Prevalence of obesity among young female adults in Coimbatore city and impact of diet counselling

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ABSTRACT

The study was conducted to find out the prevalence rate of obesity among young adults; obesity is relation to life style, dietary pattern of the selected subjects and to import the dirt counselling. The study concludes that the major cause for the prevalence of obesity among young adults was due to their unhealthy dietary habits, consuming calorie dense fried foods, milk products sweets and carbonated beverages and another main contributing factor is their sedentary life style. Through proper diet counselling and regular exercise, the weight reduction can be achieved successfully.

INTRODUCTION

Obesity has become one of the serious health problems with the prevalence steadily increasing over the past four decades. There is ever expectation that the next generation of children are likely to be fatter than the current generation of children which implies a challenge to our global health care system. While childhood obesity rates have doubled, the adolescent's obesity has tripled. The cause of obesity is complex and includes genetic, lack of physical activity, over consumption of high fat, energy dense food, family and social environment. Urbanization and modernization have inevitably altered dietary habits and life style practices contributing to the emergence of increasing obesity. There is an urgent need for obesity screening to estimate prevalence rates and early intervention programmes to combat this escalating menace. In fact, childhood obesity is expected to reach epidemic proportion in developing countries like India. National Survey Data (N.S.D.) indicate that only two per cent of school children were obese. Observation made by Mirmiran (2003) showed that out of the four states, (Haryana, Himachal Pradesh, Punjab and Rajasthan), prevalence of obesity among adult population was highest in Punjab 15 per cent being normal, 12.2 per cent overweight (obese I) and 2.6 per cent (obese II). The National Nutrition Monitoring Bureau Data, depicts that Kerala (10 %) had the highest proportion of obese population as compared to 9.6 per cent in Tamil Nadu, 4 per cent in Karnataka and Andhra Pradesh .

At the other end of the malnutrition scale, obesity is one of today's most blatantly visible-yet not neglected – public health problems. In 1995, there were an estimated 200 million obese adults worldwide. As of 2000, the member of obese adults has increased to over 300 million. Both overweight and obesity poses a major risk for serious diet related non communicable diseases, including diabetes mellitus, cardiovascular disease, hypertension and stroke, osteoarthritis and certain forms of cancer (Gutierrez *et al.,* 1999).

Economic growth, modernization, urbanization and globalization of food markets are just some of the forces inevitably to the emergence of increasing obesity among young adults . Adult spent a substantial amount of time with friends and eating is an important form of socialization and recreation (Telleton, 2002). The study has been undertaken to find out the prevalence rate of obesity among young adults, obesity in relation with life style, dietary pattern of the selected subjects and to impart diet counselling.

METHODOLOGY

Avinashilingam Deemed University, well known educational institute for women in Coimbatore district was selected for the study. Out of six faculties, Home Science faculty was selected through purposive sampling, as the

subjects oriented on nutrition aspects. All the 1242 young female adults in the age group of 18 to 25 years were selected to identify the prevalence of obesity. Among these subjects, 55 subjects who were screened as obese, at risk of obese and overweight based on Body Mass Index (BMI) given by IOTF classification (2002) were selected to conduct the study.

A structured interview schedule was used to collect the details regarding their family background such as occupational status of the parents, income of the family, dietary pattern such as food frequency and snacking pattern. Twenty four hour survey dietary recall method was followed to elicit details on the quantity of food items consumed by each selected subjects. Lifestyle pattern such as physical activity, habit of performing exercise, and medical history in terms of hormonal imbalance were also collected.

The diet counselling was given for one hour per week for 6 weeks to 55 subjects with the help of developed visual aids like charts, posters, leaflets and pamphlets who were identified as at risk of obese, overweight and obese during their leisure time without disturbing their regular class hours.

Regular exercise was taught for 15 minutes and they were asked to practice any of the exercises such as walking, jogging or skipping for 45 minutes for a day. The impact of diet counselling was assessed using the checklist to understand the gain in knowledge after counselling. Using the measurement of height, weight, body mass index was calculated. Waist and hip circumferences were taken to calculate the waist hip ratio for 55 subjects. The data collected were analyzed and statistical analysis of correlation and analysis of variance was done to prove the relationship of body mass index and selected variables.

OBSERVATIONS AND ASSESSMENT

The results obtained from the present investigation as well as well as relevant discussion have been presented under following heads :

Background information of selected subjects:

The dietary practices and health status of the individual is closely linked with the demographic factors like age, sex, size of the family, literacy and income of the family.

Body mass index:

Table 1 gives details about the grade of obesity among the selected sub sample.

The body mass index of 1242 subjects revealed that 11 per cent, 19.6 per cent and one per cent were found to be at risk of obese, obese grade I and obese grade II, respectively. Obese grade I was observed in 19.3 per cent of the selected subjects in the age group of 18-21 years. Life style factors such as over intake of energy and decrease in physical activity contributed to obesity (Bonnie, 2002).

Waist hip ratio:

The National Institute of Health in October 2000 indicated that waist circumference measurement is an easy, inexpensive and useful tool for identifying overweight and obesity and for evaluating treatment in adults (Rockville, 2000). Waist Hip Ratio of the sub sample is shown in Table 2.

Table 2 : Waist hip ratio of the selected subjects						
	Age (years) (n=55)				Total	Per cent
Waist hip ratio	18-21		22-25			
	No.	%	No.	%		
0.8	9	16	7	13	16	29
0.9	24	44	15	27	39	71
Total	33	60	22	40	55	100

According to Mirmiran (2003), waist hip ratio of 0.8 in women and 1.0 in men and waist circumference 88 cm in women and 102 cm in men was considered as central obesity. It is clear from Table 2 that majority of 71 per cent subjects had the waist hip ratio 0.9 and minority of 29 per cent had normal WHR of 0.8. The per cent of

Table 1 : Body mass index of the selected subject (n=1242)						
	Age (years)				Total	Per cent
BMI	18-21		21-25			
	No	%	No	%		
Underweight (<18.5)	156	12.5	4	0.3	160	12.8
Normal (18.5-22.9)	865	69.6	164	13.2	1029	82.8
Risk of obese (23-24.9)	14	11.2	2	0.1	16	11.3
Obese I (25-29.9)	24	19.3	3	0.2	27	19.6
Obese II (≥ 30)	7	0.56	5	0.4	12	0.96

obesity on the basis of WHR was similar to that of BMI grading. The physical inactivity is the major factor contributing to the prevalence of obesity. The immediate cause of obesity is a calorie intake which is persistently higher than calorie output (Weinser *et al.*, 2002).

Life style pattern, snacking habits and exercise pattern of the selected subjects:
Frequency of eating outside:
The practice of consuming foods outside home by the selected subjects is given in Table 3.

Table 3 : Pattern of eating a way from home by the selected subjected				
	Number of subjects (n=55)			
Frequency of eating out	Family members		Both friends and family	
	Number	Per cent	Number	Per cent
Daily	-	-	2	4
Weekly	6	11	15	27
Monthly	4	7	11	20
Seldom	3	5	1	2
Never	-	-	13	24
Total	13	23	42	77

It can be noted from Table 3 that the majority of 76 per cent of the selected subjects had the habit of eating away from home with both friends and family members and 24 per cent do not dine out at all. About 38 and 27 per

cent went away to eat on a weekly and monthly basis. According to Linda *et al.* (2001) the energy intake of groups who eat away from home is found greater and thus increases the body weight.

Exercise pattern of the subjects:
It is observed that only 31 per cent of the selected subjects reported that they do exercise regularly so as to bring down their excess body weight. Majority (69 per cent) of the selected subjects were devoid of exercise. Alisa (2001) reported that sedentary life style has lead to obesity. The increasing industrialization, modernization and mechanization have led to sedentary habits which have become the part of their life style.

Snack items consumed by the selected subjects:
The common snack items consumed by the selected subjects in their home are given in Table 4.
Consuming snack was one of the common habits among the selected subjects. It was observed from Table 4 that snacking was higher in mid-morning and evening time especially when viewing television or when gathered with friends and family members. More than 90 per cent of the obese subjects had baked items, fast foods and chat items. Fried items like baji, bonda, vadai, samosas were consumed by 20-27 per cent. Sweets like Gulab jamoon, mysurpa, laddu and milk sweets were snacking items for 35 per cent of the subjects.

Table 4 : Snack item consumed by the selected subjects										
Snack items	>300g		200-300g		100-200g		<100g		Never	
	No.	%	No.	%	No.	%	No.	%	No.	%
Baked items	30	54	18	33	7	13	-	-	-	-
Western fast food	27	49	12	22	16	29	-	-	-	-
Indian chat items	11	20	9	16	21	38	8	15	6	11
Fried Indian snacks	15	27	7	13	22	40	9	16	2	4
Sweets	19	35	14	25	16	29	6	11	-	-

Table 5 : Mean nutrient intake by the selected sub-sample							
Nutrient	ICMR RDA(2000)	Mean nutrient intake					
		18-21 (years)	Difference		22-25 (years)	Difference	
			No.	%		No.	%
Energy (kcal)	2222	2458			2707	+485	22
Protein (g)	60	69.16	+9	15	78.5	+18.5	31
Fat (g)	20	51.7	+31	155	50.9	+30.9	155
Carbohydrate (g)	-	481.9	-	-	416.5	-	-
Iron (mg)	28	21.2	-7	25	26	-2	7
Fibre (g)	40	11.78	-28.3	70	15.5	-24.5	61

Mean nutrient intake:

The mean nutrient intake of the selected sub sample was calculated and are presented in Table 5.

The mean energy intake was higher than the ICMR recommended dietary allowance (Table 5). The high calorie intake was due to consumption of fat rich foods and non-nutrient soft drinks. About 81 per cent female subjects had high fat diet which was more than the recommended allowances due to consumption of items like fried, baked and other snack items. The protein intake of the subjects met the RDA requirements as they included grams, pulses and milk in their diet. Poor intake of fruits and vegetables may be attributed to less fibre in the diet.

Correlation and analysis of variance:

Correlation value of BMI with selected variables:

From the correlation analysis (Table 6) it is inferred that as age increased, BMI increased and it was significant at 5 per cent level. There was a significant correlation ($p<0.05$) between income and BMI and energy intake and BMI indicating the higher intake of calorie dense foods among the high income group.

Table 6 : Correlation with BMI for selected variables	
Factors	't' = values
Age	0.5795**
Income	0.4686**
Energy	0.4524[NS]
Fat	0.7387**

** indicate significance of value at P=0.05
NS = Non-significant

It is a known fact that fat plays an important role in rising the body weight also. The analysis variance of body mass index with family history, income and eating pattern is shown in Table 7.

From the analysis of variance (Table 7) it can be inferred that between the group and within the group, family history did not significantly play a role in the prevalence of obesity. There was a significant difference ($p<0.05$) in the body mass index of the selected 55 subjects within the group belonging to various income groups. The variables of eating outside and frequency of eating food outside did not influence the body weight as there was no significant difference.

Table 8 : Mean scores of the selected subjects		(n= 55)	
	Maximum scores	Mean scores	
		Before counselling	After counselling
Causes for obesity	2	1.5	2
Risk factors	2	1	2
Knowledge on fibre rich and calorie dense food	2	1.2	1.9
Aspects on BMI	4	2.1	4

Diet counselling:

Nutrition knowledge in terms of scores of selected subjects before and after counselling is given in Table 8.

The mean score obtained after counselling for the factors such as causes and risk factors for obesity, knowledge on fibre rich and calorie dense food and aspects on BMI was more when compared with mean score before counselling (Table 8). Subjects pointed out that fat in food leads to obesity and it should be restricted but they were not aware that excess amount of food and fried items ultimately increases calorie and fat intake. The subjects could identify the unsaturated oil and its beneficial effect on controlling serum lipid fraction.

Through proper counselling everyone understood that balance diet with regular exercise help them to reduce weight and the snack in between meals will increase fat intake. They knew to calculate body mass index for the maintenance of ideal body weight.

Table 7 : Analysis of variance					
Factors	Source	d.f	Sum of squares	Mean squares	F ratio
Family history	Between groups	3	34.20	11.40	1.40 [NS]
	Within groups	51	413.94	8.11	
Income	Between groups	2	77.68	38.84	5.45**
	Within groups	52	370.46	7.12	
Eating outside	Between groups	2	31.40	15.7	1.95[NS]
	Within groups	52	416.74	8	
Frequency of eating food	Between groups	3	40.42	13.47	1.65[NS]
outside	Within groups	49	399.58	8.15	

** indicates significance of value at P=0.05   NS=Non-significant

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