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Kavita Verma
Dept. of Food Nutrition and Public Health, Ethelind College of Home Science, SHUATS, Allahabad, Uttar Pradesh, India

Alka Gupta
Dept. of Food Nutrition and Public Health, Ethelind College of Home Science, SHUATS, Allahabad, Uttar Pradesh, India

Sushila Verma
Dept. of Food Nutrition and Public Health, Ethelind College of Home Science, SHUATS, Allahabad, Uttar Pradesh, India

Correspondence
Kavita Verma
Dept. of Food Nutrition and Public Health, Ethelind College of Home Science, SHUATS, Allahabad, Uttar Pradesh, India

Impact of awareness and consumption pattern of functional foods among college going girls in SHUATS, Allahabad

Kavita Verma, Alka Gupta and Sushila Verma

Abstract
Functional foods are a broad term that has attracted significant attention from scientific researchers, health professionals & Journalist. The present study was aim to assess the consumption pattern among college going girls. For the study schedule questionnaire was prepared for interview of respondents, anthropometrical indices were taken. Results showed that 16.67 percent respondents were underweight, 21 percent was IInd grade obese and 60 percent girls were aware about functional foods whereas rest of girls had no idea. Some common functional foods such as tomato, garlic, etc. were consumed in high amount by college girls than some other functional foods like oats, barley, and beet root in daily diets. Therefore concluded adequate knowledge about nutrition is key factor in leading people towards adopting functional foods in their daily diets for healthy eating.

Keywords: functional foods, anthropometrical, underweight

Introduction
The functional foods constitute the important segment of the food market. They include foods enriched with some supplements enhancing the vitamin content, fortified with hydro carbonates or proteins for sportsmen, lowering the cholesterol level in the case of cardiac diseases and fibre contained food proposed to lose the weight. Functional food is basically a food derived from naturally occurring raw materials which is taken as a part of daily diet & has this additional functionally (Varshney, 2002) [14]. Functional food is a part of an everyday diet & is demonstrated to offer health benefits & to reduce the risk of chronic disease beyond the widely accepted nutritional effects.

Functional foods are a broad term that has attracted significant attention from scientific researchers, health professionals & Journalist. Although there is no consensus on an exact definition. Some of the definitions of Functional food which are given by different Scientist/ organization are as follows: Functional food are generally characterized as foods similar in appearance to conventional foods, consumed as part of a usual diet and providing health-related benefits beyond meeting basic nutritional needs (Mazza, 1998 and Dairy Council Digest, 1999) [11]. Functional food usually refers to food containing significant levels of naturally occurring, biologically active components that impart health benefits beyond the basic essential nutrients. These components may play a vital role in disease prevention & health promotion, but there is no Recommended Daily Allowance (RDA) for them.

Food preference is determined by both nutrition and pleasure derived from food consumption. With the development, the "society of abundance" faces new challenges such as increasing costs for health care, extension of the life span of individuals, and the new scientific knowledge and new technologies lead to significant changes in the lifestyle. Due to all these, functional food plays a major role in improving the standard of living, balancing and maintaining maximum physiological functions, in preserving health and reducing the risk of diseases Changes of consumer's attitudes about diet and the connection between diet and health can be achieved by placing an emphasis on targeted and balanced diet, maximizing physiological functions of the body in order to reduce the risk of disease or formulating functional food as an important source of specific nutrients from which are of great importance.

Functional foods bridge the gap between ordinary foods aimed to maintain adequate nutrition status and pharmaceutical agents, medicines aimed to diagnose, prevent, cure or treat an illness. In contrast to the efficacy area of medicines functional foods are developed for enhanced function of reduction of risk of disease (Pfannhauser *et al*., 2001) [16].

Objectives

1. To assess the nutritional status of the selected college girls.
2. To find out the consumption pattern of functional food among college girls.
3. To assess the awareness about functional foods among college girls.

Materials and Methods

Sample selection

The research involved college going girls, representing the district and effort were made therefore made to locate the subject of varied socio economic background. The college selected was SHIATS. Total 30 girl's age groups of 18-25 years were selected from SHUATS.

Shuats data collection

The survey method was used for the data collection. The selected respondents were personally interviewed and necessary information collected using a prestructured and pretested questionnaire.The questionnaire included aspects which led to the fulfillment of the objectives of this study. 24 hours dietary recall (Swaminathan) will be done and average nutrient intake per day calculated of each respondents using the nutritive value for Indian foods by C. Gopalan *et.al*.

The questionnaire included the following information:

- General Profile Survey
- Dietary intake (24 hours dietary recall method)
- Anthropometric measurement
- Clinical sign and symptoms
- Awareness test

General profile survey

Data regarding general profile of the respondents was collected using the first part of the questionnaire. The section covered aspects including respondent's name, age, type of family, monthly income, monthly expenditure on food items.

Dietary survey

Diet surveys constitute an essential part of any complete study of nutritional status of individuals or groups, providing essential information on nutrient intake levels, sources of nutrients, food habits & attitudes. It will help to following information. A diet survey was conducted.

24 hour dietary recall

24- Hour dietary recall method is widely used in dietary surveillance. The interviewer asks the respondents questions to obtain information on the types and the amount actually consumed by an individual one or more specific days.

Anthropometric measurement

Nutritional anthropometry is concern with the measurement of variations of physical dimensions, the gross composition and degree of nutrition. Hence, anthropometric measurements are useful criteria for assessing the nutritional status.

The anthropometric measurement including height and weight are recorded using the process prescribed by Gibson (1990).

Height Measurement

Height (cm) of the subject was taken with the help of measuring tape in centimeters by sticking it to the wall. The subject was made to stand erect, look straight with buttocks, shoulders and head touching the wall, heels together, toes apart and hands hanging loosely by the sides.

Weight Measurement

The weighing scale with maximum capacity of 120 kg and the minimum division of 0.5kg was used to weigh all the subjects. The respondents will be made to stand erect on the weighing scale with minimum of clothes, without footwear, not learning against and holding anything and the weight was recorded in kg.

Body mass index (BMI)

BMI was calculated as the standard of nutritional status anthropometrically, by using the following formula derived from the weight and height (WHO, 1995).

$$BMI = \frac{Weight(kg)}{Height(\mathrm{m}^2)}$$

Awareness test

Self-administered Questionnaires were developed and distributed to individuals. The Questionnaire measures individual awareness about functional foods.

Development of education materials- Poster and chart were prepared containing information regarding for functional foods.

Result and Discussions

The data collected and tabulated under the study are presented.

General information

Table 1: Distribution of the respondent according to the general information

Particulars	Distribution	Frequency (n=30)	Percentage (%)
Family type	Joint	12	40
	Nuclear	18	60
Occupation	Service	11	36.67
	Business	13	43.33
	Any other	6	20
Total family income	10000-15000	2	6.67
	16000-20000	5	16.67
	21000-25000	3	10
	More than 25000	20	66.67
Monthly expenditure	Food	15	50
	Shelter	5	16.67
	Education	5	16.67
	Recreation		16.67

Family type- The majority of respondents, 60 percent belonged to nuclear family and 40 percent respondent belonged to joint family. Similar result that maximum number of respondents lived in nuclear family was reported by Rita (1998) and Srivastiva (1991), in their studies carried out in different parts of Udham Singh Nagar Districts Uttaranchal.

Occupation of the family- According to the table most of the respondent family head were in business 43.33 percent and 36.67percent were government and private service and about 20 percent belonged to other occupation (agriculture etc.).

Total family income- showed that 66.67 percent monthly income more than 25000 rupees and 16.67 percent 16000-20000 rupees per month and other.

Monthly expenditure- table shows that total salary expenditure of respondent was 50 percent on food, 16.67 percent on education, shelter and recreation.

Anthropometric measurements

Table 2: distribution of college girls according to BMI

BMI Range	Frequency (n=30)	Percentage (%)
18.5 (underweight)	5	16.67
18.5-24.9 (normal)	10	33.33
25-29.9 (obese grade I)	5	16.67
30-40 (obese grade II)	8	26.67
40 (obese grade III)	2	6.67
Total	30	100

Table 2 shows that 33.33 percent of girls normal BMI, 16.67 percent girls were underweight and obese grade 1, and 26.67 percent girls were obese (grade II).

Diet and Nutrient intake

Table 3: Distribution of college girls according to the food habits

Food habits	Frequency (n=30)	Percentage (%)
Vegetarian	15	50
Non-Vegetarian	10	33.33
Eggitarian	5	16.67
Total	30	100

Study shows that majority number of respondents 50 percent were vegetarian, 33.33 percent were non-vegetarian and 16.67 percent were eggitarian.

Table 4: Average daily nutrients intake of college girls

RDA	Reference value	Average intake of nutrients	Difference between ranges	Percentage (%)
Energy(kcal)	1900	2240	340	117.89
Protein(g)	55.0	35.0	20	63.63
Fat(g)	20	30	10	150
Calcium(mg)	600	400	200	66.67
Iron(mg)	21	15	6	71.42
Retinol(µg)	600	400	200	66.66

***Source*:** ICMR, (2010)

Table 4 shows six the average nutrients intake of all nutrients with reference to energy, protein, fat, calcium, iron, and retinol compared to the RDA given by the ICMR (2010). According to RDA energy intake 1900 and 117.89 percent is consumed by the girls which shows that they intake energy in good amount, similarly protein intake percent is 63.63 which means that protein intake in the girls diet is less, the fat intake is more than in the diet of the girls as the girls as the fat percentage is 150, calcium intake is also less it is only 66.67 percent, the iron intake is less in the girls diet the percentage is 71.42 similarly retinol is 66.66 percent respectively.

Table 5: Distribution of college girls according to the food consumption frequency

Food group	Daily		Occasionally		Never	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage (%)
Cereals	30	100	-	-	-	-
Pulses	25	83.33	5	16.67	-	-
Milk & Milk products	10	33.33	15	50	5	16.67
GLVs	5	16.67	10	33.33	15	50
Roots & tubers	25	83.33	5	16.67	-	-
Fruits	5	16.67	10	33.33	15	50
Meat & Poultry	10	33.33	5	16.67	15	50
Fats & Oils	30	100	-	-	-	-
Sugars	30	100	-	-	-	-

Table 5 shows that the food consumed daily by all respondents included cereals, pulses, milk and milk products, green leafy vegetables, roots and tubers, fruits, meat and poultry, fats and oils and sugar. Regarding the consumption of cereals, it was found that all respondent consumed cereals daily. Pulses were consumed daily by 83.33 percent respondents because they know it contain many nutrients. Milk and milk products were consumed daily by 33.33 percent respondents consumed, 50 percent respondent consumed occasionally and 16.67 percent respondent consumed never.

Regarding green leafy vegetable they were consumed daily 16.67 percent, 33.33 percent respondents consumed them occasionally and 50 percent never consumed.

Meat and poultry were consumed by 33.33 percent respondents daily, 16.67 percent occasionally and 50 percent never consumed.

Fats and oils and sugar were consumed almost daily by the respondents.

Sharma *et al.* (2006) reported that the dietary patterns of girls were largely based on cereals and pulses. Milk and milk products were consumed in moderation, whereas fruits and vegetable intake was inadequate, total fat and oil consumption is more than RDA.

Specific information

Table 6: Distribution of college girls according to Awareness about Functional foods

Knowledge about functional foods	Distribution	Frequency (n=30)	Percentage (%)
Any idea about functional foods	Yes	18	60
	No	12	40
Belief that functional foods have health benefits beyond their basic nutrition	Yes	16	53.33
	No	14	46.67
Functional foods essential for preventive & treatment of diseases	Yes	12	40
	No	18	60
Functional with Probiotics benefits	Yes	10	33.33
	No	20	66.67
Functional properties of functional foods	Yes	13	43.33
	No	17	56.66

Functional foods from a part of your diet	Yes No	18 12	60 40
Knowledge about functional foods include in your diet	Yes No	14 16	46.67 53.33
Intent to know more about functional foods	Yes No	11 19	36.67 63.33
Belief that functional supplements or nutraceuticals	Yes No	10 20	33.33 66.67
Knowledge about functional foods easily available in your location	Yes No	9 21	30 70

Table 6 shows that awareness of college going girls regarding functional foods. 60 percent girls idea about functional foods and 40 percent girls no idea about functional foods. 53.3 percent believed that functional foods have health benefits beyond their basic nutrition. 40 percent were know that functional foods very much essential for the prevention and treatment of disease. 33.33 percent were known about functional foods with probiotic benefits and 43.33 percent were known the functional properties of functional foods. 46.67 percent had knowledge about functional foods, so that include in your diet and 36.67 percent were intend to more about functional foods. 66.67 percent were not taken nutritional supplements or nutraceuticals and 70 percent did not know knowledge about functional foods easily available in your location.

Table 7: Consumption of Functional foods

Foods	**Total frequency =30**					
	Frequency	**Daily**	**Weekly**	**Within 2 week**	**Within 3 week**	**Monthly**
Oats	10	1	2	3	3	1
Barley	-	-	-	-	-	-
Soy	10	-	2	4	2	2
Tomato	30	10	5	5	8	2
Broccali	1	-	-	-	-	1
Garlic	25	15	5	2	5	3
Beet root	5	-	--	1	1	3

Table 7 shows that the some common functional foods such as tomato, garlic, etc. were consumed in high amount by college girls than some other functional foods like oats, barley, and beet root.

Conclusion

This study provides awareness, knowledge about functional foods and consumption pattern among college going girls.40 percent girls have no idea about functional foods, 66.67 percent were not taken nutritional supplements or nutraceuticals and 70 percent girls have not aware or knowledge about the functional foods which is easily available in their local market. Functional foods are an important part of an overall healthful lifestyle that includes a balanced diet and physical activity. Biologically active components in functional foods may impart health benefits or desirable physiological effect.

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