

Readability and comprehension of distance education package on nutrition and value addition for rural women

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■ **ABSTRACT :** The study was conducted in purposively selected two villages Kolayat and Jhajhu of Kolayat Panchayat Samiti of Bikaner district, Rajasthan. Fifty rural women (fifth class onwards) were selected randomly (25 from each village) by chit method. Pre and post experimental research design was used for present study. The overall readability of the Module I was found to be very good as the mean score obtained by respondents for overall readability of Module I (22.7) closer to maximum scores (score range 16-25) and overall readability of the Module II was found to be very good as the mean score obtained by respondents for overall readability of Module II (23.6) closer to maximum scores (score range 18-27). In Module I majority of the respondents (70%) were above mean scores while only 30 per cent respondents were below mean score and in Module II majority of the respondents (80%) were above mean scores while only 20 per cent respondents were below mean score. For overall comprehension of Module I obtained 35.85, from total score range (score range 26-38). The overall comprehension of Module I in terms of the title, key messages and illustrations was excellent as majority of the respondents (86%) were above mean score followed by below mean score (14%) and for overall comprehension of Module II obtained 45, from total score range (32-49). The overall comprehension of Module II in terms of the title, key messages, and illustrations was excellent as majority of the respondents (705%) were above mean score followed by below mean score 30 per cent.

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Distance education is a new concept in educational system but it has been catching up very fast in all countries developed, developing or under developed, socialist or capitalist, western or non-western, hence its importance is being realized all over the world and certainly in developing countries. It is emerging as vigorous educational alternatives in nearly every region of the world. It can reach those who are disadvantaged

by limited time, distance or physical disability.

Value addition of food is the process of adding value to the underutilized foods and their discard portion in term of their nutritive value and better utilization as well as developing their variety and utilization as well as developing their variety and broadcasting them in monetary term. It is easy to prepare value added products at home. Housewives at household level can take the

technology of acceptable different values added food product, as the raw ingredients are already available in their houses. But they have no knowledge that improves the nutritional of their food stuffs of thus status. This is mainly due to lack of knowledge about addition of values of food in relation to nutrition level of food (Sharma, 2017). With the help of distance education package consisting of variety of teaching methods the knowledge gap regarding value addition and value added products could be fulfilled. Therefore for providing knowledge regarding value addition the present study was undertaken to check the readability and comprehension of developed distance education package on nutrition and value addition.

■ RESEARCH METHODS

The study was conducted in purposively selected two villages Kolayat and Jhajhu of Kolayat Panchayat Samiti of Bikaner district of Rajasthan. A sample of fifty rural women in the age group of 18-45 years (fifth class onwards) was selected randomly (twenty five respondents from each village) by chit method for present investigation. The study was conducted in two phases:

Phase I Development of distance education package on “nutrition and value addition” :

As per the objective, distance education package (two modules) was developed on value added products from fruits and vegetables. Module I entitled “Fundamental of foods and nutrition” and Module II entitled “Value addition and value added products”. These two modules were evaluated by experts on a pre-determined score cards. After that it was pre-tested with fifteen identical respondents from Beechwal village of Bikaner district.

Phase II Measure readability and comprehension of modules :

A schedule was developed having two sections *i.e.* Information regarding reading ability: This part of scheduled included information regarding reading ability of respondents and Information regarding comprehension

ability: Understanding the content of distance education package (Module I and Module II) as perceived by readers was included in second part of the schedule. This section dealt with open ended questions related to illustrations, titles, difficult words and key messages of distance education package for finding out comprehension of respondents.

■ RESEARCH FINDINGS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Readability of the modules :

Readability of printed matter can be assumed by the reading ability of the target group for which it has been designed. The reading process starts with recognition of printed words and saying it aloud or to one self. The printed matter has many characteristics which affect reading skill of users such as language, size of letter etc. One of the parts of the present study was to measure the readability of modules. Readability of printed matter was judged by reading ability of the target group for which it has been designed. It was measured on following aspects.

Readability on the basis of fog index value :

To measure the readability of modules fog index was calculated. Higher fog index indicates lower readability and *vice-versa*. Fog index calculated for the modules and information regarding this is presented in Table 1.

A glance of Table 1 shows that both the modules have low fog index value which indicates that the modules were having high readability. The number of difficult words were also few. Readability of modules was high because of short and simple sentences. The words comprising fewer letters rather than bulky words. They were bold and printed in appropriate size. All this contributed to higher readability by respondents. Also clear and appropriate illustrations were used for supporting the messages.

Table 1 : Level of readability on the basis of fog index value			(n=50)
Modules	No. of difficult words	Pertaining to difficult words	Fog index value
Module-I Fundamentals of Food and Nutrition	6	5	4.77
Module-II Value Addition and Value Added Products	8	4	6.97

Fluency in reading :

Fluency is the smoothness and rapidity in reading of words uninterrupted by failures. Fluency was measured on three point continuum that is fluent, slow and very slow. Information about the level of fluency of each respondents with their mean weighted score is presented in Table 2. Majority of the respondents (70%) read the module I fluently and majority of the respondents (80%) read the module II fluently. Only few respondents were slow or very slow in reading. This means that modules were good and contained easy and simple words which could be read by the respondents very easily. The possible reasons for such findings may be that fluency in reading depends on number of difficult words, which were not read by the respondents. But it is found that modules were having low fog index value which indicates that they were good in reading as they consist of clear illustration with simple language and easy sentences that enhanced the fluency in reading.

Words perceived as difficult by respondents :

Efforts were further made to know how many words were found difficult to read by the respondents. Table 3 clearly shows that there were six words in Module I and eight words in Module II considered as

difficult to read. It means that most of the respondents were able to read even these words because percentage of respondents were less who found difficult to read these words.

Readability index of the modules :

The readability index was measured on 3 point continuum such as easy, average and difficult to read by assigning scores 3, 2 and 1, respectively. Readability index was calculated to determine the reading skills of target group. Table 4 portrays that majority of the respondents (86%) reported that the Module I was easy to read and majority of the respondents (90%) reported that Module II was easy to read. The possible reason could be that the language was very easy to understand. The words included in the modules were related to health, nutrition and value addition. Moreover, illustrations enabled to catch whole meaning of the messages. Table 4 further depicts that 10 per cent of the respondents found Module I to be average and 4 per cent of respondents found Module I to be difficult in reading and very few respondents (6%) found the Module II to be average and 4 per cent difficult in reading because of their low level of understanding.

Table 2 : Percentage distribution of respondents by their fluency in reading the modules with their mean weighted scores (n=50)

Modules	Fluent		Slow		Very Slow		Mean weighted score
	Mean	%	Mean	%	Mean	%	
Module-I Fundamentals of Food and Nutrition	35	70	10	20	5	10	4.3
Module-II Value Addition and Value Added Products	40	80	8	16	2	4	4.6

Table 3: Percentage distribution of the respondents who perceived the words as difficult to read (n=50)

Module	Word perceived difficult	Frequency	Per cent
Module-I Fundamentals of Food and Nutrition	रक्तअल्पता	4	20
	स्कर्वी	2	10
	क्वाशियोरकोर	5	25
	संवर्धन	2	10
	स्ट्र्यूइंग	6	30
	परिवर्धित	2	10
Module-II Value Addition and Value Added Products	पाश्चुरीकरण	6	30
	ब्लॉकिंग	2	10
	निर्जलीकरण	2	10
	विषाक्तता	3	15
	निष्क्रिय	4	20
	विवर्णीकरण	7	35
	बैक्टीरिया	5	25
	सिट्रिक	2	10

Overall readability of the modules :

This part gives information about the overall readability of the modules by rural women. An overview of Table 5 reveal that the mean score obtained by the respondents for readability of Module I was 22.7 out of 25 scores and mean score obtained by the respondents for readability of Module II was 23.6 out of 27 scores. This indicates that readability of the Modules were very good as it is nearer to maximum scores.

Table 5 further depicts that majority of the respondents (70%) obtained readability score above the mean score on Module I and 80 per cent of the respondents obtained readability score above the mean score in Module II. The possible reason for such findings may be that content was organized in proper sequence. Second reason was that unnecessary details were avoided in the Modules. For clarity of content, local, simple and familiar words were used to deliver the messages to rural women, that might helped them in reading the message. It may also be due to expert's guidance and suggestions were follower while preparing modules. The results of this study confirm the findings of Badruden and Sabharwal (2010) and Gupta (2007).

Comprehension of the modules :

This part deals with the comprehension of the

modules by the rural women. Comprehension is the ability of the readers to understand what they read. The effectiveness of any published material depends on the comprehension of that material by the respondents.

In the present investigation comprehension was studied for words, title, content and illustrations in the modules. The respondents were asked to read the title, content along with illustrations and asked what they understood by them. These responses were assessed in accordance with messages identified by the investigator with the guidance of experts.

Comprehension of words :

It is clear from the Table 6 that in Module I there were only three words and in Module II there were four words whose meaning was not known to the respondents. In general those words which were not comprehended by them and found to be difficult, they were described in the glossary given at the end of every chapter.

Comprehension of modules – titles :

Title is an important aspect of any published material. It should be clear and self-explanatory. An effort was made to assess the comprehension of titles used in the modules. The Table 7 reveals that the title of the Module I was understand by all the respondents (100%) and title

Modules	Easy		Average		Difficult	
	n	%	n	%	n	%
Module-I Fundamentals of Food and Nutrition	43	86	5	10	2	4
Module-II Value Addition and Value Added Products	45	90	3	6	2	4

Modules	Score range	Mean score obtained	Below mean score		Above mean score	
			n	%	n	%
Module-I Fundamentals of Food and Nutrition	16-25	22.7	15	30	35	70
Module-II Value Addition and Value Added Products	18-27	23.6	10	20	40	80

Module	Word perceived difficult	Below mean score	
		n	Per cent
Module-I Fundamentals of Food and Nutrition	रक्तअल्पता	9	45
	क्वाशियोरकोर	11	55
	परिवर्धित	5	25
Module-II Value Addition and Value Added Products	पाश्च्युरीकरण	15	75
	विषाक्तता	3	15
	निष्क्रिय	7	10
	विवर्णीकरण	2	35

of Module II was clearly understood by most of the respondents (90%). This shows that the titles were clear, short, catchy, relevant to the point, appropriately highlighted and evenly placed letters were used. In the modules, the titles were printed in appropriate font size, bold enough to be read and understood by respondents. Due to all these reasons the comprehension of titles was excellent.

Comprehension of content in the modules :

Comprehensions of content of modules were done separately according to messages intended in the modules. The key messages were selected by the investigator under the guidance of experts. Detailed information regarding comprehension of key messages of modules is presented in Table 8.

Perusal of the Table 8 depicts that the messages related to balanced diet, malnutrition, nutrients, functions of Food, Importance of fruits and vegetables in diet, points to be kept in mind while purchasing fruits and vegetables, proper ways of cooking green leafy vegetables, methods of cooking food by water, steam, oil, hot air, combined method, points to be kept in mind for increasing and

conserving nutrients of food were comprehended by 66 to 100 per cent of the respondents. This shows excellent comprehension of messages of Module I by the respondent. The reasons might be that the messages were very simple and conveying single idea. The messages were to the point and were appropriately highlighted.

Table 9 depicts that the messages related to value addition, requirement of value addition, methods of food preservation, food intoxication, importance of dehydration, effect of dehydration, preservation of fruits and vegetables through dehydration, points to be kept in mind while preparing pickles, methods of preparing chutney, pickle, murabba and sharbat were comprehended by 80 to 100 per cent respondents. This shows excellent comprehension of messages of Module II by the respondents the reasons might be that the messages were very simple and conveying single idea. The messages were to the point and were appropriately highlighted. The size of print was also appropriate.

Overall comprehension of content / key messages:

An overview of Table 10 reveals that the mean

Table 7: Percentage distribution of the respondents by their comprehension of titles of modules (n=50)

Modules	Comprehension of titles	
	n	%
Module-I Fundamentals of Food and Nutrition	50	100
Module-II Value Addition and Value Added Products	45	90

Table 8 : Comprehension of content in the Module I (n=50)

Sr. No.	Key messages	Comprehension	
		n	%
1.	Balanced diet	48	96
2.	Malnutrition	45	90
3.	Nutrients	40	80
4.	Functions of food	48	96
5.	Importance of fruits in diet	50	100
6.	Importance of vegetables in diet	50	100
7.	Points to be kept in mind while purchasing fruits and vegetables	50	100
8.	Proper ways of cooking green leafy vegetables	50	100
9.	Methods of cooking food		
	By water	43	86
	By Steam	38	76
	By oil	43	86
	By Hot air	33	66
	Combined method	35	70
10.	Points to be kept on mind for increasing and conserving nutrients of food	50	100

score obtained by the respondents for comprehension of content of Module I was 35.85 out of 38 scores and mean score obtained by the respondents for comprehension of content of Module II was 45 out of 49 scores. This indicates the comprehension of messages of both modules were good as set was nearer to maximum scores. Table 10 further depict that majority of the respondents (86%) obtained comprehension mean score were above mean score, while only 14 per cent obtained were below mean score. In case of Module II majority of the respondents (70%) were above mean score and only 30 per cent of the respondents were below the mean score. The main reasons for good comprehension of developed modules by respondents might be: Good presentation, proper layout and spacing, simple sentences, appropriate sub title, bold letters, simple language and easy to read, clear illustrations, systematic organization and layout of subject matter content and messages were highlighted and well placed under suitable titles.

Comprehension of illustrations :

Illustrations are an important part of printed material. They simplify the messages, make the concepts clear which further helps incomprehension of messages. An effort was thus made to assess the comprehension of illustrations used in the modules. A number of illustrations

were used in the modules. Some of the illustrations were prepared by hand and some of the illustrations were scanned and prepared from computers. It was encouraging to note that from 70 to 100 per cent respondents comprehended all the illustrations of Module I. More than three fourth respondents (76 to 100%) comprehended all the illustrations of Module II. The reasons for good comprehension of all the illustrations of Module I and Module II were that illustrations were simple, self-explanatory and familiar to their day to day life. These findings are in accordance with the study of Padmapriya (2015) and Matanluk *et al.* (2013).

Conclusion :

Findings regarding readability and comprehension of the modules with respect to different criteria's as language, illustrations, subject matter coverage etc. the modules were rated as good. Generally, the overall readability of Module I and Module II were found to be very good as the mean score obtained by the respondent in Module I was 22.7 and in Module II was 23.6 which were closer to the maximum score range (score range 16-25 and 18-27, respectively). The results of this study confirm the findings of Dudi and Singh (2010). On the basis of these findings, it could be concluded that the developed distance education package on value added products from fruits and vegetables was excellent and

Sr. No.	Key messages	Comprehension	
		n	%
1.	Value addition	50	100
2.	Requirement of value addition	50	100
3.	Methods of food preservation	50	100
4.	Food intoxication	45	90
5.	Importance of dehydration	50	100
6.	Effect of dehydration on nutrients	45	90
7.	Preservation of fruits and vegetables through dehydration	50	100
8.	Points to be kept in mind while preparing pickles	50	100
9.	Methods of making chutney	43	86
10.	Methods of preparing pickles	50	100
11.	Methods of preparing murabba	45	90
12.	Methods of preparing sharbat	40	80

Modules	Score range	Mean score obtained	Below mean score		Above mean score	
			n	%	n	%
Module-I Fundamentals of Food and Nutrition	26-38	35.85	7	14	43	86
Module-II Value Addition and Value Added Products	32-49	45	15	30	35	70

could be used by distance education organization and universities for transfer of scientific information to the school dropouts, professionals, and rural poor and also who want to update their knowledge in their desired fields.

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