ . Effect of electronic devices, physical exercise and nutritionally balanced weight loss diet intervention on body composition of females were found body Fat (%) before intervention was  $33.83 \pm 4.6$  and after intervention  $32.2 \pm 4.5$  and decrease after intervention  $-1.59$ .

■ **KEY WORDS**: Adult, Overweight, Body mass index (BMI), Waist hip ratio (WHR), Balanced diet, Nutritional status

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There is a global obesity pandemic. However, the prevalence of overweight and obesity among men and women varies greatly within and between countries, and overall, more women are obese than men. These gender disparities in overweight and obesity are exacerbated among women in developing countries. In

developed countries, more men are overweight than women. Current knowledge suggests that myriad socio-cultural dynamics throughout the world exacerbate gender disparities in excess weight gain. Different contextual factors drive gender differences in food consumption, and women often report consuming

healthier foods, yet may consume more sugar-laden foods, than men. Acculturation, through complex socio-cultural pathways, affects weight gain among both men and women. The nutrition transition taking place in many developing countries has also affected excess weight gain among both genders, but has had an even greater impact on the physical activity levels of women. Furthermore, in some countries, cultural values favour larger body size among women or men as a sign of fertility, healthfulness, or prosperity. As the global obesity pandemic continues, more research on gender disparities in overweight and obesity will improve the understanding of this pandemic.

According to WHO, sex “refers to the biological and physiological characteristics that define men and women,” whereas gender “refers to the socially constructed roles, behaviors, activities, and attributes that a given society considers appropriate for men and women”. The causes of obesity are both biological and social and may vary considerably by sex or gender. A review by Power and Schulkin (2008) goes into greater detail about the sex differences in adipose tissue storage and metabolism and speculates about the evolutionary origins of these disparities. The implications of excess weight gain on health may also vary by sex. In females, the biological factor of menopause affects fat distribution that may increase risk or exacerbate negative effects of obesity on health. Yet, despite these biological differences related to the sex-specific differences in excess weight gain, gender disparities and related socio-cultural factors are largely absent from the public health (obesity) discourse and therefore from potential policies and solutions.

Global survey data indicate that the prevalence of both male and female overweight and obesity varies by region and has rapidly increased between 1980 and 2008. Studies have documented global trends in female overweight and obesity by a country’s economic status (gross national product or gross domestic product), but not among males (or both sexes). However, some studies suggest that not only do the global differences in the prevalence of obesity vary by sex, but also that the social determinants of obesity vary by gender. This review examines the global trends in the prevalence of overweight and obesity by gender and how these trends are related to socio-cultural gender differences and thus their subsequent affect on overweight and obesity

worldwide (Caballero, 2007).

There are a number of characteristics that differ between men and women that may contribute to the difference in weight loss success. Characteristics favouring greater weight loss in men include a greater percentage of muscle mass compared with fat mass, contributing to higher resting and total energy expenditure and a greater potential impact of exercise on weight loss. On the contrary, women have higher concentrations of leptin, an appetite regulation hormone that reduces energy intake. While research supports these points, there is still no consensus on whether these physiological mechanisms lead to differences in weight loss success between men and women. Other considerations contributing to weight loss variability between men and women include the study design and nature of the lifestyle interventions implemented in the current weight loss interventions.

#### **Objectives :**

- To assess the nutritional status of overweight adult people.
- To develop nutrition and complete lifestyle modification package for overweight adult people.
- To find out the effectiveness of nutrition and complete lifestyle modification package on nutritional status of overweight adult people.

#### **■ RESEARCH METHODS**

The study was conducted within the municipal limits of Udaipur City, Rajasthan. For the assessment of overweight and nutritional status of adult people, an interview schedule was developed to collect the information about respondent’s age, religion, caste, type and size of family, education, family occupation, marital status. Basic anthropometric measurements such as height, waist and hip circumference measurements were taken using standard methods given by Jelliffe (1966). The derived anthropometric measurements *viz.*, body mass index and waist and hip ratio were calculated. Weight and Body composition of the subjects was determined using bioelectrical impedance using Body composition analyzer.

In intervention phase subject were divided into 2 group male (90) and Female (90). On the basis of energy requirement of the subject for weight loss diet plan was prepared for one week and then given to the subject

During intervention phase anthropometry measurement (WT, BMI, WHR) were recorded weekly. Along this electronic muscle exerciser is used to exercise the muscle by passing an impulse through the muscle, which stimulates the muscle (motor nerves control muscle activity). For active exercise walk and yoga methods was used.

### ■ RESEARCH FINDINGS AND DISCUSSION

One hundred eighty subjects both male and female attending the weight reduction clinic was selected for

the present study. The general information of the survey group obtained through a structured questionnaire.

Pre-intervention results pertaining to anthropometric measurements as obtained in present study are given in Table 1 to 8.

### Dietary intake:

The nutritional status of any individual is directly affected by his/her food intake. The components of the diet should be chosen judiciously so that it provides all the nutrients in adequate amount and in proper proportion

**Table 1 : Anthropometric measurements of the subjects**

Sr. No	Body measurements	Mean ± SE	
		Male	Female
1.	Weight (kg)	85.6 ± 9.6	72.83 ± 11.1
2.	Height (cm)	173.2 ± 6.8	161.72 ± 6.7
3.	BMI (kg/m <sup>2</sup> )	28.3 ± 1.9	28.06 ± 1.9
4.	WHR	0.96 ± 0.12	0.86 ± 0.05
5.	Body composition		
	Fat (%)	33.8 ± 0.6	39.4 ± 0.6
	Body fat mass(kg)	30.1 ± 0.8	27.9 ± 0.9
	Total body water(kg)	29.9 ± 0.9	27.9 ± 0.9
	Fat free mass(kg)	50.5 ± 0.6	40.6 ± 0.6

**Table 2 : Mean ± SE values of food intake of females**

Sr. No.	Food groups	Balanced diet	Mean±SE	% to BD*
1.	Cereals (g)	270	170.2±4.6	63
2.	Pulses (g)	60	28.3±1.7	47.1
3.	Leafy vegetables (g)	100	36.2±5.6	36.2
4.	Roots and tubers (g)	100	125±6.9	125
5.	Other vegetables (g)	100	89.7±8.5	89.7
6.	Fruits (g)	100	72.5±9.9	72.5
7.	Milk and its products (ml)	400	151.2±6.8	50.4
8.	Sugars (g)	20	51.2±0.7	256
9.	Fat and oils (g)	20	91±1.5	455

\*BD- Balanced diet

**Table 3 : Mean ± SE values of food intake of males**

Sr. No.	Food groups	Balanced diet	Mean±SE	% to BD*
1.	Cereals (g)	350	290±2.8	83.4
2.	Pulses (g)	70	40.8±3.5	61.4
3.	Leafy vegetables (g)	100	46.2±1.1	47
4.	Roots and tubers (g)	100	145±6.9	151
5.	Other vegetables (g)	100	48.2±9.0	57
6.	Fruits (g)	100	70.2±8.9	71.5
7.	Milk and its products (ml)	600	229.7±32.5	43.5
8.	Sugars (g)	30	50.2±9.8	196.6
9.	Fat and oils (g)	35	90.5±1.0	450

\*BD- Balanced diet

(ICMR, 2010).

### Food intake:

In the present investigation food intake of subjects was studied by “24 hour recall method”.

### Nutrient intake:

Life cannot be sustained without adequate nourishment. Man needs sufficient food for growth, development and to lead an active and healthy life (ICMR, 2010).

Table 4 and 5 indicates that diet of male and female obese subjects was higher in energy, fat and carbohydrates, as compared to respective recommended values, slightly inadequate in calcium, iron, riboflavin and niacin whereas extremely low in fibre and protein. It indicates that fruits, green leafy vegetables, pulses need to be increased in the diet of subjects under study.

During intervention phase, each subject was counselled and monitored weekly. Results revealed that greater per cent of the subjects (70 %) lost half kg weight in the first week, so similar diet plan was given for next week whereas 30 per cent subjects did not lose weight, in this case energy was further reduced by 100 kcal. Those subjects who did not reduce the weight during the prior week, all of them began to lose in the second week. Only one female was found to be started losing weight by third week of intervention. Diet plan was given to the subjects till reduction in BMI unit was similar with the observation recorded in case of individuals on crash diet.

Physical activity is a key determinant of energy expenditure and thus is fundamental to energy balance and weight control. Therefore, approximate time spent on various physical activities by the subjects was also studied to have an idea about the general lifestyle pattern of the subjects.

Sr. No.	Nutrient intake	RDA	Mean $\pm$ SE	% to RDA
1.	Energy (Kcal)*	1900	2053.4 $\pm$ 291.5	108.0
2.	Protein (g)*	55	39.5 $\pm$ 0.6	9.6
3.	Fat (g)*	20	105.6 $\pm$ 2.6	291
4.	Carbohydrates (g)*	400	252.1 $\pm$ 3.9	102.6
5.	Fibre (g)	20	7.2 $\pm$ 0.1	36.4
6.	Calcium (mg)	600	268.4 $\pm$ 50.5	44.66
7.	Iron (mg)	31	10.69 $\pm$ 3.75	34.1
8.	Thiamin (mg)*	1.0	0.44 $\pm$ 0.17	44.0
9.	Riboflavin (mg)*	1.1	0.52 $\pm$ 0.17	47.2
10.	Niacin (mg)*	10.8	8.31 $\pm$ 2.7	78.8
11.	Vitamin C (mg)	40	20.58 $\pm$ 7.8	51.2

RDA- Recommended dietary allowance suggested by ICMR, 2010

\*Khanna *et al.* (2003)

Sr. No.	Nutrient intake	RDA	Mean $\pm$ SE	% to RDA
1.	Energy (Kcal)*	2320	2438 $\pm$ 398.1	105.0
2.	Protein (g)*	60	119.1 $\pm$ 22.4	198.3
3.	Fat (g)*	25	62.07 $\pm$ 62.6	248
4.	Carbohydrates (g)*	400	330.12 $\pm$ 52	82.5
5.	Fibre (g)	20	10.78 $\pm$ 4.2	53.9
6.	Calcium (mg)	600	322.5 $\pm$ 64.8	53.66
7.	Iron (mg)	17	9.99 $\pm$ 2.23	58.7
8.	Thiamin (mg)*	1.2	0.68 $\pm$ 0.15	56.6
9.	Riboflavin (mg)*	1.4	0.74 $\pm$ 0.21	52.8
10.	Niacin (mg)*	16	9.61 $\pm$ 2.79	60.0
11.	Vitamin C (mg)	40	15.66 $\pm$ 4.3	39.1

RDA- Recommended dietary allowance suggested by ICMR, 2010

\*Khanna *et al.* (2003)

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Electronic muscle exerciser was also used to exercise the muscle by passing an impulse through the muscle, which stimulates the muscle (motor nerves control muscle activity). Results pertaining to effect of nutrition complete life style modification programme as obtained in present study are given in Table 6.

Globally, men and women face markedly different risks of obesity. In all but of handful of countries, obesity is much more prevalent among women than men. Globally, men and women face different risks of obesity. Table 8 shows gender wise Comparative effect of diets on body composition its shows that the average reduction in fat per cent was significantly greater in the Male group than Female group. With regard to fat loss, also there was a trend towards greater loss of fat mass in the Male group than Female. Table 8 also exhibits that the Male and female group obtained same increments in fat free mass (+ 1.2 %) and total body water (+ 0.3 %) but the significance difference between the groups was observed

in fat mass, body fat per cent and fat free mass.

### Conclusion :

This study looked at to find out the gender difference in the effectiveness of nutrition and complete lifestyle modification package on overweight adult people. It reveals that there are some important gender-specific associations with the risk of overweight. In the present study it was found that the weight loss was enhanced with inclusion of diet and exercise along with electronic devices which are in agreement with the results from a meta –analysis. This indicates superiority of the use of diet on diet exercise in reducing obesity during the period of treatment.

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Table 6 : Effect of nutritionally balanced weight loss diet intervention on body composition of females				
Body composition	Mean ± SE			Paired 't' value
	Before intervention	After intervention	Increase/decrease after intervention	
Body fat (%)	33.83±4.6	32.2±4.5	- 1.59	3.73
Fat mass (kg)	27.4±1.5	24.5±1.4	- 2.9	7.51**
Total body water (kg)	30.9±0.6	31.2±0.6	+ 0.3	1.18NS
Fat free mass (kg)	39.9±1.1	41.1±1.1	+ 1.2	5.90**

\*\* indicates significance of value at P=0.01 level  
NS=Non-significant

Table 7: Effect of nutritionally balanced weight loss diet intervention on body composition of males				
Body composition	Mean ± SE			Paired 't' value
	Before intervention	After intervention	Increase/decrease after intervention	
Body Fat (%)	31.10±3.2	29.26±4.1	- 1.84	2.36**
Fat mass (kg)	27.4±1.5	24.5±1.4	- 2.9	7.51**
Total body water (kg)	30.9±0.6	31.2±0.6	+ 0.3	1.18NS
Fat free mass (kg)	39.9±1.1	41.1±1.1	+ 1.2	5.90**

\*\* indicates significance of value at P=0.01 level  
NS=Non-significant

Table 8 : Gender wise comparative effect of diets on body composition of males and females subjects				
Body composition	Group	Pre-intervention	Post-intervention	% change
Fat per cent	I Male	31.10±3.2	29.2±4.1	- 1.84
	II Female	33.83±4.6	32.2±4.5	-1.59
Fat mass (kg)	I Male	24.4±1.5	21.5±1.4	- 3.0
	II Female	27.4±1.5	24.5±1.4	-2.9
Fat free mass (kg)	I Male	39.9±1.1	41.1±1.1	+1.2
	II Female	37.9±1.1	39.1±1.1	+1.2
Total body water (kg)	I Male	30.9±0.6	31.2±0.6	+0.3
	II Female	30.9±0.6	31.2±0.6	+0.3

cooperation.

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