International Journal of Current Advanced Research
ISSN: O: 2319-6475, ISSN: P: 2319-6505, Impact Factor: SJIF: 5.995
Available Online at www.journalijcar.org
Volume 7; Issue 1(C); January 2018; Page No. 8908-8913
DOI: http://dx.doi.org/10.24327/ijcar.2018.8913.1453

Research Article

A QUASI - EXPERIMENTAL STUDY TO ASSESS THE EFFECT OF NUTRITIONAL DEMONSTRATION PROGRAMME (NDP) ON MOTHERS' KNOWLEDGE AND ITS EFFECT ON HEALTH STATUS OF THEIR UNDER-FIVE (UF) MALNOURISHED CHILDREN IN SELECTED AREAS OF LUDHIANA (PUNJAB)

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A R T I C L E I N F O

Article History:
Received 15th October, 2017
Received in revised form 25th November, 2017
Accepted 23rd December, 2017
Published online 28th January, 2018

Key words:

Health Status: Under-Five Children (UFC), Mothers, Knowledge, Protein Energy Malnutrition, Nutritional Demonstration Program (NDP)

A B S T R A C T

Background: Better nutrition is a prime entry point to ending the malnutrition. Better health means stronger immune systems which mean less illness. Healthy people feel stronger, can work better and may have more earning opportunities to gradually lift them out of both poverty and malnutrition. Healthier, more productive societies are a potential outcome. Protein energy malnutrition has been identified as one of the major nutritional problem among children in India. Since mothers were the primary care takers of children, if they possess adequate knowledge on food and nutrition of children, they can be prevented from protein energy malnutrition.

Purpose of the study: The purpose of the study is to assess the health status of under-five children and knowledge of mothers of malnourished children regarding nutritious diet and effect of NDP on knowledge of mothers and health status of malnourished under-five children and prepare guidelines for the mothers on the basis of findings.

Materials and Methods: A quantitative approach was used for this study. The study was carried out in selected village i.e Sarabha, Ludhiana, Punjab. The sample comprised of 62 malnourished under-five children and their mothers. Sample was selected by using Non Probability Judgemental Sampling Technique. Data collection was done in the month of Februaury- March 2015. Formal written permission from Sarpanch of village and written consent from the mothers of malnourished under-five children was taken. Data was collected by administering the Standardized WHO weight for age growth chart, Demographic Tool and Multiple choice questions regarding nutritious diet and protein energy malnutrition. Data was analyzed by using descriptive and inferential statistics.

Findings: The results of this study showed that there is positive effect of NDP on mothers' knowledge and health status of under-five children. At the time of initial assessment of under-five children in selected anganwadis of Sarabha village it was found that 50.59% of under-five children were moderately malnourished, 24.71% of under-five children were normal, 22.35% of under-five children were mildly malnourished and only 2.35% of under-five children were severely malnourished.

On the basis of assessment of level of knowledge among mothers about nutritious diet and malnutrition in experiment group, it was seen that 28.12% had average knowledge and 71.88% of mothers had poor knowledge. After the administration of structured teaching programme, in post test it was found that 18.75% of mothers had good knowledge, 65.63% had average knowledge and 15.62% had poor knowledge.

On basis of health status of under-five children in experimental group, 46.88% were mildly malnourished children and 53.12% were moderately malnourished. After the intervention of giving nutritious laddoo to malnourished children in post test 40.62% children shifted to normal state, 31.25% of children were in mild malnourishment and 28.13% were in moderate malnourishment.

Interpretation and Conclusion: The findings of this study support the need to provide Nutritious Laddoo to Under-Five Children to prevent from Malnutrition. Educating the mothers of under-five children with correct information regarding Protein Energy Malnutrition and Nutritious Diet will be helpful in improving the Health Status of Under-Five Children. This study proved that the Nutrition Demonstration Programme (NDP) had effect on Knowledge of Mothers and Health Status of Malnourished Under-Five Children.

INTRODUCTION

Child health is the foundation of the family and wealth of a nation. Disease free young children are the pillars of our nation.

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Good nutrition is the basic component of growth and development for maintenance of health throughout life. "Nutrition is defined as combination of dynamic process by which the consumed food is utilized for nourishment, structural and functional efficiency of every cell of the body." Under-five children require balanced nutrition to

become healthy for national growth and economic development**. (Vasundra Mrs.)**[1]

India has been a country which faced a number of natural calamities and epidemics that manifested into a series of health problems for the country. While the British ruled India, a number of draughts and famines plagued the country side that resulted in giving us a history of poverty and malnutrition particularly of women and children. India's children still languish in malnutrition inspite of lot of progress in terms of food production, procurement and food security. According to the voluntary health association of India, the term malnutrition implies imperfect nourishment which occurs when the demands of the body for certain nutrients are not met, results in Protein- Energy- Malnutrition or met in excess leads to over nutrition.[2]

Nutrition in early childhood can have lifelong implications. It is important to develop healthy eating practices in childhood to prevent or delay the development of lifestyle related diseases. Caregivers of this age must receive the best information and resources available. The health and nutrition of the children need protection in order to ensure sound foundation and secure the future of any society. In India, there are 53% of under-five children in which 67% million – live without basic healthcare facilities. This means that India alone accounts for about one-third of all children in the world aged below five who don't have basic health care. **(Park K, 2008)**[3]

Protein deficiency constitutes a major health problem in India and other countries of the developing world. In infants and children every year over 50% of children are undernourished. The most vulnerable period of malnutrition is first five years. And it is basically the result of poor knowledge on part of the mothers regarding nutritional requirements.[2]

Malnutrition means "badly nourished" but it is more than a measure of what we eat or fail to eat. Nutritional status is complex interaction between the food we eat, our overall state of health, and the environment in which we live. In short food, health and caring are the three pillars of well-being. Child malnutrition is the biggest challenge which our country is facing today, even when the economy is said to be surging ahead. Every second child under three in the country is malnourished.[4]

Kwashiorkor also called wet protein-energy malnutrition is a form of protein energy malnutrition characterised primarily by protein deficiency. This condition usually appears at the age of about 12 months when breast feeding is discontinued, but it can develop at any time during a child's formative years. Marasmus primarily caused by energy deficiency is characterised by stunted growth and wasting of muscle and tissue. Marasmus usually develops between the ages of six months and one year in children who have been weaned from breast milk.[5]

According to WHO Health Statistics of 2012 for India, the proportion of stunting was 47.9% and that of underweight was 43.5%. Protein energy malnutrition affects every fourth child worldwide. One hundred and fifty million (26.7%) are underweight while 182 million (32.5%) are stunted. Geographically more than 70% of PEM children live in Asia, 26 % in Africa and 4% Latin America and the Caribbean. Their plight may well have begun even before birth with a malnourished mother.[6] The global community has set a target of halving the prevalence of underweight children by 2015 as a key indicator of progress towards the Millennium Development Goal (MDG) of eradicating extreme poverty and hunger.[7]

A nutritious laddoo is a most popular ball shaped sweet in India which is nutritious as well as tasty. It is nutritious because of its ingredients with their own nutritive values. Different states use different recipes for preparation and have different names such as Krishna Poshak Mix in Hyderabad and nutritious laddoo in Punjab. In Punjab ingredients such as whole wheat, Black gram, Green Moong Dal, Jaggery, Groundnuts and Desi Ghee/Ghee are used to prepare it. Each ingredient has its own importance. Whole Wheat is a good source of carbohydrate and most efficient source of energy available to human body. Black gram is rich in protein, vitamin A, B, B_3, Potassium, Phosphorus, Calcium and Iron and helps in curing hair disorders and improves digestion. Green Moong Dal is also full of Proteins, fibre and Vitamins. Jaggery is rich in iron and is also improving digestion, curing cough, cold, asthma and constipation and purify blood. Jaggery also gives sweet taste to laddoo and therefore attracts children to eat it. Groundnuts give a crunchy taste to laddoo and are full of mineral and protein element. Desi ghee/Ghee helps in binding the laddoo and also provides energy to body and it is easy to digest and is full of vitamin A, D, E and K. Nutritious laddoo is beneficial in treating Protein Energy Malnutrition at low cost in home itself as it is easy to prepare. It has other benefits too like it is helpful in treatment of Anaemia as well and it can be prescribed to pregnant ladies so that they can give birth to healthy child.[8]

A descriptive study was conducted among the mothers of under-five children admitted to the paediatric wards of Rajah Muthiah Medical College and Hospital Chidambaram (Tamil Nadu) to assess the knowledge regarding protein energy malnutrition. Data was collected by purposive sampling technique from 30 mothers. The results showed that 26.67% mothers had inadequate knowledge, 53.33% mothers had moderately adequate knowledge and 20% mothers had adequate knowledge regarding protein energy malnutrition. This study concluded that inadequate knowledge of mothers may be the reason behind the illness of children. Jeyagowri S. Kamala S. (2009)[9]

Studies have pointed out the significant role of women's education in infant and child mortality, widespread women's education is an important determinant factor in unusually low mortality and yet low income regions. It has been noted that the similar set of relationship has been noted with regard to women's education and child's nutritional status.

The mother is the key person in the family to promote the child's well being and to prevent the diseases. Mother's education can generate different types of intrahousehold effects and thereby reducing the risk of nutritional deficiency like Protein- Energy- Malnutrition. The effects which will bring through mothers' education are:

- Improved health of children and nutrition knowledge among mothers.
- Psychological changes and improved nutritional behaviour
- Shift of power relations within the household in favour of better nutrition which includes breast feeding,

weaning practices and child feeding and pregnancy diets may lead to more effective dietary behaviour on the part of mother's who manage food resources within the household.[10]

Objectives

1. To assess the health status of under-five children in selected area.
2. To assess and compare the pre-test and post-test knowledge score of mothers' regarding nutritious diet of under-five children in both experimental and control group.
3. To assess the effect of NDP on health status of selected malnourished under-five children in experimental group.
4. To find out the correlation of knowledge of mothers' regarding nutritious diet with health status of malnourished under- five children in experimental group.
5. To find out the relationship of mean post-test knowledge score of mothers' regarding nutritious diet with selected demographic variables such as age of child, age of mother, no. of children, type of family, education of mother, occupation of mother, family income per month (in Rs), dietary pattern and source of information in experimental group.
6. To find out the relationship of health status of under-five children after the effect of NDP with selected demographic variables such as age of child, age of mother, no. of children, type of family, education of mother, occupation of mother, family income per month (in Rs), dietary pattern and source of information in experimental group.
7. To prepare and distribute informative guidelines to mothers' of under-five children on the basis of findings.

Hypothesis

H_1: The mean post-test knowledge score of mothers will be significantly higher than pre-test score regarding nutritious diet after NDP at $p \leq 0.05$ level of significance.

H_{01}: The mean post-test knowledge score of mothers will not be higher than pre-test regarding nutritious diet after NDP at $p \leq 0.05$ level of significance.

H_2: There will be significant improvement in Health Status of malnourished under- five children after NDP in experimental group at $p \leq 0.05$ level of significance.

H_{02}: There will be no significant improvement in Health status of malnourished under-five children after NDP in experimental group at $p \leq 0.05$ level of significance.

H_3: There will be significant co-relation between knowledge of mothers' regarding nutritious diet and health status of malnourished under- five children in experimental group.

H_{03}: There will be no significant co-relation between knowledge of mothers' regarding nutritious diet and health status of malnourished under- five children in experimental group.

H_4: There will be significant relationship between mean post-test Knowledge score of mothers of under-five year children with selected variables such as age of mother, no. of children, type of family, education of mother, occupation of mother, family income per month (in Rs), dietary pattern and source of information in experimental group.

H_{04}: There will be no significant relationship between mean post-test Knowledge score of mothers of under-five year children with selected variables such as age of mother, no. of children, type of family, education of mother, occupation of mother, family income per month (in Rs), dietary pattern and source of information in experimental group.

H_5: There will be significant relationship between health status of under-five children after the effect of NDP with selected variables such as age of child, age of mother, no. of children, type of family, education of mother, occupation of mother, family income per month (in Rs), dietary pattern and source of information in experimental group.

H_{05}: There will be no significant relationship between health status of under-five children after the effect of NDP with selected variables such as age of child, age of mother, no of children, type of family, education of mother, occupation of mother, family income per month (in Rs), dietary pattern and source of information.

METHODOLOGY

Research Approach

A Quantitative quasi experimental research approach was adopted to accomplish the objectives of the study to assess the effectiveness of Nutritional Demonstration Programme (NDP) on Mothers' Knowledge and Its Effect on Health Status of their Under -Five (UF) Malnourished Children in Selected Areas of Ludhiana, Punjab.

Research Design

Pre-test – post-test control group design was used in this study to achieve the objectives.
Experimental group – O1 X O2
Control group – O1 O2
O1 – Pre test
O2 – Post test
X – Intervention

Research Setting

The study was conducted in anganwadis and home settings of malnourished children of selected village of Ludhiana, Punjab which come under the Community Health Center Pakhowal, Ludhiana. The village which was selected by researcher was Sarabha which is at the walking distance of 500 meters from the college and has 4 anganwadis which has total 90 Under-Five Years Children. Five Children were not assessed as they belonged to migratory population and they were not approachable at their home also for 15-18 days.

Population

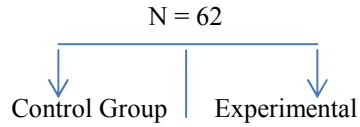
The assessible population consisted of all 62 Under-Five male and female Children and their mothers who fall in the category of mild and moderate malnourishment and regularly attending anganwadis in the selected village were included in the study.

Sampling Technique

Non Probability Sampling Technique in which Judgemental Technique was used to select the anganwadis. Then the physical health status of under-five children was assessed as per the criteria of World Health Organisation and mild and moderately malnourished children were selected. Total 32 and their mothers were contacted.

Sample

Sample was comprised of 62 under-five children and their mothers, 32 for experimental group and 30 for control group who fulfilled the inclusion and exclusion criteria from the selected village of Ludhiana.



Development and Description of Data Collection Tool

The tool used in the study was:

Part I- Socio Demographic Variables. Demographic tool - It consisted of age of child, age of mother, no. of children, type of family, education of mother, occupation of mother, family income per month (in Rs), dietary pattern and source of information.

Part II

Assessment of Weight for Age According to World Health Organisation

Weight was calculated in kilograms and then following criteria measure was used to assess the weight according to age.

Criteria Measure

Level	Percentile
Normal	Above 85th Percentile
Mild	50th-85th Percentile
Moderate	15th-50th Percentile
Severe	Below 15th Percentile

Assessment of Knowledge of Mothers regarding Nutritious Diet and Protein Energy Malnutrition

Criteria Measure

Level	Score
Good	>24
Average	18-24
Poor	<18

Part III- Self Structured Multiple Choice Questionnaires were constructed to assess the knowledge regarding diet of under-five children and protein energy malnutrition and checklist for return demonstration.

Part IV- Teaching Plan was prepared to teach the mothers regarding protein energy malnutrition and nutritious diet.

Content Validity of Tool

Content validity was done by obtaining the valuable opinions and suggestions from the experts in Community Health Nursing, Paediatric Nursing, Obstetric and Gynaecological Nursing, Medical Surgical Nursing and Psychiatric Nursing Field. At the time of construction of tool there were total 25 Multiple Choice Questions and after taking suggestions from the experts the Multiple Questions were increased to 32 in number and distractors were changed according to the suggestions given by the experts.

Reliability of the Tool

Reliability was calculated by applying split half method and Karl Pearson's correlation coefficient and it was 0.84. It shows that the tool was reliable to conduct the main study.

Pilot Study

Pilot study was conducted on 1/10th of total sample in the selected anganwadis on under-five malnourished children who had mild and moderate malnutrition and their mothers. Pilot study was conducted in the month of November 2014 with the objective to find out the feasibility and accountability in the tool items and to find out the generalizability of the study.

Data Collection Procedure

The researcher collected the data in the month of February 2015- March 2015 from the under- five malnourished children and from their mothers. Firstly researcher visited anganwadis of selected villages and did physical examination of Under-Five Year Children in terms of weight according to WHO Weight for Age Growth Chart. Researcher selected two anganwadis from one side of village as experimental setting and other two anganwadis from other side of village as control setting to avoid contamination. Then researcher selected the mild and moderate malnourished children from those anganwadis .The mothers of those mildly and moderately malnourished children were called to anganwadis and purpose of study was explained to them and written consent was taken from them that they were willing to participate in the study. Then knowledge of mothers of both experiment and control group was assessed. After that teaching was given to the mothers in experimental group regarding nutritious diet and protein energy malnutrition and demonstration of nutritious laddoo preparation was given. Following that re-demonstration was taken from mothers and they were motivated to give nutritious diet to their child. The researcher took the post test for Knowledge of mothers regarding nutritious diet and Protein energy malnutrition from both experiment and control group after one week of structured teaching programme. Researcher herself provided nutritious laddoo to the children whose families were not able to afford and had not enough time to prepare at home. Researcher went to their home settings in off hours on same time to make sure that the mothers were giving nutritious diet to their malnourished children as per instructions given. After giving this intervention for complete 40 days to experimental group researcher again checked the weight of malnourished under-five children in experimental and control group to check the effectiveness of Nutritious laddoo on weight of malnourished under-five children in experimental group.

Data Analysis

Data analysis was done by using descriptive and inferential statistics according to the objective of the study. Descriptive statistics like mean, percentage and standard deviation was calculated to know about the sample dispersion and the average value.

Inferential statistics i.e. 't' test and Chi- square and ANOVA methods were used to analyse the data. The't' test was used to

find out the effectiveness of intervention in experimental group. Chi square was used to find out the matching of demographic variables between control and experimental group and to describe the demographic characteristics. ANOVA was used to find out the relationship of Knowledge of mothers and health status of their malnourished children with the selected demographic variables.

RESULTS & DISCUSSION

The first objective of the study was to assess the level of malnutrition among under-five children in selected area with the help of standardized WHO growth chart. It was concluded that 50.59% of under-five children were moderate malnourished (15th-50th percentile) and 22.35% of under-five children were mildly malnourished (50th -85th percentile) and only 2.35% were severely malnourished (<15th percentile).

The second objective was to assess and compare the pre-test and post-test knowledge score of mothers regarding nutritious diet of under-five children in both experimental and control group. The study concluded that in experimental group, the pre-test mean knowledge score was 15.78 and post-test mean knowledge score was 20.37. The difference between pre and post-test mean knowledge score in experimental group was found significant at $p \leq 0.05$ level of significance. In control group pre-test mean knowledge score was 15.30 and post-test mean knowledge score was 15.60. The difference between pre and post-test mean knowledge score in control group was non-significant.

The third objective was to assess the effect of NDP on health status of selected malnourished under-five children in experimental group The mean pre-test weight of malnourished under-five children in experimental group was 13.93.The mean post-test 1 weight of malnourished under-five children was found to be 14.35 on 20th day of observation. The mean post-test 2 weight of malnourished under-five children increased to 14.73 on 30th day of observation. On final 40th day of observation the mean post-test weight increased to 14.92. This clearly showed that there was effect of NDP on the health status of selected under-five malnourished children.

The fourth objective was to find out the correlation of knowledge of mothers' regarding nutritious diet and health status of malnourished under- five children in experimental group**.** The study concluded that mean score of knowledge of mothers and health status of children were 20.37 and 14.92 respectively. Therefore, the correlation between knowledge of mothers and health status of under-five children is Low degree of positive correlation.

The fifth objective was to find out the relationship of mean post-test knowledge score of mothers' regarding nutritious diet with selected demographic variables such as age of child, age of mother, no. of children, type of family, education of mother, occupation of mother, family income per month (in Rs), dietary pattern and source of information in experimental group. The mean post-test knowledge score was found to be significant in demographic variables such as occupation of mother, education of mother and source of information, within the group at $p \leq 0.05$ level of significance. The mean post-test Knowledge score was found to be non- significant with demographic variables like age of mother, type of family, number of children, family income per month (in Rs), and dietary pattern.

The sixth objective was to find out the relationship of health status of under-five children after the effect of NDP with selected demographic variables such as age of child, age of mother, no. of children, type of family, education of mother, occupation of mother, family income per month (in Rs), dietary pattern and source of information in experimental group. The mean post-test weight was found to be significant in Demographic variables like age of children, education of mother and source of information, at $p \leq 0.05$ level of significance. The mean post-test weight was found to be non-significant in demographic variables like age of mother, number of children, type of family, occupation of mother, family income per month (in Rs) and dietary pattern.

CONCLUSION

Total 85 under-five children were assessed in Sarabha Village and out of 85 children 75.29% children were suffering from Malnutrition. After selecting mildly and moderately malnourished children the sample was divided into two groups i.e Experimental and control group. 32 children were taken in experimental group and 30 were taken in control group. Knowledge of mothers was assessed and in experimental group 71.88% and 28.12% mothers had Poor and Average knowledge in pre-test and after structured teaching programme only 15.62 % mothers were left with poor knowledge while 65.63% mothers had average knowledge and 18.75 % mothers gained good knowledge. Two nutritious laddu weighing 50 gram each was given to all children daily under personal supervision for complete 40 days and researcher assessed the weight of child in between and it was seen that the children started gaining weight at 20th day as 9.28% children became normal and at 40th day it was found that 40.63% children were in the normal state which clearly showed that home- made less expensive nutritious laddu was beneficial in improving the health status of under-five children.

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How to cite this article:

Simranjeet Kaur and Balwinder Kaur (2018) 'A Quasi - Experimental Study to Assess the Effect of Nutritional Demonstration Programme (Ndp) on Mothers' Knowledge and its Effect on Health Status of their Under-Five (Uf) Malnourished Children in Selected Areas of Ludhiana (Punjab)', *International Journal of Current Advanced Research,* 07(1), pp. 8908-8913. DOI: http://dx.doi.org/10.24327/ijcar.2018.8913.1453

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