ACTUAL INTAKE VERSES RECOMMENDED INTAKE AMONGST FEMALE ADOLESCENTS

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Abstract

Background: The study was conducted to determine the dietary intake patterns of young females and to compare them with recommended servings. It was a descriptive quantitative study, in which a total of 100 girls of age 18-22 years participated from the Kinnaird College for Women, Lahore.
Methods: Data was collected by taking dietary recall of the previous day using a 24 recall form. A food frequency questionnaire was also handed out to determine the dietary intake patterns and in order to validate the 24 hour recall. Before giving them a four day food diary which was collected after four days, they were explained about the serving sizes of different foods.
Results: Approximately 50% of the respondents met the requirements of the food groups with the exception of vegetable group as only 2 % were taking according to the standards. When the validity of 24 hour with the food diary was checked, the insignificant p values being more than 0.05 indicated that their daily consumption was similar to the 24 hour recall.
Conclusions: There should be more focus on eating a well balanced diet. Half of the young female adults are meeting the recommendations of the food groups with the exception of vegetable groups. It was concluded that the individuals had wrong perceptions about portion sizes and serving sizes thus awareness programs should also focus on that. A revised tool for the implementation of the dietary guidelines was recommended.

Keywords: Serving size: The serving size of a given food is the amount recommended by MyPyramid.gov (Martinez, 2011)
Portion size: A portion is simply the amount of food you choose to eat. This means that you may eat less or more than the serving size of a food

(Martinez, 2011)
Portion size measurement aids
These are the aids that facilitate the estimation of serving.

Introduction

Food intake is the ingestion of any substance consisting of carbohydrates, proteins, fats, vitamins and minerals. The intake of food is very important as it provides energy, promotes growth and maintains life of an individual. The actual food intake is the amount of food that you actually consume. A person consuming a larger portion size of a food then his actual food intake is said to be greater than the recommended serving. A portion size is defined as an amount of food a person puts on his plate. The estimation of food portion size helps in determining the actual food intake by a person (Hight, 2008).

The consumption of larger portion sizes contributes to weight gain and obesity. Now a-days people especially the kids and the teenagers do not consume a healthy and well balanced diet, consisting of all the essential nutrients that helps in maintaining all the functions of the body and instead they prefer eating fast food. The college cafeterias and frequent dining out has also contributed to unhealthy eating patterns among adolescents and kids (Byrant, 2005). Their diet mostly consists of fats, sugars, carbohydrates, sweetened beverages and small amounts of fruit, vegetable and milk. This dietary habit can become a problem for them in future and they might suffer from several nutritional deficiencies and obesity.

The study is focused at assessing the actual intake compared to the recommended intake as compared to the dietary guidelines by USDA. It is a tool which helps in measuring our actual intake of various foods against what we should be eating. It is a pyramid shaped guide which is divided into six sections to show the recommended intake of each group which are starch group, milk group, meat group, fruit group, vegetable group, fats and sugars. The recommended servings for starch group are 6-11; 3-5 for vegetable group, 2-4 for fruit group, 2-3 for meat and milk group, and fats and oils should be used sparingly (Mahan&Stump,2008)

It is important for a person to consume a well balanced and nutritious diet to lead a healthy life, therefore, this nutrition guideline plays an important role in it. If a person follows this guideline then he is consuming the right amount of calories, vitamins, and minerals and in this way he can maintain the ideal weight for his body but usually people do not focus on the recommended servings. A number of studies indicate that the food intake by most of the people is not according to the recommended servings. In Hispanic Health and Nutrition Examination Survey, the comparison between the mean daily servings of food groups with the

recommended servings indicated that the daily servings of meat and milk group exceeded where as the intakes of fruit and vegetables were lowest of the recommended servings in children. In teenagers the servings of all the food groups were the lowest (Murphy, 1990)

I.
Methods

A cross-sectional descriptive research focusing on comparison of actual food intake with the recommended food servings of USDA My Pyramid was conducted in February 2012 till June 2012 on 100 females of 18-22 years studying at Kinnaird College for Women, Lahore. Convenient sampling was done to select the sample. The tools used to conduct the study were a questionnaire consisting of

- **Questionnaire** A questionnaire consisting of
    - **Anthropometric measurements** .The students self-reported their height and weight.
    - **Body Mass Index (BMI)**
        The body mass index was calculated as:
    BMI= weight in kg/Height in meter square

BMI range

Below 18.5	Underweight
18.6-24.9	Normal weight
24.9-29.9	Overweight
30 and above	Obese

(Mahan & Stump, 2008)

- **24 hour recall form**
  The 24 hour recall is a method to collect information regarding dietary intake of the previous day therefore it was taken from the individuals.

- **Food frequency questionnaire**
  A food frequency questionnaire which represented the frequency of consumption of various foods in a week was distributed amongst the individuals
    In a study carried out by Foot *et al* (2000) similar method was used for comparing the diet of the citizens of US with the Food Guide Pyramid Recommendations.

- **Portion size measurement aids**
  These are the tools that facilitate the estimation of serving. Measuring cups , tea spoons, table spoon, glass, quarter plate,dinner plate ,tennis ball and food models like a small, medium, and larged size apple and orange, 6 inch chapatti and pictures were shown to the individuals for the correct estimation of food portion sizes by them.

Similar method was used by Howat *et al* (1994) to access the ability of the subjects to estimate portion sizes, three portion tests were given to the subjects so food models and food photographs were used for estimation. It was reported that most participants overestimated the portion sizes. The ability of the subjects to recall and estimate portion sizes was improved by using both the techniques, however using food photographs was more helpful.

- **Food diary**

  A food diary was given to the individuals and they recorded their intake of 4 days by keeping it with themselves . A four day food diary consists of dietary recall forms of four days with pictures showing portion sizes of different foods.

  Similar method was used by Small *et al* (1999) to assess dietary intake among children.

Permission was taken from the college authorities and the consent of the students participating in the research was taken before conducting the study. The procedure was carried out during the class and the students were briefed about the purpose of the study before filling out the questionnaires. After the instructions they were shown the pictures and models of fruits and vegetables of various sizes, the standard size of a chapatti, the amount of milk, rice and gravy contained in a standard sized cup which was then poured in a plate to show the exact quantity to the individuals so that they could easily recall the portion of food consumed by them. After that they were asked to fill a 24 hour recall form of the previous day and write the amount of food consumed according to the pictures or models shown to them, so that by estimating the portion sizes of the foods, comparison between the actual and recommended servings could easily be made. A food frequency form was also attached with the 24 hour recall. The participants took almost twenty five minutes in filling out the dietary recall forms. Mostly the students were cooperative and found the procedure interesting.

A food diary was given and the students kept it with themselves for 4 days and recorded their dietary intake. This diary was collected after 4 days.

After the collection of data , all the food and ingredients consumed were categorized into the relevant food groups. The combination foods such as pizzas, macaronis were broken down into their component ingredients and were then placed into various food groups and then total number of servings from each group was calculated. Friedman test was performed to validate the 24 hour recall.
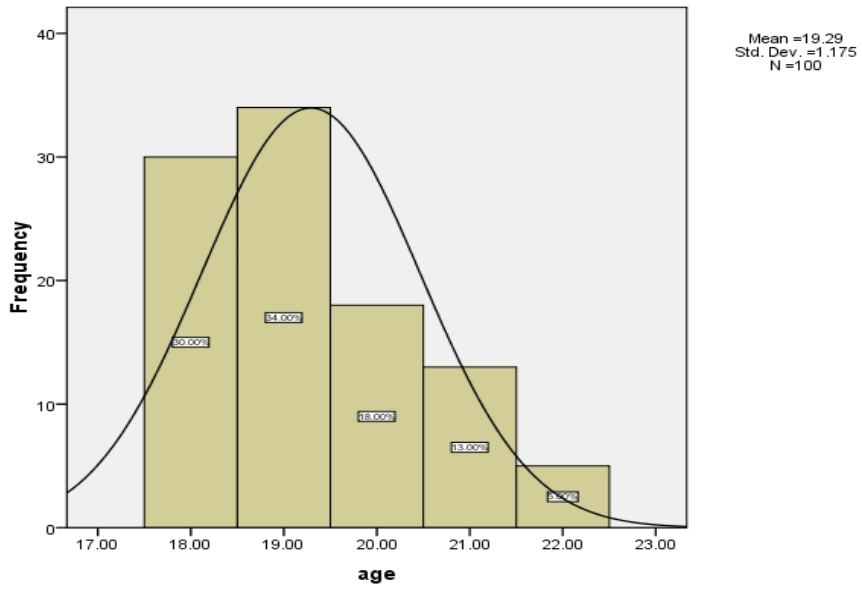
Results

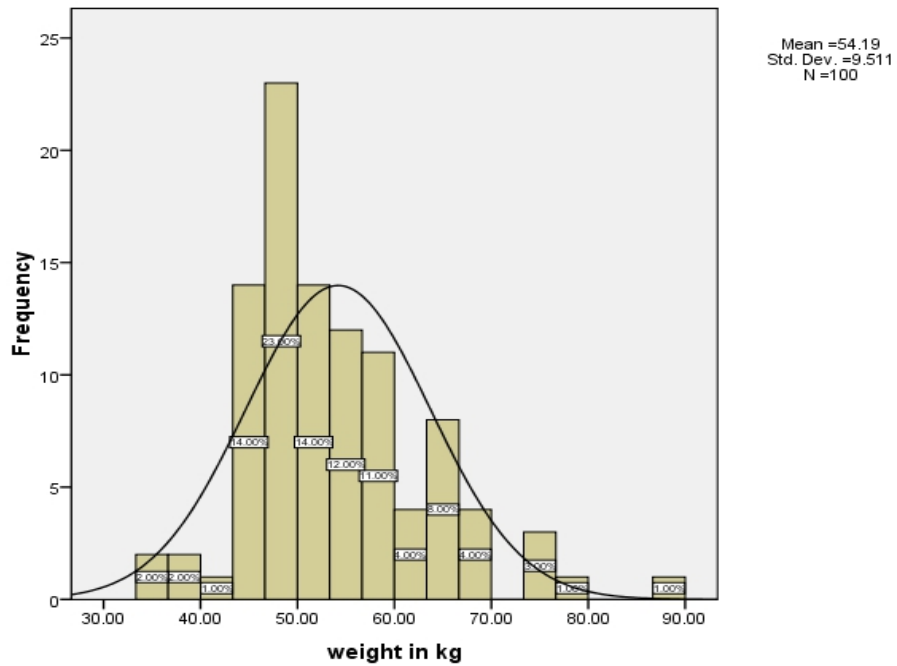Figure 1 The age of the respondents

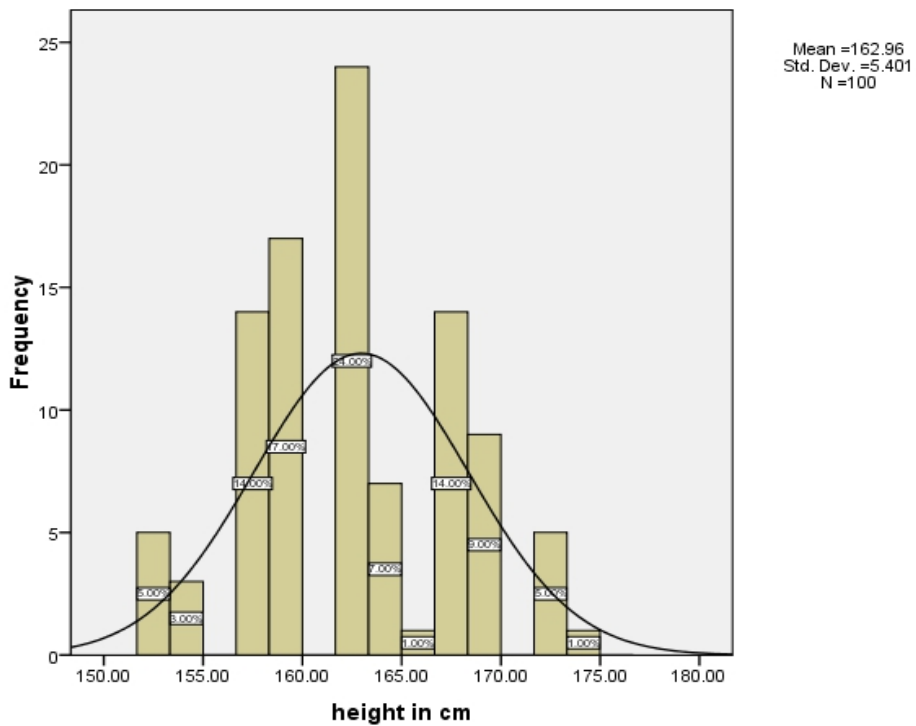Figure 2 The weight of the respondents

Figure 3 The height of the respondents

Figures 1, 2 and 3 indicate the characteristics of the respondents. The mean age (*figure 1*) was 19.29 years, the median and mode of age was 19 years, with 18 being the minimum and 22 being the maximum age of the respondents. 34 % of the respondents were of age 19.

The mean weight (*figure 2*) was 54.19 kg, the median was 52.5 kg, the mode was 45 kg with 35 being the minimum and 89 being the maximum weight.

Food groups	Percentage distribution of the respondents according to the recommended servings				Standard deviation
	Recommendations	Above recommendations	Below recommendations		
Starch group	59%	34%	7%	10.255	3.89735
Milk group	42%	4%	54%	1.4275	1.14332
Meat group	49%	18%	33%	2.2850	1.28168
Vegetable group	2%	0%	98%	0.5	0.80630
Fruit group	50%	3%	47%	1.49	1.57714

Table 1 Comparison of actual food intake with recommendations

The mean height *(figure 3)* was 162.9 cm, the median and mode of height was 163 cm, with 152cm being the minimum and 175 cm being the maximum height.

recommended servings of starch : 6-11servings, milk :2-3servings,
    meat :2-3servings,vegetable:3-5servings, fruit :2-4 servings.

Table 1 shows the comparison of the actual food intake of the respondents with the recommended food servings and it indicates that the majority of the respondents consume all the food groups according to the recommended servings except the vegetable group.

Discussion

Age, height and weight are the characteristics of the respondents and it was found out that these characteristics had no significant effect on the dietary consumption patterns. A study by Rolls *et al* (2002) found no effect of gender, age and BMI on actual intake and concluded that these characteristics had no considerable effect on intake. Similarly , studies by Kral *et al* (2004) and Deliberti *et al* (2004) found no effect of subject characteristics on the intake of the respondents.

Foods have been divided into groups of starch, meat, milk, fruit, vegetables and fat and their recommended servings have also been suggested to improve the diet and make it healthy. Mostly, the guidelines suggested by US are followed universally. The recommended servings for starch range from 6-11. The mean consumption of starch among the individuals was 10.2550 59% of the individuals consumed the recommended servings of starch , 34% consumed above normal , this may be due to the fact that major portion of our diets is composed of starch like cookies , bread, cakes , pastries ,chips ,potatoes and these food products are also available in college.

The results are different when compared to the study of Munoz *et al* (1997) which was carried out to access adolescents dietary intake as it was found out that only 30% of the respondents met the requirements of starch group. This may be due to the difference in trends in food consumption as the staple food of Pakistan is chapatti which comes under the starch group and almost everyone consumes it daily at every meal. People do not have the concept of serving sizes therefore they consume more than one serving of starch at a time by taking chapatti of various sizes and thickness , similarly people are fond of eating large portions of rice so due to difference in dietary intake patterns of Pakistani adults and adults of other regions , different results can be observed.

It is recommended to take 2 to 3 servings in a day from the milk group.4 % of the respondents had slightly higher intakes of milk , 42% consumed servings ranging from 2 to 3 whereas 54% respondents consumed less than 2 servings of milk per day which are comparable to a study

conduted by Wang *et al* (2010) in which he found out that 49% of the American adolescents met the dairy requirements. Mostly the girls, especially the school or college going consume milk in the form of tea, coffee , shakes and other milk based desserts that may be the reason that their intake from dairy group is according to the standards.

The mean consumption from the meat group by the respondents was 2.2850+/- 1.28168 , with 0 being the minimum and 7 being the maximum servings consumed by them. 49% of the individuals met the required needs which is higher in proportion as compared to 33% of the individuals not meeting the standards. The results were similar when compared to the study of Cleveland *et al* (1997) , as they also indicated that 49% of the adolescents met meat requirements. In college cafeteria many products such as shawermas , sandwiches , pizzas, burgers , biryani contain meat and when the dietary recalls of the 100 individuals were accessed , many of them had consumed these products thus they met the requirements.

When the intake from the fruit group was assessed it was found out that the mean fruit consumption was 1.45 +/- 1.57 . 50% of the respondents consumed recommended servings of fruit. As the respondents in this study were students of Food Science and were well aware of the nutritional value of fruits therefore the consumption of half of the population was according to the standards. The affordability and availability of the fruits is also the main reason as fruits are easily available in the markets at cheap prices for example water melon , everyone especially upper and middle class can afford and fulfill their requirements . However , a study conducted by Munoz *et al* (1997) indicates a large proportion of American teenagers did not consume recommended servings of fruit.

On average 0.6 servings of vegetables were consumed by the respondents. 98 % of the respondents did not consume according to the normal servings . Although the respondents were from Food Sciences and despite knowing the nutritional value of vegetables , they preferred eating from meat and starch group may be because of the palatability of these foods. Many studies carried out internationally also show similar results like that of Munoz (1997), in which less than 40 % of the respondents met the requirements.

As the data was gathered using a 24 hour dietary recall , there were some chances of inaccuracy in reporting the intake therefore it was necessary to validate the 24 hour recall. For this purpose a food diary was given to the respondents. The p value for each group was not significant being more than 0.05 (starch p value = 0.294, milk p value=0.122 , meat p value = 0.09 , fruit p value = 0.470 and vegetable p value = 0.62) thus indicating that their daily consumption of starch , milk, meat , fruit and vegetables was similar to the amount consumed in those 24 hours of which the data was collected.

The intake of starch was up to the standards or slightly higher than that , 7% of the individuals never consumed pizza and pastas whereas 74% consumed it more than once a week. College going students prefer eating fast foods may be because of peer pressure or frequent hang outs with friends. Majority of the population prefer using oil daily in their food items as compared to the other products from the fat group. This may be because of the influence of television commercials or taste preferences.   The consumption of sweets and sugars is also high in girls , 76 girls consumed chocolates more than once in a week. 92 individuals consumed fruits daily , only 7% of the individuals did not consume vegetables at all , however the rest 97 individuals also did not take recommended servings of vegetables daily as indicated by p value of 0.00. Only 12% individuals did not consume beverages at all whereas the rest consumed it more than once a week. The frequent consumption of carbonated beverages among young people is due to the influence of advertisements and dining out. When they go out they prefer having colas and other beverages instead of water with their food.

The results revealed that approximately 50% of the individuals met the recommendations of the food groups with the exception of the vegetable group .

Conflict of interest

There is no conflict of interest in this research.

Conclusion

The study suggests that there should be more focus on eating a well balanced diet. Although half of the young female adults are meeting the recommendations of the food groups with the exception of vegetable group. Majority of the respondents had normal BMI but there are chances of micronutrient deficiencies in future as their diet is deprived of vegetables which are a rich source of micronutrients.It was concluded that the individuals had wrong perceptions about portion sizes and serving sizes thus awareness programs should also focus on that .

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