



ASSESSMENT OF NUTRITIONAL STATUS OF OBESE GYM GOERS

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ABSTRACT

Present study deals with the nutritional assessment of obese gym goers in an urban area of Nagpur city within middle to high class community. Sample size consisted of 100 obese gym goers (females: n=40 & males: n=60). The nutritional status was determined through anthropometric measurements & dietary intake. 24 hours dietary recall history was followed to know subject's food intake based on which nutrient intake was calculated. Comparisons were done with reference standards & recommended dietary allowances (RDAs). Mean values of waist circumference & waist to hip ratio of females & males were found to be significantly greater as compared to the reference values. Majority of subjects were found to be non-vegetarian. Mean intake of energy & protein by females & males was found to be deficient. Among females, with the exception of intake of carotene, mean daily intake values of thiamine, riboflavin, niacin & vitamin C were found to be higher than RDAs. Among males, mean daily intake of niacin & vitamin C were found to be exceeding the RDAs. Family history of obesity was noticed. Both female and male subjects were following regular exercise regimen however, the majority of subjects were seen to be following cardio and weight training exercise pattern. To reach an ideal body weight and to achieve a true weight loss, there is a need to improve food choices. Lifestyle modification with regular exercise is needed to lead sound healthy life.

Keywords: Obese gym goers, anthropometric measurements, RDAs, exercise schedule.

INTRODUCTION

Overweight and obesity are growing global health concerns. Strategies to control obesity emphasize obesity management and weight reduction as well as obesity prevention. In the United Kingdom, a national strategy report recommends that the

management of obesity be an integral part of clinical practice. This envisages that persons may transit from obesity to a more healthy body weight. A target of 5% body weight loss is often recommended for obese individuals who intend to lose weight. However, access to weight



management interventions may be limited, and weight management interventions have only small and poorly maintained effects on body weight (Fildes, A. et al., 2015). The prevalence of obesity in India is estimated to be 5%. According to NFHS survey in 2007 in Karnataka, the prevalence of obesity in males is 14% & in females it is 17.3%. These figures seem to be increasing. Obesity is not just limited to urban & affluent society, but also affects the rural places & persons belonging to lower socio economic strata (Aswathappa, J. et al., 2014).

Obesity is a pathological condition in which excess body fat is accumulated, leading to adverse effects on health and life expectancy. It is a chronic disorder with complex interaction between genetic and environmental factors. It characterized by high cholesterol, fatty acid levels; imbalance in metabolic energy; insulin desensitization; lethargy, gallstones; high blood pressure; shortness of breath; emotional and social problems; and excessive

adipose mass accumulation with hyperplasia and hypertrophy. Pathological obesity is associated with several secondary commodities like heart disease, type 2 diabetes, breathing difficulties during sleep, cancer and osteoarthritis. It is most commonly caused by a combination of excessive dietary calories, lack of physical activity, and genetic susceptibility. Evidence to support this view is that some obese people eat little yet gain weight due to slow metabolic rate. The primary treatment for obesity is dieting and physical exercise. To supplement this, or in case of failure, anti-obesity drugs may be taken to reduce appetite or inhibit fat absorption. In severe cases, surgery is performed or an intragastric balloon is placed to reduce stomach volume and/or bowel length, leading to earlier satiation and reduced ability to absorb nutrients (Gupta, P. et al., 2011).

Controlled eating with regular exercise is one of the best



treatment options to deal with obesity. Balanced energy deficit diet coupled with aerobic exercises can lead to gradual & steady weight loss. Now-days, owing to modernization & changed eating habits, weight gain is common. Hence, burning extra body fat is becoming tough for which gym is the easier option people are following. Present study is an attempt to assess nutritional status of obese gym goers.

METHODOLOGY

Present study had dealt with assessment of nutritional status of obese subjects attending regular gym.

Study Area & Sample Selection

The present study was conducted in Nagpur city of Maharashtra in India. Sample population comprised of overweight/obese men and women regularly attending gym. For this study, a total sample of 100 was selected. Sixty males and forty females aged 18 to 55 yrs were purposively selected.

Anthropometric Measurements

Measurements like height, weight, waist & hip circumferences were recorded using standard procedures & equipments.

Dietary Information & Nutrient Intake

24 hour's dietary recall method was used to know food intake of each subject. Based on this, nutritive values of diets consumed by subjects were calculated (Gopalan et al., 2012) and compared with RDAs.

Exercise Schedule

Information about exercise regimen followed by subjects in the gym was noted.

Statistical Analysis

Data was gathered and tabulated. Mean, standard deviation, range and percentage were derived. Comparisons were made with standard anthropometric measurements & RDAs using "z" test. Conclusions were drawn at both 5% and 1% levels of significance.

RESULTS AND DISCUSSION

Anthropometric Measurements

Table 1 shows data on body measurements of subjects.



Height: 140 cm was the lowest value of height & 162.56 cm was the highest value of height among the female subjects whereas 152 cm was the lowest height noted in the male subjects and 190.50 cm was the highest height noted in the male subjects (Table 1).

Weight: Weight is the critical measure in nutrition assessment. An increased body weight results from an imbalance between energy intake (food) and energy expenditure. It can be seen that there was major difference between the mean values of weight of both male and female subjects. Irrespective of age, it was noted that all women & men were found to be obese. The mean values of body weight of women & men were found to be significantly higher than ideal body weight for height ($z=14.56$ & 18.93 , respectively). This difference was found to be significant at both 5% & 1% levels. % excess was calculated as 46.39 for females & 31.13 for males (Table 1).

Body Mass Index (BMI): BMI is the more accurate measure of body

fat than weight alone. It is quickest and most accepted measure of obesity. The BMI defines the level of adiposity according to the relationship of weight and height. All subjects had BMI above 25 kg/m^2 . The minimum & maximum values of BMI were $25.19\text{-}39.97 \text{ kg/m}^2$ for females & $25.95\text{-}42.90 \text{ kg/m}^2$ for males (Table 1).

Waist Circumference: Waist circumference is an indicator of health risk associated with excess fat around the waist. People with the large waist circumference as compared to the standard values are at the risk of type 2 diabetes, heart disease and high blood pressure. From Table 1, it is seen that males showed greater mean waist circumference value than females. The mean values of waist circumference of females & males were found to be significantly greater as compared to the reference values and these differences were found to be significant at both 5% and 1% levels ($p<0.01$; $z=9.43$ & 16.62 , respectively). % excess was



calculated as 8.89 for females & 1.94 for males (Table 1).

Hip Circumference: The hip region is located lateral and anterior to the gluteal region i.e. the buttock. Obese individuals have high hip circumference as compared to the normal individuals. It can be observed from Table 1 that there is difference between the mean values of this measure of both female and male subjects, male subjects were having greater hip circumference as compared to the female subjects. Individual differences were noted for this measurement (minimum & maximum values for females & males were recorded as 85.00-125.00 cm & 94.00-139.00 cm, respectively).

Waist to Hip Ratio (WHR): WHR differentiates between android and gynoid obesity. The android obesity also known as apple shaped fat distribution refers to the centric fat distribution pattern with increased deposition towards the abdominal and waist area while gynoid obesity/pear shaped obesity refers

to the fat distribution at the hips and thighs. The greater WHR may indicate obesity related diseases such as diabetes mellitus, heart disease etc. It can be observed from Table 1 that the mean values of WHR for female & male subjects were found to be higher than standards, however, these differences were found to be insignificant at both 5% & 1% levels ($z=0.03$ & 1.27 , respectively, $p>0.05$). % excess was calculated as 18.67 for females & 4.71 for males.

Dietary Information

Food habits of people are mainly affected by their religious and cultural beliefs, likes and dislikes of an individual, eating pattern of family and lastly the socio-economic status of an individual. For this study, majority of subjects (72% females and 75% males) were non vegetarians. 65% and 63% female and male subjects were consuming non vegetarian foods weekly.

47% females & 41% males reported weekly consumption of fast foods. 13% & 27% females &



males consumed fast foods daily. 30% & 32% females & males had fast food consumption fortnightly.

25% and 8% females & males preferred Chinese foods frequently whereas 20% females & 47% males preferred Indian cuisine. About 15 to 37% subjects consumed junk & fast foods regularly.

Consumption of green leafy vegetables is good for obese individuals as they are low in fat, high in dietary fiber and rich in water soluble vitamins such as vitamin C, carotene, folic acid and vitamin B complex. For this study, it was noted that that about 27% females & 35% males consumed green leafy vegetables weekly. 33% females & 23% males reported monthly consumption of green leafy vegetables. 40% and 32% female and male subjects reported consumption of green leafy vegetables fortnightly, respectively.

Consumption of fresh fruits is very beneficial for the obese individuals as they provide less calories and are low in fat, high in dietary fiber and rich in water

soluble vitamins such as vitamin C and vitamin B complex and antioxidants that promotes weight loss. 85% female and 92% male subjects reported everyday consumption of fresh fruits whereas 15% female and 8% male subjects reported weekly consumption of fresh fruits.

Only 7% female and 5% male subjects had everyday consumption of sprouts. 32% female and 35% male subjects had fortnight consumption of the sprouts.

Consumption of low energy salads & unstrained soups are good sources of insoluble fiber which keeps the digestive tract healthy. Consumption of salads helps in losing weight as they are low in calories, fat and high in micronutrients. Consumption of salads & soups helps in fulfilling the feeling of satiety. For this study, 67% female and 72% male subjects reported daily consumption of the low energy salads.

The consumption of soup before meals is very beneficial in



obese individuals to lose weight as it gives feeling of fullness & hence, helps reducing hunger. Homemade soups are comparatively more beneficial than canned soup because canned soups are high in sodium. 30% female and 42% male subjects reported monthly consumption of soups. 28% subjects consumed soup weekly.

Nutrient Intake

Table 2 shows the data on mean daily intake of energy and energy giving nutrients by subjects.

Energy: Energy intake is a key factor which determines the outcome of dietary management for overweight/obese individuals. The male subjects under this study were having higher energy intake as compared to the female subjects because of the consumption of energy drink before workout. As compared to RDAs, both females & males showed significantly ($p < 0.01$) lower mean energy intake values ($z = 21.13$ & 43.59 , respectively, Table 2). It was noted that these gym goers were kept on diet

restrictions for faster weight loss. This was the reason for having deficient energy intake. The lowest value of energy intake among females & males was 1000 kcal & 1015 kcal, respectively. The highest value of energy intake among females & males was 1654 kcal & 1810 kcal, respectively. % deficit was calculated as 31.92 & 42.55 for females & males, respectively.

Carbohydrate: There was no markable difference for the mean values of both the female and male subjects as far as carbohydrate intake is concerned. Female subjects were having slightly higher mean carbohydrate intake as compared to males. No greater differences were noted for minimum & maximum carbohydrate intake values for females & males (Table 2).

Protein: Adequate amount of protein should be included in the diet to ensure proper metabolism and prevent weakness which is usually experienced by persons after weight loss which is achieved by consuming an unbalanced diet.



There was a slight difference noted between the mean values of protein intake of female and male subjects; males showed higher intake than females (50.30 ± 8.26 g & 48.63 ± 8.21 g, respectively, Table 2). Mean protein intakes of both male and female subjects were lower than the RDAs. This difference was significant at both 5% & 1% levels ($z=4.90$ & 9.09 , respectively for males & females). % deficit was calculated as 11.58 & 16.17 for females & males, respectively. It was noted that subjects consumed protein shakes before and during workout.

Fat: Fat, being a concentrated source of energy, needs to be restricted for obese persons. Excess dietary fat promotes much more weight gain than carbohydrates or protein of the same amount. From Table 2, it can be seen that there was no major difference in mean values of fat intake by female and male subjects. However, very high individual differences were noted for fat intake, with minimum values were recorded as 26 g & 30

g & maximum values were recorded as 60 g & 75 g, respectively for females & males.

Fatty Acids & Cholesterol: An attempt was made to derive fatty acid content [saturated fatty acids (SFA), polyunsaturated fatty acids (PUFA) & monounsaturated fatty acids (MUFA)] of the diets consumed by subjects (Table 3).

The lowest value of SFA was recorded as 3.00 g whereas the highest value was recorded as 38.50 g. There was a slight difference between the mean PUFA intake values of female and male subjects. The minimum value of PUFA was recorded as 5.00 g whereas the maximum value was recorded as 16.80 g. Mean MUFA intake by females & males did not show variations (Range: 2.00 to 18.00 g). Mean intake of dietary cholesterol was higher among males than females as also shown in Table 3.

Correlation Coefficient between Anthropometric Measurements & Major Nutrient Intake

An attempt was made to derive correlates of anthropometric measurements & energy & energy



yielding nutrients & data is presented in Table 4.

Energy intake was positively correlated with body weight, BMI & waist circumference ($r=0.0181$ to 0.2719 for females & $r=0.0320$ to 0.2221 for males, Table 4). It is clear from Table 4 that all indicators of obesity showed direct relationship with consumption of calories; hence, confirming the fact that energy intake is a primary causative factor in gaining weight & deposition of fat.

Similar to energy intake, major energy giving nutrients - carbohydrate & fat also showed positive relationship with these indicators of obesity. When consumed in excess, carbohydrates are stored as adipose tissues in the body. Protein intake among females & males depicted positive correlations with weight & BMI (Table 4). This could be attributed to development of muscle mass which adds body weight.

Waist circumference showed positive correlation with weight, which means that increase in body

weight also increased the circumference (Table 4).

Intake of Vitamins: Table 5 shows data on daily intake of vitamins by female and male subjects.

Intake of micronutrients should not be restricted while losing body weight. All vitamins should be consumed as per the requirements, otherwise deficiencies can occur. From Table 5, it can be noted that among females, with the exception of intake of carotene, mean daily intake values of thiamine, riboflavin, niacin & vitamin C were found to be higher than RDAs. The differences were found to be significant for thiamine, niacin & vitamin C at both levels i.e. 5% & 1% ($z=2.83$, 5.74 & 3.73 , respectively). % excess was calculated as 22.00, 33.75 & 13.63, respectively. Mean intake of carotene by females was found to be highly deficient in comparison with RDA ($z=21.48$, % deficit: 47.27, Table 5).

Among males, mean daily intake of niacin & vitamin C were



found to be exceeding than RDAs ($z=5.68$ & 4.15 , %excess: 39.00 & 146.70 , respectively). Mean daily intake of carotene, thiamine & riboflavin by males were found to be deficient ($z=27.30$, 1.72 & 4.78 ; % deficit: 40.03 , 8.33 & 21.43 , respectively, Table 5).

It is very important for obese persons to consume all vitamins in daily diet as per requirements.

Intake of Minerals: Table 6 shows data on daily intake of minerals by female and male subjects.

Consumption of potassium was significantly deficient among females & males ($z=9.89$ & 11.38 ; % deficit: 27.44 & 30.01 , respectively, Table 6). Mean daily consumption of calcium, phosphorus & sodium by females & males was found to be excess than RDAs ($z=5.28$ & 13.33 ; 16.44 & 16.40 & 3.49 & 4.43 ; % excess: 119.56 & 269.83 ; 251.26 & 314.78 & 19.28 & 20.39 , respectively). Women require additional calcium during premenopausal stage to avoid the occurrence of osteoporosis. Also, women require sufficient iron intake. But here, in

this study, it was found that females consumed significantly lower mean daily iron intake ($z=4.40$ & % deficit: 22.38). Mean daily iron intake by males was found to be in excess (Table 6).

Daily intake of important minerals should be upto the RDAs otherwise deficiency can cause serious health issues.

Intake of Fiber: Table 7 shows intake of total dietary fiber (TDF), soluble dietary fiber (SDF) & insoluble dietary fiber (IDF) by female and male subjects.

It can be observed from Table 7 that there occurred slight difference between the mean values of TDF, SDF & IDF for both female and male subjects.

Family History of Obesity: Figures 1 & 2 show percentage wise distribution of female and male subjects based on family history of obesity.

Obesity is genetically transmitted. Genetics play important role in the development of obesity. For this study, from Figures 1 & 2, it is seen that 40% and 56% mothers of females &



males were obese, respectively. 15% fathers of males were obese. 37% fathers of females were obese. 45% and 7% females & males respectively said that there was no history of obesity. Majority of females & males under this study were obese since childhood. Few females gained weight post delivery.

Exercise Schedule: The physical exercise can be effectively used in the combination with mild dietary restriction for an effective loss of body fat. Exercise enhances the mobilization and breakdown of fat from the body's adipose deposits. Exercise helps in improving fitness, improving psychological state, changing body composition, controlling weight, improving physical work capacity or stamina etc. however, it becomes very important to have a regular exercise schedule for a true weight loss. For this study, 90% and 80% female and male subjects were having regular exercise schedule whereas 10% females and 20% males were having irregular exercise schedule.

Data on types of exercise performed by subjects is shown in Figures 3 & 4.

Basically in the gym from where this survey was done, there were various types of machines available according to the exercise regime of the subjects. The types of exercises that have been commonly followed by the both female and male subjects were cardio exercise, weight training exercise and aerobics exercise. The cardio exercise consists of different machines and warm up exercises such as treadmill, stair mill, recumbent bike, spin bike, elliptical, ARC trainer, skierg etc. and weight training exercise consist of various machines depending upon the upper and lower body workout such as abdominal bench, barbells, cables and pulleys, dipping bars, dumb bells, hack squat machine, hyper extension bench, incline bench press, lat pulldown machine, leg abduction machine, leg curl machine, leg extension machine, pull up bar, squat rack etc. whereas, aerobic exercises consist



of boxing and Zumba. It can be noted from Figures 3 & 4 that about majority of females (72%) & males (78%) females & males were doing cardio and weight training exercise.

Intensity of Exercise: The intensity of exercise plays a vital role in the weight loss; however, there are various factors that influence the intensity of exercise such as age, gender physical health and physical strength. About 22% and 18% female and male subjects were doing low intensity exercise, respectively whereas, 60% both the female and male subjects were doing medium intensity exercise. 15% and 25% female and male subjects were doing high intensity exercise, respectively. Only 3% of female subjects were doing extremely low intensity exercise because of their health problems.

Duration of Exercise: Time duration of exercise plays an important role in weight loss process. The time duration of exercise is influenced by various factors such as age, gender, physical health, physical strength and the intensity of exercise. It was observed that majority of female subjects were doing their daily exercises for 60 to 90 minutes whereas majority of male subjects were doing their daily exercises for 90 to 120 minutes. The timing for exercise for each subject was fixed by their trainers.

From the results of the study, it is concluded that management of obesity requires short term as well as long term goal setting. Balance energy deficit diet coupled with exercise regimen, lifestyle modification & eating behaviour modification is the requirement for sound weight loss.

**Table 1: Data on anthropometric measurements of subjects**

Sr. No.	Parameters	M ± SD	Range	Standards	z Values	% Excess
I	FEMALES (n=40)					
1	Height (cm)	157.12±4.42	140.00-162.50	-	-	-
2	Weight (kg)	76.30±9.25	53.00-90.00	52.12	14.56*	+46.39
3	BMI (kg/m ²)	31.12±3.73	25.19-39.97	-	-	-
5	Waist circumference (cm)	98.00±8.79	76.00-114.30	90	9.43*	+8.89
6	Hip circumference (cm)	109.26±9.17	85.00-125.00	-	-	-
7	Waist to Hip Ratio	0.89±0.95	0.89-0.91	0.75	0.03	+18.67
II	MALES (n=60)					
1	Height (cm)	169.29±7.93	152.00-190.50	-	-	-
2	Weight (kg)	90.86±10.58	72.00-124.00	69.29	18.93*	+31.13
3	BMI (kg/m ²)	31.86±3.39	25.95-42.90	-	-	-
5	Waist circumference (cm)	101.94±8.12	86.50-121.00	100	16.62*	+1.94
6	Hip circumference (cm)	113.86±9.48	94.00-139.00	-	-	-
7	Waist to Hip Ratio	0.89±0.85	0.91-0.87	0.85	1.27	+4.71

Values in italics & in parenthesis indicate z values; * - Significant at both 5 % and 1% levels ($p < 0.01$); ** - Significant at 5 % level but insignificant at 1 % level ($0.01 < p < 0.05$); Values without any mark indicate insignificant difference at both 5% & 1% levels ($p > 0.05$).

Table 2: Data on daily intake of energy & energy giving nutrients by subjects

Sr. No.	Nutrients	M ± SD	Range	RDAs	z values	% Deficit
I	FEMALES (n=40)					
1	Energy (kcal)	1293.40±181.53	1000.00-1654.00	1900	21.13*	-31.92
2	Carbohydrates (g)	186.24±39.24	125.00-260.00	-	-	-
3	Protein (g)	48.63±8.21	30.00-60.00	55.0	4.90*	-11.58
4	Fat (g)	45.76±9.17	26.00-60.00	-	-	-
II	MALES (n=60)					
1	Energy (kcal)	1332.77±175.40	1015.00-1810.00	2320	43.59*	-42.55
2	Carbohydrates (g)	180.53±29.95	120.00-250.00	-	-	-
3	Protein (g)	50.30±8.26	30.00-70.00	60.0	9.09*	-16.17
4	Fat (g)	45.75±11.38	30.00-75.00	-	-	-

* - Significant at both 5 % and 1% levels ($p < 0.01$); ** - Significant at 5 % level but insignificant at 1 % level ($0.01 < p < 0.05$); Values without any mark indicate insignificant difference at both 5% & 1% levels ($p > 0.05$).

Table 3: Data on daily intake of SFA, PUFA, MUFA & cholesterol by subjects

Sr. No.	Nutrients	Females (n=40)		Males (n=60)	
		M ± SD	Range	M ± SD	Range
1	SFA (g)	18.52±9.20	5.00-38.50	15.10±7.50	3.00-35.00
2	PUFA (g)	10.87±2.43	6.50-16.00	9.37±2.38	5.00-16.80
3	MUFA (g)	10.25±3.70	4.00-18.00	10.18±3.06	2.00-18.00
4	Cholesterol (mg)	8.94±3.94	3.00-18.00	12.15±6.24	4.00-34.00



Table 4: Coefficient of correlation between anthropometric measurements & major nutrient intake

FEMALES							
Parameters	Weight	BMI	Waist Circumference	Energy Intake	Carbohydrate Intake	Protein Intake	Fat Intake
Weight	1						
BMI	0.8534	1					
Waist circumference	0.5002	0.4374	1				
Energy Intake	0.1392	0.0181	0.0886	1			
Carbohydrate Intake	0.0192	0.0924	0.0485	0.8785	1		
Protein Intake	0.0460	0.0000	-0.1066	0.3980	0.2373	1	
Fat Intake	0.1519	0.0728	0.0807	0.5430	0.4781	0.5429	1
MALES							
Parameters	Weight	BMI	Waist Circumference	Energy Intake	Carbohydrate Intake	Protein Intake	Fat Intake
Weight	1						
BMI	0.6433	1					
Waist circumference	0.0259	0.0059	1				
Energy Intake	0.0944	0.0402	0.0320	1			
Carbohydrate Intake	0.1251	0.0412	0.0560	0.9147	1		
Protein Intake	0.0413	0.0536	0.1043	0.5261	0.4366	1	
Fat Intake	0.1738	0.1553	0.1318	0.7108	0.5280	0.1867	1

Table 5: Data on daily intake of vitamins by female & male subjects

Sr. No.	Vitamins	M ± SD	Range	RDAs	z values	% Excess /Deficit
I FEMALES (n=40)						
1	Carotene (µg)	2530.84±667.97	1105.00-3600.00	4800	21.48*	-47.27
2	Thiamine (mg)	1.22±0.49	0.70-3.00	1.0	2.83*	+22.00
3	Riboflavin (mg)	1.29±0.82	0.58-4.56	1.1	1.46	+17.27
4	Niacin (mg)	16.05±4.46	8.00-35.00	12	5.74*	+33.75
5	Vitamin C (mg)	45.45±9.23	25.00-70.00	40	3.73*	+13.63
II MALES (n=60)						
1	Carotene (µg)	2878.49±859.88	1120.00-4500.00	4800	17.30*	-40.03
2	Thiamine (mg)	1.10±0.45	0.12-3.00	1.2	1.72	-8.33
3	Riboflavin (mg)	1.10±0.49	0.40-4.00	1.4	4.74*	-21.43
4	Niacin (mg)	16.68±5.21	8.00-31.00	12	5.68*	+39.00
5	Vitamin C (mg)	98.68±109.35	13.00-780.00	40	4.15*	+146.70

* - Significant at both 5 % and 1% levels (p<0.01); ** - Significant at 5 % level but insignificant at 1 % level (0.01<p<0.05); Values without any mark indicate insignificant difference at both 5% & 1% levels (p>0.05).

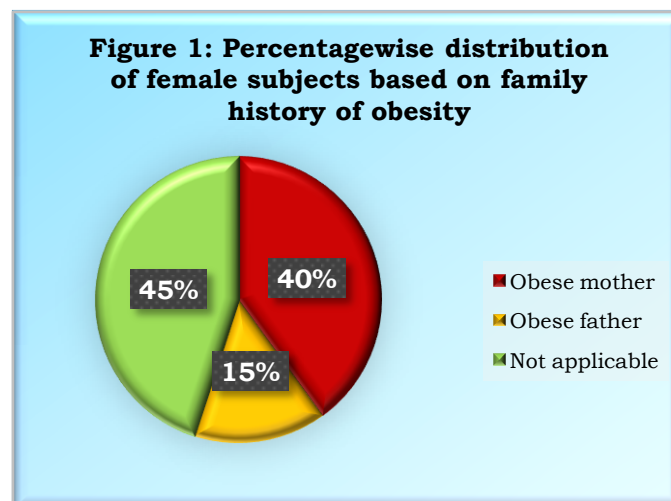
**Table 6: Data on daily intake of minerals by female & male subjects**

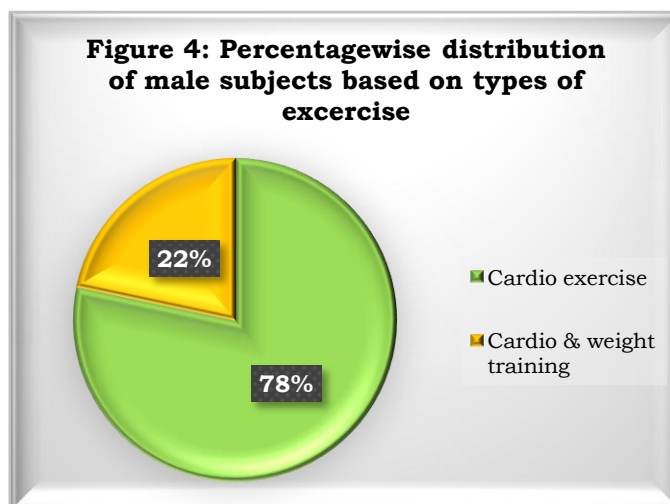
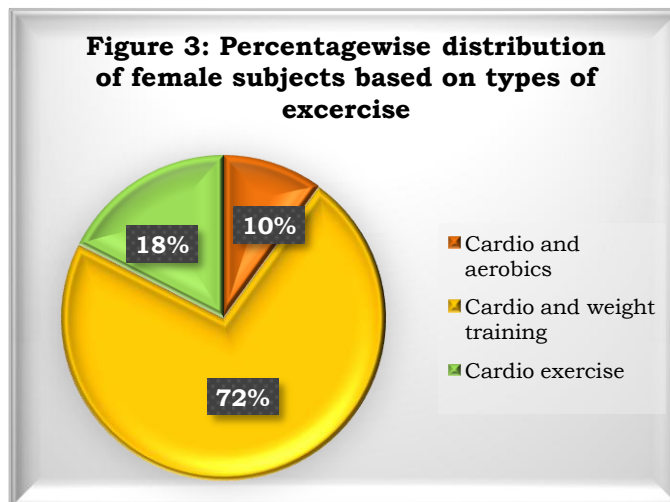
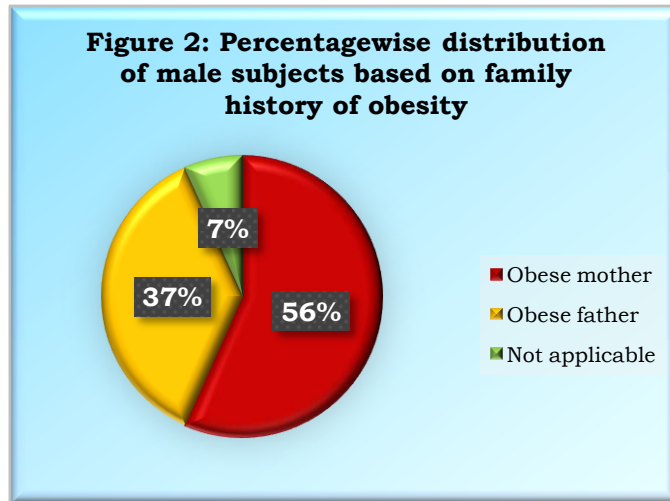
Sr. No.	Minerals	M ± SD	Range	RDAs	z values	% Excess/Deficit
I FEMALES (n=40)						
1	Calcium (mg)	1317.34±857.80	450.00-3500.00	600	5.28*	+119.56
2	Phosphorus (mg)	2107.58±579.92	890.00-3452.00	600	16.44*	+251.26
3	Iron (mg)	16.30±6.75	7.00-36.00	21	4.40*	-22.38
4	Sodium (mg)	2268.67±663.38	1100.00-3600.00	1902	3.49*	+19.28
5	Potassium (mg)	2339.98±565.43	1011.23-3901.00	3225	9.89*	-27.44
II MALES (n=60)						
1	Calcium (mg)	2219.88±940.74	60.00-4200.00	600	13.33*	+269.83
2	Phosphorus (mg)	2488.70±891.57	700.00-4600.00	600	16.40*	+314.78
3	Iron (mg)	18.98±5.11	11.00-30.00	17	3.00*	+11.65
4	Sodium (mg)	2518.53±745.53	940.00-4345.00	2092	4.43*	+20.39
5	Potassium (mg)	2624.48±765.56	560.00-4560.00	3750	11.38*	-30.01

* - Significant at both 5 % and 1% levels ($p < 0.01$); ** - Significant at 5 % level but insignificant at 1 % level ($0.01 < p < 0.05$); Values without any mark indicate insignificant difference at both 5% & 1% levels ($p > 0.05$).

Table 7: Data on daily intake of fiber by subjects

Sr. No.	Parameters	Females (n=40)		Males (n=60)	
		M ± SD	Range	M ± SD	Range
1.	TDF (g)	33.23±7.05	20.00-50.00	34.19±9.19	15.00-58.00
2.	SDF (g)	15.95±4.47	7.00-27.82	15.92±4.17	6.00-25.00
3.	IDF (g)	17.48±4.93	9.50-30.00	18.15±5.73	9.00-35.00







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