

Adequacy of Fiber Intake of Students of Nutrition Aged Between 18 to 23 years



Healthcare

KEYWORDS : Dietary fiber, RDA

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ABSTRACT

Fiber, while not an essential nutrient, performs several vital functions. Fiber, maintains digestive health and regularity, enhances satiety, reduces the risk of bowel cancer, lowers blood cholesterol, controls blood sugar levels and prevents disorders associated with a low fiber diet. The present investigation was undertaken to analyze the food consumption pattern and the dietary fiber intake of students of Nutrition, aged between 18 to 23 years, in Chennai on a working day using the 24-hour dietary recall method. Students of Nutrition were selected for this study to find out if they implemented their nutritional knowledge in their own food choices. The major findings of the study were 1. The fat intake was significantly higher, whereas, the carbohydrate, iron and fiber intake were very less when compared to RDA. 2. Skipping breakfast was common among the study group. 3. The fruit and vegetable consumption was very less than the recommended amounts. Though the participants in the study had nutrition knowledge and were also aware of the benefits of dietary fiber, it was clear from their diet pattern that they seldom put it into practice.

Introduction

Dietary fiber has demonstrated benefits for health, maintenance, disease prevention and as a component of medical nutrition therapy. Dietary fiber should be obtained through the consumption of foods. In addition to fiber, fruits, vegetables, grains and legumes provide micronutrients that are essential components of healthful eating. The American Dietetic Association recommends that public should consume adequate amounts of dietary fiber from a variety of plant foods.

Rationale for the study

Epidemiological data suggest that the intake of complex carbohydrate and dietary fiber is associated in an inverse manner to the risk of coronary artery disease (Anderson, 1995). Food fibers are not absorbed into the body. Therefore dietary fibers are not a nutrient. Nevertheless, the role that dietary fiber plays in maintaining body's health is tremendous.

On an average, adolescents consume diets that are inadequate in several vitamins and minerals, including folate, vitamins A and E, iron, zinc, magnesium and calcium. Dietary fiber intake among adolescents is also low. Diets consumed by many teens exceed current recommendations for total fat and saturated fat, cholesterol, sodium and sugar (Lino et al., 1999, Fox, 2001).

A study was conducted in Bogalusa (Berenson, 2001) to determine the dietary fiber intake of children and young adults. The Bogalusa heart study was an epidemiologic investigation of cardiovascular risk factor variables and environmental determinants. The 24-hour dietary recall method was adopted to collect data on the food habits of individuals. Their carbohydrate and fat intake in relation to the fiber intake were analyzed. The study revealed that individuals who had a high fiber intake generally consumed foods that were low in fat and carbohydrate.

With this study in mind, the present investigation was undertaken to analyze the food consumption pattern of college girls aged between 18 to 23 years, in Chennai on a working day using the 24 - hour dietary recall method. Students of Nutrition were selected for this study to find out if they implemented their nutritional knowledge in their own food choices.

Objectives of the study

The main objective of the study was to analyze the dietary habits and the intake of specific nutrients (carbohydrate, fat, energy, fiber and iron) of college girls aged between 18 to 23 years. The results obtained were compared to the recommendations prescribed by the Indian Council of Medical Research (ICMR). The objectives of the study are as follows:

- To analyze the food consumption pattern of college girls aged between 18 to 23 years on a working day using the 24 hour dietary recall method.

- To determine the mean percentage of energy contributed by carbohydrate and fat in their diet.
- To determine the mean intake of dietary fiber based on the meal period and contributions made by different food groups.

Design of the study

The design of the study was descriptive in nature. Data on food choice, meal pattern and dietary habits were studied using the 24 hour dietary recall method.

Selection of sample

The study was conducted among 200 undergraduate students aged between 18 to 23 years. All these students were students of Nutrition Science.

Students of Nutrition have definite knowledge about the different nutrients and their role in human nutrition. The aim of the study was to find out if the subjects were exercising their nutrition knowledge on their food choices. They also have a clear knowledge about food portion sizes, which was very important to increase the reliability and validity of the 24 hour dietary recall method adopted in this study.

Samples between the age groups of 18 to 23 years were selected for the study since this age group has greater freedom to choose between junk foods and a well balanced diet.

The 24 hour dietary recall was done on a working day since during the weekends the diet will definitely be better than on a college going day in terms of nutrient intake, food choices and meal pattern.

Method of calculation

The nutrient intake in grams of selected nutrients such as carbohydrate, fat, fiber and iron were calculated using the values provided in the Nutritive value of Indian foods.

Results and Discussion

Mean intake of different food groups

The mean intake in grams of various food groups by the subjects was calculated and compared with the recommendations prescribed by ICMR.

It was evident from the results that the intakes of all foods were much less than the ICMR's recommended values. Majority of the girls were rice eaters. The major pulses consumed were Bengal gram dhal and red gram dhal. The fruit and vegetable consumption was also less. Milk was consumed by 80 per cent of the girls but the amount consumed was as low as 50 ml. Since snacking was common during break time, most of them had cola beverages, chocolates, toffees and chips that added to the calorific value of food.

Specific nutrient content of the diets

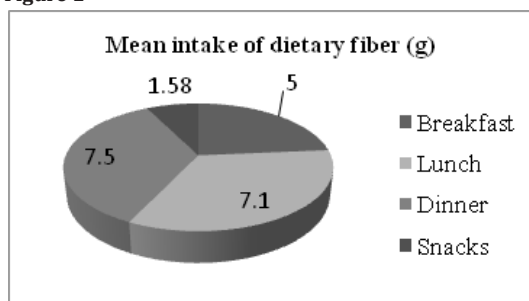
The energy, carbohydrate, fat, iron and fiber intake of the study group are presented in Table 1.

Table 1 Nutrient composition of the diets

Nutrients	ICMR recommendations	Study group Mean
Energy (kcal)	1875.0	1516.71
Carbohydrate (g)	280.0 (60 % of energy)	265.1
Fat (g)	20.0	33.17
Iron (mg)	30.0	9.6
Fiber (g)	40.0	20.27

The diets were deficient in the intake of all nutrients, excepting fat, when compared to ICMR recommendations. The fat intake was significantly higher among non-vegetarians when compared to vegetarians which was attributed to the intake of meat, egg and chicken. The iron intake was much less than the recommended allowance of 30 mg per day. This reflects on the iron status of the girls which predisposes them to iron deficiency anaemia. ICMR recommends a daily intake of 25 to 40 g of dietary fiber. In this study, the mean intake was around 20 g which is less than the minimum intake recommended by ICMR. A low fiber intake may increase the risk for diabetes because such diets are usually more energy dense and promote obesity and coronary artery disease.

Mean intake of dietary fiber based on meal period
Figure 1



Data on dietary fiber intake was compared for different eating occasions – breakfast, lunch, snacks and dinner. Dinner contributed the greatest percentage of total dietary fiber followed by lunch. Not much difference was observed in the contribution of dietary fiber between lunch and dinner. Breakfast contributed 5 g of dietary fiber. Skipping breakfast was also common among the study group. Snacks contributed the least. These findings are in agreement with another study by Nicklas, (1993) where dinner meal contributed the greatest percentage of dietary fiber. Snacks and lunch contributed one fourth to one third of dietary fiber and breakfast contributed less than 15 per cent.

Percentage contribution of dietary fiber by different food groups

The percentage of dietary fiber contributed by each food group in the diet of subjects was studied. The findings are presented in table 2

Table 2

Mean percentage of Dietary fiber contributed by different food groups

Food Group	% dietary fiber
Cereals (g)	61.59
Pulses (g)	21.02
Green leafy veg (g)	4.84
Other veg (g)	1.0
Roots and tubers (g)	7.8
Fruits (g)	1.106
Nuts (g)	2.64

The major contributors of dietary fiber (Table 2) were cereals and pulses. Coconut was the common nut consumed that contributed a small percentage of fiber. Dietary fiber from the fruit and vegetable group was far behind the recommended intake for these two food groups. Subjects who had higher fiber intake consumed more cereals, pulses and vegetables. It was evident from the present study that the girls were unconsciously neglecting the intake of vegetables and fruits, which contribute a good percentage of fiber.

In a similar study among children in Bogalusa (Berenson, 2001), it was found that children who had high fiber intake consumed more fruits and fruit juices, vegetables, bread and grains than children who had low fiber intakes. Children with low fiber intake consumed foods that were higher in fat such as fats and oils, egg, cheese, beef and pork than those with high fiber intake.

Summary and conclusion

The major findings of the study were

- The intakes of all foods were much less than the ICMR's recommended values.
- The fat intake was significantly higher than the recommended daily allowance (RDA), whereas, the carbohydrate, iron and fiber intake were very less when compared to the RDA.
- Dinner contributed major quantity of dietary fiber followed by lunch and breakfast.
- Skipping breakfast was common among the study group.
- Among the food groups, cereals were the major contributors of dietary fiber. The vegetable and fruit intake was very less when compared to ICMR recommendations.

The conclusion is that the diets of girls in the present study are not satisfactory when compared to the recommendations prescribed by ICMR. The diets were generally deficient in calories, carbohydrate, iron and fiber. The iron intake was alarmingly low reflecting on their iron status. Though the participants in the study had nutrition knowledge and were also aware of the benefits of dietary fiber, it was clear from their diet pattern that they seldom put it into practice. This was evident from their low intake of vegetables and fruits. Skipping breakfast, snacking and exclusion of foods from the vegetable and fruit group makes one wonder whether the subjects in the study are really mindful of what they eat.

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