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Impact of Nutrition Education Programme on Functional Foods Among Teaching Fraternity in Chennai City

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ABSTRACT

Food promotes optimization of good health. Healthy eating is regarded as the most important means of food promotion. Lifestyle changes, poor eating habit and lack of physical activity lead to a strong adverse effect on the development of degenerative diseases like diabetes mellitus, cardiovascular diseases, obesity and certain types of cancer like never before. Functional foods provide additional benefits that may significantly reduce health risk and promote optimal health through calorie free foods, low fat and reduced sodium foods. Bioactive compounds present in functional foods give numerous physiological benefits and promote health care by continuous preventive mechanism. These benefits also include antioxidants, anti-inflammatory and various preventive properties. However, the awareness and knowledge on the health benefits of functional food is inadequate and scare even among educated population. It is believed that awareness through the nutrition education plays an important role in having an impact on individual's knowledge on goodness of functional foods and thereby improves their nutritional status. In this study, the awareness level on the concept and importance of functional foods among teaching fraternity in Chennai was studied using survey and education was given through nutrition education programme. The study design used in the present study was a pre and post- test descriptive study and was carried out in five phases. Purposive Sampling Technique was used and the Sample size is 100 (N=100), Subjects were selected from the schools located in Chennai. A well-structured questionnaire with 40 questions on aspects of knowledge, usage and functional benefits of functional foods was framed. A pilot study was conducted with 20 teaching fraternity to test the reliability and validity of the questionnaire and changes was made accordingly by the researcher. Nutrition education was given to the participants through non-machine operated aids - face to face counseling and pamphlet distribution. After the collection of the raw data, it was coded, classified, tabulated and analyzed statistically.

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The overall impact of nutritional education on knowledge about functional foods among teaching fraternity was analyzed and a statistically significant result at p<0.01 was found. The results concluded that there was a drastic improvement in knowledge gained by the participants after imparting nutrition education. After the awareness programme, maximal improvement in the knowledge level was observed. It was so evident from the study that nutritional education is an effective gauge which can improve the dietary habits and food choices of the participants.

Keywords: *Functional foods, Bioactive components, Nutrition education, Lifestyle management,*

INTRODUCTION

Functional food usually refers to food containing significant levels of naturally occurring biologically active components that impart health benefits beyond the basic essential nutrient. They bridge the gap between ordinary foods and maintain adequate nutrition status. Food those lost their nutrient content due to processing are enriched with lost nutrients by functional food (Jitendra et al., 2015).

Functional foods are originated in Japan by Japanese Ministry of Health and Labor in 1980 (Yamada K et al., 2008). Early in 90's the practice of fortifying table salt with iodine to prevent goiter was the first attempt for establishing functional foods. The Ministry of Health and Welfare launched a regulatory system for the approval of certain foods with documented health benefits and these foods are also recognized as "Foods for Specified Health Use" (FOSHU). According to the 2011, Health Consumer Trending Survey, 73% of consumers "believes that food and nutrition play a 'great role' in maintaining and improving overall health". About 70% of people named fruits and vegetables as the most recognized functional food and 80% of consumers agree that functional foods helps to maintain or improve health and wellness, including bone health (81%), heart and circulatory health (79% and 74%, respectively), immune health (79%), digestive health (78%), and eye health (66%) (Academy of Nutrition and Dietetics, 2013).

Functional foods let consumers eat augmented foods close to their natural state, instead of consuming dietary supplements manufactured in liquid or capsule form. They promote health benefits that can only be ensured by consuming these foods at the correct content and amounts. They are found in groups based on their characteristics, content, product class, benefits purposes and therefore the products with different names may also be included in definition of functional food. These foods are also effective in increasing mental and physical performance, accelerating growth and development, and enhancing quality of life (Kendilci et al., 2017).

Functional foods are broadly classified into two categories. They are Conventional foods and Fortified foods. Natural or conventional foods like vegetables, tomatoes, carrots, broccoli, soy products, garlic, citrus fruits, vegetables, dairy products, dietary fiber, tea, chocolate, cocoa and animal products like fish etc. are powerful, health enhancing conventional foods. These foods contain bioactive components related to health promotion and are mostly preferred by consumers.Some common examples are antioxidants, vitamins in orange juice, isoflavones in soy-based foods,and probiotics in yogurt. Fortified foods include Calcium, fortified orange juice, eggs and pasta with high levels of omega-3 fatty acids, cereals enriched with folate or sterol ester-enhanced margarine, beverages with added vitamin E etc. (Jha et al., 2016).

OBJECTIVES OF THE STUDY

1. To study the demographic and socioeconomic profile of the subjects.
2. To assess the knowledge on the use of functional foods among teaching fraternity through pre-test questionnaire.
3. To create awareness through nutritional education programme on functional foods.
4. To assess the impact of nutritional education programme on functional foods through post-test questionnaire.

MATERIALS AND METHODS

This study has been approved by the Independent Human Ethics Committee (IHEC) dated: 04/09/2019 (Protocol No. SDNBVC/HSC/IHEC/2019/11), conducted by the Department of Home science, SDNB Vaishnav College for Women, Chromepet, CH-44. One copy of Ethics Approval letter is attached with this project.

The Study design used in the study was a pre and post- test descriptive study. This study describes on the knowledge on functional foods among school teachers from various schools in Chennai. This study was carried out in five phases.

Selection of Area

The present study took place in schools located in Chennai. The data is collected from the undergraduate and post graduate school teachers after seeking prior permission from the principal of the respective schools.

Selection of Sample

Purposive Sampling technique was used as sample design and to observe the impact of nutrition education program for women on knowledge of Functional Foods, Teaching fraternities from various schools around Chennai were selected.

Sample size is 100 (N=100). The primary data was collected from both under graduate and post graduate teaching fraternity. Every teacher who showed willingness to participate in the respective schools was included in the study. The need and purpose of the study was clearly explained. The data was collected after getting prior oral consent from the subjects.

Criteria for Sample Selection

Inclusion Criteria

- Teaching fraternity working in schools.
- The subjects who showed interest to participate in nutrition education.

Exclusion Criteria

- The subjects who are not willing to participate.
- The subjects those who are not willing to respond to the questionnaire.

Tools and Techniques

A well-structured questionnaire was framed for pre and post intervention programme to assess the knowledge of teaching fraternity on functional foods. The questionnaire includes demographic and socioeconomic profile such as age, gender, educational qualification, marital status and monthly income along with 40 questions on aspects of knowledge, usage and functional benefits of functional foods. A good rapport was established with the participants in order to attain smooth co-operation throughout the study. The participants were actively involved in attaining knowledge on good health through the intake of functional foods.

Pilot Study

A Pilot study was conducted on 20 teaching fraternity from Tagore Matriculation Higher Secondary School to test the proposed methodology of the study. The questionnaire developed for the study was tested for its reliability in context with the study design and modified based on the response of the participants.

Nutrition Education Programme

Nutrition education is an essential component for improving food choices and dietary habits in order to improve their nutritional status. A positive impact on nutritional education on the nutritional status of adults had been confirmed by many studies. In this present study, Nutrition education was given to the participants

through non-machine operated aids. Non machine operated aids opted for the study is face to face counselling and pamphlet distribution. Face to face counselling is a two-way interaction through which the participant and trained counselor interpret the results of nutrition assessment (NACS., 2016). It is an effective method in which helps to achieve the desired outcome from an individual (Raymond 2013).

Pamphlets are convenient and capture attention. They are easy to carry and convey messages with precised content and consumes less time. Colorful, Interesting and informative pamphlets were designed on knowledge and functions of functional foods and distributed to the participants.

Statistical Analysis

After the collection of the raw data, it was coded, classified, tabulated, analyzed using SPSS software. Tools used for statistical analysis are Mean, Standard Deviation and Paired *t* test.

RESULTS AND DISCUSSION

The results are discussed under following sections.

Demographic Profile

In the present study a number of (N=100) school teaching fraternity were selected and their demographic data (Age, Gender, Marital status, Educational qualification and their Family income) was collected. The percentage distribution of demographic data has been depicted below in the below Table 1.

Table - 1

Demographic data of the participants

S.No	Distribution	Percentage (n=100)
1.	Age (in years)	
	Less than 30	4
	30-50	86
	Above 50	10
2.	Sex	
	Male	8
	Female	92
3.	Marital status	
	Unmarried	23
	Married	77
4.	Educational qualification	
	Undergraduate	41.5
	Postgraduate	55.5
5.	Income	
	Less than 6000	0
	6000-18,000	60.5
	Above 18,000	39.5

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The age groups of the participants were around 30-75 years, in which majority of the participants are female 92% and 8% of the participants were male. Female participants are more eager than male about modifying new foods in their lifestyle. Among the selected participants about 76% were married and 24% of teachers were unmarried. Regarding their educational qualification, of about 41.5% of the participants completed their Bachelor degree and 58.5% participants were Masters.

Socioeconomic status is one of the prime factors that influence an individual's health status. The income status was classified according to kuppuswamy 2019 socioeconomic scale. The income level of the participants was analyzed and revealed that about none of them belong to lower socio-economic group, 60.5% belong to middle income group and 39.5% people belong to higher socio-economic group. All these research studies lead to the conclusion that the influence of socio-demographic factors varies according to different geographic, economic and cultural settings.

Impact of Knowledge on Functional Foods

Adequate and appropriate knowledge to make right food choice for better health is well known by every individual. Assessment of knowledge regarding functional foods in relation to actual dietary patterns and health risk profiles is necessary for better lifestyle. People are quite aware of the possible positive role regarding disease risk management.

Table – 2

Impact of nutritional education on knowledge towards functional foods

S. No	Distribution	Intervention	Pre-test %	Post-test %
1.	Familiarity of functional foods	a. Yes b. No	15 97	85 3
2.	Knowledge on medicinal benefits of functional foods	a. Yes b. No	25 98	75 2
3.	Can functional foods have taken in the form of pills	a. Yes b. No	7 6	93 94
4.	Source of knowledge	a. Books b. Food labels c. Internet d. Newspaper	25 30 37 9	25 41 12 22
5.	Meaning of functional foods	a. Specific body function b. Health benefits beyond nutritive value c. Isolated or purified bioactive foods	30 31 39	1 99 1
6.	Origination of term functional foods	a. France b. Japan c. U.S.A d. United kingdom	13 20 38 29	0 100 0 0
7.	Consumption of functional foods	a. Daily	7	55

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		b. Monthly c. Weekly d. Never	44 10 38	6 39 0
8.	**Reason for not consuming functional foods**	a. Expensive b. Inadequate knowledge c. Organic foods d. Not necessary	10 19 32 39	3 93 3 1
9.	**Factors which influence functional foods consumption**	a. Advertisement b. Price c. Availability d. Knowledge and awareness	10 27 47 16	1 1 1 97

From the above table it was clearly evident that only 15% of the participants had knowledge on functional foods before intervention and the percentage incremented to 97 after providing the nutrition education. Only 25% of the participants had knowledge regarding their medicinal benefits of foods that they consume in their daily life in pre-test. But after intervention it has significantly incremented to 98%. It is eminent that 93% of the participants have knowledge that foods are not taken in the form of pills before intervention and consequently a percent is incremented after post-test. It is clear that the number of participants gain source of knowledge from Food labels (41%)is high when compared to other sources of knowledge**.** About 99%of the participants correctly identified the proper meaning of functional food as foods having basic benefits beyond the nutritive content. Cent percent of them correctly reported that the term functional foods have been originated in Japanafter providing nutritional education.

Table 2 exhibits the consumption, reason for consuming and factors that increase the functional foods consumption. Only 7% of the participants consume functional foods daily and regarded functional food are more expensive and not necessary for consuming. After the post-test it is gradually incremented to 55% of daily consumption and 39% participants of weekly consumption. It is significant that Knowledge and awareness 97%n is the key factor to increase functional food consumption. The success of the post-test is none of the participants responded that they will never consume functional foods.

Impact of Nutritional Education on Behavior Towards Functional Foods

Table – 3

Impact of nutritional education on behavior towards

Functional foods

S.no	Distribution	Intervention	Pre-test %	Post- test %
1.	**Only health conscious individual take functional foods**	a. Yes b. No	21 84	79 16

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2.	**Functional foods fit into natural way of life**	a. Yes b. No	24 95	75 5
3.	**Opinion about functional foods**	a. Dietary products b. Healthy foods c. Unhealthy foods	20 51 29	38 61 1
4.	**Nutritional benefits of functional foods**	a. Dietary fiber b. Salt, sodium c. Omega 3 fatty acids d. sugar	50 12 19 20	1 97 2 0
5.	**Does sterol ester in functional foods reduce the risk of CHD**	a. Yes b. No	27 97	76 3

The above table shows the nutritional knowledge of the participants according to their general behavior towards functional foods. By analyzing pre-test there is a negative behavior 21% that health-conscious individual's intake fewer amounts of functional food and only 24% participants reported that they functional foods fit into natural way of life. It is interfered from post-test that only health-conscious individual intake higher amount 84% of functional foods, after providing nutritional education 95% agreed that they fit into natural way of life.

Before intervention only few participants identified functional food as healthy food but after intervention 61% of the participants had positive opinion regarding functional foods. 12% of them identified salt, sodium as nutritional benefit during pre-test and later the percentage gradually increased to 97% after post intervention.

Sterol esters are dietary supplements, fortified foods and beverages that may reduce the risk of coronary heart diseases. Some sterol ester products include orange juices, yogurt and chocolates. After providing nutrition knowledge 97% of the participants correctly identified sterol esters reducethe risk of CHD**.**

Impact of Nutrition Education on Knowledge Regarding Functional Food Based on Gender

Table: 4

Impact of nutrition education on knowledge regarding functional food Based on gender

Male (n=100)		**Female (n=100)**			**Level of significance**
Knowledge	**Mean ± SD**	**Mean ± SD**	**t-value**	**p-value**	
Pre-test	2.63±2.27	2.57±2.5	0.90	0.92	**NS**
Post-test	6.7±0.74	6.8±1.04	0.48	0.63	

NS- Not significant

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The above table depicts the awareness on nutrition education in relation with gender. When comparison between gender was tested statistically by applying 't' test it was found that there is no significant difference on the participants knowledge about functional foods regarding their gender.

Relationship Between Nutritional Status and Educational Qualification

Table - 5

Relationship between nutritional status and educational qualification

Undergraduate (n=100)		Postgraduate (n=100)			Level of significance
Knowledge	**Mean ± SD**	**Mean ± SD**	**t-value**	**p-value**	
Pre-test	2.6±1.8	2.5±1.8	0.345	0.731	**NS**
Post-test	7.0±0.8	7.0±1.1	1.160	0.249	

NS- Not significant

The table depicts the awareness on nutrition education in relation with educational qualification. The participants were classified on basis of their education qualification as undergraduate and postgraduate. After post intervention, the mean score of both undergraduate and postgraduate teachers gradually increased. Hence both the graduates gained enormous knowledge about functional foods after providing nutritional education program.

Awareness on Nutritional Knowledge in Relation with Income Group

Table - 6

Awareness on nutritional knowledge in relation with income group

Rs.6000-18,000 (n=100)		Above 18,000 (n=100)			Level of significance
Knowledge	**Mean ± SD**	**Mean ± SD**	**t-value**	**p-value**	
Pre-test	2.5±1.6	2.4±1.8	3.023	0.123	**NS**
Post-test	7.0±0.8	7.0±0.8	2.057	0.137	

NS- Not significant

The above table depicts the awareness on nutrition education in relation with income level. The result revealed that there is no significant difference observed among various income groups. Only after imparting of nutrition education programme the participants learnt about the concept functional foods and assured to apply the same in their daily life. Therefore, it is evident that participants from different socio-economic group lacked knowledge regarding functional foods.

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Overall Impact of Nutritional Education on Knowledge Towards Functional Foods

Table - 7

Overall impact of nutritional education on knowledge towards functional foods

Distribution	N	Mean ± SD	t-value	Significance
Knowledge				
Pre-test	100	2.5±1.8	19.102	0.000**
Post-test	100	6.7±1.0		

** Highly Significant at < 0.01 level of confidence,

The above Table 7 shows the overall impact of nutritional knowledge about functional foods among teaching fraternity. The mean scores obtained from the respondents before and after intervention is statistically analyzed using paired sample t- test. It is proved that the overall knowledge gained regarding functional foods and their health benefits improved drastically and it is highly significant at <0.01 level of confidence.

CONCLUSION

Many Functional Foods may hold promise for public health as they contain bioactive compounds with potential health benefits. This study was conducted to assess the Impact of Nutrition Education programme on Functional foods among teaching fraternity. But the knowledge and awareness on functional foods was found to be limited among a majority of teacher. All the teaching fraternity had a positive tendency learn more about health benefits of functional foods. Post-intervention results revealed a significant ($p<0.01$) improvement in Knowledge after providing nutrition education among selected participants. So, it can be concluded that the nutrition education program offered by the researcher was extremely effective tool in elevating nutritional knowledge of the subjects regarding the concepts of functional foods needed for healthy survival. It was also evident from the study that nutritional education is an effective gauge which can improve the dietary habits and food choices of the participants.

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