

Cereals, Vegetable and Fruits Consumption among College Students in India

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ABSTRACT

Cereals are the staple diet of the world population. The present study explored the cereal and vegetable consumption of college students in Chennai. Adopting stratified random sampling technique, about 1000 college age population consists of both the gender were chosen for the study. The study subjects belonging to the age group of 19 to 22 years were selected based on the inclusion criteria. After obtaining ethical clearance, permission for college authorities and written consent from the students study was commenced. Pre-tested, standardized Food frequency questionnaire was given to all the participants and were asked to fill accordingly. The obtained raw data were subjected to statistical analysis using SPSS Version 20.0. Then the results were interpreted. Rice was consumed by all the participants daily. Only about 0.5% consumed greens daily. 0.2%, 3.6% and 0.3% consumed sambar vegetables, poriyal vegetables and fruits daily respectively. Consumption of whole grains and millets like ragi, bajra should be encouraged to add variety to the diet and also to increase the vitamins and minerals intake. Encouraging the intake of greens must be initiated to add iron and calcium to the diet. Workshops on "Eating Right" could be conducted at school, colleges and workplaces to bring awareness among the population. Regular nutritional screening camps along with Nutrition education program could be conducted to follow healthy eating habits

Keywords: Fiber, Cereal, Vegetables, Micro nutrient, Deficiency, Non-communicable Diseases

INTRODUCTION

Nutrition can be termed as the supply or provision of necessary materials

that support life in cells and organisms. The recent nutrition transition in developing countries from traditional fiber-rich diets to "western-styled" fast-foods has been found to affect the dietary habits of young adults, such as students of universities and other tertiary institutions. [1] Drastic and speedy changes in diets and lifestyles have occurred with growing industries, urban life, global marketing of goods and increase in economic development with people with easy access to fast foods, luxurious and cost lifestyles. This trend is becoming more harmful for developing countries such as India. [2] Vegetable plants and fruit trees though occupying about 65% of cultivable terrain are consumed less frequently in India's general population. [3]

Driven by aggressive advertising practices, relatively low cost, and increasing purchasing power, adolescents are increasingly consuming high saturated-fat snacks, refined carbohydrates, sweetened carbonated beverages, and diets low in polyunsaturated fatty acids (PUFAs) and fibers. Such rapidly changing dietary practices, accompanied by an increasingly sedentary life, predispose to nutrition-related non-communicable diseases like Type 2 Diabetes mellitus and coronary artery disease. [4]

The main problem in the world is the foodstuff deficiency including micronutrients. Estimates showed that more than 2 billion people around the world are affected by the lack of essential vitamins and minerals particularly vitamin A, iodine, and zinc. Nutrient deficiency is a risk factor

leading to global burden of diseases. [5] A diet deficient in nutrients can cause health issues ranging from tiredness, lack of energy to serious issues involving loss of function of vital organs, lack of growth and development. [6] Micronutrient deficiency largely goes unnoticed by the general public, by many decision makers and even by the affected individuals themselves. [7] This is why this form of malnutrition is also called 'hidden hunger'. [8] Micronutrient deficiency is mainly caused by lack of balanced diet. While often providing enough calories, monotonous diets based on cereals and other starchy staple foods frequently fail to deliver the sufficient quantities of essential minerals and vitamins. [9] A report published in British Nutrition Foundation (BNF) has re-confirmed that a huge proportion of adolescents have been found to have low intake of vitamins and minerals, in particular, Vitamin A, riboflavin, iron, calcium and magnesium. [10]

Nutritional experts recommend that one should take 400 gm of vegetables and fruits or servings/portion per day. But a study conducted by Mendhe showed that medical students are not taking adequate fruits and vegetables even though those food are protective and having good source of vitamins and minerals. It is also found that cereal consumption is also less in college going students. [11]

MATERIALS AND METHODS

Adopting stratified random sampling technique, about 1000 college age population consists of both the gender were chosen for the study. The study subjects belonging to the age group of 19 to 22 years were selected based on the inclusion criteria. The study was conducted at Chennai, capital of the state Tamil Nadu and also one among the four of the metropolitan cities of India. Students who were on immunosuppressant or any other medical intervention were excluded from study. Pregnant and lactating women were also excluded from the study. Ethical clearance to conduct the study was obtained from Universal ethics committee. Permission from the concerned college authorities of the city was obtained. Written consent from the participants to participate in the study was also obtained before the commencement of the study. Once the formal basic procedures were completed, study was initiated. Pre tested, standardized Food frequency questionnaire was given to all the participants and were asked to fill accordingly. The obtained raw data were subjected to statistical analysis using SPSS Version 20.0. Then the results were interpreted.

RESULTS AND DISCUSSION

Table-1: Cereals and Millets intake of the Participants

Cereals and Millets	Daily	Alternate days	Thrice a day	Twice a day	Once a day	Rarely	Never	Total
Rice	1000 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1000 (100)
Wheat	9 (0.9)	5 (0.5)	25 (2.5)	111 (11.1)	310 (31.0)	426 (42.6)	114 (11.4)	1000 (100)
Ragi	0 (0)	0 (0)	3 (0.3)	49 (4.9)	168 (16.8)	384 (38.4)	396 (39.6)	1000 (100)
Maida	5 (0.5)	10 (1.0)	68 (6.8)	157 (15.7)	206 (20.6)	429 (42.9)	125 (12.5)	1000 (100)
Barley	0 (0)	0 (0)	0 (0)	2 (0.2)	17 (1.7)	221 (22.1)	760 (76.0)	1000 (100)
Rava	0 (0)	7 (0.7)	86 (8.6)	393 (39.3)	357 (35.7)	138 (13.8)	19 (1.9)	1000 (100)
Bajra	0 (0)	4 (0.4)	10 (1.0)	51 (5.1)	130 (13.0)	261 (26.1)	544 (54.4)	1000 (100)
Vermicelli	0 (0)	1 (0.1)	6 (0.6)	288 (28.8)	442 (44.2)	233 (23.3)	30 (3.0)	1000 (100)
Oats	0 (0)	0 (0)	0 (0)	1 (0.1)	30 (3.0)	197 (19.7)	772 (77.2)	1000 (100)

Values within () denotes row percentage

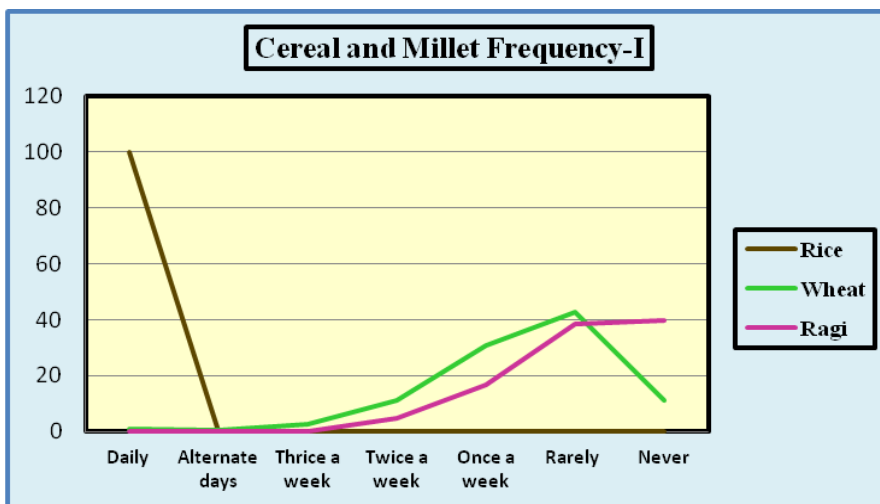


Figure-1

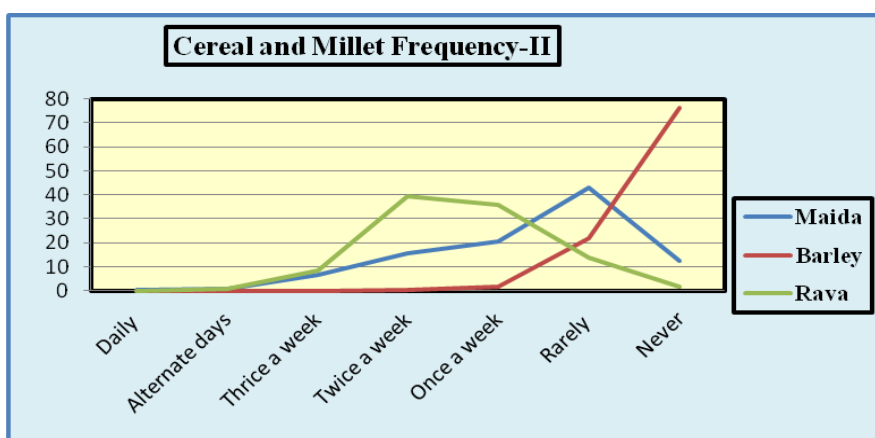


Figure-2

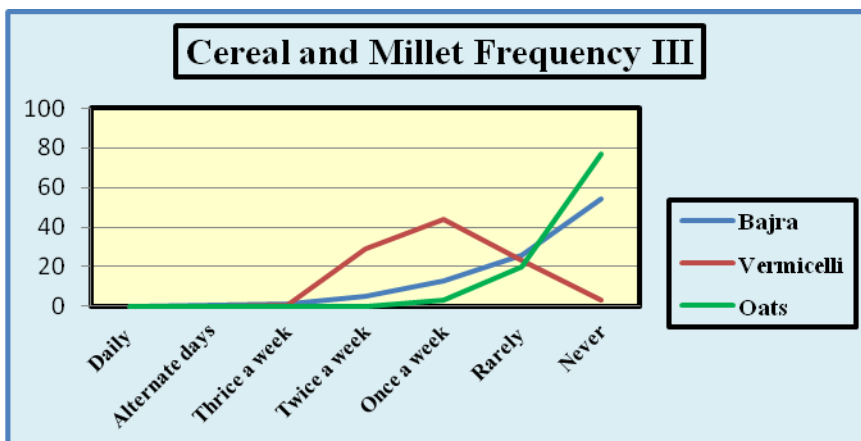


Figure-3

“The rice eater is weightless like a bird, the one who eats jowar is strong like a wolf; one who eats ragi remains ‘nirogi’(illness-free) throughout his life”- an old Kannada saying,

Rice is a staple diet of Tamilnadu, unsurprisingly it is consumed daily by all the study participants. Wheat is consumed

daily by 0.9% and only 0.5% consumed on alternate days. About 2.5%, 11%, and 31% consumed wheat thrice a week, twice a week, and once a week respectively. About 42.6% consumed it rarely and 11.4% never consumed wheat. In spite of the awareness of oats consumption, it is a surprise to note that about 77.2% never consumed oats.

About 19.7% consumed oats rarely, daily and only 0.1% consumed thrice a week respectively. *Mendhe* showed less cereal consumption among the college students. [11] Cereals were in the form of rice and only few were eating rotis and chapattis.

Rava and vermicelli are important cereal products which are used in Tamilnadu. They are used in the preparation of Tiffin items such as upuma, rava idli, rava khichidi and desserts like payasam and kesari in shorter duration, so it is preferred by all especially by office goers. Unsurprisingly, rava is consumed by 35.7% and 39.3% once a week and twice a week respectively. About 8.6% consumed thrice a week and 0.7% alternate day. Only about 1.9% never consumed rava and 13.8% consumed it rarely. Vermicelli is a South Indian form of noodles, and it is made from rice. It is consumed once a week by 44.2%. About 0.6% and 28.8% consumed vermicelli thrice a week and twice a week respectively. About 23.3% consumed it rarely and 3% never consumed vermicelli.

Maida or white flour is a refined form of whole wheat flour. It is fully loaded with simple carbohydrates. Due to the taste, it is highly preferred by all groups of population in Tamilnadu. But Maida does not fulfill the nutritional aspects. It is deficient in fiber, vitamins and minerals. About 0.5% and 1% consumed maida daily and on alternate days, respectively. About 6.8% and 15.7% consumed maida thrice a week and twice a week, respectively. About 20.6% consumed it once a week. 42.9%

consumed it rarely, and 12.5% never consumed maida.

Millets are coarse grains and loaded with protein, fiber, vitamins, and minerals. The practice of consuming millets as a part of the daily diet is not new to India. Millets had been the major staple food in central India, southern India and hilly regions. Millets consumption seems to be less among the study group, only 0.3% and 4.9% consumed ragi thrice a week and twice a week respectively. About 16.8% consumed once a week, 38.4% consumed rarely and it is sad to note that 39.6% never consumed ragi.

It is very pathetic to note that about 54.4% never consumed bajra. About 0.4% consumed bajra on alternate days. About 1% and 5.1% consumed thrice a week and twice a week respectively. 13% consumed once a week, and about 26.1% consumed it rarely. Barley is a millet rich in soluble fiber and it plays a vital role in controlling blood sugar and blood cholesterol levels. But in spite of the nutritional properties of barley, about 76% never consumed barley and 22% consumed it rarely. About 1.7% and only 0.2% consumed once a week and twice a week respectively. It is revealed from the study group that barley is consumed in the form of porridge only during fever. There is a practice in Tamilnadu to consume barley porridge during fever.

It is clear from the above table that soluble fiber and micronutrients rich cereals and millets (Oats, ragi, barley, bajra) are not frequently consumed by the study group.

Table-2 : Vegetables and Fruits intake of the participants

Vegetables and fruits	Daily	Alternate days	Thrice a week	Twice a week	Once a week	Rarely	Never	Total
Greens	5 (0.5)	11 (1.1)	36 (3.6)	111 (11.1)	166 (16.6)	404 (40.4)	267 (26.7)	1000 (1000)
Sambar vegetables	2 (0.2)	16 (1.6)	57 (5.7)	287 (28.7)	418 (41.8)	166 (16.6)	54 (5.4)	1000 (100)
Poriyal vegetables	36 (3.6)	58 (5.8)	159 (15.9)	350 (35.0)	309 (30.9)	84 (8.4)	4 (0.4)	1000 (100)
Fruits	3 (0.3)	11 (1.1)	30 (3.0)	97 (9.7)	210 (21.0)	446 (44.6)	203 (20.3)	1000 (100)

Values within () denote row percentage

Greens, vegetables and fruits have a beneficial combination of antioxidants, fiber, vitamins A, vitamin B, vitamin C, iron, calcium, potassium and other phytochemicals. The present study clearly indicated the lower consumption of greens by the study group. It is

pathetic to note that about 26.7% never consumed greens, about 40.4% and 16.6% consumed it rarely and once a week respectively. About 11.1% and 3.6% consumed twice a week and thrice a week respectively. It is disgusting to note that only 1.1% and 0.5% consumed on alternate days and daily respectively.

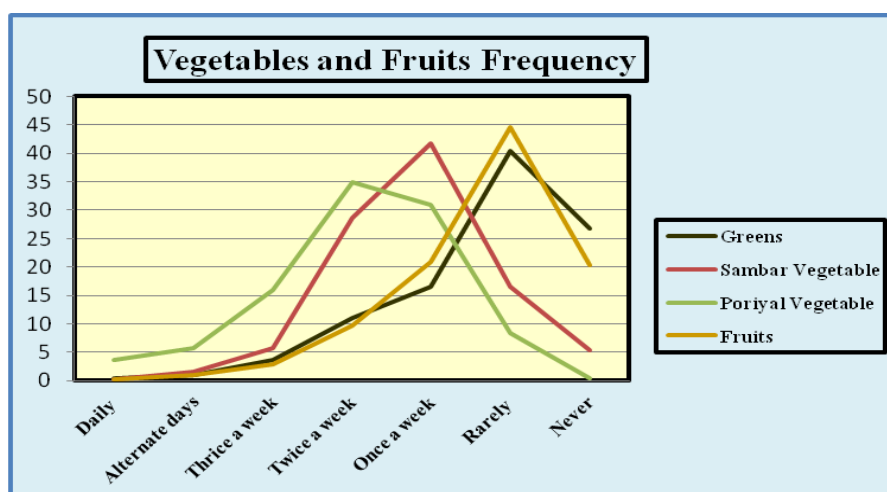


Figure-4

It is evident from the present study that sambar vegetable consumption found to be poor among the study group. About 0.2% and 1.6% consumed daily and alternate days, respectively. About 5.7% and 28.7% consumed thrice a week and twice a week respectively. About 41.8% and 16.6% consumed sambar vegetables once a week and rarely respectively. Poriyal vegetables were consumed by 3.6% and 5.8% of the subjects daily and on alternate days. About 15.9% and 35% consumed it thrice a week and twice a week, respectively. About 30.9% and 8.4% consumed poriyal vegetables once a week and rarely. It is also reported that only 0.4% never consumed poriyal vegetables.

Fruits consumption seems to be very less among the study group; 0.3% and 1.1% consumed daily and on alternate days, respectively. About 0.3% and 9.7% reported to consumed thrice a week and twice a week respectively. About 21% and 44.6% consumed it once a week and on alternate days. About 20.3% never consumed fruits.

A study conducted by **Meenal Vinay Kulkarni (2016)** showed that 43% of the students have consumed fruits daily and only 9.6% students reported eating of three or more than three servings of fruits per day.

[12] Another study conducted among undergraduates students in a Medical college of Delhi reported 12% students consumed 5 or more servings of fruits per day. [13]

CONCLUSION

Cereals are the staple diet of the world population. Whole cereals are rich sources of fiber, B Complex vitamins and carbohydrates. Energy from daily menu of an individual is obtained from cereals and millets. Refined cereals like maida lack fiber and B Complex and provides only carbohydrates. Vegetables and greens plays indigenous part in an individual's diet. Vegetables and greens are completely loaded with fiber, Vitamins and minerals. The intake vegetables and greens found to be very less among our study population, which causes deficiencies. Rice is consumed daily by almost all the study participants. Consumption of whole grains and millets like ragi, bajra should be encouraged to add variety to the diet and also to increase the vitamins and minerals intake. Encouraging the intake of greens must be initiated to add iron and calcium to the diet. Establishing kitchen garden helps in the consumption of greens daily. Importance of consuming fiber

rich and nutrient dense food must be educated among the population for following right eating habits. Workshops on “Eating Right” could be conducted at school, colleges and workplaces to bring awareness among the population. Regular nutritional screening camps along with Nutrition education program could be conducted to follow healthy eating habits. This might prevent number of communicable and non-communicable diseases among the public. Healthy eating habits lead to healthy lifestyle.

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