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RESEARCH ARTICLE

DIETARY HABITS OF THE SELECTED OBESE IN COIMBATORE DISTRICT

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ABSTRACT

Good nutrition is the cornerstone for survival, health and development for current and succeeding generations. A key factor in the progressive increase in the prevalence of obesity is poor dietary habits. The treatment of obesity with regular diets often fail, so knowing the specific habits of these patients can be very useful to individualize treatment. The aim of this study was to assess the dietary habits of obese subjects residing in coimbatore city. A well-structured interview schedule was formulated to elicit information on the dietary pattern followed by the selected subjects by using a pretested questionnaire. The data collected were systematically consolidated and statistically analyzed. Although dietary education improves eating habits of obese individual, a high percentage remain with inadequate dietetic customs, which could be a key factor in the failure of obesity treatment. Education on food intakes of this group is therefore needed along with further large scale studies.

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INTRODUCTION

In many developing countries, the progression of nutritional transition has been detected, characterized by a reduction in the prevalence of nutritional deficiencies and the more expressive occurrence of overweight and obesity not only in the adult population but also among children and adolescents (Hanley et al., 2000). These characteristics are fundamentally associated with changes in lifestyle and eating habits. (Katzmarzy et al., 2004). Food intake has been associated with obesity not only in terms of the volume of food ingested but also in terms of the composition and quality of diet. Furthermore, eating habits have also changed and current habits include low consumption of fruits, green vegetables, and milk; increasing consumption of snacks, sweets, and soft drinks; and skipping breakfast; these eating habits result in continuous increase in adiposity (Hanley et al., 2000) Eating habits in addition to environmental differentials represent the most dominant determinant in increasing the tendency of overweight and obesity among children (Nicklas et al., 2001) and a modification in the eating habits may be singleton tactic strategy to a more appropriate weight control (Triches and Giugliani, 2005). The objective of this study was to find the possible dietary habits among the selected obese subjects.

MATERIALS AND METHODS

The study was carried out in and around Coimbatore district located in Tamil Nadu. The total numbers of 429 male and 571 female were surveyed.

Data collection tools and techniques

Personal interview is a survey method of data collection which employs a questionnaire. The components of the personal

interview are the researcher, the interviewer, interviewee and the interview environment (Pannerselvam, 2012). A well-structured interview schedule was formulated to elicit information on the dietary pattern followed by the selected subjects by using a pretested questionnaire specially designed for the purpose. 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.

RESULTS AND DISCUSSION

Dietary Pattern of the selected subjects

Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and/or increased health problems (Haslam and James 2005). Increased fat intake is associated with body weight gain which can lead to obesity and other related metabolic diseases. Details regarding the type of diet, daily meal pattern, methods of cooking, diet restrictions, type of fats and oils used in cooking, knowledge about dietary fiber in their diet are tabulated and discussed in the following pages.

Dietary habit of the obese subjects

The type of diet followed by the subjects are tabulated in Table I and discussed below. From the above table it was clear that 74.1 percent of the male subjects were non vegetarian 20.3 percent were vegetarian and only 5.6 percent were ova vegetarian. Similarly among the females 25.4 percent, 60.2 percent and 14.4 percent were non vegetarian, vegetarian and ova vegetarian respectively.

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Table I Dietray Habit of the Selected Subjects

Type of diet	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
Non Vegetarian	318	74.1	145	25.4	463	46.3
Vegetarian	87	20.3	344	60.2	431	43.1
Ova Vegetarian	24	5.6	82	14.4	106	10.6
Total	429	100.0	571	100.0	1000	100.0

Table II Meal Pattern Adopted by the Selected Subjects

Meal Pattern	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
3 meals with healthy snacks	235	54.8	142	24.9	377	37.7
3 meals	117	27.3	263	46.1	380	38.0
< 3 meals	42	9.8	92	16.1	134	13.4
Irregular eating pattern	35	8.2	74	13.0	109	10.9
Total	429	100.0	571	100.0	1000	100.0

Table III Food Consumption Pattern by the Selected Subjects

No of servings / Day	Male		Female		Total	
	N	%	N	%	N	%
Grains						
4- 6 servings	129	30.07	196	34.33	325	32.50
6-11 servings	300	69.93	375	65.67	675	67.50
Pulses						
< 4 servings	401	93.47	436	76.36	837	83.70
4- 6 servings	28	6.53	135	23.64	163	16.30
Vegetables						
< 3 servings	175	40.79	89	15.59	264	26.40
3 – 5 servings	101	23.54	354	62.00	455	45.50
5 & above	153	35.66	128	22.42	281	28.10
Fruits						
< 2 servings	313	72.96	356	62.35	669	66.90
2-4 servings	107	24.94	185	32.40	292	29.20
> 4 servings	9	2.10	30	5.25	39	3.90
Diary products						
< 2 servings	45	10.49	215	37.65	260	26.00
2-4 servings	365	85.08	269	47.11	634	63.40
> 4 servings	20	4.66	87	15.24	107	10.70
Water						
2-4 glasses	52	12.12	75	13.13	127	12.70
4-8 glasses	201	46.85	422	73.91	623	62.30
> 8 servings	176	41.03	74	12.96	250	25.00
Snacks						
1 servings	60	13.99	173	30.30	233	23.30
2 servings	274	63.87	298	52.19	572	57.20
> 2 servings	95	22.14	100	17.51	195	19.50

Note: 1 serving = 1 sl. Bread, 1/3 cup oat meal, rice or grain products, 1cup of raw or 1 cup of cooked vegetables, 1 piece of fruit, 1 cup of milk.

Table IV Consumption of Dairy Products by the Selected Subjects

Diary products	Quantity consumed/ day											
	Male					Female						
	<100gm		100gm		>100gm	<100gm		100gm		>100gm		
	N	%	N	%	N	%	N	%	N	%		
Milk												
Low fat*	33	7.7	190	44.3	35	8.2	73	12.8	167	29.2	22	3.9
Medium fat	65	15.2	94	21.9	12	2.8	119	20.8	172	30.1	18	3.2
Curd												
Low fat*	87	20.3	95	22.1	40	9.3	161	28.2	141	24.7	31	5.4
Medium fat	41	9.6	111	25.9	18	4.2	69	12.1	101	17.7	51	8.9
Buttermilk												
Low fat*	66	15.4	88	20.5	23	5.4	11	1.9	97	17.0	290	50.8
Medium fat	19	4.4	45	10.5	155	36.1	38	6.7	71	12.4	55	9.6
Paneer												
High fat	-	-	48	11.19	-	-	-	-	61	10.7	-	-
Cheese												
High fat	-	-	54	12.59	-	-	-	-	32	5.6	-	-

*Skimmed milk-low /zero fat

Table V Consumption of Flesh Foods by the Selected Subjects

Frequency	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
Daily	12	4.7	5	2.3	17	3.6
Twice a week	119	46.1	47	21.5	166	34.8
Once a week	76	29.5	130	59.4	206	43.2
Ocasionally	51	19.8	37	16.9	88	18.4
Total	258	100.00	219	100.00	477	100

Table VI Type and Quantity of Fats and Oils Used For Cooking

Types of fats and oils	Male				Female			
	<25ml		25ml		<25ml		25ml	
	N	%	N	%	N	%	N	%
Sunflower oil	278	64.8	167	38.9	321	56.2	156	27.3
Groundnut oil	145	33.8	121	28.2	146	25.6	89	15.6
Olive oil	34	7.9	32	7.5	29	5.1	31	5.4
Palm oil	57	13.3	78	18.2	64	11.2	6	1.1
Rice bran oil	31	7.2	34	7.9	19	3.3	2	0.4
Coconut oil	89	20.7	23	5.4	34	6.0	67	11.7
Gingelly oil	10	2.3	0	0.0	0	0.0	2	0.4
Vanaspathi & Ghee	19	4.4	0	0.0	11	1.9	12	2.1

*Multiple response

It was clear to state that the percentage of male who consumed non vegetarian diet were nearly 3 times higher than that of the female. Overall the percentage of subjects consuming non vegetarian were higher when compared to vegetarian and ova vegetarians. People are interested to consume non-vegetarian foods than vegetarian items. This may be one of the possible factors to gain body weight.

Meal pattern

The meal pattern followed by the selected subjects is presented in Table II. The meal pattern such as number of meals along with their healthy snacks by the selected subjects revealed that a great majority of 54.8 percent of male subjects consumed 3 meals a day with healthy snacks because of their pattern of work and regular eating timings. Whereas 46.1 percent of female subjects followed 3 meal pattern without snacks. Only 8.2 and 13 percent of male and female respectively had irregular eating pattern due to heavy work load and were not time conscious to have food. On an average 38 percent of the selected obese subjects took 3 meals a day.

Food consumption pattern

The frequency of consumption of various foods such as grains, vegetables, fruits, dairy products, water and snacks are depicted below in Table III. Among the selected subjects 32.5 percent consumed 4-6 servings of grains per day and 67.5 percent of them consumed 6-11 servings/ day. With regard to the consumption of pulses majority (83.7%) consumed only < 4 servings and only 16.3 percent of the selected subjects consumed 4-6 servings of per day. Selected obese subjects also consumed vegetables and fruits as part of their daily diet. Nearly 45.5 percent of the subjects consumed 3-5 servings of vegetables per day, whereas only 26.4 percent and 28.1 percent consumed < 3 servings and > 5 servings of vegetables respectively per day. It was happy to note that majority (66.9%) of the selected subjects consumed at least 2 servings of fruits daily. Around 29.20 percent and 3.9 percent included fruits for 2-4 servings and more than 4 servings respectively in their regular diet. Dietary fiber is an important part of diet and is present in cereals, pulses, vegetables and fruits. Intake of 25 gm of fiber per day per 1000 calories is considered to be optimum for a daily diabetic diet (Therese, 2009).

Fruits and vegetables may play a protective role as they are rich in nutrients and other components such as antioxidants and fiber that are believed to be protective foods. Data regarding the consumption of dairy products revealed that 63.4 percent consumed 2-4 servings and only 0.7 percent consumed more than 4 servings per day. They consumed in the form of milk added with tea, coffee or any beverages and also in the form of curd or buttermilk. Water consumption is very important aspect in our daily life. With regard to water intake 73.91 percent, 13.13 percent, 12.96 percent of female drink at least 4-8 glasses, 2-4 glasses and more than 8 glasses of water respectively, whereas male drink more water when compared to female i.e only 47 percent drink 4-8 glasses of water and 41 percent drink > 8 glasses of water this is because most of the men travel around the whole. With regard to the consumption of snacks a great majority of 63.87 percent and 52.19 percent of male and female respectively consumed at least 2 servings of snacks daily.

Consumption of dairy products

The consumption of dairy products by the selected obese subjects is given in the table IV. The dairy products such as milk, curd, buttermilk, paneer and cheese were categorised according to their fat content as low, medium and high fat products. The consumption of skimmed milk powder was categorised under the low fat products. The quantity of dairy products consumed were discussed below. From the above table it was clearly depicted that majority of males (44.3%) consumed 100 g of low fat milk every day, whereas only 7.7 and 8.2 percent of them consumed < 100g and > 100 g of low fat milk respectively. Similarly 21.9, 15.2 and 2.8 percent of males consumed 100g, < 100g and > 100g of medium fat milk/day respectively i.e standard milk or toned milk. With regard to female subjects 12.8, 29.2 and 3.9 percent of the subjects respectively consumed < 100g, 100g and > 100g of low fat milk. Also 28.2 percent of the female consumed < 100g of low fat curd everyday, 24.7 percent of female subjects consumed 100g of low fat curd per day whereas only 5.4 percent were taking > 100g of low fat curd. It is surprising to see that none of the selected subjects consumed high fat milk. Among the selected male subjects most of them (20.5 % and 10.5%) consumed 100g of buttermilk prepared from low and

medium fat. In female subjects it was observed that 50.8 percent of them were consuming more than 100g of low fat buttermilk. The paneer and cheese are high fat food was being consumed by 11.19 and 12.6 percent of male respectively and 10.7 and 5.6 percent of female subjects consumed the same respectively. They were having these foods occasionally when they have family get together, business meeting or family functions.

Consumption of flesh foods

The frequency of consumption of flesh foods such as meat, fish chickens etc are presented in Table V. The flesh foods consumed by the selected subjects were chicken, fish and mutton. Among these foods chicken was consumed by majority of the subjects. Nearly half of the male subjects consumed non-vegetarian items twice a week whereas 60 percent of female subjects consumed once in a week, only 4.7 and 2.3 percent of male and female subjects respectively consumed daily. It is noteworthy from the data that the consumption of non vegetarian foods on daily basis and twice a week may also be a major cause for weight gain.

Types and quantity of fats and oils

Various types of fats and oils were used for cooking such as sunflower oil, groundnut oil, olive oil, palm oil, rice bran oil, coconut oil, gingelly oil and ghee. The amount of oil consumed was tabulated and presented in table VI. Sunflower oil was used by majority of the selected subjects irrespective of the sex. About 64.8 percent of male and 56.2 percent of female used < 25 ml of sunflower oil per day. Similarly 38.9 and 27.3 percent of male and female respectively consumed 25 ml of sunflower oil every day. Groundnut oil was also consumed by 33.8 and 25.6 percent of male and female subjects on an average of < 25 ml per day. Similarly 28.2 and 15.6 percent of male and female consumed 25 ml of groundnut oil daily. Nowadays the awareness and benefits of olive oil and rice bran oil towards healthy heart was well established among the public and as a result 7.9 and 7.2 percent of male consumed < 25 ml of olive oil and rice bran oil respectively. In the case of females around 5.1 and 5.4 percent consumed < 25 ml and 25 ml of olive oil per day and 3.3 percent and 0.4 percent of female consumed <25ml and 25 ml of rice bran oil per day respectively. Among the selected male subjects 20.7 percent consumed < 25ml of coconut oil only 5.4 percent used 25 ml per day and 11.7 percent of female used 25 ml of coconut oil per day, as it was a habit and taste preference which they were not willing to change. It was happy to note that vanaspathi and ghee users were very meagre in both the sexes. With regard to the quantity consumed most of the subjects used less than 25 ml, whereas only minimum percent of subjects used > 25ml per day. So people are health conscious and used right type and quantity of fats and oil for their cooking.

Knowledge about dietary fiber

Sixty seven percent of male subjects were aware of the importance of dietary fiber in human health and rest of 33 percent of the subjects did not have any knowledge regarding dietary fiber. With regard to the female group, 74 percent of the subjects had some knowledge about dietary fiber. Around 26.39 percent of female were not aware of dietary fiber. The results revealed that majority of the subjects were aware of dietary fiber and other constituents and also included liberal quantity in their daily dietaries. Intake of dietary fiber and whole grain is inversely related to obesity, type two diabetes, cancer and cardiovascular disease (CVD). Increased dietary fiber intake has been recommended as a part of an overall healthy diet and as an adjunct in the treatment of elevated serum cholesterol concentration (James et al., 2010).

CONCLUSION

Exact cause of increased prevalence of Non Communicable Diseases (NCD) in persons of Indian origin is unknown. Nature and nurture, both may have a role. While we have a little to do, at present with nature, we can definitely modulate nurture for desirable results. Dietary control of culturally acceptable yet preventive food and not encouraging sedentary habits help to reduce the prevalence of NCD's and is most beneficial in Indian context, as it is cost-befitting.

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