

# **“A Study To Assess The Effectiveness Of Structured Teaching Programme On Knowledge Regarding Balanced Diet Among Mothers Of Underweight Preschool Children In Selected Villages At Udaipur.”**

Mr. Yassar Khan

Master Of Science In Nursing

Child Health Nursing

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## **ABSTRACT**

### **BACKGROUND AND OBJECTIVES:**

Malnutrition is a worldwide problem and a major public health concern. A report by the International Food Policy and Research Institute indicated that developing countries have the largest proportions of malnourished children. According to this report, over one third of the children in developing countries are malnourished. Despite the various programs to combat this health crisis, under nutrition remains to be an overriding problem among children 0-10 years old and continues to be a top most concern. Dietary advice from health care personnel has been effective in achieving only modest dietary change.

### **STATEMENT OF PROBLEM:**

“A study to assess the effectiveness of structured teaching programme on knowledge regarding balanced diet among mothers of underweight preschool children in selected villages at Udaipur.”

### **OBJECTIVES OF THE STUDY:**

1. To assess the pre test knowledge regarding balanced diet among mothers of underweight preschool children.
2. To assess the post test knowledge regarding balanced diet among mothers of underweight preschool children.
3. To evaluate the effectiveness of structured teaching programme by comparing the pre and post test scores.
4. To determine the association between knowledge regarding balanced diet and selected socio-demographic variable of mothers.

### **ASSUMPTIONS:**

The study assumes that:

1. The mothers of underweight preschooler children may not have adequate knowledge regarding balanced diet for their children.
2. Structured teaching programme will improve the knowledge regarding balanced diet among mothers of underweight preschool children.
3. The knowledge regarding balanced diet for preschoolers may have relation with demographic variables of the mothers.

### **HYPOTHESIS**

**H1:** The mean post test knowledge on balanced diet will be significantly higher than mean pre test knowledge among mothers of underweight preschool children.

**H2:** There will be significant association between the knowledge of mothers regarding balanced diet for preschool children and selected demographic variable.

### **METHOD:**

One group pre and post test pre-experimental design was used for this study to find out the effectiveness of structured teaching programme. The mothers of underweight preschool children were selected. The samples were drawn from villages under the primary health center (P.H.C.) Bara Pal, Udaipur. They were selected by using convenient sampling technique. Structured teaching programme was given to the samples after pretest. On 8<sup>th</sup> day after the structured teaching programme post test was done to assess the knowledge on balanced diet. In this study a comparison between the pretest and post test score was done to find out the effectiveness of structured teaching programme.

### **RESULTS:**

There was a significant improvement obtained following S.T.P. on the knowledge regarding balanced diet among mothers of underweight preschool children. Pretest mean is 10.98, S.D. is 3.2 and after S.T.P.

mean is 20.48 S.D. is

3.29. Its enhancement mean is 9.5 S.D. is 1.9. Paired *t* test value 36.8 is significant at  $p < 0.05$  level. The results of Chi-square analysis indicated that there was significant association between knowledge with age, number of children, education, monthly income, and type of family.

**INTERPRETATION AND CONCLUSION:**

There was a significant improvement obtained following STP on the knowledge regarding balanced diet among mothers of underweight preschool children. This study enlightens that there is a need for educational programmes in the anganwadi or schools or community based educational programmes to improve the knowledge regarding balanced diet. Based on the above findings of the study, recommendations were drawn for nursing practice, nursing administration, nursing education and nursing research.

**KEYWORDS:** Structured teaching programme; knowledge; balanced diet

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## I. INTRODUCTION

*Disease is only a healthy response to an unhealthy environment...*

*-Brain Schaefer*

Pediatrics is the branch of medicine that deals with the medical care of infants, children, and adolescents. The age limit of such patient ranges from birth to

18. In countries where the age of majority is 18, this age limit may be from birth to age 17. A medical practitioner who specializes in this area is known as a pediatrician.<sup>1</sup> In nutrition, diet is the sum of food consumed by a person or other organism. Dietary habits are the habitual decisions an individual or culture makes when choosing what foods to eat. With the word diet, it is often implied the use of specific intake of nutrition for health or weight management reasons (with the two often being related). Although humans are omnivores, each culture and each person holds some food preferences or some food taboos, due to personal tastes or due to ethical reasons. Individual dietary choices may be more or less healthful. Proper nutrition requires the proper ingestion and equally important, the absorption of vitamins, minerals, and food energy in the form of carbohydrates, proteins, and fats. Dietary habits and choices play a significant role in health and mortality, and can also define cultures and play a role in religion.<sup>2</sup>

Malnutrition is a worldwide problem and a major public health concern. A report by the International Food Policy and Research Institute indicated that developing countries have the largest proportions of malnourished children. According to this report, over one third of the children in developing countries are malnourished. Malnutrition is a major health concern because a large number of young children die each year due to complications resulting from poor nutritional status. Malnutrition coupled with the high incidences of infections account for the high mortality rates observed among children in developing countries. More than half of the yearly 10.8 million deaths of children younger than 5 years are attributed to malnutrition according to the international reference recommended by the World Health Organization (WHO). These deaths are not caused by higher frequency of common childhood diseases but by higher case fatality rates and would not occur if the children were not malnourished. Malnourished children who survive have a high risk of impaired health and function throughout life, which contributes to the intergenerational continuation of poverty. In developing countries more than one quarter of all children younger than 5 years, about 150 million total, are estimated to be malnourished (Rivera et.al. 2004). Today, malnutrition affects one-fifth of the world's population despite the fact that the world has enough food to provide every individual with the food they need to lead a healthy and productive life. Adequate food at the international, national or even regional level does not rule out food shortages at the household level. The coexistence of hunger and malnutrition with the capacity to end them both continues to be one of the great paradoxes of our time (WHO Geneva, 1997)<sup>3</sup>

Devising a balanced diet, that is a diet that gives all the necessary nutrients to an individual is at once a simple and complicated task. This is because the knowledge of what contributes to a balanced diet is very simple; but how to offer it to a given individual requires tact and wisdom along with the knowledge.<sup>4</sup>

Health has been the ultimate agenda to be acquired by most regions in the world for the coming millennium as emphasized in the "Alma Ata Declaration" that health should be accessible to all by year 2000. Poor nutrition is an increasing problem for economically deprived families, and mothers play a key role in establishing children's diets. Childhood obesity is a global epidemic involving both developed and developing countries. It is a state of over-nutrition with long-term complications such as dyslipidemia, hypertension, and coronary artery disease and type-2 diabetes. Underweight is the result of under nutrition leading to reduction in growth and development of every body organ especially the Central Nervous System. Long-term under-nutrition causes failure in linear growth (height) of the child. Growth is further retarded by the repeated attacks of respiratory infections, diarrhea and anemia as a result of reduced immunity.<sup>5</sup>

Many parents feel uncertain about what constitute a normal or recommended food intake for the children. This uncertainty can lead to worries that a child is not eating well enough variety is important in child's diet. Children need a a lot of different types of food to get the energy they need to grow, to learn and to stay healthy. Children need a range of foods from each of the food group.<sup>6</sup>

The amount of nutrients needed by individuals vary with different ages, activities and sex. A well planned diet which furnishes a sufficient amount of nutrients mentioned from natural foods, will supply adequate amount of all nutrients well. A balanced diet is one which contains the various food stuffs, such as energy yielding foods, body building foods and protective foods in the correct proportions so that individual is assured of obtaining the minimum requirement of all the nutrients. Mothers consider the needs of their family (e.g. children, partner, and extended family members) and other constraints, such as time and cost, as they make daily decisions related to planning meals, shopping for food, and preparing meals. These decisions can affect a child's present and future food choices. In the present, a mother selects what foods are available at home and what meals are provided. Studies demonstrate the association of food resources in the home with children's intake of soft-drinks and fruit and vegetables. Evidence suggests mothers' modeling of unhealthy food choices, such as consuming sweet snacks or high-energy drinks, may influence children's intake of sweet snacks and high-energy drinks. In addition, research indicates that mother shapes her child's eating habits, including self-control in eating and food preferences, which can remain with the child in the future. Studies discuss the importance of a mother's feeding style on her children's weight status.<sup>7</sup>

A child's mother is not the only key player in determining the child's food choices. Other family members also influence how individuals make food choices, and for Women, a woman's mother can have a lasting impression on her daughter's and grandchildren's food choices. Women typically learn about food and cooking from their mothers, or others, such as grandmothers and mothers-in-law, during childhood and adolescence, and incorporate their mother's food practices into their own food choices. Scholars conceptually describe how food practices are transferred from mothers to daughters, who are also mothers, through "solidarity and separation processes". Furthermore, a woman's mother can be a present influence on her family's food choices through direct interactions with grandchildren. Studies indicate grandmothers may "undermine" a mother's control over the mother's food choices for her child.<sup>8</sup>

## **NEED FOR THE STUDY**

India is one of the fastest growing countries in terms of population and economics, sitting at a current population of India is 1,382,233,964 till March 2020, based on World meter elaboration of the latest United Nations data. India 2020 population is estimated at 1,380,004,385 people at midyear according to UN data. Indian population is equivalent to 17.7% of the total world population and growing at 1.5 % annually (2019-2020)<sup>9</sup> Though most of the population is still living below the National Poverty Line, its economic growth indicates new opportunities and a movement towards increase in the prevalence of chronic diseases which is observed in at high rates in developed countries such as United States, Canada and Australia. The combination of people living in poverty and the recent economic growth of India has led to the co-emergence of two types of malnutrition: under nutrition and over nutrition. The implication of both over nutrition and under nutrition indicates that a country can exert rates of infectious diseases and chronic diseases simultaneously: A situation that has not been observed before in history.<sup>10</sup>

Christine Joy T. Soldao has conducted a study to assess the effect of lecture and meal guide on the knowledge, attitude, and practices of mothers with undernourished children ages 2-5 years old regarding proper meal preparation and on the nutritional status of their undernourished children in fishing village, Barangay Poblacion , Alicia, Zamboanga Sibugay Province . Total 48 mothers were selected as the samples. The intervention was the lecturing about the meal guide. The result of the study shows a tremendous increase in the knowledge of mothers about the preschool nutrition.<sup>4</sup>

According to the World Food Program and the M.S.Swaminathan Research Foundation (MSSRF), over the past decade there has been a decrease in stunting among children in rural India, but inadequate calorie intake and chronic energy deficiency levels remain steady.<sup>7</sup> Today child malnutrition is prevalent in 7 percent of children under the age of 5 in China and 28 percent in sub-Saharan African compared to a prevalence of 43 percent in India. Under nutrition is found mostly in rural areas and is concentrated in a relatively small number of districts and villages with 10 percent of villages and districts accounting for 27-28 percent of all underweight children.

Under nutrition includes both protein-energy malnutrition and micronutrient deficiencies. Undernourishment not only affects physical appearance and energy levels, but also directly affects many aspects of the children's mental functions, growth and development which has adverse effects on children's ability to learn and process information and grow into adults that are able to be productive and contributing members of society. Undernourishment also impairs immune function leaving them more susceptible to infection. Child malnutrition is responsible for 22 percent of India's burden of disease.<sup>10</sup>

Micronutrient deficiencies are also a widespread problem in India. The prevalence of micronutrient deficiencies varies in different states, More than 75 percent of preschool children suffer from iron deficiency anemia (IDA) and 57 percent of preschool children have sub-clinical Vitamin A deficiency (VAD). Most growth retardation occurs by the age of two, and most damage is irreversible. The prevalence of underweight in rural areas 50 percent versus 38 percent in urban areas and higher among girls (48.9 percent) than among boys (45.5 percent). At the same time as a large number of population suffers from malnutrition, more than 100 million people (11% of Indian population) in India are over-nourished.<sup>10</sup>

A study done by experts in the food and nutrition department of M S University (MSU), found that there was a big divide in the children aged six to fourteen of the urban and rural areas of the Vadodara district. The study found that 75% of 3,000 children in the rural areas of this district were malnourished, whereas 15% of the 23,000 children studied in the urban areas were overweight.<sup>9</sup>

Survey results done by the medical students of Ateneo de Zamboanga University School of Medicine in 2007 showed that of the 115 children ages 5 and below 73 % or 85 children suffered malnutrition, 45.9% (39) are mildly wasted, 32.9% (28) are moderately wasted, and 21.1% (18) are severely wasted.<sup>4</sup>

To perform a balanced diet adapted to the needs of the different life stages is important for a correct children's physical and psychological growth, preventing disease, and obtaining an optimal health status. Food is actually very closely related to our social and cultural lives. It forms an integral part of our family, religions and cultural celebrations. Many aspects of food are culturally determined: such as what parents think is appropriate to be eaten; how we eat (with fingers, spoon and forks, or chopsticks); with whom we eat, and when we eat throughout the whole day. Children, in particular, rely on their parents' and caregivers' attitude and behavior in terms of providing the appropriate healthy choices of food, environment and living conditions. Teaching children to make healthy choices in the food they select is certainly a worthwhile goal and one that will affect their lives through adulthood.<sup>6</sup>

Children are building their bodies that are to last them a life-time, therefore they must know that the food they eat has a direct relationship to the quality of their health. They must be informed that consuming processed foods or foods high in sugar, salt and fat are physically detrimental. An intervention program in preschools is necessary to install in children a positive attitude towards food.<sup>6</sup>

The parents have to -uncleanl the wrong habits that they have been practicing; that is, of making the child eat more by forcing, diverting her attention, coaxing, cajoling, threatening and screaming. They may have even struck your child when she did not eat. We are surprised at the number of parents who admit to having beaten their children if they did not wipe -their plates clean.<sup>5</sup>

The latest trend among families in India is to have meals outside because working mothers and the mothers who do not have time to prepare home-cooked food. The eating out life style further aggravates the problems of unhealthy eating and unbalanced diet. We find now, more and more children eat food brought from stalls along road sides or from fast food restaurants. Hence there is a great need to educate children as well as the parents on the importance of good nutrition for healthy growth and for prevention of illness.<sup>11</sup>

Young children embark on a traditional nutrition journey, progressing from total reliance on care givers to independence, autonomy and self determination. Appropriate nutritional intake in children is a diverse concept, incorporating suitable nutritional choices and feeding behaviors'. Lessons learned in childhood will have long term effects on the individual and the society overall. Since in India children are raised in a country where under and over nutrition exist simultaneously, a careful balance should be achieved in any national public health message. The Indian pediatric food based dietary guide lines for children younger than 7 years strive to facilitate the education of care givers of young children in the adoption of healthy eating practices. The guidelines address issues regarding variety in the diet that has been shown to improve both micro and macro nutrient intakes.<sup>12</sup>

Therefore more research studies should focus on nutrition education in mothers of preschool children as we believe that mothers have much to learn about food and nutrition. Maternal education has also been identified as one of the factors that influence the nutritional status of young children (Smith and Haddad, 2000).The incidence of malnutrition has been reported to decrease as the mother attains more education (Cochrane et al., 1982; Ighogboja, 1992). Mothers and caretakers with formal education tend to feed their children more frequently and pay more attention to what their children eat.<sup>13</sup>

From the above researches and evidences I found a strong need to conduct a new research on effectiveness of structured teaching programme regarding balanced diet among mothers of underweight preschool children.

## **II. OBJECTIVES**

### **STATEMENT OF PROBLEM:**

“A study to assess the effectiveness of structured teaching programme on knowledge regarding balanced diet among mothers of underweight preschool children in selected villages at Udaipur.”

### **OBJECTIVES OF THE STUDY:**

1. To assess the pretest knowledge regarding balanced diet among mothers of underweight preschool children.
2. To assess the post test knowledge regarding balanced diet among mothers of underweight preschool children.
3. To evaluate the effectiveness of structured teaching programme by comparing the pre and post test scores.
4. To determine the association between knowledge regarding balanced diet and selected socio-demographic variable of mothers.

### **OPERATIONAL DEFINITIONS:**

1. **EFFECTIVENESS:** It refers to the extent to which the structured teaching programme will be helpful in gaining knowledge regarding balanced diet among the mothers of underweight preschool children.
2. **STRUCTURED TEACHING PROGRAMME:** It is a systematically developed programme with teaching aids, design to impart knowledge regarding balanced diet among the mothers of underweight preschool children.
3. **PRESCHOOLER:** In this study preschooler denotes the children between the age group of 4-6 years.
4. **UNDERWEIGHT:** According to Indian Academy of Pediatrics underweight denotes less than 20% of the expected weight for their age.<sup>15</sup> The present study also means underweight as the children having less than 20% of expected weight for their age.
5. **BALANCED DIET:** A balanced diet means getting the right types and amounts of foods and drinks to supply nutrition and energy for maintaining body and for supporting normal growth and development.<sup>8</sup> In this study is refers to the low cost foods containing less amount of milk and fair amount of cereals, legumes and green leafy vegetables.
6. **KNOWLEDGE:** Information possessed regarding balanced diet among mothers of underweight preschool children.
7. **MOTHER:** A woman who have an underweight child in the age between 4- 6 years at selected villages in Udaipur .
8. **SELECTED VILLAGES:** It refers to the villages under Bara Pal PrimaryHealth Centre.

### **ASSUMPTIONS:**

The study assumes that:

1. The mothers of underweight preschooler children may not have adequate knowledge regarding balanced diet for their children.
2. Structured teaching programme will improve the knowledge regarding balanced diet among mothers of underweight preschool children.
3. The knowledge regarding balanced diet for preschoolers may have relation with demographic variables of the mothers.

### **DELIMITATION**

The study is limited to the mothers of underweight preschool children in the selected villages at Udaipur District.

### **HYPOTHESIS:**

**H1:** The mean post test knowledge on balanced diet will be significantly higher than mean pre test knowledge among mothers of underweight preschool children.

**H2:** There will be significant association between the knowledge of mothers regarding balanced diet for preschool children and selected demographic variable at 0.05 Level of significant.

### **CONCEPTUAL FRAME WORK**

A concept is defined as a complex mental formation of an object, property, or event that is derived from individual perception and experiences.

A conceptual frame work is interrelated concepts or abstractions that are assembled together in some rational scheme by virtue of their relevance to a common theme. A person's ability to participate in health care is influenced by one's own health beliefs. The conceptual frame work of the present study was developed based on the General System Theory by Ludwig Von Bertalanffy(1968).<sup>16</sup> In this study there are input, throughput and output'.

## **INPUT**

Input is the process by which the system receives energy and information from the environment. In the present study the mothers of preschool children are the system that has input within itself and that acquired from the environment. This input includes the demographic performance which may influence the knowledge and factors influencing the knowledge regarding balanced diet for preschool children.

## **THROUGH PUT (PROCESS)**

It refers to the use of input, that is, information for the maintenance of a homeostasis of the system. Through dynamic interaction with the environment, the system changes information in different forms. The present study focuses on the preparation, assessment of the knowledge and the administration of the structured teaching programme to the mothers of underweight preschool children regarding balanced diet.

## **OUTPUT**

It refers to the outcome of the input and process as they relate to the target group trained by the structured teaching programme. In the present study evaluation of the effectiveness of the structured teaching programme for mothers of preschool children is the output that may be regarded as the product of the process. This is demonstrated by the comparison between pre and post test knowledge regarding balanced diet for the preschool children. The increased post test score is an indication of the effectiveness of the structured teaching programme.

## **III. REVIEW OF LITERATURE**

Review of literature is a key step in the research process. Review of literature refers to an extensive, exhaustive and systematic examination of publications relevant to the research project. It can inspire new research ideas and helps to lay the foundations for further studies. It is a critical early task for most of quantitative researchers.<sup>17</sup> A literature review early in the reports provides me with a background for understanding current knowledge on a topic i.e. effectiveness of structured teaching programme on knowledge regarding balanced diet among mothers of underweight preschool children and illuminates the significance of this new study. Written literature reviews thus serve an integrating function and facilitating the accumulation of the evidence on this current problem.

**The reviewed related literature for the present study has been organized under the following headings.**

1. The impact of nutrition education with and without a school garden on knowledge, vegetable intake and preferences and quality of school life among primary-school students.
2. Prevalence of malnutrition in preschool children.
3. Knowledge of mothers regarding nutrition.
4. Need for nutrition education.
5. Effectiveness of structured teaching programme in improving nutritional status.
6. Prevalence of malnutrition in children.
7. Studies related to role of nutrition and activities of children.

The impact of nutrition education with and without a school garden on knowledge, vegetable intake and preferences and quality of school life among primary-school students.

To investigate the impact of school garden-enhanced nutrition education (NE) on children's fruit and vegetable consumption, vegetable preferences, fruit and vegetable knowledge and quality of school life. Quasi-experimental 10-week intervention with nutrition education and garden (NE&G), NE only and control groups. Fruit and vegetable knowledge, vegetable preferences (willingness to taste and taste ratings), fruit and vegetable consumption (24 h recall  $\times$  2) and quality of school life (QoSL) were measured at baseline and 4-month follow-up. Two primary schools in the Hunter Region, New South Wales, and Australia. A total of 127 students in Grades 5 and 6 (11-12 years old; 54 % boys). Relative to controls, significant between-group differences were found for NE&G and NE students for overall willingness to taste vegetables ( $P < 0.001$ ) and overall taste ratings of vegetables ( $P < 0.001$ ). A treatment effect was found for the NE&G group for: ability to identify vegetables ( $P < 0.001$ ); willingness to taste capsicum ( $P = 0.04$ ), broccoli ( $P = 0.01$ ), tomato ( $P < 0.001$ ) and pea ( $P = 0.02$ ); and student preference to eat broccoli ( $P < 0.001$ ) and pea ( $P < 0.001$ ) as a snack. No group-by-time differences were found for vegetable intake ( $P = 0.22$ ), fruit intake ( $P = 0.23$ ) or QoSL ( $P = 0.98$ ). School gardens can impact positively on primary-school students' willingness to taste vegetables and their vegetable taste ratings, but given the complexity of dietary behaviour change, more comprehensive strategies are required to increase vegetable intake.<sup>55</sup>

### **Prevalence of malnutrition in children.**

The World Bank estimates in 2011 that India is ranked 2nd in the world of the number of children

suffering from malnutrition, after Bangladesh, where 47% of the children exhibit a degree of malnutrition. The prevalence of underweight children in India is among the highest in the world, and is nearly double that of Sub-Saharan Africa with dire consequences for mobility, mortality, productivity and economic growth. The 2011 Global Hunger Index (GHI) Report ranked India 15th, amongst leading countries with hunger situation. It also places India amongst the three countries where the GHI between 1996 and 2011 went up from 22.9 to 23.7, while 78 out of the 81 developing countries studied, including Pakistan, Nepal, Bangladesh, Vietnam, Kenya, Nigeria, Myanmar, Uganda, Zimbabwe and Malawi, succeeded in improving hunger condition. The prevalence of micronutrient deficiencies varies in different states, More than 75 percent of preschool children suffer from iron deficiency anemia (IDA) and 57 percent of preschool children have sub-clinical Vitamin A deficiency (VAD). Iodine deficiency is endemic in 85 percent of districts, mostly due to the lack of iodized salt that is common in the developed world. Progress in reducing the prevalence of micronutrient deficiencies in India has been slow. The prevalence of underweight in rural areas 50 percent versus 38 percent in urban areas and higher among girls (48.9 percent) than among boys (45.5 percent).<sup>18</sup>

In India 44% of children under the age of 5 are underweight. 72% of infants and 52% of married women have anemia. Research has conclusively shown that malnutrition during pregnancy causes the child to have increased risk of future diseases, physical retardation, and reduced cognitive abilities.<sup>54</sup>

The World Health Organization estimates that by the year 2015, the prevalence of malnutrition will have decreased to 17.6% globally, with 113.4 million children younger than 5 years affected as measured by low weight for age. The overwhelming majority of these children, 112.8 million, will live in developing countries with 70% of these children in Asia, particularly the south central region, and 26% in Africa. An additional 165 million (29.0%) children will have stunted length/height secondary to poor nutrition. Currently, more than half of young children in South Asia have PEM, which is 6.5 times the prevalence in the western hemisphere. In sub-Saharan Africa, 30% of children have PEM. Despite marked improvements globally in the prevalence of malnutrition, rates of under nutrition and stunting have continued to rise in Africa, where rates of under nutrition and stunting have risen from 24% to 26.8% and 47.3% to 48%, respectively, since 1990, with the worst increases occurring in the eastern region of Africa.<sup>19</sup> In a survey done by UNICEF in 2009 showed that the prevalence of malnutrition varies across states, with Madhya Pradesh recording the highest rate (55 per cent) and Kerala among the lowest (27 per cent). In India, around 46 per cent of all children below the age of three are too small for their age, 47 per cent are underweight and at least 16 per cent are wasted. Many of these children are severely malnourished. Anaemia affects 74 per cent of children under the age of three, more than 90 per cent of adolescent girls and 50 per cent of women. Iodine deficiency, which reduces learning capacity by up to 13 per cent, is widespread because fewer than half of all households use iodised salt. Vitamin A deficiency, which causes blindness and increases morbidity and mortality among pre-schoolers, also remains a public-health problem.<sup>20</sup>

### **Prevalence of malnutrition in preschool children**

A cross-sectional study was conducted to understand the prevalence of chronic malnutrition and to identify the factors affecting height-for-age z-score (HAZ) among preschool children, among 380 randomly-selected children aged less than five years in Dhaka city, Bangladesh in 2009. Results of analysis of this study data revealed that the prevalence of stunting among preschool children in Dhaka city was 39.5%, with 25% severely stunted and 14% moderately stunted ( $p < 0.001$ ). Results of bivariate analysis revealed that socioeconomic and demographic factors were most significantly associated with the stunting of children.<sup>21</sup>

A cross sectional anthropometric study done in Yemen in 2008 using a sample of 3407 children revealed that an overall prevalence of wasting (8.7%) and stunting (35.2%). For younger age groups, rural children were shorter than urban children, but at 7 years of age all the children were similar, with a mean height for age corresponding to 1.7 standard deviations of that for the reference population.<sup>22</sup>

A study done in Sri Lanka in 2003 by using anthropometric measurement as the tool to assess the nutritional status of preschool children showed that about 18% of the preschool children born in this region during this period show poor nutritional status of the mother and her family. They also found that about 26% of the growth charts show unsatisfactory growth rates and hence about 26% of them were suffering by acute or chronic malnutrition. They further found that about 61% of the preschool children have been admitted to the clinics and hospitals at least once due to medical and other pediatric problems related to malnutrition. Analysis revealed that — severe and —moderate acute malnutrition were associated with 5.1% and 19.1% of the preschool children respectively. Analysis of height-for-age revealed that the children of age above 2 years had severe growth impairment and hence we can conclude that the most devastating situation arose just after exodus 1995. They also found that —severe and —moderate chronic malnutrition were associated with 2.2% and 52.3% of the preschool children respectively.<sup>23</sup>

Three cross-sectional surveys were conducted between 1996 and 1998 to monitor the nutritional status of the children in Kenya. Anthropometric indices are presented for 2,103 children. The prevalence of stunting

(Z-scores for height-for-age [HAZ]  $<-2$ ), wasting (Z-scores for weight-for-height [WHZ]  $<-2$ ) and being underweight (Z-scores for weight-for-age [WAZ]  $<-2$ ) was 30%, 4%, and 20%,

respectively. This was severe (Z-score  $<-3$ ) in 12% (stunting), 1% (wasting), and 5% (underweight) of the children. Few children less than three months of age were malnourished ( $<2\%$ ), but height-for-age and weight-for-age deficits increased rapidly in children 3–18 months of age, and were greatest in children 18–23 months old (44% stunted and 34% underweight).<sup>24</sup>

#### **Knowledge of mothers regarding nutrition.**

A study was done in Tamil Nadu in 2011 to assess the knowledge on nutrition of under five children among migrating mothers, and prevalence of nutritional problems among their children. The study found that, maximum 59 (98.33%) of the mothers had inadequate knowledge on nutrition of under five children, 1(1.67%) of the mothers had adequate knowledge. The prevalence of clinical aspects of nutritional problems were lack of luster in 45 (70%), thick built 35 (58.3%), pale conjunctiva 33 (55%), angular stomatitis 16 (26.6%), pale and flabby sign 23 (38.3%), red and raw signs 3 (5%), mottled enamel 32 (53.3%), Dental carries 18 (80%), parotid gland enlargement 1 (1.6%), dry and scaly skin 4 (96.6%), koilonychia 5 (83%). With regard to degree of malnutrition 5 (8.33%) of them had III degree malnutrition, 23 (38.33%) of them had II degree of malnutrition, 29 (48.33%) of them had I degree malnutrition and 3 (5%) of them had normal nutritional status. The mean score of overall knowledge on nutrition of under five as 8.57 with S.D. 2.63, the mean score of degree of malnutrition was 74.37 with S.D. 10.5 with an  $r^2$  value of -0.225 which indicate that when knowledge level decreases the prevalence rate will be increased.<sup>25</sup>

#### **NEED FOR NUTRITION EDUCATION.**

A community-based cross-sectional study carried out in tribal areas of Maharashtra covering 1751 pre-school children to assess nutritional status in 2011. Nutritional status was assessed using new WHO Growth Standards. Household wealth index was constructed using principle component analysis. The prevalence of underweight, stunting and wasting was 64, 61 and 29%, respectively. There was a significant ( $p < 0.05$ ) reduction in the prevalence of underweight and stunting over two times periods (1999 and 2008). Logistic regression showed that the risk of underweight was 1.7 times higher among children of illiterate mothers and those suffering from orbidities, while stunting was 1.4 times higher among children belonging to lowest and middle household's wealth indexes. Under nutrition is a public health problem and is associated with literacy of mother, household wealth index and morbidities. Therefore, improving socio-economic condition along with literacy of mothers and preventing infections through personal hygiene might help in improving the nutritional status of children.<sup>26</sup>

An evaluative research analyses the effects on children's nutritional status of their mothers' knowledge of nutrition while controlling for the effects of the socio-economic characteristics of the family in India in 2006. In almost every test of the effects of various aspects of nutritional knowledge on weight for age and height for age, per capita monthly income was a significant intervening factor; the exception was the knowledge of ORS preparation. In the case of weight for height, house construction type was a significant intervening factor. The authors conclude that, unless mothers' economic status improves simultaneously with nutrition knowledge, they may not be able to practice what they know, but that it is nevertheless essential to increase their nutrition knowledge.<sup>27</sup>

A research conducted in 2004 by the U S department of agriculture found significant evidence that the more a mother knows about health and nutrition the better is the overall quality of her children's diet, for preschoolers more so than older children. They also found that a mother's years of schooling, smoking status, race, and ethnicity influence her children's diet. Their results imply that health and nutrition education may be more effective if targeted toward mothers with young children but directly toward school-age children.<sup>28</sup>

Three consecutive welfare monitoring surveys over the period 1996-1998 were done in Ethiopia regarding child malnutrition. This study identifies household resources, parental education, food prices and maternal nutritional knowledge as key determinants of growth faltering in Ethiopia. Income growth is important for alleviating child stunting, though on its own it will not suffice to reach the international goal of halving each country's level of child malnutrition by 2020. Universalizing access to primary schooling for girls has slightly more promise. However, to reduce child growth faltering in Ethiopia in a significant – and timely - manner, our empirical results indicate that targeted child growth monitoring and maternal nutrition education programs will be needed in conjunction with efforts to promote private income growth and formal schooling.<sup>29</sup>

A survey was done on nutritional status of preschool children in Kuwait in 1996. The nutritional status of 645 male and 635 female preschool children was assessed. Mothers were interviewed to collect data on socioeconomic variables. The length/height and body weight of the children were recorded and haemoglobin concentration was determined. The results show that 11.5% of the boys and 9.9% of the girls were stunted; the prevalence of wasting was fairly similar in both sexes (10.1%-10.9%). Obesity was more prevalent in girls



(18.4%) than boys (16.1%). Anaemia was more prevalent in boys (32.9%) than girls (25.8%). Factors such as birth order, family income and mother's education and employment were found to affect the prevalence of under nutrition.<sup>30</sup>

### **Effectiveness of structured teaching programme in improving nutritional status.**

A pre and post interventional research study in 2010 that aimed to see the effect of a lecture and meal guide on the knowledge, attitude, and practices of mothers with undernourished children aged 2-5 years old in Fishing Village, Barangay Poblacion, Alicia, Zamboanga Sibugay. Respondents of the study were a total of 48 mothers along with 51 children obtained through convenience sampling. A 30 item self-administered questionnaire was utilized to evaluate the knowledge, attitude and practice of mothers. Data analysis revealed a significant increase in the mean scores (30%) in all phases of the intervention. In conclusion, this study has proven that the lecture and meal guide is effective in improving the knowledge, attitude, and practices of mothers and more importantly the nutritional status of their children.<sup>4</sup> A study to assess the mothers' interpretations of dietary recommendations in United Kingdom in 2010. They conducted qualitative semi structured interviews of 46 mothers. The result shows that many descriptions of what mothers reported as a balanced diet would not satisfied official definitions. Television (43%) was the main source of information on dietary advice. The study concluded to provide effective advice and guidance; health professionals need a deeper understanding of how families interpret messages about healthy eating.<sup>31</sup>

An experimental study was conducted on effective food supplement (milk ) and nutrition education program in Brazil. Three hundred sixty-eight individual- housed low socioeconomic level families in a peri urban area of the town of Ribeiroa were studied. Only families with children two to six years old were invited to participate in the program. Two hundred fifty-five children entered the study and 139 completed (95% moved from the area). The intervention lasted for nine months and consisted of monthly nutrition education classes for mothers and weekly nutrition education classes for the children over four years of age. The children received at no cost two 200 ml. glasses of milk a day at one of six small stores in the area. The children had a better attendance record at the nutrition classes than the mothers. This study has proven that the lecture and meal guide is effective in improving the knowledge, attitude, and practices of mothers and more importantly the nutritional status of their children.<sup>32</sup>

An experimental study assessed the impact of Hale and Hardys Helpful Hints preschool health education curriculum on the health knowledge of children ages three to six in 2009. Nine preschool programs with 194 children and their parents comprised the experimental group and three preschool programs with 73 children and their parents comprised the comparison group. The pretest was administered in September and the posttest in April of that school year. They concluded that the curriculum had a moderate impact on health knowledge, including nutrition, but did not make a significant change in knowledge of feelings and emotions.<sup>33</sup>

A prospective cohort study was conducted to evaluate the impact of nutrition education in kindergartens and to promote healthy dietary habits in children in Hefei, eastern China in 2009. Four kindergartens with 1252 children were randomized to the intervention group and three with 850 children to the control group. The personal nutritional knowledge, attitudes and dietary behaviors of the parents were also investigated. The main outcome measures were anthropometrics and diet-related behaviors of the children and the nutritional knowledge and attitudes of the parents at baseline, 6 months (mid-term) and 1 year (post-test). The prevalence of children's unhealthy diet-related behaviors decreased significantly and good lifestyle behaviors increased in the group receiving nutrition education compared with controls.<sup>34</sup>

An evaluative research on distribution of macro- and micronutrient intakes in relation to the meal pattern of preschool children was conducted in the city of Quetzaltenango, Guatemala in 2009. Design was cross-sectional dietary survey in schoolchildren. Twelve private and public schools in the urban setting of Quetzaltenango, Guatemala was selected as setting. There were a total of 449 schoolchildren (from higher and lower socio-economic strata) were enrolled in the study. Each child completed a single, pictorial 24 h prospective diary and a face-to- face interview to check completeness and estimate portion sizes. Estimated daily intakes were examined by mealtime as: (i) absolute intakes; (ii) relative nutrient distribution; and (iii) critical micronutrient density. Nutrient density in relation to the WHO Recommended Nutrient Intakes/median age-specific Guatemalan energy requirements. The study concluded with the result of meal-specific distribution of energy, macro- and micronutrients provides a unique and little used perspective for evaluation of children's habitual intake, and may provide guidance to strategies to improve dietary balance in an era of coexisting energy over nutrition and micronutrient inadequacy.<sup>35</sup> An experimental study was done on the effectiveness of nutrition education programme for the mothers of preschool children in Maryland in 2009 and they compared an eight week nutrition instruction program using a pretest, posttest, and control group experimental model. Twenty mothers were taught in a child development lab, twenty were taught at home, and twenty mothers served as a control group. It was found that the mothers taught in the classroom learned significantly better than

those taught at home. The researchers concluded that this occurred because they needed to more systematically train the parents.<sup>36</sup>

A descriptive study related to body mass status of preschool children of Dera Ismail Khan, Pakistan in 2008. This study was carried, out eight primary schools of Dera Ismail Khan. Total 1338 preschool children were examined Percentage of underweight was higher(56%) in girls than boys Percentage of obesity was higher(45%) in boys than girls. The study result shows that awareness about balanced diet, improvement in the level of education and socioeconomic conditions, easy access to health facilities and prevention of the gender discrimination, are the remedial measures to be taken to redress the situation.<sup>37</sup>

An experimental study was conducted in 2007 on the effectiveness of a microcomputer lesson on food identification compared with a traditional nutritional lesson (using a puppet, picture cards and a card chart) with fifty-five parents of preschool age children in Japan. Both teaching methods were equally effective in increasing nutrition knowledge (identification and recognition of foods). It was suggested from the data that the computer is an effective tool to engage mothers from the lower socioeconomic groups in learning but a lack of demographic data on the subjects precludes any definitive conclusions.<sup>38</sup>

An evaluative study was conducted to assess the effects of a nutrition education program on the dietary behavior and nutrition knowledge of parents of first grade students in 2005. Participants included 1100 parents of first-grade students selected by convenience-type sampling from public schools in Alabama. A pre assessment and post assessment control group design assessed dietary behavior and nutrition knowledge using Pizza Please, a specially designed interactive evaluation tool. Results ( $t = 28.33$ ) suggest that nutrition education programs that teach positive dietary messages potentially can improve dietary behavior and increase nutrition knowledge in parents.<sup>39</sup>

An experimental study was conducted in 152 children in Nigeria who attended well baby clinics to intensify the health education program in 2005 . Ten percent of mothers were sampled on clinic days for four consecutive days. The children's ages ranged from one to forty eight months. The mothers attending the clinic were consistently exposed to health education activities. Prior to the awareness to intensify the health education program in these two clinics, records and surveys indicated that the weight of the children from the low-income group, especially the preschoolers, were below standard. Weight for age was chosen as the parameter for assessing nutritional status. When analyzing the weight for age data, she observed( $t=24.33$ ) that the health and nutrition education intervention has decreased the incidence and severity of malnutrition.<sup>40</sup>

An experimental study to assess the effectiveness of nutrition education and diet modification in iron depleted preschool children in nurseries in Tehran in 2004. Sixty- two children who were judged anemic, iron-depleted, or having low iron stores were randomly allocated to "control," "dietary modification" (consuming one additional citrus fruit after lunch), and "nutrition education" (teaching the mothers proper eating patterns based on the food pyramid) groups Food habits were surveyed, including 24- hour dietary recall and food frequency, as well as timing of consumption of special items; this survey was carried out for each child before and after intervention. After three months, blood samples were taken from the subjects. The result( $t=32.23$ ) suggests that educating mothers of iron-deficient children while increasing the iron stores in children can prevent the recurrence of iron deficiency and result in general child well- being.<sup>41</sup>

A pre and post interventional study was conducted in 2004 to assess the effect of an intervention programme for improving the nutritional status of children aged 2–5 years in a day care center in Alexandria . 974 children from 3 day care centers in Alexandria were followed for 1 year. Anthropometric measurements and 3-day 24- hour recall data were gathered at base line and dietary intake was calculated and compared with recommended daily allowances. An intervention programme was implemented through the establishment of kitchens in the 3 centers, provision of 2 meals/day, nutrition education for parents and training of supervisors. Baseline data revealed deficient intake of most nutrients especially calcium, calories, vitamin C and iron. Post-intervention test revealed improvement in mothers' nutrition knowledge. A decrease in the percentage of underweight, stunted and wasted was also observed.<sup>42</sup>

A pretest and posttest study was conducted on the comprehension of concepts of nutritive value, nutrient function and the impact of nutrition on health among the preschooler children and their mothers in China in 2004. Two treatment groups (one taught by nursery school teachers and the other taught in a child development lab) and a control were selected. Each group contained 20 pairs of mothers and children who ranged in age from three-and-one-half to five years old. They used Food Profile Cards which displayed a picture of the food, its name in large type, and color-coded graph bars for vitamin A, vitamin C, iron and calcium. The study revealed that the treatment group has a higher comprehension on the given topic.<sup>43</sup>

An evaluative research was conducted to assess the effect of orange and apple juices on iron absorption in children in United States in 2003. Experimental study design was adopted for the study. On 2 successive days, children consumed identical meals that included apple juice on one day and orange juice on the other, in

random order. A total of 25 healthy children, 3 to 6 years of age, were recruited, of whom 21 (11 male and 10 female) completed the study. The study concluded by saying that children absorb iron well from a meal that includes either orange(33%) or apple juice(29.9%).<sup>44</sup>

An experimental study designed to encourage the development of preschool children’s nutrition knowledge and abilities used a total of 1000 Head Start children and their parents in 65 schools nationwide were studied in Europe in 2003. Each school was randomly assigned to either the experimental (instructed) or control (non- instructed group). The effect of six weeks of instruction using a sampling of the lessons in the guide on the nutrition knowledge, attitudes and behaviors of the children were investigated using a classical experimental design. Teachers in the control and experimental groups were trained in the use of the curriculum. The curriculum was very experiential and easy to use.. However children in the experimental group which used the new curriculum decreased their refusal of foods served and increased their requests for low-sugar snacks. The control group of children increased their refusal of foods served and decreased their requests for low-sugar snacks.<sup>45</sup>

A pretest/posttest experimental study was conducted on role of food and nutrition in the health perceptions of sixty mothers of preschool children, four to seven years of age in China in 2000. They randomly assigned mothers to experimental and control groups. The experimental group completed a four week home-based nutrition education program. They found that the nutrition education intervention significantly increased the mother’s perception that health and nutrition were related concepts.<sup>46</sup>

An experimental study was conducted on the effect of two teaching strategies, benefit appeal (emphasized the positive, favorable results of eating a variety of vegetables) and threat appeal (focused on the health and nutrition risks arising from not eating vegetables), on the nutrition knowledge, attitudes, and food behavior of 103 mothers of preschool children in U.S in 2000. The study employed a pretest/posttest design. Preschool classes were randomly assigned to a benefit appeal experimental group, a threat appeal experimental group or a control group. The experimental groups were exposed to three nutrition education presentations consisting of modified popular fairy tales that teach about the benefits of vegetables. It is found that both appeals were effective but the benefit group had a higher nutrition knowledge score and a higher score for vegetable snacks based on selection of vegetables from a snack tray.<sup>47</sup>

A pretest/posttest interventional study was conducted to assess the effectiveness of an education intervention program designed to prevent weight problems in children by encouraging family changes in food selection, eating habits and activity levels in 1997. Thirty-six families with at least one preschool age child participating in the PEP program served as the experimental group and eleven families with at least one preschool age child served as the comparison group. Parents in the experimental group met weekly for five weeks in small groups of four or five families. Each group had leaders with expertise in nutrition and behavioral change and each family was given a manual. The families in the PEP program had more health promoting patterns, the fathers improved in verbal response to food situations and there were less negative parental verbalizations at mealtime. This educational oriented preventive strategy was successful in changing parents behavior in the feeding situation.<sup>48</sup>

An experimental study was conducted related to Parental participation in nutrition education homework in Haynes 1992. Over a three-week period, a samples of fourth grade pupils brought home nutrition education homework, with which their parents had previously agreed to help. Pupils in a comparison group had the same nutrition program in school but with no homework assignments. Six months later, parents in both samples anonymously completed a survey form inquiring about nutritional practices at home. Returns were obtained from 214 parents in the homework group and from 218 parents in the non-homework group. A significantly greater percentage (56%) of parents in the homework group reported that meals at home had changed in an important way in the interim period, that their children were eating more of the "right foods" for breakfast and for supper, and that they had requested printed materials on how to plan a balanced diet.<sup>49</sup>

### **Studies related to role of nutrition and activities of children.**

J. McCary (2006) conducted a study on Improving Access to School-Based Nutrition Services for Children with Special Health Care Needs states that lack of proper nutrition can be considered a barrier to optimal learning, justifying nutrition services for school aged children in the school setting. Nutrition may be especially important for children with disabilities and special health care needs (3). Children with disabilities and special health care needs often have more physical health-related problems that impact their 27 education and nutrition status. It is estimated that at least 40% of children with special health care needs are at risk for nutrition-related challenges (4). Common issues include growth alterations, oral-motor problems that adversely affect feeding, medication– nutrient interactions, altered energy and nutrient needs, and partial or total dependence on enteral or par enteral nutrition (5). In addition, children with special needs have been shown to have three times as many school absence days as their age-matched peers (6). Absenteeism further threatens the

ability for students to meet educational goals and when absence results from illness, poor nutrition status may be a contributing factor. Unfortunately, despite the documented need, access to and delivery of nutrition services for children with special needs presents challenges.<sup>56</sup>

Howard Taras (2005) conducted a study on Nutrition and student performance at school and found that children with iron deficiencies sufficient to cause anemia are at a disadvantage academically. Their cognitive performance seems to improve with iron therapy. A similar association and improvement with therapy is not found with either zinc or iodine deficiency, according to the reviewed articles. There is no evidence that population-wide vitamin and mineral supplementation will lead to improved academic performance. Food insufficiency is a serious problem affecting children's ability to learn, but its relevance to US populations needs to be better understood. Research indicates that school breakfast programs seem to improve attendance rates and decrease tardiness. Among severely undernourished populations, school breakfast programs seem to improve academic performance and cognitive functioning.<sup>57</sup>

J. Bryan (2004) conducted a study on Nutrients of Cognitive Development in Schoolaged Children., states that Under nutrition and deficiencies of iodine, iron, and folate are all important for the development of the brain and the emergent cognitive functions, and there is some evidence to suggest that zinc, vitamin B12, and omega-3 polyunsaturated fatty acids may also be important. Considerations for future research include a focus on the interactions between micronutrients and macronutrients that might be influential in the optimization of cognitive development; investigation of the impact of nutritional factors in children after infancy, with particular emphasis on effects on the developing executive functions; and selection of populations that might benefit from nutritional interventions, for example, children with nutrient deficiencies or those suffering from attention deficit-hyperactivity disorder and dyslexia.<sup>58</sup>

Mukudi E (2003) conducted a study on nutrition status, education participation, and school achievement among Kenyan middle-school children. Data collected from 851 students from 5 elementary schools included height, weight, attendance records, and raw scores from standardized tests. 29% of students fell below 90% cutoff of acceptable weight for height (described as a measure of nutrition). The measure of "weight for height" was the second strongest predictor of achievement on standardized tests (school attendance was the strongest predictor).<sup>59</sup>

D. Ivanovic (2002) conducted a study on Nutritional status, brain development and scholastic achievement of Chilean high-school graduates from high and low intellectual quotient and socio-economic status, states that independently of socio-economic status, high-school graduates with similar IQ have similar variables of nutritional status, brain development and scholastic achievement. Past nutritional status, brain development, child IQ and scholastic achievement are strongly and significantly inter-related. These findings are relevant in explaining the complex interactions between variables that affect IQ and scholastic achievement and can be useful for nutritional and educational planning.<sup>60</sup>

**S. Grantham-McGregor and C. Ani (2001)** conducted a study on a review of studies on the effect of iron deficiency on cognitive development in children states that associations between iron-deficiency anemia and poor cognitive and motor development and behavioral problems. Longitudinal studies consistently indicate that children anemic in infancy continue to have poorer cognition, school achievement, and more behaviour problems into middle childhood. However, the possible confounding effects of poor socioeconomic backgrounds prevent causal inferences from being made. In anemic children <2 y old, short-term trials of iron treatment have generally failed to benefit development. Longer trials lacked randomized placebo groups and failed to produce benefits. Only one small randomized controlled trial (RCT) has shown clear benefits. It therefore remains uncertain whether the poor development of iron-deficient infants is due to poor social backgrounds or irreversible damage or is remediable with iron treatment.<sup>61</sup>

**R.O. Abidoye, D.I. Eze (2000)** conducted a study on Comparative school performance through better health and nutrition in Nsukka, Enugu, Nigeria, Two hundred and eighty five (73.1%) of the pupils selected, participated in the final studies. There was predominance of malnutrition among the pupils. Only 28.9% of the pupils were of normal weight for height (using Z-scores on Nutritional Center for Health Statistics Values). 47.1% were mildly underweight, 20.1% were moderately underweight while 30.4% were severely underweight. Overall nutritional status (using weight-for-age Zscores) significantly affects school performance ( $p < 0.05$ ). Only 26.0% of the pupils were of normal height-for-age, the rest were stunted. Complications for pregnancy was found to significantly affect later school performance ( $p < 0.05$ ). Birth complications also significantly affected later school performance ( $p < 0.05$ ). There was no significant association between duration of breast feeding and later school performance ( $p > 0.05$ ). Of the social factors that influence health and nutrition, level of maternal education was found to have a significant effect on school performance of pupils ( $p < 0.05$ ).<sup>62</sup>

**Hutchinson SE, Powell CA, Walker SP, Chang SM, Grantham-McGregor SM (1997)** conducted a study on Nutrition, anemia, and school achievement in rural Jamaican primary school children. states that school achievement (arithmetic) was associated with height for age. School achievement was not associated with body

mass index (measure of relative weight). Anemic children and those with parasites in their stool had lower attendance and achievement scores (reading and spelling).<sup>63</sup>

**Del Rosso, Joy M. and Tonia Marek (1996)** conducted a study on “Class Action: Improving School Performance in the Developing World through Better Health and Nutrition.” states that healthier and better-nourished children have higher enrolment and attendance rates, and perform better than children suffering from malnutrition. They also discuss long-term benefits to the wider community beyond the children fed. The authors outline three cost-effective nutrition and health interventions and provide lessons learned for policymakers on successful management of school-based nutrition programs.<sup>64</sup>

#### **IV. METHODOLOGY**

Research methodology involves systematic procedures which the researcher starts from initial identification of the problem to its final conclusion. The role of methodology consists of procedures and techniques for conducting a study. For every piece of research work the methodology of investigation is of vital importance. The success of any research depends upon the suitability of method.<sup>50</sup>

This chapter deals with the type of research approach used, the setting of the study, the different variables used, the population, sampling technique, sample selection, the inclusion criteria, exclusion criteria, the development of tool, the validity and reliability of tool, the description of tool, collection of data, pilot study, procedure of data collection and plan for data analysis which was used to find out the effectiveness of structured teaching programme.

#### **RESEARCH APPROACH**

The research approach used for this study was evaluative research approach, since the purpose of the study was to find out the effectiveness of structured teaching programme on knowledge regarding balanced diet among mothers of underweight preschool children in selected villages at Udaipur.

#### **RESEARCH DESIGN**

One group pre and post test pre-experimental design was used for this. In this research structured teaching programme was given to the samples after pretest. On 8<sup>th</sup> day after the structured teaching programme post test was done to assess the knowledge on balanced diet. In this study a comparison between the pretest and post test score was done to find out the effectiveness of structured teaching programme.

The design chosen for the study is presented in the table as:

**Table 4.1: One group pre-test post-test design**

Group	Pre-test	Intervention	Post-test
	O1	X	O2

#### **VARIABLES OF THE STUDY**

**Dependent Variable:** Knowledge regarding balanced diet among mothers of underweight preschool children.

**Independent Variable:** Structured teaching programme.

**Attributing Variable:** Socio-demographic variables such as age of the mother, number of children, religion, education of the mother, type of the family, monthly income, occupation, degree of malnutrition.

#### **STUDY SETTING**

The mothers of underweight preschool children were selected. The samples were drawn from the villages under Bara Pal Primary Health Center. They were selected by using convenient sampling technique.

#### **POPULATION**

A population is the entire aggregation of cases in which a researcher is interested.<sup>17</sup> The population consists of the mothers of underweight preschool children in all the villages.

#### **SAMPLE**

A sample is a small portion of population selected for observation and analysis. Sample of this study consists of mothers of underweight preschool children in villages under Bara Pal Primary Health Center.

### **SAMPLING TECHNIQUE**

Sampling is the process of selecting a portion of the population to represent the entire population. Convenient sampling technique was used to select the sample.

### **SAMPLE SIZE**

The sample size of the study consists of 60 mothers of underweight preschool children.

### **CRITERIA FOR SELECTION OF SAMPLE:**

#### **INCLUSION CRITERIA:**

- 1.) Mothers of preschool children with weight less than 20% of the expected weight for age.
- 2.) Mothers of preschool children who are willing to participate in the study.
- 3.) Mothers who can understand Hindi or English.

#### **EXCLUSION CRITERIA:**

- 1.) Mothers of underweight preschool children who have serious physical and mental disability.
- 2.) Mothers of underweight preschool children who are working in the health sector.
- 3.) Mothers of underweight preschooler children who are not available during the study.

### **SELECTION AND DEVELOPMENT OF THE TOOL**

Tool developed for the study consisted of a structured questionnaire. It was formulated on the basis of the clinical experience of the investigator, review of literature, opinion of experts from different fields of pediatrics.

### **STEPS IN THE CONSTRUCTION OF THE TOOLS**

- 1.) The following steps are followed by the investigator to construct the tool
- 2.) Literature was reviewed in preparation of the tool.
- 3.) Guidance and suggestion was taken from experts.
- 4.) Consultation was obtained from statistician

### **DESCRIPTION OF THE TOOL:**

A structured questionnaire was developed with the consideration of objectives and consultation with experts. The tool had 2 parts.

**Part I:** It consists of a form for collecting demographic data of mothers of underweight preschool children and their underweight child

It includes the age of the mother, number of children, religion, education of the mother, type of the family, monthly income, occupation, degree of malnutrition.

**Part II:** Consists of 30 multiple choice questions to assess the knowledge of mothers of underweight preschool children on balanced diet. Each question had 3 alternatives out of which two are distracters and one was the correct answer. A score value of one was allotted to each correct response. A total knowledge score was 30.

### **VALIDATION OF THE TOOL:**

Validity is defined as the accuracy with which a test measures whatever it is intended/supposed to measure. Content validity is the evaluation of content done by the experts, to assess whether all the major aspects of the content area must be adequately covered, and to elicit the response on specific topic after the validation the correction has been made. For this study, content validation is done by experts includes 03 professionals from nursing and 2 from medicine.

### **SCORE INTERPRETATION**

#### **SCORING KEY FOR KNOWLEDGE QUESTIONNAIRE**

Q.NO	MAXIMUM SCORE	MINIMUM SCORE
1-30	30	0

### **KNOWLEDGE SCORE**

SCORE	KNOWLEDGE
Below 50%	Inadequate
50-75%	Moderate
Above 75%	Adequate

### **RELIABILITY OF THE TOOL**

A pilot study was conducted to test the reliability of the tool. The reliability of the measuring instrument is a major criterion for assessing the quality and adequacy. Reliability of instrument is the degree of consistency with which it measures the attribute, it supposed to measure.<sup>17</sup>

For this study, the reliability of instrument was analyzed by using split half method which measures the co-efficient of internal consistency. The reliability is obtained as **r=0.91** which is desirable.

### **PILOT STUDY**

A Pilot study is a miniature version of the planned research. Researcher has to identify and correct problems which would affect the research process.<sup>50</sup>

The primary objective of the pilot study is to test as many elements of the research proposal as possible, in order to correct any part that does not work well. After getting the experts validation of the tool, some modification was made. A pilot study was conducted from 10 February 2020 to 27 February, 2020 after getting permission from the Medical Officer, Rural Health Training Centre Bara pal 8 mothers were selected by convenient sampling technique. After getting samples, consent was obtained, good inter-personal relationship was maintained and data was collected from samples.

### **PROTECTION OF HUMAN SUBJECTS**

The study was conducted after approval of research committee from the college. Permission was obtained from the concerned persons from the Primary Health Center. The procedure was explained to samples and got consent to make them participate in the study. Assurance was given to the study participants regarding the confidentiality of the data collected.

### **METHOD OF DATA COLLECTION**

Before starting the study, researcher was obtained written permission from the Medical Officer of Primary Health Center Bara pal. The data collection period for the study was 10 Jun, 2020 to 20 June 2020. The samples for the study were identified through convenient sampling procedure. The consent was obtained and data collected using structured questionnaire. After procedure mothers were subjected to structured teaching programme for one hour. Post test was done on 8<sup>th</sup> day following intervention. The same tool used to assess the effectiveness of structured teaching programme. Total duration spent with each mother for conducting pre-test, structured teaching programme and post test is two hour.

### **METHOD OF DATA ANALYSIS AND PRESENTATION**

The data collected through structured questionnaire will be carefully recorded and analyzed through following techniques.

#### **DESCRIPTIVE ANALYSIS:**

1. Frequency and percentage analysis will be used to describe the demographic characteristics of mothers of underweight preschool children.
2. Mean, standard deviation, and mean score percent will be used to assess the knowledge regarding balanced diet among the mothers of under weight preschool children in selected villages at Udaipur.

#### **INFERENTIAL STATISTICS:**

The paired  $t$  test will be carried out to assess the statistical significance and compare the pre and post test knowledge scores on knowledge regarding balanced diet among the mothers of underweight preschool children in selected villages at Udaipur.

The chi square ( $\chi^2$ ) analysis will be used to determine the association between knowledge and socio-demographic variable.

#### **SUMMARY:**

This chapter has dealt with research methodology, research design, research approach, and population, sample and sampling technique. This chapter has also dealt with validation of tool, reliability of the tool description of the tool, pilot study and plan for data analysis. Next chapter deals with data analysis.

## **V. RESULTS**

This chapter deals with the analysis and interpretation of data collected from a sample of 60 mothers of underweight preschool children to evaluate the effectiveness of structured teaching programme on knowledge regarding balanced diet among mothers of underweight preschool children at selected villages in Udaipur. The purpose of analysis is to reduce the data into an interpretable and meaningful form so that the results can

compared and significance can be identified. Kerlinger (1976) has defined analysis as categorizing, ordering, manipulating and summarizing of data to obtain answers to research hypothesis questions.<sup>17</sup>

The data analysis contains four major sections. The first is frequency and percentage analysis which was used to describe characters of mothers of underweight preschool children. The second section include the descriptive analysis such as mean, standard deviation, and mean score percent was used to assess pre and post test level of knowledge regarding balanced diet among mothers of underweight preschool children. The third section compares the pre and post test knowledge scores on balanced diet among mothers of underweight preschool children using paired ‘t’ test. Finally the chi square analysis was used to determine the association between knowledge and demographic variables of mothers of underweight preschool children.

**OBJECTIVES OF THE STUDY**

- To assess the pretest knowledge regarding balanced diet among mothers of underweight preschool children.
- To assess the post test knowledge regarding balanced diet among mothers of underweight preschool children.

To evaluate the effectiveness of structured teaching programme by comparing the pre and post test scores.

- To determine the association between knowledge regarding balanced diet and selected socio-demographic variable of mothers.

**PRESENTATION OF DATA AND ANALYSIS:**

The data are organized and presented in the following sections.

**Section 1.** Description of socio demographic characters of mothers of underweight preschool children.

**Section 2.** Assess the pretest knowledge regarding balanced diet among mothers of underweight preschool children.

**Section 3.** Assess the posttest knowledge regarding balanced diet among mothers of underweight preschool children.

**Section 4.** Determine the effectiveness of structured teaching programme by comparing the pre and post test level of knowledge regarding balanced diet.

**Section 5.** Association between knowledge with the selected socio-demographic variable. SECTION 1

**DISTRIBUTION OF DEMOGRAPHIC VARIABLES AMONG MOTHERS OF UNDERWEIGHT PRESCHOOL CHILDREN**

**Table 5.1 : Frequency and percentage distribution of demographic variables among mothers of underweight preschool children.**

**N -60**

Sl. No	Socio-demographic variables	Frequency (f)	Percentage (%)
1	Age of mother in Year		
	a. Below 20	13	21.7
	b. 20—29	12	20
	c. 30—39	34	56.7
	d. 40 and above	1	1.7
2	No of Children		
	a. 1	14	23.3
	b. 2	28	46.7
	c. 3	15	25
	d. More than 3	3	5
3	Religion		
	a. Hindu	29	48.3
	b. Muslim	31	51.7
	c. Christian	0	0
	d. Any others	0	0
4	Education		
	a. Illiterate	4	6.7
	b. Primary School	28	46.7
	c. High School	7	11.7



	d. Pre University	19	31.7
	e. Graduate	2	3.3
<b>Sl. No</b>	<b>Socio-demographic variables</b>	<b>Frequency (f)</b>	<b>Percentage (%)</b>
5	Family Income		
	a. < Rs. 3000	25	41.7
	b. Rs. 3001--Rs.6000	26	43.3
	c. >6000	9	15
6	Occupation		
	a. Employed	5	8.3
	b. Unemployed	55	91.7
7	Type of family		
	a. Nuclear family	22	36.7
	b. Joint family	33	55
	c. Extended family	5	8.3
8	Dietary pattern		
	1 <sup>st</sup> degree	3	5
	2 <sup>nd</sup> Degree	0	0
	3 <sup>rd</sup> Degree	57	95

The above table 5.1 depicts frequency and percentage distribution of mothers of underweight preschool children according to age, number of children, religion, education, income of the family, occupation, type of family and dietary pattern.

**According to age**, more than half of the mothers (56.7%) were between the ages of 30-39 years, 21.7% were in the age group of below 20 years, 20 % were from 20 – 29 years only one mother (1.7%) was in the age group of 40 years and above.

**According to the number of children** 46.7% of them had two children, 25% had three children, 23.3% had only one child and 5% of the mothers had more than 3 children. **Regarding religion**, of the mothers of underweight preschool children majority 51.7% were Muslims, 48.3% were Hindu and no other religious mothers were participated.

**Among the mothers regarding education** 46.7% had primary school education, 31.7% had pre-university education, 11.7% had high school education, 6.7% were illiterate and the remaining 3.3% were graduates.

**Regarding monthly income of the family**, 43.3% were having within 3001-6000 rupees, 41.7% were having below 3000 rupees and remaining 15% were having above6000 rupees.

**According to occupation**, among the mothers majority 55 (91.7%) are unemployed and the rest 5 (8.3%) are employed.

**According to type of family**, 55% were from joint family, 33.7% were from nuclear family and only 8.3% were from extended family.

**Regarding the dietary pattern** majority of them (95%) were following mixed diet and 5% of them were vegetarians.

## SECTION- 2

### DISTRIBUTION OF PRE-TEST LEVEL OF KNOWLEDGE REGARDING BALANCED DIET AMONG MOTHERS OF UNDERWEIGHT PRESCHOOLCHILDREN.

**Table 5.2 Frequency and percentage distribution of the pretest knowledgeregarding balanced diet among mothers of underweight preschool children.**

n=60

Level of knowledge	Score	No of Respondents	
		Frequency	Percentage
Inadequate	< 50%	50	83.33
Moderate	50--75%	10	16.67
Adequate	> 75%	0	0

The above table-5.2 shows the frequency and percentage distribution of mothers of underweight preschool children according to the pre test level of knowledge regarding balanced diet. The levels of knowledge were seen into 3 categories, inadequate, moderate and adequate. Of the mothers of underweight

preschool children more than half of the students (83.33%) had inadequate knowledge, 16.67% had moderately adequate and no one had adequate knowledge.

**Table 5.3 Mean, SD and Mean% of the pretest knowledge regarding balanced diet among mothers of underweight preschool children.**

**n=60**

Domain	Statements	Max Score	Range	Mean	SD	Mean%
Knowledge	30	30	17--5	10.98	3.2	36.6

The statistical outcome such as mean, standard deviation, mean score percentage of pre test knowledge regarding balanced diet among the mothers of underweight preschool children were shown in the table 5.3. Out of the maximum score of 30, the mothers had mean knowledge of 10.98 with standard deviation of 3.2. The mean score percent attained as 36.6%.

**SECTION- 3**

**DISTRIBUTION OF POST TEST LEVEL OF KNOWLEDGE REGARDING BALANCED DIET AMONG MOTHERS OF UNDERWEIGHT PRESCHOOLCHILDREN.**

**N=60**

Level of knowledge	Score	No of Respondents	
		Frequency	Percentage
Inadequate	< 50%	0	0
Moderate	50--75%	36	60
Adequate	> 75%	24	40

The above table 5.4 shows the frequency and percentage distribution of adolescents according to the post test level of knowledge regarding balanced diet among mothers of preschool children and 40% of the mothers had attained adequate knowledge, 60% had attained moderately adequate and no one had inadequate knowledge.

**Table 5.5 Mean, SD and Mean % of post test knowledge regarding balanced diet among mothers of underweight preschool children**

**N=60**

Domain	Statements	Max Score	Range	Mean	SD	Mean%
Knowledge	30	30	25--15	20.48	3.29	68.27

The statistical outcome such as mean, standard deviation, mean score percentage of post test knowledge regarding balanced diet among mothers of underweight preschool children were shown in the table 5.5. Out of the maximum score of 30, the mothers had attained mean knowledge of 20.48 with standard deviation of 3.29. The mean score percent attained as 68.27%.

**SECTION- 4**

**EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING BALANCED DIET**

**Table 5.6 Pre test and post test level of knowledge among mothers of underweight preschool children.**

**n=60**

Level of knowledge	Pre test		Post test	
	Frequency	Percentage	Frequency	Percentage
Inadequate (<50%)	50	83.33	0	0
Moderate (50--75%)	10	16.67	36	60
Adequate (>75%)	0	0	24	40

The above table 5.6 compares the pre and post test knowledge of students regarding the balanced diet among mothers of underweight preschool children. The frequency and percentage distribution of knowledge on pre test were, more than half of the mothers (83.33%) had inadequate knowledge, 16.67% had moderately

adequate and no one had adequate knowledge. And in post test, of the mothers 40% had attained adequate knowledge, 60% had attained moderately adequate and no one had inadequate knowledge.

## **VI. DISCUSSION**

This chapter discusses the major findings of the study and reviews them in relation to findings from the results of the previous studies. The present study was aimed to evaluate the effectiveness of structured teaching programme on knowledge regarding balanced diet among mothers of underweight preschool children in selected villages at Udaipur.

### **THE OBJECTIVES OF STUDY WERE**

- To assess the pretest knowledge regarding balanced diet among mothers of underweight preschool children.
- To assess the post test knowledge regarding balanced diet among mothers of underweight preschool children.
- To evaluate the effectiveness of structured teaching programme by comparing the pre and post test scores.
- To determine the association between knowledge regarding balanced diet and selected socio-demographic variable of mothers.

### **THE STUDY ATTEMPTED TO EXAMINE THE FOLLOWING HYPOTHESIS:-**

H1: The mean post test knowledge on balanced diet will be significantly higher than mean pre test knowledge among mothers of underweight preschool children at 0.05 level

H2: There will be significant association between the knowledge of mothers regarding balanced diet for preschool children and selected socio-demographic variable at 0.05 level

### **MAJOR FINDINGS IN THE STUDY.**

#### **SAMPLE CHARACTERISTICS:**

- ❖ According to age of mother, more than half of the mothers (56.7%) were between the ages of 30 - 39 years, 21.7% were in the age group of below 20 years, 20 % were from 20 – 29 years only one mother (1.7%) was in the age group of 40 years and above.
- ❖ According to the number of children 46.7% of them had two children, 25% had three children, 23.3% had only one child and 5% of the mothers had more than 3 children.
- ❖ Mothers of the underweight preschool children majority 51.7% were Muslims, 48.3% were Hindu and no other religious mothers were participated.
- ❖ Among the mothers regarding education 46.7% had primary school education, 31.7% had pre-university education, 11.7% had high school education, 6.7% were illiterate and the remaining 3.3% were graduates.
- ❖ Regarding monthly income of the family, 43.3% were having within 3001- 6000 rupees, 41.7% were having below 3000 rupees and remaining 15% were having above 6000 rupees.
- ❖ Among the mothers majority 55 (91.7%) are unemployed and the rest 5 (8.3%) are employed.
- ❖ According to type of family, 55% were from joint family, 33.7% were from nuclear family and only 8.3% were from extended family.
- ❖ Regarding the dietary pattern majority of them (95%) were following mixed diet and 5% of them were vegetarians.

#### **Pre-Test Knowledge On Balanced Diet Among The Mothers Of underweight Preschool Children**

The levels of knowledge were seen into 3 categories, inadequate, moderate and adequate. Of the mothers of underweight preschool children more than half of the students (83.33%) had inadequate knowledge, 16.67% had moderately adequate and no one had adequate knowledge. Out of the maximum score of 30, the mothers had mean knowledge of 10.98 with standard deviation of 3.2. The mean score percent attained as 36.6%.

A study aimed to assess the nutritional knowledge of the mothers of preschool children in Texas. A total of 68 mothers aged 22-43 years participated in the survey. The results showed that levels of nutrition knowledge were distributed as follows: low for 63.7%, moderate for 29.6% and high for 6.8%.<sup>51</sup>

#### **Post-Test Knowledge On Balanced Diet Among The Mothers Of Underweight Preschool Children.**

In the post test, more than half of the mothers (60%) had attained moderately adequate knowledge, 40% had attained adequate and no one had inadequate knowledge. Out of the maximum score of 30, the mothers had attained mean knowledge of 20.48 with standard deviation of 3.29. The mean score percent attained as 68.27%.

A study conducted in Nigeria to assess the needs of nutrition education for mothers, Ministry of

Health, in collaboration with UNICEF, provided nutrition education for the parents in all the weekends for a month. Knowledge and attitudes were measured in a sample of 1443 parents in Nigeria, in November 2008 and again in January 2009. Parents exposed to the education programme significantly increased knowledge of nutrition.<sup>52</sup>

#### **EFFECTIVENESS OF STP ON BALANCED DIET**

The table-5.6 shows that there is a significant improvement in knowledge of mothers after structured teaching programme. In this study in pre test out of the maximum score of 30, the mothers had mean knowledge of 10.98 with standard deviation of 3.2. The mean score percent attained as 36.6%. and in post test out of the maximum score of 30, the mothers had attained mean knowledge of 20.48 with standard deviation of 3.29. The mean score percent attained as 68.27%. Its enhancement mean is 9.5 SD is 1.9. Paired t test value 36.8 is significant at  $p < 0.01$  level. Thus the research hypothesis is accepted.

A study conducted to evaluate the effectiveness of structured teaching programme on knowledge regarding balanced diet for school age children in a selected community at Mangalore. The study was conducted in 30 mothers from the rural area of Mangalore. The pretest knowledge mean score was  $8.57 \pm 2.285$  and the mean post test score was  $22.43 \pm 1.406$ . The paired 't' test value of 9.53 which is greater than the table value shows that STP on balanced diet was effective in increasing the knowledge of mothers of school age children in all the areas.<sup>1</sup>

#### **Association Of Knowledge Regarding Balanced Diet And Selected Socio-Demographic Variables.**

The table-5.8 envisages the association between knowledge and selected socio-demographic variables of mothers Age, No of children, Religion, Education, Monthly income, Occupation, Type of family, and Dietary pattern. Of these variables the age ( $\chi^2=8.31$  df=3), no of children ( $\chi^2=8.2$  df=3), education ( $\chi^2=9.93$  df=5), monthly income ( $\chi^2=11.9$  df=2) and type of family ( $\chi^2=6.97$  df=2) were significant at 5% level i.e.,  $p < 0.05$  and religion ( $\chi^2=1.02$  df=1), occupation ( $\chi^2=0.49$  df=1), and dietary pattern ( $\chi^2=0.17$  df=1) were not significantly associated with knowledge.

Thus the result can be interpreted as that there will be significant association between the level of knowledge of mothers of underweight preschool children and the selected socio-demographic variable such as age, number of children, education, monthly income, and type of family.

A study conducted in China regarding nutrition education for the parents using 104 samples reveals the association between inadequate knowledge and demographic variables such as low income, young age of the mothers, low educational status, increased number of children in the family, joint family. Most of the participants had heard about the word balanced diet, but did not know much about that.<sup>53</sup> The results of Chi-square analysis indicate that there was significant association between knowledge and age, number of children, education, monthly income and type of family.

### **VII. CONCLUSION**

This chapter enlightens the importance of this research and it reveals that there was a significant lack in knowledge regarding balanced diet among the mothers of preschool children at Udaipur and structured teaching programme had a significant role in improving their knowledge. The study also reveals that, there was significant association between knowledge with age, number of children, education, monthly income and type of family among selected mothers of underweight preschool children

#### **The data were analyzed on the bases of objectives of the study:**

1. To assess the pretest knowledge regarding balanced diet among mothers of underweight preschool children.
2. To assess the post test knowledge regarding balanced diet among mothers of underweight preschool children.
3. To evaluate the effectiveness of structured teaching programme by comparing the pre and post test scores.
4. To determine the association between knowledge regarding balanced diet and selected socio-demographic variable of mothers.

#### **IMPLICATIONS OF THE STUDY:**

The findings of the study have implications for Nursing Education, Child Health Nursing Practice, Nursing Research and Nursing administration.

#### **NURSING EDUCATION:**

During basic nursing education courses, students may given clinical and community assignments regarding nutritional status of the children. The curriculum should give importance of demonstration of

nutritious diet preparation in the community. The curriculum should also emphasis on provision of written health information to people and provision of health education. The health care providers are the key personnel in imparting education to the people both in the hospital and community. There is a need for in-service education programme for the health care providers for preparing them to function effectively as a counselor for clients. A knowledgeable nurse has to handle such problem in the country for identifying the high risk group who are prone to malnutrition and teach them the effective prevention. Nurses should have the knowledge and skill in preparation of educational material for both literate and illiterate people in the society. Nurses at post graduate level need to develop skill for mass media production which is field tested and found to be effective and useful.

#### **CHILD HEALTH NURSING PRACTICE:**

Along with the changing scenario of health care delivery system, the emphasis is shifted from care oriented approach to preventive approach. So, it focuses mainly on primary prevention, which is aimed at health promotion. The study reveals that, there is a need of information regarding balanced diet among the mothers of preschool children. This study stresses that there is a need of involvement of nursing staff in planning and conducting education programs. And also there is need of student nurses to involve in the education programs. Considering these factors, nursing personnel can contribute much for prevention by creating awareness in the community through school health programmes, camps and special programmes at community and mass media education. And also there is need of nurses to involve in the education program for the prevention of underweight and malnutrition among the preschool children. Health messages can be disseminated through various mass media like T.V, radio, news paper, magazines and other print materials.

Nurses working in the hospital setting will be able to find out the malnutrition among children who attend the hospital for any other symptoms also. The nurses in the community area also should be able to identify the high risk children and should be able to do early diagnosis and treatment. The nurses should have the skill in delivering educative counseling which motivates mothers to practice balanced dietary choices for their children.

#### **NURSING RESEARCH:**

In India many research studies are already done in the field of child nutrition. But the result of this study directs the light towards the fact that the research findings are not been implemented properly. Studies reveal that malnutrition is a major health concern which is a leading cause of morbidity and mortality in children in India. The present study reveals that there is a lack or inadequate knowledge about balanced diet among the mothers of preschool children. This study enlightens that there is a need for educational programmes in the schools or community based educational programmes to improve the knowledge balanced diet among the mothers of preschool children. This study motivates other investigators to conduct further studies regarding this topic to find out the high risk group. This study emphasis the need for the proper communication implementation of the research findings.

#### **NURSING ADMINISTRATION**

The main focus of nursing administration is to organize seminars and workshop and other educational programmes for staff nurses as a part of in-service education programme by which they can gain the knowledge on the changing nutritional need of children according to the age and can provide school or community based education programmes to the target population (mothers and older children) effectively.

Nursing administrators should take part in the health policy making and developing protocols for short term and long term health education. Nursing administrators should concentrate on the proper selection, placement, and effective utilization of the nurses in all areas by giving proper guidance. The nursing administrative should take initiative in imparting the health information through campaigns, printed materials, in the form of booklets, pamphlets and posters in every community areas and arrange for teaching.

#### **SUGGESTIONS**

1. Special education programmes shall be initiated for the mothers regarding child nutrition.
2. Regular guidance and education programs can be initiated attached to all primary health centers and community centers.
3. Screening programmes can be conducted in each anganwadi for early identification of malnutrition.
4. Older children can be included in guidance and education programme.
5. Cooking demonstration can be included in the education programme.
6. A survey of cooking practices can be done in the community areas.

### **RECOMMENDATIONS:**

Keeping in view the findings of the present study, the following recommendations were made since the study was carried out on a small sample. The results can be used only as a guide for further studies.

1. The study can be repeated by the taking a large sample in other parts of the country.
2. An experimental study could be undertaken with a control group to assess the real effect of educational intervention.
3. A similar study can be conducted on assessment of knowledge on balanced diet among mothers of school age children
4. Another study can be conducted on assessment of knowledge on balanced diet among mothers of infants.
5. A similar study can be conducted on assessment of knowledge on balanced diet among mothers of toddlers.
6. A descriptive study can be done to assess the knowledge of adolescents on balanced diet
7. An observational study can be conducted in the actual practice for a period of time.
8. An experimental study can be carried out to find out the effectiveness of a dietary intervention in reducing underweight and malnutrition among children.
9. This study motivates other researchers to do a comparative study to assess the knowledge among mothers from urban and rural areas.
10. Another study can be done on the effectiveness of an educational programme in improving the knowledge, attitude and practice of mothers regarding child nutrition
11. This study can be replicated in such a way that it assesses the causes of malnutrition among children in various age groups.
12. Another study can be done by involving both parents and other caregivers of the children.
13. A comparative study can be conducted to assess the knowledge regarding balanced diet between mothers of preschoolers and mothers of school age children.

### **LIMITATIONS**

1. The study was limited to the particular village at Udaipur, the generalization of study to a large population can be made.
2. This study uses the convenient sampling technique which also restrict the generalizability.
3. The study lacks control group to allow testing for an increase in knowledge without STP.
4. The study was limited only to the mothers of underweight preschool children at Udaipur.
5. The data collection tools used for the investigation were prepared for this purpose and used for the first time, where adequacy of the content of the tool cannot be established. The tools used were not standardized tools.
6. The study was limited to only knowledge aspect. The study could be conducted to assess the attitude and practice also.

### **SUMMARY:**

This chapter has deals with implication suggestions and recommendations of the study. This study is implacable to Nursing Education, Nursing Practice, Nursing Research and Nursing Administration. Next chapter deals with the summary of the study.

### **SUMMARY**

This chapter deals with the process of the study to assess the effectiveness of structured teaching programme on knowledge regarding balanced diet among mothers of underweight preschool children in selected villages at Udaipur.

### **OBJECTIVES OF THE STUDY:**

1. To assess the pretest knowledge regarding balanced diet among mothers of underweight preschool children.
2. To assess the post test knowledge regarding balanced diet among mothers of underweight preschool children.
3. To evaluate the effectiveness of structured teaching programme by comparing the pre and post test scores.
4. To determine the association between knowledge regarding balanced diet and selected socio-demographic variable of mothers.

### **THE FORMULATED HYPOTHESIS WERE**

**H1:** The mean post test knowledge on balanced diet will be significantly higher than mean pre test knowledge among mothers of underweight preschool children.

**H2:** There will be significant association between the knowledge of mothers regarding balanced diet for preschool children and selected socio- demographic variable.

The conceptual frame work adopted for the present study was General System Theory by Ludwig Von Bertalanffy (1968) aimed to explore the effectiveness of STP in gaining the knowledge balanced diet among mothers of underweight preschool children in selected villages at Udaipur.

Research design was selected for the present study was one group pre and post test pre- experimental design is used for the study. Knowledge regarding balanced diet among mothers of underweight preschool children is the dependent variable, structured teaching programme was the independent variable and age of the mother, number of children, religion, education of the mother, type of the family, monthly income, occupation, dietary pattern were the socio-demographic variables of mothers of underweight preschool children

Convenient sampling technique was used to draw the sample for the research study. The tools developed and used for the data collection were socio-demographic variables and structured questionnaire regarding balanced diet. Content validity was obtained and it was found to be reliable and feasible. The reliability of the tools was established by using split half technique.

A pilot study was conducted from March 2020 to March 2020, after getting permission from the Medical Officer, Rural Health Training Centre, **Bara Pal** 8 mothers were selected for the study. The main study was conducted from

.....2020 to.....2020 in villages under Bara Pal primary health center. The samples for this study were identified through convenient sampling. The consent was obtained and data collected using structured questionnaire. Structured teaching programme regarding balanced diet was given to the samples. On 8<sup>th</sup> day of teaching programme post test was done using the same structured questionnaire.

The data was collected by structured questionnaire before and after STP. The data gathered were analyzed and interpreted according to the objectives. Descriptive statistics used were frequency, percentage, mean, mean percentage score, standard deviation. Further, inferential statistics like paired ‘t’ test and Chi-square test was used to test the hypotheses at 0.05 level of significance and the data obtained are presented in the graphical form also.

#### **THE FINAL FINDINGS OF THE STUDY ARE AS FOLLOWS:**

There was a significant improvement obtained following STP on the knowledge regarding balanced diet among mothers of underweight preschool children in selected villages at Udaipur. Pretest mean is 10.98, SD is 3.2 and after STP mean is 20.48 SD is 3.29. Its enhancement mean is 9.5 SD is 1.9. Paired t test value 36.8 was significant at  $p < 0.0005$  level.

The association between knowledge and selected socio-demographic variables of mothers of underweight preschool children identified according to age, no of children, religion, education, monthly income, occupation, type of family, and dietary pattern. Of these variables the age, no of children, education, monthly income and type of family were significant at 0.01% i.e.;  $p < 0.05$  level. Rest of the socio- demographic variables was not significantly associated with knowledge.

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