

# Strategies to Prevent Protein Energy Malnutrition and Improve Nutrition in Children under 5 years

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## Abstract

**Background:** Every country in the world is affected by one or more forms of malnutrition. And it is frequently a result of lack of knowledge of the parents. The aim of the study was to assess the effectiveness of structured teaching programme regarding prevention of PEM among mothers of fewer than 5 years children.

**Methods:** The study was quantitative research approach using pre-experimental research design with one group pretest posttest design on 30 mothers of under 5 years children which is selected by purposive sampling technique from the urban area of Sangam Vihar, New Delhi. The post test data was collected on 7<sup>th</sup> day after implementation of structured teaching programme.

**Result:** The mean posttest knowledge score  $17 \pm 3.333$  was higher than the mean pretest knowledge scoring  $25 \pm 1.832$  of mother of under 5 years children regarding prevention of PEM. The computed 't' value was found to be statistically significant at 0.05 level of significant. There was no significant association of pretest and posttest knowledge score regarding PEM with selected demographic variables.

**Conclusion:** The findings revealed that the structured teaching programme regarding prevention of PEM was effective. Therefore, it is recommended to provide knowledge to the mothers of fewer than 5 years children regarding prevention of PEM.

**Keywords:** Effectiveness • Protein energy malnutrition • Mother of less than 5 year's children

## Introduction

Every country in the world is affected by one or more forms of malnutrition. Combating malnutrition in all its forms is one of the greatest global health challenges. Women, infants, children and adolescents are at particular risk of malnutrition [1]. The World Health Organization (WHO) defines malnutrition as the cellular imbalance between the supply of nutrients and energy and the body's demand for them to ensure growth, maintenance, and specific functions [2].

Protein energy malnutrition is a major public health problem in India. It affects particularly the preschool children (<6 years) with its dire consequences ranging from physical to cognitive growth and susceptibility to infection. PEM is measured in terms of underweight (low weight for age), stunting (low height for age) and wasting (low weight for height) [3].

Globally, malnutrition is attributed to almost one-half of all child deaths. Survivors are left vulnerable to illnesses, stunted growth and intellectual impairment. The causes of growth retardation are deeply rooted in poverty and lack of education. School-going girls in the rural

areas were found to be severely anemic, and necessary action should be taken to prevent future complications [4].

In India, approximately 20% of children under the age of four suffer from severe malnutrition, while half of all the children suffer from under nutrition. Previous study shows that the gender of the child and socioeconomic factors were stronger risk factors for malnutrition. The father's occupation was a more accurate indicator for malnutrition than household income. The results suggest a need for intensive nutritional programs targeted toward poor female children and their mothers [5].

The occurrence of overall and Grade I, II, III PEM was highest among the age group 1-3 years. Female child had a higher percentage occurrence of overall and Grade I PEM. The prevalence of overall and Grade I, II, III PEM was highest among children of illiterate mothers. Improper education and death of awareness among mothers results in poor health of a child. The children of laborers were affected most with overall and Grade I, II, III PEM. The extent of malnutrition can be countered by educating the parents with respect to basic nutritional requirements of their children and encouraging them to consume locally available low cost nutritious foods [6].

A survey study was conducted on 500 children of the age group (4-6 years) to determine the risk factors and intervening factors of protein energy malnutrition in children. Anthropometric measurements, clinical examination and dietary intake of 100 malnourished children were recorded, and nutrient intake was calculated. Majority of the undernourished children had typical clinical signs of malnutrition. Nutrition education program was conducted for the mothers of the children; there was an improvement in the knowledge and awareness of the parents after the nutrition program so it is necessary to educate the mothers of the children on the quantity and quality of food [7].

Approximately 11% of children worldwide suffer from moderate or severe acute malnutrition. Experience from the past two decades indicates that children with uncomplicated moderate or severe acute malnutrition can be managed successfully as outpatients, by use of appropriate treatment of infections and either lipid-based, ready-to-use therapeutic foods or appropriately formulated home diets, along with psycho social care. Children's caregivers prefer community-based treatment, which is also less costly than in-patient care. National programs for the Community-based Management of Acute Malnutrition (CMAM) provide periodic anthropometric and clinical screening of young children, and referral of those who meet established criteria [8]. However, it is necessary to educate the mother of under 5 years children which can further prevent from protein energy malnutrition.

## Aim of the study

The aim of the study was to assess the effectiveness of structured teaching programme regarding prevention of PEM among mothers of fewer than 5 years children.

## Methods

The study was conducted on 30 mothers by using pre-experimental design with one group pretest post-test design. The data was collected from 1<sup>st</sup> march 2017 to 30<sup>th</sup> march 2017 by purposive sampling technique. The inclusion criteria were mother of under 5 years children from the urban area of Sangam Vihar, New Delhi and are available at the time of data collection.

The instrument used for data collection were demographic variables of mothers consisting of 10 items and structured questionnaire on PEM comprising 25 items with sub-sections as Part I consist of 7 questions regarding definition and causes, Part II consist of 6 questions regarding signs and symptoms, diagnosis and complications, Part III consist of 7 questions regarding prevention and Part IV consist of 5 questions regarding miscellaneous. The correct response is given a score of '1' mark and the wrong response is given as '0' at minimum 0 and maximum 25.

The data of demographic variables were collected and pretest was taken before implementing the structured teaching programme. The teaching programme were given covering the area of definition, causes, signs and symptoms, diagnosis, complications and prevention on PEM. On 7<sup>th</sup> day, post- test were taken. Formal permission was obtained from the concerned authority to conduct the study. Consent was obtained from each subject after giving assurance of confidentiality.

**Data analysis**

Data were analyzed by using SPSS software. For evaluation of the data, percentage, arithmetic mean, standard deviation, t- test and ANNOVA test for association were used.

**Results**

The mean percentage of post-test knowledge score  $17 \pm 3.333$  was higher than the pretest knowledge score  $25 \pm 1.832$  of mothers regarding prevention of PEM. The computed't' value) were found statistically significant at 0.05 level. Thus, the mean difference between pretest and post-test knowledge score was true difference not by chance indicating that the structured teaching programme was effective in enhancing the knowledge of mothers of less than 5 years children regarding prevention of PEM. There was no association of pretest and post-test knowledge score regarding PEM with types of family, educational status, religion, children below 5 years of age, occupation, monthly income, types of food, source of knowledge and knowledge regarding health services.

Table 1 depicted that most of the mothers were from nuclear family (56.66%). Half of the mothers were illiterate (50%). Majority of the mother were from Hindu religion (80%). Most of the mothers have one child below 5 years of age (63.3%). Majority of the mothers were housewife (96.66%). Most of the monthly income of the family was 5000-1000 (66.66%). Majority of the mothers were non-vegetarian (90%). All the mothers do not have any knowledge regarding PEM.

Data presented in Table 2 represents the knowledge score for both pretest and post-test score regarding prevention of PEM. The data indicate that after implementation of structured teaching programme, mean percentage of post-test knowledge score  $17 \pm 3.333$  was higher than pretest knowledge score  $25 \pm 1.832$  of mother regarding prevention of

PEM.

Data represent in Table 3 represents that mean of knowledge score regarding prevention of PEM in pretest and post-test were (9.83) and (20.77) with a mean difference of 10.933 respectively. The calculated't' value of knowledge score ( $t=18.261, p=0.00$ ) were found statistically significant at 0.05 level.

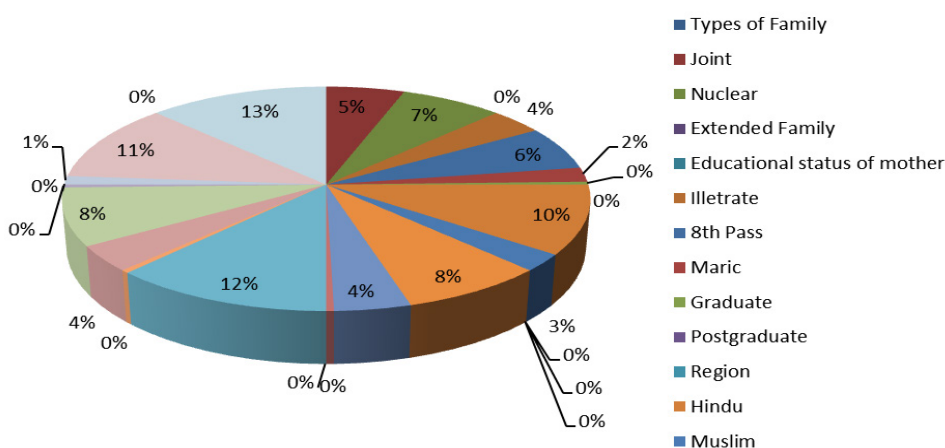
Data presented in Table 4 represents the mean pretest knowledge score were definition & causes (2.2), sign and symptoms (2.2), prevention (2.63) and miscellaneous (2.73) whereas in mean post-test knowledge score were definition & causes (5.93), sign & symptoms (4.87), prevention (5.7) and Miscellaneous (4.27) respectively. The computed't' value were found statistically significant at 0.05 level of significant. Thus, the mean difference between pretest and post-test knowledge score was true difference not by chance indicating structured teaching programme was effective in enhancing the knowledge of mothers of under 5 years children regarding prevention of PEM.

The Table 5 depicted that the association of knowledge score of mothers under 5 years children regarding PEM with selected demographic variables i.e types of family ( $\lambda^2=1.885, p=0.290$ ), educational status ( $\lambda^2=1.538, p=0.673$ ), religion ( $\lambda^2=0.72, p=1.00$ ), children below 5 years of age ( $\lambda^2=0.349, p=0.840$ ), occupation ( $\lambda^2=1.59, p=0.69$ ), monthly income ( $\lambda^2=8.317, p=0.16$ ) and types of food ( $\lambda^2=0.513, p=0.474$ ) respectively was found to be non-significant at 0.05 level of significance.

The Table 6 depicted that the association of knowledge score of mothers under 5 years children regarding PEM with selected demographic variables i.e types of family ( $\lambda^2=4.914, p=0.086$ ), educational status ( $\lambda^2=2.427, p=0.877$ ), religion ( $\lambda^2=0.833, p=0.659$ ), children below 5 years of age ( $\lambda^2=2.733, p=0.604$ ), occupation ( $\lambda^2=0.207, p=0.902$ ), monthly income ( $\lambda^2=3.00, p=0.558$ ) and types of food ( $\lambda^2=0.667, p=0.717$ ) respectively was found to be non-significant at 0.05 level of significance.

Thus, research hypothesis  $H_1$  was rejected and null Hypothesis  $H_{01}$  was accepted. Thus, it can be interferred that there was no association of pretest and post-test knowledge score regarding PEM with types of family, educational status, religion, children below 5 years of age, occupation, monthly income, types of food, source of knowledge and knowledge regarding health services (Figure 1,2).

**Demographic Variables**



**Figure 1.** Pie chart showing percentage and frequency distribution of mothers under 5 years children regarding prevention on PEM.

**Table 1.** Percentage and frequency distribution of mothers under 5 years children regarding prevention on PEM

Demographic variables	Frequency (f)	Percentage (%)
Types of family	Joint	43.33
	Nuclear	56.66
	Extended family	0
Educational status of mother	Illiterate	30
	8 <sup>th</sup> Pass	50
	Matric	16.66
	Graduate	3.33
	Postgraduate	0

Religion	Hindu	24	80
	Muslim	6	20
	Sikh	0	0
	Christian	0	0
	Others	0	0
Children below five years of age	One	19	63.3
	Two	10	33.3
	Three	1	3.33
	More than three	0	0
Occupation of Mother	Housewife	29	96.66
	Service	1	3.33
Monthly Income	Below 5000	9	30
	5000-10000	20	66.66
	10001-15,000	1	3.33
	More than 15,000	0	0
Type of food	Vegetarian	3	10
	Non-vegetarian	27	90
Knowledge regarding PEM	Yes	0	0
	No	30	100

**Table 2.** Overall range, mean, mean percentage, median and standard deviation of knowledge score of mother under 5 years children regarding prevention of PEM.

Prevention of PEM	Knowledge score	Range	Mean	Mean%	Median	SD
	Pretest score	5-17	9.83	17%	9.5	3.333
	Post-test score	16 – 25	20.77	25%	21	1.832

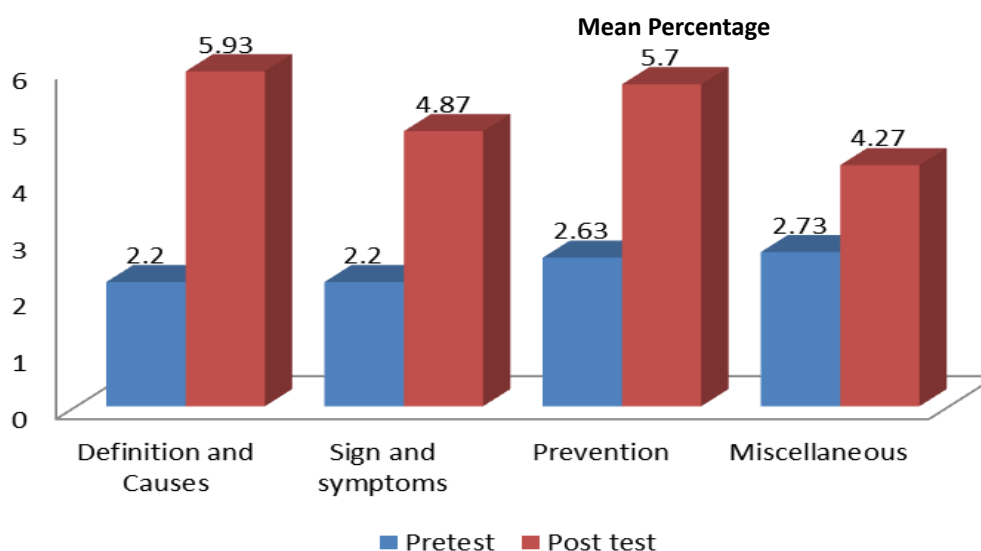
**Table 3:** Mean, Mean Difference, Standard Error Mean Difference and 't' test of Pretest and Post-test Knowledge score of Mothers under 5 years Children regarding Prevention on PEM.

Knowledge score	Mean	Mean difference	Std. error mean difference	t value	P value
Pretest score	9.83	10.933	0.599	18.261	.000*
Post-test score	20.77	-	-	-	-

t value (28)=1.701 , \*Significant (p ≤ 0.05)

**Table 4.** Area wise mean, mean difference, standard deviation, standard error of mean difference and 't' value of pretest and post-test knowledge score of mothers under 5 years children regarding prevention on PEM.

Knowledge score	Mean	Mean difference	Std. error mean difference	SD	t value	p value
Definition and causes	Pretest	2.2	0.283	1.552	13.174	0.000
	Post-test	5.93				
Signs and symptoms	Pretest	2.2	0.246	1.348	10.838	0.000
	Post-test	4.87				
Prevention	Pretest	2.63	0.258	1.413	11.891	0.000
	Post-test	5.7				
Miscellaneous	Pretest	2.73	0.196	1.074	7.818	0.000
	Post-test	4.27				



**Figure 2.** Bar graph showing area wise mean percentage of pretest and post-test knowledge score of mothers under 5 years children regarding prevention on PEM.

**Table 5.** Association between pretest knowledge score with selected demographic variables regarding prevention of PEM.

Demographic variables		Pretest knowledge score		Chi-square ( $\lambda^2$ )	df	p value
		Poor	Average			
Types of family	Joint	10	3	1.885	1	0.29
	Nuclear	16	1			
Educational status of mother	Illiterate	8	1	1.538	3	0.673
	8 <sup>th</sup> Pass	12	3			
	Matric	5	0			
	Graduate	1	0			
Religion	Hindu	21	3	0.72	1	1
	Muslim	5	1			
Children below five years of age	One	16	3	0.349	2	0.84
	Two	9	1			
	Three	1	0			
Occupation of Mother	Housewife	25	4	1.59	1	0.69
	Service	1	0			
Monthly Income	Below 5000	7	2	8.317	2	0.16
	5000 -10000	19	1			
	10001 – 15,000	0	1			
Type of food	Vegetarian	3	0	0.513	1	0.474
	Non-vegetarian	23	4			
	Knowledge regarding PEM	27	3			

**Table 6.** Association between post-test knowledge score with selected demographic variables regarding prevention of PEM.

Demographic variables		Pretest knowledge score			Chi-square( $\lambda^2$ )	df	p value
		Average	Good	Very good			
Types of family	Joint	0	11	2	4.914	2	0.086
	Nuclear	3	14	-			
Educational status of mother	Illiterate	0	8	1	2.427	6	0.877
	8 <sup>th</sup> Pass	2	12	1			
	Matric	1	4	-			
	Graduate	0	1	-			
Religion	Hindu	2	20	2	0.833	2	0.659
	Muslim	1	5	-			
Children below five years of age	One	1	16	2	2.733	4	0.604
	Two	2	8	-			
	Three	-	1	-			
Occupation of Mother	Housewife	3	24	2	0.207	2	0.902
	Service	0	1	-			
Monthly Income	Below 5000	0	9	0	3	4	0.558
	5000 -10000	3	15	2			
	10001 – 15,000	0	1	0			
Type of food	Vegetarian	0	3	0	0.667	2	0.717
	Non-vegetarian	3	22	2			
	Knowledge regarding PEM	3	25	2			

## Discussion

The present study shows that implementation of structured teaching programme was effective as indicating teaching enhances the good knowledge score which are similar to findings of Kenneth H. Brown et al. shows that there was an improvement in the knowledge and awareness of the parents after the nutrition program [9]. Before administration of the structured teaching program, 27 (90%) had poor knowledge and 3 (10%) had average knowledge while after implementation of the structured teaching program, 3 (10%) had average knowledge, 25 (83.3%) had good knowledge and 2 (6.7%) had very good knowledge which are similar to the findings of Alka Mishra et al. shows that before administration of the structured teaching program, 18 (40%) mothers had poor knowledge, 15 (33.3%) had average knowledge and 12 (26.7%) had good knowledge about malnutrition and its prevention, while after administration of structured teaching program, 12 (26.7%) had poor knowledge, 21 (46.7%) had average knowledge and 12 (26.7%) had good knowledge about malnutrition and its prevention indicating that the intervention was effective [10]. There was no association of knowledge score regarding PEM with types of family, educational status, religion, children below 5 years of age, occupation, monthly income, types of food, source of knowledge

and knowledge regarding health services which are not consistent with the findings of M Edith shows significant association of knowledge of mother age, education, occupation, monthly income, religion and source of health information but have similar findings in type of family, no. of under 5 year children and types of food consumption which shows no significant association.

## Conclusion

The study was conducted to evaluate the effectiveness of teaching programme on prevention of PEM of mother under 5 years of children in Urban area of Sangam Vihar, New Delhi. The study concluded that the knowledge score in pretest, most of the mother had an average knowledge score but in post-test, most of the mother had good knowledge score. The study findings revealed that the structured teaching programme was effective enhances PEM can be prevented by improving the knowledge of mothers under 5 years children.

## Limitation

Generalization of the findings is limited.

## Recommendation

The researcher recommended that the study need to be replicated on large sample to validate and generalize its finding. A comparative study can be conducted between two group of mothers under 5 years of children.

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