Objectives: To assess the knowledge and attitude of primary school children and their mothers regarding nutritional needs, to design and implement a health promotion nutritional educational program for the primary school children and their mothers; and to evaluate the impact of the health promotion nutritional educational program on the primary school children and their mothers.

Subjects and Methods: A total of 100 4th grade school children (and their corresponding 100 mothers) were randomly selected following a systematic random sample technique. Study tools were an interviewing questionnaire to assess the children's and mothers' knowledge and to assess mothers' and children's attitude. Based on the results obtained as well as literature review, the health promotion nutritional educational program for primary school children and their mothers was developed by the researcher. Results: The main sources for information of mothers were relatives as stated by two thirds of mothers, followed by mass media as stated by less than half of mothers. On the other hand, the main sources for information about nutrition for schoolchildren were the family, as stated by almost two thirds of schoolchildren (64%), followed by teachers, as stated by less than half of schoolchildren (46%). It is also to be noted that the health unit was not a source of information about nutrition for mothers, nor their children. In urban and rural areas, knowledge assess of mothers and their children about nutrition improved significantly immediately after the application of health promotion nutritional educational program in all components compared with their knowledge scores immediately after the application of the program. A slight decline occurred 4 months later. Conclusion: Knowledge and attitude of primary school children and their mothers regarding nutrition of schoolchildren are deficient. Main sources of knowledge of mothers about nutrition of their children are the relatives and the mass media, while the main sources for knowledge of school children about nutrition are their family and teachers. The health unit plays no role in offering health education for mothers and their school children as regard nutrition. The application of a health promotion nutritional educational program is an effective strategy to improve knowledge and attitude of mothers and their school children regarding nutrition of school children. Recommendations: Health promotion nutritional educational programs should be continuously implemented at primary schools that should involve all school staff, including the school nurse to improve the knowledge and attitude of mothers and their school children about nutrition (e.g., choosing daily nutritional requirements, and following a balanced diet to maintain health and prevent malnutrition). Mass media should have an active role in nutrition education for the public. Unconstructive advertisements about junk food of low nutritional value should be stopped. Essential information, habits and values concerning nutrition should be taught for children all through their school age. Total community development, particularly in rural areas, including social, economic, environmental and cultural in a long range strategy. The school curriculum about nutrition should be revised, updated and improved. Qualified teachers, nutritional specialists and possibly the school nurse can participate in this important task. More research should be done concerning nutrition, especially in adolescence stage.
INTRODUCTION

School children constitute a significant and important sector of the population who are constantly growing and developing. This basic dynamic character accounts for their increased vitality and vulnerability and requires specific health promotion in relation to seeking health and using various resources to attain optimum health (Green et al., 2001).

In Egypt, with a population of 61 million, children are 14.5 million, constituting nearly one-fourth of the total population, 90% of them are enrolled at schools (Statistical Yearbook, 1998). Many Egyptian studies revealed that poor growth is prevalent among Egyptian children. Poor attention and scholastic achievement, behavioral alterations, apathy and lethargy are the main complications of malnutrition during school age. Moreover, anemia was found among 41.9% of school children (Nutrition Institute, 1998).

Health promotion is the process of fostering awareness, influencing attitudes and identifying alternatives, so that individuals can make informed choices and change their behavior to achieve an optimal level of physical and mental health and improve their physical and social environment (Allender and Wiltshire 2001).

Nutrition education for primary school children have positive results, as children aged 6-12 years are at a receptive period to achieve greater probability of success for change of improper food attitudes and habits (FAO, 1998). Pollock and Middleton (1999) noted that nutrition education enables each individual to make wise decisions when choosing food throughout his life. Such education should be integrated at all levels and must be started at an early age in order to achieve a greater impact on the individual’s behavior.

Nurses who work with school-age children are able to maintain the children’s normally healthy status. This is done through a variety of health promotion mechanisms such as health management, health counseling, health education, program planning and community liaison (Hunt, 2003).

Nurses, as educators with sufficient professional background, can plan and conduct nutritional educational programs for school children and their mothers to help them acquire healthy nutritional concepts and establish positive attitudes concerning food and nutrition (Rowden and Smith, 2003).

Mothers are the most care providers who play an important role in formulating their children’s nutritional patterns and attitudes toward food and nutrition. They are mainly responsible for leading and serving meals for their children (Wardlaw and Kesseli, 2002).

Aim of the study

The present study aimed to assess the knowledge and attitude of primary school children and their mothers, regarding nutritional needs, to design and implement a health promotion nutritional educational program for the primary school children and their mothers; and to evaluate the impact of the health promotion nutritional educational program on the primary school children and their mothers.

SUBJECTS AND METHODS

Setting: This study was conducted in 6 governmental primary schools in Benha City and Tookh District in Kalyobia Governorate to assess the knowledge and attitude of primary school children and their mothers regarding nutritional needs, to design and implement a health promotion nutritional educational program according to the deficit in needs and to evaluate the impact of the program on the primary school children and their mothers.

Sampling: All schools in the selected study area were listed and 6 were chosen by a simple random sample technique. From each study area, 100 4th grade school children (and their corresponding 100 mothers) were randomly selected following a systematic random sample technique. The total number of 4th grade school children in Benha was 510 and those in Tookh were 500. So, following a sampling fraction of 1:5, 100 school children were selected. The rationale for selecting 4th grade primary school children into the present study was as follows:

1-Their curriculum does not include any lessons about nutrition
2-They are expected to continue in the same school during the next year in their 5th grade during the implementation phase of the health promotion program.

Tools: Three tools were used for data collection, as follows:

An interviewing questionnaire to assess the chil-
...and mothers’ knowledge. It covered sociodemographic characteristics of school children, assessment of mothers’ and children’s knowledge as regard their nutrition. The second tool was an interviewing questionnaire to assess mothers’ and children’s attitude.

Based on the results obtained from the interviewing questionnaire and the observation checklist as well as literature review, the health promotion, nutritional educational program for primary school children and their mothers was developed by the researcher. Contents of the program were selected to meet mothers’ and children’s needs and to fit into their interest and levels of understanding. All members received the same program content using the same teaching methods. Methods of teaching were: Lectures/Discussions, Demonstration and redemonstration, Role play and presentation. The program was implemented on 200 primary school children and their mothers in the form of sessions. The duration of each session was variable, according to its contents as well as the mothers’ and children’s response. It was difficult to meet all children and their mothers on the same place and time. Thus, the program was implemented for children separately in each school. However, mothers were individually met through home visits. On the other hand, mothers were individually visited at home. A special place (preferably the dining room) was assigned for the purpose of the implementation of the nutrition education program. The duration of the home session was 1-2 hours. So, the number of sessions at home was 8, in addition to 2 other visits for pre- and post-test evaluation. In a single visit, at least two sessions were covered. Home visits were paid 4 times a week. Each session started by a summary about the previous session and the objectives of the new, taking into consideration the use of simple language that suit the mothers’ and children’s level of understanding. Children and their mothers were interviewed immediately after the program and 4 months later. Evaluation was based on scores of acquired knowledge and attitudes in pre-test, immediate post-test and follow up after 4 months.

RESULTS

Table (1) shows that less than half of mothers aged 40 years or more (48% in urban areas and 46% in rural areas). As regard education, more than one third of mothers in urban areas were those who had secondary education (36%), while in rural areas, two-fifths of mothers (40%) were illiterate mothers. More than half of mothers were employed in urban areas (56%) while less than three-fourths of mothers in rural areas (74%) were unemployed (housewives). Less than two-thirds of the families of schoolchildren in urban areas were less than 5 members (64%), while more than two-fifths of family size in rural areas was for those of 8 members or more (41%). As regard monthly income, three-fifths of families in urban areas (60%) earned less than 400 LE monthly, while in rural areas, more than half of the families (54%) earned 200–400 LE monthly. More than half of the families in urban areas (56%) spent about 50% of their income on food, while less than three-fourths of the families in rural areas (72%) spent the same percentage on food.

Table (2) shows that the mean age of schoolchildren was 9.7±0.42 years. Rural schoolchildren were significantly younger than those in urban areas (p<0.001). Mean weight of schoolchildren was 27.62±17 kg, with urban schoolchildren having significantly more body weight. Mean height of schoolchildren was 105.0±12.5 ± cm, with urban schoolchildren being significantly taller than rural schoolchildren (p<0.001).

Table (3) shows that the main sources for information of mothers were relatives as stated by two thirds of mothers, followed by mass media as stated by less than half of mothers. On the other hand, the main sources for information about nutrition for schoolchildren were the family, as stated by almost two thirds of schoolchildren (64%), followed by teachers, as stated by less than half of schoolchildren (46.5%). It is also to be noted that the health unit was not a source of information about nutrition for mothers, nor their children.

Table (4) shows that in urban areas, knowledge scores of mothers about nutrition improved significantly immediately after the application of health promotion nutritional educational program in all components compared with their knowledge scores immediately after the application of the program. However, a slight decline occurred 4 months later.

Knowledge scores of schoolchildren about nutrition improved significantly immediately after the application of health promotion nutritional educational program in all components compared with their knowledge scores immediately after the application of the program. However, a slight decline occurred 4 months later.

Table (5) shows that in rural areas, knowledge scores of mothers about nutrition improved signifi-