

SNACKING PATTERN OF RESIDENTS OF VADODARA: A PILOT STUDY

SWATI DHRUV¹, SHRADDHA PATEL¹ AND UMA IYER*¹,

¹ Department of Foods and Nutrition, Faculty of Family and Community Sciences, The M.S. University of Baroda, Baroda-390002, Gujarat, India

ABSTRACT: Obesity has reached epidemic proportions globally and is a major contributor to the global burden of chronic diseases. Dietary factors are the major modifiable factors through which many of the external forces promoting weight gain act. Thus, with the objective of examining the snacking pattern of the people living in Vadodara city, a cross-sectional study was conducted among the urban population of Vadodara city. In all 60 households were surveyed, 15 from each ward representing each zone. Qualitative data was collected in a pre-structured questionnaire by interviewing the subjects through house to house visits. Data was analyzed using Microsoft Excel package. The prevalence of overweight and obesity by Asia pacific classification was found to be 21.7% and 48.3% respectively. The major type of snacks consumed by the people was found to be shallow fried foods, bakery products and deep fried foods. Thus, there is a need to promote healthy snacking habits among the people of Vadodara.

Key words : Snacking, Residents, Vadodara

INTRODUCTION

Obesity is increasing at an alarming rate worldwide. In simple terms, 'Obesity' is described as body weight that is much greater than what is considered healthy. The World Health Organization's (WHO) latest projections indicate that globally in 2005 approximately 1.6 billion adults (age 15+) were overweight, 400 million adults were obese and at least 20 million children under the age of 5 years were overweight¹. The scenario in India, though less alarming, is not very comforting. According to the NHFS-III data (National Health and Family Survey), obesity has already affected 12.1 percent males and 16 percent females of the country's total population and the percentage is growing rapidly. A research carried out in Maharashtra, Delhi and Gujarat from November 30, 2009 to January 6, 2010, revealed that obesity is highest among Gujaratis, more than even the paratha-butter packing Delhiites. Nearly 25 per cent patients in Gujarat were found to be overweight². One of the prime reasons for Gujaratis putting extra kilos is rapidly changing imbalanced dietary habits ("nutritional transition"). This is due to many reasons- easy availability of convenience foods, frequent snacking on energy-dense fast foods like pizzas, burgers, fries and packaged foods apart from their regular gujarati snacks. This transition has resulted in excess consumption of calories, saturated fats, trans-fatty acids (TFAs), simple sugars, salt and low intake of fiber.

Snacking is more common today than ever before. Snack is described as a small quantity of food eaten between meals or in place of a meal. Snacks have officially become the fourth meal of the day, according to the New Product Development Group. Snack food generally comprises bakery products, ready-to-eat mixes, chips, namkeen and other light processed foods. Snacking has long been a part of Indian culture, but a gradual transformation in Indian consumer's overall dietary patterns and preferences has resulted in changing snacking habits. Snacks now account for 21% of all meals consumed. Globalization, liberalization, mall culture and urbanization has brought about radical changes in the snacking pattern of the people across the nation, resulting into the escalating intake of processed and fast food.

There are approximately 1,000 types of snacks and another 300 types of savouries being sold in the Indian market today. Potato chips and potato-based items are the most popular products with more than 85 per cent share of the salty snack market³.

It has been seen that urban Indian consumers eat ready-made snacks 10 times more than their rural counterparts. Indians in the western regions eat the maximum amount of snacks, followed by the people in northern region.

Food choices related to snacking are believed to be a cause of concern. Different food groups, such as baked foods, sweets and beverages, have been related to snacking in both adolescent and adult normal weight subjects, as well as normal populations^{4,5,6,7,8}. Comparisons of snacking patterns and snack food choices among the households of India, particularly of Gujarat, is sparse. Thus, the aim of this study was to conduct a household survey of commonly consumed snacks by the people of Vadodara.

MATERIALS AND METHODS

The present study was a cross-sectional study. The survey was carried out between 25th November 2010- 3rd December 2010, in an urban population of Vadodara city of Gujarat state.

A sampling frame was prepared by making a list of 12 wards in the city which were divided into 4 zones. From each zone 1 ward was randomly selected and from that 2 societies were purposively selected. To accomplish the sample size, it was decided to select 15 households from each ward of each zone. The subjects were interviewed through house-to-house visits. All females more than equal to 18 years of age who were present in the household at the time of visit were surveyed. Consent of the subjects was taken by initially explaining the purpose of the study. A predesigned questionnaire was used for collection of qualitative data. The questionnaires assessed the socio-economic status, anthropometric details, family and medical history, morbidity profile, medication details of the subjects and snacking pattern of the household. Information on snacking pattern was collected by asking about the snacks (made at home and bought from outside) consumed in the past 3 days during the meals and in between meals.

Statistical analysis

The data was analyzed using Microsoft Excel package and the values were considered significant at $p < .05$ level.

RESULTS AND DISCUSSION

Socio-economic status of the subjects

The socio-economic status is depicted in Table 1. A total of 60 subjects were surveyed. The mean age of these subjects was 43 years. Majority of the subjects (98.3%) were Hindus and belonged to the higher income group. Around 6.7% of the subjects had received primary schooling and 66.7% were graduates. Majority of the subjects (75%) were housewives and 15% of them were in service. About 19 families had children under 12 years and 16 families had adolescents (13-19 yrs).

Anthropometric details of the subjects

Table 2. shows anthropometric details of the subjects. The anthropometric profile of the subjects showed that the mean BMI and waist circumference was 25kg/m² and 88cm respectively. The subjects had higher waist hip ratio (0.86).

Obesity measures in the subjects

Nowadays a number of obesity measures are available to assess abdominal and general obesity. We made an attempt to assess the prevalence using various indicators which is given in Table 3. The prevalence of overweight was 21.7% and that of obesity was 48.3 % among the subjects, using the Asia Pacific classification. Majority of the subjects had higher than normal values for waist circumference and waist hip ratio as can be seen from the Table 3. Thus, the prevalence of obesity as determined by various obesity measures was high in the study population.

Table 1. Socio- economic status of the subjects (n, %)

Variable	Total number of families(n = 60)
Age (mean \pm SD)	43.07 \pm 12.09
Household size	
1	3 (5.0)
2	3 (5.0)
3	17 (28.3)
4	17 (28.3)
5	10 (16.7)
6	4 (6.7)
More than 6	6 (10.0)
Religion	
Hindu	59 (98.3)
Muslim	1 (1.7)
Education	
Primary	4(6.7)
Secondary	5(8.3)
Higher secondary	3(5.0)
Diploma	5(8.3)
Graduate	40(66.7)
Post graduate	4(6.7)
Doctorate	2(3.3)
Occupation	
Housewife	45(75.0)
Service	9(15.0)
Business	2(3.3)
Self employed	2(3.3)
Student	2(3.3)
Monthly income (Rs.)	
< 10,000	3(5.0)
10,000 – 20,000	16(26.7)
>20,000	41(68.3)
Have kids	
Have kids under 12 years	19 (31.7)

Values in parentheses indicate percentage

Table 2. Anthropometric Details of the Subjects (Mean \pm SD)

Variable	Total number of subjects (n= 60)
Weight (kg)	61.31 \pm 11.77
Height (cm)	155.23 \pm 6.54
BMI (kg/m ²)	25.38 \pm 4.24
WC (cm)	88.86 \pm 11.77
HC (cm)	103 \pm 12.27
WHR	0.86 \pm 0.05

BMI = Body Mass Index, WC = Waist Circumference

HC = Hip Circumference, WHR = Waist Hip Ratio

Family history

About 43.3%, 40% and 21.7% of the subjects had the family history of diabetes, hypertension and hypercholesterolemia respectively (Table 4.).

Table 3. Obesity Measures in Subjects: Prevalence Data

Variable	Total number of subjects (n= 60)
BMI: 23-25kg/m ² (overweight)	13 (21.7)
BMI: > 25 kg/m ² (obese)	29(48.3)
WC (cm)(F: ≥ 80)	49(81.7)
WHR (F ≥ 0.85)	52(86.7)

Values in parentheses indicate percentage

Table 4. Family History of the Subjects

Condition	Number of subjects (n= 60)
Diabetes mellitus	26 (43.3)
Hypertension	24 (40.0)
Hypercholesterolemia	13 (21.7)
Coronary heart disease	11 (18.3)
Thyroid problem	5 (8.3)
Cancer	4 (6.7)
Obesity	5 (8.3)

Values in parentheses indicate percentage

Medical history

Information on the medical history (Table 5) showed that 13.3 % of the subjects had hypertension and 8.3% of the subjects had thyroid problem and thus took the medications for the same. It was seen that thyroid problem and hypertension was linked with obesity.

Table 5. Medical history of the subjects

Condition	Number of subjects (n =60)
Diabetes mellitus	2 (3.3)
Hypertension	8(13.3)
Hypercholesterolemia	4(6.7)
Thyroid problem	5(8.3)
Cancer	0(0.0)
Thyroid problem+ obesity	2(3.3)
Hypertension + obesity	5(8.3)
Hypertension + thyroid problem + obesity	1(1.7)
Diabetes mellitus +hypertension + obesity	1(1.7)
Diabetes mellitus +hypercholesterolemia +obesity	1(1.7)
Hypercholesterolemia+ obesity	1(1.7)

Values in parentheses indicate percentage

Snacking pattern

The major snacking sources were shallow fried snacks (68.3%), bakery products (51.7%) and deep fried snacks (45%) as can be seen from Table 6. The intake of bakery and shallow fried foods was the highest (35%) followed by bakery and deep fried foods (28.3%) as shown in Table 7. The snacker's most preferred food items from all types of snacks were Biscuits (48.3%), Mamra (33.3%) and Bhakhri i.e thick masala roti (28.3%) and the least preferred snacks (1.7%) were Sweets and some of the Fresh and Steamed foods (Table 8).

Table 6. Types of Snacks Consumed by the People of Vadodara

Type of snack	Number of families (n=60)
Shallow fried foods	41 (68.3)
Bakery products	31 (51.7)
Deep fried foods	27 (45)
Roasted foods	23 (38.3)
Fresh foods	16 (26.7)
Fermented foods	14 (23.3)
Steamed foods	13 (21.7)
Fast food	8 (13.3)
Sweets	2 (3.3)

Values in parentheses indicate percentages

Table 7. Types of Snacks Consumed by the Subjects over a Period of 3 Days.

Types of snacks	Number of families (n= 60)
Bakery + shallow fried foods	21 (35.0)
Bakery + deep fried foods	17 (28.3)
Bakery + deep fried + shallow fried foods	10 (16.7)

Values in parentheses indicate percentage

Table 8. Snacks Preferred by the Subjects

Name of the Food item	Number of Families (n= 60)
Biscuits	29 (48.3)
Mamra/ Sev mamra	20 (33.3)
Bhakri/ Khakra	17 (28.3)
Poha/ Papad poha	10 (16.7)
Thepla	9 (15)
Chevdo	7 (11.7)
Bhajiya/Bataka/Dalwada/Upma/ Bataka poha	6 (10)
Sukhdi/Coconut burfi/Sev puri/ Khandvi/Pav bhaji/Poona missal/Burger/Dal dhokli/ Boiled egg/Puff	1 (1.7)

DISCUSSION

The prevalence of overweight and obesity in the urban female population of Vadodara city was found to be 21.7% and 48.3% respectively. The prevalence of overweight/obesity in female population of Gujarat, as found in National Family Health Survey during 2005-06, was 17.7%⁹. Thus, the prevalence found in the present study is higher than the national average indicating increased risk of developing non-communicable diseases. A 3.4 % increase in the prevalence of obesity was found in this study as compared to the survey conducted by Iyer et al in 2011¹⁰.

With respect to the occupational status of the subjects, the highest contributor to the prevalence of obesity (as far as BMI and waist circumference is concerned) were the housewives (35% of them were obese and 65 % had higher waist circumference than the normal) as compared to the working women. The possible reason for this could be the replacement of strenuous domestic jobs/ household chores by sedentary touch- button technology, availability of maid in the house and prolonged television viewing.

In the present study, an attempt was made to explore the snacking pattern of the people living in Vadodara. It was found that traditional gujarati snacks- shallow fried foods (68.3%), bakery products (51.7%) and deep fried foods (45%) was savoured by most of the people of Vadodara. It was also found that consumption of bakery products (especially biscuits) was highest among families having children (73.6%). A pan- India study on snacking by AC Neilson¹¹ also found that biscuits were among the top five pre-dinner snacks among children. Thus, the food choices of children have become increasingly unhealthy, putting them at increased risk of malnutrition, as they grow older.

The top 5 snack items (from different types of snacks) preferred by the households of Vadodara were biscuits, mamra, Bhakhri, poha and thepla which indicates that the people consume around 250-300kcal from these snacks. This type of snacking pattern depicts that people snack on foods laden with fat and with high carbohydrate content, which is devoid of any healthy nutritional components. It was observed that the intake of fresh (26.7%) and fermented foods (23.3%) was not much preferred by the subjects indicating that people are now deviating from the healthy food intake. Thus, it can be said that Indian snacking has transformed as consumers seek convenient and novel snacking alternatives. Also the diminishing ability of Indian consumers to prepare traditional snacks is driving the demand for ready – made and easy to prepare snacks.

CONCLUSIONS

In view of these observations we conclude that consumption pattern of snacks have a role to play in the development of not only obesity but chronic diseases also like diabetes, hypertension and cardiac diseases and thus snacking needs to be considered in obesity treatment, prevention and general dietary recommendations. For this, we recommend that educational messages should be tailored based on healthy snacking habits (like opting for fresh, nutritionally dense foods and some healthy snacking alternatives) and its effect on health.

Future research directions

There is need to validate results on large sample size and to determine the snacking pattern on individual basis to see its relationship with the medical history of the subject.

REFERENCES

1. World Health Organization. Obesity: preventing and managing the global epidemic: report of a WHO consultation. Geneva; 2000
2. www.timesofindia.com
3. www.ibef.org
4. Bellisle F, Dalix AM, Mennen L, Galan P, Hercberg S, de Castro JM, Gausseres N. Contribution of snacks and meals in the diet of French adults: a diet-diary study. *Physiol Behav* 2003; **79**: 183–189.
5. Cross AT, Babicz D, Cushman LF. Snacking patterns among 1,800 adults and children. *J Am Diet Assoc* 1994; **94**: 1398–1403.
6. Hampl JS, Heaton CL, Taylor CA. Snacking patterns influence energy and nutrient intakes but not body mass index. *J Hum Nutr Diet* 2003; **16**: 3–11.
7. Summerbell C, Moody R, Shanks J, Stock M, Geissler C. Sources of energy from meals vs snacks in 220 people in four age groups. *Eur J Clin Nutr* 1995; **49**: 33–41
8. Zizza C, Siega-Riz A-M, Popkin BM. Significant increase in young adults snacking between 1977–1978 and 1994–1996 represent a cause for concern!. *Prev Med* 2001; **32**: 303–310
9. www.nfhsindia.org
10. Iyer U, Nitya E, Desai P. Comparative prevalence of non- communicable disease in the adult population of Vadodara and Godhra in Gujarat and determinants of diabetes mellitus in the population. *IJAPT* 2011; **2**:346-352
11. www.am2pm.com