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2.3 SUMMARY OF THE CHAPTER
2.0 INTRODUCTION

Research can never be undertaken in isolation of the work that has already been done on the problems which are directly or indirectly related to a study proposed by a researcher. One of the important steps in the planning of any research study is a careful review of the research journals, books, dissertations, theses and other sources of information on the problem to be investigated. Therefore, a review of the related literature must precede any well-planned research study.

Thus the present chapter deals with review of various studies and literatures based on the Health and Nutritional Practices towards Pre-school Children. The present chapter review of related literature is divided into two different categories viz., Foreign Studies and Indian Studies.

2.1 FOREIGN STUDIES

2.1.1 Studies Related to Child Nutrition

Manju Panwar, (2005), stated in her study that the magnitude of malnutrition is immeasurable not only in Asia but also in the entire world where nearly 11 million children under the age of five die each year from common illness and malnutrition associated with poverty. Improving the child’s health should be the first step to fight against poverty because only the healthy, educated and socially accepted children can be instrumental in creating a better quality of life. Adequate nutrition is essential for children to ensure their well-being. One of the main reasons of the pathetic condition of malnourished children is that not much concerned effort has been made by the governments to improve their health.

According to WHO, (2000), nutritional well-being firmly rests on a foundation of at least four main factors-food, care, health and environment. Caring for the nutritionally vulnerable includes the time, attention, and behaviour needed (in addition and complementary to household food security) to ensure food, health and love are sufficiently provided to ensure healthy nutrition. Among the range of caring behaviours are breast-feeding and appropriate complementary feeding for infants and young children, care and support for mothers during pregnancy and lactation, time and help to ensure adequate nutrition for the elderly, improving education, literacy, social
security, employment opportunities and rights of women. Nutritional well-being of children is particularly well correlated with women’s education, literacy and economic security.

**UNICEF Action in Nutrition, (2000)** states that, translating nutrition strategy into real progress for children require action across a broad range of areas. Improved nutrition in countries around the world has been achieved through approaches as diverse as fortifying staple foods, promoting breast-feeding, improving access to health services and education.

**International Food Policy Research Institute, (2000)** stated that, low birth weight babies were prone to frequent infections, leading to undernourished children with a reduced mental capacity. The child who has inadequate food, health and healthcare grows into a stunted adolescent who has a reduced mental capacity.

**Gillespie, S., (1997),** reported in his study that approximately 38 million children were born in South Asia and one in eight fails to survive to the age of 5 years. Approximately 3 million of these child deaths were directly or indirectly associated with malnutrition. These babies were born with impaired growth due to poor nutrition during foetal life. Low birth weight was a retrospective marker of the mother’s nutritional and health status while it was also a prospective marker of the child’s growth and development.

**National Institute of Nutrition, (1997),** reported about nutrition for pre-schoolers. The report reveals that the nutritional health of young children begins with the attention paid by parents and caregivers to providing a healthy diet and food experiences, which foster healthy eating patterns. To promote nutritional health during pre-school years, health and childcare professionals can do the following: 1. Enable parents and child care providers to provide a healthy diet to pre-school children. 2. Help parents and child care providers to foster food attitudes and eating practices, which promote health. 3. Further the development of programmes and policies, which advance nutritional health for the pre-school population.
Jane, H., Paterson, B.S.C., Dipnut and Diet, M.P.H., (1994) reported that the nutrition of Pacific Island children varies according to geographic and socio-economic conditions and because of cultural diversity across the islands. Nutrition problems result when children do not receive the right food, in the right amounts, at the right times, and as a consequence of infection and disease, or inadequate care.

Gopalan, C., (1992) reported in his study that in developing countries of South-East Asia, about 10% of the children under the age of 5 suffer from severe under nutrition, 15% are normal and the rest suffer from mild to moderate forms of under nutrition.

UNICEF, (1990) stated that health and nutrition problems were the result of unsatisfactory food intake or severe and repeated infections, or a combination of both. These conditions were closely linked to inadequate access to food, neglected care for mothers and children, insufficient health services and an unhealthy environment. These parameters were reflected in the standard of living of a population, and whether its basic needs were met, for example with adequate food and healthcare.

IFPRI, (1983) studies revealed that the level of adequacy of the household diets tends to be better than the child’s diet in cash cropping system. An analysis of Kenya and Phillippine studies showed that a doubling of household income could result in only a 9 per cent and 4 per cent increase in energy consumption of pre-schoolers respectively. This was in households where pre-schoolers were consuming only 60-80% of their energy needs. The data implied that large increase in household income would be needed in order to fill the energy gap in children’s diet. It was found that increase in household income did not decrease illness, children from the highest-income households. Since illness affects child’s nutritional status the cash cropping schemes did not have a dramatic effect on pre-schooler nutritional status. It was found that in Kenya, as the household income increased, the vitamin A intake decreased. The reason was that, many of the vitamin A rich foods were seen as low prestige foods.

2.1.2 Studies Related to Health and Nutritional Practices
Anwer, I. and Awan, J.A., (2003), reported in their study that health and nutrition problems are the result of unsatisfactory food intake or severe and repeated
infections, or a combination of both, and are closely linked to inadequate health services and an unhealthy environment. In Pakistan, there was a significant difference in the economic status, life style and nutrition between urban and rural population, and between male and female children. Such differences affect the health and nutritional status of children.

**Denisard Alves, (2003)** pointed out in his study that child nutrition and health are among the main commodities produced within the household. Because these commodities typically were produced under the responsibility of mothers, the human capital embodied in mothers may have significant impact on children’s health status. If better educated parents were more successful at protecting or improving their children’s health status (holding everything else constant), the cost-effectiveness of public health programmes aimed at reducing infant mortality such as programmes to improve child nutrition and health, can be increased by prioritizing the types of households to be targeted.

**Kruger, R. and Gericke, G.J., (2003),** made a qualitative exploration of rural feeding and weaning practices, knowledge and attitudes on nutrition of mothers/caregivers. The result of the study states that the breast-feeding was the choice feed and bottle-feeding was only given when breast-feeding was impossible. Solid food was introduced early (at 2-3 months) and a mixed family diet at 7-9 months. Milk feeds were stopped completely from 18-24 months. Weaning diets were compromised due to poor food choices, preparation practices and limited variety. The study concluded that inadequate nutritional knowledge and adherence to cultural practices lead to poor-quality feeding practices. Cultural factors and taboos have a powerful influence on feeding practices and eating patterns. Nutritional knowledge needs to be changed in a first step towards implementing improved feeding practices.

**WHO, (2002)** stated that breast-feeding is an unequalled way of providing ideal food for the healthy growth and development of infants, it is also an integral part of the reproductive process with important implications for the health of mothers. As a global public health recommendation, infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health. Thereafter, to meet their evolving nutritional requirements, infants should receive nutritionally adequate
and safe complementary foods while breastfeeding continues for up to two years of age or beyond.

Mieke Faber and Benade, A.J.S., (1999) made a study on nutritional status and dietary practices of 4-24 month-old children from a rural South African community. The result of the study states that 80% of infants in the 4-12 month-old category and 56.9% of children in the 12-24 month-old category were being breastfed. Food intake reflected a high intake of carbohydrate-rich foods, and irregular intakes of fruits and vegetables, especially those rich in vitamin A. Foods of animal origin were not consumed regularly. Of these under-twos, 15.9% experienced an episode of diarrhoea during 2 weeks prior to the survey. It was concluded in the study that the under-twos had a poor vitamin A and iron status. Nutritional education, intervention programmes and feeding schemes should address micronutrient deficiencies, with the focus on the quality of the diet, rather than quantity.

Amjad H. Wyne, et. al., (1997), found in their study that the percentage of children using commercial baby food was highest in the 7-12 month age period, and there was a sudden drop across the older age periods to the age period 25-36 months, where only few parents used commercial baby foods. Home-made food was given to children by a large majority of parents. Parents mostly used tap water in the preparation of food. Tap water was fluoridated in the Adelaide Statistical District. A minority of parents added flavorings to the home-made foods. Children do not need additional salt and sugar other than those naturally present in the food. It was discussed in the study that parents were in need of advice about feeding patterns of infants and young children. This advice may come from health professionals such as nutritionists, pediatric dentists, general dentists, general medical practitioners, and nursing staff of local mother and child health care centres.

2.1.3 Studies Related to Child Health and Nutritional Status

Anushua Chaudhuri, (2003) made a study on the programme impact on the health and nutritional status of children and other socio-economic characteristics on the health status of children in rural Bangladesh. The result of the study shows that the children residing in the treatment area were of higher quality in terms of health status. A significant determinant of children’s health was mother’s education and an important
conclusion was that this program was a substitute for formal education for mothers with low schooling attainment. The treatment effect is positive and significant for girl’s weight-for-age measures while boys are significantly less stunted in the treatment area as a result of the MCH program.

Santhat Sermrri, (2002), conducted a descriptive study to assess the maternal and child care practices related to the nutritional status of under-five year old children in Banpon Hospital, Ratchaburi Province, Thailand. The findings of the study shows that the completeness of immunization, food withholding (fruits and juices) during diarrhea, complementary food, childhood illnesses diarrhea and coughing) and food taboos during pregnancy and lactation were significantly associated with child nutritional status on either weight for age, height for age or weight for height basis. Many factors that were related to maternal and child care practices in this study contributed to malnutrition in children. Therefore, it was recommended in the study that a multi-sectoral approach should be adopted in designing programmes that are aimed at alleviating childhood malnutrition such as community-based growth monitoring and nutritional education. Emphasis should be put on breastfeeding and complementary feeding because they were found to be poorly practiced.

Mia, M.U., Florencio, C.A., Hossain, M., (2002), conducted a study on agro-economic determinants of nutritional status of pre-school children. Stepwise regression analysis was done to identify the significant determinants of nutritional status of pre-school children. Per-capita landholding, tenurial status, crop production, size of farm households, age, and sex were the significant determinants of nutritional status in children. The variabilities explained by the model were 30% and 37% in relation to the local and international standards respectively. The children aged less than 2 years were significantly heavier compared to other age groups.

Ronald Walela Wasike, (2002), conducted a study to assess maternal and child care practices that are related to the nutritional status of under-five year old children in Banpong hospital, Ratchaburi Province, Thailand. The study recommended that a multi-sectoral approach should be adopted in designing programmes that are aimed at alleviating childhood malnutrition such as community-based growth monitoring and
nutritional education. Emphasis should be put on breastfeeding and complementary feeding because they were found to be poorly practiced.

**Abidoye, R.O., Ihebuzor, N.N., (2001),** assessed the nutritional status using anthropometry of 1-4 year old children in an urban slum in the Mushin Local Government Area of Lagos State. A total of 365 children were enrolled using multistage random sampling techniques. Anthropometric measurements used were weight and height. Height-for-age, weight-for-height, and weight-for-age Z-scores below -2.00 SD of the reference NCHS standard were used to define stunting, wasting and underweight, respectively. The study revealed a prevalence of underweight of 39.2%, stunting of 34.5% and wasting of 21.9%. The mean of weight-for-age, height-for-age, weight-for-height and mid-upper-arm-circumference were less than the mean of the NCHS reference population. This difference might be due to the socio-economic backgrounds of the two populations. Using the modified Wellcome Classification of malnutrition, 37.8% of the children were malnourished. Most subjects came from homes with inadequate water supply and poor refuse disposal methods.

**Yuko Tada, (2001),** conducted a study on nutritional status of children (1-5 years old) living in Bangkok congested area. It was found from the study that among the potential related factors (characteristics of the family (mothers' age, marital status, educational background, family size, family income, mothers' occupation), characteristics of the children (children's age, gender, birth order, immunization status, history of illness), mothers' knowledge and perception on nutrition, and mothers' food practice), only mothers' food practice was found to be related to the nutritional status of children by weight-for-age (z=-2.509, p-value= 0.012). With respect to height-for-age, from the results of bivariate analysis, it was found that family income (z=-3.140, p-value=0.002), mothers' educational level (z=6.782, p-value=0.034), mothers' occupation (z=8.811, p-value=0.003), and mothers' food practice (z=-2.184, p-value=0.029) had a relationship with the nutritional status of children. Regarding weight-for-height, no factors were found to have a significant association with the nutritional status of children.

**Doan Phuoc Thuoc, (1999)** reported that prevalence of malnutrition (combined first, second and third degree) was 45.8% by weight for age. Among socio-
demographic factors, age of mothers and age of children had relationship with
nutritional status. More than half of mothers had poor breast-feeding practices but
good complementary feeding practices. More than half of mothers had poor utilization
of child health care services but good utilization of maternal health care services.
Results showed that better feeding practices and utilization of maternal child health care services brought better nutritional status.

Kesitegile Gobotswang, (1998), made a study on determinants of the
nutritional status of children in a rural African setting: The case of Chobe District,
Botswana. A total of 643 households and 898 pre-school children were surveyed to
determine factors that are associated with the nutritional status of children below the
age of five years in the northwestern District of Chobe. Except for those in remote and
difficult-to-reach places, all households with a pre-school child were selected for the study. The results showed that young children up to the age of 10 months have a better nutritional status than older children. By the age of three years, a child in Chobe was more than twice as likely to be underweight as a 10-month old. The results of the regression analysis further reveal that there is a negative association between age and the nutritional status of the child.

Lynnda Kiess, (1998), made a study on comparison of nutritional status among
pre-school children living in rural, slum and urban Dhaka. The results of the study showed that the prevalence of stunting (%<-2 z-score) among the pre-school children was higher in the urban slums, followed by the rural and urban non-slum areas (66.2%, 61.1%, and 52.5%) respectively. Analysis of the household socio-economic situation showed that there was also great disparity within each of these areas. Comparing nutritional status among the children from vulnerable households (landless and/or where the main earner is a casual worker) by area revealed the severity of underweight in the urban slums: 71.0% vs. 61.9% in the urban non-slums vs. 64.8% in the rural areas. Diarrhoea, vulnerability, and slum habitat were significantly associated with increased risk of being underweight.

Garg, S.K., et.al., (1997), made a study on nutritional status of children (1-6 years) in slums of Ghaziabad city. The major objectives of the study were –to assess the nutritional status of the children, to find out the nutritional deficiency disorders in
them and to study their dietary intake. A cross-sectional study was made and totally 771 children of 1-6 years were taken as the sample. It was found from the study that majority (58.2%) of children were having undernutrition of varying grades irrespective of their sex and caste but influenced by their age and ICDS beneficiary status. Anaemia, xerophthalmia and goiter were present in 14.7 percent, 1.6 percent and 0.6 percent children respectively. Average daily dietary intake of energy and nutrients were lower than the Recommended Daily Allowances (RDA). It was concluded in the study that nutritional supplementation along with adequate nutrition education would reduce the nutritional deficiency disorders among children.

Waihenya, E.W., Kogi-Makau, W., Muita, J.W., (1996), made a study on maternal nutritional knowledge and the nutritional status of pre-school children in a Nairobi slum. The study established that most mothers (97.5%) have access to nutritional education. Prevalence of stunting (86.2%) and underweight (58.4%) was high but that of wasting (1.9%) was low. There was no significant relationship between the nutritional status of children and overall nutritional knowledge. Unexpectedly, a negative relationship was found between nutritional status and mothers' ability to recognise clinical signs of malnutrition, knowledge in the weaning process and dietary management during sickness. Knowledge on frequency of feeding was, however, positively related to nutritional status.

Ezzat K. Amine and Fawzia A. Al-Awadi, (1996), conducted a study on the nutritional status of 645 male and 635 female pre-school children in Kuwait. Mothers were interviewed to collect data on socio-economic 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 undernutrition.

Waihenya, E.W., Kogi-Makau, W., Muita, J.W., (1996), carried out a cross-sectional in a Nairobi slum (Kibera), nutritional status of 363 children aged six to 24
months was measured and nutritional knowledge of their mothers assessed. Makina
village was randomly selected as the study site and all consenting households were
involved in the study. The study concluded that nutritional knowledge alone is
inadequate in ensuring young children's nutrition security and, hence, for nutritional
education programmes to have a positive impact, facilitational strategies must be
incorporated.

**Bernadette Kumar, (1995),** made a study on the assessment of the nutritional
status of children under five in the Gaza strip. Out of fifteen hundred children, 705
males and 795 females were selected by cluster sampling. Their heights and weights
were measured and recorded. By way of questionnaire, additional socio-economic
information was collected—as was that relating to food and feeding practices and health
services. It was discovered that 15.1% of the sampled children were underweight
(below - 2 SD of the reference weight for age). Wasting (below –2SD of the reference
height for age) was found in 14.2% of the children. No significant differences were
found between the two sexes that were sampled. Significant linkages were found
between nutritional status and education, sanitation, size of the family, number of meals
per day, feeding practices, the socio-economic status of the family and other hardship
indicators.

**Jing Chen and Douglas Taren, (1995),** conducted nutrition surveillance in
June 1990 in four poor rural counties of Hubei Province, China, that included 25
villages and 3,564 children, to determine early feeding practices and the nutrition status
of pre-school children. Data were collected through interviews, anthropometric
measurements, analysis of haemoglobin values, and physical examinations. More than
90% of the infants under 6 months of age were being breast-fed, as were approximately
75% of those 12 months old and 26% of those 24 months old. A trend to introducing
solid foods into children's diets at younger ages appeared to have occurred between
1984 and 1988; only 15% of the children ate solid food at 6 months of age and 58% at
12 months in 1984, compared with 23% and 78% respectively in 1988. The children's
anthropometric measurements were comparable to international standards for the first
months of life, and then weight-for-age and height-for-age Z scores deviated negatively.
The data also indicated that during a time of sweeping economic changes and expanded
health care availability, breast-feeding was maintained, food was introduced into the diets of children at younger ages, and acute malnutrition was not common.

Kiyu, A., Teo, B., Hardin, S., Ong, F., (1991), made a study on the nutritional status of 641 children between the ages of 0 to 4 years old, from 835 households in 41 randomly selected rural villages with water supply in Sarawak were determined. Based on Waterlow’s classification and the National Center for Health Statistics (NCHS) standards, 61% of the children were stunted and 44.1% were wasted. Based on Gomez’s classification and the NCHS standards 81.9% of the children were malnourished. There was no sex difference in nutritional status. The percentage of malnourished children increased continuously with age while the percentage of children who were wasted increased from 6 to 36 months and then it leveled off. The percentage of stunted children also increased with age but the increase was sharpest in children who were 12 to 23 months old. It is noted that the Gomez classification overestimates the prevalence of undernutrition.

Food and Nutrition Board, (1991) reported that pre-school children are extremely vulnerable. They succumb readily to infections particularly when their diets are inadequate both quantitatively and qualitatively. Several studies have shown that the diets of pre-school children are deficient in energy, protein, vitamin ‘A’, riboflavin and iron. Thus, almost all the major nutritional problems such as protein-energy malnutrition, vitamin ‘A’ deficiency, iron deficiency anemia etc., are common in this age group. Even when malnutrition is not severe, pre-school children suffer from varying children against common childhood diseases such as tuberculosis, polio, diphtheria, whooping cough, tetanus and measles.

Poh Siang Choo, (1990), made a study on nutritional status of Indian pre-school children in the rubber plantation sector in Malaysia. The subjects consisted of households with children six years and less, drawn from three estates in the area. Health related information of the child was obtained from the records in the estate clinics. Nutritional status of the child was assessed by anthropometrics. It was found that about 80 percent of the children above one year of age were breastfed for a period ranging from 4 to 24 weeks. The median duration of breast-feeding was eight weeks and this coincides with the usual practice where women estates workers are given about
eight weeks of paid maternity leave after their delivery. The staple diets of the children were found to consist mainly of high carbohydrate foods such as biscuits, local cakes and snacks, and rice with limited servings of curried fish and vegetables. Fruits and protein rich foods such as eggs, milk, poultry and red meat were not frequently available to most of the children. Because such food items are expensive and most estate families cannot afford to purchase them. There was also no subsistent production of fruits, vegetables, and poultry products carried out by these estate families.

2.1.4 Other Related Studies

World Bank, (2005) reported that nutrition is equally critical for child health and survival. According to the WHO, the proportion of children under five in the developing world who are malnourished to the point of stunting fell from 39% in 1990 to 30% in 2000. By 2005, this figure is projected to fall below 26%. And the UN's Food and Agriculture Organization (FAO) estimates that 17% of people in the developing world were undernourished in 1999-2001, a slight drop from 18% in the mid-1990s. The absolute number of undernourished people, however, rose slightly over that period, however, from 780 to 798 million. Moreover, inadequate nutrition of mother and child accounts for 9.5% of the global burden of disease.

UNICEF, (2004) reported that every year more than 10 million children still die before their fifth birthday, the vast majority of these deaths occur in poor countries. Three causes – pneumonia, diarrhoea and malaria – account for more than 40 per cent of deaths, and malnutrition was associated with over half of all deaths. A third of all deaths occur in the neonatal period (the first 28 days of life).

Saleumsak Keochanthala, (2002), carried out a study to describe socio-demographic characteristics, knowledge, perception and sources of information and children's immunization status. The study tried to find out the relationship between these variables and child immunization status. A cross sectional study was conducted on knowledge and perception of mothers with children under two years of age on immunization status in Nongbok district, Khammuane province, Lao PDR. Two hundred and seventy three mothers who had children under two years old were chosen from fifteen villages. The result of study was found that most of the respondents (93.8%) their children were vaccinated and most of them (87.5%) went to get
vaccination for their children at mobile services. The total immunization rates among children under two years old were very low (37.0%). Only BCG vaccination was quite high (80.6%), other vaccines were found to be less than 50%. The results also indicated that the mothers' occupation, education, number of children alive and residences were significantly related with children immunization status, while the mothers' ages and family income were not related. Regarding the mothers' knowledge about diseases and immunization programmes, a few more, one-third, of respondents had a similar knowledge level (good, fair and poor). Regarding sources of information on the knowledge of immunization and the side effects of vaccines, most of the respondents got information from health personnel and also got from the village commission for mother and child. It was found that only information on side effects DPT / MsV vaccines were significantly related to immunizational status of children.

The implication from these findings provide useful information for the improvement and strengthening of immunization programmes in Khammuane province by the health personnel, commission for mother and child, village health volunteers and private sectors for giving mothers' knowledge and perception toward immunizable diseases and immunization programme.

**World Bank, (2002)** has done a study on Inequalities in Child health: Comparing the living standards Measurement study and Demographic and Health Surveys. The result of the study indicates that, in all countries poor children are less well nourished than better-off children. However, the degree of inequality between poor and nonpoor children can vary substantially across countries, even at similar levels of development (although many of the intercountry comparisons are not statistically significant.

**MSSRF, (2001)** reported that five hundred and fifteen million Asians are chronically undernourished, accounting for about tow-thirds of the world's hungry people. Child malnutrition exacts its highest debilitating toll in the Asia-Pacific region, especially South Asia. Likewise, nearly 800 million, two-thirds if the world’s poor, have their homes in this area. It is disquieting that in recent years the numbers of hungry and poor people have not been decreasing and remain stubbornly high. Of the annual reduction of 20 million hungry people at the global level, 14 million such people
are to be from the Asia-Pacific Region. Thus, the task of reducing the number of hungry and poor must assume first place in the developmental agenda of Asian countries and of all concerned regional and international organizations. Anthropometrically also, over two-thirds of 174 million undernourished children under five years of age in the developing world were Asian children (especially South Asian). It is estimated that more than half of the young children in South Asia suffer from protein-energy malnutrition, which is about five times the prevalence in the Western hemisphere, at least three times the prevalence in the Western hemisphere, at least three times the prevalence in the Middle East, and more than twice that of East Asia. A lifecycle approach to nutrition will help to attend to the differential nutrition needs at different stages of an individual’s growth. It is now widely accepted that malnutrition is the major cause for child mortality in developing countries as a whole. It is now widely accepted that malnutrition is the major cause for child mortality in developing countries as a whole. Prevalence of LBW babies provides a good indicator of the nutritional status of mothers. The UN Commission on Nutrition has rightly warned that nutritionally deficient infants and children will suffer from handicaps in brain development, thereby having serious repercussions on the intellectual potential of nations in this region.

**Katherine Alaimo, et.al., (2001)** investigated associations between family income, food insufficiency, and health among US pre-school and school-aged children. The result of the study reveals that low-income children had a higher prevalence of poor/fair health status and iron deficiency than high-income children. After confounding factors, including poverty status, had been controlled, food-insufficient children were significantly more likely to have poorer health status and to experience more frequent stomach aches than food sufficient children; pre-school food-insufficient children had more frequent colds.

**Kraisid Tontisirin, et.al., (2001)** reported that children are major victims of PEM and an estimated 192 million children under 5 years suffer from acute or chronic symptoms, worldwide. Currently over three-fourths (79 per cent) of the world’s malnourished children live in Asia. Half of the underweight children live in South Asia and the prevalence of underweight shows wide variation among Asian countries. In Southeast Asia, Cambodia and Vietnam have higher rates of total underweight
(moderate and severe) among under-fives to the extent of 40-50 per cent. Indonesia
and the Philippines have somewhat less extensive problems. Even Thailand has
significant proportions of children that are underweight in comparison with WHO
standards. Stunting and wasting are both highly prevalent in Asia, and this is reflected
in the numbers of children who are underweight. On the whole, in the countries
reviewed, factors such as maternal malnutrition, associated childhood illnesses as well
as poor quality of diets appear to be significant in the causation of childhood
malnutrition. The factor of household food security also appears to be an important
factor.

Atkin, L. and Davies, P., (2000) reported in their study that the prevalence of
overweight and obesity is increasing at dramatic rates in the western world. In recent
years, more focus has been turned to prevention strategies to help resolve this health
problem. The aim of the study was to determine whether diet composition is related to
percentage body fat in pre-school-aged children. Seventy seven pre-school children,
aged 1.5-4.5 years, served as subjects. Four-day weighed food records were collected
by the child’s primary caregiver to determine intakes of total energy and energy from
carbohydrate, fat, and protein. The percentage of body fat in the children studied was
not significantly correlated with dietary intake variables including total energy or
percentage of energy from carbohydrate, protein, or fat. The percentage body fat did
not differ significantly among the three increasing levels of each intake variable.
Through multiple regression analysis, it was found that physical activity level was
related to body fat. It can be concluded that there is no apparent relationship between
intake of any of the macronutrients and body fatness in pre-school-aged children.

WHO, (2000) reported that poverty underlies most of the world’s malnutrition,
with attendant inadequate and insecure food supply, inappropriate feeding practices and
care, nutritional emergencies, and widespread infection and infestation compounded by
lack of health services. Maternal malnutrition remains a major factor for the 30 million
infants born each year with intrauterine growth retardation leading to retarded physical,
mental and intellectual growth, and heightened risk of infectious diseases and death.
Malnutrition contributes to nearly half (49%) of the 10.7 million deaths each year
among pre-school children in developing countries.
Lucca, et al., (2000) reported that Iron-deficiency anaemia is the most widespread nutrient deficiency in the world, affecting an estimated 2 billion people worldwide. Between 40 and 50% of children under the age of 5 in the developing countries are iron deficient and iron deficiency accounts up to 20% of all maternal deaths. It also impairs immunity and reduces the physical and mental capacities of people of all ages. In short, iron deficiency is a major public health problem worldwide with enormous social and economic costs.

Amer Attique, (1999), made a study on utilization of immunization services among mothers with children under five years of age. The results of the study revealed that only 62.5 per cent of the respondents were utilizing the immunization services. Furthermore, this study also revealed that socio-demographic characteristics such as age, education of the respondents, occupation of the respondents, family income and number of children under five years of age had an effect on the utilization of immunization services; similarly, knowledge and perception of the respondents about immunizable diseases and immunization programme had an effect on the utilization of immunization services. There was also an effect of accessibility and availability of immunization services on the utilization of immunization services.

Tin Maung Hlaing, (1998), conducted a study on nutritional status of children (1-5) years in malaria endemic area, Kanchanaburi, Thailand. It was found that more than half of mothers showed comparatively high knowledge and practice on feeding habits to their children and prevention of malaria. Better knowledge and practice on feeding practice brought better nutritional status. Although knowledge and practice on malaria prevention was not directly related to nutritional status, it showed influence on the prevalence of malaria infection.

Tuncbilek, E., Unalan, T. and Coskun, T., (1996), conducted the Turkish Demographic and Health Survey (TDHS) in 1993, provided data on the magnitude of malnutrition in a sample of 3152 pre-school children from five geographical regions, and on its causal and conditioning factors. Stunting was found to be the dominant form of malnutrition (21 per cent). Altogether 10 per cent of children were underweight and 3 per cent were wasted. There were urban-rural (16 v. 27 per cent, P<0.001) and regional differences (highest in the East 38 per cent, lowest in the West and North 10
and 14 per cent, respectively; P<0.001) in the stunting. Among the most important conditioning factors were too early introduction of supplementary foods, mother's educational level, mother's work area, person who takes care of children while mother is at work, birth rank of children, birth spacing, number of children in an individual family, family size, and mother's welfare and hygiene indices. The need for an inter-sectoral approach for the development of remedial programmes to reduce the effect of these factors and for periodic assessment of nutritional status of pre-school children is stressed.

UNICEF, (1988) reported that malnutrition among infants and children of preschool age continues to be a problem of considerable magnitude in most of the developing countries of the world. More than one-third of the child population in India is not allowed to grow up to their full physical and mental potential due to malnutrition and deficiency diseases. There are increasing expressions of concern in low-income countries about the malnutrition problem both as a major source of mortality and sickness and as a serious drain on development efforts to achieve human potential. The mortality rate among children under 5 years in these countries roughly ranges from 10-40 times higher than in industrialized nations.

2.1.5 Resume of Foreign Studies

All these studies help the researcher in framing the variables of the present study and also to get an overview of the prevailing child health and nutritional practices/condition and its relevant aspects at international level.

2.2 INDIAN STUDIES

2.2.1 Studies Related to Child Nutrition

Amutha, S., (2007), pointed out that according to an assessment of underweight and stunted growth of children during 1997, in the age group of 1-5 years, almost half (49.1%) of the girls were underweight and 20.3% were severely underweight. Stunted growth was observed in 56% of the girls. The Body Mass Index (BMI) indicated that 36.1% of women were underweight due to chronic energy deficiency. The survey conducted by National Nutrition Monitoring Bureau, Hyderabad indicated that though malnutrition in children have declined, the micronutrient deficiency of Vitamin A, Iron, Calcium and Iodine have been affecting the children in various degrees.

Fred Arnold, et.al., (2004) reported that in India, levels of under-nutrition are much higher in rural areas than in urban areas, but even in urban areas more than one-third of young children are stunted and underweight. The education of the child’s mother has a strong negative relationship with under-nutrition among children. Children, whose mothers are illiterate are more than twice as likely to be stunted and
under-weight and one and a half time as likely to be wasted as children whose mothers have completed at least a high school education. Malnutrition and related disorders among children may be caused by multiple factors, such as lack of food, a poor diet, severe or recurrent diseases (such as diarrhea), or improper feeding practices. It is noticed in India that many women do not follow the child feeding practices recommended by the Government of India and the World Health Organisation.

**Government of India, Food and Nutrition Board, (2004),** states that besides modified family food and reconstituted infant food mixes, protective foods like milk, curd, lassi, egg, fish and fruits and vegetables are also important to help in the healthy growth of the infants. Green leafy vegetables, carrots, pumpkin and seasonal fruits like papaya, mango, chikko, banana etc., are important to ensure good vitamin A and iron status of the child.

**British Nutrition Foundation, (2003)** reported that the diets of pre-school children have changed dramatically in the last fifty years, and a lot of these changes may not be desirable in terms of achieving a balanced diet. Compared with the 1950’s, the diets of four-year-old children in the 1990s included less energy and iron, and fewer starchy foods, but more confectionery and soft drinks. Health professionals have a significant role to play in encouraging breast-feeding and advising on the transition from a milk-only regime to a mixed diet; advice on appropriate weaning foods, the use of a cup, and the inclusion of fruits and vegetables, is crucial in terms of eating a mixed diet later in life.

In the most recent national studies of pre-school children, intakes of nutrients were adequate. However, specific problem nutrients were vitamin A, zinc, copper and iron. Half of the pre-school children studied had a marginal intake of vitamin A, three-quarters had a marginal intake of zinc, half had a marginal intake of copper and 12% of 1½ -2½ year olds had a low hemoglobin level.

**Alok Bhargava, (2001),** made a study on nutrition, health, and economic development: some policy priorities. It was reported in the study that most developing countries face different resource and infrastructural constraints that limit their economic growth. Nutritional deficiencies, poor environmental conditions, and inadequate
educational infrastructure hamper children’s learning, which is critical for the future supply of skilled labour and hence for economic development. Higher intakes of protein and micronutrients such as iron are important for children’s physical growth, morbidity, and learning. Improved sanitation and vaccines against infections will prevent loss of vital nutrients. Nutrition and health policies based on long-term considerations will lead to a well-trained labor force enabling non-resource-rich developing countries to escape from poverty traps.

Kavita Rana and Munira Hussain, (2001) have done a study on body weight status of pre-school children belonging to high-income group in relation to nutrient intake. One hundred and fifty children of 1 to 3 year age group belonging to higher income group residence of Indore city formed the sample. It was found through the study that children have adequate iron intake. The intake of vitamin A was also poor. It further states that out of 150 children, 104 children had deficient iron intake, 91 of them are under weight and only 22 of them are normal in weight.

Vinod, K., et. al., (1999), conducted a study on Child Nutrition in India. The results of the study indicate high level of both chronic and acute malnutrition among Indian children. Fifty-two percent of all children below age four age were stunted (as measured by height-for-age), and 17 percent were wasted (as measured by weight-for-height). The extent of severe malnutrition was also substantial. A multivariate analysis of the effects of selected demographic and socio-economic factors on child malnutrition indicates that the strongest predictors of child nutrition in India were child’s age, child’s birth order, mother’s education, and household standard of living. Older children and children of higher birth order are more likely to be malnourished. Children whose mothers were more educated and children who live in households with a relatively high standard of living tend to be better nourished than other children.

NFHS-2, (1998) reported that almost half of children (47 per cent) under three years of age are under-weight, a measure of short and long term under-nutrition. A similar proportion is malnourished to the extent that they are stunted (46 per cent). Severe underweight is observed for 18 percent of children and severe stunting for 23 percent. Sixteen percent of children are excessively thin (wasted). Rural children are much more likely than urban children to be undernourished. Under nutrition is lowest
among children less than six months old, an age when children are mainly breastfed, and most widespread among children age 12-35 months. Children born to mothers who already have a large number of children and to mothers who are themselves undernourished are more likely to be undernourished. Under nutrition among children varies greatly by mother’s education and household standard of living. Children born to illiterate mothers are more than twice as likely to be underweight or stunted as children born to mothers who have completed at least high school. Children from scheduled tribes are more likely than other children to be undernourished (especially wasted).

Lakshmi, S., (1997) reported in her study that lack of balanced diet was one major factor responsible for malnutrition. Lack of good sleep, fresh air, exercise and rest are other factors that cause it. Food should not only satisfy hunger, but should invigorate, promote the growth of the body. It should supply energy and help in body building. Hence it is necessary that the mother should know the different kinds of food which contribute to nutrition and hence good health of children.

Vashist, S.R., (1997), said that the pre-school children require food prepared simply and served in a manner, which enables them to feed themselves independently at mealtime. The nutritious snack should include the nutrients most commonly lacking in the diet of our children. Each day’s menu should include- raw fruits and vegetables for ascorbic acid, enriched bread for thiamine, meat products for complete protein and milk for calcium and protein.

Varma, et.al., (1996), in their study pointed out that the statistical analysis of the dietary data revealed that the weight for age status of the children was positively correlated with their milk intake. In contrast, associations between weight and other food items like cereals, pulses, fats, sugar and food supplement provided through the ICDS was non-significant. This was an expected outcome, considering the child’s near complete dependence upon milk for fulfillment of his/her nutritional needs. Mothers, because of their lack of understanding of the child’s nutritional needs, were delaying the introduction of complementary foods. Milk is an expensive food commodity and where the purchasing power is inadequate, the child is fed insufficient milk or diluted milk. This results in the widening of the gap between energy intake and requirement;
consequently they become victims of malnutrition. Computation of correlation between nutrient intake and weight for age of the children revealed that energy, protein, calcium and vitamin A intake correlated positively with their weight. Milk is a good source of all these nutrients. It therefore, is probable that, the difference in the intake of these nutrients could be because of the difference in the milk intake.

Alpna Agarwal and Hussain, (1995), observed in their study that 6.52 mg mean iron intake of pre-school children in Indore city and the mean hemoglobin level was also highly lower (6.12 mg/fl). The iron intake was found significantly linked with body weight, as the children who are taking low iron are underweight. Similarly vitamin A intake was also found significant related with body weight. Vitamin A has definite role in growth and also deduces that low intake of these nutrients is an indicator of over all inadequate dietary intakes, which caused gross deficiency of all these nutrients.

World Bank, (1995) suggests that the cost of undernutrition in India was at least US$ 10 billion annually in terms of lost productivity, morbidity and mortality.

Kathuria, A.K., (1994) observed that over the years, the major nutritional problems amongst pre-schoolers have been protein, energy malnutrition, vitamin ‘A’ deficiency disorders. Though these continue to be major areas of concern, even today a positive trend in the incidence and severity of these emerging, possible due to the intervention measures.

NFHS, (1992-93) indicated that, in India more than half of the children, that is, 54 percent of children under age four are low weight for age, and 52 percent are low height for age and 29 percent are low weight for height. The proportion severely malnourished was 21 percent, 29 percent and 3 percent for low weight for age, low height for age and low weight for height respectively.

NNMB, (1990-1992) reported in their annual survey report about the percentage prevalence of nutritional deficiency cases in pre-school children in A.P. which were as follows- Oedema (0.0), Emaciation (0.9), Meamua (0.7), PEM (0.3), Bitot apora (0.5) and Angular Stomatitis (6.2). Angular Stomatitis was more prevalent
in A.P. compared to other nutritional deficiency symptoms. PEM and Vitamin A deficiency were next in the order of prevalence.

**Raman, L., et.al., (1992),** made a study on ‘Iron Nutritional Status of Pre-school children. It was stated in that study that iron deficiency is a common occurrence in pre-school children especially of poor community and is mainly due to poor iron stores at birth, low iron intake during infancy due to prolonged breast feeding, inadequate food intake, repeated gastrointestinal and respiratory infections and poor quality of diet. As is obvious from Hb levels, this is reflected in high incidence of anemia in this age group.

**Ray, S.K., et.al., (1990),** made a cross sectional study of undernutrition in 0-5 yrs. age group in an urban community. The relationship between age and nutritional status was not statistically significant, but the association between sex and nutritional status was significant. 68.88% of females and 46.53% of males were undernourished. 64.71% of the undernourished and 51.35% of the nourished had illiterate parents. 70% of children with 3 or more siblings and 58.85% of children with less than 3 siblings were undernourished. 41.18% of the undernourished had upper respiratory tract infections, 52.82% had diarrhea, and 97.37% had parasitic infections. The respective proportions for nourished children were 59.46%, 40.54%, and 78.57%. Statistically significant differences occurred only for parasitic infections.

### 2.2.2 Studies Related to Health and Nutritional Practices

**Nathiya, V., (2007),** stated that health and nutrition is an important factor in the promotion and maintenance of good health throughout the entire life course. Rapid changes in diets and life style that have occurred with industrialization, urbanizations, economic development and market globalization, have accelerated over the past decade. This is having a significant impact on the health and nutritional status of populations, particularly in developing countries and in transitions while standards of living have improved food availability has expanded and became more diversified.

**Srivastava, N. and Sandhu, A., (2007),** stated in their article that infant and young child feeding practices, especially the complementary feeding practices, are dismal throughout the world, more so in the developing countries. This has in turn resulted in continuous malaise of extensive under nutrition in the vulnerable age group
of under two children. It is well recognized that effects of undernutrition and neglect are most profound in this age group. At the same time it is well known that adverse consequences like stunting and associated physical and cognitive defects being irreversible after 2 years of age.

Kumar Dinesh, et.al., (2006), made a study on Influence of infant-feeding practices on nutritional status of under-five children. It was found through the study that initiation of breast-feeding after six hours of birth, deprivation from colostrum and improper complementary feeding were found significant (P<0.05) risk factors for underweight. Wasting was not significantly associated (P>0.10) with any infant feeding practice studied. ICDS benefits received by children failed to improve the nutritional status of children. The study concludes that delayed initiation of breast-feeding, deprivation from colostrum, and improper weaning are significant risk factors for undernutrition among under-fives. There is need for promotion and protection of optimal infant feeding practices for improving nutritional status of children.

Parthasarathy, K. and Kavitha, R., (2005), conducted a study on Health and Nutrition: Study on Practices of Tribal Women. The study reveals that the practice of child health and nutrition among the tribal women was entirely different. It was found from the study that the tribal woman does not have enough knowledge about nutritional aspects. Though some of the tribal women were giving nutritional foods to their child, yet they do not fully know about its nutritional or nutrient factors/contents.

Kanti Singh, (2004) stated that malnutrition in children was more an interplay of female illiteracy, ignorance about nutritional needs of infants and young children and poor access to health care. Appropriate feeding is crucial for the healthy growth and development of an infant.

Roshan Habeeb and Sushila Srivastava, (2004), made a study on child care practices and infant growth in an urban slum. One of the findings of the study shows that there is a positive correlation between educational level of mothers and immunization. The salient observation in this context was that multi-paras mothers do not get their infants immunized at the right age although eventually they may be immunized. With regard to measles vaccination, the coverage was comparatively less
than triple antigen vaccination. In the case of polio vaccination the entire group had vaccination.

Rasania, S.K., et.al., (2003), conducted a study on breast-feeding practices in a maternal and child health centre in Delhi revealed that though 92.4 per cent mothers breast-fed their children, it was only 26.6 per cent who exclusively breast-fed up to four months of age. 67.3 per cent of the mothers breast-fed their children on demand. While 22.0 per cent of women were found to have initiated breast-feeding within two hours of giving birth, it was delayed for a day (12.2%) or even two days (17.1%) for others. Initiation of immediate breast-feeding was found significantly correlated with the literacy status of mothers. The frequency of breast-feeding was 5-8 times per day among 45.6 percent of those interviewed. The period of breast-feeding was up to six months of age of the child in majority (73.7%) of the cases. Bottle-feeding was also a common practice among 65.8 per cent of mothers. Problems related to breast-feeding were reported mainly from illiterate mothers. The above findings support the need to increase awareness among mothers on the importance of breast-feeding. The campaign may be successfully spearheaded through formal lactation counselling and infant feeding and management programmes by government and non-government organizations.

Alamelumangai, S., (2003) conducted a study on “Knowledge, Attitude and Practices of Mother and Child Health Care- Nutrition in Rural Area of Thiruverembur Taluk, Tiruchirappalli District, Tamil Nadu”. The study contains a sample of 126 respondents, which were randomly selected through simple random sampling technique. The findings of the study revealed that there is no significant difference between respondents number of children, monthly income and there is no significant variance in mean gain scores of the variance among respondents age of first pregnancy in terms of knowledge, attitude and practices on mother’s medical and nutritional care. It was concluded in the study that promoting women’s health improves not only individual health, but also the health and survival of women’s families.

Kavitha, R., (2003) undertook a study on Health and Nutrition: Study on Practices of Tribal Women. A sample of 152 respondents was selected randomly through adopting proportionate simple random sampling technique. The findings of the
study revealed that majority of the respondents (88.2%) were aware of breast-feeding which gives enough nutrition for baby. It was also found from the study that there is no association between educational qualification of the respondents and the child health and nutritional practices such as pre-lacteal feeding, breast feeding, nutritious food and nutritional status. The study concluded that the tribals are the child’s of nature, if the right approach made by government through various development measures and if the health workers dedicated themselves for the nutritional health development of tribals, surely tribal development can be achieved.

Kniger, R., Gericke, G., (2003) investigated to determine the feeding and weaning practices, knowledge and attitudes towards nutrition of mothers/caregivers of children up to 3 years old. The result of the study shows that breast-feeding was the choice feed and bottle-feeding was only given when breast-feeding was impossible. Solid food was introduced early (at 2–3 months) and a mixed family diet at 7–9 months. Milk feeds were stopped completely from 18–24 months. Weaning diets were compromised due to poor food choices, preparation practices and limited variety. The participant's nutrition knowledge regarding specific foods, their functions and recommended quantities were poor. The women adhered to their cultural beliefs regarding food choices and preparation practices.

Shahnaz Vazir, (2003), found through his study that according to mother’s opinion, a child could digest adult food (including green leafy vegetables) only at the age of about 2 years. They perceived that green leafy vegetables were good for health, tasty and were cooling foods. However, they did not consume them during early lactation in the belief that they caused green stools in young children. Milk and milk products were considered good for health, and especially buttermilk was consumed frequently especially in summer as it was cooling. Eggs were frequently consumed, but avoided in summer in the belief that they were hot food. Yellow pumpkin was disliked because it caused the body to swell up and was bad for health. Carrots were considered fruit for children. Mangoes were the most preferred fruit during the summer season.

Sunita Mishra and Braja Kishori Mishra, (2002), conducted a study on socio-ecological variables and pre-school child feeding practices of working mothers in Central Orissa. The study finds a higher percentage of mothers used bottle during
supplementary milk feeding followed by use of spoon. Majority of mothers introduced artificial milk due to either inadequate breast-milk or for the demand of the child. Other reasons attributed were employment of mother, old age of child etc. In urban and rural areas respectively, about 70% and 88.5% of the mothers introduced semisolids between six to nine months of age. There was no appropriate relationship between time of introduction of semisolid/type of semisolid and mother’s education and income level of the family. It was found that there was a significant association between length of exclusive breast-feeding and age of introduction of semi solids in urban children where as the association was not insignificant among rural children. But with regards to total length of breast-feeding, its association with the age of introduction of semi solids was significant both in urban and rural children. Similarly, when the association of socio-economic variables with the introduction of semi solids were tested through Chi-square test, maternal education was found to have no significant association in both urban and rural children, where as both income group and caste had a strong association with introduction of semi solids in urban children but not among rural children.

Thandavakumari, (2002) made a study on “Knowledge, attitude and practice of rural and urban mothers on child nutrition”. The researcher adopted survey method with 200 respondents each in rural and urban areas respectively of Pudukkotai district. The data was collected with a structured interview schedule. The main finding of the study was that there exist a significant correlation between the variables knowledge, attitude and practice on child nutritional concepts among urban and rural respondents.

Alaimo, K., Olson, C.M., Frongillo, E.A. and Briefel, R.R., (2001), investigated association between family income, food insufficiency, and health among US pre-school and school aged children. The result of the study shows that low-income children had a higher prevalence of poor/fair health status and iron deficiency than high-income children. After confounding factors, including poverty status, had been controlled, food-insufficient children were significantly more likely to have poorer health status and to experience more frequent stomachaches and headaches than food-sufficient children; pre-school food-insufficient children had more frequent colds.

Udipi, S.A., Bhattacharjee, L.I., Parulkar, R., Varghese, M.A., (2000), in their study reported the influence of water availability, environmental sanitation, and
personal hygiene on the morbidity profile in 212 pre-school children residing in urban slums was examined in a three-month follow-up study. Information on water availability, per-capita consumption, socio-demographic particulars, environmental sanitation, hygienic practices, and anthropometrics details was obtained. Morbidity were found to be influenced by family size, socio-economic status, mother's educational level, hygiene practices, environmental sanitation, and water availability. Provision of adequate and safe water for the underprivileged population is the most urgent need in community health intervention strategies.

**Gunasekaran, S., Sankarapandian, M., Vasantha, L., (2000),** conducted a study on infant feeding practice in Tamil Nadu with a sample of 912 children born during 1990-94 in Tamil Nadu. The result of the study revealed that only 28 per cent of mothers had practiced ideal infant feeding practice. It was more among urban women (32 per cent) as compared to their rural counterparts (26 percent). Place of residence, age at marriage, sex of the child, number of antenatal visits by ANM during pregnancy and place of delivery had a significant relationship with infant feeding practice. The study suggests to bring about an improvement in the delivery of maternal and child care services by strengthening of health education programme with special emphasis on interpersonal communication with women to improve the ideal infant feeding practices.

**Renata Forste, (1998),** conducted a study on Infant Feeding Practices and Child Health in Bolivia. The study states that the effects of breast-feeding and supplementation practices on recent diarrhoea occurrence and stunted growth are modelled using logistic regression techniques. Data from the Demographic and Health Survey of Bolivia, 1989, show that, among children aged 3-36 months at the date of interview, the benefits of breast-feeding to child health were most pronounced among children living in rural poverty. Reduced breast-feeding among these children increased the likelihood of diarrhoea and stunted growth. In addition, the introduction of solid foods to currently lactating infants negatively influenced child health.

**Aggarwal, et.al., (1998),** in their study reported that maternal education, socio-economic status, maternal nutrition, family support, motivation for breast feeding, birth order and infant sex were found to have no correlation with duration of exclusive breast
feeding or reason for starting supplementary feeds among children of low socio-economic status of urban women.

Chhabra, et.al., (1998) in their study observed that breast-feeding was maintained at a higher level (79%) throughout infancy while exclusive breast-feeding showed a rapid decline. At one month, 74% and at 4 months, 46% of infants were exclusively breast-fed. The median duration of exclusive breast-feeding was 3.83 months. Mothers with lesser education and lower education and lower family income were more likely to be exclusively breast-fed.

De, N.C., (1998), in his study observed that 51.3% infants were started on supplementary feeds within 6 weeks of age in low socio-economic status families and the commonest reason for starting supplementary feed was lack of secretion.

Pandey, et.al., (1997) observed in their study that in the age group of 6-9 months, 56.4% of the infants received complementary feeding although the right age of initiation of complementary feeding is 4-6 months.

Brown, (1995) stated in his study that children who were exclusively breastfed had better nutritional status than those who were not exclusively breastfed. Interestingly, there were less malnourished children who were breastfed up to 6 months than those who continued to breastfeed beyond 6 months. The significant associations found between exclusive breast-feeding and the children’s nutritional status support the importance attributed to exclusive breast-feeding as the optimal means of feeding and caring for young children, during the first few months of life.

Greiner, (1995) pointed out in his study that the complementation feeding before 6 months of age especially in poor setting may displace breastmilk and may have a negative effect on child’s growth.

Braja Kishori Mishra, (1994), conducted a study on feeding practices of pre-school children in western Orissa. The survey was undertaken in industrial, urban and rural communities of western Orissa. It was found from the study that the mean height, weight, Dugdale’s Index, weight for age (% of Harvard Standard) and Body-mass index
were higher in colostrums-fed babies than the babies not fed with colostrums, in all the communities. Although the differences in the mean-values between the two groups may not be statistically significant, the trend of having higher anthropometrics measurements and higher nutritional status indicates the importance of colostrums for the growth of the child. Chi-square analysis revealed a significant association between duration of exclusive and total breast-feeding and number of malnourished children. Thus, the duration of exclusive breast-feeding, total breast-feeding and age of introduction of supplementary food have much more impact on the rural children than on the industrial and urban children. Factors like poverty, poor nutritional knowledge and feeding practice and inadequate health care might be contributing to such low nutritional status of rural children of western Orissa.

Anoop, I., Benjamin and Prema Zachariah, (1993), made a study on the nutritional status and feeding practices in under-3 years old children in a rural community in Ludhiana, Punjab. The study findings revealed that more than a quarter of the under 3 years old children in village Lalton Kalan in Ludhiana district of Punjab were suffering from PEM. One-third of the malnourished ones were suffering from moderate PEM. The highest proportions of malnourished children were in their second year of life, while two-thirds of the malnourished 30-35 months old were observed to be suffering from moderate PEM. Introduction of supplements earlier than 4 months of age and exclusive breast-feeding till >9 months of age were both observed to be associated with a higher prevalence and severity of PEM. The average nutritional intake of all age groups was deficient, more in calories than in protein. The nutritional intake of children in the present study has been found to be deficient more in calories than in a protein, and they have been observed to be suffering from “chronic starvation”, however, unpleasant it may sound. Intake of food, particularly that of pure calorie-providing food items, needs to be increased, through more frequent feeds and addition of significant amounts of high-energy foodstuffs like sugars and fats in the daily diet. Protein metabolism is quite expensive in terms of energy, and with low levels of calorie intake the utilization of protein was poor. However, the prevention of childhood malnutrition extends beyond purely nutritional considerations. The roots of the problem lie in poverty, maternal illiteracy, discrimination amongst the female offspring, lack of family planning with too many and too frequent childbirths, and occupational opportunities, as this study demonstrates. A multi-sectoral approach to
combat childhood malnutrition is essential, and efforts to increase female literacy, encouraging acceptance of family planning especially amongst the younger couples through emphasis on spacing methods, encouraging equality of the sexes and overall socio-economic development are very important components to fight against childhood malnutrition.

NNMB, (1991) conducted a survey on the consumption of food and nutrients of pre-school children in rural areas of selected states. It was found that the per child calorie intake of children aged 1-3 years showed an increase of 74 kcal/day and of the children aged 4-6 years by 142 kcal in the rural areas of the sample states. The increase has been mainly due to the increase in their cereal intake.

Rohini Devi, et.al., (1990) conducted a study on the dietary pattern of malnourished Marathwads pre-school children. This study was conducted among 200 rural pre-school children of either sex in the age group of one to five years. The finding of the study shows that the diets of children with PEM grade II and I were deficient in calories, calcium, riboflavin and vitamin C. The severe form of PEM (Grade III and IV) was associated with significantly reduced intake of all food items and nutrients. Since the per cent consumption of protein is comparatively higher than that of calories by malnourished children in almost all grades, it can be predicted that the PEM among rural Marathwada children is arising from marketed calorie deficiency.

2.2.3 Studies Related to Child Health and Nutritional Status

Anuradha Goyle, et.al., (2004), undertook a study on nutritional status of 281 children in the age group of 2-4 years belonging to families residing on pavements and in squatter settlements along the roadsides of Jaipur city was assessed in terms of nutrient intakes. The mean intakes of energy, total fat, calcium, iron, carotenes, vitamin A, riboflavin, niacin and ascorbic acid were below the RDAs, except for protein and thiamin intakes. No statistically significant differences in the nutrient intakes of boys and girls were observed.

Urade, B.P., et.al., (2004), made a study on assessment of nutritional status among the Khaire children of Maharashtra. A cross-sectional study was carried out with a view to assess the nutritional status among the growing children belonging to the
It is found that majority of the children suffers from various grades of malnutrition. The impact of malnutrition was more marked during early childhood period and pubertal period resulting into high frequency of wasting and stunting in both sexes.

**Brijilata Dubey, et.al., (2003)** conducted a comprehensive survey to assess the nutritional status of 150 pre-school children of 1 to 6 years from low-income families of Jabalpur city. The results of the study shows that dietary intake of nutrients was low in these children. About 17.3% of children were suffering from vitamin A deficiency, whereas 24% of pre-school children were suffering from anaemia. The most common illness reported was cold, cough, fever and measles.

**Nanjeen Begum and Khadi, P.B., (2003)**, made a study on the impact of ICDS on physical development and nutritional status of rural pre-schoolers. A sample of 80 children each attending ICDS and 80 not attending ICDS or irregular were selected from 4 selected villages of Dharwad taluk. The two groups were matched on age, gender and socio-economic status. Various anthropometric parameters like height, weight, circumferences of head, chest and arm were measured. Height and weights were measured and compared with NCHS and ICMR standards. Nutritional status of pre-schoolers was assessed using weights as per Gomez’s classification. Results showed that majority of non-ICDS children fell under the category of grade II malnutrition. A higher percentage (71.25%) of ICDS children fell under the category of grade I malnutrition and 2.5 percent of non-ICDS children fell under grade III malnutrition. Thus the results of the study showed that physical growth and nutritional status of pre-school children who availed the ICDS package services were relatively better than that of non-ICDS group.

**Sujatha K. Das, (2003)**, stated in her study that the effects of nutritional status on infections and infections on malnutrition signify a very important relationship. The majority of children in most developing countries suffer from malnutrition at some time in their first five years of life. The problem of infection and malnutrition are closely interrelated, yet programmes to control communicable diseases and to improve nutritional tend to be introduced quite independently. It would be much more efficient and effective if the twin problems were attacked together. Success in improving the
health and reducing the mortality of children is dependent both on control of infectious diseases and on improvements in the children’s food intake and care.

Mallikharjuna Rao, K., et.al., (2002), made a study on nutritional status of pre-school children in different agro-economic regions of Andhra Pradesh. Multistage stratified sampling procedure was adopted in selection of districts in each region, and mandals in each selected district. Ten villages in each mandal were randomly selected based on probability proportion to size. In each village, twenty household having at least one pre-school child were chosen for the study. The result indicated that socio-economically Rayalaseema was better with higher per capita income, smaller family size, higher literacy and higher percent of agriculturists, which ultimately resulted in better nutritional status compared to the other two regions. Inadequate land holdings, landlessness, sharecropping and other causes of poverty are all potent causes.

Ghosh, R., et.al., (2001), made a study on Health and Nutritional Status of Ho Pre-school children of Keonjhar district, Orissa. A sample of 191 children of 110 households was measured for height, weight and midarm circumference. The results show that malnutrition decreases with increase of age. The impact of family size, income and birth order shows that less than 7 family size has little effect whereas birth order and income has direct effect on nutritional status of the Ho pre-school children.

Krishna Agarwal. etal., (2001), made a study on dietary analysis and assessment of nutritional status of pre-school children of urban and rural population. The result of the study revealed that the nutritional status of children of both areas showed that the percentage of normal children were found higher in urban areas than rural areas, whereas cases of malnutrition were found more in rural children. It was also found that the children of rural areas consumed more cereals and pulses in comparison to urban children, whereas other foods like fruits, vegetables, milk, flesh foods etc. were consumed in relatively higher amounts by the urban children than those of rural counter parts.

The results showed that more amounts of calorie, protein, carbohydrates and mineral elements were taken by the rural children in comparison to urban children, but the extent of malnutrition has been found more in rural children than urban children.
This might be due to the consumption of imbalance diet containing mostly cereals and millets and devoid of required amount of fats and vitamins. It was also seen that the water used for drinking purpose in rural areas contained relatively more amounts of mineral elements. In addition to this various other factors such as ignorance about awareness of nutrition, preparation of food, weaning, practices and vaccination and importance of hygiene and sanitation also contributed for more incidence of malnutrition in rural areas in comparison to urban areas.

Minnie Mathew, (2001) reported that nutritional status is influenced by a number of factors such as dietary preferences, nutrition knowledge, caring practices, safe drinking water and sanitation, health facilities, food safety, and above all intra-household distribution and control over food and other resources. Some groups of people are more at risk than others of not getting sufficient and adequate food. The most vulnerable are pregnant and nursing mothers, as well as children below the age of three years as they are in their critical periods of their lives when they have special nutritional needs. India has 20 per cent of the world’s children, but double that number of malnourished children 47 percent undernourished children and 18 percent severely malnourished. The inter-regional variations with regard to these indicators are significant. Five percent reduction in underweight children and 2 percent reduction in severe malnutrition is the only improvement over the last 5 years and it has not been dramatic.

Effective steps for improving nutritional indicators should include:

- Supporting exclusive breast-feeding for at least six months and continue breast-feeding for at least 2 years.
- Creating awareness on introduction of complementary food by 6 months.
- Providing awareness to women in the informal sector such as crèches as a solution for encouraging breast-feeding.
- Strengthening growth monitoring and counseling through the ICDS.
- Creating awareness on gender inequality and encouraging preferential treatment to girls and women with regard to education, jobs, loans, and other entitlements.
- Influencing family size and birth intervals through awareness and addressing child survival.
- Encouraging girl’s education.
FNRI –DSWD ECD Special Nutrition Survey, (2000), carried out a study on correlation analysis of children's nutritional status with psycho-social development and caregiving practices in early childhood. The study states that the health practices which included immunization, deworming, hand-washing before feeding a child, sterilizing feeding bottles, use of spoon and for during feeding, boiling of water for drinking and milk or juice preparation and re-heating of left-over food before serving were statistically analyzed with the three anthropometric indices and UIE level. The result revealed that except of immunization and deworming, these practices were significantly associated with weight-for-age and height-for-age classifications. It was only immunization, hand-washing before feeding, boiling of water and re-heating of food that resulted in significant associations with weight-for-height classification.

Mini, P., et.al., (2000), made a study on maternal employment and nutritional status of pre-school children. The study revealed that majority of children in all the three groups (based on maternal employment ie. Casual Labourers (CL), Housewives (HW) and Employment Mothers (EM)) were malnourished. Their weight, height and mid upper arm circumference, chest and head circumferences were lower than the Indian standards. The different anthropometric indices except mid upper arm circumference were found to be independent of maternal employment. The dietary survey also pointed towards a poor intake in terms of quantity and quality. The intake of all food groups except flesh food was below the RDA. Among nutrients, protein intake met the RDA among the three groups. Clinical examination revealed no difference in percentage prevalence of clinical symptoms between the groups. Thus, the study indicated that maternal employment had no significant positive or negative impact on the nutritional status of pre-school children. This result had great social relevance as the women are being accepted in their role of wage earners to improve the economic status of the family.

Niveditia Awasthi and Kumar, A.R., (1999), made a study on Nutritional status of hill primary school children. The study states that the nutrition in childhood was the basis for survival and good health in adulthood. Inadequate nutrition in childhood may lead to malnutrition, growth retardation, reduced work capacity and poor mental and social development.
Sabah Tarannum, S.M., Ziauddin Hyder, (1998), made a study on the Determinants of Nutritional Status of Pre-school Children in BRAC-eligible Households. It was found from the study that the overall prevalence of stunting was 71% which was higher in males (67%) than females (57% (p<0.01). The prevalence of stunting was highest (71%) among the 6-24-month age group. The prevalence of stunting was associated with age, point prevalence of acute respiratory infection and diarrhoea, vitamin A capsule coverage, type of latrine, sex of household head, family size, mother’s literacy, occupation of main earner, BRAC membership, and per capita monthly food expenditure (p<0.01). Multivariate analysis suggests that birth order, point prevalence of diarrhoea, sex of household head, monthly food expenditure, occupation of main earner, and loan received during last month are the significant predictors of stunting of the children among the BRAC-eligible households (p<0.05).

Yasoda Devi, P. and Geervani, P., (1998), conducted a study on determinants of nutritional status of pre-school children. The data of the findings suggests that mother’s child care activities are influenced by innumerable factors like her status in the household, her happiness at home, co-operation she received from her husband and other members of the family, her health, her health seeking behaviour, resources available, nutrition and health knowledge, specially knowledge on preparation of suitable weaning foods and introducing the same at the right time, and also knowledge of how to avoid some of the omnipresent microbial pathogens in the environment. It was also suggested to implement intervention programmes like provision of preventive and curative medical services to women and children, provision of easy to digest weaning food at a subsidized cost through public distribution system, health and nutrition education to masses, specially to women, creating crèche facilities, safe drinking water supply, improvement of sanitation are the most essential programmes to improve pre-school child’s health and nutritional status.

Darna L. Dufour, (1997), reviews current understanding of the associations between physical activity and nutrition in children 1 to 10 years of age. In general, lower levels of physical activity than in controls accompany both undernutrition and overnutrition. In children of normal nutritional status, an association between physical activity and body composition has been difficult to demonstrate. It is clear that levels of
physical activity in children are responsive to the physical and social environments, as well as to a child's nutritional status. In children of normal nutritional status, the level of physical activity increases with age in young children and then decreases in early adolescence, and males tend to be more physically active than females in a given population. Although there is a perception that children are less physically active than they were in the past, trends in physical activity through time are not known.

Devi, S.B., Devi, L.R., Singh, W.G., (1997), employed anthropometric standards to assess the nutritional status of 452 newborns and 2210 additional children under 5 years of age, from both urban and semi-urban areas of Manipur, India. According to the Indian Standard, 86.3% of these children had normal weight-for-age and 73.8% had weights exceeding 100% of this standard. However, when the US (Harvard) standard was used, 64% were classified as having low weight-for-age and 66% had protein-energy malnutrition. In terms of height, 90% were normal according to the Indian Standard, compared to only 64.7% by the Harvard standard. Mid-upper arm circumference was 90% of the US standard. Chest and head circumference ratios exceeded 1 by the second year of life, while 6 months is the expected time for this development. Malnutrition was more prevalent among girls than boys. Recurrent infections and parasite infestations are presumed to have a cumulative negative effect on child nutritional status in this population.

Promilla Kanwar and Jatinder Kishatwaria, (1997), conducted a case study on nutritional status of scheduled caste pre-school children in Kangra district of Himachal Pradesh. The study was undertaken among 45 scheduled caste families having 75 pre-school children. In majority of these families the per capita income was much below the per capita income of the state and 60-80 per cent of their total annual income was spent on food. The calorie and protein intake in pre-school children were less than the recommended allowances. The male children were getting more protein and calories as compared to female children. Mother's education, types of family and family occupation have some influence on calorie intake of these children. Children suffering from diarrhoea were maximum in the age group of 0-1 year. Among the rearing practices, faulty practices like feeding the child on 3rd day after removing the colustrum, starting solid food at an age of one year were commonly seen.
Sandhya Joshi, (1996) reported about the major indicators of health and nutritional status of underfive children. The following statistics highlight the harsh reality in convincing terms:

- Underfives Mortality Rate (5MR) is alarmingly high at 142 per 1000 live birth per year. India ranks 38th in the descending order of 129 nations of the world according to their U5MR - only a few African and Asian countries are worse off.
- Infant Mortality Rate (IMR) is also very high at 94 per 1000 live births per year.
- Thirty per cent children are born with low birth weight (2500 grams or less), which is a strong determinant of survival. On this account, the country has achieved the dubious distinction of leading the group of 129 nations documented by UNICEF’s State of the World Children Report 1992.
- Also, 61 per cent children between the age of 0-4 years are classified as being moderately and severely underweight and another 9 percent as severely underweight.
- An average Indian child of 1-5 years receives only 810 kilocalories per day as against the Indian Council of Medical Research recommended daily allowance (RDA) of 1200 k cals. However, somewhat on favorable side, pre-school children on staple diet of cereals and pulses manage to meet the needs of proteins to near adequacy.
- Therefore, it has been recognized that Indian under fives suffer from primary energy malnutrition and secondary protein deficiency. Overall, 80 per cent children suffer from varying degrees of growth retardation.
- Dietary intake of vitamin ‘A’ is around 100 mu grams per day as against RDA of 300 mu grams.
- Percentage of fully immunized children under one year as per UNICEF’s 1992 report improved dramatically during the eighties.

Sujatha, et.al., (1996), made a study on nutritional status of children in the anganwadis of Nagpur city. The result of the study indicates that nutritional status of ICDS children was better than non-ICDS group. From that it was clear that, ICDS had significant impact on nutritional status of pre-schoolers. Better nutritional status among
children of ICDS group than non-ICDS group may be attributed to supplementary food provided to children at anganwadi centres.

**Dhanalakshmi, N. and Murthy, M.S.R., (1995),** made an attempt to observe nutritional status of under five children a comparative study between drought prone and agriculturally developed areas of Andhra Pradesh. The sample consisted of 800 mothers in the age group of 15 to 45 years with atleast one under five-year child, i.e., 400 mothers each from drought prone area i.e. Piler Mandalam of Chittoor district and from agriculturally developed region i.e. Allur Mandalam of Nellore District. The variables considered were mother’s nutritional status, in terms of food choices, breast feeding and nutritional status of children as measured by anthropometric measurements like weight/age sex-wise and height/weight for both the sexes. Children with optimum nutritional status in terms of weight-for-age and weight-for height are found more in Allur region compared to Piler region. Allur region being an agriculturally developed area, children as well as mothers obtain good food to offset nutritional deficiency. The children of drought affected Piler region had the highest moderate malnourishment and suffered from marasmus and rickets. Further sex wise nutritional deficiency revealed that males in general are malnourished compared to females. Further it was observed that males are provided with better medical attention when illness occurs when compared to females in both the regions. In the direction, parents and elders are to be educated about this purposeful negligence of girls in the face of morbidity. Most probably basic health education, sanitation and personal hygiene may in general improve the health status of boys and in particular girls.

**Khongsdier, R., (1995),** made a study on growth and nutritional status of the War Khasi children of Meghalaya with regard to height for age and weight for height. An interval method of determining the cut-off point and trigger level was proposed for the assessment of growth retardation is not only the manifestation of undernutrition and infection, but also that complex interaction between genetical and environmental factors. Relaxation of selection pressure among the elites seems likely to be related to the attainment of the so-called genetic potential.

**Bapat, M.M. and Ashok P. Aspatwar, (1993),** made a comprehensive survey to assess the nutritional status of 155 pre-school and 166 school children in slums of
Bombay suburbs. The results show that dietary and nutrient intake was low in these children. About 22.58 per cent of pre-school and 16.86 per cent of school age children were suffering from PCM. The most common illnesses reported were cold, fever and worm infestation. The prevalence of malnutrition appears to be age related. The high prevalence of malnutrition among the children above 2 years of age indicated that the foods consumed by these children were of poor quality or were inadequate to meet their growing needs.

The major determinant of the nutritional status of these slum children in Bombay suburbs were age, house hold income, number of children in the family, duration of breast feeding, lack of education among the parents, poor personal hygiene, unsatisfactory environmental conditions and poor sanitary facilities. Consumption of protective foods in urban slums is inadequate. Even if these foods are available, poverty or purchasing power of the community is a limiting factor.

Panda, P., Benjamin, A.I. and Zachariah, P., (1993), made a study on health status of under-fives in a Ludhiana slum. A random cross-sectional survey of 237 under-five years old children in 205 families out of 902 under-fives in 1512 families living in the “Ash Heap Slum” of Ludhiana, revealed majority of the children to belong to migrant families from three out of the five BIMARU States, mostly from Bihar. About half the children had illiterate fathers. The mean per capita income was Rs.176 per month. Only 27 percent of the children were fully immunized while 28 percent had received no immunization. About 19 percent of the children had severe malnutrition, with males and females suffering equally. Diarrhoeal diseases were the major cause of under-five slum, recurring of it was considered as a vital necessity.

Yasoda Devi, P. and Geervani, P., (1993), had undertaken a study on determinants of nutrition status of rural pre-school children in Andhra Pradesh, India. A longitudinal study was conducted in four villages in the Medak district of Andhra Pradesh. One hundred and ninety-seven children up to four years old were selected from low-income households in the study area. Pre-tested, structured interviews were conducted to collect information on child-related, maternal, paternal, and socio-economic factors from the households. The result of the study confirms that the prevalence of moderate and severe forms of malnutrition was high in children age 13 to
36 months (i.e., pre-school age). Regression analysis indicated that numerous factors affect child nutrition with a maximum effect on weight for height and lead to wasting, stunting, or underweight. Of the four categories of factors studied (child-related, maternal, paternal, and socio-economic), two child-related factors, number of diarrhoeal episodes and calorie adequacy of diet, showed a highly significant effect on a child's current as well as past nutrition status. These factors in turn are highly correlated with other socio-economic, maternal, and paternal factors. In addition to a child's calorie adequacy and number of diarrhoeal episodes, regularity of bathing the child had a significant effect on both height for age and weight for age, as it was indirect evidence of maternal care and personal hygiene. Among socio-economic factors, income from land can be used as a good indicator of a child's nutrition. It emerged as a single but significant factor that influenced weight for age, height for age, and weight for height. Families who receive higher incomes from land may have fewer constraints in feeding children. Per capita income and per capita food expenditure emerged as important factors, but were not significant. The effects of chronic calorie deficiency and infection appear to be the basic causes of the poor nutrition status of children below three years of age. Thus the results of this study indicate a strong influence of socio-economic status and parental care on the control of infectious diseases and food intake, which are the two major causes for malnutrition among children in developing countries.

Krishna, D., et.al., (1991), made an attempt to study the nutritional status and the impact of agro-economic and socio-demographic indicators on PEM among preschool children of the backward communities in and around Hyderabad city. The results show that considerable proportion of children were found with severe and mild forms of malnutrition. Prevalence of mild and severity of malnutrition increases with age. Degree of malnutrition was apparent more among female children than in male children. Anthropometric measurements and indices were lower than those of well to do children. The study concluded that the best set of indicators useful for the assessment of malnutrition were education level of the head of family, family size, earning status, age of the child and land in possession. Order of these indicators only differs with the severity and sex differentials of malnutrition.
2.2.4 Other Related Studies

Kavitha, R., (2007), reported in her article that, the population growth and family life are part of population education programme. This would help for preserving health of the mother and child, the welfare of the children, the economic stability of the family and the future prospects of the younger generation and it is desirable to adopt the small family norm. Further, responsible parenthood, delayed marriage, nutrition, mother and child care etc., are also added as major concepts in population education to enhance the quality of life of the younger generation. Thus, systematic planning, co-operation and clear vision will promote population and development education in the future.

Parthasarathy, K. and Kavitha, R., (2006), stated that health is fundamental to national progress in any sphere. In terms of resources for economic development, nothing can be considered of higher importance than the health of the people which is a measure of their energy and capacity as well as of the potential of man-hours for productive work in relation to the total number of persons maintained by the nation. Health was thus a vital part of a concurrent and integrated programme of development of all aspects of community life.

Kasturi Gupta Menon, (2004), emphasized that the child is the chief victim of interplay of nutrition, socio-economic and health factors that cause malnutrition. The steep rise in malnutrition in children during the first two years of life is indicative of poor infant feeding practices. Prof. Amartya Sen has rightly described the nutritional status of children under-5 years as the most sensitive indicator of development of a particular area.

The National Nutrition Policy adopted by the Government of India under the aegis of the Department of Women and Child Development in 1993 laid due emphasis on nutrition and health education of mothers on infant and young child feeding and efforts to trigger appropriate behavioral changes among mothers were considered as direct interventions for reducing malnutrition in children.

Parthasarathy, K. and Kavitha, R., (2004), stated about the planning of health and nutrition during the five year plan period in India. It was highlighted in the tenth
five year plan that, current programmes try to treat existing nutritional problems in pre-school children and mothers during pregnancy and lactation. The focus is now on prevention of malnutrition at various stages of life cycle is highly emphasized, as school going children and adolescents are not covered extensively by the existing programmes. The major task in the war against malnutrition, therefore, is to ensure that nutritional objectives are not only articulated in various development/sectoral plans and policies, but are also matched by plans of action and there is close co-ordination between these sectors to achieve the goals set in various sectors in the tenth five year plan and improve development outcomes in a sustainable manner.

Ashok Vikhe Patil, et al., (2002), reported in their study on current health scenario in India, that despite several growth-orientated policies adopted by the government, the widening economic, regional and gender disparities were posing challenges for the health sector. About 75% of health infrastructure, medical manpower and other health resources were concentrated in urban areas where 27% of the population lives. Contagious, infectious and waterborne diseases such as diarrhoea, amoebiasis, typhoid, infectious hepatitis, worm infestations, measles, malaria, tuberculosis, whooping cough, respiratory infections dominate the morbidity pattern, especially in rural areas. The health status of Indians, was still a cause for grave concern, especially that of the rural population. This was reflected in the life expectancy (63 years), infant mortality rate (80/1000 live births), maternal mortality rate (438/100000 live births), however, over a period of time some progress had been made. To improve the prevailing situation, the problem of rural health was to be addressed both at macro (national and state) and micro (district and regional) levels. This was to be done in an holistic way, with a genuine effort to bring the poorest of the population to the centre of the fiscal policies.

Srilakshmi, B., (2002) reported that according to National Nutrition Monitoring Bureau (1988-90) the prevalence of malnutrition among 1-5 years is high. The underweight children are 68.6 per cent, while stunting is at 65.1 per cent and wasting 19.9 per cent.

The study of Bhaskaram, (2001), presented evidence that undernutrition will perpetuate for generations. The most serious problem was the undernutrition among
girl children. The cycle of malnourished girl grows up to a malnourished mother who in turn gives birth to a small undernourished baby.

World Food Programme, (2001) reported that nearly one third of the world’s hungry people reside in India. Despite a substantial increase in food grains production since the independence in 1947, India is still classified by the Food and Agriculture Organization (FAO) as a low income led food-deficit county.

Studies carried out by the World Bank and the Planning Commission, (2001) on state-wise expenditure on nutrition and the prevalence of under-nutrition seem to reveal no correlation between the two. In states, like Bihar that have high levels of poverty and under-nutrition, the expenditure is low, while more developed states like Gujarat, Delhi and Tamil Nadu are spending more than the required amount. However, in terms of nutritional status of children, even in states with higher levels of expenditure, the nutritional status is not much above the country average. This seems to indicate the importance of other factors like intra-family food distribution and caring practices. Also the experience of Orissa has shown that it is possible to achieve substantial improvement in the nutrition status of children without increasing the outlay, by focusing on children with severe under-nutrition and ensuring that they receive the required inputs. This is in order to indicate that visible impacts on nutrition status would require re-focusing to the most vulnerable age groups backed by a package of interventions implying effective synergy among existing programmes.

Ram Prawesh Choudhary and Suchita Prasad, (2000), conducted a study on Prevalence of Anaemia in Pre-school children of Pahariya Tribe of Rajmahal hills. The Pahariyas, the population studied, are living in disadvantages condition of diet and nutrition as well as in infection prone environment. These tribes are impoverished and handicapped due to food deprivation and are economically backward. There is prolonged breast-feeding in them. The quality and quantity of food consumed by the children are also below the recommended requirements. The low level of hemoglobin content among the pre-school children of the three sects of the Pahariyas most probably is due to the cumulative effects of the above factors. Decrease in frequency of anemia with increase in the age of the children observed in the present study has also been reported in many other Indian populations. This frequency of anemia among younger
age group may be due to higher dietary inadequacy of all the nutrients including iron because of poor knowledge in the part of the mother regarding their nutritional requirements as well as of the baby.

Shiva Prakash, et.al., (2000), have done a study on Morbidity pattern of 0-6 years children. The result of the study shows that 24% children were suffering from anemia, 17.3% from vitamin A deficiency, whereas 7.3% suffered from dental caries and 4.7% were victims of measles. Other most common illness reported were cold, cough and fever.

Sheela, K., (1999), made a study on Nutrition scenario in Karnataka. The food consumption patterns reveal that cereals and millets are the main food items. However, protective foods (i.e. foods that are rich in proteins, vitamins and minerals) are consumed in lesser amounts. The average intake of vitamins, however, was 50% less than the RDI. Unlike adults, energy deficiency is a problem in the diets of pre-school children. Growth retardation has been observed in a vast majority of children in Karnataka. Protein energy malnutrition, vitamin A deficiency and B-complex deficiencies are the major nutritional deficiencies among pre-school children, while anaemia remains a major health problem in women. Improvement in the healthcare system has brought a decline in the infant mortality rate in Karnataka and the state attained universal immunization coverage in 1990. The National Nutrition Programme – Integrated Child Development Scheme provides an integrated package of services to residents of Karnataka.

Aarthi, P., (1998), had made a study on Pre-school children of Coimbatore and revealed that out of 100 children selected from four zones 80 percent suffered from nutritional disorders. It was found that the prevalence of anemia was around 40 to 48 percent among the children belonging to different zones except the north zone were the prevalence was recorded as high as 80 percent.

Dutta, P.K., (1998), took a study on a total of 76 children under 5 years of age for various diarrhoeal diseases. The study showed that the incidence of diarrhea was more in lower socio-economic groups and was inversely proportional to the literacy status of mother. Dehydrations and fever were present in 78.95 and 75.00 percent
respectively. Majority of diarrhoeal cases were found to be suffering from malnutrition. 50 percent mothers of the children had no knowledge about oral rehydration therapy (ORT), underlying the need for health education of mothers particularly regarding ORT.

Anjali Pattanaik, (1994), conducted a study on Nutrition, Education and Child Development. The study was exploratory in nature, involved school going children at three different areas: urban, rural and slum. To find out development status and educational achievement, the researcher selected four groups of children from each area, in the age of 6, 7, 8, and 9 years, from both the sexes. Nutritional status of urban children was found to be better than that of rural children. Slum children had poorer nutritional status than children of both the rural and urban areas. Level of education was found to be one of the important factors responsible for nutritional status of the child as found from its positive and significant correlation with nutritional status in case of both the sexes and different age groups except 6 years children. Size of the family including children was proved to be a causative factor of affecting nutritional status. As found from the interpretation of the result, its correlation with nutritional status was found to be inverse and significant in most of the cases.

Malnutrition was the common denominator of the diseases and deprivation process that reduce child survival (Ghosh, 1994). Moderate to severe undernutrition affects nearly half of the children and contributes directly or indirectly to 60 percent of all child deaths. Those severely malnourished have 20 times greater chances of dying than normally nourished peers.

A study was conducted by All India Co-ordinated Research Project in Food and Nutrition on Food and Nutrition situation of rural families in seven Agro-climatic zones of A.P. (1992-1993). It was found that the intake of green leafy vegetables, fruits and oil was very low and below the RDI. Though the milk intake was low in landless families, the intake of flesh food was more. The energy intake was lower than the RDI. Pre-school children were found as per their height/ age and weight/ height. Twenty five percent of girls in small farm families were found suffering from grade III malnutrition.
NFHS (1992-93) indicated that, in India more than half of the children, that is, 54 percent of children under age four are low weight for age, and 52 percent are low height for age and 29 percent are low weight for height. The proportion severely malnourished was 21 percent, 29 percent and 3 percent for low weight for age, low height for age and low weight for height respectively.

Braun, et al., (1992) made a study on Income sources and diversification strategies of the malnourished rural poor. The study revealed that while income differences did result in a large difference in the prevalence of food energy deficiency in many remote rural areas, household income differences were not making much of a difference to the levels of malnutrition of children in short run. Calorie deficiencies were addressed effectively with household income growth.

Jayalakshmi, et al., (1992), conducted study on impact of on going ICDS programme on anthropometric measurements of pre-school children in Karnataka. The results of the study indicate that 52 male and 48 female children comprised of control group, while 54 male and 46 female children were in the experimental group. More number of children was in 3-4 and 4-5 year age groups compared to 5-6 years in both the groups. When control group children were compared with experimental group, five per cent of them were found normal. On the other hand, 18 per cent of experimental group were found to be normal. The number of children in presently underfed status in control group, was higher than the experimental group. This indicates that the supplements provided under ICDS project could be a contributory factor for the elevation of percentage of normal children and decline in the percentage of presently underfed in experimental group. When modified ‘chi-square’ test was applied, a highly significant (P<0.01) difference was found between nutritional status of control and experimental group children.

Sumita Devi, et al., (1990), carried out a study on Anthropometric measurements of pre-school children in Ghumarwin Block of Himachal Pradesh. A total of 240 pre-school children (1-5 years) of Ghumarwin Block, Himachal Pradesh were selected randomly. The analysis revealed below the normal for anthropometric parameters. Severe forms of malnutrition were found to be more in the age group of two to three years. With the increase in the annual per capita income of the family
there was an increase in the percentage of well-nourished and normal children. There was statistically significant association between the family income and nutritional grades. This may be because of the reason that the families with high-income levels have better purchasing power, can buy good quality and variety of foods, which the poorer families were unable to do due to limited resources, and more over the affluent population had easy access to the market. Thus it was concluded in the study that the nutritional status was improved through the increase in income level and educational status of parents.

Thomas, S., Walker and James G. Ryan, (1990), studied the village and household economics in India’s Semi-arid tropics (SAT) and reported that the primary deficiencies in diets were vitamin C, vitamin A, calcium, riboflavin and energy across the six study villages. The proportions consuming less than 50% RDA for calories ranges from 11-15% for children (1-12 years), severe cases of malnutrition among preschool children ranged from 2-7% across seasons and villages. Calorie deficiencies were most pronounced among 1-3 years old children. About 8% of individual fell < 70% of their age-sex weight for higher standards.

2.2.5 Resume of Indian Studies


Thus these studies are very helpful to the researcher for choosing the variables of the present study and also to gain knowledge on the previous studies conducted in the relevant aspects.
2.3 SUMMARY OF THE CHAPTER

Thus the present chapter deals with various reviews related to child nutrition, health and nutritional practices, child health and nutritional status and other related studies, which were collected in the form of foreign studies and Indian studies. From these reviews it is noted that lack of knowledge on nutrition among the mothers is the main problem for the cause of undernutrition among children. The next chapter deals with the Methodology of the research study.