

NUTRITION EDUCATION AND HOMESTEAD FOOD PRODUCTION ENSURES HOUSEHOLD FOOD SECURITY: AN EXPERIMENTAL STUDY

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Abstract

An intervention study was carried out among selected rural secondary school students of Kishoreganj district in Bangladesh to investigate the impact of nutrition education and nutrition education & homestead food production interventions on nutritional knowledge and household food security of them. A total number of students (1214) were divided into three groups. In study group 1 and 2 included 406 and 400 respectively, whereas in the control group it was 408. The study group 1 received nutrition education, whereas the study group 2 got homestead food production inputs along with nutrition education. Knowledge, attitude, practice (KAP), and food security-related information were collected at baseline and after six months of intervention. The KAP percent scores were significantly increased in study group 1 ($p < 0.001$) and study group 2 ($p < 0.001$) after the intervention; no significant change was seen in control group ($p = 0.445$). Although, in the study group 1 ($p = 0.211$) and the control group ($p < 0.510$) food insecurity followed an increasing pattern; in study group 2 it reduced significantly ($p < 0.001$). The findings indicate that nutrition education, along with homestead food production, can play an important role to improve nutritional knowledge as well as household food security.

Keywords: Nutrition education, Homestead food production, KAP, Household food security, Secondary school students

Introduction

School-age children with appropriate nutrition have not only direct and short-term impact on physical and mental growth during that period but also indirect and long-term influence on growth and development. The learning ability of children during this period, and this unfavorable condition can be recovered by providing appropriate nutrition to

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school-age children (Lee, 2004). Moreover, the universal reasons for low school enrolment, high absenteeism, quick dropout, and unacceptable classroom enactment is health problems due to miserable nutritional status in school-age children (IIPS, 2007). Indeed, healthy food choices improve a child's wellbeing and ability to learn and normally play (Keia-Etherton, 2004). School-age children do not have sufficient knowledge regarding their health and nutrition and most often are unaware about the importance of health, therefore select foods based on fondness and taste without judging the consequences of exaggerating unbalanced diets (Chung *et al.*, 2004). Nutrition education is widely used for a range of population groups as a medium to deliver healthy diet and nutrition information.

At the household level, food security refers to the ability of the household to secure, either from its production or through purchases, adequate food for meeting the dietary needs of its members (Hasan and Sultana, 2011). One of the main reason of high global food prices is the number of hungry people in the world increased by 50 million people in 2008 (FAO, 2008). Many households have been enforced to accept detrimental coping strategies for survival, which have a long-term negative effect on nutrition, health, and food security (Klotz *et al.*, 2008). Therefore, to improve household food security, homestead food production would be a good means, which in turn plays an important role in diet diversification. Diet diversification is arguably the most sustainable and affordable strategy to improve nutrition for the community population—particularly the poor (Talukdar *et al.*, 2001).

No intervention study was found where both nutrition education and homestead food production inputs were provided to the school students in Bangladesh yet. An effort was made to see the possessions of nutrition education and nutrition education & homestead food production interventions on nutritional knowledge and household food security of selected rural secondary school students.

Materials and Methods

Study Design

A total number of 1214 students were selected from six secondary schools at Kishoreganj district in Bangladesh. Data were collected from August 2014 to May 2015. Two groups of school students were selected for the intervention with nutrition education (group-1) and nutrition education with inputs of homestead food production (group-2). They were monitored regularly up to six months along with a control group. Each group consisted of participants of two schools out of six schools.

Collection of Data

Knowledge, Attitude, and Practices (KAP) Related Information : For adjudging the existing level containing a list of questions on food belief, fads, and fallacies, as well as

constituent of a balanced diet, functions of food, food hygiene, and sanitation, etc., were procured through direct interview. For evaluating the level of nutritional knowledge 1 score was awarded for the right, 0 for wrong and 0.5 for a partially correct answer for each question.

Table 1. Suggested levels indicating the need for a nutrition education intervention (Marias and Glasauer, 2014).

Nutrition education strategy	Percentage of “Correct answers” in the survey population
Nutrition education strategy is urgent	≤ 70
Nutrition education should be considered	71 – 89
Nutrition education is difficult to justify	≥ 90

Measure of Food Insecurity

A recall period of four weeks (30 days) were asked with the Household Food Insecurity Access Scale (HFIAS) questions. The respondent was first asked an occurrence question whether the condition in the question happened at all in the past four weeks (yes or no). If the respondent answered ‘yes’ a frequency-of-occurrence question was asked to conclude whether the situation occurred in frequently (once or twice), sometimes (three to ten times) or often (more than ten times) in the past four weeks. Where the answer to the corresponding occurrence question was ‘no’ then the code was ‘0’. When the answer was ‘rarely’ ‘sometimes’ or ‘often’ the code was ‘1’, ‘2’ and ‘3’ respectively. By summing up the codes for each frequency-of-occurrence question, an HFIAS score variable was calculated. The high score indicates the more food insecurity the household experienced and vice versa (Coates *et al.*, 2007).

Table 2. Lesson plan of nutrition education

Session Title	Nutrition Education Materials
1. Definition of food and its general function in the body	Booklets
2. Easily available common nutritious foods	Posters & booklets
3. Basic food groups	Practical food demonstration
4. Balanced diet	Practical food demonstration
5. Malnutrition-related diseases and their preventive foods	Posters and practical food demonstration
6. Extra need for adolescents	Posters & leaflets
7. Iodized salt (importance & testing)	Posters
8. Personal hygiene & sanitation	Booklets & leaflets
9. Homestead food production	Posters
10. Safe food	Booklets & leaflets
11. Rememberable information's on nutrition	Posters
12. Review (the materials presented in the past sessions were recounted and summarized)	A question-answer session

Contents and Procedure of Nutrition Education

Nutrition education based lesson plan was designed to determine the educational content of each session. The main aim of this lesson plan was to deliver practical and systematic nutrition education to improve the overall educational quality. In the intervention groups, students received twelve 45-minutes sessions during six months. Around 50 students (25 boys and 25 girls) were in each group.

To implement the HFP program, families of study group 2 received some selected inputs (seeds, seedlings, fertilizer, chicks, and fry) along with nutrition messages.

Table 3. Inputs Given for Homestead Food Production (HFP)

Inputs	Sample given
Seeds	Lalshak (Red Spinach), Puishak (Spinach), Mistikumra (Pumpkin), Dheros (Okra), Begun (Brinjal), Lau (Guard) (1+1+1+1+1+1= 6 Packets)
Seedlings	Peyara (Guava), Papaya (1+1= 2)
Fertilizer	Organic fertilizer (2 packets)
Chicks	One to one and half months old chicks (2)
Fry	Grass carp (<i>Ctenopharyngodon idella</i>), Gonia (<i>Labeogonius</i>), Carfu (Cyprinus carpio) = (50 + 50 + 50 = 150 Fry)

Follow up History

After the collection of baseline data and HFP input giving, the participants of study group 2 were followed up by visiting households of them fortnightly for 6 months. During the follow-up period, the parents of the participants were asked about the effectiveness of homestead food production inputs, whether their children ate those or not, and whether they earned some money from those.

Statistical Analyses

All of the statistical analyses and all other data processing were done by using IBM SPSS 20 version windows program. Comparative analysis of data was done by paired *t*-test. In all statistical tests, *p* values of < 0.05 were considered significant.

Results and Discussion

The knowledge, attitude, and practice score were compared among the three groups over the study period. The KAP percent score was significantly increased in the study group 1 and study group 2 after the intervention, although no significant change was seen in the control group (*p* = 0.445) (Fig. 1).

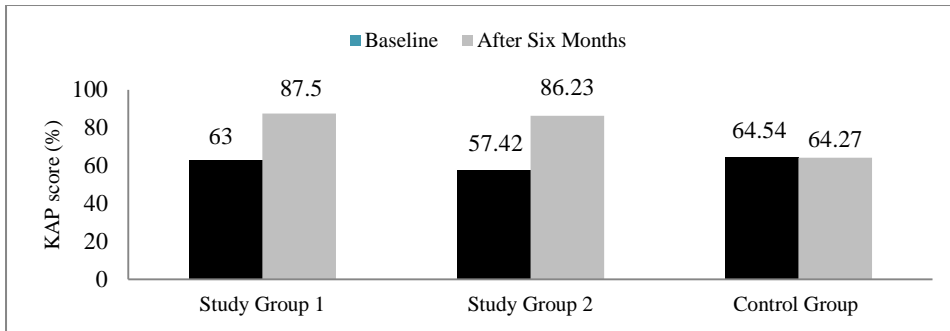


Fig. 1. Knowledge attitude practice (KAP) percent score changes across the groups

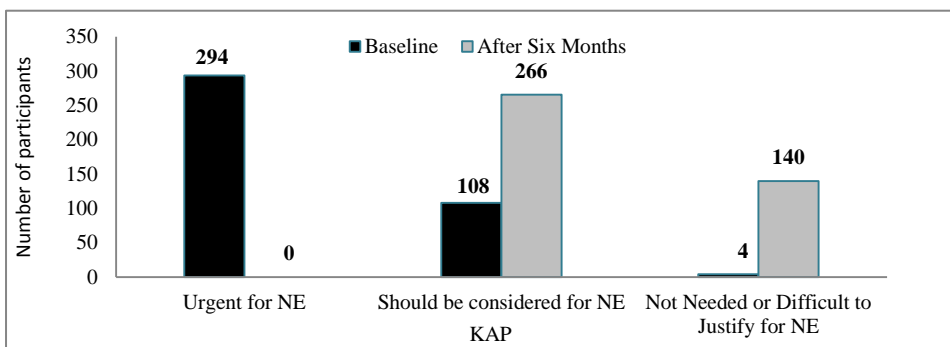


Fig. 2. Knowledge attitude practice (KAP) category changes across the study group 1

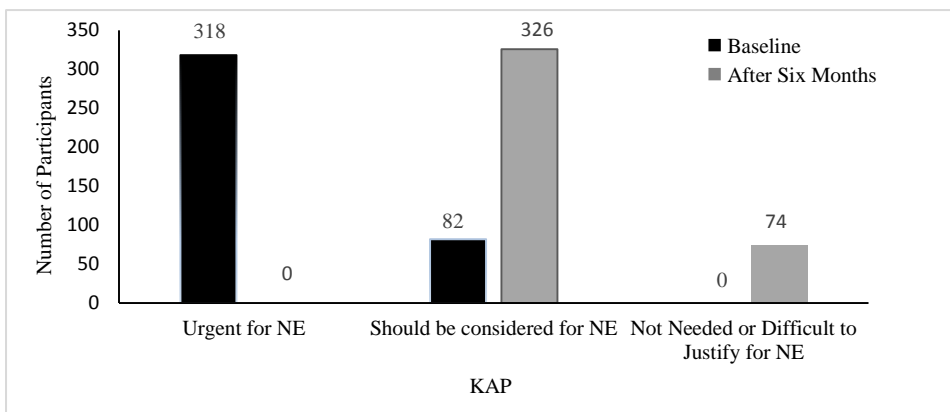


Fig. 3. Knowledge attitude practice (KAP) category changes across the study group 2

Several studies demonstrated a significant increase in the score of nutritional knowledge after imparting nutrition education for the treatment group compared to the control group (Lytle, 1994 and Raby Powers *et al.*, 2005). Fig. 2, 3, and 4 show the KAP category changes in three groups across the study. Although in the baseline 294 and 318 participants were categorized as urgent for nutrition education, this number reduced to 0

and 0 after the intervention, whereas the number for other categories ‘should be considered’ and ‘not needed’ for nutrition education increased dramatically in study group 1 and 2 respectively. There were no changes in the number of participants in different categories of KAP at the end of the study in the control group after six months.

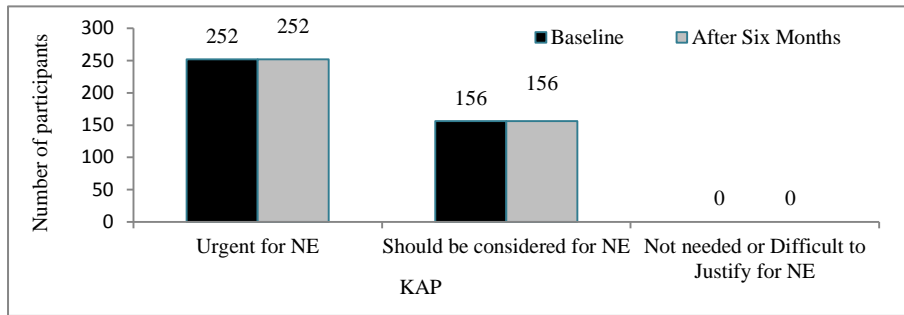


Fig. 4. Knowledge attitude practice (KAP) category changes across the control group

Food security status was estimated according to the Household Food Insecurity Access Scale (HFIAS). The percent of the participants from food secured and food-insecure household did not remarkably change in study group 1 from baseline to the end of the study (Fig. 5) and control group (Fig. 7). After 6 months of intervention, the percent of participants from severe food insecure access household reduced from 37.6 to 26 in study group 2 (Fig. 6).

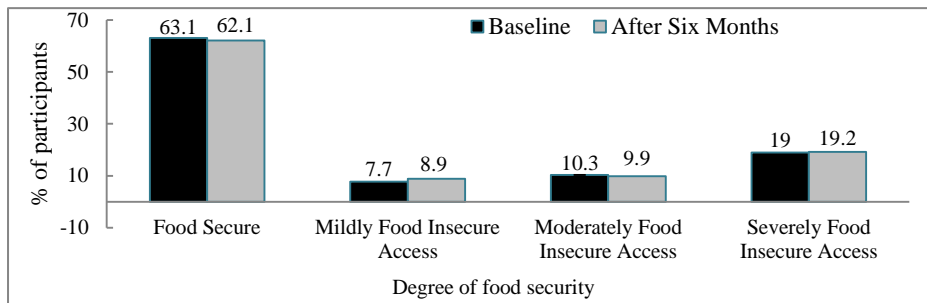


Fig. 5. HFIAS category changes in the study group 1 across the study

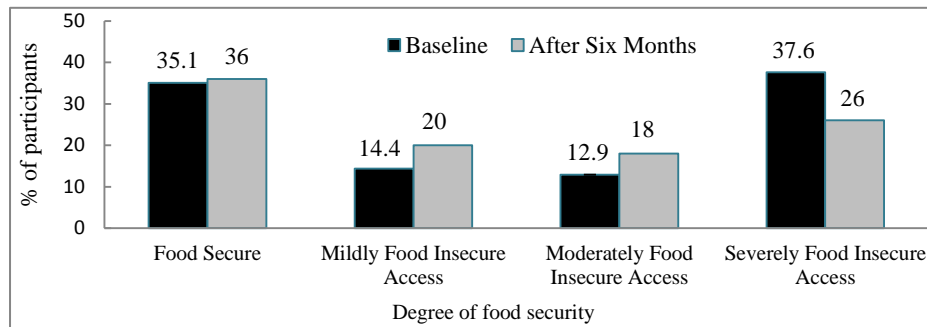


Fig. 6. HFIAS category changes in the study group 2 across the study

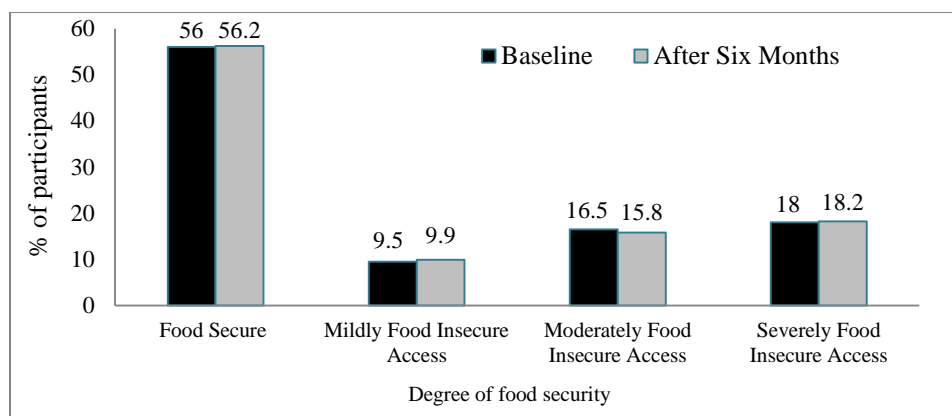


Fig. 7. HFIAS category changes in the control group across the study

Fig. 8 shows the mean HFIAS score for different groups in the baseline and after the intervention. Less score indicates less food insecurity in a household. Although, in the study group 1 ($p = 0.211$) and the control ($p < 0.510$) food insecurity followed an increasing pattern; in study group 2 it reduced significantly ($p < 0.001$). Improvement in household food security through homestead gardening was found by (Talukdar *et al.*, 2008) in another study.

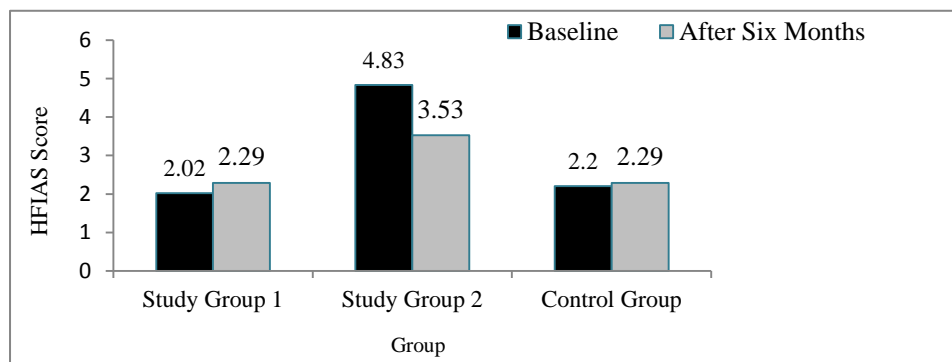


Fig. 8. HFIAS score changes in different groups across the study

Conclusion

The knowledge, attitude, and practices (KAP) study between group 1 and study group 2 were more significant compared to the control group after the intervention period. Food security followed an increasing Patten in the study group1 and the control group. Nutrition education program for school age children is requisite not only to get correct nutritional knowledge but also to improve positive dietary behavior. It can be concluded that nutrition education and homestead food production program can be a sustainable means to improve household food security.

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