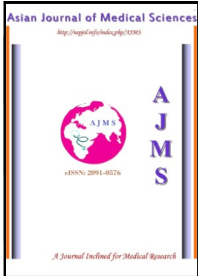


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## The Impact of Nutritional Awareness Package (NAP) on Secondary School Students for the Improvement of Knowledge, Attitudes and Practices (KAP) at Rural Areas of West Medinipur, West Bengal

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### Abstract

**Objective:** Nutritional problem in school age children is common throughout the India. Occurrence of nutritional problems like anaemia, scurvy, ricket and protein energy malnutrition (PEM) may develop due to lack of knowledge and awareness. Poor knowledge on nutrition among children can lead to unhealthy community. The purpose of this study was to assess the impact of school-based nutrition awareness package on the development of nutritional knowledge of school children at rural areas of West Medinipur district.

**Material & Methods:** Total 827 secondary school children were selected randomly from class VII to IX of three different schools of West Medinipur comprising 433 boys and 394 girls. To access the awareness level, a peer-reviewed, scoring system questionnaire was applied. The nutrition education was imparted through lectures, audiovisual aids and demonstrations for three months in school settings. Before and after imparting nutrition education, the changes in knowledge, attitude and practices regarding good nutrition was evaluated by questionnaire method.

**Results:** After delivery of nutrition education, a significant improvement in their nutritional knowledge was observed. Nutritional knowledge was improved significantly on anaemia ( $p \leq 0.001$ ), scurvy ( $p \leq 0.001$ ), ricket ( $p \leq 0.001$ ) and PEM ( $p \leq 0.001$ ) at post-awareness stage. The analysis of data also inferred that the students scoring more marks in management part of deficiency diseases which is important during their future life. The study was successful in identifying certain gaps in their knowledge, attitude and practices before imparting nutrition education.

**Conclusion:** It is concluded that a school-based comprehensive nutritional programme has significant effect on cognitive and attitudinal variables to increase the level of knowledge and to follow-up appropriate dietary behaviours. The findings support the importance of knowledge in nutrition of the children in connection with the development of healthy dietary behaviours.

**Key Words:** School Children; Nutritional diseases; NAP; KAP

### 1. Introduction

In India, 30 per cent of the school age children have moderate to severe malnutrition. Major nutrition problems reported to be are anaemia, scurvy, ricket and PEM.<sup>1</sup> Rural children are more affected by these diseases.<sup>2</sup> Dietary inadequacies have been considered as predominant etiological factor in the cause of all deficiency diseases.<sup>3</sup> Dietary habits in childhood have impact on growth, development and disease risk throughout life.<sup>4</sup> Nutritional problems not only affect

their growth and development but also affect future adversely. High prevalence of malnutrition among young children is also due to lack of awareness and knowledge regarding their food requirements, food choice and absence of a responsible adult care giver along with other causes.<sup>5</sup>

School children form an important vulnerable segment of population and constitute about 20 per cent of total population of India. School age is a dynamic period of growth and development as children undergo physical, mental, emotional and social changes during this stage. Malnutrition, in its various forms, is a leading health problem of today, which affect the childhood. Malnutrition leads not only to stunt the physical growth

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but also lead to suboptimal intellectual development.<sup>1</sup> Many of the diseases and cases of malnutrition that have a negative impact on school-age children are preventable and/or treatable. Realizing the adversity of the problem several recommendations were made by WHO in order to minimize the nutrition related problems of adolescent population and one of these emphasizes, "Mass information and awareness programmes are needed to alert government and communities about the importance of health and nutrition".<sup>6</sup>

During school age promoting good health and nutrition are essential for effective growth and development. Schools offer a readily available venue for reaching most of school age children. School age is a formative time in the development of a human being and the school setting provides a strategic point of entry for improving children's health, self-esteem, life skills and behavior.<sup>7</sup> In addition to provide a site where interventions that promote health and prevent many of the specific disease can be implemented. School-based nutrition education has shown some success in promoting appropriate dietary behaviors in children.<sup>8</sup> As such, nutrition education is an important tool that enables the children to learn at an early age the importance of healthy eating. Nutrition education in schools offers a unique opportunity to integrate the teaching of nutrition and the application of that knowledge to achieve a change in behavior. Nutrition education may bring a permanent and favorable solution to the problem of malnutrition especially in rural sectors. It is an effective tool of changing the food habits of the children as well as community members. It is a process by which knowledge, attitudes and practices about food and health are channelized into actual practices which are sound and consistent with the individual needs, purchasing power, food availability, health and socio-cultural background.<sup>9</sup>

In view to this recommendation, the present study was formulated to assess the nutrition awareness level of rural school students and also evaluate the acceptability and effectiveness of nutrition education regarding healthy nutrition and dietary habits based on local epidemiology for the empowerment of the community healthcare.

## **2. Material and Methods**

### **2.1. Study Area and Participants**

The present study was conducted at three rural blocks of Paschim Medinipur district, West Bengal, from the

months of April 2009 to March 2010. Three co-ed secondary schools from three different blocks were selected for the study. The study was carried out on 827 schoolers belonging to age group 13-15 years. Both 433 boys and 349 girls from class VII to IX of these schools were imparted the health education. The purpose and importance of nutritional awareness programme were explained to them.

### **2.2. Research Design**

#### **2.2.1. Pre-awareness evaluation**

The knowledge regarding vitamin deficiency, iron deficiency and protein deficiency diseases like scurvy, ricket, anaemia and PEM was assessed by a self-administered, peer reviewed questionnaire method. Questionnaire was constructed by local language and MCQ in type. A reliable questionnaire of each disease covered mainly on the following domains-etiology, signs and symptoms, complications and dietary management.

To assess the primary knowledge level, the students were directed to fill in the questionnaire independently. For this purpose they were given 45 min and the filled forms were collected for evaluation.

#### **2.2.2. Nutritional education package**

The information obtained in the pre-awareness phase was utilized for preparing an awareness package where questions in various nutritional diseases were answered. The above mentioned diseases and their nutritional management were discussed separately in each class of the concern school by visual presentation and movie picture through animation (LCD projector). Some informative leaflets of specific diseases were provided to the students in this connection. Posters were also displayed in the classroom on dietary management of deficiency diseases through locally available, low cost fruits and vegetables. This was followed by an interactive session in which all the students were encouraged to participate in the session where the wrong ideas on diseases were focused. The nutritive values of different food items were provided to them based on the standard guidelines and recommendations (recommended daily allowance) from the National Institute of Nutrition, Hyderabad and ICMR.

A total of 24 sessions were organized to cover all aspects of above diseases in each school. Nutrition education was imparted in regular sessions for a period of three months.

### 2.2.3. Post-awareness evaluation

After disseminating the nutritional awareness package, each school was revisited six month later. Improvement of knowledge and change in their attitude were assessed by fresh questionnaire method. Comparison was made between the result of pre-awareness and post-awareness to monitoring the impact of nutritional awareness package.

### 2.3. Analysis of Data

The obtained data was statistically analyzed to see the effect of awareness programme. Mean and standard error of mean were calculated. Comparison of the pre-awareness and post-awareness evaluation was done by 'paired t test' ( $p \leq 0.001$ ).

### 2.4. Ethical Consideration

School authority consent was also taken prior to the conduction of the package by focusing the nature and purpose of the said study.

## 3. Results

### 3.1. Characteristics of participant

The current study was carried out among 827 children of three secondary schools. The study covered 433 (52.3%) boys and 394 (47.7%) girls. As shown in table 1, 38.82%, 33.13% and 28.05% students were in class VII, VIII and IX, respectively. The age wise distribution of participants was 13 years (26.84%), 14 years (35.43%) and 15 years (37.73%). Majority (68.8%) of the subjects were from the families engaged in agriculture or agricultural labour.

Table-1: Characteristic of participants (n=827)

Characteristics	No.	Characteristics	No. (%)
<b>Gender</b>		<b>Age (in years)</b>	
Male	433 (52.36)	13	222 (26.84)
Female	394 (47.64)	14	293 (35.43)
		15	312 (37.73)
<b>Class</b>		<b>Family occupation</b>	
VII	321 (38.36)	Agriculture/Labour	569 (68.80)
VIII	274 (33.13)	Business/Service	156 (18.87)
IX	232 (28.05)	Others	102 (12.33)

### 3.2. Source of health information

The fig. 2 showed that the children got about nutritional information from various sources like family members of their own, friends, television, radio, news papers etc. Most of the children got information through friends (34%), school teachers (20.9%) and mass media (Radio 13.7%, television 11.7%, and news paper 10.7%). But only 8.7% children obtained health message through their family members.

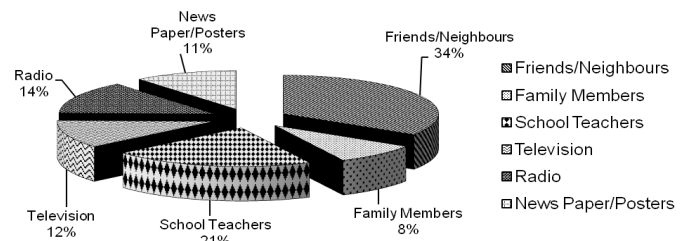


Figure-2: Source of Health Information of School students

### 3.3. Changes of KAP about nutritional deficiency diseases and its management

The distribution of the scores regarding anaemia obtained before and after imparting nutrition education is presented in table 2. During the pre-awareness phase, very less percentage of students had appropriate knowledge about anemia. Only 597 schoolers got correct answer but 2694 schoolers failed to right answer at pre-awareness stage. Where 23.9% of children had known the etiology of anaemia and 25.0% of children had idea about its signs and symptoms. Only 5.2% children had awareness about dietary management while 5.2% children had awareness about dietary practices (Table 2).

Table 2: Effect of nutrition awareness programme on knowledge, attitude and practice of students regarding anaemia (n = 827)

Disease	Pre-awareness		Post-awareness	
	Correct answer	Incorrect answer	Correct answer	Incorrect answer
<b>Anaemia</b>	n (%)	n (%)	n (%)	n (%)
Etiology	198 (23.9)	629 (76.1)	569 (68.8)	258 (31.2)
Signs and symptoms	207 (25.0)	620 (75.0)	612 (74.0)	215 (26.0)
Preventive measurement	101 (12.2)	618 (87.8)	471 (56.9)	356 (43.1)
Dietary management	48 (5.8)	779 (94.2)	402 (48.6)	425 (51.4)
Dietary practice	43 (5.2)	784 (94.8)	355 (42.9)	472 (57.1)
<b>Total</b>	<b>597</b>	<b>2649</b>	<b>2409</b>	<b>1726</b>

Mean of correct answer at pre-awareness 0.72,  $t = 6.029$   
Mean of correct answer at post-awareness 2.91,  $p \leq 0.001$

After imparting awareness package students' knowledge was improved where 2409 children gave correct answer. Majority of the participants' i.e 68.8% of schoolers answered correctly regarding etiology and about half of the participants (42.9%) maintain dietary practices. Effect of education on anaemia at pre and post-awareness phases was compared and this was found significant ( $p \leq 0.001$ ).

Knowledge of the subject regarding ricket at pre and post-awareness showed in table 3. The results also indicated that lack of knowledge about ricket at primary

stage, where only 22.0% students had the perception about signs and symptoms but after imparting awareness package it increased to 74.0%. Most of the students are not adequately aware about preventive measurement of the ricket (89.8%) but after six months it was decreased to 53.0%. An encouraging change in dietary habits was demonstrated in current study 5.6% to 39.8% where more children were aware of the importance of food choice. Statistical analysis showed that the scores at post-awareness were significantly higher ( $p \leq 0.001$ ) than pre-awareness stage.

**Table 3: Effect of nutrition awareness programme on knowledge, attitude and practice of students regarding ricket (n = 827)**

Diseases	Pre-awareness		Post-awareness	
	Correct answer	Incorrect answer	Correct answer	Incorrect answer
Ricket	n (%)	n (%)	n (%)	n (%)
Etiology	149 (18.1)	678 (81.9)	541 (68.8)	286 (34.6)
Signs and symptoms	182 (22.0)	645 (78.0)	585 (74.0)	242 (29.3)
Preventive measurement	84 (10.2)	743 (89.8)	398 (47.0)	438 (53.0)
Dietary management	31 (3.7)	716 (86.6)	377 (48.6)	450 (54.4)
Dietary practice	30 (5.6)	797 (96.4)	328 (39.8)	465 (56.2)
Total	476	3579	2247	1945

Mean of correct answer at pre-awareness 0.57,  $t = 6.643$   
Mean of correct answer at post-awareness 2.71,  $p \leq 0.001$

Table 4 showed that the prevalence of knowledge on, etiology, signs and symptoms, dietary management of scurvy was low. Before imparting nutrition education, majority of the respondents (73.9%) gave wrong answers on etiology of scurvy whereas it decreased to 24.8% after implementation of nutrition education. Initially, 13.2% of children were aware regarding preventive measurement related with scurvy which increased to 46.9%. Only 6.9% of students had idea about dietary management, where majority of them had no knowledge about the vitamin-C rich fruits.

The mean scores 0.74 obtained in pre-test was increased to 2.87 after giving nutrition education. The post-test knowledge level had significantly better knowledge than the pre-test as regards to scurvy ( $p \leq 0.05$ ). The statistical analysis of the data (Table 5) further revealed the effectiveness of the nutrition education among the respondents, which was measured in terms of gain in scores. Although 18.1% of students at pre-awareness did not know about cause of PEM but at post-awareness stage 58.4% of students answered.

**Table 4: Effect of nutrition awareness programme on knowledge, attitude and practice of students regarding scurvy (n = 827)**

Diseases	Pre-awareness		Post-awareness	
	Correct answer	Incorrect answer	Correct answer	Incorrect answer
Scurvy	n (%)	n (%)	n (%)	n (%)
Etiology	216 (26.1)	611 (73.9)	622 (75.2)	205 (24.8)
Signs and symptoms	182 (22.0)	645 (78.0)	598 (72.3)	229 (27.7)
Preventive measurement	109 (13.2)	718 (86.8)	413 (49.9)	414 (50.1)
Dietary management	57 (6.9)	770 (93.1)	388 (46.9)	439 (53.9)
Dietary practice	51 (6.2)	776 (93.8)	359 (43.4)	468 (56.6)
Total	615	3520	2380	1755

Mean of correct answer at pre-awareness 0.74,  $t = 5.464$   
Mean of correct answer at post-awareness 2.87,  $p \leq 0.05$

The knowledge regarding the right amount of calories required by the children was hardly known to them but after intervention majority could mention correctly. Significant, difference was clear between pre and post-test knowledge of children concerning PEM ( $p \leq 0.001$ ). The mean scores of 0.43 obtained in pre-test was increased to 2.34 after giving nutrition education. Thus, imparting nutrition education was found to be effective for improving the level of nutrition education among the students in the present study.

**Table 5: Effect of nutrition awareness programme on knowledge, attitude and practice of students regarding PEM (n = 827)**

Diseases	Pre-awareness		Post-awareness	
	Correct answer	Incorrect answer	Correct answer	Incorrect answer
PEM	n (%)	n (%)	n (%)	n (%)
Etiology	132 (18.1)	695 (81.9)	483 (58.4)	344 (41.6)
Signs and symptoms	111 (22.0)	716 (78.0)	452 (54.6)	375 (45.4)
Preventive measurement	64 (10.2)	763 (89.8)	322 (39.00)	505 (61.00)
Dietary management	28 (3.7)	799 (86.6)	307 (37.1)	520 (62.9)
Dietary practice	28 (5.6)	799 (96.4)	376 (33.5)	451 (54.5)
Total	363	3772	1940	1779

Mean of correct answer at pre-awareness 0.43,  $t = 7.736$   
Mean of correct answer at post-awareness 2.34,  $p \leq 0.001$

#### 4. Discussion

Improved child health and survival are considered as universal humanitarian goals. The present study was conducted to assess the impact of a school-based nutrition education program at rural areas. The study participants have been represented from socio-economically weaker stratum, showed overall poor

knowledge on nutritional diseases along with poor dietary management. The result showed that very less percentage of students had proper knowledge, attitude and practice about said diseases at the pre-awareness stage. Anaemia is very common among rural adolescent girls but they had no knowledge about its etiology and dietary management by the locally available low cost foods. Levels of knowledge about etiology of rickets were not adequate (18.1%). Nutritional management of scurvy (6.9%) and PEM (3.7%) was poor among the schooler. They have no idea about their energy requirement and how fulfill this demand. A previous study found the nutritional awareness to be low in rural school children.<sup>7,8,10</sup> Similar results were obtained which focus that the knowledge of young children regarding nutrition was low in their studies.<sup>11</sup> Kapil *et al.*, (1991) studied the nutritional knowledge of the Indian school girls and reported that incorrect dietary beliefs existed in India.<sup>12</sup>

But being the most vulnerable segment of the population, the school children are at greatest risk of malnutrition. Inadequate and improper food intake adversely affects the growth of growing pupil particularly those from the disadvantaged sections of the community.<sup>13</sup> Moreover some of the physiological processes those lead to certain chronic diseases are associated with unhealthy eating habits during childhood. This unhealthy eating habit in children usually continue until adulthood.<sup>8</sup>

Majority of the rural schooler have been suffering from these types of deficiency diseases in developing countries. It was very interesting to note that in spite of the students studying in class VII, VIII and IX they did not have knowledge about etiology, signs and symptoms, and preventive measures of common nutritional diseases. This may be due to the limited sources of health information and rural students are less exposed to different health improvement programme which improve their knowledge, attitudes and practices. This finding indicates that the promotion in nutritional knowledge is integral to the achievement of healthful dietary behaviors and consequently in the improvement of dietary choice. They need to be well informed about preventive aspect of nutritional diseases such as anaemia, scurvy, PEM and ricket using school environment. A nutrition programme that successfully promotes and inculcates healthy eating habits as well as active lifestyle in children and adolescents could not

only prevent them from chronic diseases and early death, but also reduce healthcare cost and enhance their quality of life.<sup>14</sup> CDC (1996) suggested that nutrition education programmes need to focus as well as on steps to prevent children and adolescents from developing these chronic diseases throughout their lives. Several studies have reported that despite of adequate nutritional knowledge and positive attitude towards healthy nutrition, lack of food availability and accessibility experienced by the children or individuals in low socioeconomic households may remain as an important deterrent in the achievement of a healthy and varied diet.<sup>7</sup>

A comprehensive nutritional awareness programme was implemented for three months with the help of audio visual aids which was associated with changes in knowledge, attitude and practices relating to nutritional deficiency diseases. Here we gave dietary management knowledge to prevent nutritional diseases by the supplementation of low cost and locally available foods.

Overall, our results indicated that the program was effective through the increase of nutrition awareness among school children at post-awareness. As regards to the level of knowledge of anaemia, the current study showed that post-test had significantly better than pre-test ( $p \leq 0.001$ ). Knowledge of etiology and dietary management were better at post-test. It was demonstrated that significant difference between both stages as regards to scurvy ( $p \leq 0.001$ ). Ricket knowledge significantly improved such as its etiology, symptoms and positive changes are reflected in dietary habits, as well as improvements in the choices of food. Concerning the prevalence of PEM knowledge have significantly better than preliminary stage ( $p \leq 0.001$ ). Earlier studies involving nutrition education also reported that nutrition education programme could improve nutritional knowledge and attitude significantly among the children.<sup>8,10,15</sup> Biswas *et al.* (1990) reported that health knowledge of the student significantly improved after education. On the other hand, a study done by using a video package have improved nutritional knowledge among school children.<sup>8</sup> These examples showed that a comprehensive nutrition education programme can be an excellent medium to aware the children on nutrition diseases.

Better outcome in the present study suggests that school based nutrition awareness strategy would have greater impact at rural areas. The school health nutrition

programs is one approach to community health education that is effective in change of knowledge, attitude and practices to prevent in nutritional diseases and favour healthy lifestyle.

### 5. Conclusion

In our study, rural school children have inadequate knowledge about importance of sound nutrition healthy food and the, especially dietary management. There was significant improvement in the nutritional knowledge of the subjects after nutrition education. Schools can be an effective and efficient medium to influence the health of school children. In addition, the use of educational media such as videos in this programme may attract children attention to learn and understand better nutrition. Hence, we can conclude from the present investigation that a comprehensive nutrition education is an important measure to improve the knowledge of dietary habits and food choices of the children towards better nutrition knowledge. For the improvement of nutritional knowledge among the school children, this strategy should include a balanced mix of palliative and preventive measures. We thus recommend that nutrition education and promotion programs should be incorporated within the school setting intended for rural children in secondary schools.

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