

**MORBIDITY PATTERNS OF RURAL CHILDREN AND IMPACT OF NUTRITION
EDUCATION ON THEIR HEALTH AND NUTRITIONAL HABITS**

BY

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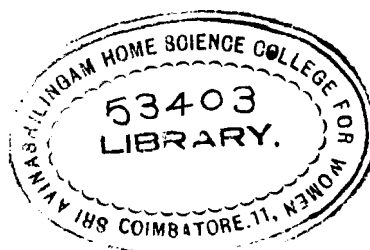


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INTRODUCTION

Healthy, contented children can become tomorrow's peace makers. Children are civilisation's basis for the future and constitute a valuable source of its perennial renewal (Desai, 1979). A nation's children are its supremely important asset. The progress of the country is judged not by its industries but by the welfare of the future citizens. Our nation's future, its prosperity or poverty, strengthness or weakness depends on the care with which we build up the character and habits of our children (Dash, Humandur and Nayyar, 1979 and Central Social Welfare Board, 1979).

In India, one child is born every $1\frac{1}{2}$ seconds; 21 million children come to this world per year. Within the age group of 0-14, our child population is 828 million. Many of them affected by poverty are victims of a high rate of malnutrition and its tragic consequences. Seshadri (1979) have estimated that the infant mortality rate in India is as high as 122 per thousand live births. Singh (1979) estimates that 10-15 per cent of our children, suffer from severe calorie and protein malnutrition.

Millions of children in developing countries lack even the rudimentary necessities of life such as health care, nutrition, safe

drinking water, elementary education and shelter (Malgankar, 1979). These are the prime causes for high mortality and morbidity rate (Reddy, 1979). Varadarajan (1979) and Buch et al (1979) remark that the high mortality and morbidity of Indian children are further accentuated by poverty and poor sanitary condition which causes diseases like respiratory infections, pneumonia and gastro - enteritis. These diseases are mostly caused by malnutrition.

Parthasarathy and Bhalla (1979) opine that malnutrition during critical phases of early development can lead to stunting of physical growth and lack the full genetic intellectual potential. It is the poverty coupled with ignorance that promotes the rate of infant mortality in India (Patwari, 1979; Sengupta, 1979 and Parooqui, 1979).

Keeping in view the high incidence of mortality, morbidity and malnutrition among children, the scheme of Integrated Child Development Service has been conceived as our integrated approach with its components of supplementary nutrition, immunisation, health check up, referral services, nutrition and health education and non-formal pre-school education. Further International Year of the Child offers chances to promote health, nutrition and education of children and for a renewal and intensification of its commitment to assist the children in developing to their full potential (Liu, 1979 and Dayal, 1979).

A child is an individual who has to be helped in the growing up process (Desoares, 1979). The world has made a beginning to realise that modernisation will not succeed unless it is based on the proper care and development of the younger generation. India proposes to make concerted efforts to reduce the incidence of maternal and child mortality and morbidity by providing a solid health and nutritional infrastructure. Immunisation is the vital link in the chain of services planned to bring down the morbidity rate (Nair, 1979).

Child to Child Programme, which has been initiated by the Institute of Education and Child Health of London and the Ministry of the Overseas Development of the United Kingdom, uses the services of the school child to help the healthy development of the pre-school child. For healthy growth, a child needs adequate attention, love, understanding, protection, security, nutrition, health-care stimulation through language and play and social environment to cope with future experiences. Adults in a family though try to provide these things, yet to a large extent older brothers and sisters are the prime developmental influence on their younger siblings. Children helping children is the basis of this programme (Buch, 1979).

Periodic evaluation of child's health status and nutrition education reveals that there is an inequality in the distribution of health services and lack of adequate information to the poorest of the poor. Very

limited surveys have been done on the morbidity pattern of the children in the interior part of the rural areas. Hence this study aims to find out the childhood morbidity in relation to different income levels, in Pannimadai one of the villages of Coimbatore City; give nutrition education to the children and evaluate in terms of its impact.

II REVIEW OF LITERATURE

The related literature of this study on "morbidity pattern in rural children and impact of nutrition education on their health and nutritional habits," are discussed under the following headings.

- A. Importance of children
- B. Childhood mortality
- C. Childhood morbidity in relation to income levels
- D. Childhood morbidity in relation to feeding practices
- E. Morbidity pattern in children in relation to environmental factors.
- F. Need for nutrition education in children and the impact of nutrition education on their health and nutritional habits.
- G. Preventive health care in the International Year of the child.

A. Importance of Children

Children are our possessions, a trust and investment, since it is a vulnerable period, there is a great need to provide organized health, nutrition, education and welfare services. (Mishra and Madhubala, 1978).

Children are the world's greatest resource. Investment in a child's development is an investment in the future of a nation (UNICEF, 1977 and Chandrasekar, 1977). Child is the father of man and if his childhood is well cared the better will he be to take up responsibilities of a full grown citizen.

Needs of children are critically important, while they are under 5 years of age while this age is so important, they are the ones comparatively less attended to, through organized services in relation to health, nutrition, education and recreation (ICCV, 1978 and Phabhesingha, 1973).

According to Central Health Education Bureau (1977), children in the developing countries and their families constitute two third of the world population. But most of them are without the essentials with which to build decent and productive lives.

Children upto the age of five years constitute 17 per cent of the population (Ghosh, 1977; Grewal, 1979). Out of 115 million (1971 census) children between the age of 0 and 6 years in India, atleast 46 million are below the poverty line. Of these 9.2 million live in the slum of the cities, 2.8 million live in tribal areas and 34 million in rural areas (Nair, 1979).

B. Childhood Mortality

In India, one child is born every 1-1/2 seconds. In a whole year, 21 million children come to this world. Only a minority is born healthy. For the others, coming to grips with life is losing battle (Seshadri, 1979).

Thirty five to sixty per cent of all deaths in the general population occur in children under 5 years of age (Oberoi, 1972; Srikantia, 1979; IAPB, 1972; Breetjeld, 1976; Acharya et al 1978;

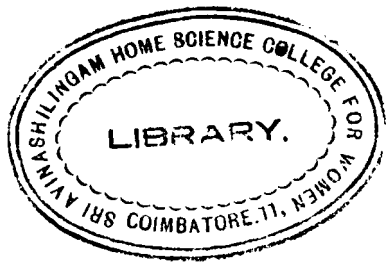
Padmabhanu, 1977 and Ray and Sen, 1978. 122 children out of every 1,000 born alive die soon after birth (Seshadri, 1979).

According to 1970/1975 census, the annual deaths of infants under one year of age per thousand live births are in Table I.

TABLE I
MORTALITY IN CHILDREN

Country groups (number)	Deaths per 1000 live births 1970/1975
Industrialised countries (20)	15
Developing countries High income (20)	26
Upper middle income (25)	35
Intermediate middle income (30)	48
Lower middle income (22)	59
Low income (25)	129
Centrally planned economies (7)	25

One lakh Indian children die every month as a direct result of malnutrition. In India, poor environmental sanitation, poor housing and low socio-economic status result in malnutrition that is responsible



for 50 per cent of deaths in children below the age of five (Viswanathan, 1979).

According to Raju (1975), World Health Organisation (1977) and Ramalingaswamy (1976) in India as in many developing countries 50 per cent of the total mortality are contributed by mortality in children under five years of age. The main causes of mortality as reported by Devadas (1972) are gastro enteritis (35.6%), respiratory infections (22%), marasmus (33.6%), Kwashiorkor (92%), other nutritional disorders (42.8%), typhoid, diphtheria (70.5%) tuberculosis (51%), convulsive disorders (50%), meningitis and encephalitis (30.5%) and encephalopathy (88.6%). Among 929 deaths in the Paediatric Department, 40 per cent were among the pre school age group and 90 per cent of those deaths were due to kwashiorkor.

Summarising the All-India Statistics, Ghosh (1977) reports that malnutrition is the underlying cause of death in 7 per cent of deaths in the age group of 0-5 years and an associated cause in 46 per cent.

Infant mortality is higher in rural as compared to urban region and varies between 80 and 150. On an average it is around 100. The mortality between 1-4 years is about 45/1000 as compared to 1/1000 for Western Europe and North America while infant mortality

is 7 to 9 times in Punjab. The mortality among the female children is higher than the males except in the first week of life (Jhosh, 1976, and CHES, 1977). This may be due to the cultural bias against the female children.

According to All India Rural Statistics (1972), deaths by cause, age and sex are in Table II.

TABLE II
MORTALITY RATES IN CHILDREN

Cause of death	Less than 1 Year		1-4 Years	
	Male	Female	Male	Female
Diarrhoea	6.4	5.9	19.7	21.5
Respiratory diseases	19.9	19.0	29.6	25.8
Fever	8.9	10.5	24.7	26.9
Other infant deaths	53.1	54.4	-	-
Percentage of total deaths	21.6		11.5	

Keilmann et al (1977) studied the cause of deaths in 1415 children, 9 day to 3 years of age in 1971. He reported the occurrence of diarrhoea and dehydration in 44 per cent, lower respiratory infection in 22 per cent, malaria and nutritional deficiency diseases in 7 per cent, tetanus neonatorum in 2 per cent and other causes in 18 per cent.

As Gopalan (1973) and UNICEF (1977) point out, the proportionate mortality rate in children below 4 years in our country is as high as 40 per cent as compared to less than 7 per cent in our country. Wagle (1977) and Holey (1977) in their summary of findings, point out that in many rural poor families, a quarter of the children die before they are five years old.

Sharma et al (1978) stated that the main causes of mortality are asphyxia neonatorum, prematurity, sepsis. Neonatal septicemia, hyperbilirubinemia, congenital heart disease, pneumonia and intracranial injury.

Mortality rates for different age groups are 0-1 years (19.1 per cent), 1-4 years (20.5 per cent), 5-9 years (8.1 per cent), 10-14 years (3.5 per cent). The IAP's has put forward mortality pattern in urban poor economic environment is mainly due to

Gastro-intestinal disorders	- 40.8 %
Respiratory infections	- 15.4 %
Tuberculosis	- 5.7 %
Malnutrition	- 3.7 %
Infectious diseases	- 7.7 %
Syria of unknown origin	- 13.5 %
Miscellaneous	- 10.4 %

Ghoshal (1976) and Datta (1972) have studied ten villages of Pondicherry State. Death rate was by far higher among infants under one year than in any other age group. It was generally higher among females

than males. Malnutrition, diarrhoea and anaemia were among the main causes of death.

Mortality among pre-school children in India is more than 50 times that of the technologically developed countries. Nearly half of the children die in India before they reach adulthood (Raju, 1978). Infant and child death rates are 4 or 5 times higher in rural areas than in other areas (CHGB, 1977).

Apart from its direct effects, malnutrition also increases the susceptibility and aggravates the course of various infectious diseases. Thus, malnutrition is a major cause of ill-health and mortality (WHO, 1977). The greater number of deaths in the under-developed are due to many causes in addition to bad nutrition.

C. Childhood Morbidity in Relation to Income of the Family

The pattern of morbidity varies from country to country and in the same country in different regions and in the same region from place to place. Sukhatme (1974) states that inadequate income is one of the main determinants of the incidence of malnutrition.

In a study done by Devadas (1972) on morbidity, 294 children below the age of 10 years visited the outpatient clinic of the

Institute of Child Health in Madras for one ailment or another.

Considering each visit to the children's hospitals, 43,400 cases, were registered among children below 75 years out of total 57,788 cases.

Atharevale (1977) and Raju *et al* (1978) studied the causes of morbidity incidence and pattern among pre-school children in an urban lower economic environment. The reasons are acute respiratory infections (mild 57.5 per cent, severe 64.9 per cent,) ear infections (59.5 per cent) acute diarrhoea (61.5 per cent), chronic diarrhoea (63.7 per cent), ascariasis (62.4 per cent), thread worm infection (55 per cent), infective hepatitis (65 per cent), amoebiasis (63.7 per cent), bacillary dysentery (60.6 per cent), cirrhosis (63.3 per cent), malaria (73 per cent), Kuchipoker (61.1 per cent) undernutrition 60.5 per cent), xerosis (61.2 per cent), Keratomalacia (67.4 per cent), night blindness (64 per cent) Angular stomatitis (62.6 per cent), whooping cough (61.7 per cent), measles (59.9 per cent), chicken pox (32.4 per cent), poliomyelitis (93.7 per cent), scabies (57.1 per cent), impetigo (66.5 per cent), pyoderma (62.7 per cent), pyrexia origin (63.5 per cent), acute conjunctivitis (52.7 per cent) and Febrile fits (79.5 per cent).

In a study conducted by Rao *et al* (1976) with 1350 children of both sexes and three income groups living in a rural area, children from income groups I (above Rs 7000), and II (Rs 2000-7000) were found to be taller and heavier than those of income group III (below Rs 2000).

Chhab (1977) conducted a survey of pre-school children, covering 1670 households in Punjab, which is economically better off than most other states. Malnutrition was widespread and only about 1/3 of the children were adequately nourished. Severe to moderate malnutrition was between 1 and 2 years.

Srikantia (1978) exhorted that among the various nutritional problems, protein calorie malnutrition is particularly serious among young pre-school children. Three per cent of children among poor income group of society suffer from diseases like Kwashiorkor (child looks puffy due to swollen cheeks, has swollen legs, suffers from repeated infections like diarrhoea, has coppery brown hair and discoloured skin) and marasmus child looks thin due to wasting of muscle and loss of subcutaneous tissue.

According to Gupta *et al* (1977), percentage incidence of nutritional disease of children, in relation to the socio economic status of the parents are in Table III.

TABLE III
NUTRITIONAL DISEASE OF CHILDREN IN RELATION TO THE SOCIO ECONOMIC
STATUS

Per capita income in Rupees per year	Vitamin deficiency		Anemia		Deficiency of fat	
	Rural	Urban	Rural	Urban	Rural	Urban
	Percentage		Percentage		Percentage	
500/or more	-	-	-	-	-	-
400-499	-	-	-	-	-	-
300-399	5	1.72	-	-	-	-
200-299	21.6	14.85	4	1.63	-	-
100-199	26.2	18.75	6.5	2.19	-	-
50-99	32.5	32.05	6.5	3.42	-	-
50 or less	42.9	10.4	42.9	24.0	1	1.43

Two hundred and four children of different socio-economic group of 5-8 years old was studied by Dhingra *et al.* (1977). While those from the public school who hailed from families of higher income group were adequately fed, those from the low socio-economic group corporation school were mostly malnourished. The incidence of infection increased with fall in living standard.

IAPB (1972) figures out that nutritional deficiencies in urban lower economic children of 0-10 years are undernutrition (28.9 per cent) marasmus (5.3 per cent) Kwashiorkor (4.8 per cent), Vitamin A deficiency (18.2 per cent), vitamin B₂ deficiency (52 per cent), moderate and severe anaemia (25 per cent).

More than 7,000 school children belonging to the high socio-economic strata and about 2,000 children belonging to the low income groups were studied by Vijayaraghavan (1978). All the anthropometric measurements of the well to do children were superior to those of children of low income group. A health and nutrition survey revealed that while 20 per cent of the children belonging to the low income groups had one or more deficiency signs, the children of high income group were free from any deficiency signs.

A survey was made by Devadas *et al.* (1974) on 2208 children of both sexes aged 7, 8 and 9 years from 11 schools in Coimbatore. The heights and weights were measured every month for six months. The mean heights

of the children aged 7, 8 and 9 were 111.9, 117.9 and 122.4 centimetres and weights were 17.10, 18.99 and 20.88 kilograms. Compared with the American standard, 90 per cent of the children were shorter and lighter than 50 per cent of American boys and girls. The height and weight showed consistent increments during the period of the study. The income of ^{the} family, birth order of the child, diet and childhood diseases have a direct influence on height and weight of the subjects. The heights and weights of our rural, low income pre-school children are found to be 15-20 per cent and 40-50 per cent below the Indian and American standard respectively (Nao, 1978).

Income is an important variable in the evolution of nutritional behaviour. Wherever there is low income, the negative features in the environment result in behavioural and educational disaster, Malnutrition is invariably present in those segments of the population who are economically backward (Devadas, 1974).

D. Childhood Morbidity in Relation to Feeding Practices

Ensuring adequate feeding practices to our infants and children should receive the highest priority in any nation building programme because the progress and prosperity of the nation depends on the care bestowed upon its children (Devadas et al 1977).

The sum total of the few research studies have indicated that early weaning in itself is not a significant cause of malnutrition among the most malnourished, who are deprived with respect to many other variables effecting nutritional status (Zeitlin et al 1978). Waldson (1976) state that the repeated gastro-intestinal infections occurred during the weaning period; respiratory infections and measles pose a serious hazard.

Sharma (1978) exhorted that the nutritional status of children largely depends on the feeding practices of the community besides the availability of food. A nutritional survey was conducted by Sharma et al (1977) with 280 urban and 300 rural mothers in Jammu Province. Weaning was complete before 18 months old in 76 and 85 per cent respectively. Additional beverages were given to 44 and 35 per cent. Demand feeding was the routine and generally bottle hygiene was poor. Frequent diarrhoea, vomiting or excessive crying were the common problems of early childhood in 56 and 37 per cent which the mothers associated with demand feeding.

Cunningham (1977) analysed the medical records of 328 normal infants with birth weight 2,500 grams. At the time of discharge, 164 were being breast fed and 162 were being artificially fed. The two groups were comparable with respect to average birth weight, sex distribution, Apgar score and mode of delivery. Breast feeding was associated with a higher level of parenteral education, also with

significantly less illness during first year, especially if continued beyond 4½ months.

E. Morbidity Pattern in Children in Relation to Environmental Factors

A survey carried out by the Indian Council of Medical Research (1974) revealed that ocular manifestations of vitamin A deficiency like conjunctival xerosis and bitot's spots are frequently encountered among the children. The overall prevalence of conjunctival xerosis with increasing age is from 1.5 per cent among children between 1-1½ years and 5.8 per cent in children between 4-5 years of age. A similar trend is observed with respect to bitot's spot.

Surveys conducted by Mazy (1977), Sarma (1978) and Venkatesh (1978) throughout the country have revealed that children below six years of age suffer from protein calorie malnutrition, vitamin A deficiency, anaemia and various infectious diseases. About three to five per cent of pre-school children suffer from vitamin A deficiency.

A survey carried out by Somen et al (1978) with 2,500 pre-school children of fishermen, in a selected coastal village revealed that more than 33 per cent of these children suffered from grade III malnutrition. Only 2 per cent of children could be called normal (using Gomez criteria). Prevalence of vitamin A and riboflavin

deficiency was surprisingly less than their urban counterparts .
96 per cent of children suffered from intestinal helminthiasis, while
about 75 per cent of children had anaemia.

A comprehensive country wide survey carried out by the National
Institute of Nutrition (1978) on 18, 536 pre-school children in six
different regions in the country confirmed the prevalence of malnutri-
tion among the pre-school population both in rural and urban communities.
According to UNICEF (1978), two or three per cent of India's pre-
school children suffer from severe clinical protein energy malnutri-
tion. Merchant (1977) reports that malnutrition in most cases is a
result of poverty, lack of suitable food ignorance, superstition and
lack of guidance.

Of 1061 rural pre-school children around Udaipur, 50 per cent
had one or more signs of nutritional deficiency. There was severe
marasmus in 7.5 per cent and kwashiorkor in 2.1 per cent of tribal
children.

Another interesting feature is nearly 61 per cent of all
forms of protein calorie malnutrition (PCM) were observed in children
of birth orders four and above. Limitation of family size would
reduce the overall incidence of severe forms of PCM by nearly 60 per
cent (Sivaraman, 1975).

Prasad et al (1977), Sharma (1978) and Shaw (1974) have stated conjunctivitis, diarrhoea, upper respiratory infection, convulsions, hypoglycaemia, deep jaundice, sclerema, vomiting, intracranial injury, facial palsy, and pyoderma as causes of morbidity. Analysing the morbidity pattern in infancy and childhood, Lakshma (1978) and Banik (1977) attribute the reasons to pneumonia next to gastritis and enteritis.

F. Need for Nutrition Education on their Health and Nutritional Habits

Development of human resources depends on education and health. While education helps an individual to develop fully his intellectual potential, increase productivity and become an useful and responsible member of the society, health imparts the capacity to use the body effectively and is equally essential for the realisation of the personal, economic and social objectives. Hence, if the younger generation is to develop into responsive citizens with correct attitudes towards food and health, nutrition education is the primary tool (Devadas et al 1978).

The primary school offers numerous possibilities for conveying nutrition information to children. Nutrition can be incorporated in teaching subjects such as arithmetic, general science, history, geography, social studies, music and physical education. Devadas (1974)

opines that a large proportion of malnutrition could be avoided if people knew how to make better use of foods available to them. In order to impart such knowledge, nutrition education is an effective tool.

According to Gopaldas (1977), the aim of nutrition education to children is to achieve better nutrition for a community within the existing framework of the availability, cost and the distribution of food.

Institute of Child Health (1978) and Lamb et al (1978) opine the nutrition education is important in school because the child can learn how much foods cost; tell the family what the best energy foods are, select the food they need and take care of the younger siblings when they are sick. It is the first step towards improving the existing food habits. (Chandrasekar, 1977).

A study was undertaken by Devadas and Sarojini (1978) to evaluate the impact of a nutrition and health integrated curriculum on the selected primary school children in Coimbatore District. The results of the study revealed that the nutritional knowledge of the children showed significant increase over that of the control school children. The children followed improved health and sanitary practices after nutrition education.

Changes in health habits of the children, (200 children/block)
are given in Table IV.

TABLE IV
CHANGES IN HEALTH HABITS OF THE CHILDREN

Habits	A		B		C		D		Control	
	Before	After	Before	After	Before	After	Before	After	Before	After
Wash their hands before meals	42	66	36	78	40	90	45	98	25	50
Wash the Plates before meals	26	110	30	86	48	120	39	110	7	12
Eat without spilling	15	75	18	92	21	96	27	86	22	23
Waiting for others	22	190	25	172	32	44	34	192	40	75
(Consideration for others)										
Drinking water after washing the container (tumbler)	11	198	6	112	12	116	15	126	20	30

The school is in a unique position to relate nutrition to other learnings and make it a part of the fabric of wholesome living. The school tends to dignify and formalize the type of informal nutrition learning a child has acquired at home and place it in a setting that encourages food habit formation. Properly handled, the school nutrition programme tends to strengthen and reinforce good food habits developed in the home.

67. Preventive Health Care in the International Year of the Child

One of the principles of the declaration in the IYC is that the child is "entitled to grow and develop in health" (Idm, 1979). According to Mahler (1977), it is tragic that vaccination one of the most effective techniques in preventive medicine, is not yet available to all children in the world. Over the last 50 years, vaccination has been successful in many countries in controlling diphtheria, whooping cough, infantile paralysis and measles.

In the IYC, the action plan devised includes education and preparation of local community for immunisation against diseases like small pox, tetanus, polio, diphtheria, tuberculosis through individual and group approaches.

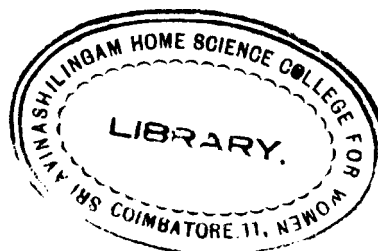
The other activities are,

- a) Large scale distribution of health aids
- b) Promotion of scientific practices relating to community health, hygiene and sanitation

- c) Education of expectant and nursing mothers on scientific practices relating to child rearing and child care.
- d) Organisation of camps for detection and treatment of diseases and "at risk" cases (ICGV, 1978).

IRC aims at concrete, practical action within each country, stimulating each government and the people in every community to begin or expand activities which will overcome adverse conditions affecting many children in developed and developing countries. The WHO has launched the expanded programme on immunisation. This programme aims to immunise all the children of the world against diseases by 1990 (Henderson, 1978). Arrangement to establish an efficient and permanent childhood immunisation service is a significant step for any nation's progress in that direction.

Today child welfare has received international attention, because the child of today is the citizen of tomorrow. Every nation is concerned about world peace and human betterment. Therefore it has become an urgent need to raise our younger generation, as free, well adjusted happy citizens of tomorrow. The welfare of the child is the welfare of the nation and therefore the welfare of the entire world.



III EXPERIMENTAL PROCEDURE

The procedure of this study on the "morbidity pattern in rural children and impact of nutrition education on their health and nutritional habits", included the following steps:

- A) Selection of the area
- B) Selection of the sample
- C) Selection of the method
- D) Conducting the study.

A) Selection of the Area

One of the nearby village Panninadai which is situated 18 kilometres away from Coimbatore city was selected. As 80 per cent of Indian population live in villages (Janik, 1977; Shastri, 1977; WHO, 1976; Parthasarathi, 1976 and Chandrasekharan, 1979), this study had its focus in a rural area. Other reasons that could be attributed are easy accessibility and co-operation rendered by the village people.

B. Selection of the Sample

In order to know the population of children in the village, the investigator conducted bench mark survey. 400 children were there in the village Panninadai and they were helped to undergo

CLINICAL ASSESSMENT OF CHILDREN



FIGURE I

clinical assessment (Figure 1). Only unhealthy/malnourished children of both sexes below 14 years of age from the selected village constituted the sample for the study. They were 520 totally. Apart from these children 290 school children were selected for giving nutrition education. The sample for the immunisation programme was the children who had not already vaccinated and immunised.

C. Selection of the Methods.

Wilson's criteria was slightly modified for clinical assessment. The modified schedule is in Appendix. A. The interview method, being an effective tool for collecting the data (Gupta, 1977), was adopted to elicit information regarding the health status, causes of illness, effect of illness, food habits of children and morbidity pattern of children. Lecture cum demonstration method was selected for nutrition education.

D. Conducting the Study.

Through the bench mark survey conducted to study the number of children in the village, the investigator established rapport with the housewives. In order to ^{do} clinical assessment for the children in the village, drums were beaten to let the people know that the free medical check up could be availed at such and such a place on a particular day. Repeated announcements were made motivating the families to take their

NUTRITION EDUCATION THROUGH



FIGURE II

SONGS



FIGURE III

KOLATTAM

FIGURE IV

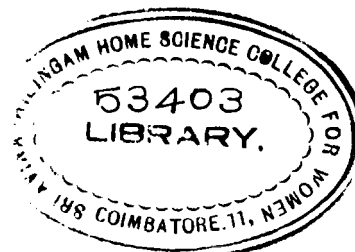
NUTRITION EDUCATION THROUGH EXERCISE



children for medical check up. The investigator arranged for clinical assessment and immunisation programmes in the village school with the help of doctors from the local Primary Health Centre. The investigator collected the family background of the unhealthy / malnourished children. The schedule used to collect the family background is in Appendix B.

Children numbering 290 from standard I to VIII from Panninadal school selected for nutrition education were divided into three groups to increase the effectiveness of nutrition education. The first group constituted from standard I to III. The second group included standard IV to VI and the third group had children from standard VII and VIII. Nutrition education was conducted daily for one and a half an hour on two days of the week for a period of two months. Totally 58 sessions were conducted for each group by the investigator. The children were educated in the selection, production, preparation, conservation and consumption of good quality foods. The content of nutrition education is given in Appendix C.

Children were also taught desirable hygienic practices in the form of folk songs, other songs (Figure.2), stories, kumi, demonstration, kolattas (Figure. 3), posters, sand tray model, stick puppets, exercise (Figure 4), proverbs and puppet shows. The nutritional knowledge and



beliefs and health practices of the children were evaluated before and after two months of nutrition education through a written test for the children. The investigator interviewed the standard I to III since they were too young to write and communicate. The children belonging to the other classes (IV to VIII) undertook a written test. The schedule used for assessment of nutrition education is given in Appendix.D.

In order to know how far the nutrition education of children influenced the parents in terms of nutritional knowledge, the investigator interviewed the parents of school children to whom education on nutrition was offered. Interview schedule used to elicit information regarding the impact of nutrition education imparted to children, on their parents is given in Appendix.E.

IV RESULTS AND DISCUSSION

The results of this study on "Morbidity pattern of rural children and impact of nutrition education on their health and nutritional habits" are presented and discussed under the following headings:

- A. Health status of children in the selected village
- B. Family background of the selected children
- C. Morbidity pattern of children
- D. Child Mortality
- E. Impact of nutrition education on children's health and nutritional habits.
- F. Impact of children's nutrition education on their parents.

A. Health Status of Children in the Selected Village

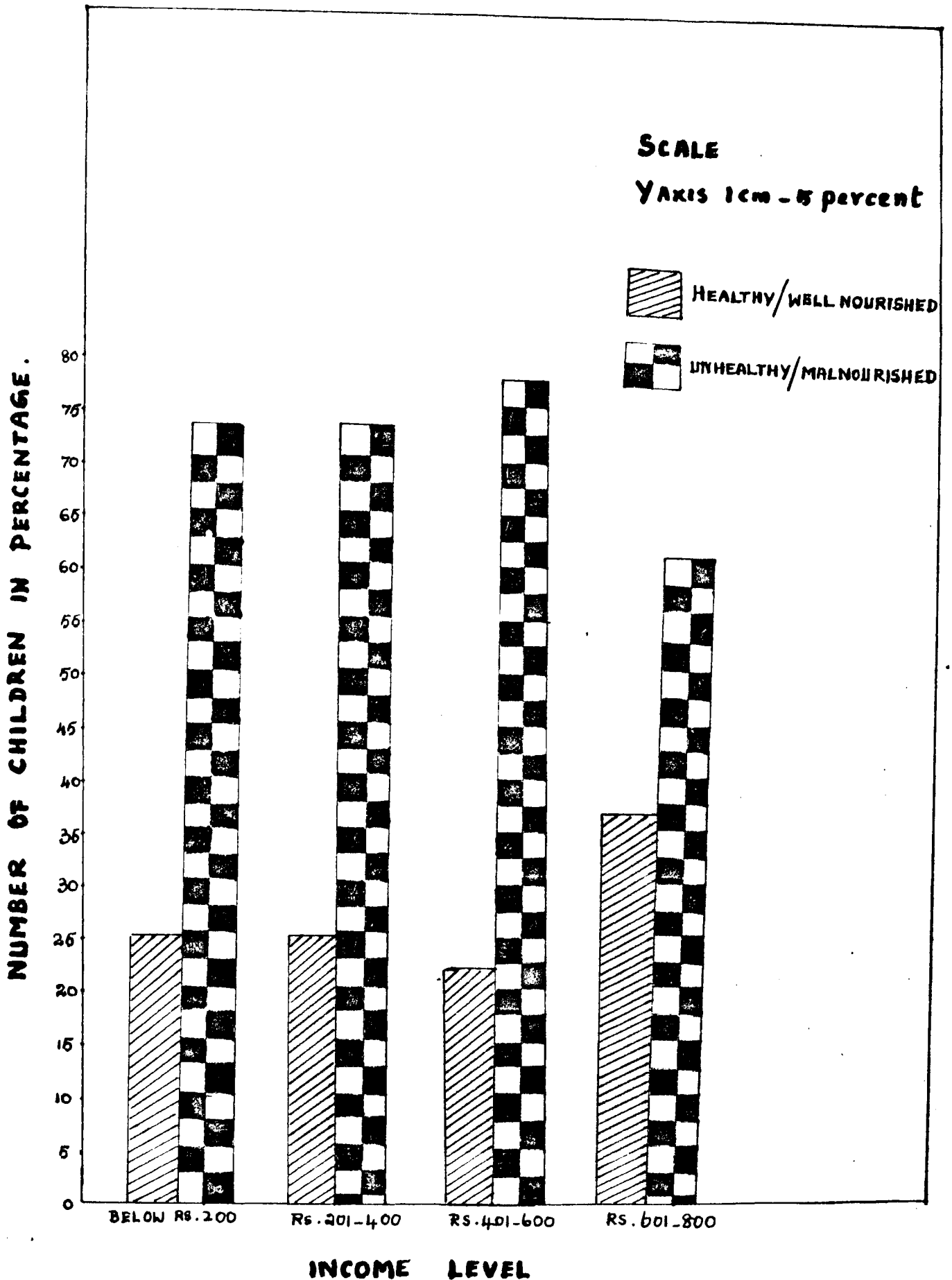
Table I shows health status of the children in the selected village.

TABLE I
HEALTH STATUS OF CHILDREN IN THE SELECTED VILLAGE

Health Status	Male N=245		Female N=187	
	Number	Percentage	Number	Percentage
Unhealthy/Mal-nourished	176	72	144	77
Healthy/Well-nourished	67	28	43	23
Total	245	100	187	100

FIGURE V

HEALTH STATUS OF CHILDREN IN THE VILLAGE.



From the Table it is obvious that more male children were malnourished than female children. This finding is supported by Jaya (1977) who had also found that the number of male children affected by diseases was greater than that of female children. Health status of children in families of different income is given in Figure V.

1- Immunization / Vaccination Given to Children

Table II shows the details of immunisation / vaccination given to the children in the selected village.

TABLE II

IMMUNIZATION / VACCINATION GIVEN TO CHILDREN

Immunized	Number of children immunized			
	Below Rs. 200 Rs. 1-54	Rs. 201-400 Rs. 1-50	Rs. 401-600 Rs. 1-50	Rs. 601-800 Rs. 1-16
Yes	32	127	51	16
No	22	25	40	-
Type of vaccines				
B.C.G				
0-6 months	12	12	20	16
6-12 months	-	50	19	-
Smallpox				
Below 1 year	6	25	25	-
1-2 Years	1	24	15	4
2-3 years	4	28	11	4
3-4 years	9	24	7	-
4-6 years	-	8	2	-
Total children				
Below -6 months	4	11	-	16
Polio				
Below-6 months	-	12	12	11

It is interesting to note that there is an association between income level and immunisation for children. Immunisation status of children improved with a rise in the income level of the parents. It is again the families of low income level who have not immunised their children.

The children who were not immunised were helped to have immunisation undertaken. DT was given to 107 children in the age group of 6-10 years and DPT was given to 45 children below 5 years. However, all the children in the village were given B.C.G. second time.

B. Family Background of the Selected Children.

The family background of the children selected for this study are discussed in terms of the following headings.

1. Type of Families.

Of the total (187) families in the village, 162 and 25 families were of nuclear and joint type respectively.

2. Occupational Status of the Heads of the Families.

Table III depicts the occupational status of the heads of the families selected.

TABLE III.
OCCUPATIONAL STATUS OF THE HEADS OF THE FAMILIES

Occupation of Heads of the family	Number mentioned (No.157)	Percentage
Labourers	62	39.1
Skilled workers	56	35.0
Small farmers	55	34.0
Professional	6	3.4
Unemployed	8	4.5

Majority of the heads of the families (62) are labourers followed by skilled workers(56) and small farmers (55). It is just surprising that among 157 families only 6 are professionalists.

8. Expenditure Pattern of the Families of Unhealthy Children at Different Socio-economic Levels.

The following Table IV brings forth the expenditure pattern of the families of unhealthy/malnourished children at different socio-economic levels. The statistical appraisals are in Appendix F.

TABLE IV
EXPENDITURE PATTERN OF THE FAMILIES OF UNHEALTHY/MALNOURISHED CHILDREN
AT DIFFERENT SOCIO-ECONOMIC LEVELS

Items of expenditure	Average Expenditure in Rupees				'F' test
	Below Rs. 200 N=33	Rs. 201-400 N=26	401-600 N=47	Rs. 601- 800 N=11	
Food	121	196	277	315	Between income levels 6,000 **
Clothing	27	54	55	179	
Recreation	5	15	25	30	
Medicine	4	12	26	29	Between expenditure items 22,055 **
Others	6	15	59	104	

** Significant at 1 per cent level.

It is seen from the table that the mean expenditures differ significantly with respect to families of different income levels. Mean expenditure on food, clothing, recreation, medicine also differed significantly.

4. Educational Status of the Sick Children.

The following Table V presents the educational level of the children.

TABLE V
EDUCATIONAL STATUS OF UNHEALTHY/MALNOURISHED

Qualification	Number of children		
	Male	Female	Total
Pre-school	26	25	51
Primary	48	42	90
Secondary	42	32	74
High school	32	19	51
Dropouts	8	10	18
Below 4 years not enrolled in pre-school	22	14	36
Total	178	142	320

The above table shows that the male children studying were more in number than the female children.

5. Feeding

Most of the selected children (99 per cent) had been breast fed in all the income groups. Artificial foods such as Amal and Horlicks were

given by 45 and 33 per cent of the families. The last in the list was cow's milk. Education to feed the children with cow's milk is obvious from this finding since cow's milk is the second best food for children next to breast milk.

6. Supplementary Foods Given to the Children

Supplementary foods given to the children are indicated in the following Table VI.

TABLE VI

SUPPLEMENTARY FOODS GIVEN TO THE CHILDREN

Type of food: given	Supplementary foods given to the children in percentage			
	Below Rs. 200	Rs. 201-400	Rs. 401-600	Rs. 601-800
Cow's milk	29.6	11.3	26.7	-
Eggs	11.1	24.0	22.2	45.2
Dood	20.5	16.7	17.6	25.5
Upousa	16.8	21.5	22.2	31.5
Rice	22.2	26.7	11.1	-

The supplementary foods given to children do not include vegetables, pulses, fruits and greens. This points out the need for nutrition education in the village.

7. Snacks Taken

Table VII indicates snacks taken by the children.

TABLE VII

SNACKS TAKEN

 Snacks taken by children in percentage

Details	Below Rs. 200 N=54	Rs. 201-400 N=150	Rs. 401-600 N=100	Rs. 601-800 N=18
Biscuit	27.4	27.8	16.7	45.8
Bun	57.3	30.6	26.2	18.9
Murukha	33.5	34.7	19.0	37.4
Sweets	-	-	9.5	-
Puffed rice	2.0	6.9	23.6	-
Source				
Home	6.0	16.7	34.5	63.6
Petshop	60.0	46.7	42.9	-
Store	8.0	26.6	14.3	38.4
Neighbours	24.0	10.0	8.5	-

The children in families of different income levels do not appear to take anything else except biscuit, bun and murukha. There is a great need to offer education to these young children and help them to consume

nutritious foods. The major source for getting these snacks tend to be petty shops in families of income level below Rs. 500.

C. Morbidity Pattern in Children:

Table VIII indicates the morbidity pattern in children at different age levels.

TABLE VIII

MOBILITY PATTERN IN CHILDREN

Children affected disease

Disease	Below 1 year N=23		1-5 years N=25		5-9 years N=21		9-14 years N=26		10-14 years N=28	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Riboflavin deficiency	3	13.0	14	56	29	70.7	39	51.2	23	21.7
Iron deficiency	3	13.0	14	56	25	61.0	35	43.0	26	23.6
Respiratory infection	10	43.4	17	68	29	69.5	36	28.8	57	34.9
Malnutrition	12	52.2	21	84	22	53.7	24	19.2	9	8.5
Vitamin A deficiency	1	4.3	7	28	20	48.8	26	20.8	18	17.0
Skin disease	3	21.7	12	48	15	35.6	12	9.6	15	16.0
Gastro Intestinal disorder	1	4.3	19	72	21	51.2	29	22.2	22	20.8
Dental disease	9	39	10	40	7	17.1	10	8	3	2.8
Ear disease	2	8.7	6	24	5	12.2	4	3.2	3	2.8
Head ache	-	-	2	8	-	-	1	0.8	-	-
Throat infection	-	-	1	4	-	-	2	1.6	-	-
Cardio vascular diseases	-	-	2	8	-	-	-	-	-	-
Allergic reaction	-	-	1	4	-	-	2	1.6	-	-
Nervous disorder	-	-	-	-	2	4.9	-	-	-	-
Vitamin B deficiency	-	-	3	12	1	2.4	-	-	-	-

The incidence of more severe forms of malnutrition was higher in the age group of 1 to 6 years. This finding is in line with findings of Ghosh (1977). Riboflavin deficiency, iron deficiency, respiratory infection, malnutrition, vitamin A deficiency, skin diseases and intestinal disorders are seen highly in the younger age group of 1 to 6 years than in the older group 6 to 14 years.

1. Morbidity Pattern of Children

Table II points out the morbidity pattern of children in families of different income.

TABLE II

MOBILITY PATTERN OF CHILDREN IN FAMILIES OF DIFFERENT INCOME GROUPS

Disease	Below No. 270		No. 271-400		No. 401-600		No. 601-800	
	Number	Percentage	Number	Per centage	Number	Percentage	Number	Percentage
Folatein deficiency	19	55.2	47	51.5	39	39	4	25
Iron deficiency	16	29.6	44	29.5	56	36	6	33
Respiratory infection	24	68.0	71	67.5	50	30	5	18.3
Malnutrition	14	25.9	46	30.7	30	20	4	25
Vitamin A deficiency	9	16.7	42	28	28	18	3	18.9
Skin disease	19	35.2	23	16.7	12	12	1	6.5
Central Intestinal disorder	26	48.2	60	40.0	5	5	-	-
Dental disease	6	11.1	24	16	6	6	2	12.6
Ear disease	-	-	12	9.7	6	6	2	12.5
Throat infection	-	-	3	2.0	7	-	-	-
Head ache	-	-	3	2.0	-	-	-	-
Cardio vascular	-	1.8	1	0.7	-	-	-	-
Allergic reaction	1	-	3	2.0	-	-	-	-
Nervous disorder	-	-	2	1.5	-	-	-	-
Vitamin B deficiency	1	-	4	2.7	-	-	-	-

Maximum number of children affected by diseases were from families with an income below Rs. 200 and between Rs. 401-600 than in the income group between Rs. 601-800. Mortidity and socio-economic status are inversely correlated. As Sahasra (1974) points out ⁱⁿ adequate income seems to be the main determinant of the incidence of malnutrition and other sickness. Respiratory infection, riboflavin deficiency, vitamin A deficiency, anaemia and skin disease are prominent in children of families with these income groups.

2. Mortidity Pattern of Children Sex Wise.

The following table X brings forth mortidity pattern of children ~~sexwise~~.

TABLE I

MORBIDITY PATTERN OF CHILDREN SEEN/RS

Disease	Male Jan 76		Female N = 144	
	Number affected	Percentage	Number affected	Percentage
Riboflavin deficiency	57	32.4	51	35.4
Iron deficiency	59	33.5	43	29.9
Respiratory infection	48	27.3	80	55.5
Malnutrition	39	22.2	49	34.0
Vitamin A deficiency	40	22.7	32	22.2
Skin disease	35	19.9	24	16.7
Gastro intestinal disorder	47	27.2	45	30.9
Dental caries	28	14.8	15	9.0
Ear disease	10	5.7	10	6.9
Head ache	1	0.6	2	1.4
Throat infection	2	1.1	1	0.7
Cardiovascular disease	1	0.6	1	0.7
Allergic reaction	1	0.6	2	1.4
Nervous disorder	-	-	2	1.4
Vitamin B deficiency	3	1.7	1	0.7

The Table above reveals that the incidence of deficiency diseases and other sicknesses was higher in females than in males. This may be because of the immediate medical care and attention given to male children in the rural community.

3. Special Foods Given/Avoided During Chicken pox.

Fever and Diarrhoea

Since chicken pox, fever and diarrhoea are the most repeated attacks on children in the village special foods given/avoided during chicken pox, fever, diarrhoea and jaundice were elicited and given in the following Table II.

TABLE XI

SPECIAL FOODS GIVEN/AVOIDED DURING CHINESE POL, FEVER AND
DIARRHOEA

Special foods given/avoided during illnesses to the children in percentages

Food Given	Children pol	Fever	Diarrhoea	Food avoided	Children pol	Fever	Diarrhoea
Buttermilk	20.2	20.5	25.0	Non Vegetarian	22.8	-	-
Milk	6.9	-	-	Sambar rice	27.5	29.8	37.6
Card rice	18.6	-	32.8	Kali	49.7	-	27.5
Pala Jaggery	22.5	-	-	Card rice	-	10.5	-
Tender coconut	21.5	-	-	Butter Milk	-	31.9	-
Bajra kali water	10.5	-	-	Ice	-	27.8	-
Dan with milk	-	9.3	-	Old rice	-	-	31.5
Coffee	-	25.5	-	Tried foods	-	-	8.4
Barli porridge	-	15.1	-				
Pusa rice	-	24.8	-				
Buttermilk with fennugreek	-	10.0	42.2				

Apparently the parents were aware of special foods to be given and avoided when the child is affected by children pol, fever and diarrhoea. Perhaps they need to be taught prevention of diseases in order to help their children to be healthy.

4. Availing Medical Facilities

Table XII depicts the details of families availing medical facilities from Primary Health Centre and Private doctor.

TABLE XII

AVAILING MEDICAL FACILITIES

Medical facilities availing	Number of families receiving medical facilities from P.H.C and Private doctor in Percentage			
	Below Rs. 200 Rs.55	Rs. 201-400 Rs.96	Rs. 401-600 Rs.67	Rs. 601 -800 Rs.1
Primary Health Centre	65.7	33.5	12	-
Private doctor	12.1	29.2	34.5	64.6
P.H.C and Private doctor	18.1	27.0	44.5	35.4
Not consulting doctor at all	6.1	1.5	8.5	-

Among the families with income below Rs. 200/- Only 64 per cent sought medical facilities from Primary Health Centre, since they found the centre unreachable and time consuming. Private doctors were approached more by those families which had an income between Rs. 601 and 800. As the income increased, the number of families availing medical facilities from Primary Health Centre decreased.

D. Child Mortality.

Inquiry on child mortality during the past three years in the families of the village selected brought forth the following details.

TABLE XIII

CHILD MORTALITY

Age in years	Below Rs. 200 No. 64		Rs. 201-400 No. 150		Rs. 401-600 No. 200		Rs. 601-800 No. 16		Total
	M	F	M	F	M	F	M	F	
Below 1 year	-	-	1	-	-	1	-	-	2
1-2 years	-	8	2	4	-	-	-	-	14
2-3 years	-	-	6	-	-	-	-	-	6
3-5 years	-	-	-	-	-	-	-	-	-
6-7 years	-	1	-	1	-	-	-	-	2
8-9 years	1	-	-	1	-	-	-	-	2
9-11 years	-	-	-	-	-	-	-	-	-
12-15 years	-	-	-	-	-	1	-	-	1
Total	1	9	9	6	-	2	-	-	27

While 15 children have been lost when they were between 1 to 2 years in the families having income below Rs. 400, those families who have Rs. 401 to 800 as their income had lost only one baby. Mortality among females are higher than in the males and the finding is in line with that of Ghosh (1976)

The causes for the death of children are chicken pox (5) cholera (5) fever (3) and diarrhoea (2). This perhaps may be due to the lack of protected water supply, contamination of food and milk, improper disposal of human, excreta and poor standards of personal hygiene.

1. Number of Abortions

Number of abortions in the families of selected indicated in the following Table.

TABLE XIV

NUMBER OF BIRTHS AND ABORTIONS

Income level	Total No. of families N=187	Number of abortions
Below Rs. 200	35	21
Between Rs. 201-400	66	15
Between Rs. 401-800	47	8
Between Rs. 801-900	11	-

The total number of abortions were more in the first three income levels. In the last group which is characterized by higher income there is no abortion at all.

E. Impact of Nutrition Education on Children's Health and Nutritional Habits

Impact of nutrition education on childrens' health and nutritional habits were assessed in terms of nutrition knowledge before and after education and the extent to which the messages were transmitted to others by the children.

1. Nutrition knowledge of Children before and after Nutrition Education:

Nutrition knowledge of children before and after nutrition education are indicated in Table I

TABLE I

NUTRITIVE KNOWLEDGE OF CHILDREN BEFORE AND AFTER NUTRITION EDUCATION

Particulars	Before		After	
	Number mentioned N=250	Percentage	Number mentioned N=250	Percentage
<u>Functions of food</u>				
Gives Strength	-	-	214	73.8
Keeps our body health	22	7.6	206	71.0
Prevents diseases	-	-	205	70.7
Replaces worn-out tissue from the body	-	-	179	61.7
<u>Dresses and vegetables</u>				
Types	265	91.3	290	100
Uses	6	1.7	140	48.3
Intrinsic value of food items	-	-	224	77.2
Understood food requirements for myself	-	-	228	-
Components of balanced diet	-	-	117	40.3
Symptoms of deficiency diseases	-	-	216	-
Prevention of diseases	-	-	265	19.0
<u>Cleanliness</u>				
Bathing daily	176	60.3	266	86.3
Washing their hands before and after meals	360	88.7	290	100
Cleaning the house	146	50.3	263	90.7
Arranging for dust bins in hous.	26	9	54	18.6

It is obvious from the above table that there is a tremendous change in health and nutritional aspect of children after nutrition education. Before nutrition education, 7.6 per cent 21.3 per cent, 1.7 per cent and 50 per cent of the children had knowledge about the functions of food, types and values of fruits and vegetables and concept of cleanliness respectively. But after nutrition education 75 to 100 per cent of the children had acquired knowledge in the above aspects. Regarding the nutritive value of food items, components of balanced diet and prevention of diseases none in the group was aware of the facts before nutrition education whereas after nutrition education, 75 per cent of the children revealed desirable knowledge about these aspects.

2. Table III below illustrates the scores obtained by the children in a written test given to them to evaluate nutrition education.

TABLE III
EVALUATION OF NUTRITION EDUCATION

Maximum marks -100	Number of children	Percentage
Marks obtained	N=200	
70 to 100	164	82.0
40 to 69	72	36.0
10 to 39	54	27.0

In the evaluation of Nutrition education, 56.5 per cent of the children obtained marks in the range of 70 to 100, 24.8 per cent of the children were in the range of 40 to 69. Only 18.7 percent of the children received marks below 30. This aspect of the study shows that the young children are highly capable of understanding concepts of nutrition. The school children seem to have a unique role to play in relating nutrition to other learnings and make it a part of the fabric of wholesome living.

3. Transmission of Nutrition Message.

The information on transmission of nutrition message to others by children who had nutrition education is presented in Table III.

TABLE III
TRANSMISSION OF NUTRITION MESSAGES,

Information conveyed to	Number mentioned in-230	Percentage
Mother	285	68.3
Father	203	60.7
Brother	215	74.1
Sister	174	60
Neighbours	165	55.2
<u>Information transmitted</u>		
Intrinsic Value of food items	224	77.2
Amount of food to be eaten during infancy, childhood and adolescence	216	74.4
Value of greens, vegetables and pulses in daily diet	150	65.5
Types of greens, vegetables and fruits	140	48.3
Components of balanced diet	117	40.3
Correct methods of cooking	68	23.4
Concept of cleanliness	204	70.3
Prevention of diseases	101	34.0
Uses of kitchen garden	42	14.5

Majority (98 per cent) of the children conveyed nutrition information to their mothers thus reflecting the key role played by the mothers in food preparation and management. Next in the list came fathers (91 per cent) followed by brothers (74 percent) and sisters (60 per cent). 85 per cent had conveyed to their neighbours information on nutritive value of food items, value of greens, vegetables and pulses, components of balanced diet, correct methods of cooking, prevention of disease, uses of kitchen garden and concept of cleanliness. This study reveals that children carry home nutrition education and help parents to gain knowledge in nutrition. The same finding has been reported by Devedas (1978) through a study on the introduction of nutrition education in the curriculum of primary schools.

4. Suggestions Given by the Children

The suggestions given by the children regarding nutrition education are depicted in Table IV.

TABLE IV

SUGGESTIONS GIVEN BY THE CHILDREN

Suggestions	Number mentioned	Percentage
Nutrition education to everyone in the village	62	21.4
Nutrition education should be given by the school teachers through more songs, stories and dances.	35	12.0
Education on low cost food recipes to all the villagers	32	17.9

The suggestions given by the children are meaningful and interesting. This finding has put forth a clue that nutrition education to adults through children would really have a positive impact. Perhaps this is one reason why Child to Child Programme is being laid more emphasis during the International Year of the Child. Education through songs stories and dances seem to have more appeal for the children. There is a need to orient all the school teachers in nutrition education in order to help them to incorporate nutrition education in the curriculum.

F. Impact of Childrens' Nutrition Education on Their Parents

The impact of nutrition education imparted to children on their parents was assessed in terms of information conveyed regarding nutrition, benefits gained by the children's parents perceive and implementation of knowledge gained by the parents in action.

1. Information Acquired From the Children by the Parents

Table I indicates the information acquired from the children by the parents.

TABLE I

INFORMATION ACQUIRED FROM THE CHILDREN BY THE PARENTS

Information	Number mentioned	Per centage
Nutritive value of food items	234	81
Need to cook greens and vegetables often	166	58
Cutting the vegetables in big size	144	50
Components of balanced diet	145	50

Information	Number mentioned	Percentage
Prevention of diseases	192	66
Concept of cleanliness	225	78
Uses of kitchen garden	62	21

It is interesting to know ^{what} 81 per cent of parents have acquired information on nutritive value of food items from their children. This basic information given to the parents by the children might influence their food pattern in the long run. There is no doubt, follow up in nutrition education programme is highly imperative to make this gain permanent. The information on the components of balanced diet, need to eat the vegetables in big size, cook them often have been received by about 50 per cent of the parents. Health education in terms of cleanliness and prevention of diseases had been given to 66 and 78 per cent respectively. Uses of kitchen garden as an item of learning from the children were pointed only by 21 per cent of the parents. Perhaps the rest were aware of the same already.

2. Benefits Gained by the Children as Parents Perceive

Table II represents the benefits gained by the children as parents perceive.

TABLE II

BENEFITS GAINED BY THE CHILDREN AS PARENTS PERCEIVE

Benefits gained	Number mentioned	Percentage
Children take bath regularly	256	88
Learnt songs and stories	206	71
Acquired concept of nutrition	187	65
Children eat meals regularly	119	41
Eat more vegetables and greens than before	48	17
Children avoid buying sweets from petty shops	18	6

Eighty eight per cent of parents perceive that their children take bath regularly after receiving nutrition and health education. Learning of songs and stories was stated by 71 per cent, while acquisition of concepts of nutrition was mentioned by 65 per cent of the parents. 41 per cent of the parents reported that their children eat meals regularly after nutrition education. The number mentioning the fact that their children eat more vegetables and greens than before is very small (17 per cent) but quite encouraging. Nutrition education given to the children seems to be valuable when its ultimate effects are considered.

3. Implementation of Gained Knowledge in Action by the Parents.

The following Table depicts the implementation of gained knowledge in action by the parents.

TABLE IXI

IMPLEMENTATION OF GAINED KNOWLEDGE IN ACTION BY THE PARENTS

Action taken	Number mentioned	Percentage
Cooking greens frequently	197	68
Cutting vegetables big in size	156	54
Cook the food that child likes to eat	146	50
Maintain cleanliness better than before	24	8
Follow absorption method	112	38

After receiving information on nutrition through their children, 68 per cent of the parents cooked greens frequently and 54 of them cut the vegetables in bigger size.

Maintenance of the house clean and better than before is an appreciable effect of the nutrition and health education given to children. Much more concrete efforts need to be taken to educate parents on the right lines.

When the parents, 187 in number were asked what help they require to help their children to be healthy, 122 desired drainage facilities as the foremost need. Next in the list were housing, toilet facilities and dust bins.

V SUMMARY AND CONCLUSION

This study was undertaken to find out the morbidity pattern of rural children and impact of nutrition education on their health and nutritional habits. The first part comprised the study of health status of children in the village, family background, morbidity and mortality pattern of children in families of different income levels. The second part comprised the study of impact of nutrition education on children's health and nutritional habits and impact of children's nutrition education on their parents.

The findings of the study are summarised below.

1. Against 187 malnourished / unhealthy girls there were 243 boys.
2. Of the total 187 families in the village, 162 and 25 were of nuclear and joint type respectively.
3. The total income of selected children in the village families was below Rs. 600 / month.
4. Higher number (178) of boys attended the school than the girls (142).
5. The mean expenditure differed significantly in relation to income.
6. The higher the income level, the better the number of children who had been immunised.
7. The supplementary foods given did not have nutritious foods excepting biscuit, bun and murukku bought mostly from the petty shops.
8. Riboflavin deficiency, iron deficiency, respiratory infection, malnutrition, vitamin A deficiency, skin diseases and intestinal disorders were seen more in children of the younger age group 1 to 5 years than in the older groups.

9. The number of children affected by diseases decreased proportionately as the total family income increased.
10. The incidence of deficiency diseases and other sicknesses were higher in females than in males.
11. As the income increased, the number of families availing medical facilities from Primary Health Centre decreased.
12. Female mortality was higher ^{and} the causes were mainly chicken pox (5), cholera (5), fever (5) and diarrhoea (2).
13. The number of abortions were more in the lowest income group (below Rs. 200). There was no instance of abortion in income group Rs. 601-800.
14. Health and nutritional habits of children changed favourably after nutrition education.
15. Children have suggested strongly that nutrition education should be given to everyone in the village, by the school teachers through songs, stories and dances.
16. Most of the parents have acquired information on health and nutritional aspects from their children. The parents perceived that their children are benefitted through nutrition education.

BASED ON THESE FINDINGS THE FOLLOWING RECOMMENDATIONS ARE MADE

1. Village level workers should be entrusted the responsibility of nutrition and health education in an effective manner.
2. Proper drainage facilities should be provided in the village.
3. Vegetable seeds should be distributed in large measure to the village people to enable them to produce and consume nutritious foods.
4. More Primary Health Centres should be established within approachable limits.
5. The school syllabus should be reformed including lessons on nutrition and health aspects.
6. Voluntary agencies should come forward to propagate low cost

nutritious foods for children.

7. Village teachers should be helped to promote the need for immunisation in children.

8. Refresher training and regresther training in nutrition to all the school teachers and village welfare officers.

Human welfare depends for their realization on the children's wellbeing. Therefore children should be provided healthy food, good environmental and medical facilities and above all fostering care and affection and helped to enjoy their rights and privileges.

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APPENDIX A

GENERAL INFORMATION DATA SHEET

1. Name of the Interviewer:

Date:

2. Name of the Interviewee:

Family No:

3. Type of family: Joint / Nuclear.

4. Family Background:

S.No.	Name of the family Members	Relation-ship to the Head of the family	Age in Years	Sex	Marital Status	Educational Qualifications	Occupation	Monthly Income Rs./mth.
						Studied up to	Studying in	ill-iterate

4. Other sources of Income:

- a) Business earnings:
- b) Property Land: building:
- c) Income from investments:
- d. Other earnings.

5. Has the child been immunized? Yes No
 If yes,

S.No.	Type of Vaccines	Age in years
1.	B.C.G .	
2.	Small pox	
3.	Triple antigen	
4.	Polio	
5.	T.A.B.	
6.	Cholera.	

CLINICAL ASSESSMENT**INSPECTION****I. Head**

- a. Head ache
- b. Trauma

II. Eyes

- a. Strabismus
- b. Pain
- c. Inflammation
- d. Diplopia
- e. Other disturbances

III. Ears

- a. pain
- b. discharge
- c. tinnitus

IV. Nose

- a. discharge
- b. epistaxis
- c. obstruction
- d. disturbances in olfactory sense

V. Teeth

- a. Extractions
- b. disorders in dentition
- c. abscesses
- d. general condition

VI. Mouth

- a. mouth breathing
- b. sore mouth
- c. sore tongue
- d. caries bleeding gums

VII. Throat

- a. pain
- b. infections
- c. tonsillitis
- d. difficulty in swallowing
- e. hoarseness

VIII. Respiratory

- a. cold
- b. cough
- c. sputum
- d. hemoptysis
- e. stridor
- f. bronchitis
- g. asthma

IX. Lower Intestinal

- a. food idiosyncrasies
- b. vomiting
- c. abdominal discomfort or pain
- d. constipation
- e. diarrhoea
- f. encopresis
- g. Jaundice
- h. pain in the abdomen.

X. Cardio-Vascular

- a. dyspnea
- b. cyanosis
- c. edema
- d. precordial pain
- e. palpitation
- f. syncope

XI. Genito Urinary:

- a. Difficulty in micturition
- b. Stranguria
- c. passing yellow coloured urine
- d. dysuria

XII. Musculoskeletal

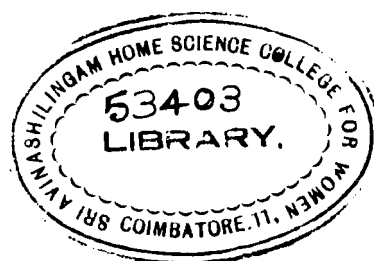
- a. weakness
- b. Joint or muscular pain or swelling
- c. deformities
- d. fractures.

XIII. Nervous**Sleep disturbances**

- b. tics.
- c. tremors
- d. vertigo tiddings
- e. Convulsions
- f. ataxia
- g. paralysis
- h. projectile vomiting
- i. distractibility

XIV. Skin

- a. Eruptions
- b. Congenital anomalies
- c. itching
- d. pigmentation
- e. erythema
- f. bruising
- g. petechial.



XV. Allergic reactions.

- a. Hives
- b. asthma
- c. hay fever
- d. urticaria
- e. hypersensitivity reactions to inhalants foods

XVI. Accidents

- a. Burns
- b. Fractures

XVII. Helminthiasis.

- a. Irregular bowel movement
- b. passing blood and mucus during bowel movement
- c. pain during bowel movement
- d. passing worms through rectum or vomiting worms

XVIII. DEFECIENCY**Vit. A**

- a. cessation of growth
- b. loss of weight and apathy
- c. Night blindness
- d. Xerophthalmia
- e. Keratomalacia
- f. Bitot's spot
- g. Dryness of cornea
- h. Ulceration

Vibrio (Vibrio)

- a. Vomiting
- b. Waxy skin
- c. Drowsiness
- d. apathy
- e. Tachycardia
- f. enlargement of the liver
- g. loss of consciousness
- i. calf muscle tenderness
- j. edema
- k. cardiac enlargement
- l. loss of ankle jerks
- m. loss of knee jerks
- n. motor weakness.

Biboflavix

- a. Cheilosis
- b. glossitis
- c. corneal vascularization.
- d. keratitis
- e. atrophic lingual papillae
- f. lesions of the skin
- g. dysphagia
- h. Angular stomatitis

Vit. A

- a. Xerophthalmia
- b. Scurvy Scurvy
- c. Follicular hyperkeratosis^{Por}

- d. irritability
- e. loss of appetite
- f. spongy gums
- g. bleeding gums
- h. petechial

Iron

- a. Anemia
- b. pale conjunctiva
- c. atrophic lingual papillae

Malnutrition

- a. loss of weight
- b. Fatigue
- c. lassitude
- d. restlessness
- e. nervousness
- f. Anorexia,
- g. constipation
- h. anasarca

APPENDIX B

INTERVIEW SCHEDULE TO ELICIT INFORMATION RELATED TO
HEALTH STATUS OF CHILDREN AND CHILDHOOD MORBIDITY.

Name of the child :

Date :

Age of the child :

Family No.

Address:

I. Expenditure patterns:

S. No.	Expenditure	Amount Spent Rs.
1.	Food	..
2.	Clothing	..
3.	Shelter	..
4.	Household	..
5.	Recreation	..
6.	Others	..

II. Did/Do you breast feed? Yes No

If yes,

When was breast feeding started for the child

Reasons

V. Introduction of supplementary foods:

Age at which supplementary foods were given	Supplementary foods given	Frequency of feeding	Amount of food given per feed	Age at which supplementary foods stopped
---	------------------------------	-------------------------	-------------------------------------	--

VII. Does your child take snacks in between meals?

If yes, give the following details:

Snacks taken	Frequency	Source	Reasons
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VIII. Special foods given/avoided:

S.No.	Stage	Special foods given	Reasons	Special foods avoided	Reasons
1.	Infancy				
2.	Weaning				
3.	Pre-School Years				

X. Diet during illness of the child:

Illness	Foods given	Reasons	Foods avoided	Reasons

XIII. Indicate the number of abortions.

XIV. Did you have any child mortality in your family during the past 5 years?

Yes	No	Age	Sex	Causes

XIV. Do you avail medical facilities from the primary health centre?

Yes No

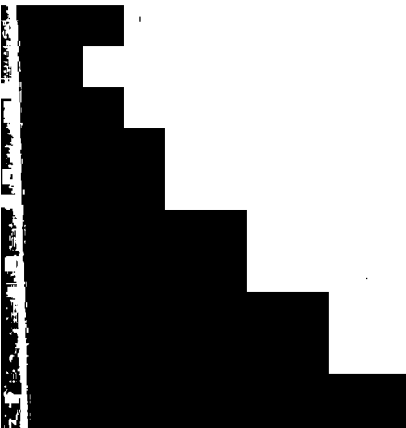
If no, reasons:

XVI. Do you seek private Doctor's assistance?

Yes No

If no, reasons:

XVII. What sanitary and other facilities would you like to have to overcome diseases in your children?



உலர்ந்த உற்பத்தி	பயிற்சல உலர்ந்த உற்பத்தி	உலர்ந்த தரணத்தி உபகரண
17. பசு	பசு உற்பத்தி உலர்ந்த உற்பத்தி உலர்ந்த உற்பத்தி	பசு உற்பத்தி, உலர்ந்த உற்பத்தி, உலர்ந்த உற்பத்தி
18. பசு	பசு உற்பத்தி 60-80 உலர்ந்த உற்பத்தி	உலர்ந்த உற்பத்தி, உலர்ந்த உற்பத்தி, உலர்ந்த உற்பத்தி
19. உலர்ந்த	பசு உற்பத்தி 16-20 உலர்ந்த உற்பத்தி	உலர்ந்த, உலர்ந்த, உலர்ந்த, உலர்ந்த

உலர்ந்த உற்பத்தி உலர்ந்த உற்பத்தி

	1-3 உலர்ந்த	4-6 உலர்ந்த	7-9 உலர்ந்த	10-12 உலர்ந்த
உலர்ந்த	(4) 150	(4) 200	(4) 250	(4) 320
உலர்ந்த	50	60	70	70
உலர்ந்த உலர்ந்த	50	75	75	100
உலர்ந்த, உலர்ந்த	30	50	50	75
உலர்ந்த	50	50	150	50
உலர்ந்த	300	250	250	250
உலர்ந்த	20	25	30	35
உலர்ந்த	30	40	50	50

പ്രതിവർഷത്തിൽ വേണ്ടുന്ന പച്ചക്കറി വിവിധ

വിവിധ	1-3 വർഷങ്ങൾ	4-6 വർഷങ്ങൾ	7-9 വർഷങ്ങൾ	10-12 വർഷങ്ങൾ
കറുത്ത (മ.മ)	1200	1500	1800	2100
കുറുപ്പ് (മ)	18	22	33	41
കൊഴുപ്പ് (മ)	0.4-0.5	0.4-0.5	0.4-0.5	0.4-0.5
കൊഴുപ്പ് (മ.മ)	15-20	15-20	15-20	15-20
കറുപ്പ് (മ.മ)	1000	1200	1600	2400
കറുപ്പ് (മ.മ)	0.6	0.8	0.9	1.0
കറുപ്പ് (മ.മ)	0.7	0.8	1.0	1.2
കറുപ്പ് (മ.മ)	30-50	30-50	30-50	30-50

APPENDIX D

INTERVIEW SCHEDULE ON ASSESSMENT OF NUTRITION EDUCATION

1. Mention the functions of foods?
2. What is a balanced diet?
3. Mention the functions of the following in the body
 - Protein -
 - Fat -
 - Carbohydrate -

4. Fill in the Blanks (10 Marks)

- a. Milk is rich in _____
- b. Brushing teeth everyday prevents _____
- c. Minerals are abundant in _____
- d. Cereals are main source of _____
- e. _____ is the best method of cooking rice.

State whether the following statements are correct or wrong

- f. Lack of vitamin - B leads to beri beri
- g. Cleanliness is next to Godliness
- h. Greens are rich in Iron
- i. Vitamin C prevents scurvy
- j. Immunisation helps in preventing disease.

5. Cleanliness

- a. Do you brush your teeth daily?
- b. How often do you take bath ?

Daily / twice a day / alternative days / once in a week.

- c. Do you wash your hands before and after meals?
- d. Do you keep your home and surroundings clean?
- e. Do you possess dust bin in your house?

Yes No

6. To whom did you convey nutrition messages learnt?

Mother

Father

Brother

Sister

Neighbours

7. What other aspects do you think should be included in Nutrition education?

1.

2.

3.

4.

APPENDIX B

INTERVIEW SCHEDULE TO ELICIT INFORMATION REGARDING THE IMPACT OF
NUTRITION EDUCATION IMPARTED TO CHILDREN, ON THEIR PARENTS.

1. Do you find any change in your child during the last two months?

Yes No

If yes, in what aspects.

2. Did your child convey any information regarding nutrition?

Yes No

3. Was the information given by your child clear to you.

Yes No

If yes,

Do you implement the suggestions given by your child

Suggestion given by the child	Implemented or not	Reactions of the child.
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4. What do you think are the benefits that your child has achieved
from nutrition education?

APPENDIX F

STATISTICAL ANALYSIS

EXPENDITURE PATTERNS IN FAMILIES OF SELECTED CHILDREN

	Below Rs. 200	Rs. 201-400	Rs. 401-600	Rs. 601-800
	No. 33	No. 66	No. 87	No. 11
Food	121	196	277	315
Clothing	27	54	55	179
Recreation	5	13	23	30
Medicine	4	12	26	29
Others	6	13	49	104
	168	286	430	657

A. V. TABLE

Source	S.S	D.S	M.S	F Ratio
Income	27137.2	5	9045.7	6.899
Expenditure	122567.8	4	37891.7	
Error	16273.8	12	1357.8	22.655
Total	165708.8	19		