DOI: https://doi.org/10.54393/pbmj.v5i5.290

PAKISTAN BIOMEDICAL JOURNAL

https://www.pakistanbmj.com/journal/index.php/pbmj/index

Volume 5, Issue 5 (May 2022)

Original Article

Impact of Maternal Nutrition Education on Dietary Practices of School Going Children

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ARTICLE INFO

Key Words:

Maternal, Nutrition, Dietary Practices, Children, Education

How to Cite:

Zahid, M. ., Jabeen, S., Khalid, S. ., Rehman, H.- ur-., & Aslam, M. . (2022). Impact of Maternal Nutrition Education on Dietary Practices of School Going Children (3-6 years of age) : Maternal Nutrition Education on Children's Dietary Practices. Pakistan BioMedical Journal, 5(5). https://doi.org/10.54393/pbmj.v5i5.290

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Received Date: 6th March, 2022

Acceptance Date: 24th May, 2022

Published Date: 31st May, 2022

ABSTRACT

Nutrition (Nutritional) education is a kind of education that is important to improve the health status of people. School children are undergoing rapid mental and physical development. Therefore, an appropriate diet is critical throughout this stage of life to ensure normal and healthy growth. As a result, nutrition education should begin at a young age for children **Objective:** To evaluate the impact of nutrition education of mothers on the dietary habits of school-going children aged 3-6 years **Methods:** A Quasi-Experimental study was executed on 77 children of class playgroup to class 1 studying in the Government girl's school of Garhi Shahu, Lahore. Firstly, anthropometric data were collected through the children and secondly socio-demographic and dietary knowledge of mothers of selected children were noted through pre-designed questionnaires and interview method. The mothers were then given 45 minutes of nutrition education and a dietary change course, and some informative dietary guidelines leaflets and a weekly healthy kid's school lunch planner were given to the mothers which they were requested to implement in the daily routine of children. After three months again the anthropometrics and questionnaires were assessed and compared with the initial findings **Results:** After nutrition education, the percentage of children who followed the servings of healthy food groups and avoided consumption of harmful meals (fast, fried, processed foods), unhealthy beverages (carbonated drinks), and intake of fruits and vegetables increased dramatically. After the intervention, the percentage of children who followed recommended nutritional, lifestyle, and physical activity guidelines, as well as healthy school lunch practices, improved statistically significantly ($P<0.005$). The percentage of children who skipped meals on daily basis was 20% decreased to 8%. Before the intervention, 63% of mothers say that their children consumed breakfast regularly and after the intervention, it increases to 75%. The children's anthropometric status improved significantly, with a $P<0.005$ significance level **Conclusions:** In this study, nutrition education had a significant impact on the school-going children in their anthropometry measurements, healthy school lunch boxes, and awareness of their mothers about healthy eating practices. Seminars and camps should be arranged in schools to educate the mothers and the students at a young age regarding their health and healthy eating to reduce the nutritional deficiencies and diseases.

INTRODUCTION

Nutrition education is a kind of education that is important to improve the health status of people. Underdeveloped countries like Pakistan have many health-related issues, which can be solved by bringing about a change in dietary practices. Nutrition education combines many areas and develops strategies that seek help from environmental support [1]. It is designed to improve and change people's dietary practices so that their health status can be improved [2]. Nutrition education is more likely to be effective when it focuses on behavior/action (rather than just information) and systematically links pertinent theory, research, and practice, according to a review of over 300 studies [3]. Schoolchildren are undergoing rapid mental and physical development, so an adequate diet is critical during this stage of life to guarantee normal and healthy growth [4]. In general, children's eating patterns endure into adolescence and often into adulthood. As a result, children should be taught about nutrition from an early age [5]. The elementary school would be the best strategic site for developing a healthy lifestyle and a second front in the

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struggle against sickness and malnutrition. The School Health Committee appreciates this as well [6]. A poor diet is one of the key risk factors for many chronic diseases, and society's propensity, particularly among children and adolescents, suggests a warning condition [7]. Many adult disorders are caused by nutritional behaviors that began in childhood [8]. Over the last decade, little has changed in terms of anthropometry. In 2011, 43.7% of children under the age of five were stunted, compared to 41.6% in the National Nutrition Survey (2001). 15.1% were overweight, up from 14.3% in 2001, while 31.5% were underweight, a figure that has been constant since 2001. According to the National Nutrition Survey (2011), stunting, wasting, and micronutrient deficiencies are widespread in Pakistan. Dietary deficits, poor mother and child health, and nutrition are also contributing factors [9]. Mothers' awareness can be improved, which is linked to the prevalence of childhood malnutrition. Child caregivers' lack of nutritional understanding about child feeding relates greatly to children's bad eating habits [10]. The development of nutrition education tools is the main aim of the study, which may help in minimizing nutritional problems of Children due to improper feeding practices in Pakistan. Mothers and their Children of school age are one of the vulnerable groups who suffer from malnutrition. A nutrition education tool will be developed in this study which will focus on mothers' nutritional education for their school-going Children about their dietary habits, dietary requirements, and healthy school lunch options, as their awareness is very important to raise healthy children in this country like Pakistan.

METHODS

An intervention study Quasi-Experimental design was conducted for 9 months. Convenient sampling was used to assess the nutrition education of mothers through questionnaires. The data were collected from the mothers of children studying in the government school of Garhi Shahu, Lahore. The study was completed in three stages: the first stage involved collecting anthropometric data from children and assessing mothers' knowledge of the diet and lifestyle of their children, the second stage involved implementing a NE program, and the third stage was completed three months after the last educational session to assess the intervention's impact on mothers' knowledge, their children's lifestyle, and their children's anthropometric data. The sample size was estimated using the Open Epi info application, and it was 77. 18 to 20 students were randomly chosen from each class playgroup to 1, and then their anthropometric data was collected. Mothers of the selected students were interviewed before giving Nutrition education and after 3 months' the same students and mothers were again analyzed to check the differences.

Tools of data collection: the data was collected by using the weighing machine, height scale, and measuring tape [11]. After taking anthropometric data from the students, the mothers of these students were gathered by arranging a nutrition education session in school, firstly after creating a friendly environment with mother's pre-intervention education was assessed by giving them pre-designed questionnaires, then after the first demographic data was taken from the participants to determine socioeconomic status of mothers. Then there's the pre-prepared food. With the use of appropriate teaching materials such as charts, posters, and pamphlets, messages and lessons were conveyed to a group of 77 mothers from the school. The mothers were taught about diet, the necessity of a balanced diet, nutrient sources, cooking techniques, healthy school lunch options, the value of green leafy vegetables and fruits in the diet, nutrient deficiency disorders, and nutrient conservation, among other things. After three months again the anthropometric data were collected from the students to check the differences, and the responses from the mothers of these students were also obtained to assess the nutritional knowledge and implementation of their children's dietary practices and lifestyle habits.

RESULTS

According to the study results, a significant association was found between pre-intervention weight mean (17.4 ± 3.02) to post-intervention weight (18.05 ± 2.99) which means that there was an increase of 3.7% in weight after the intervention, the mean of height increases from (108 ± 9.2) to (109.6 ± 9.3) with the increase of 1.48% which shows that there was a significant association as p-value is less than 0.005. There was a significant association between pre-intervention BMI (14.66 ± 1.4) to post-intervention (14.99 ± 1.3) which means there was an increase of 1.36% in BMI of children [12]. There was a significant association between pre-intervention MUAC (16.2 ± 0.9) to post-intervention (16.5 ± 0.8) which shows there was an increase of 1.85% (Table 1).

Anthropometrics	Pre-Intervention Mean ± SD	Post-Intervention Mean ± SD	% Change	Significance level (P-value)
Weight	17.4 ± 3.02	18.05 ± 2.99	+3.7	0.001
Height	108 ± 9.2	109.6 ± 9.3	+1.48	0.004
BMI	14.76 ± 1.4	14.99 ± 1.3	+1.36	0.003
MUAC	16.2 ± 0.9	16.5 ± 0.8	+1.85	0.002

Table 1: Distribution of children according to anthropometric measurements

Table 2 explains the pre and post-intervention frequency and percentages of daily servings of different food groups

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consumed by children. The correct answer scored 1 and the others scored 0, the change in the correct answer before and after education will analyze whether there was a significant association or not. The servings of grains increase from 23.4-41.6% which means that there was a significant association as the p-value is >0.005. The servings of vegetables increase from 28.6-40.3% which shows that there was a significant association as the p-value is >0.005. There was a significant association between pre and post-intervention servings of fruit as there was an increase of 15.5-22.1%. Servings of meat/ legumes/ eggs increased from 20-29%, meaning there was a significant association as P-value is >0.005. Servings of dairy also increases from 20.8-37.7% which means there was a significant association between pre and post-intervention as P-value is >0.005.

Food groups	Servings	Scores	Pre-int. frequency	Post-int. frequency	Pre-int. %		Significance level (P-value)
Servings of grains	2-3 servings	0	23	5	29.9	6.5	0.002
	3-4 servings	0	35	40	45.5	51.9	
	5-6 servings	1	18	32	23.4	41.6	
	Never	0	1	0	1.3	0	
Servings of vegetables	1-2 Serving	1	22	31	28.6	40.3	0.003
	per day2-3 serving In a week	0	5	4	6.5	5.2	
	3-4 serving in a week	0	36	20	46.8	26.0	
	4-5 serving in a week	0	6	17	7.8	22.1	
	Never	0	8	5	10.4	6.5	
Servings of fruits	1 serving per day	0	25	35	32.5	45.5	0.002
	2-3 servings per day	1	12	17	15.6	22.1	
	3-4 servings in a week	0	16	9	20.8	11.7	
	4-5 servings in a week	0	15	12	19.5	15.6	
	Never	0	9	4	11.7	5.2	
Servings of meat, eggs, legumes, nuts	1 serving per day	0	28	37	36	48	0.003
	2-3 servings per day	1	16	22	20	29	
	3-4 servings in a week	0	18	8	23	10	
	4-5 serving in a week	0	11	9	14	12	
	Never	0	4	1	5	14	
Servings of Dairy	1 Serving per day	0	32	36	41.6%	6.8%	0.004
	2-3 Servings per day	1	16	29	20.8%	37.7%	
	3-4 Servings In a week	0	5	6	6.5%	7.8%	
	Never	0	24	6	31.2%	7.8%	

Table 2: Recommendation about consumption pattern of different food groups of Children before and after nutrition education

Table 3 shows the percentage comparison of healthy and unhealthy eating practices of school-going children before and after giving nutrition education to their mothers. The percentage of children who skipped meals on daily basis was 20% decreased to 8% and 38% skip their meals very often decreased to 27%. 42% never skipped their meals which increased to 65%. Before the intervention, 63% of mothers say that their children consumed breakfast regularly and after the intervention, it increases to 75%. 20% skipped sometimes and after the intervention, it was 15%. 17% never consumed breakfast daily which was decreased to 10%.

education

Healthy and unhealthy eating practices	Daily		Often		Never		P-value
	Before interv-ention %	After interv-ention %	Before interv-ention %	After interv-ention %	Before interv-ention %	After interv-ention %	
Percentage of skipped meals	20%	8%	38%	27%	42%	65%	0.003
Consumption of breakfast	63%	75%	20%	15%	17%	10%	0.002

Table 3: Comparison of healthy and unhealthy eating practices of school-going children before and after giving nutrition education to their mothers

DISCUSSION

By evaluating pre and post-questionnaire data, data was obtained from 77 mothers of school-aged children aged 3-6 years from a middle-class school to determine the impact of nutrition instruction. Results show a significant increase in their knowledge and practices regarding eating habits and healthy lunch boxes [13]. Similarly, Kigaru et al., collected the sample from four schools among 202 school children. Data were collected through questionnaires, interviews, and discussions. The low, moderate, and high knowledge ratio was 41-69%. Dietary practices were noticed by food consumption and the attitude about what they ate [14,15]. The purpose of this study was to increase the healthy eating habits and nutritional value of lunch boxes among the primary school-going children by providing nutrition education and also ensuring their likes and dislikes about their meal patterns. 77 children were chosen from the primary school in which there was 57% of children fall in 3-5.9 years of age group whereas, 43% of children fall in 6-8 years of age group. 24% of students fall in playgroup, 25% students in Kg and from prep class, there were 25% students and 26% from 1 class. Table 1 shows there was a significant association between pre-intervention weight mean (17.4 ± 3.02 Kg) to post-intervention weight (18.05 ± 2.99 Kg) which means that there was an increase of 3.7% in weight after the intervention, the mean of height increases from (108 ± 9.2cm) to (109.6 ± 9.3cm) with the increase of 1.48% which shows that there was a significant association as p-value is

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less than 0.005. There was a significant association between pre-intervention BMI (14.66 ± 1.4) to post-intervention (14.99 ± 1.3) which means there was an increase of 1.36% in BMI of children, there was a significant association between pre-intervention MUAC (16.2 ± 0.9) to post-intervention (16.5 ± 0.8) which shows there was an increase of 1.85%. There was a considerable increase in fruit servings from pre-intervention to post-intervention, from 15.5-22.1%. Meat, legumes, and egg servings increased from 20% to 29%, indicating a significant correlation with a P= 0.003 [16]. In our study dietary intake of the basic food, groups were also observed before and after intervention and then analyzed. The servings of grains increase from 23.4-41.6% which means that there was a significant association as p=0.002. The servings of vegetables increase from 28.6-40.3% which shows that there was a significant association as the p-value is 0.003. Similarly, a study conducted by F Tilley et al., presents the development of a healthy lunch box challenge. Staff members and parents were targeted on summer days. The total ratio of students who took fruits and vegetables and water in their lunch was 31-42% [17]. LN Gase et al., found similar results, with dairy servings increasing from 20.8-37.7%, indicating a significant connection between before and post-intervention (P=0.004) [18]. Ostachowska-Gasior et al., conducted a study to confirm the proper value of nutrition education among adolescents and also noticed the students who consumed daily their breakfast and know the value of other meals. This fact shows that the consumption of breakfast is very beneficial for the consumption of other meals in a whole day [19]. The impact of nutrition education can be seen in the respondents' eating habits. Meal skipping was discovered to be a regular practice among the participants, with breakfast being the most commonly skipped meal. As it was found that the percentage of children who never skipped meals was 42% which increased to 65%, and the percentage of children who consumed breakfast daily was 63% which increased to 75% which shows that there was a significant change observed as P < 0.005. After receiving nutrition education, meal skipping was reduced and regular breakfast consumption rose. Similarly, Kaur et al. found that meal skipping decreased (from 43-24), and respondents skipping breakfast and lunch decreased (from 29 and 12-16 and 8 respectively) after receiving nutrition education. NE also improved respondents' living habits statistically significantly (p<0.001) [20]. The women who have a greater level of nutritional understanding feed their children more vegetables, fruit, legumes, and less sugared drinks like cola juice and fast eats, according to this study. A mother's nutritional knowledge level affects children's eating habits. Proper intake of a healthy diet is very important for children, deficiency of which causes the serious effect on a healthy life. It is very obvious that being an inhabitant of an underdeveloped country like Pakistan, many people cannot afford to have a balanced diet. Resultantly, the efficiency of the individuals gets affected.

CONCLUSIONS

In this study, nutritional education had a significant impact on the school-going children in their anthropometric measurements, healthy school lunch boxes, and awareness of their mothers about healthy eating practices. The inadequate dietary intake during school hours was substituted with the incorporation of healthy options to be consumed with the help of the nutritional education program. It has been discovered that mothers with a high level of nutritional education have a good impact on their children's eating habits and behaviors. If the mother receives constant nutritional instruction, all family members may develop good eating habits and behaviors. Seminars and camps should be arranged in schools to educate the mothers and the students at a young age regarding their health and healthy eating to reduce the nutritional deficiencies and diseases. Teachers should engage themselves in nutrition education sessions so that they can further educate their students and there should be a regular check and balance on the school canteen and cafeterias for the sake of students' health.

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