

Effectiveness of distance education on food and nutrition

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ABSTRACT : Distance education is the process of educating large number of people, dispersed and distantly located, with face to face interaction between the teacher and the taught. It is characterized by no rigid entry qualifications, learning according to one's own pace and convenience, flexibility in choice of courses and use of modern and appropriate methods of education and communication. An experimental study was conducted to assess the knowledge of selected rural school dropout girls and women about food and nutrition at pre and post stage of distance education in selected villages of Dharwad district of Karnataka. After the education, results showed that about 97 per cent of the respondents gave correct answer about food groups followed by better cooking methods (81.67%), balanced diet (80.00%) and nutrition (61.66%). The knowledge of food showed cent per cent increase about cereals, pulses and essential food required for human growth. High majority of the respondents answered rightly about the fermented foods, methods of cooking and cutting of vegetables. More than 90 per cent of the respondents were able to answer about nutritious foods, grains required in daily diet, importance of balanced diet. This experimental study clearly shows that there was significant impact on gain in knowledge of rural school dropout girls and women about food and nutrition. The results of this study created scope of learning for the poor people living in remote rural areas, for the women whose life is still covered by the four walls of social systems and for those who cannot spare time for learning in lieu of their own earning schedule.

KEY WORDS : Effectiveness, Distance education, Food, Nutrition

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INTRODUCTION

Distance education is democratic as well as socialistic in nature. It helps in diffusion of education and equalization of educational opportunities. In the entire world, the population is increasing so fast that formal means of education cannot keep pace with it. Besides, even the existing educational resources are not being fully utilized by those for whom they are intended.

It is more so in developing country because of poverty. A number of persons are deprived of education due to these

problems but providing proper educational opportunities to such vast numbers can be taken care of by means of distance education only.

This non formal means of education has wide scope for the emerging learning society in general and educational under developed or developing society in particular. It has message both for lifelong education as well as for internalization of education. It is acting as useful medium for promoting diversified as well as vocational education. It is the source of inspiration, for those who had dropped out of it at some stages or other. In other words, distance education is an organized

provision for learning opportunity on part time basis, outside the time table of formal system of education, covering a person life time in his own environment, more or less according to his own perception and at his own time. It has earned credibility all over the world as an effective alternative and parallel system of imparting education to large segments of population and particularly, the disadvantaged group such as those living in remote and rural areas, including working people, housewives, adults, school dropouts and who want to update the knowledge in their desired fields. Hence, the study was conducted to analyze the impact of distance education provided to the school dropout rural girls and women about food and nutrition at pre and post stage of the distance education.

METHODOLOGY

The study was carried out in randomly selected four villages viz., Harobelawadi, Uppinbetageri, Mansur and Garag of Dharwad taluk. Purposive random sampling method was used to select 120 school dropout girls and women, 30 in each village, to know the knowledge level of food before and after the distance education. To study the impact before and after type of experimental study was adopted. To know the level of knowledge about food and nutrition, pre test of the selected respondents was conducted with the help of structured schedule through 'Multiple choice' and 'True or False' type of questions.

A booklet on food and nutrition was prepared by the researcher with elaborated information in local simple language "Kannada". To make it effective and attractive, relevant pictures and live photographs about food and nutrition were taken. Every care was taken to understand the content easily by the readers. The whole content of the booklet with 10 chapters was divided into two parts like part-A about food and part-B about nutrients. At the end of each chapter some simple questions were asked in the form of exercise and all chapters were summarized in the form of "Important points to be remembered" and included at the end of each part. Course outline developed for the syllabus of food and nutrition is as follows :

Chapters

Part A-Food

Food :

Introduction, Functions, Classification.

Nutrition :

Classification, Functions.

Balanced diet :

Points to be considered in preparing balanced diet, advantages, recommended dietary allowance for Male, Female, Pregnant women, Lactating mother and Children.

Better cooking methods :

Importance, hints for cooking to retain the nutrients.

Questions :

Multiple choice and True or False type.
Important points to be remembered.

Part B-Nutrients

Protein :

Importance, functions, sources, deficiency diseases, preventive measures through diet.

Carbohydrate :

Importance, functions, sources, deficiency diseases.

Fat :

Importance, functions, sources, deficiency diseases.

Vitamins :

Importance, sources, functions, classification –water soluble and fat soluble vitamins. deficiency diseases of vitamin A, B (Thiamin, Riboflavin, Niacin, Folic acid, B12) C, and D.

Minerals :

Importance, classification, functions, sources, deficiency diseases of - calcium, iron, iodine, zinc.

Water and Fibre :

Importance, sources, functions

Questions :

Multiple choice and true or false type.
Important points to be remembered.

The booklet was distributed to each of the selected respondents and they were given two months time to read, understand and clarify the doubts of the contents of the distributed booklet. During these two months time, contact classes were conducted in each village at the end of each week to clarify the doubts in the lessons of reading material supplied. After two months of study duration, post test was conducted with the help of schedule developed for pre test to know the impact of distance education. Change in knowledge about food was measured by assessing pre and post-test results of distance education by using frequencies, mean and percentage.

OBSERVATION AND ASSESSMENT

Table 1 indicates knowledge of the respondents before and after the distance education about food and nutrition. It includes the chapters on food, nutrition, balanced diet and better cooking methods.

In first chapter :

Food, the respondents gave cent per cent correct answer after the education with respect to the knowledge of 'cereals', 'pulses' and 'food for growth' which were 87.50 per cent, 81.66 per cent and 97.50 per cent, respectively before the education. Knowledge about 'root vegetables' (87.50%) and 'spice' (72.50%) increased to 91.67 per cent and 94.16 per cent, respectively after the education. About 'energy food' there was not much difference between the knowledge scores of pre (94.16%) and post (96.66%) test.

In second chapter :

Nutrition, number of respondents who answered in pre test increased considerably with respect to 'nutrients' (34.16% to 71.66%), 'protective foods' (27.50% to 65.83%), 'energy foods' (22.50% to 57.50%), 'vitamins' (15.84% to 60.83%) and 'food for body protection' (18.33% to 55.84%) after the education. The knowledge about 'sources of food for growth' was increased by 20 per cent after the education.

In balanced diet chapter, about 80 per cent of the respondents gave correct answer for 'importance of balanced diet' and 'food grains required in daily diet', but, after the education the number of correct answers in these two increased by 95 per cent of respondents. About the knowledge of 'essential foods in daily diet' and effect of imbalanced diet' the respondents number increased from 44.16 to 75.84 per cent and 49.16 to 67.50 per cent, respectively. Very less respondents gave correct answer for 'recommended quantity

of cereals per day for children' before the education (15%) which was increased to about 56 per cent after the education. With respect to 'nutritious food' there was not much difference between the number of respondents of pre (91.66%) and post (92.50%) test (Table 1).

In chapter 4, knowledge about better cooking methods showed that nearly 90 to 97 per cent of the respondents gave correct answer after the education with respect to 'cooking of leafy vegetables', 'fermented food' and 'effect on frequent heating of cooked food' which were 78.34 per cent, 74.16 per cent and 62.50 per cent, respectively before the education. As far as 'cutting of vegetables', 'vitamins loss during washing rice' and 'boiling of food', number of respondents was in the range of 25 to 35 per cent which was increased to 65 to 80 per cent after the education.

Fig. 1 reveals the chapter wise knowledge of respondents before and after distance education with regard to food and

Table 1 : Knowledge of respondents before and after distance education about food and nutrition**(n=120)**

Sr. No.	Subject particulars	Distance education			
		Before		After	
		Correct answer		Correct answer	
		F	%	F	%
Chapter I : Food					
1.	Cereals	105	87.50	120	100
2.	Pulses	98	81.66	120	100
3.	Root vegetables	105	87.50	110	91.67
4.	Spice	87	72.50	113	94.16
5.	Food for growth	117	97.50	120	100
6.	Energy food	113	94.16	116	96.66
Chapter II : Nutrition					
1.	Nutrients	41	34.16	86	71.66
2.	Sources of food for growth	48	40.00	72	60.00
3.	Protective foods	33	27.50	79	65.83
4.	Energy foods	27	22.50	69	57.50
5.	Vitamins	19	15.84	73	60.83
6.	Food for body protection	22	18.33	67	55.84
Chapter III : Balanced diet					
1.	Essential foods in daily diet	53	44.16	91	75.84
2.	Nutritious food	110	91.66	111	92.50
3.	Effect of imbalanced diet on the body	59	49.16	81	67.50
4.	Recommended quantity of cereals per day for children	18	15.00	67	55.83
5.	Importance of balanced diet	97	80.84	114	95.00
6.	Food grains required in daily diet	95	79.16	115	95.84
Chapter IV: Better cooking methods					
1.	Cutting of vegetables	31	25.84	96	80.00
2.	Vitamin loss by washing rice many times	43	35.84	79	65.83
3.	Vitamin loss during boiling of food	33	27.50	82	68.34
4.	Use of fermented food	89	74.16	109	90.84
5.	Cooking of leafy vegetables	94	78.34	116	96.66
6.	Effect on frequent heating of cooked food	75	62.50	107	89.16

nutrition. Among the four chapters, very less per cent of the respondents (26.66) gave correct answer with respect to the second chapter 'Nutrition' which was increased to a good extent (61.67%) after the education. With regard to III and IV chapters, 'Balanced diet' and 'Better cooking methods' about 51 to 60 per cent of the respondents knowledge was increased to 80 to 82 per cent. The first chapter 'Food' showed nearly 10 per cent increase in the respondents after the education *i.e.*, from 86.67 to 96.67 per cent.

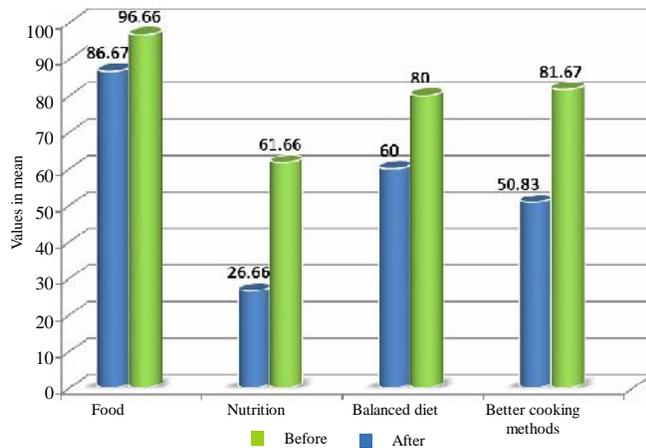


Fig. 1: Chapter wise knowledge of respondents before and after distance education with regard to food and nutrition

The possible reasons for increase in the number of respondents giving correct answers after the education might be that majority (90.84 %) of them were doing household work and cooking as their main occupation. So they might have found it very interesting and useful to know about different aspects of food and nutrition.

Now-a-days people are more concerned about good health of family members especially children, pregnant women and lactating mothers. This has made them to seek more information about balanced diet. Also in the book-let ICMR recommendation has been converted into local and familiar measurement which has made them to remember easily and correctly after the education.

With respect to cooking methods, education has made them to know about the loss of nutrients during cutting and washing of vegetables, boiling of food and advantage of using fermented food.

Table 2 depicts knowledge of the respondents before and after distance education about nutrients (part-B). It includes six chapters on protein, carbohydrate, fat, vitamins, minerals and water and fibre. In protein chapter, there was good increase in the number of respondents from 69.16 to 83.34 per cent after the education for 'protein and body immunity'. Similarly, there was increase from 47.50 to 53.34 per cent and 41.66 to 71.66 per cent for 'deficiency of protein and marasmus' and for 'functions of protein', respectively.

The lowest number of respondents found in 'recommended quantity for adults' (26.66%) and 'protein deficiency disease in children' (22.50%) which were increased to 60.84 per cent and 54.16 per cent, respectively. The knowledge about 'protein rich foods' increased by about 20 per cent after the education (Table 2).

In carbohydrate chapter, more number of respondents who had scored very low before the education, scored high with respect to 'nutrients in potato' (14.16 % to 46.66%), 'carbohydrate rich foods' (15.84% to 54.16%), 'sources of carbohydrate' (20.84% to 54.16%) and 'functions of carbohydrate' (26.66% to 58.34%). About 75.83 per cent of the respondents gave correct answer towards 'carbohydrate rich food grains' in post test which was 30.84 per cent in pre test.

In the next chapter knowledge regarding fat, majority of the respondents (65.84%) answered rightly for 'fat storing parts in body' followed by 'fat and energy' (60.00%) before the education which was increased to 86.66 per cent and 87.50 per cent, respectively after the education. More than 55 per cent of the respondents gave correct answer with regard to 'protective foods' after the education which was very low (16.66%) before the education. Less number of respondents scored very low with respect to 'deficiency of essential fatty acids'(26.67%), 'source of fat'(32.50%) and 'use of stored fat' (36.66%) which were increased to 84.16,70.84 and 82.50 per cent, respectively after the education.

In vitamins chapter, after the post test there was increase in the number of respondents from 75.00 to 95.00 per cent who answered correctly for 'poor man's almond'. Similarly there was an increase in the respondents from 60.84 to 80.00 per cent and 58.33 to 90.00 per cent with respect to 'rickets and marasmus' and 'deficiency of vitamin A causes', respectively. The number of respondents answered for 'vitamin C' and 'vitamin D' found to be 20.84 per cent and 38.33 per cent which was increased to 43.34 per cent and 83.34, respectively after the education.

In minerals chapter, very few of the respondents answered for 'iron and haemoglobin' (19.16%) and 'minerals and anaemia' (24.16%) before the education which were increased to a high percentage of 62.50 and 65.84, respectively. There was an increase in the number of respondents who answered correctly for 'calcium rich food' and 'minerals and thyroid gland', from 46.66 to 75.00 per cent and 45.00 to 78.34 per cent, respectively among all women.

In water and fibre chapter, the lowest scored respondents with respect to 'food during vomiting and diarrhea' (19.16%), 'per day requirement of drinking water' (19.17%), 'water and digestion' (20.84%) and 'excrete of waste products from the body' (25%) increased to high number *i.e.*, 58.33 per cent, 70.84 per cent, 71.66 per cent, and 66.67 per cent, respectively after the education among all women.

Table 2 : Knowledge of respondents before and after distance education about nutrients (n=120)

Sr. No.	Subject particulars	Distance education			
		Before		After	
		Correct answer		Correct answer	
		F	%	F	%
Chapter I : Protein					
1.	Recommended quantity of protein per day for adults	32	26.66	73	60.84
2.	Functions of protein	50	41.66	86	71.66
3.	Protein deficiency disease in children	27	22.50	65	54.16
4.	Protein rich foods	75	62.50	99	82.50
5.	Protein and body immunity	83	69.16	100	83.34
6.	Deficiency of protein and Marasmus	57	47.50	64	53.34
Chapter II: Carbohydrate					
1.	Functions of carbohydrate	32	26.66	70	58.34
2.	Carbohydrate rich foods	19	15.84	65	54.16
3.	Nutrients present in potato	17	14.16	56	46.66
4.	Carbohydrate rich food grains	37	30.84	91	75.83
5.	Sources of carbohydrate	25	20.84	65	54.16
6.	Energy yielding food sources	32	26.66	62	51.66
Chapter III: Fat					
1.	Protective foods	20	16.66	68	56.66
2.	Sources of fat	39	32.50	85	70.84
3.	Use of stored fat	44	36.66	99	82.50
4.	Deficiency of essential fatty acids	32	26.67	101	84.16
5.	Fat and energy	72	60.00	105	87.50
6.	Fat storing parts in body	79	65.84	104	86.66
Chapter IV: Vitamins					
1.	Deficiency of vitamin A causes	70	58.33	108	90.00
2.	Poor man's almond	90	75.00	114	95.00
3.	Vitamin 'C' rich fruits	25	20.84	52	43.34
4.	Deficiency of vitamin 'D' causes	46	38.33	100	83.34
5.	Rickets and Marasmus	73	60.84	96	80.00
6.	Bow legs in Rickets	29	24.16	69	57.50
Chapter V: Minerals					
1.	Calcium rich food grain	56	46.66	90	75.00
2.	Minerals and thyroid gland	54	45.00	94	78.34
3.	Iodine deficiency	90	75.00	97	80.84
4.	Minerals and anaemia	29	24.16	79	65.84
5.	Iron and haemoglobin	23	19.16	75	62.50
6.	Features of iron deficiency	74	62.66	99	82.50
Chapter VI: Water and fibre					
1.	Per day requirement of drinking water	23	19.17	85	70.84
2.	Fruits containing more water	101	84.16	111	92.50
3.	Food advised during vomiting and diarrhoea	23	19.16	70	58.33
4.	Excrete of waste products from the body	30	25.00	80	66.67
5.	Water and digestion	25	20.84	86	71.66
6.	Functions of kidney and water	113	94.16	119	99.16

Fig. 2 depicts the chapter wise knowledge of respondents before and after the distance education with regard to part B-Nutrients. Out of 6 chapters, less per cent of respondents (22.50 and 40.00) gave correct answer with respect to the II and III chapters ‘Carbohydrate’ and ‘Fat’ which increased to 56.67 per cent and 78.33 per cent after the education. With regard to IV,V and VI chapters ‘Vitamins’ ‘Minerals’ and ‘Water and Fibre’ number of respondents given correct answers increased from 45.83 to 75.00 per cent, 45.00 to 74.16 per cent and 43.33 to 76.66 per cent, respectively.

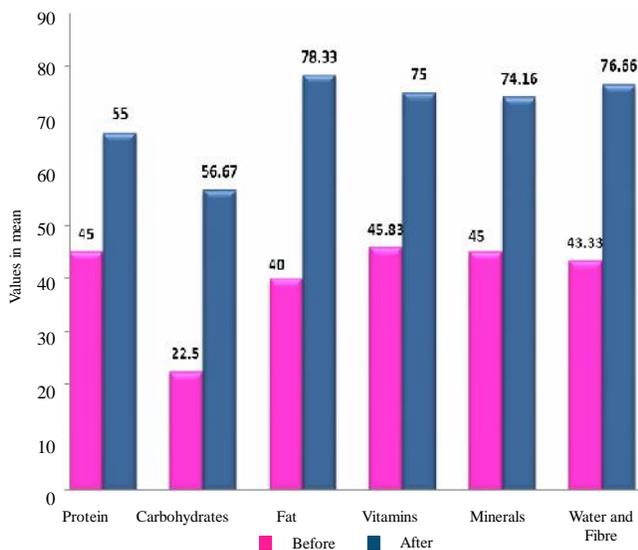
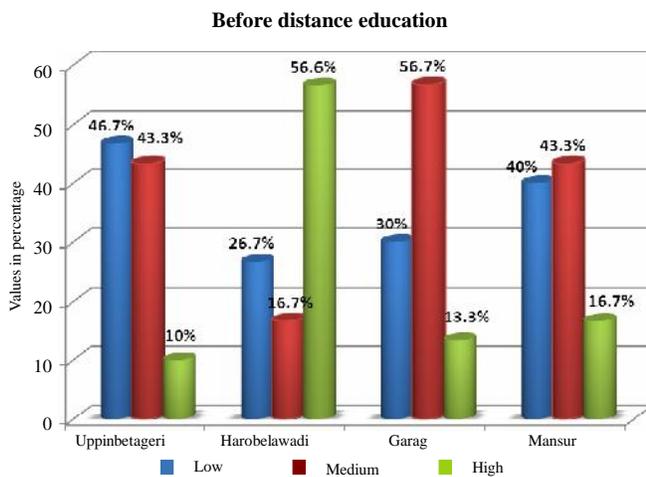


Fig. 2 : Chapter wise knowledge of respondents before and after distance education with regard to nutrients

Fig. 3 reveals the village wise categorization of knowledge level of respondents before and after distance education about food and nutrition. Overall values of all



four villages exhibited that majority of the respondents were in medium (40.00%) followed by low (35.84%) and high (24.16%) knowledge level before the education. Looking to the villages, majority of the respondents were in medium (56.70%) knowledge level followed by high (56.60%) and low (46.70%) by Garag, Harobelawadi and Uppinbetageri village respondents, respectively. The respondents of both Uppinbetageri and Mansur village showed medium knowledge level that is 43.30 per cent each. Among all the selected 30 respondents of each village, more number of them belonged to low knowledge level (46.70%) in Uppinbetageri, high knowledge level (56.60%) in Harobelawadi, medium knowledge level (56.70%) in Garag and Mansur (43.30%) before the distance education. After the distance education cent per cent of the respondents of all the selected villages showed high knowledge level about food and nutrition.

Similar results were reported by Jackson *et al.* (2004) wherein, pre and post assessment of preschoolers in both the intervention and control groups indicated that the distance education program was successful in positively impacting the literacy skills of preschool children. Also the study conducted by Nithya Shree and Hiremath (2006) showed significant impact of distance education on gain in knowledge of rural women about food and nutrition. This type of education can have advantage of providing greater access to higher education for women, children and other socially disadvantaged groups (Alavalapati and Bannister, 2007). Shukla and Singh (2010) evaluated that developed distance education package *i.e.* Module I entitled “Fundamental of Food and Nutrition”, Module II entitled “Value addition and value added products”, were found to be effective and significant in terms of gain in knowledge.

The experimental study conducted clearly shows that there was significant impact of distance education on gain in knowledge of rural school dropout girls and women about food and nutrition. Distance education has proved to be a very

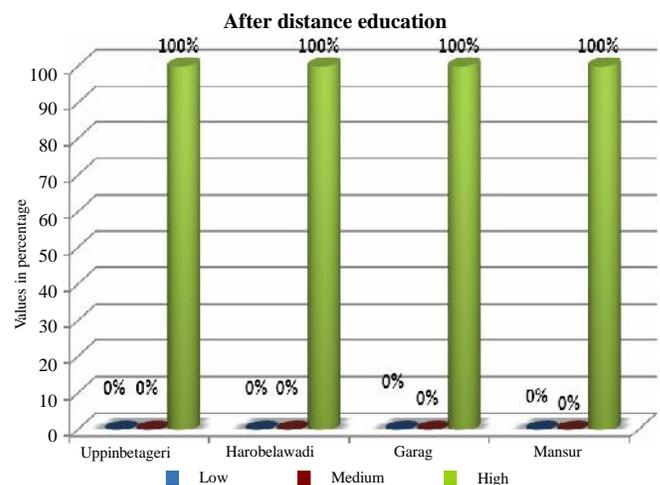


Fig. 3: Knowledge level of respondents before and after the distance education about food and nutrition

effective mode of education for the people who do not have access to education through formal education system.

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