

# A PILOT STUDY REPORT: EFFECTIVENESS OF NUTRITION EDUCATION PACKAGE ON GROWTH OF CHILDREN AND KNOWLEDGE OF MOTHERS OF CHILDREN IN SELECTED RURAL AREAS, MYSURU, KARNATAKA

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**ABSTRACT:** *Preschool children are one of the most nutritionally vulnerable segments of the population. Nutrition during the first five years has an impact not only on growth and morbidity during childhood. In India, under-nutrition is a major public health problem. Almost 11 million children will die before they reach the age of five and 4 million of them in the first month of life. Malnutrition is the principle cause of child deaths. Pilot study has been undertaken to assess the effectiveness of nutrition education package on growth of children, and knowledge of mothers of children in selected rural areas of Mysuru district. The total sample taken were 10 children (3-5Years) and their mothers of selected rural areas through non probability convenience sampling technique. The research design adopted for this study is quasi experimental, one group pretest posttest, time series design. Personal proforma was used to assess the selected personal variables. Growth of children was assessed through anthropometric measurements of children (height for age and weight for height). Structured knowledge questionnaire was used to assess the knowledge of mothers of children regarding recommended nutrition among children. The tool and study design were found to be feasible. Data were collected using structured knowledge questionnaire. The results of the study revealed that the significance of difference between the mean pre-test and mean post-test knowledge scores which was statistically tested using paired' test and it was found to be significant at 0.05 level of significance. It was concluded that nutrition education package was effective in increasing the knowledge of mothers and improving nutritional status of children. Information pamphlets were distributed to mothers to enhance the knowledge regarding recommended nutrition among children*

**Key words - Nutrition education package, growth of children, knowledge**

## INTRODUCTION

Children under the age of five years constitute a priority group because of their large numbers. In India, they comprise about 13% of the total population. They are also regarded as vulnerable or high risk group because of the problems arising out during their growth, development & survival. 50% of the deaths are occurring among children during the first five years of life in developing countries including India. Malnutrition is regarded as the most widespread condition affecting the health status of under five children. Approximately 47% of the India's (under age of five years) children are underweight and one in three adult women in India is underweight and therefore at risk of developing babies with low birth weight. Children under age of five years suffer from a host variety of diseases like diarrhea, respiratory infections, measles, pertussis, polio, tuberculosis and diphtheria due to malnutrition.<sup>1</sup>

Preschool children are one of the most nutritionally vulnerable segments of the population. Nutrition during the first five years has an impact not only on growth and morbidity during childhood, but also acts as a determinant of nutritional status in adolescent and adult life. Moreover, the crucial period is birth to two years when maximum growth takes place and any deprivation at this stage would be difficult to remedy later.<sup>2</sup>

In India, under-nutrition is a major public health problem. Almost 11 million children will die before they reach the age of five and 4 million of them in the first month of life. Malnutrition is the principle cause of child deaths. In this country, almost one out of every two children goes to bed on an empty stomach. Half of all children deaths in India could be prevented if this one issue is tackled. Malnutrition in young children is attributed to inadequate feeding; faulty feeding practices, repeated infections like diarrheal diseases, acute respiratory infections and worm infestations. Economically weaker section and illiterate

families bear the brunt of malnutrition. The consequences of malnutrition are; high level of morbidity, mortality and disability apart from poor physical growth and-development.<sup>3</sup>

Malnutrition continues to be a growing problem in most developing countries. Poor nutrition during childhood is one important factor impeding the physical and mental development of children, which ultimately propagates the vicious cycle of intergenerational malnutrition. The issue of child malnutrition is critical because its effects are not limited to the boundary of childhood but rather persist into adulthood. It silently destroys the future productivity of nations. Malnutrition increases the economic burden of a society because it leads to increased risk of death from infectious diseases, more severe infections, and higher case fatalities, creating an additional psychosocial burden. In developing countries, it is estimated that 29% of children aged less than five years (under-five children) are stunted [ $<-2$  standard deviation (SD) height-for-age] or chronically undernourished. Although stunting has declined from 47% in 1980 to 29% in 1995, prevalence are still extremely high, especially in South Central Asia, which alone accounts for about half of the global problem.<sup>4</sup>

Anthropometric measurement is a practical and immediately applicable technique for assessing children's development patterns during the first five years of life. Assessing of growth patterns and also provides useful insights into the nutrition and health situation of entire population. Anthropometric indicators are less accurate than clinical and biochemical techniques when it comes to assessing individual nutritional status. In field situations where resources are severely limited, however, anthropometry can be used as an inexpensive, easy to perform and non-invasive tool to identify individuals at risk of undernutrition, followed by a more elaborate investigation using other techniques. Similarly, growth monitoring permits the detection of individuals with faltering growth, who can then be appropriately referred to specialized care.<sup>5</sup>

Child malnutrition is a widespread public health problem. AS per UNICEF reports 167 million preschool children are underweight in the world of which half are from south Asia. Nationwide surveys are conducted in India indicate that more than half the children were underweight and stunted and one in six was exclusively wasted indicating acute under nutrition.<sup>6</sup>

The findings of the third National Family Health Survey (NFHS-3) reveals an unacceptable Prevalence of malnutrition in India:

- 42.5% of our children under the age of five years are underweight (low weight for age).
- 48 % of our children are stunted (low height for age – chronically malnourished).
- 19.8 % of our children are wasted (low weight for height – acutely malnourished).
- In poorer states, the situation is even worse with over 50 % of children underweight.

#### **Prevalence of malnutrition in Karnataka:**

44% of children under the age five are stunted, or too short for their age, which indicates that they have been undernourished for some time. 18% of children are wasted, or too thin for their height, which may result from inadequate recent food intake or a recent illness. 38% are underweight, which takes into account both chronic and acute under nutrition. Children in rural areas are more likely to be undernourished; but even in urban areas, more than one-third of children under age five years suffer from chronic under nutrition.<sup>7</sup>

A Community based cross sectional study was conducted among Kadukuruba tribes of Mysore district over a period of one year among 101 under-five children. Socio-demographic information and anthropometric measurements were obtained by using standard techniques. Height and weight of each child was compared with World Health Organization (WHO) child growth standards-2006 for that particular age and sex to get weight for age, height for age and weight for height indices and below  $\pm 2SD$  of the reference median on these indices were considered as underweight, stunted and wasted respectively. The findings of the study reveals that prevalence of underweight, stunting and wasting was 60.4 %, 55.4% and 43% respectively which was significantly associated with respect to age, presence of ration card in the family and egg in the child's diet. The investigator concluded that significantly higher prevalence of under-nutrition was noted among under-five children in this community. This calls for educating mothers and other caretakers in the family regarding increased nutritional requirements with increasing age, strengthening Public Distribution System (PDS) and ensuring egg made available in the regular weekly menu at all Anganawadi's.<sup>8</sup>

A community based cross sectional study was conducted to determine the nutritional status of under five children registered in 12 anganwadis coming under urban health centre, Ashok Nagar, Belgaum, Karnataka state, India in 2012 using predesigned and pretested questionnaire. Statistical analysis was done by using percentages and proportions. Results of the study reveals that overall 59 (10.6%) male children were malnourished with 42 (3.8%) from moderate degree and 17 (1.5%) from severe degree malnourishment compared to 7 (10.7%) female children with 44 (1.1%) from moderate degree and 13 (1.5%) from severe degree malnourishment. The study concluded that emphasis should be given on maternal nutrition and their education and improvement of socio-economic status to reduce the burden of childhood under nutrition. The present study may help the policy planners to develop strategies to combat different forms of malnutrition by targeting the high-risk groups.<sup>9</sup>

#### **OBJECTIVES**

1. To assess growth of children (height for age and weight for height)
2. To determine knowledge of mothers of children regarding recommended nutrition among children (3-5Years)

3. To assess the effectiveness of a nutrition education package on growth of Children (3-5Years) and knowledge of mothers of children regarding recommended nutrition among children

### RESEARCH METHODOLOGY

The research design adopted for this study is quasi experimental, one group pretest posttest, time series design. Personal proforma was used to assess the selected personal variables. Growth of children was assessed through anthropometric measurements of children (height for age and weight for height). Grade of stunting and wasting calculated according to Waterlows classification. Structured knowledge questionnaire was used to assess the knowledge of mothers of children regarding recommended nutrition among children (3-5Years). Tools were content validated by six experts. Lesson plan and content for information pamphlet was developed and content validated by the experts and tools were found to be reliable.

#### Schematic representation of the design

| First session                                | Second session                | Third session                 |
|--|-------------------------------|-------------------------------|
| O <sub>1</sub> X <sub>1</sub> O <sub>2</sub> | X <sub>2</sub> O <sub>3</sub> | X <sub>3</sub> O <sub>4</sub> |

Nutrition Education package will be carried out in 3 sessions with 3 months interval

#### Keys:

**O<sub>1</sub>** – Pretest (Dietary Adequacy, growth of children and knowledge of mothers of children regarding recommended nutrition will be assessed)

**X<sub>1</sub>**–Intervention in first session (Nutrition Education Package)

**O<sub>2</sub>** – Posttest 1(Dietary Adequacy, growth of children and knowledge of mothers of children regarding recommended nutrition will be assessed after 3 months of first session)

**X<sub>2</sub>** – Intervention in second session (Nutrition Education Package)

**O<sub>3</sub>** – Posttest 2 (Dietary Adequacy, growth of children and knowledge of mothers of children regarding recommended nutrition will be assessed after 3 months of second session)

**X<sub>3</sub>** – Intervention in third session (Nutrition Education Package)

**O<sub>4</sub>** – Posttest 3 (Dietary Adequacy, growth of children and knowledge of mothers of children regarding recommended nutrition will be assessed after 3 months of third session)

**Nutrition Education package-** Nutrition education package was developed and implemented in 3 sessions at 3 months interval which includes

#### Group Education and Distribution of Information Pamphlet

Group education was conducted to rural mothers regarding recommended nutrition using A V Aids (flash cards and charts).

During education, explained about following key messages

- Nutrients in foods and their role in promoting growth and good health,
- Nutritional benefits,
- Food pyramid, food varieties and food diversity
- Recommended nutrition for children (3-5Years)
- Food hygiene
- Hands hygiene
- Food groups and dietary diversity
- Food frequency (at least 5 meals a day)
- Healthy and balanced meal containing three main ingredients:
- energy (staple food –maize), body-building (protein-source foods: beans, groundnuts, meat, eggs, and protective food (vegetables, fruits)
- Daily fruit and vegetables consumption (at least three portions).

#### Individual Counseling

Individual counseling was conducted to provide opportunities for mothers to have personal questions and concerns about child nutrition, food frequency and about recommended nutrition (e.g. what to feed, how to feed) and also to increase practical knowledge of rural mothers on selection and preparation of new food recipes. Mothers were guided in identification and grouping of locally available foods for making typical household meal and inclusion of varieties of foods to increase content and intake of nutrient density of meals.

#### Cooking a healthy meal with practical demonstrations

**Cooking demonstration** - Cooking demonstrations aim to show how different food items can be used to prepare nutritious meals, illustrate appropriate amount and consistency of meals. The recipes prepared for one day balanced meal that provides adequate protein and calories.

## RESULTS

TABLE 1

Frequency and percentage distribution of mothers of children according to their selected personal variables  
n=10

| Sl no | Sample characteristics          | Frequency(f) | Percentage (%) |
|-------|---------------------------------|--------------|----------------|
| 1     | Age in years                    |              |                |
|       | 1.1 <20                         | 0            | 0              |
|       | 1.2 21-30                       | 5            | 50             |
|       | 1.2 21-30                       | 5            | 50             |
| 2     | Religion                        |              |                |
|       | 2.1 Hindu                       | 9            | 90             |
|       | 2.2. Muslim                     | 1            | 10             |
|       | 2.3 Christian                   | 0            | 0              |
| 3     | Occupation                      |              |                |
|       | 3.1 Government employee         | 0            | 0              |
|       | 3.2 Private employee            | 5            | 50             |
|       | 3.3 Business                    | 0            | 0              |
|       | 3.4 Home maker                  | 5            | 50             |
| 4     | Educational status              |              |                |
|       | 4.1 No formal education         | 0            | 0              |
|       | 4.2 Primary education           | 3            | 30             |
|       | 4.3 High school education       | 5            | 50             |
|       | 4.4 Degree                      | 2            | 20             |
| 5     | Type of family                  |              |                |
|       | 5.1 Nuclear family              | 8            | 80             |
|       | 5.2 Joint family                | 2            | 20             |
|       | 5.3 Extended family             | 0            | 0              |
| 6     | Family monthly income in rupees |              |                |
|       | 6.1 <3000/-                     | 0            | 0              |
|       | 6.2 3000/- to 6000/-            | 0            | 0              |
|       | 6.3 6000/- to 9000/-            | 3            | 30             |
|       | 6.4 >9000/-                     | 7            | 70             |
| 7     | Source of nutrition information |              |                |
|       | 7.1 Media                       | 7            | 70             |
|       | 7.2 Friends and relatives       | 2            | 20             |
|       | 7.3 Health professionals        | 1            | 10             |
|       | 7.4 No information              | 0            | 0              |

TABLE 2

Frequency and percentage distribution of children according to their selected personal variables

| Sl no | Sample characteristics      | Frequency (f) | Percentage (%) |
|-------|-----------------------------|---------------|----------------|
| 1     | Age in years                |               |                |
|       | 1.1 3-4                     | 7             | 70             |
|       | 1.2 4years one month-5years | 3             | 30             |
| 2     | Gender                      |               |                |
|       | 2.1 Male                    | 5             | 50             |
|       | 2.2 Female                  | 5             | 50             |
| 3     | Birth order                 |               |                |
|       | 3.1 First order             | 4             | 40             |
|       | 3.2 second order            | 6             | 60             |
|       | 3.3 third order and above   | 0             | 0              |

TABLE 3

Frequency and percentage distribution of growth of children according to their pre test and post test scores

n=10

| Degree of malnutrition<br>Stunting (Height for age) | Pre test<br>f(%) | Post test 1<br>f(%) | Post test 2<br>f(%) | Post test 3<br>f(%) |
|---|------------------|---------------------|---------------------|---------------------|
| Normal >95%   | 3(30%)           | 4(40%)              | 6(50%)              | 9(90%)              |
| Grade I (87.5-95%)                                  | 5(50%)           | 4(30%)              | 4(30%)              | 1(10%)              |
| Grade II (80-87.5%)                                 | 2(20%)           | 2(30%)              | -                   | -                   |
| Grade III (<80%)                                    | -                | -                   | -                   | -                   |

TABLE 4

Frequency and percentage distribution of growth of children according to their grade of stunting

n=10

| Degree of malnutrition<br>Wasting (weight for height) | Pre test<br>f(%) | Post test 1<br>f(%) | Post test 2<br>f(%) | Post test 3<br>f(%) |
|---|------------------|---------------------|---------------------|---------------------|
| Normal >90%   | 2(20%)           | 5(50%)              | 7(70%)              | 9(90%)              |
| Grade I (80-90%)                                      | 6(50%)           | 5(50%)              | 3(30%)              | 1(10%)              |
| Grade II (70-80%)                                     | 2(20%)           | -                   | -                   | -                   |
| Grade III (<70%)                                      | -                | -                   | -                   | -                   |



TABLE 5

Frequency and percentage distribution of level of knowledge of mothers according to their pre test and post test scores  
n=10

| Knowledge level         | Pre test f(%) | Post test 1 f(%) | Post test 2 f(%) | Post test 3 f(%) |
|-------------------------|---------------|------------------|------------------|------------------|
| Poor knowledge(0-7)     | 4(40%)        | 0                | 0                | 0                |
| Average knowledge(8-15) | 6(60%)        | 6(60%)           | 1(10%)           | 0                |
| Good knowledge(16-22)   | 0             | 4(40%)           | 9(90%)           | 10(100%)         |

TABLE 6

Mean, Median, Standard deviation and Range of pre-test and post-test knowledge score of mothers  
n=10

| Sl.no       | Mean | median | Range | SD    |
|-------------|------|--------|-------|-------|
| Pretest     | 11.2 | 12     | 7-12  | ±1.34 |
| Post test1  | 12.1 | 13     | 8-14  | ±0.51 |
| Post test 2 | 13   | 13.5   | 8-15  | ±0.53 |
| Post test 3 | 13.5 | 13.5   | 8-16  | ±0.68 |

The data presented in Table 6 shows that, the mean pre test knowledge score is 11.2 with standard deviation of ±1.34 and ranged from 7-12 and the mean post test1 knowledge score is 12.1 with the standard deviation of ±0.51 and ranged from 8-14. Mean post test 2 knowledge score is 13 with the standard deviation of ±0.53 and ranged from 8-15. Mean post test 3 knowledge score is 13.5 with the standard deviation of ±0.68 and ranged from 8-16. This indicates that there was an increase in mean knowledge scores mothers after the nutrition education package.

TABLE 7

Mean, mean difference, standard deviation difference, standard error and paired 't' value of pretest and post-test 1 knowledge scores of mothers

| Knowledge scores | mean | Mean difference | SD difference | Standard error | Paired t test value |
|------------------|------|-----------------|---------------|----------------|---------------------|
| pretest          | 11.2 | 0.9             | 0.75          | 0.23           | 0.26                |
| Post test 1      | 12.1 |                 |               |                |                     |

$t(9)=1.671$ ;  $p<0.05$ \* significant

The data presented in the Table 7 shows that the mean difference between knowledge pre test score and post-test score is 0.9. To find the significant difference in mean knowledge scores, paired 't' test was computed and obtained value of paired 't' = 0.26,  $p>0.05$  is found to be not significant. Hence the null hypothesis is supported. It is inferred that there is no significant improvement in knowledge of mothers of children

TABLE 8

Mean, mean difference, standard deviation difference, standard error and paired 't' value of pretest and post-test 2 knowledge scores of mothers

| Knowledge scores | mean | Mean difference | SD difference | Standard error | Paired t test value |
|------------------|------|-----------------|---------------|----------------|---------------------|
| pretest          | 11.2 | 1.8             | 0.74          | 0.23           | 11.3                |
| Post test 2      | 12.1 |                 |               |                |                     |

The data presented in the Table 8 shows that the mean difference between knowledge pre test score and post-test score 2 is 1.8. To find the significant difference in mean knowledge scores, paired 't' test was computed and obtained value of paired 't' = 11.3,  $p<0.05$  is found to be significant. Hence the null hypothesis is not supported. It is inferred that there is significant improvement in knowledge of mothers of children after nutrition education package.

**TABLE 9**  
**Mean, mean difference, standard deviation difference, standard error and paired 't' value of pretest and post-test 3 knowledge scores of mothers**

| Knowledge scores | mean | Mean difference | SD difference | Standard error | Paired t test value |
|------------------|------|-----------------|---------------|----------------|---------------------|
| pretest          | 11.2 | 2.3             | 0.89          | 0.28           | 11.07               |
| Post test 3      | 12.1 |                 |               |                |                     |

The data presented in the Table 9 shows that the mean difference between knowledge pre test score and post-test 3 score is 2.3. To find the significant difference in mean knowledge scores, paired 't' test was computed and obtained value of paired  $t' = 11.07$ ,  $p < 0.05$  is found to be significant. Hence the null hypothesis is not supported. It is inferred that there is significant improvement in knowledge of mothers of children after nutrition education package.

## CONCLUSION

Preschool children are one of the most nutritionally vulnerable segments of the population. Nutrition during the first five years has an impact not only on growth and morbidity during childhood, but also acts as a determinant of nutritional status in adolescent and adult life. The main aim of the study was focused to determine the effectiveness of nutrition education package. The results of the study revealed that the significance of difference between the mean pre-test and mean post-test knowledge scores which was statistically tested using paired 't' test and it was found to be significant at 0.05 level of significance. It was concluded that nutrition education package was effective in increasing the knowledge of mothers and improving nutritional status of children. Information pamphlets were distributed to mothers to enhance the knowledge regarding recommended nutrition among children.

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