Chapter - II

REVIEW OF PAST STUDIES
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A review of literature plays an important role in establishing the back drop for any research work in society. It is felt that justification of the present study can be established by reviewing the available literature on the subject. Therefore an attempt has been made to review the available literature on the subject to find out gaps in research before finally selecting the present topic for study. The chapter has two sections - One on studies about the status of child health and nutrition in general and the other on ICDS in particular.

SECTION I

Gupta et al. (1996)\textsuperscript{1} in their study, observed that overall prevalence of PEM was 51.11\%, using Indian Academy of Pediatrics (IAP) classification. Grade IV PEM was to the tune of 3.41\% and 140 (23.85\%) under five, had weight for age <70\% of reference standard. Failure to gain weight in three successive months was observed in 2.55\% subjects. Prevalence of PEM in males and females was 47.9\% and 55.3\% respectively. Forty – one (9.17\%) subjects of age group 1-5 years had Mid Upper Arm Circumference (MUAC) <12.5 cms subjects having birth order >3 and those not immunized had significantly higher prevalence of PEM.

Devi et al. (1997)\textsuperscript{2} in their study, revealed that the total of 452 new borns and 2210 children up to the age of 5 years were assessed through anthropometrical measurements in the urban areas
of Manipur. The study revealed that 86.3% of the children had normal weight for age by Indian standard (ICMR) when compared with Harvard standard, 64.0% were having low weight for their age. On the basis of height for age, 64.7% of the children were normal by Harvard standard whereas 90% were normal by Indian standard. The chest and head circumference ratio was more than one about the second year of life. Between boys and girls, malnutrition was more prevalent among girls.

Chhabra et al. (1997)³ based their study, on a house-to-house survey, which included 366 children in the under-five age groups, in the village. Mothers were interviewed for personal characteristics. A detailed examination was done which included a general physical and systematic examination and assessment of nutritional status of children. The study revealed that out of 366 children, the majority 242, (65.9%) had a normal nutritional status 95 (26%) had mild nutrition and 30 (8%) had moderate to severe malnutrition. A statistically significant association ($\chi^2 = 8.06, P<0.02$) was observed between overall incidence of ARI and the nutritional status. The incidence of ARI was 3.27, 2.87 and 2.26 episodes per child per year in the moderate to severely malnourished, mildly malnourished and children with a normal nutritional status respectively. The incidence of Upper Respiratory tract Infections (URI) was higher in the malnourished children than the children with a normal nutritional status. There was a significant association
(x2 = 12.38, p<0.01) between the incidence of lower respiratory tract infections (LRI) and nutritional status and the incidence being highest (0.6 episodes per child) in the moderately to severely malnourished children and lowest in the children with a normal nutritional status (0.2 episodes).

Grag, S.K. et al. (1997)\textsuperscript{4} in their study, revealed that majority (58.2\%) of children were having under-nutrition of varying grades irrespective of their sex and caste but influenced by their age and ICDS beneficiary status. Anemia, xerophtalmia and goitre were present in 14.7\%, 1.6\% and 0.6\% children respectively. Average daily dietary intake of energy and nutrients were lower than the recommended daily allowances (RAD). Regular nutritional supplementation along with adequate nutrition education would reduce the nutritional deficiency disorders among children.

Aswar et al.,(2000)\textsuperscript{5} in their study, examined all children (197) below five years of age who were attending the outpatient department for immunization were included in the study. All children were examined thoroughly and screened for presence of risk factors; mothers were interviewed for demographic information, using pretest semi-structured proforma. The study revealed that out of 197 children, 128 (64.97\%) were identified as 'at risk' children. There was no significant difference between presence of 'at risk' factor amongst male and female children (x2 = 1.2, df=1, p>0.05). A statistical significant
association was also observed between the 'at risk' children and low family income, that is 75.2% 'at risk' children belonged to the families having monthly per capita income of less than Rs.500.

The Bulletin of WHO (2000)\(^6\) revealed that nutritional status can be assessed using clinical signs of malnutrition, biochemical indicators and anthropometry. Anthropometry has an important advantage over other nutritional indicators: whereas biochemical and clinical indicators are useful only at the extremes of malnutrition, body measurements are sensitive over the full spectrum. In addition, anthropometric measurements are non-invasive, inexpensive and relatively easy to obtain. The main disadvantage of anthropometry is its lack of specificity, as changes in body measurements are also sensitive to several other factors, including intake of essential nutrients, infection, attitude, stress and genetic background.

Mahapatra, A. (2000)\(^7\) in his study, concluded that random selection of 75 children aged 0-5 years were studied for anthropometrical and for the clinical signs of nutritional deficiency. Findings showed that there was no significant difference between boys and girls regarding nutritional status 57.1% of the children suffered from underweight, 21.3% of children had very less body weight 41.8% of children had stunting and 27.9% had wasting. The children below one year of age had relatively lower prevalence of malnutrition than other age group. The conclusion of the study was that malnutrition was the leading problem among pre-school children of Kalahandi District.
Zalilal Mohd Shariff (2000)\textsuperscript{8} in their article, revealed that growth status was examined in relation to gender and age factors in urban primary school children (6-10 years old) from low income households in Kuala Lumpur, Wilayah Persekutuan. The sample consisted of 4,212 boys (53\%) and 3,793 girls (47\%). Data on weight and height were obtained from two sources – investigator’s and teachers’ measurements of the school children. This study defined mildly and significantly underweight, stunted or wasted as z-score below minus one and below minus two of the NCHS/CDC reference median, respectively. Approximately 52\% (n = 4,249), 50\% (n = 3,893) and 30\% (n = 2,568) of the school children were underweight, stunted and wasted, respectively. However, the majority of these undernourished children were in the mild category. Prevalence of overweight (2 SD) of NCHS/WHO reference median was found in 5.8\% of the sample. For both, prevalence of under nutrition and over nutrition, more boys than girls, were found to be underweight, stunted, wasted and overweight. Compared to girls, boys had lower mean z-scores for the variables height-for-age (p<0.05) and weight-for-height (p<0.01). Older children had significantly lower mean z-scores for height-for-age (p<0.01) but higher mean z-scores for weight-for-height (P<0.001) than younger children. This finding indicates that with increasing age, stunting is associated with improved weight-for-height or that the children’s weights have been adapted to their short statures.
George, K.A. *et al* (2000)\(^9\) in their study, revealed that the prevalence of anaemia was 11.4%. The percentage of anaemic children among male and female children was 10.25 and 12.55 respectively and statistical analysis showed that female children were more susceptible to anaemia. Normal nutritional status was seen among 46.7% of the children. When 187(11.78%) of the mild undernourished children were anaemic, the percentage anaemic among the moderate undernourished children was 57(16.37%). Among 927 vegetarians 86(9.27%) were anaemic and among 2706 non-vegetarians, 328(12.1%) were anaemic. Dietary survey revealed that, consumption of iron sources, whether home or non-home, was below the recommended level.

Alok Bhargava (2001)\(^{10}\) in his article, examined that many factors promote economic development, among which population health is of critical importance. Countries need to devise different strategies for increasing prosperity, depending on their level of economic and social development. Some countries in East Asia have prospered without natural resources by reducing family size and educating children to create a well-trained labour force. However, the developmental problems in many countries in Africa and Asia remain complex and cannot be viewed in terms of simple paradigms. Rather, policy makers need to devise specific policies for each country, taking into account the nutritional and health status of their populations, the environmental conditions, and the educational infrastructure. In
populous African countries, the AIDS epidemic is reducing the life expectancy of both unskilled and skilled population groups and is hindering economic development. Without better polices, many of the poor countries are unlikely to escape from the poverty trap in the foreseeable future.

Siddartha Ramaji (2001)\textsuperscript{11} in his study, observed that female child mortality between the age of 1-4 years is one and a half times more than the male child mortality rate in urban areas that is 14.56 and 19.7 respectively. The country requires major thrust in the areas of female literacy, a female empowerment and female socio economic independence.

Kumari (2001)\textsuperscript{12} in her study revealed that better health is maintained by only 16% of the children, more than 46% of the children were suffering with various health problems, 10.5% of the children above 3 years of age were in a state of ill health. Birth order was observed to be strong indication of child health. It had also been observed that only 44% of the children of illiterate mothers were healthy while 8% of the children of educated mothers were in a state of good health for grading malnutrition. The study revealed that malnutrition was not significantly related to the sex of the child or per capita income. Nearly 49% of the children had a normal nutrition status. Of the rest, majority were in Grade I malnutrition. Approximately 51% of the malnourished children were boys and 49%
were girls. The prevalence of malnutrition was 42.3% among children with literate as compared to 57.2% in those whose mothers were illiterate.

Shoba Roa (2001) in her study finds that, High prevalence of low birth weight, high morbidity and mortality in children and poor maternal nutrition of the mother continue to be major nutritional concerns in India. Although nationwide intervention programmes are in operation over two decades, the situation has not changed greatly. In addition, the Indian population is passing through a nutritional transition and is expected to witness higher prevalence’s of adult non-communicable diseases such as diabetes, hypertension and coronary heart disease according to the theory of ‘fetal origin of adult disease’. Clearly, there is a need for examining several planning of interventions. In particular, maternal nutrition and fetal growth relationship, long term effects of early life under nutrition, interactions of prenatal nutritional experiences and postnatal under nutrition are some of the major issues that have been discussed in the paper with the help of prospective data from various community nutrition studies carried out in the department.

The study of Amirthaveni, S.M. (2002) is based on samples of 200 pre – school children (3-5 years) selected by random sampling method. Questionnaire was administered to collect data, blood samples were collected and anthropometrics measurements were
recorded. The values were compared with ICMR values; finding showed that 79 percent of the pre-school children were under weight. The nutritional intake was more or less adequate except in few nutrients viz. energy, fat and iron. The blood profile was normal even though some form of malnutrition was seen in the study like PEM, anemia, but none of the disorder were present in severe form. The study concluded that the prevalence of malnutrition is high among pre-school children in Meghalaya.

Archana Saxena (2002)\textsuperscript{15} pointed out the health and nutrition problems of women in the country. The scientific foundations of our present concern with respect to women's' health and nutrition are clearly articulated and understood. Society is a fast flowing stream. It's direction and it's needs and moods change at a rapid pace. Every aspect of our world impinges upon social change and this change reciprocally affects different spheres such as technology and progress. In order to keep in step with the changes that are coming about in the social scenario, the Central Social Welfare Board attempts to modify and change it's programmes to meet new challenges. The programme of vocational training for women is one such programme of the Board that has altered it's form and content in keeping with the new market economy.

Gulati (2003)\textsuperscript{16} in a study, concluded that the sample of 176 children attending pediatrics O.P.D. was done for 30 days. Out of
176 children 9.09% had mild anemia. 56.81% had moderate, 34.1% had severe anaemia, 56.81% had moderate, 34.1% had severe anemia, out of 132 (75%) had malnutrition according to Indian Academy of Pediatrics 44 (25%) children had grade I, 42(23.9%) had grade II, 38 (21.6%) had grade III and 8(4.5%) had grade IV malnutrition who were advised for hospitalization. Among 176 children 50% of children were (ill health) suffering from ARI. The conclusion of study documented that increased susceptibility of malnourished children to respiratory infections.

Emily Bloss et al. (2004)\textsuperscript{17} conducted a Cross-sectional survey among 121 adults and 175 children during July 2002. Primary caretakers were interviewed during home visits to assess agricultural and sanitation resources, child feeding practices, and the nutritional status of their children aged 5 years and under. Through anthropometry, the prevalence of underweight, stunting and wasting were determined: 30 percent were underweight, 47 per cent were stunted, and 7 percent were wasted. It is observed that emphasis should be placed on current immunization, prolonging exclusive breastfeeding, and improving access to nutrient-rich foods among adopted children and their families via community-based nutrition interventions.

Uma Sanghri et al., (2004)\textsuperscript{18} assessed potential risk factors for child malnutrition in rural Kerala. It is indicated that 42-57 percent of all child deaths in developing countries are due to the potentiating
effects of malnutrition on infections diseases, of which over three -quarters can be attributed to mild - to- moderate malnutrition.

Meenakshi Avasthi Sood (2006) in her article, found that the health status of children has improved tremendously and the Infant mortality rate (IMR), which was 146 per 1000 Live births in 1951, fell to 64 per 1000 live births in 2002. Polio has nearly been eradicated, and the incidence of measles, diphtheria, neo-natal tetanus, whooping cough etc. has come down due to vigorous efforts undertaken under the Universal Immunization Programme (UIP). The health infrastructure in rural areas, however is inadequately staffed and poorly equipped, and needs to be strengthened. Studies on the nutritional status of children have found that around 74.3 percent children (0-35 months) were anaemic, 47 percent were underweight, 45.5 percent were stunted and 42.1 percent males and 40.8 percent females 1-5 years suffered from moderate and severe malnutrition. Boys and girls were consuming less than the Recommended Dietary Allowance (RDA) of nutrients, and there was need for undertaking nutrition education programmes on a large scale.

Rao, V.G. (2005) collected samples of 1022 pre-school children selected by Probability Proportionate to Size(PPS) sampling. Structured Performa to collect data, blood samples were collected and anthropometric measurements was recorded, Findings showed that 19.2% of children suffered from various health problems, moderate
and severe anemia was observed in 71% and 27% underweight. 30.3% stunting, and 27.8% wasting (mid arm circumference). The conclusion of study revealed wide spread of prevalence of under nutrition among pre-school children, and two deaths recorded with sever malnutrition.

Sharma (2005)\(^2\) collected a sample of 612 under five chosen by simple random sampling, Interview schedule and anthrometrical measurement were recorded. The findings showed that 'at risk' (ill health) children were found to be 65.69% and 70% underweight with less than 12.5 cm. (70%) mid-arm circumferences, all children (100%) falling in the groups of grade II, III and IV of malnutrition. The conclusion of study has brought about some important epidemiological factors of 'at risk'.

Tamil Nadu Development Report (2005)\(^2\) stated that free vaccination services for all eligible children against six serious but preventable diseases - tuberculosis, diphtheria, pertussis, tetanus, poliomyelitis and measles - are an important component of the child health care system in the state, as in the rest of the country. The Universal Immunization Programme (UIP) in 1985-86 with the objective of having coverage of all infants against the six vaccine preventable immunization is commendable. Another interesting fact that emerges from this survey is a low dropout, (hardly two percent) between the first and third dose of DPT and polio vaccination.
Dinesh Kumar (2006) in his article, revealed that among all under five children surveyed, 36.4% underweight (<2SD weight- for -age), 51.6% stunted (<2SD height- for- age), and 10.6% wasted (<2SD weight- for- height). Proportions of underweight (45.5%) and stunting (81.8%) were found maximum among children aged 13-24 months. Wasting was most prevalent (18.2%) among children aged 37-48 months. Initiation of breast-feeding after six hours of birth, deprivation from colostrums 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.

Jean Dreze (2006) in his article examined some of the worst indicators of child well –being. About half of all Indian children are undernourished, more than half suffer from anaemia, and a similar proportion escape, “full immunization”. Therefore, an urgent need to re- examine what India is doing for the survival, well being and rights of children under the age of six years. Ultimately, it involves addressing the structural roots of child deprivation. However, there is also an immediate need to protect this age group by integrating it in an effective system of child development services that leaves no child behind. The main challenge of "Universalisation with quality" is to make ICDS a lively political issue. This may sound like to tall order, if not wishful
thinking. But the same would have been said 15 years ago of the right to education, 10 years ago of the right to information, 5 years ago of the right to food and 3 years ago of the right to employment”.

Nirmala Lakshman (2006)\textsuperscript{25} pointed out that India has a staggeringly high rate of children suffering from malnutrition. One in three malnourished children of the world lives in India. The role of ICDS to secure children’s right to food cannot be overstated. In states like Tamil Nadu, it’s functioning has yielded positive results. It is the only programme that exceeds from pregnant women and nursing mothers to cover infants and children up to the age of six. It's role as an instrument to secure children's right to food cannot be overstated.

Arun Gupta \textit{et al.}, (2007)\textsuperscript{26} in their article, analysed early childhood care and development has correctly been understood to be the critical foundation for overall growth and development, not only of children but of society on the whole. Development indices show that India neglects the early care and development of children, especially those under the age of six. The recently released report of the third National Family Health Survey shows that progress in the improvement of their condition is very slow. These children receive very little attention in the media, political debates or parliament. This paper prepares a framework for the Eleventh five year plan that urges the government to prioritise policies towards children under the age of six to protect their rights and ensure a better future for them.
Rajkumar Siwach et al., (2007)\textsuperscript{27} in their article, made an attempt to examine the effectiveness of addressing the challenge of child's well being incorporating health, education and nutrition. Domination of the nutritional status and food habits of the child and pregnant mothers, is shifting the efforts and energies of the AWW to other developmental programmes due to her overburdened extra duties imposed by the state government. The functionaries and beneficiaries view the scheme a food dole initiative, instead of a nutrition and development programme.

Manju (2008)\textsuperscript{28} in her article explained that women's poor reproductive health in India is affected by a variety of socio-cultural factors. Underlying poor reproductive health among Indian women is their poor overall status on the one hand and an inadequate delivery system to cater to the needs of secluded, shy and devalued women on the other. The women's health status in general, and reproductive health in particular, is determined by women's power to make a choice in the quality of available health care services, lifestyle, and women's position in the society. It is thus important that while aiming at improving the reproductive health standards of the women, policy makers should address factors which are responsible for the spread of diseases as well as its socio-cultural dimensions. More innovative and systematic intervention strategies involving communities (women and their families) are needed to meet this challenge.
Khandare, A.L. (2008)\(^{29}\) in an article, finds that the overall prevalence of stunting (<Median-2SD) in the children of the 0-6 year age group was 60.4\% while that of severe stunting (<Median-3SD) was 38.5\%. The index of current nutritional status and measure of wasting as indicated by weight for height showed overall prevalence as 30.2\% and severe wasting as 4.4\%. The results of the rapid survey indicated that various factors including health status of mothers, dietary and socio-economic factors have been contributory to the malnutrition of the children and that malnutrition alone may not be the direct cause of the deaths that are reported in the media.

Harsha Aturupane \textit{et al.} (2008)\(^{30}\) examined the determinants of child weight and height in Srilanka: A quantile regression approach reveals that reducing child malnutrition is a key goal of most developing countries. To combat child malnutrition with the right set of interventions, policy makers need to have a better understanding of its economic, social and policy determinants.

Shailaja Chandra (2009)\(^{31}\) in her article, analysed the India’s very high maternal and infant mortality levels repeated child births are seen as an insurance against multiple infant and child deaths. A number of people cannot avail of services even when they are available due to problems of knowledge and access. Additionally a strong son preference leads to negative feelings towards girls and results in prenatal sex determination and elimination of the female
foetus. All these issues require that civil society fully understand the importance of driving change within civil society, and the media and religious leaders can play the most influential role.

Barun Kanjilal et al. (2010) in their article, revealed that inspite of the declining trend of chronic childhood malnutrition in India, the concerns remain for its disproportionate burden on the poor. The socio-economic gradient of long-term nutritional status among children needs special focus, more so in the states where chronic malnutrition among children apparently demonstrates a lower prevalence. The paper calls for state specific policies which are designed and implemented on a priority basis, keeping in view the nature of inequality in childhood malnutrition in the country and its differential characteristics across the states.

Hassam Saqib Lodhi (2010) in his article, observed that Malnutrition is one the major public health problem in developing countries. In Pakistan more than 38% of the children are under weight and stunted. The current study is being done to access the nutrition status of children of 6 months to 5 years in District Abbottabad. The objectives of the study were to determine the macronutrient deficiency both acute and chronic in children 1–5 years of age, and recommend appropriate interventions. A cross-sectional descriptive survey was conducted in an urban Union Council (UC) of District Abbottabad, with a sample size of 100, selected through simple random sampling. For
data collection a questionnaire was designed. According to height for age Z-score, out of 100 children studied, 80 were normal, 11 were underweight and 10 were severely underweight. According to weight for height Z-score, 83 children were normal while 13 were wasted and 4 were severely wasted.

Rajkumar Siwach et al., (2010)\textsuperscript{34} in their article analysed the socio-economic development of the country on the health status of its children. The opportunities for early childhood development determine the present and future of the country. This component includes health care of children under six years of age, antenatal care of expectant mothers and post natal care of nursing mothers. The various health services provided for children by AWWs and PHC staff include regular health checkups, recording of weight, immunization, management of malnutrition, treatment of diarrhoea, deworming and distribution of simple medicines. At the centre, the enrolled children are examined at regular intervals by the Lady Health Vistor (LHV) and Auxiliary Nurse Midwife (ANM).

Anrudh K. Jain (2010)\textsuperscript{35} in his article analysed the surveys that indicate that the Janani Suraksha Yojana which offers cash assistance to pregnant women opting for institutional deliveries, has increased the number of such births in hospitals. Can this increase be used as an indicator of a decrease in the MMR. It is likely that the cash incentive may disproportionately attract pregnant women without
complications to institutions while the increased workload leads to women with complications not getting proper treatment. To evaluate the programme adequately studies in states with a high MMR based on a representative sample of institutions with and without emergency obstetric services are needed.

Izharul Hasan et al., (2011) in their article, revealed that children are the future of the country. The importance of child health has been described by many ancient Unani physicians. In India, children under 15 years of age constitute about 40 percent of the population. School children constitute a large pool of children of this age group. Nutritional status is a major component status of government Urdu higher primary schools in Azad Nagar and its surrounding area, Bangalore. To assess the anthropometric indices among children, the present study was one time cross sectional, and deviations from the normal were recorded. The overall prevalence of malnutrition among boys was 53.85% (161) and among girls was 49.25% (99). The stunting was 41.47% (124) and 38.81% (78) in boys and girls respectively. The prevalence of stunting was more in boys as compared to girls (41.47% Vs 38.81%). In the study, nutritional status was found highly related to the personal hygiene and socio economic status. Main emphasis may be given towards nutrition education, personal hygiene education, health education, apart from the regular educational activities in the community.
Prema Ramachandran (2011) in her article, finds that attempts to compare the pattern of growth of Indian children as assessed by weight for age, height for age and BMI for age with the WHO standards for growth (2006) and to explore the implications of differences in under-nutrition rates in the 0-59 months of age group as assessed by these three indices. During the first three months there was no increase in under weight and stunting rates. There was progressive increase in underweight and stunting rates between 3-23 months of age. Low BMI for age and wasting rates were highest at birth. Poor growth is an adaptation to chronic low energy intake and stunting is a measure of cumulative impact of chronic energy deficiency on linear growth. It is important to prevent stunting because it is not readily reversible. Low BMI is an indicator of current energy deficit. Early detection of energy deficit using BMI for age and expeditious interventions to correct the deficit might be effective in prevention of stunting.

Tamoghna Biswas et al., (2011) made a Cross-sectional, Observational Community based study in the brick kilns of periurban Kolkata along the eastern banks of the river Hooghly, with house to house visit, clinical examination and anthropometric measurements of the under five children and interview of the adult care-givers with a pre-designed pre-tested proforma. The prevalence of underweight, wasting and stunting amongst the study
population were 64.9%, 20.3% and 64.9% respectively, proportion of exclusively breast feed children was only 18.1% and no children was found fully immunized. Acute Respiratory Infections, Improper immunization, socioeconomic status and not practicing exclusive breast feeding were identified as risk factors of under nutrition.

Utkarch Shah (2011) in a study, observed that there was a strong association between the consumption of nutria - cookie designed by the FMCHI team and increase in weight and height among the beneficiaries. This finding was consistent at a general level and also when internal comparison was made between specific age groups. Excepting a few participations, in whom weight loss was recorded and attributed to some form of underlying illness, a consistent improvement in height and weight parameters was observed among the beneficiaries. This was indicative of the nutria-cookie in improving general health among underweight children. Further, higher consumption of the nutria-cookie showed higher positive gains in terms of improvement in height and weight. In addition, the findings of the study suggested that the benefits of the Nutri-cookie were positively correlated with the extent of malnourishment among the beneficiaries. Higher gains were observed in beneficiaries who were grossly underweight, in comparison to ICMR standards. This implies that the Nutri-cookies were beneficial in providing essential nutrients, carbohydrates, and vitamins to the child to help reduce the deficit. The benefits of the Nutri-cookies (in
terms of improving height and weight) reduced as the deviation from ICMR standards reduced, which over-rules the possibility of obesity among children with higher levels of consumption of the nutri-cookie. Though the beneficiaries were evaluated for mental performance, the findings of this evaluation were inconclusive primarily due to short duration of the intervention. Further, no gender difference was observed in terms of the consumption or the benefits from the intervention. The Nutri-cookie designed by FMCHI, has shown promising results in the domain of improving malnutrition and under nutrition among children. This evaluation study calls for implementation of the program on a larger scale to further assess and review the impact of the program on under nourished children between the age group of 0-6 years.

Arpita Sharma (2011) in her article examined the public policy even needs to be reordered to improve nutrition right from the period spanning 9 months to + 24 months (i.e. from conception to the second birthday) as against past policies targeting children under the age of five. In India 20 percent of children under five years old are wasted (too thin for their age) due to acute under nutrition and 48 percent are stunted (too short for their age) due to chronic under nutrition and 70 percent of children between six months and 59 months are anaemic. The percentage of children below five years of age who are underweight is 42.5 percent as compared with 47 percent in Brazil and six percent in China.
Mehrota Monika et al., (2011)\textsuperscript{41} assessed the nutritional health status of primary school children of rural and urban areas by assessing their clinical health status and the quantity and quality of food intake by the children in both the areas of study. The nutritional deficiency signs and symptoms were observed more in rural children than the urban children. Nutrient intake and consumption frequency of all the food groups was more among the urban children compared to their rural counterparts.

Navaneethan et al., (2011)\textsuperscript{42} undertook an empirical study in the rural areas of TamilNadu, in the South of India, to understand the nutritional status of the children between 11 and 18 years old. The majority of them were found to be underweight and only least of them were in the normal range. The regression model showed that students age, sex and father’s occupation significantly affects their BMI. Further analysis showed that BMI was independent of the student's blood group. It was concluded that malnutrition among school children can be eliminated by providing additional healthy foods and by improving the socio economic background of the region.

Anurag Srivastave (2012)\textsuperscript{43} in his article, revealed that one of the greatest problems for India is under-nutrition among children. The country is still struggling with this problem. Malnutrition, the condition resulting from faulty nutrition, weakens the immune system and causes significant growth and cognitive delay.
Growth assessment is the measurement that best defines the health and nutritional status of children, while also providing an indirect measurement of well-being for the entire population.

Arpita Sharma (2012)\textsuperscript{44} in her article highlighted one fifth of maternal mortality can be averted by addressing maternal stunting and iron deficiency anemia. One (fifth of child mortality (under 5 years) in India can be prevented by ensuring universal exclusive breast feeding for the first six months and appropriate complementary feeding practices after 6 months (along with continued breast feeding till 2 years and beyond). Over one fourth of all child deaths would be reduced in the short term, by available nutrition interventions, implemented at state.

Mary Sunanda (2012)\textsuperscript{45} in her article, examined that 47 percent of India’s children below the age of three years are malnourished (underweight). Forty seven percent of Indian children under five are categorized as moderately or severely malnourished. South Asia has the highest rate and by far the largest number of malnourished children in the world. At least half of Indian infant deaths are related to malnutrition, often associated with infections diseases. The most damaging effects of under nutrition occur during pregnancy and the first two years of a child’s life. These damages are irreversible, making dealing with malnutrition in the first two years crucially important. A close reading of available statistics shows the
problem to be far from uniform as in Vitamin A supplementation coverage rate (6-59 months) 2004 UNICEF statistics.

Pushkar Maitra et al., (2013)\textsuperscript{46} in their article, explained that there are few areas where the statistics are as dismal as child health in India. Four interrelated child health indicators in West Bengal - child malnourishment (measured by the rates of stunting and wasting), prenatal, infant, and child mortality rates are discussed in the study. It also provides evidence on how these rates vary with the gender of the child, parental education, and the wealth status of households. West Bengal does not fare badly on child health in relation to the all-India figures and does better than the rest of east India, but lags behind south India. Its performance on mortality rates is much better than India as a whole, and, quite significantly, compares favourably with those in south India. However, effective policy interventions are required to delink maternal health from child health and the importance of this cannot be overstated.

Amarjeet Singh (2013)\textsuperscript{47} in his study, examined the immunization registers of 6 subcenters and 36 Anganwadi workers were scrutinized to enlist eligible children aged 12-23 months on the day of survey. Of the 747 eligible children, 708 (94.8\%) were fully immunized. Main reasons for incomplete immunization were parental indifferences or migration of the child/ family. In 10\% cross checking resurvey, majority of the records were found to be correct. Quality of
record keeping was reasonably good, Record based estimation of immunization coverage rate was to be feasible.

**SECTION II**

Mina Swaminathan (1991)\(^{48}\) in her study emphasized the network of child care services in Tamil Nadu. The author pointed out the consequences of poverty for children, parental absence, high infant mortality rate, the high incidence of morbidity, malnutrition, deficiency disorders and disabilities among children and low literacy levels. The major government programmes to support to mothers and children are Tamil Nadu Integrated Nutrition Programme, ICDS and Creches and Balwadis for low income families. The overwhelming presence of the government programmes have created a climate of dependency with a negative impact of community participation. The basic shortcomings of the programme are the poor quality of care for young children and the near absence of facilities for the care of infants below the age of two years.

Mathur, G.P. *et al.*, (1995)\(^{49}\) in their study, explained that amongst the 1,545 children, Anganwadi workers identified disability in 126 subjects which were verified in 118 cases by pediatricians. The disability rate was 7,638 per 1,00,000 population. Visual, mental, orthopedic, speech and hearing disabilities rates were 4790, 2654, 583, 518 and 453 per 1,00,000 population, respectively. In the repeat
survey, 35 of the 74 children with visual disability, 4 of the 9 with orthopedic disability and 3 of the 7 with hearing disability could be managed satisfactorily. AWW can help in early detection and appropriate management of incipient and preventable childhood disabilities.

Kulkarni et al., (1998)\textsuperscript{50} in their study, explained that the total of 547 children, who were enrolled for supplementary nutrition and education, formed the study group. Impact of the programme on nutritional status was seen only in severely malnourished children (Grade III and IV). Severely malnourished children constituted 9.3\% of total initially and 3.9 percent at the end of the study. The number of children belonging to grade I and II malnutrition were 74\% initially and 81.5\% at the end of the study. Not much improvement in the immunization status for BCG., all 3 doses of oral polio vaccine and DPT was 42.4, 59.4 and 73.3 \% at the baseline study and 56, 67.7 and 79\% respectively at the end of the study. The supply of supplementary nutrients and vaccines was irregular. High prevalence of anemia were noted.

Kapail et al., (1998)\textsuperscript{51} in their study, explained that the total of 1,623 children in 50 Angan-wadi centres were studied. The study revealed that about 56.8\% children were males and 43.2\% were females. It was observed that 35.2\%, 26\%, 6.5\% and 1.5\% of the children belonged to II, III, IV and I grade malnutrition respectively.
Thirty percent children were found to be normally nourished. The nutrient intake of severely malnourished children revealed that the mean calorie intake in 6-11 month age group was 26% less than recommended dietary allowances for this age group. In 12-35 months age group children, the calorie deficit was 42.2%; Similarly in 36-71 months age group the deficit in calorie intake was 50.4%. The calorie intake of severely malnourished children was found to be low and insufficient in all the age groups, in spite of registration for delivery of supplementary nutrition.

Devendra et al., (1998)\textsuperscript{52} analysed the method of strengthening ICDS Programme. The ICDS is operated in 5,416 development blocks of the country and in 310 urban slum projects. Recently with the universalisation of the scheme, the programme is supposed to reach each and every development block of the country. ICDS provides health care for children and ante and postnatal care to women. Child health care consists of growth monitoring, health checkup, identification of risk cases, treatment of minor diseases deworming and referrals of serious health cases.

Swami, H.M. (2001)\textsuperscript{53} in his study, took a sample of 1,286 pre-school children selected by a stratified random sampling who were residing in urban, rural and slum areas of Chandigarh for assessment by making domiciliary visits. The study findings revealed that the overall prevalence of Protein Energy Malnutrition (PEM) was found
to be 51.6% while 55.4%, 26.3%, 5.3% and 3% of children had grades I, II, III and IV PEM, respectively. The prevalence of malnutrition significantly increased with increase in age till 3rd year, (P<0.001). The prevalence of PEM was significantly higher among non-ICDS (53.8%) than ICDS beneficiaries (46.9%) (P<0.05).

Bhalani, K. D. et al., (2002) in their study, concluded from the total 3,157 children, 62.9% were found malnourished. The prevalence of moderate to severe malnutrition among girls was 28.4% as against 16.9% in boys (P<0.0001). Nutritional status of the children started worsening in the second year of their life. More than 60% of infants were found normal as against 37.6% of children of age group of 1-2 years, 29.3% of children of 2-3 years and 23.5% of children of 3 years and above (p<0.0001). From the children who were normal in 1996, only 44.4% remained normal after attending ICDS Anganwadis for 2 years, while from the children who were malnourished in 1996, 17.8% children deteriorated further, 58% remained as malnourished as they were and only 24.2% of them improved.

Shalini Saxena et al., (2002) in their article, highlighted the recent advances in the field of social and behavioural sciences. The most important programme introduced in this direction was the ICDS scheme with a package of interrelated services to the children of 0-6 years of age and pregnant and lactating mothers. The ICDS Programme is the largest programme of child service in the world. But
how happy are the Anganwadi workers, the pivot around which the programme functions. This study seeks to analyse the areas in which the Anganwadi workers achieve job satisfaction and pinpoint those where improvement is needed. Happy workers are the key to the success of a programme. The effectiveness of ICDS Programme rests on the effective job performance of the Anganwadi workers.

Kumar (2002) in his study explained that the malnutrition or under nutrition of children and expectant mothers are due to Vitamin A and protein deficiency. It influences the longevity of human life, earning potential, labour productivity and dependency ratio. In order to combat malnutrition and under nutrition, the government has been implementing a number of nutrition schemes, namely, TINP, ICDS, Chief Ministers Mid Day Meal Scheme and Pradhan Mantri’s Gramoday Yojana (PMGY). This scheme is aiming at providing required nutrition for meeting the gap in the recommended dietary allowances by supplementing the state’s commitment for supplementary nutrition with adequate additional Central assistance under the PMGY.

Brinda Viswanathan (2003) in her study found that household food security remains to be a major concern around the globe with millions of adults and children suffering from malnourishment. More importantly, a large percentage of these people reside in India despite the presence of many public polices to tackle
household food insecurity. Food insecurity is caused by three interlinked factors viz. availability of food, access to food and utilization of food. In India, the first problem has been taken care of fairly well but much needs to be done with respect to the second and third aspects. An intervention scheme like the ICDs for the pre-school children deals with these aspects by providing a combination of supplementary feeding, health and nutrition, education and regular health check-ups, to improve the quality of food intake and its absorption by the body at the initial stages of growth. The evaluation studies indicate that the impacts of this programme have not reached the target groups effectively and the operational efficiency of the program is not satisfactory. The key of malnutrition reduction lies in decentralization of the scheme, community participation, along with education and empowerment of women as is observed in the case of the Tamil Nadu Integrated Nutrition program. This would go a long way in creating a good human resource that can take advantage of the process of liberalization and globalization.

Vimala Ramachandran (2004)58 in her article, revealed that focusing of the children, their family, their community, the available education and health services helps in the effort to understand the social processes that affect children’s participation in schooling. The relatively poor utilization of ICDS by children in 0-3 years age group and relatively low coverage of ICDS Programme in tribal areas conform with findings of earlier studies.
Shanti Ghosh (2004) in her article highlighted the ICDS programme. ICDS programme was expected to prevent the incidence of severe malnutrition of the kind that has been reported in some parts of the country. However, after 30 years of operation, the ICDS is yet to have an impact on the poor nutritional status of children. The ICDS has to be converted into a true health, nutrition and development programme. For nutrition to improve, we have to strengthen proper breast feeding and complementary feeding, together with complete immunization and prompt management of any illness. Nutrition of young children is better in the urban areas where it should be easier to deliver services.

Sumati Vaid et al., (2005) in their study has analysed that all the ICDS centres were providing supplementary nutrition to children, pregnant women and nursing mothers who enrolled in the Anganwadi. Most of the mothers had the knowledge about the nutritional status of children and got information from the Anganwadi workers. Data shows that all the Anganwadi workers were assessing the nutritional status of children by taking height and weight in Anganwadi. Majority of the respondents were not aware regarding the maintenance of records in the Anganwadi centres but they had very positive attitude towards ICDS Centres and all the mothers observed some changes in the children after enrolled in the ICDS centres. Result indicates that majority of the mothers whose children did not attend
any ICDS centres told that it was not necessary for the children to attend any ICDS centres and did not have any knowledge regarding supplementary foods and nutritional needs of the children. Majority of the mothers have immunized their children from the Primary Health Centres. All the respondents observed some changes in the children. It was found that children who attended Anganwadi centres had good health or appearance as compared to their counterparts. It was also observed that ICDS children had good dietary intake as compared to the children who did not attend ICDS centre.

Michele Gragnolati et al., (2006) in their article, has pointed out the effectiveness of the Integrated Child Development Services programme in addressing the challenge of child undernutrition in India. It finds that although the ICDS programme appears to be well-designed and well-placed to address the multidimensional causes of malnutrition in India, there are several mismatches between the programme’s design and its actual implementation that prevent it from reaching its potential. These include an increasing emphasis on the provision of supplementary feeding and preschool education to children aged four to six years, at the expense of other programme components that are crucial for combating persistent undernutrition; a failure to effectively reach children under three and, ineffective targeting of the poorest states and those with the highest levels of undernutrition which tend to have the lowest levels of programme funding and coverage. In addition, ICDS faces substantial operational challenges.
Georcekent (2006)\textsuperscript{62} in an article highlighted ICDS programme and right to food. Social service programmes have problems in achieving the desired coverage and in achieving the appropriate quantity and quality of services. The most common approach to dealing the shortfalls in coverage is to put more money in the programme. ICDS should provide services to every child up to six years of age, every pregnant or lactating woman, and every adolescent girl. This order and subsequent orders extending it mean that these women and children are entitled to services from ICDS.

Renuka Chowdhury (2006)\textsuperscript{63} in her article, highlighted the balanced linkages between education, health and nutrition for proper development of a child. India is the home of the largest child population, the child is the first priority on the country’s development agenda, not because they are the most vulnerable, but because they are our supreme assets and also the future human resources of the country. The best possible investment is the investment that promises the highest returns to ensure that every Indian child grows up in an environment conducive to his or her development.

Noor Mohamed \textit{et al.}, (2007)\textsuperscript{64} in their article, analysed the Integrated child Development Service (ICDS) Scheme. This Scheme was started in 1975 and intended to provide food supplementation to children and pregnant / nursing women. It is evident that the ICDS scheme plays a major role not only in child care and development but
also for the welfare of feeding mothers, to reduce infant mortality, illness and nutrition deficiency.

K.R.G. Nair (2007) analysed the inter-state differentials in malnourishment among children in India, the study finds the ICDS as the best package to tackle the issues and suggest extending it and making it more oriented towards reducing child malnourishment.

Saroj K Adhikari et al., (2009) in their study, focusing on the ICDS - India's largest nutrition and early child development program - describes the political, organizational, and technical challenges in building and sustaining an outcomes-oriented approach to nutrition program monitoring. It is shown that the current policy environment appears to be conductive to strengthening nutrition program monitoring; political commitment is growing, financial allocations to ICDS have increased and, recently, a number of reforms to strengthen the ICDS monitoring and evaluation system have been undertaken. Yet, substantial weaknesses remain. This paper discusses some of the challenges in converting this vision into action and suggests some immediate steps that could be considered both at the central and state levels.

Mohan Rao, V. (2010) in his article, examined that the schemes provide an integrated approach for converging basic services through community - based workers and helpers. The services are provided at Anganwadis. The Anganwadi, literally a 'courtyard' is a play
centre, a child care centre located within the village itself. The services
provided under the ICDS scheme are supplementary nutrition, non-
formal pre-school education, immunization, health check up, referral
services and nutrition and health education. Considering the
importance of ICDS, the government has given very high priority to the
scheme. The significant achievements in its implementation will
certainly help as an effective tool in the eradication of malnutrition and
ensure all round development of the children.

Monika Jain et al., (2011)\textsuperscript{68} in their study, explain that the
health of people is not only a desirable goal but it is also an essential
investment in human resources. Various intervention programmes
have been launched by the government to improve the provision of
basic services pertaining to public health and to devise a security
system through which the most vulnerable section, viz., women and
children could be protected. The Integrated Child Development
Services (ICDS) programme is the reflection of the Government of India
to effectively improve the nutrition and health status of underprivileged
section of the population through direct intervention mechanism. ICDS
is the world’s most unique health and welfare programme, which
holistically addresses health, nutrition and development needs of young
children, adolescent girls and women across the life cycle. In addition,
the programme also addresses goals of universal elementary education
and other primary health care goals. The convergence of services has resulted in better prenatal and immunization coverage in the ICDS blocks. Inbuilt monitoring system is the salient feature in this programme management, which draws attention to implementation flaws immediately and given an edge to this intervention based public health programme over others.

Jarnail Singh Thakur et al., (2011) found that decline in malnutrition levels has been dismal since the 1990s. They ascertained decadal trend in childhood nutritional status between 1997 and 2007 in Chandigarh and assessed impact of ICDS on childhood undernutrition. A total of 803 under five children, 547 children between 12-23 months age, and 218 women with an infant child were recruited for the study. Findings of present study were compared with another methodologically similar study (1997) from Chandigarh and Reproductive and child health Rapid household survey (1998) to draw decadal trends. Prevalence of underweight among under five children remained almost stagnant in the last one decade from 51.6%(1997) to 50.4% (2007). There was insignificant difference (P = 0.3) in Prevalence of underweight among children registered under ICDS program (52.1%) and those not registered (48.4%) in 2007. Other health and service provision indicators had mixed results in the past decade. Health services utilization was poorest in urban slums.
Vandana Pandey et al., (2011)\textsuperscript{70} in their article, say that the nutritional status of children who have received supplementary food for more than one year under ICDS Scheme so as to assess its impact on the nutritional status. The finding shows that their diet was unbalanced mainly based on cereals; their intake of Pulses Green leafy vegetables, other vegetables, roots and tubers sugar and fat were very low as compared to ICMR Standard. The ICDS Scheme may be very attractive but beneficiaries don’t realize its importance. Proper and sufficient nutrition supplementation provided to the beneficiaries may help the children towards leading a nutritionally sound and healthy life combating malnutrition.

Brajesh Raj Merta (2012)\textsuperscript{71} in his study analyzed that with more chronic under-nutrition prevailing in the community, the majority of the children were still in severe underweight category even after intervention and utilization of majority of the services. Continuing the intervention till the child reaches normal weight with emphasis on health education, measuring height as a routine, more frequent medical evaluation of child, regular supply of drinking water and societal transformations to improve the autonomy of mother are necessary ingredients for improvement.

Shashi Manhas et al., (2012)\textsuperscript{72} in their article, concluded that mostly Anganwadi workers were familiar with the various services of ICDS but the provision of these services, their importance for the
programme was not clear to them; also the implementation part of these services was immensely lacking in aspect of effective utilization of these services by the beneficiaries and for the beneficiaries. The study also revealed that irregularities at work place were a common practice among Anganwadi workers. The quality of knowledge was one of the neglected features among job profile of Anganwadi workers. Since the percentage of highly aware Anganwadi workers for various services was ranging in between the 8-15 percent only, the study strongly felt the need of improving the quality of knowledge and awareness among Anganwadi workers. Hence, there is a strong and intense need for improving the training quality provided to Anganwadi workers before letting them go into the field jobs: frequent interactions among Anganwadi workers and supervisors should be introduced for imparting information and awareness.

Naheed Vaida (2013)\textsuperscript{73} in her article, observed that the practice of placing deprived children having minimum or no emotional and material resources, in orphanages has since long been prevailing in socio-economically poor Asian countries. A sample of 100 children residing in three different orphanages in district Budgam in the age group of 10-15 years were selected for the present study. Most of the children were found socially disturbed with respect to weight for age as per IAP classification the situation was not that bad as 84 percent of the children were found to be normal. Similarly height for age as per Waterloo’s classification revealed that more than half of the children were normal.
Niyi Awofeso (2013) in their study, express that the ICDS has not met its objectives, three decade on, due in part to poor health management. A system capacity building approach is proposed to improve the health and development of mothers and children in India. This approach entails a revitalised India’s public health, rather than the ICDS, as a major facilitator of maternal and child health improvements. Issues that need to be addressed include; (1) Revitalising India’s public health system, and providing adequate funding to make it more responsive to the needs of the whole population, instead of the over-reliance of vertical programmes such as ICDS; (2) Introducing sustainable poverty reduction programmes, particularly in areas with high maternal and child malnutrition. Improvement in maternal education is also very important in reducing maternal and child health. Remarkably, such improvements are already underway; (3) Expanding the depth and breadth of the training curriculum of Anganwadi workers and professionalising the cadre within India’s public service. These workers require adequate remuneration commensurate with their job description, over and above the minimum wage in India’s public sector; (4) Developing the supply of ICDS food from pilfering contractors to local women groups. Employment of dieticians to facilitate adequate quantity (at least 500 calories per meal) and quality (i.e. rich in all food classes) of the meals served at Anganwadi centres. Home visits should be introduced,
particularly for malnourished children, to work with the mothers of such children in the provision of nutritious meals at their respective homes; (5) Streamlining the wide array of existing maternal and child health programs, most of which have not demonstrated evidence of effectiveness, to assure quality implementation; (6) Targeting children from 1-3 years, as most of the malnutrition in children develop from this period, and most long term consequences of malnutrition may be minimised if this cohort of children are properly monitored nutritionally; Training and employment of health administrators to adequately manage the ICDS program; Focusing more on program outcomes, linked to child nutrition measures, rather than ICDS processes such as numbers of centres established; (7) Fortifying the food handed out by the PDS and those prepared at ICDS centres with micronutrients and vitamins, as this would be an economical and effective way to lower rates of anaemia, and increase maternal and child nutrition; (8) Standardised building and equipment plans for ICDS centres should be established nationally, and only ICDS centres that meet minimum standards for building and equipment within a specified budget range should be allowed to operate. Such an approach will enhance the functioning of ICDS centres, and reduce fraudulent practices related to the construction of these sites.

Trivedi, S. et al., (2013) in their study, explained that the children in the ICDS group were just as likely to be malnourished
as those in the control group. For children aged 1-2, BCG vaccination status was 80.2% for the ICDS group and 88.8% for the control group. The control group was significantly more likely than the ICDS group to have received 3 doses of DPT, 3 doses of OPV and the measles vaccine. These findings indicate that, 3 years after implementation of ICDS in Sanwer block, nutritional and immunization status has not improved.

Kaushik Bose et al., (2013) in their study, revealed that the overall rates of stunting, under weight and wasting were 23.9%, 31.0% and 9.4%, respectively. In general, the frequency of stunting increased with increasing age in both sexes. In conclusion, the nutritional status of the subjects is unsatisfactory. There is scope for improvement in the form of enhanced supplementary nutrition.

**To Recapitulate :**

A review of past studies, attempted so far, shows that the two limits of child development are child health and child nutrition. Turning to the studies on ICDS, some draw on a wider canvas - The Nation/State; some others limit their probe into a relatively restricted area - The block/village. It is felt that studies on some intermediate level will be more informative. Hence, the present study - "Impact of Integrated Child Development Schemes on the Nutritional and Health Status of Children in Kanyakumari District".
Reference

Section I


Section II


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