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Eating Habits, Nutritional Status and Portion Sizes in the Elderly Population of Mauritius

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Abstract

It is known that nutrition plays a role in the ageing process, however the elderly do not give enough importance to their diet and they very often have inadequate dietary intake and misconceptions about portion sizes. As the number of older people is increasing, their nutritional and health status become a major concern for public health authorities. Nutritional studies in the elderly population are required in order to get a better understanding of their dietary intake and lifestyle characteristics.

A study was therefore conducted to investigate (i) the Mauritian elderly people's nutritional status using anthropometric measurements such as weight and height, (ii) their food consumption patterns as well as the portion sizes of their foods using a food frequency questionnaires which were administered to a random sample of male and female elderly population (n=60) aged 58 years old and above. The interview was carried out face to face.

The findings of this study showed that the nutritional status assessed by anthropometry is rather unsatisfactory with a large proportion of obese independent of sex. As for the food patterns of the Mauritian elderly individuals, they were characterized by a prominent consumption of the following four food categories: beverages, dairy products, meat and fish products, vegetables and fruits. For beverages, we observed that tea (93.3%), milk (66.6%) and water (96.7%) were most frequently consumed. In the dairy product group, the majority of them consumed yogurt (61.7%). Rice (98.3%) and "Farata" (66.7%) were the most frequently consumed carbohydrate group. We also found that, for the meat category, chicken (73.3%) was preferred by most of them. 88.3% and 96.7% of the study sample population consumed fruits and vegetables respectively. Intakes of other mixed food products were of much lower levels. Characteristic dietary features, such as missing meals and eating out, were not observed among the elderly. Moreover, it was found that the portion size of food intake varied largely among the elderly subjects. However, although more female than male respondents (73.3% vs. 26.3%) considered portion sizes of food to be very important they did

not have a clear notion what an appropriate portion size is.

Our study showed that the nutritional status of the elderly population as assessed by anthropometry was not satisfactory with a high prevalence of obesity, although their dietary patterns revealed relatively good eating habits. This discrepancy could be attributed either to other lifestyle characteristics or diseases appearing in old age. Further nutrition and healthy lifestyle education is thus warranted in this population.

Keywords: Nutrition survey, eating habits, nutritional status, portion size, elderly, Mauritius

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1. INTRODUCTION

The ageing society occupies a critical and unique place in the course of life which has both health and social importance for individuals, family and the whole society. The elderly people are accompanied by a variety of physiological, behavioural and socio-economic changes that may have a negative impact on diet and nutritional status (Dickerson *et al.*, 1988). The Mauritian eating pattern is characterized by a lifestyle and culture that has evolved during the past decades. Moreover, this age group is a vulnerable stage from the point of view of nutrition because nutritional deficiencies are more frequent in old people than in other age groups and their effects are much more serious.

Nutrition studies have shown an increased risk of nutrient deficiencies among the elderly (Birren, 1996). Evidence from numerous sources indicates that a significant number of elderly fail to get the amounts and types of food necessary to meet essential energy and nutrient needs (Rurik, 2006). Demographic values from the Central Statistics Office in Mauritius show that the proportion of people who are sixty or over is constantly increasing (from 6.3% in 2000 to 6.5% in 2003). Concerning this particular age group, nutritional studies assessing their past and current dietary patterns are limited. Therefore, we believe it is important to study the food consumption patterns and nutritional status of this age group, including their nutritional problems, as a first step towards the introduction of corrective measures leading to health, functional, economic and social benefits.
Evidence suggests that increases in both the portion size of foods encourage the overconsumption of energy (Ello-Martin *et al.*, 2005) and another study showed that a decrease in energy density led to a decrease in energy intake (Bell *et al.*, 1998). Our knowledge of the nutrient requirements of elderly people remains inadequately documented. Moreover, no specific previous dietary surveys carried out on the people in Mauritius considered things such as portion sizes of food, energy, macro- and micro-nutrient intakes. Therefore, this study also takes into consideration the variations in portion size intake of food items among our study population.

The study of the diet pattern of the elderly and the relationship between diet and health-related problems in this age group becomes a field of close scrutiny. This study is warranted in the absence of data regarding elderly nutrition in Mauritius. Therefore, we aim to evaluate the food consumption patterns and to estimate the portion size intake in a random sample of elderly people in Mauritius.

2. MATERIALS AND METHODS

Experimental design and Subjects

A dietary survey was carried out between October 2004 and December 2004 around the island. 43.3% of our study population was from rural areas while 56.7% were from urban areas to be representative of the Mauritian population. A total of 60 individuals (23 elderly men and 37 elderly women) participated in the study. All the participants were 58+ years of age. These elderly people belonged to an average socioeconomic level.

In order for the subjects to be able to participate in the study, a criteria-inclusion scheme was followed. The participants were required to be reliable, willing to take part, taking no medications that might interfere with the study results, and to have a regular meal pattern. They all lived in their homes. Before the study began, the purpose and objectives were carefully explained to the subjects. Informed consents were obtained from them.

Dietary survey

Information on the foods and beverages consumed was collected by an interviewer-administered food-frequency questionnaire (FFQ). The questionnaire was designed to elicit information regarding the eating habits of the elderly subjects, taking into account the different portion sizes of the food consumed by them. A pre-testing study was carried out with ten elderly people- five from rural areas and five from urban areas.

The 9-paged questionnaire contained 47 questions and covered six areas including dietary intake and nutritional status, lifestyle, home-life and meal patterns and personal data. A detailed list of food items covered by the food-frequency questionnaire is given Table 1. For each food, the usual size of the serving was defined. For example, for tea, three portion sizes were provided and they were 160 ml, 195 ml and 360 ml, respectively. For each food item the subjects were asked to compare/estimate the amounts they consumed by referring to a self designed Nutrition Album of the usual food portion sizes commonly consumed in Mauritius. In addition, they had to select how often the listed items were taken.

The album was self-designed and was based on taking photographs of the different foods incorporated in the questionnaire. A total of 37 most commonly consumed food items were present and they were grouped into nine classes of food, namely beverages, bread and cereal, dairy products, main dishes, protein-rich foods (meat/ fish/ poultry), pulses, fruits, vegetables and snacks.

Anthropometric measurements
Height and weight were measured without the subject wearing shoes nor any jewel. Weight was measured to the nearest kilogram (kg) with subjects with emptied pockets. A calibrated weighing platform scale with weighing capacity of 130 kg was used. Height was measured to the nearest centimeter (cm) by means of a measuring tape with a steel tape joined to a level platform to facilitate holding of the measuring tape at the bottom while taking the height at head level. From the anthropometric data, body mass index (BMI) was calculated (kg/m^2) and was used to grade the subjects into normal weight, overweight and obese. A subject having a BMI >30 was considered obese.

Statistical analysis
All statistical analyses were performed with the use of SPSS for Windows (version 10.0; SPSS, Inc, Chicago). Pearson Chi Square test was conducted to test for association between specific variables. Statistical T test was performed to determine whether there was any difference between the two sexes and the variable/s under consideration. Spearman coefficient of correlation was used to verify if there was any relationship between alcohol intake and BMI. For all statistical analyses, P values of <0.05 were considered statistically significant. Finally, Excel was used for graphical representations.

3. RESULTS

Socio-demographic characteristics of the study population
Table 2 shows the socio-demographic characteristics of the elderly participants in the study.

Evaluation of Dietary Intake and Nutritional Status
Among the study population, 13% of the elderly participants were classified as vegetarians and 87% as non vegetarians.
In general, the meals consumed most frequently were breakfast (98.3%), lunch (95%), and dinner (98.3%). Only 26.7% consumed meal at bedtime. Pearson Chi Square test showed that there is a relationship between income and meals taken at bedtime since the p-value obtained is 0.024 (2.4%).
A comparison between the meals taken by the male and female subjects is shown in Figure 1. Lunch and dinner consumption were slightly greater in males than in females, and this attained a value of 100%. However, breakfast consumption was highest in the female respondents (100%). We also note that more female (73%) consumed tea at tea-time than their male counterparts (52.2%). The percentage of individuals having meals at bed-time was approximately equal in both gender groups (males, 26.1%; females, 27%). Independent sample t-test ($p<0.05$) revealed no significant difference between males and females and the meals they consumed. It was also observed that the maximum time taken to have a meal was between 20 to 30 minutes.

Food taste in our participants
Our study population revealed that the participants consumed more salty and sweet foods (Figure 2). However, more female respondents consumed salty and sweet foods (61.2% and 66.7%, respectively). Male response was higher for salty food (37.9%) than for sweet food

(33.3%). Fast-foods were consumed by more males (60%) than females (40%). A substantial proportion of elderly subjects consumed fortified foods. Of the responders, 43.3% were men and 56.7% were women.

Frequency and portion size of food intake by the elderly participants

[**Note**: In this section, FC refers to frequency of consumption and PS refers to portion size. For example, mean FC= 6.42 implies that a particular food item is consumed on approximately 6 days in a week; and mean PS= 235.61 implies that a participant consumes approximately 235 g (or ml) of a particular food item.]

In our present study, the frequency of consumption and portion size intake of 37 food items (Table 2) were assessed. The mean frequency of consumption and portion size intake of the food items are represented graphically in Figure 3 and Figure 4, respectively. It has been observed that the foods consumed in higher amounts by the elderly population in this study are tea, milk, water, bread, butter and cheese, yogurt, rice, "Farata", fish, chicken, egg, canned food, fruits, and vegetables. To a lesser amount, the respondents consumed fresh juice, "Dahi", pasta, oily cakes and pastries.

Beverages

Within the "beverage" group, both males and females consumed preferably tea (93.3%), milk (66.7%), water (96.7%) and fruit juice (48.3%) on an average day of 6, 4, 6, and 2, respectively. The mean portion size intake (ml) of these four food items were approximately 236, 204, 992, and 191, respectively.

Dairy products

Yogurt (61.7%; mean FC= 2.68; mean PS= 125) and "Dahi" (36.7%; mean FC= 2.23; mean PS= 200) were the dairy products consumed in higher amounts.

Carbohydrate-rich foods

Rice (98.3%; mean FC= 6.42; mean PS= 480.68) and pasta (35%, mean FC= 1.38; mean PS= 497.86) were the mainly consumed food items within the "staple food" group.

Bread, butter and cheese were consumed by three-quarter of the study population (mean FC= 4.76; mean PS= 14.38).

Protein-rich foods

Within the "animal products" group, both males and females consumed preferably fish (60%; mean FC= 1.64; mean PS= 98.47), chicken (73.3%; mean FC= 2.61; mean PS= 52.29), egg (58.3%; mean FC= 1.83; mean PS= 43.29), and canned food (60%; mean FC= 1.81; mean PS= 46.67). Only 23.3% and 25% of the respondents were consumers of octopus (mean FC= 1.36; mean PS= 50.93) and mutton liver (mean FC= 1.27; mean PS= 37.14), respectively. 91.7% of respondents reported to consume pulses (mean FC= 3.75; mean PS= 162.50).

Fruits and Vegetables

Within the "fruits and vegetables" group, a high proportion of respondents (88.3%) from both sexes reported to consume fruits and vegetables. Orange, banana and kiwi were the varieties of fruit most widely consumed. For vegetables, the highest consumption was observed for green vegetables (96.0%) and lettuce (75.0%; mean FC= 3.47; mean PS= 4.98).

Snacks

The varieties of snacks most highly consumed were oily cakes (45.0%; mean FC= 1.89; mean PS= 5.14) and pastries (36.7%; mean FC= 1.55; mean PS= 98.75).

Lifestyle characteristics

One important element of lifestyle is physical activity. A total of 48.3% of both genders claimed to practise physical activity. It was noted that the level of physical activity was higher in males (69.6%) than in females (30.4%). Statistically significant difference was observed between the two sexes and the level of physical activity (p=0.009). The majority of participants reported to practise light physical activity (such as walking). Moreover, among the elderly respondents, only males reported to practise strenuous exercise (such as swimming). It was noticed that the level of physical activity was positively associated with gender, as revealed by a p-value of 0.009 (p< 5%).

Among the study population, we note that the majority of respondents had never consumed alcohol (69.4% females and 26.1% males). The consumption of alcoholic beverages occasionally was reported to be higher in males (26.1%) than in their female counterparts (10.8%). Moreover, we notice that only males consumed alcohol daily to a significant value of 0.016.

Furthermore, our study shows that most of the elderly participants are non-smokers. Of the responders, 34.8% male subjects claimed that they had stopped smoking. We also note that only males responded the "1-2 cigarettes/day" and "3-5 cigarettes/day" category responses. 13% of males smoked one packet of 10 cigarettes per day. A significant value of 0.006 ($p<0.05$) demonstrated that there is a significant difference between gender and cigarette smoking. Data regarding the frequency of alcohol consumption and cigarette smoking are given in table 3 and table 4, respectively.

Nutritionally-related diseases

In our present study, health problem was prevalent mostly among the female respondents (Figure 5). 66.7% of the female participants suffered from diabetes and were found to be obese. Moreover, of the responders, hypertension was present in 29.4% men and 70.6% women. Cardiovascular diseases occurred in a ratio of 1: 2 for male: female. It can also be observed that cataract was present in a ratio of 2: 3 for male: female. A great proportion of female participants (88.9%) suffered from poor memory, as compared to their male correspondents (11.1%). Statistically significant difference was noted between gender and each of the diseases mentioned above, since the p-value obtained was less than 0.05. For example, for diabetes, a p-value of 0.01 was obtained.

4. DISCUSSION

Socio-demographic characteristics

Most of the vegetarians in our study claimed that ethical reasons were their primary motivation for being a vegetarian.

The Central Statistics Office in Mauritius shows that life expectancy is higher among females than among males of all ages. This is consistent with our study population since a higher percentage of female subjects (61.7%) were noted. From the findings of the present study, we

observe that the educational level of the study participants was relatively low. When the elderly population we interviewed was young, most of them could not afford schooling, most probably due to poverty. This is consistent with our results since 90.9% of the female respondents did not attend school. The majority of subjects received only primary education. Moreover, at that time, there was no tertiary institution in Mauritius and hence none of our respondents was found to have studied beyond secondary level. It is also noteworthy that 15% of our elderly respondents were labourers, and we can associate this with their level of education, since we find a relationship to exist between previous occupation and level of education ($p=0.053$; $p<10$ %).

Moreover, in the present study, dietary practices may be related to income and lifestyles. Normally, a low income or loneliness may be associated with low food consumption (Rousset *et al*., 2003). Women living alone spent more time in pursuit of passive activities such as watching television, reading or resting. Our findings also found that only 28.3% of our respondents received a family income above Rs10000 per month. The majority of them had a monthly income of up to Rs 5000. We can say that monthly income is unlikely to influence the eating habits of our study sample, especially for those receiving above Rs 5000 per month.

Dietary Patterns and Eating habits among the Elderly Participants

Dietary patterns are of considerable interest in nutritional epidemiology to reflect the complexity of dietary intake in relation to diseases (Schulze *et al.*, 2003). The majority of the study sample regularly consumes their three most common types of meals, namely breakfast, lunch, and dinner. It can be said that our respondents took these three servings in order to meet their daily energy requirements. During breakfast, lunch, and dinner consumption, the nutrient intakes of the elderly individuals differ and in this respect we can state that the amount of energy these three types of meals provide varies considerably. Epidemiological surveys have reported that the consumption of high energy breakfast lead to a significantly higher energy consumption for the whole day (Blanc *et al.*, 2004). Our study population reveals that 98.3% of the elderly participants have their breakfast. This shows that the habit of missing meals is very uncommon among the elderly. In addition, many respondents perceived that taking their breakfast every morning provides for a better health throughout the whole day.

Taking a tea at tea-time after lunch reflects the current eating habit of the Mauritian population; and this is consistent with our result since a great proportion of individuals had their tea in the afternoon. Additionally, our findings indicate that some individuals (26.7%) also consumed a particular food before going to bed. The majority of them reported to having either milk or fruits for their bed-time. Milk was taken for medication purposes and fruits were mainly consumed as snacks.

This is, to our knowledge, the first study at the University of Mauritius to provide a list of the principal portion sizes of all the food items mentioned in the FFQ. The portion sizes were consistent with those being offered most frequently at home. It was observed that subjects responded to both small and large portion sizes according to the food items incorporated in the Nutrition Album. However, it was noticed during the course of the survey that most respondents were unaware what constitutes an appropriate portion. From our findings, it was found that more female subjects (73.7%) considered portion sizes of food to be very important. However, 57.1% claimed that portion sizes of food are not important at all for

them. It is possible that the portions of food presented in our study did not offer all possibilities about the amount that the elderly ate. Rolls (2002) suggested that the serving method may be an important determinant of whether portion size has an effect on intake. It is possible that some individuals, such as those who are overweight or obese, are particularly susceptible to the influence of portion sizes. Large portions of food may contribute to excess energy intake and greater obesity (Rolls *et al.*, 2006). The ready availability of foods in large portions is likely to be facilitating the overconsumption of energy in many participants.

Our findings indicate that 93.3% of the participants in the survey consumed tea. Coffee and fresh juices were consumed in relatively low amounts. Several cross-sectional studies describe a more atherogenic diet among high consumers of coffee (Mosdøl *et al.*, 2002). This is often accompanied by other factors such as smoking and physical inactivity. Our findings lead support to this notion since we find that many coffee drinkers claimed that smoking has an effect on their dietary pattern. This is supported by a p=value of 0.091.

Bread (75%), rice (98.3), pasta (35%) and "Farata" (66.7%) were the mainly consumed food items rich in carbohydrates. The mean portion size intake of cooked rice was 480 g, and this provides approximately 623.67kcal (or 2619.4kJ) of energy. Comparing this value with the Dietary Reference Intakes for Older Adults (http://www.fiu.edu/~nutreldr/SubjectList/D/DRI_RDA.htm), we find that both male and female respondents aged 55+ meet the recommended dietary allowance (RDA) of energy.

In fact, there was an excess energy intake if we are to consider the value provided for female aged 51-70 (1978 kcal). This might provide a plausible explanation why obesity was more prevalent in the female elderly subjects than in the male (significant value=0.013; p< 5%). Variations in portion size have an effect on energy intake across a range of different types of foods. As the size of the portion served is increased, both weight of food consumed and energy intake also increase (Rolls *et al.*, 2004). A study has shown that an increase in both portion size and energy density of a single food led to independent increases in energy intake during a meal (Kral *et al.*, 2004).

High fruit and vegetable intakes have been associated with lower risks for cardiovascular diseases, some forms of cancers and obesity (Velde *et al.*, 2006). The elderly men and women of the present study consumed about 60.7g of vegetables per day (at least 4 servings per week). Fruits were also consumed 4 times a week on average. The presence of these fruits could explain the absence of constipation among the study sample.

Physical activity

Regular physical activity has an essential role in the maintenance of nutritional status. Our study revealed that more males (55.2%) performed physical activity than their female counterparts (44.8%). An important finding from our study is the observation that the majority of respondents performed light physical activity, such as walking and gardening. This may be important in obese people since physical activity improves muscle strength and muscle mass. Most of our study participants practise exercise in order to be in a good health. However, 16.7% of the study participants would show lack of time or lack of interest to practise physical activity. This may be due to the fact that they would prefer to engage in some sedentary activities, such as watching television or reading newspapers.

Alcohol consumption

In general, alcohol intake by the elderly participants was relatively low. The majority of females (69.9%) claimed that they had never consumed alcohol. However, only males reported to drink alcohol either 3-5 times per week or daily. Statistically significant difference exists between gender and alcohol intake.

Cigarette smoking

Cigarette smoking is associated epidemiologically with a high risk for various types of chronic illnesses. Our results support this particular fact since there was an association between cigarette smoking and disease studied in the present study ($p=0.021$; $p< 5\%$).

5. CONCLUSION

In summary, our survey is a substantial study in which an extensive number on nutritional variables were determined in a group of elderly individuals. Given that subjects in the present study are representative of the overall elderly population in Mauritius, and that the format of the FFQ is simple, we conclude that the FFQ is a useful tool for assessing intakes of common foods in the study.

This present study has provided the first nationally representative estimates of mean portion size intake by the Mauritian old people aged 58+. Our observations of the portion size intake of our study sample prove that it is useful to check up the food intake habits of the elderly so that insidious development of nutritionally-related health problems can be prevented.

We can also suggest that the Mauritian elderly consumers' attitudes, knowledge about nutritional stratus, their dietary patterns and their demographic and other lifestyle characteristics deserve structured surveys based on appropriate theoretical basis in the near future. Our present study is limited in that it surveyed a small sample size (n=60); therefore, longer studies with a larger sample size are still required. Another limitation is that our questionnaire was restricted to only a few portion sizes of food items.

It is important for the elderly in general to receive knowledge, both theoretical and practical, about how to combine and prepare a healthy diet. Because portion size is a modifiable environmental factor, it should be addressed with regard to the treatment and prevention of non-communicable diseases, such as obesity. One approach would be to educate people about appropriate portions and about interpreting nutrition labels.

6. REFERENCES

BELL, E. A., CASTELLANOS, V. H., PELKMAN, C. L., THORWART, M. L. AND ROLLS, B. J., 1998. **Energy density of food affects energy intake in normal-weight women**. *American Journal of Clinical Nutrition*, 67: 412-420.

BIRREN, J. E., 1996. **Encyclopedia of Gerontology-Age, Aging, and the Aged**, 1. Academic Press.

BLANC, S., SCHOELLER, D. A., BAUER, D., DANIELSON, M. E., TYLAVSKY, F., SIMONSICK, E. M., HARRIS, T. B., KRITCHEVSKY, S. B. AND EVERHART, J. E.,

2004. **Energy requirements in the eighth decade of life**. *American Journal of Clinical Nutrition*, 79: 303-310.

DICKERSON, J. W. T. AND LEE, H. A., 1988. **Nutrition in the Clinical management of Disease**. 2nd ed. Edinburgh: Edward Arnold Publishers Ltd.

ELLO-MARTIN, J. A., LEDIKWE, J. H. AND ROLLS, B. J., 2005. **The influence of food portion size and energy density on energy intake: implications for weight management**. *American Journal of Clinical Nutrition*, 82 (suppl): 236S-241S.

KRAL, T. V. E., ROE, L. S. AND ROLLS, B. J., 2004. **Combined effects of energy density and portion size on energy intake in women**. *American Journal of Clinical Nutrition*, 79:962-968.

Mauritius in Figures, 2003. Central Statistics Office. Ministry of Finance and Economic Development.

MOSDØL, A., CHRISTENSEN, B., RETTERSTOL, L. AND THELLE, D.S., 2OO2. **Induced changes in the consumption of coffee alter ad libitum dietary intake and physical activity level**. *British Journal of Nutrition*, 87: 261-266.

ROLLS, B. J., MORRIS, E. L. AND ROE, L., 2002. **Portion size of food affects energy intake in normal-weight and overweight men and women**. *American Journal of Clinical Nutrition*, 76: 1207-1213.

ROLLS, B. J., ROE, L. S. AND MEENGS, J. S., 2006. **Reductions in portion size and energy density of foods are additive and lead to sustained decreases in energy intake**. *American Journal of Clinical Nutrition*, 83: 11-17.

ROLLS, B. J., ROE, L. S., MEENGS, J. S. AND WALL, D. E., 2004. **Increasing the portion size of a sandwich increases energy intake**. *J Am Diet Assoc*, 104:367-372.

ROUSSET, S., MIRAND, P.P., BRANDOLINI, M., MARTIN, J. AND BOIRIE, Y., 2003. **Daily protein intakes and eating patterns in young and elderly French**. *British Journal of Nutrition*, 90: 1107-1115.

Rurik, I., 2006. **Nutritional Differences between Elderly Men and Women**. *Annals of Nutrition and Metabolism*, 50: 45-50.

SCHULZE, M., B., HOFFMAN. K., KROKE, A. AND BOEING. H., 2003. **An approach to construct simplified measures of dietary patterns from exploratory factor analysis**. *British Journal of Nutrition*, 89: 409-418.

VELDE, S., WIND, M., LENTHE, F., KLEPP, K. AND BRUG, J., 2006. **Differences in fruit and vegetables intakes between children of Dutch origin and non-Western ethnic minority in the Netherlands-a cross sectional study**. *International Journal of behavioural Nutrition and Physical Activity*, 3:31.

Table 1. List of food items in the elderly food frequency questionnaire.

BEVERAGES	BREAD AND CEREAL	DAIRY PRODUCTS
Tea	Cornflakes	Yoghurt
Coffee	Bread and butter	"Dahi"
Milk	Cheese	Ice cream
Fresh juice	Toast	
Water		
Soft drink		
MAIN DISHES	**MEAT/FISH/ POULTRY**	**PULSES**
Rice	Fish	Lentils
Noodles	Octopus	Peas
Pasta (macaroni)	Chicken	
Bread and curry	Mutton Liver	
"Farata"	Fried egg	
	Canned Food	
FRUITS	**VEGETABLES**	**SNACKING**
Orange	"Brede"	Potato crisp
Banana	Potato chips	Chocolate
Kiwi	Salads (e.g. lettuce)	Oily cakes
	Pumpkin or other green vegetables	Pastries

Table 2. Socio-demographic characteristics of elderly participants

CHARACTERISTIC		n	%
Gender	Male	23	38.3
	female	37	61.7
Age	54-59	19	31.7
	60-69	26	43.3
	70-79	9	15.0
	80-85	6	10.1
Area of residence	Rural	26	43.3
	Urban	34	56.7
Educational level	Primary	24	40.0
	Secondary	25	41.7
	Tertiary	0	0
	None	11	18.3
Religion	Hindu	40	67.8
	Muslim	6	10.2
	Christian	9	15.3
	Chinese	4	6.8
Previous occupation	Housewife	18	30.0
	Textile worker	6	10.0
	Labourer	9	15.0
	Maid	4	6.7
	Teacher	3	5.0
	Maintenance officer	4	6.7
	Clerk	4	6.7
	Businessman	5	8.3
	Policeman	3	5.0
	Driver	4	6.7
Family type	Nuclear	44	73.3
	Extended	16	26.7
Family size	1	8	13.3
	2	6	10.0
	3	13	21.7
	4	19	31.7
	5	9	15.0
	>5	5	8.3
Monthly family income (Rs)	Up to 2000	11	18.3
	2000-5000	14	23.3
	5000-10000	18	30.0
	>10000	17	28.3

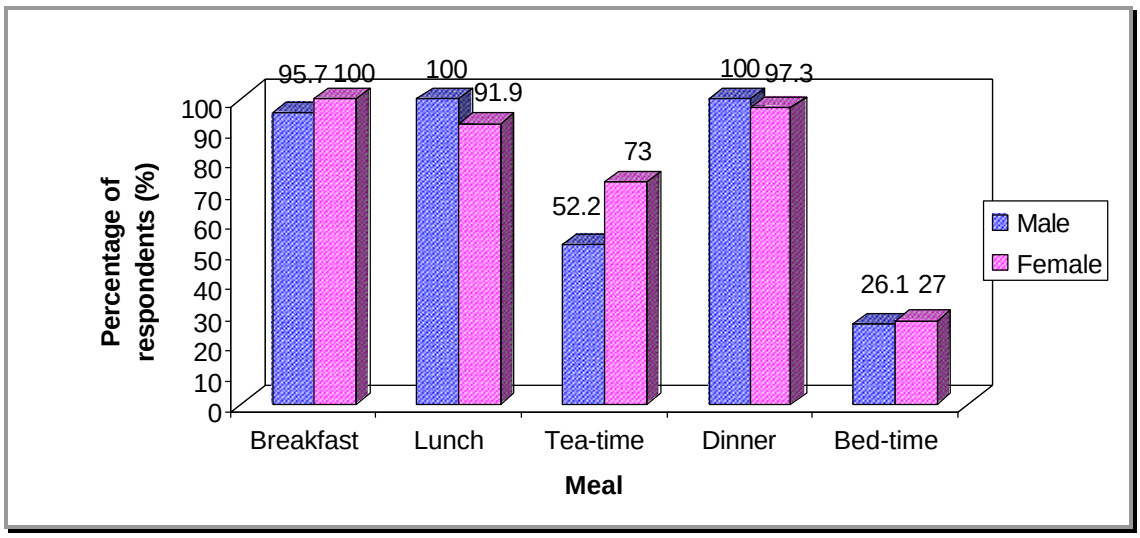

Figure 1. Comparison between male and female subjects in the meals they consume.

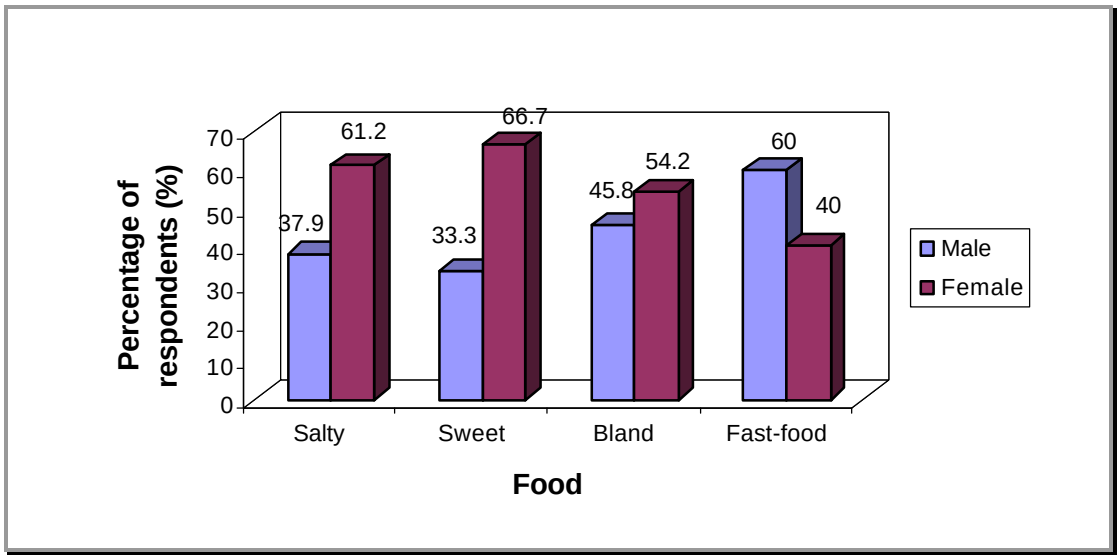

Figure 2. Type of foods consumed by elderly subjects.

Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Food item	Tea	Coffee	Milk	Fresh juice	Water	Soft drink	Cornflakes	Bread, butter and cheese
Food item	Toast	Yoghurt	"Dahi"	Ice cream	Rice	Noodles	Pasta	Bread and curry
Number	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
Food item	"Farata"	Fish	Octopus	Chicken	Mutton liver	Fried egg	Canned food	Pulse
Number	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**
Food item	Fruits	"Brede"	Potato chips	Lettuce	Potato crisp	Chocolate	Oily cakes	Pastries

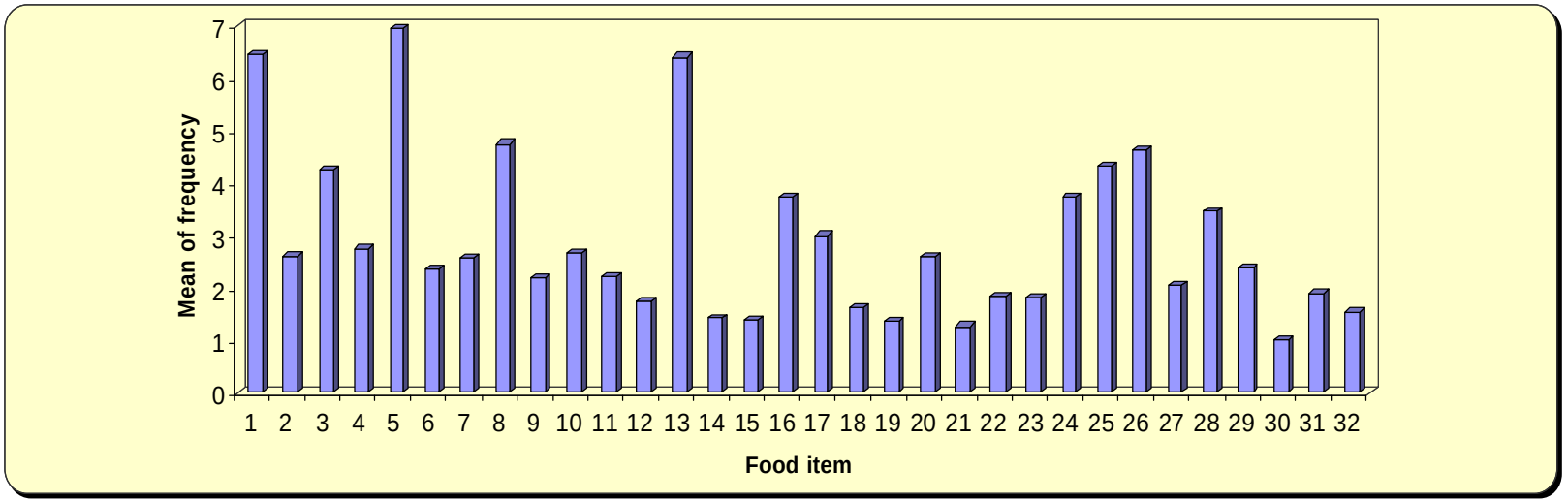

Figure 3 : Mean frequency consumption (Please note that the number of food item corresponds to the number in the above table; for example, number 1 in the graph refers to tea).

Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Food item	Tea	Coffee	Milk	Fresh juice	Water	Soft drink	Cornflakes	Bread, butter and cheese
Food item	Toast	Yoghurt	"Dahi"	Ice cream	Rice	Noodles	Pasta	Bread and curry
Number	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
Food item	"Farata"	Fish	Octopus	Chicken	Mutton liver	Fried egg	Canned food	Pulse
Number	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**
Food item	Fruits	"Brede"	Potato chips	Lettuce	Potato crisp	Chocolate	Oily cakes	Pastries

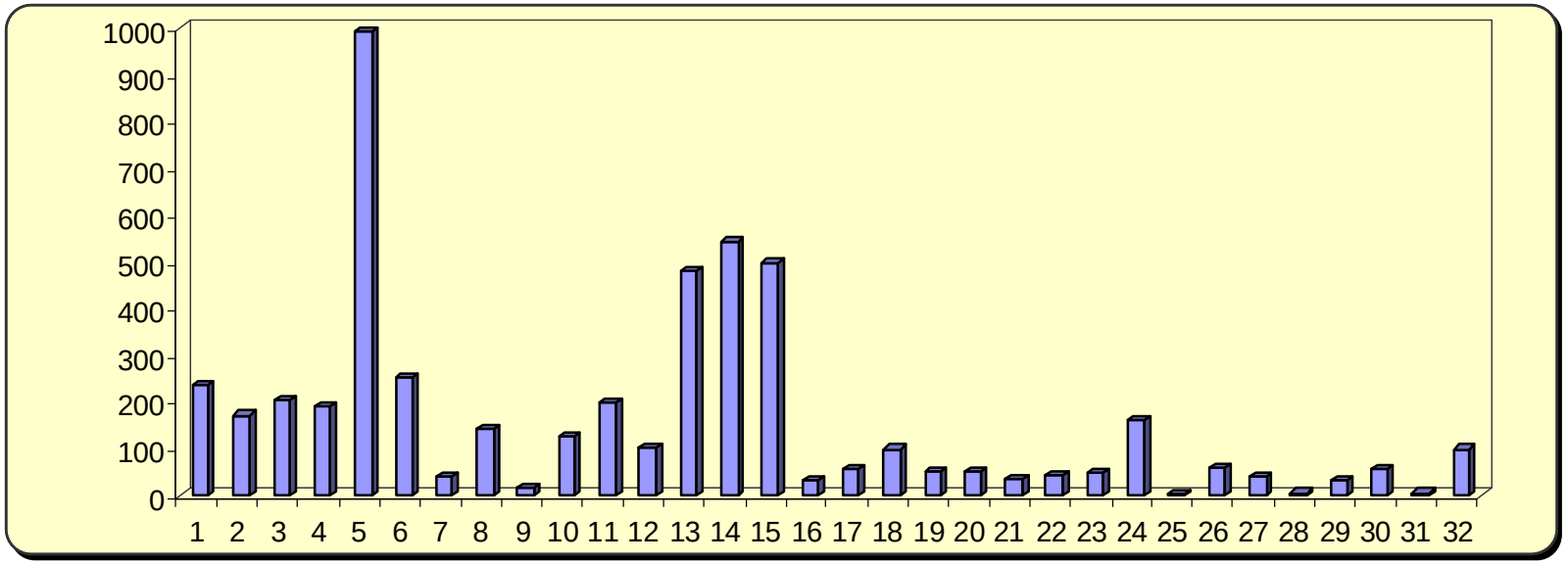

Figure 4 : Mean portion size intake (Please note that the number of food item corresponds to the number in the above table; for example, number 1 in the graph refers to tea). The x-axis represents the food number.

Table 3. Frequency of alcohol consumption

	Alcohol consumption						
	Never	Occasionally	Rarely	1-2 times/ wk	3-5 times/wk	Daily	Stopped drinking
Men	6	6	2	3	1	3	2
Women	24	4	7	2	-	-	-

Table 4. Frequency of cigarette smoking

	Cigarette smoking				
	Never	1-2 cigarettes/d	3-5 cigarettes/d	1 packet of ten cigarettes per day	Stopped smoking
Men	7	2	3	3	8
Women	37	-	-	-	-

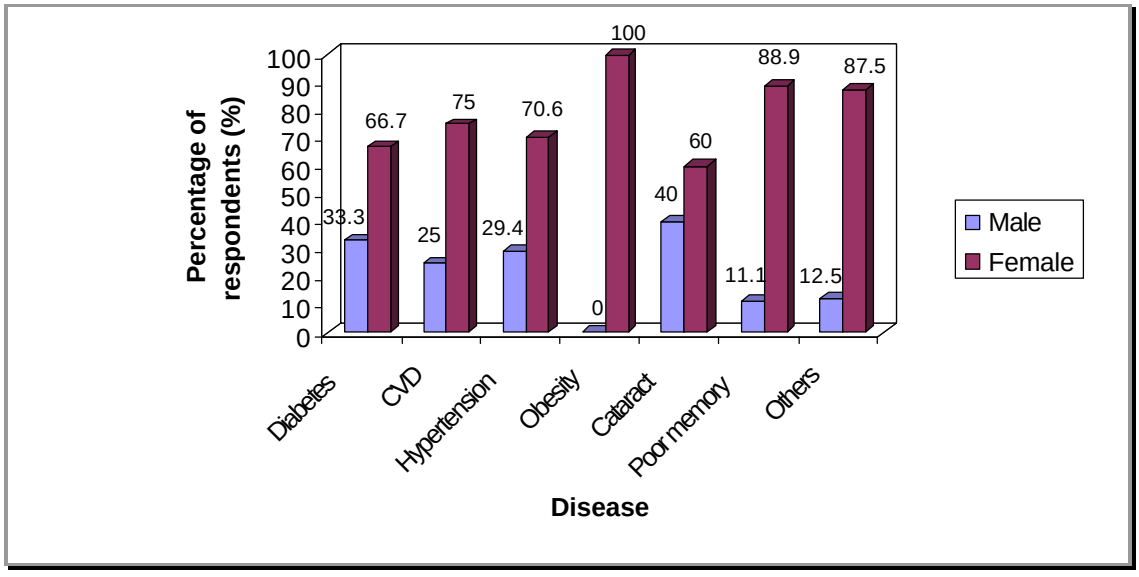

Figure 5. Prevalence of disease among the elderly participants