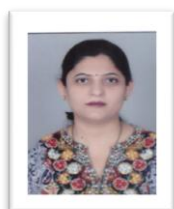


Game Based Nutrition Education Intervention and Nutritional Knowledge: An Impact Assessment Study for Upper Primary Class Students

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Abstract

Background

A child can easily adopt the habits of their parents as well as from the society whether it is good or bad. Adequate and balanced nutritional intake is quite essential for children as it fosters growth and development, protects and maintains health, prevents from nutritional deficiencies and various other illnesses and to reserve for starvation and dietary stress. Nutrition education is an important way to encourage healthy eating and build good lifelong habits. Games are an innovative and challenging educational method. They have been used as a prime teaching strategy in Primary and Junior education.

Objective of the Study

The objective of the study was to determine the change in nutritional knowledge of students of upper primary schools after receiving a game based nutrition education intervention.

Methods

The study was conducted on a representative group of 427 upper primary classes' students of age range 11-16 years from the four State Government schools of District Sitapur. Samples were selected purposively and schools were selected by purposive sampling technique in urban area of District Sitapur. Pre- nutritional knowledge of students was assessed by researcher through pre-tested questionnaire. After pre-assessment of nutritional knowledge, game based nutrition education was imparted for three months. To study the impact of game based nutrition education intervention on students nutritional knowledge was assessed through pre-used Questionnaire.

Results

The result showed that there was significant improvement in students' nutritional knowledge. The findings support the importance of providing nutritional knowledge to children to promote healthy dietary behaviors.

Keywords: Nutrition Education, Nutritional Knowledge, Students, School, Game.

Introduction

In today's era, sometimes people feel helpless to maintain their health due to their unscheduled routine in their busy lifestyle. The insufficient intake of minerals & fibers, overeating of junk foods and unhygienic practices are very common in today's lifestyle due to which the rating of critical diseases specially related to obesity & heart etc. are going higher day by day. A child can easily adopt the habits of their parents as well as from the society whether it is good or bad, that is why the children are also affected with these diseases due to poor nutrition practices & dietary behaviours. Adequate and balanced nutritional intake is quite essential for children as it fosters growth and development, protects and maintains health, prevents from nutritional deficiencies and various other illnesses and to reserve for starvation and dietary stress(1). Nutrition is the science of food, the nutrients and other substance there in, their action, interaction and balance in relationship to health and disease. In addition, nutrition is concerned with social, economic, cultural and psychological implications of food and eating. (2) In short, nutrition science is the area of knowledge regarding the role of food in the maintenance of health. Balanced diet, varieties of food and moderation are the key to good

nutrition. To stay hale and hearty, body needs the correct balance of the three main components of nutrition i.e. carbohydrates, fats, and protein as well as vitamins, minerals and other substances from a variety of foods.

School age period has been called the latent time of growth. It is a period when nutritional demand is increased and dietary habits are established. If school age children eat a healthy diet it enhances their growth and optimizes their development. To attain and sustain good health and nutritional status, it is important to provide sufficient knowledge and skills to people and more importantly to students about how to select, purchase, and eat a variety of foods consisting of all the nutrients in the right amount and combinations. To achieve this it is required that a basic knowledge of about constituents of nutritious diet and methods to best meet their nutritional needs from available resources, to be provided to the students since the beginning of school. School age is the most effective period for children for educating basic knowledge including nutrition knowledge on general dietary lifestyle, food selection, dietary habits, and table manners with organized educational contents. Nutrition education is an important way to encourage healthy eating, build good lifelong habits, and combat our country's childhood obesity epidemic. As a supporting effort to the school environment, school nutrition plays a significant role in bettering the health of students. It has been recognized through various school programmes that play offers best opportunity to a child to learn and retain the learning.

Play helps the child to understand their world, to become socialized, to solve problems in an environment and also develop critical thinking skills. Games encourage interaction among learners, increase learners' levels of motivation, and enhance the opportunity to learn from others. Games are an innovative and challenging educational method. They have also been used as a prime teaching strategy in Primary and junior education, predominantly to review and reinforce learning material for students.

The purpose of this study is to assess and promote nutritional knowledge and good eating habits among students. In the light of above mentioned background a study was carried out to adjudge the impact of game based nutrition education intervention on nutritional knowledge of the selected students of upper primary classes.

Methods

Study Design and Sampling

Sample size comprised 427 upper primary classes students of age range 11-16 years from the four State Government schools of District Sitapur respectively. Total 427 students of class 6th to 8th were chosen purposively from the schools selected as a sample. A list of all schools in urban area of Sitapur was prepared and thereafter through purposive sampling technique four schools were selected.

Data Collection Tools

Questionnaire based method was implemented for data collection. The Questionnaire was divided into two parts, First part consist of 10 questions regarding general information of

respondents and second part of the questionnaire had questions based on specific information about Nutritional Knowledge. The second part of the questionnaire consists of 69 questions and it was subdivided into seven parts according to the various aspects of nutritional knowledge. Each of the 7 parts has questions related to these dimension.

S. No.	Dimension	No of Questions
1	Food and Nutrition	6
2	Nutrients	6
3	Sources of Nutrients	12
4	Function and Advantages of Nutrients	13
5	Deficiency Diseases of Nutrient	12
6	Types of Vitamin and Chemical Name	11
7	Food Groups	9
Total No. of Question 69		

In this study second tool was games, developed by researcher. Researcher developed Picture card and Spinner Board game for imparting nutrition education.

Spinner Board Game

The spinner board game prepared by researcher to impart nutritional education is based on nutritional knowledge. It is specially designed for the students of class 6th, 7th and 8th. The nutritional knowledge being provided to the students through this game is according to their mental level. This game can be easily played by all the students of the class.

Picture Card games

Picture Card games were a type of educational games. In these cards on which pictures were drawn are used as the main playing device. There were innumerable picture card games and some of them have various methods of playing as well. Picture Card games follow a set of rules which varies widely in different regions and according to the game. In general these picture cards are accompanied with another cards on which information related to the pictures are provided. Picture Card games teach the players to follow rules and use reasoning and analytical skills. It is a good game to sharpen the logical skills of the children. To provide nutrition education to children researcher has developed 29 picture cards.

Procedure of Data Collection

The data has been collected from the above mentioned upper primary Govt. schools by selecting and imparting the nutritional education to the upper primary students. Procedure of data collection had been done in three successive steps-

Pre-Assessment of Nutritional Knowledge

Researcher has started collection of data by administering the constructed questionnaire on the selected 427 upper primary class students from the four State Government schools of District Sitapur. It was done to assess the prior knowledge of students regarding food and nutrition. After collecting the data scoring and interpretation was done to know the nutritional knowledge of student.

Intervention by imparting tool based Nutrition Education through Spinner Board and Picture Card Game

After the assessment of nutritional knowledge of 6th to 8th class students, researcher had imparted nutrition education to students with the help of games developed for it. The intervention period was of Three months.

Post-assessment of Nutritional Knowledge

After intervention of the game based nutrition education; researcher has taken post-assessment to know the effect of nutritional education provided to the students. Post-assessment of nutritional knowledge of students was done through previously used questionnaire

Data Analysis

Data extracted from questionnaires were analyzed in accordance with educational level. (upper primary classes). T-test was applied for comparison of mean score of the above mentioned group who completed pre and post nutritional knowledge questionnaire and game based intervention. Finally all collected data was analyzed by using SPSS Software (ver.16.0).

Results

The data analysis for different dimensions of nutritional knowledge of students showed that students in the study had very poor nutritional knowledge before intervention. An examination of Table1 depicts that there is significant difference in every dimension of nutritional knowledge questionnaire. High score of post-test mean value shows that students have better nutritional knowledge after intervention.

Analysis of result on the first dimension of nutritional knowledge of students in Food and Nutrition reveals that the pre-test mean score of students is lower 2.85 in comparison to post-test mean score of students 4.71. The 't' value obtained 5.27 is significant at both 0.05 and 0.01 level of significance. Hence, it could be inferred that students have more knowledge on the aspect of food and nutrition after intervention. Y. M. et al. (2005) reported the similar findings that Students had shown improvement in their nutritional knowledge after the

Table No. 1. Mean difference in pre and post test score in different dimension of Nutritional Knowledge of students

S.No.	Dimension	N	Pre-test		Post-test		t-test
			Mean	S.D.	Mean	S.D.	
1.	Food and Nutrition	427	2.85	1.39	4.71	1.71	5.27
2.	Nutrients	427	1.99	1.31	3.96	2.04	4.40
3.	Sources of Nutrients	427	5.48	2.28	9.01	3.55	7.33
4.	Functions and Advantages of Nutrients	427	4.92	2.91	8.58	4.16	8.62
5.	Deficiency Diseases of Nutrient	427	4.44	2.09	9.37	4.32	9.88
6.	Types of Vitamin and Chemical Name	427	3.45	1.96	7.41	3.45	6.05
7.	Food Groups	427	4.11	2.33	7.40	3.07	7.33

Further analysis of data on Deficiency Diseases of Nutrients the fifth dimension of nutritional knowledge questionnaire reveals that the pre-test

sessions of nutrition education; the improvement was significant and found to be highest in grade 4th students as compare to 5th and 6th grade students. Yien, Jui-Mei et al. in 2011 revealed that that there was no significant difference between genders in terms of nutritional knowledge and learning attitudes. The study indicated there is room for improvement in every category. . Krishnamoorthy, Mala (2006) showed in their study that there was no difference in the overall knowledge of male and female students.

Analysis of data on second dimension of nutritional knowledge of students i.e. Nutrients showed that the pre-test mean score of students was found to be 1.99 whereas the post-test mean score of students was found as 3.96 The 't' value obtained 4.40 is significant at both 0.05 and 0.01 level of significance. Increase in mean value shows that there is significant increase in the second aspect i.e. Nutrients of nutritional knowledge questionnaire after providing nutritional knowledge to student's .Cortez, Leticia (2012) also reported the similar results in their study on high school students that nutritional knowledge and dietary intake of particular nutrients have been increased after intervention.

Analysis of result on Sources of Nutrients the next dimension of nutritional knowledge depicts that the pre-test mean score of students is 5.48 and the post-test mean score of students is 9.01. The 't' value obtained 7.33 is significant at both 0.05 and 0.01 level of significance. Hence, it could be inferred from the analysis of data that there is significant increase in the third aspect i.e. sources of nutrients of the nutritional knowledge questionnaire after intervention.

Analysis of data of the next dimension of nutritional knowledge i.e. Functions and Advantages of Nutrients showed that the pre-test mean score of students is lower 4.92 in comparison to post-test mean score of students 8.58 . The 't' value obtained 8.62 is significant at both 0.05 and 0.01 level of significance. High increase in post-test mean value shows that there is significant increase in the second aspect i.e. functions and advantages of nutrients of nutritional knowledge questionnaire after providing nutritional knowledge to students.

mean score of students was found to be 4.44 whereas the post-test mean was found to be 9.37 . The 't' value obtained 9.88 is significant at both 0.05 and 0.01 level

of significance. It shows that there is significant increase in the fifth dimension i.e. deficiency diseases of nutrients of the nutritional knowledge questionnaire after intervention. The result is in accordance to the findings obtained by Soumyajit, Maiti et al. (2011) where the students have scored more marks in management part of deficiency diseases after providing nutritional knowledge to them.

Analysis of data on Types of Vitamin and Chemical Name the next dimension of nutritional knowledge questionnaire depicts that the pre-test mean score of students is lower 3.45 in comparison to post-test mean score of students 7.41. The 't' value obtained 6.05 is significant at both 0.05 and 0.01 level of significance. Increase in mean value shows that there is significant increase in the sixth dimension i.e. types of vitamin and chemical name of nutritional knowledge questionnaire after providing nutritional knowledge to students.

Analysis of data on next dimension of nutritional knowledge i.e. Food Groups showed that the pre-test mean score of students was found to be 4.11 in whereas the post-test mean score of students 7.40. The 't' value obtained 7.33 is significant at both 0.05 and 0.01 level of significance. High increase in post-test mean value shows that there is significant increase in the seventh dimension i.e. food groups of nutritional knowledge questionnaire after providing nutritional knowledge to students.

Discussion-

According to our findings mean values of nutritional knowledge score were lower in pre test comparison to post test, It was found that most of the respondents have poor nutritional knowledge prior to intervention. It was also found that in the pre-test nutritional knowledge mean score of students according to gender boys and girls were almost equal, so it was not favorable in both girls and boys students as a whole. The result of the present study revealed that game based nutrition education intervention was effective in increasing the nutritional knowledge of students. The positive impact of this intervention was obvious on the nutritional knowledge which became clear by the post test score, as intervention classes of 6th, 7th and 8th graders had got higher knowledge scored than their pre-test. Increase in post-test mean score shows that Sources of Nutrients, Functions and Advantages of Nutrients, Deficiency Diseases of Nutrients were the aspects in which respondents had gained maximum knowledge. Generally, the increase in knowledge score add support to other studies, which showed improvement in nutritional knowledge among children between baseline, intervention and post test^{5,6,7,8,9,10,11,12} demonstrating that favorable impact that a game based nutrition education can be on the cognitive performance of school children.

Conclusion

The game based nutrition education intervention programme had reached the real beneficiaries as most of the students had poor nutritional knowledge. So the nutrition education was given to students regarding the Food and Nutrition, Nutrients, Sources of Nutrients, Function and

Advantages of Nutrients, Deficiency Diseases of Nutrient, Types of Vitamin and Chemical Name and Food Groups. Nutritional Knowledge is very important for students because it influences the future nutritional status. So it is important to conduct awareness programmes on nutritional knowledge on a regular basis especially among school students.

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