

Impact of nutrition and health education intervention on rural high school students*

PREETY AND UMA S. HIREMATH

Department of Extension and Communication Management, College of Rural Home Science, Dharwad
University of Agricultural Sciences, Dharwad - 580 005, Karnataka, India
E-mail: preetykalash@gmail.com

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Abstract: Education intervention is a planned set of procedures which aims at teaching a specific set of academic or social skills to an individual or group. Providing such an intervention in school stage can help students to develop healthy habits of nutrition and health. Hence, an effort was made to assess the knowledge gain of students on selected topics through given intervention and to analyze retention of knowledge gain through “before and after” type of experiment. Total mean score of pre-test (72.67) and post-test (83.48) of nutrition was compared and highly significant difference was found. Similarly, total mean score of health was found to be 69.31 in pre-test and 84.89 in post-test. Further, analysis showed that the mean scores in post-test decreased after 15 days but the score increased after 30 days. The overall mean score of students with respect to knowledge about nutrition was 72.67 before intervention which increased to 82.44 after 30 days of intervention. With regard to health, highly significant change in mean scores of students was found from 69.31 (in tests before) to 84.47 (after 30 days of education intervention). Thus, it is clear that educational intervention had a significant impact on knowledge regarding both nutrition and health.

Key words: Education intervention, Health, Impact, Nutrition, Rural students

Introduction

In every nation, welfare of the entire community depends on health and welfare of youth. Educational intervention programmes can help in creating and promoting awareness among youth. Education intervention is a planned set of procedures which aims at teaching a specific set of academic or social skills to an individual or group. It is said to be more than a single lesson but less than an entire curriculum. Not only an intervention improves knowledge of student but it also breaks the monotony of daily lessons provided within the four walls of the institutions. It leads to change in knowledge, attitude and change in the practice of the people so that an improvement is observed in the lives of people who undergo intervention. Providing such an intervention in school stage can help students to develop healthy habits of health and nutrition.

Therefore, an effort was made to assess impact of health and nutrition education intervention in school students. A booklet was prepared on important aspects of nutrition and health and supplied to the school students along with providing them knowledge through lecture method with the help of power point presentation and flash cards. Hence, to know the impact of such type of educational effort, a study was undertaken with the objectives (i) to study the profile of selected students, (ii) to assess knowledge gain of students on selected topics and (iii) to analyze retention of the knowledge gain.

Material and methods

To study the impact of education intervention on nutrition and health on selected rural high school students “before and after” type of experimental design was adopted with the following steps.

- 1) *Pre-test:* To know the level of knowledge about nutrition and health, pre-test of selected students was conducted with the help of structured schedule.
- 2) *Development of educational referrals and supporting audio-visual aids:* Educational referrals are materials covering the

important information, to be distributed among the participants of intervention for self reference whenever needed. A few important chapters were selected regarding nutrition and health, and the educational referrals in the form of booklet was developed in consultation with school teachers and subject experts along with relevant audio-visual aids like flash cards and power point presentations.

- 3) *Conducting classes:* Lessons were delivered to students with the support of audio-visual aids. Educational referrals were distributed to each student to study different aspects of nutrition and health.
- 4) *Post-test:* Immediately after delivery of each of the lesson, post-test was conducted for delivered lesson through the same questionnaire used for pre-test.
- 5) *Knowledge gain:* Based on scores of pre-test and post-test, gain in knowledge of students was assessed.
- 6) *Retention test:* The retention of each delivered lesson was tested after 15 and 30 days through the same questionnaire used for pre-test and post-test.

The study was conducted in the purposively selected high school of Dharwad district of northern Karnataka. A list of schools in and around Dharwad was obtained from Block Education Office of Dharwad district. A few names of English medium schools were sorted out from the list and finally Alnavar Education Society's Smt. Annapoorna Chandrashekharyya Hiremath English Medium Primary/High School was selected. Thus, the study was carried out on selected 8th and 9th standard students including, both boys and girls. The total number of students on roll were eighty in selected standards. Based on the regularity of students attending school 75 students were selected for study.

Keeping in view the objectives and variables under study, an interview schedule was framed to collect socio personal

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information of respondents and their parents. To know the impact of education intervention, a schedule including questions on nutrition and health was prepared and pre-tested in a non-study area to remove any ambiguity in the questions. After pre-testing certain modifications were made in consultation to specialists and teachers of the school on the selected topics and related literature. Finalized schedule was used for data collection.

First part of the schedule consisted of socio-personal characteristics of respondents. Second part was related to knowledge of student, mainly to know the impact of education intervention on nutrition and health. To test their knowledge about nutrition, questions were framed on selected aspects of food, nutrients and nutrition. Likewise, to know their knowledge about health, questions on personal hygiene and deficiency diseases were framed, and asked through 'Multiple choice' and 'True or False' type of questions.

The selected variables on socio-personal characteristics were analyzed using frequencies and percentages. Gain in knowledge and retention was assessed by knowledge index. The scores of both, pre-test and post-test was compared using paired t-test.

Results and discussion

An attempt was made to know the distribution of respondents with respect to socio-personal status and details are presented in Table 1. It is evident that 86.67 per cent of respondents were of the age between 13 to 14 years followed by 9.33 per cent of respondents in the age group of 15-16 years and remaining 4 per cent were in the age group of 11-12 years. With regard to gender, a total of 42.67 per cent of the sample were girls, wherein 25.33 and 17.34 per cent of girls were from 8th and 9th standards, respectively. Among boys, 29.33 per cent were from 8th and 28 per cent boys belonged to 9th standard making 57.33 per cent of total sample.

More number of students belonged to a medium family size (56%) followed by small family (42.67%) and only 1.33 per cent of students had a large family. Among family type, majority of the students were from nuclear family (88%) followed by joint family (8%) and extended family type (4%). Regarding ordinal position, 42.67 per cent of students were first born in their family which was followed by 34.66 per cent being last born children and remaining 22.67 per cent children were in between (Table 1).

A close observation of academic grades of students revealed that 32 per cent students were between grades of 80-90 per cent followed by 22.67 per cent students in the grade level of 90-100 per cent which was closely followed by 21.33 per cent students in the grade of 70-80 per cent. The remaining were found to be in the grades of 60-70 per cent and 50-60 per cent with 17.33 and 6.67 per cent students, respectively. From the observations of awards received by students, it was found that majority of the students (40%) received awards at school level followed by taluk level (22.67 %), district level (6.66 %) and national level (4%) but 26.67 per cent students did not receive any awards. Majority of students did not receive any financial assistance except 6.67 per cent.

Table 2 reveals the chapter-wise knowledge score of respondents before and after education intervention with regard

Table 1. Socio personal characteristics of selected respondents

			N=75
Demographic characteristics	Categories		F %
Age	11-12		03 4.00
	13-14		65 86.67
	15-16		07 9.33
Gender	Girls	8 th Standard	19 25.33
		9 th Standard	13 17.34
		Total	32 42.67
	Boys	8 th Standard	22 29.33
		9 th Standard	21 28.00
		Total	43 57.33
Family Size	Small (1-4 members)		32 42.67
	Medium (5-7 members)		42 56.00
	Large (more than 7)		01 1.33
Family type	Nuclear		66 88.00
	Joint		06 8.00
	Extended		03 4.00
Ordinal Position	First Born		32 42.67
	Middle Born		17 22.67
	Last Born		26 34.66
Academic Grade	E (50-60%)		05 6.67
	D (60-70%)		13 17.33
	C (70-80%)		16 21.33
	B (80-90%)		24 32.00
	A (90-100%)		17 22.67
Awards	School level		30 40.00
	Taluk level		17 22.67
	District level		05 6.66
	National level		03 4.00
	None		20 26.67
Financial Assistance	Yes		05 6.67
	No		70 93.33

to nutrition. Among the five chapters, chapter on 'water and dietary fibre' showed the maximum increase of 26.67 per cent students followed by 'minor millets' (22.67%), 'healthy cooking methods' (21.34%), 'food' (20%) and 'balanced diet' (17.33%). It also shows chapter wise knowledge score of respondents before and after education intervention with regard to health. With reference to health maximum change was observed in knowledge of respondents regarding community health (36.00%) followed by protein energy malnutrition (34.67%), personal health (29.33%), school health (25.33%) and deficiency diseases (22.67%).

The possible reason might be their previous exposure to the same topic in lower standards of the school curriculum. The result showed that healthy cooking methods and minor millets also had a significant increase in the number of students. The chapters may not have been taught to them earlier but the interest of the students may have over powered them to pay more attention to these lessons. Bakshi and Singh (2012) showed the improvement in knowledge of adolescents regarding consumption of fruits and vegetables. Sajjan *et al.* (2011) proved nutrition education to be one of the relevant, effective and sustainable strategies to combat anaemia.

Table 2 represents the impact of education intervention regarding nutrition and health. When total mean score of pre-test (72.67) and post-test (83.48) was compared in nutrition, a

Table 2. Impact of education intervention on knowledge about nutrition and health

N=75

Subjects	Chapters	Pre-test		Post test		t-value
		Mean	SD	Mean	SD	
Nutrition	I. Food	14.01	1.27	15.63	1.49	9.69**
	II. Balanced diet	14.59	1.46	16.53	1.50	10.11**
	III. Water and dietary fibre	15.21	1.45	17.28	1.29	11.72**
	IV. Healthy cooking methods	14.79	1.26	16.76	1.48	12.01**
	V. Minor Millets	14.37	2.49	17.28	1.73	9.21**
	Total	72.67	5.27	83.48	4.89	16.91**
Health	Personal health	15.36	1.38	19.12	1.37	3.83**
	Community health	13.47	1.31	16.53	1.60	14.21**
	School health	14.17	1.86	17.55	1.49	14.67**
	Deficiency diseases	12.65	1.63	16.36	1.40	17.77**
	Protein energy malnutrition	13.65	2.05	16.29	1.58	13.05**
	Total	69.31	5.37	84.89	4.63	27.51**

**Significant at 1 per cent level, SD- Standard deviation

highly significant difference was found. Considering the chapter-wise comparison it was noticed that before the intervention the mean score was least in the chapter on 'food' (14.01), succeeded by chapter on 'minor millets' (14.37), 'balanced diet' (14.59), 'healthy cooking methods' (14.79) and 'water and dietary fibre' (15.21). After the intervention the mean scores increased to 15.63 in chapter on 'food', 16.53 in chapter on 'balanced diet', 16.76 in chapter on 'healthy cooking methods' and 17.28 each in chapters on 'minor millets' and 'water and dietary fibre'. The change in the mean score was found to be significant at 1 per cent level.

It is clear from Table 2 that the mean score of students in health before education intervention was highest regarding personal health (15.36) followed by school health (14.17) protein energy malnutrition (13.65), community health (13.47) and deficiency diseases (12.65). The mean scores of the students were noticed to increase in all the chapters after the education intervention. It was found that personal health had a mean score of 19.12 followed by school health (17.55), community health (16.53), deficiency diseases (16.36) and protein energy malnutrition (16.29). The increase in the mean score was found to be significant at 1 per cent level. The total mean score of health was found to be 69.31 in pre-test and 84.89 in post test. The t-value indicated the highly significant difference in the mean scores.

Versie (2005) showed the effect of theory based sexually transmitted infections (STI) education intervention in South Florida. Significant differences were observed between pre-test and post test scores of experimental and control groups on knowledge of STIs. Dongre *et al.* (2006) showed a significant improvement in personal hygiene of students in Wardha district and concluded that the school health education program with active involvement of school teacher lead to improvement in personal hygiene in school children and reduction in related morbidities. Sharma *et al.* (2009) developed an intervention package on the aspects of health including general health, reproductive and child health, environmental health and nutritional aspects. Intervention in the areas of general awareness was provided to the girls in the schools by visiting them once a week. Lectures, discussions and stories were the tools for disseminating the information to the girls. The intervention was found to be effective in significantly improving the awareness and knowledge of adolescent girls.

An attempt was made to assess the retention of knowledge of the respondents about nutrition and health after 15 and 30 days and the results are presented in Table 3. In context of nutrition, the mean score of knowledge retained by the students after 15 days was found to be changed in water and dietary fibre (17.29 to 16.92) followed by minor millets (17.28 to 16.95), healthy cooking methods (16.76 to 16.35), balanced diet (16.51 to 16.64) and food (15.63 to 15.27). The difference in the mean scores was not significant. With respect to health, the mean score of knowledge retained by the students after 15 days changed from 18.16 to 18.28 in personal health, 17.55 to 17.07 in school health, 16.53 to 16.23 for community health, 16.36 to 16.43 for protein energy malnutrition and 16.29 to 16.09 for deficiency diseases. The difference in the mean scores was not significant (Table 3). The students were found to retain much of knowledge after 15 days of education intervention. The booklet might have helped the students to access important information and keep in touch with them. The visuals shown during the lecture would have been effective in remembering the major points discussed in the classroom. Thus, the scores seem to be altered a little but not significant enough to prove the loss of entire knowledge.

After 30 days of education intervention the students exhibited the change in the high mean score of water and dietary fibre (17.29 to 17.60) followed by minor millets (17.28 to 16.47), healthy cooking methods (16.76 to 16.77), balanced diet (16.51 to 16.77) and food (15.63 to 14.83). The difference in the mean score of retained knowledge after 30 days to the knowledge immediately after post test was not significant except in the chapter on food and minor millets, where the change was highly significant (Table 3).

When health was considered, it was found that the high mean score was changed in personal health (18.16 to 18.01) followed by school health (17.55 to 16.73), community health (16.53 to 17.11), protein energy malnutrition (16.36 to 16.57) and deficiency diseases (16.29 to 16.04). The change in the score was noticed to be highly significant in the chapter on school health. In case of other chapters the change was not significant. There was highly significant difference in mean scores of post-test and retention-test after 30 days in the chapters on food, minor millets and school health with scores being more after 30 days as compared to that in post-test. As the learning has

Table 3. Retention of knowledge of respondents about nutrition and health after 15 and 30 days

N=75

Subject	Chapter	Mean Score		Difference	t-value	Mean Score	Difference	t-value
		Post test	After 15 days			After 30 days		
Nutrition	Food	15.63 (1.50)	15.27 (1.60)	+0.36	1.64	14.83 (1.38)	+0.80	3.44**
	Balanced Diet	16.51 (1.50)	16.64 (2.03)	-0.13	0.45	16.77 (1.65)	-0.26	0.94
	Water and dietary fibre	17.29 (1.30)	16.92 (1.90)	+0.37	1.50	17.60 (1.42)	-0.31	1.56
	Healthy cooking methods	16.76 (1.50)	16.35 (1.87)	+0.41	1.64	16.77 (1.51)	-0.01	0.06
	Minor millets	17.28 (1.73)	16.95 (1.81)	+0.33	1.05	16.47 (1.80)	+0.81	3.17**
Health	Personal health	18.16 (1.15)	18.28 (1.45)	-0.12	0.73	18.01 (1.69)	+0.15	0.79
	Community health	16.53 (1.60)	16.23 (2.18)	+0.30	1.28	17.11 (2.15)	-0.58	2.03
	School health	17.55 (1.49)	17.07 (2.21)	+0.54	2.04	16.73 (2.02)	+0.82	3.15**
	Protein energy malnutrition	16.36 (1.40)	16.43 (1.76)	-0.07	0.31	16.57 (1.80)	-0.21	0.83
	Deficiency diseases	16.29 (1.58)	16.09 (1.96)	+0.20	0.88	16.04 (1.58)	+0.25	1.00

Values in parentheses indicate standard deviation, **Significant at 1 per cent level

become examination-centered and marks-oriented these days, the students might not be revising the booklet provided to them during the intervention. Since these chapters are not a part of their examination curriculum, they might not stay in contact to the subjects. Thus, they tend to forget the given lessons after certain period. This explains the limited retention power of the students with the passage of time. Granito and Chernobilsky (2012) concluded that the students retain knowledge in a better way if the choice of subjects is provided to them. Bacon and Stewart (2006) ascertained that the knowledge tested more than once during the course was more likely to be retained than the knowledge tested only once. Auwal (2013) experimented and revealed similar retention of knowledge in senior secondary schools of Nigeria.

Table 4 indicates the overall impact of education intervention regarding nutrition as well as health. It is evident from the table that the overall mean score of the students with respect to knowledge about nutrition was 72.67 before the intervention which increased to 82.44 after 30 days of the intervention. The difference in the score was found to be highly significant. The table also indicates highly significant change in mean scores of the students from 69.31 to 84.47 with regard to health in the tests before and after 30 days of the education intervention. Thus, it is clear that the education intervention had a significant impact on the knowledge regarding both

Table 4. Overall impact of education intervention on nutrition and health

N=75

Subjects	Pre-test		30 Day post test		t-value
	Mean	SD	Mean	SD	
Nutrition	72.67	5.27	82.44	3.76	14.28**
Health	69.31	5.37	84.47	5.16	20.91**
Overall	141.98	8.06	166.91	6.29	25.12**

** Significant at 1 per cent level, SD- Standard deviation

nutrition and health. When both the subjects were combined the overall knowledge score of the students was 141.97 on an average before the exposure to the intervention which later after the exposure changed to 166.91 on an average. The difference was noted to be highly significant with respect to the complete education intervention.

It is evident that the education intervention can enhance the knowledge of human beings for their betterment. As the high school students are in a transition stage, educational interventions based on nutrition, health and other relevant topics should be given to them which can improve their daily etiquettes. As per the present study the students showed a significant gain in knowledge about both, nutrition and health. During the tests after 15 and 30 days also, they seemed to retain most of the information conveyed to them during the education intervention.

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