

Lifestyle Pattern of the Selected Obese Subjects in Coimbatore District

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Abstract: Obesity is primarily due to altered sedentary lifestyles, energy-dense diets and low-levels of physical activity. Industrialization and urbanization which lead to rise in standards of living, also promote weight gain and obesity rates begin to rapidly rise thus posing a growing threat to the health of the nation. A key factor in the progressive increase in the prevalence of obesity is sedentary lifestyle. The aim of this study was to assess the lifestyle pattern of obese subjects residing in Coimbatore city. A well-structured interview schedule was formulated to elicit information on the lifestyle practices followed by the selected subjects by using a pretested questionnaire. The data collected were systematically consolidated and statistically analyzed. Exercise plays a vital role in the management of the lifestyle disorders. It is necessary to educate the public about lifestyle modification and adopt appropriate exercise with healthy food habits for physical fitness.

Keywords: Obesity, Lifestyle habits, Coimbatore, overweight.

1. Introduction

Industrialization and urbanization which lead to rise in standards of living, also promote weight gain and obesity rates begin to rapidly rise thus posing a growing threat to the health of the nation. Now recognized as a serious medical problem, obesity affects about 30 per cent of adults, and about 14 per cent of children and adolescents in the United States. A sedentary lifestyle plays a significant role in obesity. Worldwide there has been a large shift towards less physically demanding work, and currently at least 60% of the world's population gets insufficient exercise. This is primarily due to increasing use of mechanized transportation and a greater prevalence of labour (8).

In adults, there appear to be declines in levels of physical activity due to less walking and physical education. World trends in active leisure time physical activity are less clear (2). Among the several strategies for obesity treatment, diet and exercise are considered useful for losing weight in moderately obese adults. However, it seems that even losing weight with these approaches, most obese individuals do not maintain the loss for long periods. Unfortunately, there are no accepted rules to guide interventions promoting behaviour and lifestyle changes for an effective and permanent weight loss (4).

2. Materials and Methods

A famous cardiac clinic namely Preetham Cardiac Care in Coimbatore, KR Hospital in Karamadai and KPS Hospitals in Mettupalayam town near Coimbatore were selected as venue for the present study. These hospitals were selected on the basis of easy accessibility and availability of adequate number of obese subjects and they were periodically visiting the hospital for their regular check-ups. The subjects visiting the hospital are from in and around Coimbatore district. For the study, 1000 subjects in the age group of 40- 60 years

from both sexes (571 women and 429 men) and whose BMI ≥ 30 and total cholesterol level ≥ 200 mg/dl based on their willingness to participate were selected for screening. All subjects gave their written consent to participate into this study which has been approved by the Human Ethical Committee of Avinashilingam University. (HEC.2011.29). The selected subjects were given orientation regarding the protocol of the study and also briefed on the modalities and purpose of the study.

A well-structured interview schedule was formulated to elicit background information about the selected subjects. The lifestyle pattern such as exercise pattern, smoking habits, alcoholic habits, consumption of tea, coffee, health drinks, tobacco, and pan masala were collected using the interview schedule. The data collected were systematically consolidated and statistically analyzed for arriving at the results of the dietary habits practiced among the selected obese subjects in Coimbatore district.

3. Results and Discussion

3.1 Body Mass Index

The Body Mass Index is used to assess how much an individual's body weight departs from what is normal or desirable for a person of his or her height. The WHO regards a BMI of less than 18.5 as underweight and may indicate malnutrition, an eating disorder, or other health problems, while a BMI greater than 25 is considered overweight and above 30 is considered obese (12). BMI was computed using height and weight and classified on the basis of NIN Methodologies (2012) and given in Table I.

Table 1: BMI grades of the selected subjects (n-1000)

BMI Classification* [1]	Obesity grade	Male (N-429)		Female (N-571)	
		No	%	No	%

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20.00-29.99	Pre obese (POB)	8	1.9	11	1.9
30.00- 32.49	Mild Obese class I (MO I)	238	55.5	319	55.9
32.50-34.99	Moderate Obese class I (MDO I)	115	26.8	140	24.5
35.00- 37.49	Mild Obese class II (MO II)	44	10.2	54	9.5
37.50-39.99	Moderate Obese class II (MDO II)	13	3	28	4.9
≥40.00	Obese class III (OB III)	11	2.6	19	3.3
Total		429	100	571	100

* ICMR, 2010(6)

According to BMI values the obesity grades were recorded from normal to obese class III. The above table reveals that around 55.5 per cent of male and 55.9 per cent of female were under the mild obese class I category and only 1.9 per cent of both male and female were in the pre obese category which is considered as "At risk of obesity". It is to be noted that 26.8 per cent of male and 24.5 per cent of female fell in the moderate obese class I, around 10.2 per cent of male and 9.5 per cent of female were in the mild obese class II as per the classification.

Similarly a worrying scenario in the study happened to be the fact that 2.6 per cent of male and 3.3 per cent of female were in the obese class III group whose BMI is ≥ 40.

3.2 Lipid Profile

Table II shows the mean lipid profile of the selected obese subjects.

Table 2: Lipid profile of the selected subjects (N=1000)

Lipid Profile (mg/dl)	Desirable Values* (mg/dl)	Male (N=429)	Female (N=571)
		Mean ± SD	
Total Cholesterol	< 200	194.5 ±73.5	219.4±78.6
Low density lipoprotein -C	< 130	124.1±67.9	145.4±73.4
High density lipoprotein-C	>50	42±10.5	42
Triglycerides	< 150	141.9 ±63.5	161.6±63.7
Very Low density lipoprotein-C	<30	28.4 ±12.7	32.4 ±12.8

*National Cholesterol Education Program, 2012 (9)

Mean total cholesterol levels were found to be 194.5 mg/dl for male and 219.4 mg/dl for female. Female had slightly higher total cholesterol levels than male which was greater than the desirable levels. The mean HDL- C and LDL- C of the selected subjects were recorded as 42.0 mg/dl and 124.1 mg/dl respectively for male and 42.0 mg/dl and 145.4 mg/dl respectively for females.

The mean triglycerides values of the selected subjects were noted as 141.9 mg/dl for male and for female it was recorded as 161.6 mg/dl. Similarly the mean VLDL values recorded were 28.4 mg/dl for male and 32.4 mg/dl for female. In general most of the female subjects had elevated lipid profile levels when compared to the desirable values.

3.3 Lifestyle Variables of the Selected Obese Subjects

Overweight and obesity are dangerous conditions as they can contribute to a number of different health problems (eg, heart disease and diabetes). It is therefore extremely important that obesity is treated aggressively. Lifestyle changes remain the mainstay of treatment and are important for the long term maintenance of weight loss (5). The lifestyle of the selected subjects such as activity pattern, exercise pattern, alcohol consumption, smoking habits, consumption of tea, coffee and health drinks are discussed in the following tables.

a. Activity pattern

Physical activity is essential to maintain ideal body weight by burning excess calories and is of vital significance for health and prevention of diseases. Consistent epidemiological evidences identify that physical activity is a major modifiable risk factor in reduction of non communicable chronic diseases (10).

A sedentary lifestyle is a type of lifestyle with no or irregular physical activity. A person who lives a sedentary lifestyle may colloquially be known as a couch potato. It is commonly found in both the developed and developing world. Sedentary activities include sitting, reading, watching television, playing video games, and computer use for much of the day with little or no vigorous physical exercise. Moderate activity includes brisk walking, stair-climbing, carrying small children, mopping floor, scrubbing the bathtub, car washing, general gardening and heavy activity includes playing at a fast pace, heavy gardening and other industrial works. The activity pattern of the selected obese subjects is recorded and presented below in Table III.

Table 3: Activity pattern of the subjects

Type of activity	Male (N - 429)		Female (N - 571)		Total (N - 1000)	
	N	%	N	%	N	%
Sedentary	162	37.8	182	31.9	344	34.4
Moderate	188	43.8	287	50.2	475	47.5
Heavy	79	18.4	102	17.9	181	18.1
Total	429	100	571	100	1000	100

Among the selected subjects sedentary activity was done by 37.8 per cent and 31.9 per cent of male and female respectively. With regard to the moderate activity pattern 43.8 per cent and nearly 50.2 per cent of male and female were doing moderate activity. It was shocked to note that heavy activity was done only by 18.4 per cent and 17.9 per cent of male and female subjects respectively. Overall picture of the selected obese subjects revealed that 34.4 per cent were doing sedentary activity, 47.5 per cent were doing moderate activity and only 18.1 per cent were following heavy activity and this is mainly because of their occupation like business and professionals.

Day-to-day activities like walking, housework and gardening will be beneficial not only in weight reduction but also for lowering of blood pressure and serum triglycerides. It also elevates HDL (good) cholesterol in blood. Simple modification in lifestyle like deliberately climbing up the stairs instead of using the lift and walking for short distance instead of using a vehicle could also immensely help in

increasing physical activity. A sedentary lifestyle can contribute to many preventable causes of death (10). Increasing amounts of physical activity may be necessary to maintain constant body weight of the individual with increasing age.

Sedentary lifestyle plays a significant role in obesity. Chiles and Van Wattum (2010) (2) states that worldwide there has been a large shift towards less physically demanding work, and currently at least 30 per cent of the world's population gets insufficient exercise. This is primarily due to increasing use of mechanized transportation and a greater prevalence of labor-saving technology in the home.

b. Exercise pattern

Physical exercise is any bodily activity that enhances or maintains physical fitness and overall health and wellness. Frequent and regular physical exercise boosts the immune system, and helps prevent the "diseases of affluence" such as heart disease, cardiovascular disease, Type 2 diabetes and obesity (3).

Physical exercise includes recreational or leisure-time physical activity, transportation (e.g walking or cycling), occupational (i.e. work), household chores, play, games, sports or planned exercise, community activities and exercise, in the context of daily life (12). Moderate exercises includes walking briskly, climbing steps, gardening, walking short distances for fetching milk and vegetables, bicycling, yoga and playing with children. Vigorous exercises includes running/jogging (5 miles per hour), bicycling (more than 10 miles per hour), swimming (freestyle laps), aerobics, walking (4½ miles per hour), weight lifting (vigorous effort), competitive sports, and heavy yard work such as digging, cutting wood (10).

The exercise patterns followed by the selected obese subjects were given below in Table IV. Physical activity helps to burn off excess fat. Regular physical activity combined with a healthy diet is the best way of reducing weight. From the selected 1000 subjects 94 subjects i.e 45 male and 49 female subjects were not doing any exercises. Among the subjects of those who were practicing regular exercises it was observed that, 30.77 per cent and 49.65 per cent of male carried out moderate intensity exercise for less than ½ an hour and more than ½ an hour respectively. In the case of female 32.57 per cent adopted light intensity exercise for less than ½ an hour and 43.08 per cent of subjects were doing moderate intensity exercise for more than ½ an hour. Meagre percent of subjects irrespective of the sexes did heavy or vigorous intensity exercises.

Table 4: Exercise pattern of the subjects

Duration (Hrs)	Male (N-429)				Female (N-571)			
	Moderate		Vigorous		Moderate		Vigorous	
	N	%	N	%	N	%	N	%
< ½	132	30.77	26	6.06	186	32.57	54	9.46
> ½	213	49.65	13	3.03	246	43.08	36	6.30
Total	345	80.42	39	9.09	432	75.65	90	15.8

The above results depicts that 50.8 per cent of the selected obese subjects strictly adopted exercise for more than half an hour as they were more health conscious, had an urge to

reduce weight and wanted to be free from other complications. But only 39.8 per cent of the selected subjects were following regular exercise for less than half an hour daily, the reasons were lack of time and their inability to adopt heavy physical activities and they were satisfied with light intensity exercise pattern. Strong evidence demonstrates that compared to less active obese subjects individuals who are more active have lower incidence of coronary heart disease, high blood pressure, stroke, Type 2 diabetes, metabolic syndrome, colon and breast cancer and depression. They are likely to have less risk of a hip or vertebral fracture, to exhibit a higher level of cardio-respiratory and muscular fitness and are more likely to achieve weight maintenance to have a healthier body mass and composition (12). Overall, people who do the recommended levels of physical activity can reduce their risk of premature death by 20-30 per cent.

c. Alcohol consumption pattern

The alcohol consumption pattern by the male subjects is given below in Table V. Among the selected obese subjects, male population had the habit of consuming alcoholic drinks, whereas female does not have this habit. Out of 429 male subjects 68.53 per cent have the habit of consuming alcohol, whereas 31.47 per cent do not consume alcohol. The data gathered regarding the frequency and quantity of alcohol consumption revealed that 47.8 per cent, 40.14 per cent and 12.58 per cent of male were respectively consuming 100-150 ml, 150-200 ml and 200-250 ml of alcohol per day.

With regard to the frequency of consumption, 6.8 per cent and 33.33 per cent of male were consuming alcohol daily and twice a week respectively. Around 44 per cent were consuming alcohol once a week and 15.99 per cent were consuming alcohol occasionally. It was happy to note that none of them consume more than 250 ml of alcohol daily.

Table 5: Alcohol consumption pattern of the male subjects

S.No	Alcohol Consumption	Number	Percent
1	Yes	294	68.53
	No	135	31.47
2	Quantity		
	100-150 ml	139	47.28
	150-200 ml	118	40.14
	200-250ml	37	12.58
3	Frequency		
	Daily	20	6.80
	Twice a week	98	33.33
	Once a week	129	43.88
	Occasionally	47	15.99

Alcoholic beverages such as whisky, brandy, rum, wine and beer contain ethyl alcohol in varying proportions. Alcohol increases blood pressure and heavy drinking weakens the heart muscle. Alcohol consumption has been identified as an important risk factor for illness, disability, and mortality (11).

Alcohol is a source of empty calories (without vitamins, minerals and proteins) and can be turned into fat, adding weight to the body. It increases the level of triglycerides in blood. Though alcohol in small amounts (a glass of beer, 35 ml of whisky and 70 ml of wine) may increase HDL-cholesterol levels in general, it does not increase the

protective HDL-2- cholesterol. The non-alcoholic components in wine prevent LDL-cholesterol oxidation. Thus it is best to avoid alcohol consumption because of its ill effects on blood vessels and muscles of the heart.

d. Smoking pattern

The smoking pattern by the selected male subjects is depicted in Table VI. Though smoking is injurious to health, the habit of smoking in the form of beedi, cigarette and cigar is found to be most common among the male subjects. From the above table it was noticed that majority (80.19 per cent) of them had the habit of smoking, whereas only 19.81 per cent did not have the habit of smoking. Among the smokers 21.51 per cent had the habit of smoking cigarette and 78.49 per cent had the habit of smoking beedi and none of them smoke cigar.

Smoking of beedi is much common among the low income group. It was observed that 18.02 per cent, 48.26 per cent and 33.72 per cent smoke 1-2, 3-5 and >5 cigarettes respectively. Among the smokers 15.70 per cent of them had the habit of smoking daily, 26.16 per cent had the habit of smoking twice a week and 51.16 per cent had the habit of smoking once a week. Around seven per cent of the subjects smoke occasionally and that too when they are under stress or during get together.

Table 6: Smoking pattern of the male subjects

S.No	Smoking pattern	Number	Percent
1	Yes	344	80.19
	No	85	19.81
2	Type Beedi	74	21.51
	Cigarette	270	78.49
	Cigar	Nil	Nil

Table 7: Consumption of tea, coffee and health drinks

Quantity*	Tea				Coffee				Other health drinks			
	Male (%)		Female (%)		Male (%)		Female (%)		Male (%)		Female (%)	
	D	O	D	O	D	O	D	O	D	O	D	O
1 cup	36.5	4.5	41.3	2.1	44.6	5.6	53.2	7.9	36.8	9.0	25.1	14.7
3 cups	10.7	-	4.2	-	28.2	-	33.9	-	31.5	-	26.3	-
≥5 cups	4.6	-	6.9	-	8.4	-	4.7	-	-	-	-	-

* Multiple response; D-Daily, O-Occasionally

Around 11 per cent of male and 4.2 per cent of female consume 3 cups of tea, 28.2 per cent and 33.9 per cent of male and female respectively consume 3 cups of coffee and 31.5 per cent and 26.3 per cent of male and female respectively consume 3 cups of other health drinks daily. Only a small percentage of subjects consumed five cups or more of tea/coffee/health drinks daily which showed that subjects are aware of the harmful effects of tea and coffee.

Caffeine can be considered the mankind's most popular drug consumed mainly through coffee and tea. The concentration of caffeine depends upon how the beverage is prepared. On an average a cup (150 ml) of percolated coffee has 120 mg of caffeine, a cup of instant coffee 70 mg of caffeine and a cup of tea- 50mg of caffeine. According to a research, 83,269 Japanese people who drank at least one cup of coffee daily had about 20 per cent lower risk of stroke compared to those

3	Quantity		
	1-2	62	18.02
	3-5	166	48.26
4	>5	116	33.72
	Frequency		
	Daily	54	15.70
	Twice a week	90	26.16
	Once a week	176	51.16
	Occasionally	24	6.98

Smoking causes four million deaths annually all over the world. Persons who have family history of smoking have high risk of developing diabetes. Smoking is the major modifiable risk factor for Type II diabetes. Research has also shown that smokers have a 44 per cent higher chance of developing Type 2 diabetes than non-smokers. The risk is linked to the degree of smoking rather type of smoking such as beedi, cigars, cigarettes or pipes. The risk increases with each and every cigarette they smoke and heavy smokers who smoke 20 cigarettes or more daily have been shown to have 61 per cent higher risk. Smoking has been shown to result in increased albuminuria, higher risk in nerve damage (neuropathy) and delayed wound healing in diabetic patients (7).

e. Consumption of tea, coffee and health drinks

Information on tea, coffee and health drinks consumption of the subjects were found out and given in Table VII. Data collected regarding the tea, coffee and health drink consumption pattern of the selected subjects revealed that majority of the subjects consume one cup per day. About 36.5 per cent of male and 41.3 per cent of female drink one cup of tea, similarly 44.6 per cent of male and 53.2 per cent of female drink one cup of coffee and 3.8 per cent and 25.1 per cent of male and female respectively drink one cup of health drink daily.

who rarely drank it. Hence it may be concluded that intake of coffee in the order of one cup daily may be desirable (1).

3.4. Association between BMI, type of activity, income level and total cholesterol

Chi square analysis was carried out to find the association between the BMI and other factors and the results obtained are given in Table VIII.

Table 8: Association between BMI, Type of activity, Income Level and Total Cholesterol

Variables	Chi square value
Income Vs Total cholesterol	5.55*
BMI Vs Total cholesterol	83.47**
Activity Vs Total cholesterol	10.89**
Income Vs Activity	14.05**
BMI Vs Activity	9.49**

- * Significant at five percent level,
 ** - Significant at one percent level

In a test for association, the null hypothesis states that the two categorical variables are independent i.e one variable does not influence the other variables.

From the table it is clear that there is a strong significant association between income and activity (Chi square value- 14.05, $p=0.005$), income and cholesterol (Chi square value - 5.55, $p=0.001$), BMI and activity pattern (Chi square value - 9.49, $p=0.005$), BMI and cholesterol level (Chi square value - 83.47, $p=0.005$) and activity and cholesterol level (Chi square- 10.89, $p=0.005$). Hence the alternative hypothesis stating the variables are interrelated is accepted.

4. Summary and Conclusion

There is much scope of urbanization and concentration of population in bigger cities. Globalization is also playing an important role for modernization and sedentary life. So in near future obesity would emerge as a challenging problem for India. There exists a considerable gap between the diet and lifestyle pattern in the community. For suitable and convenient weight reduction inclusion high fiber foods in the regular diet with the combination of lifestyle modification such as yoga and exercise therapy records the best result especially in lowering the body weight. Most people who are trying to lose weight focus on one thing: weight loss. However, focusing on dietary and lifestyle changes that will lead to permanent weight loss is much more productive. A better understanding of the aetiological determinants in individual subjects will provide a basis for more rational intervention to prevent this public health problem. Therefore, care should be taken for the future, as prevention is better than cure.

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Author Profile



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