

Maternal Care and Infant Growth

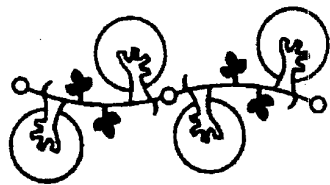
Childcare Practices of Mothers and the Growth and Development of Infants in Urban Slums

Rama Narayanan

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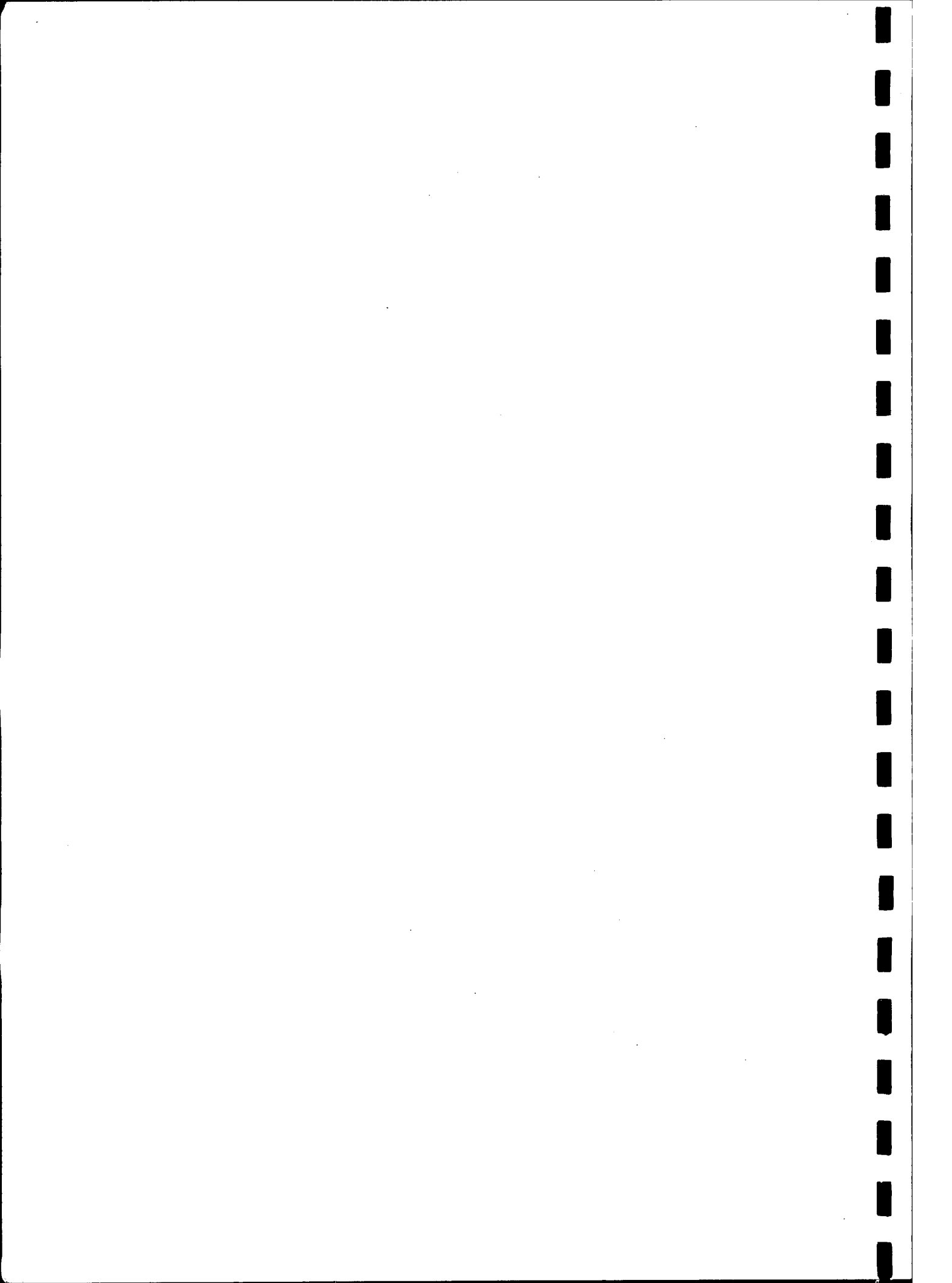
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Preface

The paucity of information on how children from disadvantaged households grow and develop, especially in the vital period of infancy was one of the major reasons for this research study to be undertaken. Little is known about the complex links between child care and the patterns of growth and development. It is important to explore and study these patterns and linkages in depth in order to seek ways to stimulate and promote growth and development. From the outset, it was felt that the findings of this study would be of interest to a wide audience including policy makers, academicians, professionals, NGOs and the common public and should be communicated through the development of appropriate communication materials to the primary care givers as well. More such studies are needed to throw further light on the issues raised in this study, and to provide a basis for planning appropriate intervention strategies.

I thank Ms. Rama Narayanan for undertaking the responsibility for conducting the research and the Bernard van Leer Foundation for the financial support.

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Executive Summary

Infancy is one of the most important and vulnerable periods in the development of an individual. Any setback during the first two years of life can cause irreversible damage to the health and productivity of an individual. The young child needs both good nutrition and a stimulating environment for optimal growth and development. Of late there is increasing realisation that the issue of malnutrition and opportunities for a stimulating environment for a young child have to be addressed together. The three important causes of malnutrition in young children are inadequate food, inadequate health and inadequate care. Of the three, care is the least investigated.

While the dietary intake and health status are the immediate determinants of good nutrition, care giving ultimately determines the quantity and quality of food ingested and health care available to infants which in turn determines growth and development. Though there are several studies pertaining to the growth of infants, feeding pattern among various sections of the population and the psycho-social stimulation available to infants, very few have considered the relationship between feeding and growth to be an interactive process of care. There is a need to look into the existing behaviour patterns and understand the strengths and weaknesses within the social fabric that may foster or threaten good caring practices. Thus the present study was formulated with the following objectives:

- To study the care giving behaviour of mothers and families of infants (birth to 12 months) in Chennai slums with specific reference to feeding, health care practices and the role of family members in interacting with the infant.
- To assess the physical growth and the attainment of developmental milestones of infants.
- To understand the relationship between care behaviour and the growth and development of infants.

Three hundred and sixty two mother-infant dyads from thirteen slums within the Corporation limits of Chennai city were chosen for the study. Mothers were interviewed and their responses were recorded with the help of a field-tested questionnaire. Growth of the infants was measured using anthropometric measurements such as height and weight and developmental levels were ascertained by questioning mothers.

The results revealed that according to the height-for-age index the linear growth of the infants was normal for both the sexes. Stunting was not prevalent indicating that there was no long-term history of malnutrition. However wasting as measured by the weight-for-height index and underweight as measured by the weight-for-age index were of the order of 33% and 28% respectively in the entire sample. This was suggestive of a

relatively short-term history of malnutrition. The mean weights for each month of age revealed the prevalence of malnutrition from the age of seven months in male infants while in the female infants it was prevalent in the age group of eleven and twelve months. On the whole girls showed a better nutritional profile when compared to boys.

Though the prevalence of undernutrition was of the order of 28% in the entire sample the distribution of malnourished infants showed a pattern when analysed monthwise. While 96% of the infants were normal at one month of age at twelve months only one third had normal body weight. This points to the finding that majority of the infants seem to start off normally but become progressively malnourished with each increasing month of age. The drop in the percentage of normal infants was clearly visible at eight and ten months of age, while it was very steep at eleven and twelve months of age with a nearly 20% drop in the percentage of normal infants between the tenth and eleventh month.

The prevalence of low birth weight was of the order of 19%. According to the pattern of growth infants could be classified into four groups.

- Those born with low birth weight but who grew up to have normal physical growth.
- Those born with low birth weight and who continued to remain undernourished even later.
- Those born with adequate body weight but who became undernourished later.
- Those born with adequate body weight and who continued to be healthy even later.

For the first group there has been a continuum of assault from the intrauterine life and also in the outside environment leading to malnutrition in the whole life period. With regard to the second group though they had started life with a disadvantage they had received adequate care enabling them to have "catch-up" growth and reach normalcy. Amongst those who were born with adequate body weight, some had slipped into malnutrition pointing to the lack of adequate care while some had continued to grow up normal, implying adequate care. The presence of such positive and negative deviants within the same community can be related to the varying coping strategies and caring behaviour of the households in which the infants are born.

Three types of feeding behaviour could be identified. Those who practised exclusive breastfeeding, those who gave only supplementary foods but no breastmilk and those who gave breastmilk along with supplementary foods. By and large the feeding behaviour of the mothers conformed to what is recommended by paediatricians. In the entire sample, 92% of the mothers were breastfeeding either exclusively or along with other foods. In the 1-4 month old age group, 80% of the mothers were exclusively breastfeeding, 18% were giving both breastmilk and supplementary food while 2% had completely stopped breastfeeding and were only giving supplements. Though a majority of mothers in this group were complying with the recommended behaviour of exclusive breastfeeding within the first four months, there was a steady fall in the percentage of

exclusively breastfeeding mothers when analysed for each month of age. While 89% of the mothers of one month old infants breastfed exclusively, only 53% were found to be exclusively breastfeeding at four months of age.

In the 5-12 month age group 81% mothers were complying with the recommended behaviour of giving both breastmilk and supplementary foods to their infants. When analysed for each month of age it was found, that 80% of mothers had introduced supplementary feeding alongwith breastmilk at the fifth month and this figure increased to 83% at six months and remained fairly steady upto to the twelfth month. Thirtysix percent of mothers of 1-4 month old infants were giving small quantities of water for drinking. From the eighth month onwards all the mothers were found to be giving water to their infants. Ninetyfive percent in the former and 73% in the latter groups were found to be giving boiled water. In addition 86% mothers of 1-4 month old infants were found to be giving gripe water which is contraindicated. In the 5-12 month old group 74% were found to be giving gripe water. Mothers believed that gripe water improved digestion.

The choice of feeding devices by mothers ranged from bottle to tumblers, spoons and traditional devices. About 30% of mothers used a bottle for feeding either water or liquid foods to their infants. A majority of mothers used only tumblers or spoons. Though bottlefeeding is reported to be a major cause of malnutrition in infancy, results of this study revealed that the distribution of malnourished infants was near equal at 30% in both the bottlefed group and the rest, indicating that probably lack of hygienic practices while handling feeding devices was more responsible for malnutrition than the device itself. Foods given to infants ranged from biscuits (58%) rice and dhal (53%) milk (47%) and baby food (35%) to coffee and tea (27%). Ragi, the traditional and most nutritive of supplements, was given by only 12% of the mothers. The available information suggests that the quantity and quality of supplementary foods and the care giver infant interaction while feeding is probably a leading determinant of malnutrition in the study infants.

With regard to health care practices 97% of the deliveries were institutional. About 95% of the infants were given BCG and oral polio at birth, another 87% DPT and polio while 66%, had been immunized for measles. Forty one percent of mothers went to private clinics and 29% to Government hospitals, while 28% utilized both services when the infants became ill. The prevalence of cold and diarrhoea at the time of survey were 34% and 6% respectively. With regard to management of diarrhoea, it was found that while 75% of the mothers were aware of oral rehydration salt (ORS), only 19% reported using it when their infants had diarrhoea. The concern of the mothers was more in arresting diarrhoea through medical intervention rather than with ORS. Mothers reported continuing with breastfeeding with no withdrawal of other food during diarrhoeal attacks in their infants. No relationship was noticed between current nutritional status and the morbidity history of infants, except in the 5-12 months group where 82% of malnourished infants had had a previous history of diarrhoea as compared to 63% of normal infants.

Only 26(7%) of the mothers were found to be economically active at the time of the study. In the "non-working" category only 16% had been economically active prior to the arrival of the infant, indicating that lack of childcare support was not the reason for women not being economically active in the given sample. Women reported that income earning work was sought only in situations when the family faced hunger, or when there was no support from their spouses. A majority of the "working" mothers relied on their natal or marital families for child care support while at work. The prevalence of malnourished infants were 33% and 27% respectively amongst infants of "working" and "non-working" mothers. However no conclusions can be drawn about the impact of economic activity of mothers on the nutritional status of infants since the number of working mothers in the sample is too small for any analysis.

With regard to the other child care activity of putting the infant to sleep, 41% of mothers of 1-4 month old infants and 30% of those with 5-12 month old infants said that they used both methods such as rocking the infant in the lap or using the hammock. Eighty two percent of mothers reported that they never sang lullabies and considered the music from the radio or the TV to be sufficient for putting the child to sleep. With regard to the role of other family members in childcare 39% reported that other family members responded when the infant cried, 33% reported that infants were being taken out by others. The husband's support seemed to be at its maximum (59%) in the activity of taking the child to the doctor. Seventy two percent of mothers said that toileting was their exclusive activity.

No conclusive picture with regard to the developmental level of malnourished and apparently normal infants could be drawn since direct field observations were not made. The results of this study have pointed to the near universal prevalence of breastfeeding, appropriate timing of initiation of supplementary feeding by a majority of mothers, the choice of other feeding devices over the bottle by most mothers and appropriate health seeking practices at times of illnesses. Yet results also reveal that though most of the infants were normal at one month of age, only one third in the twelfth month were normal, indicating that other causes such as quantity and quality of supplementary foods and adult care giver interaction while feeding could also play a role in determining the nutritional status.

During the last two decades the campaigns for preventing malnutrition have been concerned with in the education of mothers on the importance of breastmilk, in the active promotion of breastfeeding and in discouraging the use of the bottle as a feeding device.

The present study has pointed to the need for exploring the actual practices of mothers or care givers and the formulation of strategies based on those observations. This has implications for future research, campaigns and policy matters in tackling the issue of malnutrition in the most vulnerable period in life.

I. Introduction

Infancy is one of the most important and vulnerable periods in the development of an individual. Recognition of this has led to rigorous healthcare effort by Government and Non Governmental Organizations to reduce the infant mortality rate {IMR}. The IMR is very often used as a tool for monitoring the well being of a society. While ensuring survival is undoubtedly the primary task to be addressed it has also to be accompanied by promoting a good quality of life for the growing infant in order to lay a sound foundation for developing healthy and productive citizens. Good health, prevention of malnutrition and adequate opportunities for play and development are the key factors influencing optimal growth and development of infants.

Of late there is increasing realisation that the issue of malnutrition and opportunities for a stimulating environment for a young child have to be addressed together. Interventions that combine both strategies for physical and psychological development have been found to have the maximum impact on growth and development. A study was conducted in Bogota Columbia (WHO, 1999) to examine the independent and combined effects of food supplementation and psychosocial stimulation on physical growth and psychosocial development. One hundred and eighty seven children at birth were assigned to four groups which were given either only supplementation, only stimulation, both supplementation and stimulation or no intervention at all. When they were studied at the age of three it was found that supplementation had an effect on physical growth, but the combination of supplementation and stimulation had a much greater effect on physical growth than supplementation alone.

In the case of low birth weight babies Nair (1999) found that the physical growth, improved significantly when stimulation was provided. While studies such as these point to the importance of paying attention to the totality of care given to young children, very few researchers, have attempted to study the holistic care available to children within the household and its relationship to growth and development.

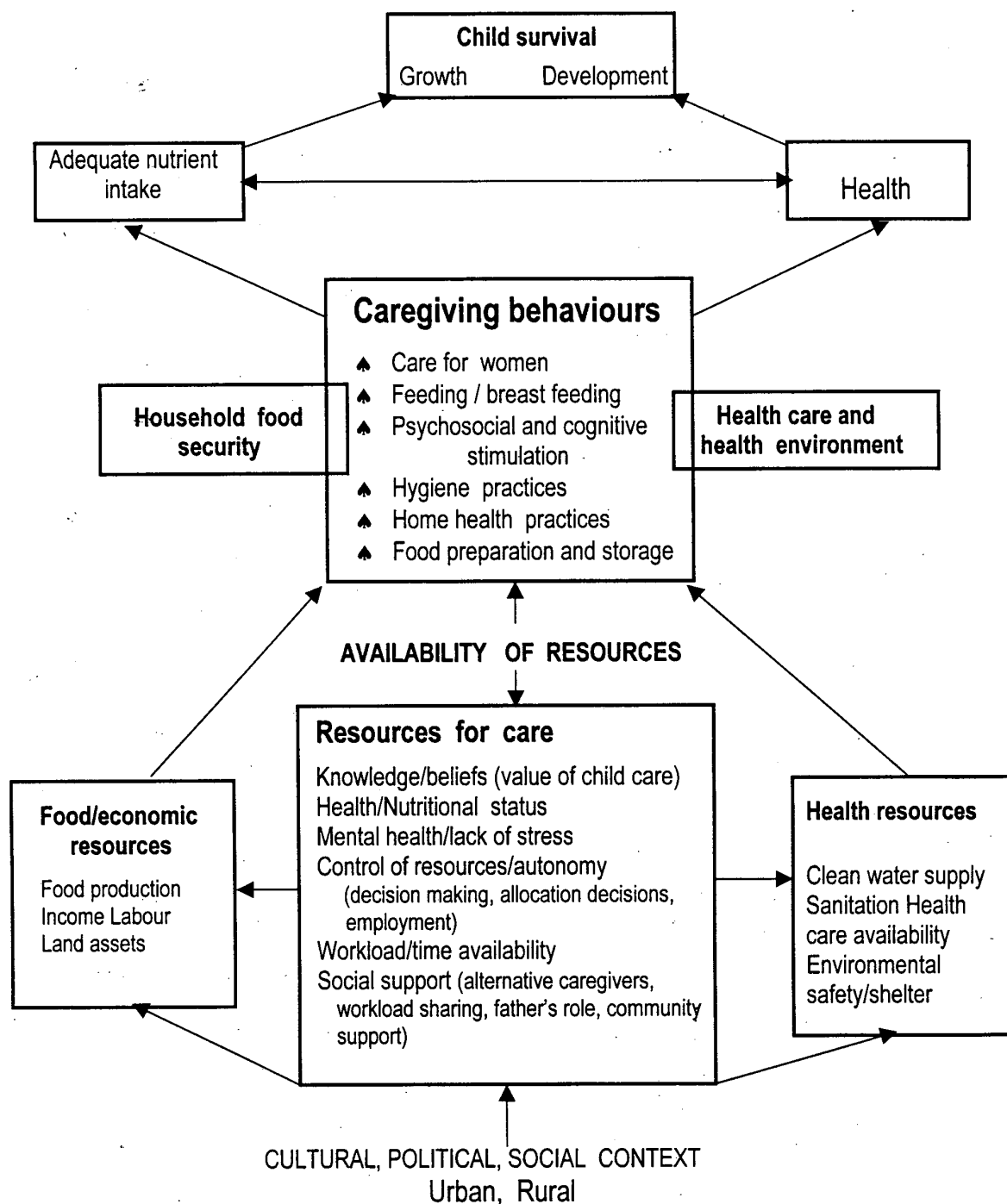
According to Latham (1995) of the three underlying causes of malnutrition in children which are inadequate food, inadequate health and inadequate care the least investigated is care. For the very young child, good nutrition depends on good care. During infancy and upto the age of three years the child is totally dependent on others for food and therefore for good nutrition. Good care will positively influence nutritional status and well-being.

According to Engle [1992] 'care refers to the care giving behaviour such as breastfeeding, diagnosing illnesses, determining when a child is ready for supplementary feeding, stimulating language and other cognitive capacities and providing emotional support'. Three worthwhile interventions to promote good care include service delivery, capacity -building and empowerment. The supplementary feeding programme initiated by the Government of Tamil Nadu in which selective feeding of malnourished children between six and thirtysix months of age is carried out is an example of a State supported service delivery mechanism in the care of the young child. While the programme is a timely intervention in improving nutritional status it is nevertheless a temporary measure and a short term strategy to promote nutritional status. It does not prevent children once rehabilitated from slipping back into the malnourished state.

Further there is growing concern on the burden to the state exchequer and the increased dependency of the population on Government programmes for survival. The long term approach towards improving nutritional status would be to enhance the capacity of families and especially empower mothers of young children to maintain good caring practices and confront situations that pose a threat to such practices. In order to do this there is a need to analyse a host of factors that form part of care giving behaviour and understand their relationship to the growth and development of infants. A conceptual framework for care and nutrition is given in page 3. The framework describes various factors that influence the quality of care and how care itself influences nutritional status. Though care is a very broad area , from the context of nutrition the framework focusses specifically on care of young children below three years.

Though adequate dietary intake and health status are the immediate determinants of good nutrition, care giving ultimately determines the delivery of adequate food and health care to the child. Although closely linked to household food security the actual amount of food ingested by the young child is determined by care-related feeding behaviour such as breastfeeding, complementation, food preparation and overseeing the progression of the child from complete dependence to partaking of adult family food. Similarly care-related behaviour determines how available health services for both preventive and curative purposes are utilized to optimize child health and thereby influence the nutritional status. Finally factors such as affection, psychosocial stimulation, emotional stability, predictability and patterning are important to the overall development of the child [Super etal, 1990 and Grantham etal, 1991].

A Theoretical Framework for Care



Source : Engle, Patrice, L., Menon Purnima and Haddad and Lawrence. "Care and Nutrition, Concepts and Measurement". International Food Policy Research Institute, 1997

In addition to the direct care-related behaviour, it is important to recognize that care is a highly interactive process between child and care giver with inputs by and rewards for both. It is important to regard care in the context of a dyad. While mothers are presumed to be the primary care givers, other family members such as siblings and grandparents could also act as care givers. Thus both the care giver and child characteristics need to be considered - such as time demands, knowledge, skill of the care giver and child characteristics such as gender, age, birth order, appetite etc.

Rationale

Though there are several studies pertaining to the growth of infants and the feeding pattern among various sections of the population very few studies have considered the relationship between feeding and growth to be an interactive process of care influenced by complex biological and social factors. Thus the solutions to combating malnutrition have always been those of feeding or of educating the mothers with scant appreciation of other issues such as time availability, nature of interaction while feeding, role and status of the care giver within the family and the workload of mothers or care givers. There is a need to look into the existing behaviour pattern and understand the strengths and weaknesses within the social fabric that may foster or threaten good caring practices. This would help us to evolve effective strategies for empowering mothers and families to take better care of infants even in a hostile environment.

The present study was formulated to analyse, understand and document the child care practices of mothers/care givers related to feeding, health care practices and the role of family members in interacting with the infant. An attempt was also made to understand its relationship to the growth and development of infants.

Objectives

The following were the objectives of the study:

1. To study the care giving behaviour of mothers and families of infants (birth to 1 year) in Chennai slums with specific reference to feeding, healthcare practices and the role of family members in interacting with the infant.

2. To assess the physical growth and the attainment of developmental milestones of infants.
3. To understand the relationship between care practices and the growth and development of infants.

Scope

The study was confined only to the urban area of Chennai city. No attempt was made to estimate the percentage of malnourished children or the percent prevalence of various types of care practices, in the given population, since it would have involved taking a much larger sample with a team of investigators which was far beyond the scope of this study. The primary concern was to document certain specific care practices and to explore the relationship if any between those practices and the growth and developmental outcome in the infants. The developmental milestones attained by infants were ascertained through questioning mothers and not by direct observation.

II. Methods and Materials

The variables which were studied, the research design and the tools developed and used for data collection are described in this section.

1. Variables

The independent variables were:

- Knowledge of mothers / primary care givers
- Breastfeeding and supplementary feeding practices
- Psychosocial stimulation for children and support for their development
- Home health practices, health seeking behaviour and care during illness
- Care giver strategies combining work with child care

2. The dependent variables were:

- Growth – defined as the increase in body length and weight as measured by taking the anthropometric measurements.
- Development – defined as the attainment of milestones appropriate to the age of the infant.

3. Design of the study

A research advisory committee was constituted with professionals from different disciplines such as nutrition, child development, paediatrics, statistics and experts with a great deal of experience in research, analysis and evaluation. An outline of the research study elaborating the theoretical and conceptual framework along with a tentative design was circulated to all the members and in a meeting held subsequently, it was further refined and finalised.

The methodology chosen was survey which was expected to provide a general picture about mothers, their care giving behaviour and the health, nutritional and developmental status of infants. An interview schedule was decided to be developed to interview mothers or primary care givers. The linkages between the independent and dependent variables were decided to be explored.

4. Definition of the Universe

The universe was defined as urban slum infants (from twenty days of birth to twelve months and fifteen days) and their mothers or primary care givers.

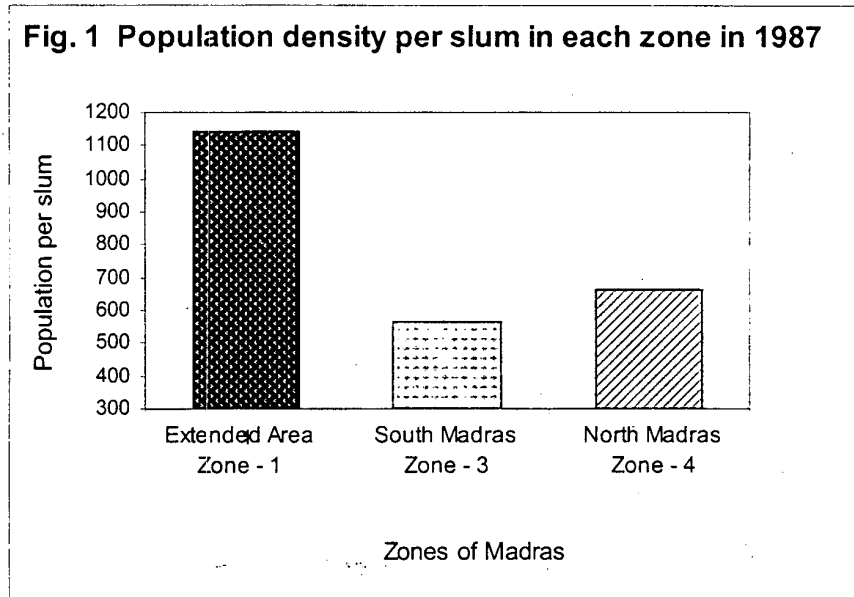
5. Selection of sample

The preliminary selection of Chennai city as the urban area was a non random selection based on the convenience of the principal investigator. Within the city the corporation city limit was chosen as the geographic boundary. The selection of slums was then based on stratified random sampling method outlined below. Once the slums were selected, in each slum all the households containing infant mother dyads were identified and studied.

As a first step, the Slum Clearance Board was approached for a list of all the slums. However it was found that the list was twenty years old and incomplete. On their advice the Madras Metropolitan Development Authority (MMDA) was approached. The MMDA, twelve years prior to the time of this study had undertaken a comprehensive survey of the slums in Chennai city. Various dimensions of the slums such as location, population, housing, literacy, employment etc. had been studied and published as an official document of the Government of Tamil Nadu.

In this document the slums of Chennai city have been classified into four zones. While three zones come under the purview of the Chennai Corporation, one is outside of its limits, managed by local panchayats. The three zones were then chosen as the geographic limit within which the slums were selected. The jurisdiction of the zones are given in Annexure I.

The population density of each zone was studied. The total population in each zone divided by the total number of slums gave the approximate density of each slum in the three zones, (Annexure-II). The population density of a slum in each zone is represented in Figure 1.



As can be seen from figure 1 zone one was the most thickly populated, the population density being approximately 1143 per slum. North Madras was the second most thickly populated at 664 followed by South Madras at 564. It was decided that out of the total sample selected, half would be from zone 1 and the rest would be equally divided between the other two zones.

Based on the ICDS reports provided by the Directorate of Social Welfare at Chennai, the proportion of children under one year of age was estimated to be 2%. Since the population size per slum unit ranged from 564 at the lowest to 1143 at the highest (refer figure 1) it was postulated that the number of children in each slum would range approximately between 10 at the least to 30 at the maximum. Keeping in mind the fact that only one more additional investigator was to be employed for data collection besides the principal investigator as well as the fact that data collection had to be completed within a time frame of three months, a sample of twelve slums was chosen, six from zone 1 and three each from zones 3 and 4.

The selection of individual slums from each zone was done in the following manner. Since six slums were to be chosen from zone one, the sixty-eight slums listed in that zone were divided into six groups each of which contained approximately 11 slums. The first two digit number within sixty eight was chosen from the random table and the slum listed against this number was chosen as the first sample. The rest were chosen at the eleventh interval from this number. A similar procedure was followed for the other two zones except that the interval for selection differed depending upon the number of slums listed and the numbers that needed to be selected.

Thirteen slums were ultimately chosen, six from zone 1, three from zone three and four from zone 4. Four slums were selected from zone 4, because in Nungambakkam area, the sample slum M.K. Stalin Nagar was situated on the banks of the Coovum. A bridge was built across the river and the slum extended on the other side of the bridge with a different name (i.e.) Jothiammal nagar. At the time of data collection it was not sure whether this was to be considered as a single entity or as two separate entities. Once it was known officially that they were two different slums the data was also treated as belonging to two slums. In every slum all the 0-1 infants and their mothers were covered except for twins and infants born with a cognitive problem. One or two families had gone out of town at the time of the survey and therefore could not be included. Totally 362 mother child dyads could be covered.

6. Tool preparation

The independent variables were chosen to be investigated through an interview with mothers with the help of a questionnaire (Annexure III). The dependent variable growth was estimated through collecting anthropometric measurements such as length and weight of the infants. The other dependent variable, development, was assessed by interviewing the mothers with regard to the attainment of appropriate milestones and infant behaviour. The milestones were derived from a well tested check list of developmental skills developed by the Madhuran Narayanan Centre for special children at Chennai. (Annexure IV) Appropriate questions to elicit the attainment of milestones were included in the questionnaire

Keeping in view the constraint that such an interview can be held for a maximum period of 40 minutes after which the subjects are likely to become tired and restless as well as being held up from other activities, the key information needed for each independent variable was identified and suitable questions were framed for eliciting the information.

The section on questions related to infant development was evolved after a series of steps. The principles on which this section, was evolved are:

- a The items should be such that they include skills from various domains of development.
- b They should be those which a majority (90%) of normal children pass through
- c They should be simple and common enough to be noticed by even the busiest of care givers.

Several tools for developmental testing were considered and finally, that prepared by the Madhuran Narayanan Centre for Special Children at Chennai, which included most of the above mentioned features was found suitable for the requirements of the study. The centre which is mandated to help mothers to detect whether their child is normal or otherwise and introduce early intervention strategies has developed the tool which is a check list of age appropriate developmental skills in five domains of development. It has drawn heavily from the existing Bayley Scales of Infant Development standardized for Indian children. In addition it includes additional elements of infant behaviour and the final product has been validated with the help of paediatricians through extensive field trials in Tamil Nadu.

The items in the checklist have been divided into five major categories namely motor skills, self-help skills, language, cognitive and socialization skills. Each category has fifty developmental items applicable from the first month of life up to two years of age and the range of coverage is of the order of two months. The check list was obtained and content validity for the infancy items was done again, both by a pediatrician and an expert in early childhood development. As per their suggestion as well as on the range adopted in the checklist the twelve months of infancy were clubbed together from birth to 2 months as the first unit and the third month was retained as a separate entity. Fourth and 5th, 6th and 7th, 8th and 9th and 10th, 11th and 12th months were clubbed together. The selected skills arrived at after this process, were then framed into suitable questions and field tested in a few urban slums, by the principal investigator, colleagues at MSSRF and a few students of the Ramachandra Medical College. The entire questionnaire after the addition of the tested developmental items was again tested for accuracy of information elicited, time limit and for easy administration (Annexure 3).

7. Measurement of Growth

The parameters chosen to measure growth were stunting, wasting and underweight. Stunting is deficit in height-for-age. It implies a slowing down in skeletal growth. It is a manifestation of long term malnutrition and is usually associated with poor overall economic conditions. The height for age index with a less than 2 score standard deviation (SD) from the reference median was used for identifying stunted infants.

Wasting indicates a deficit in tissue and fat mass compared with the amount expected in a child of same height or length. It could be a result of failure to gain weight or actual weight loss. It is very often a short term indicator of malnutrition since it can develop very rapidly and if the conditions become favourable be restored equally rapidly. The weight for height index with a SD score of less than 2 SD from the reference median was used for identifying wasted infants.

Underweight is deficit in weight for age. In most populations weight-for-age is fairly well correlated with height-for-age for which it is often used as a proxy to save the labour of measuring height. However, if height is not measured then wasting will be overlooked. The two indices weight-for-height and height-for-age together account for more than 95% of the variance in weight-for-age. Underweight is therefore a composite measure of stunting and wasting. The weight-for-age index with less than 2SD score from the reference median was used for identifying undernourished infants. (Sachdev and Choudhury, 1995)

The weights of mothers and infants were taken with the help of an electronic weighing scale supplied by UNICEF. This scale is very simply designed, easy to carry, is of light weight and more importantly is highly accurate and sensitive up to one decimal point. Since the actual weight is flashed numerically there is no question of parallax error or other errors of judgement. The heights of infants were measured with the help of a standard infantometer supplied by the Clinical Nutrition Department of Ramachandra Medical College.

8. Data Collection

This was carried out between the months of July and September'98 by the principal investigator and another senior investigator. Initially the slums were identified either through the Post office or a tea shop in the locality. In some instances the slums had totally disappeared, since the people were rehabilitated and given Housing Board flats elsewhere. In that case, the one next in the list was selected. In some cases the slums had given way to middle class tenements and flats. Once a slum was identified the local ICDS centre was visited for identifying all the households with infants and for gathering details about the local population. However the information available in the ICDS centre was sometimes unsatisfactory for the following reasons:

If a slum was very large, (more than 1500 population) then two or even three ICDS centres existed in one area. Duplication of children occurred in the registers of the different ICDS centres serving the same area.

Sometimes the information was not up to date, since details of some new born children had not been entered in the register.

Very often ICDS centres did not cater to the children of the new entrants or migrant labourers into the slum. Wherever such people stayed within the slum, using the same facilities available to the other residents, contributing to common fund collection if any and generally accepted by the rest as being part of the community they were included as samples. Participatory Rural Appraisal exercise could not be done because in many slums beyond 10 or 15 houses no one knew who lived there, unless they were related.

There was no other option except to knock on each door to find out whether there was an infant in that household. On the first day of the visit, all the streets in the slum were enumerated. The two investigators would work independently in two different streets. While the principal investigator would interview mothers as well as take the anthropometric measurements the other would only do the interviews.

At the end of the day all the forms were collected by the principal investigator and were scrutinised overnight. Any discrepancy, or inconsistency found in any of the forms were noted down. The next day the mothers interviewed by the second investigator were revisited by both and the anthropometric measurements taken. All the anthropometric measurements were collected by the principal investigator only. Clarifications if any were

also obtained. Each mother--infant dyad was seen by the principal investigator. On an average it took about a week to complete data collection in each slum. This enabled a higher degree (99%) of coverage of children than what one would normally get on a single day's visit since repeated visits were made to the same house if the mother or child had not been available. Even then in about 6 or 7 slums one mother-infant pair had to be left out in each due to various factors such as chicken pox, out station visits etc.

The interviews were done in a conversational mode and the questionnaire was used more as a checklist for the necessary information to be elicited. It was easy for both the investigators to establish a rapport and as the speed and efficiency of the investigators increased the time limit came down by about 10-15 minutes. Basic details about the slum were collected from local leaders and elders in the slum.

Once the survey was completed a focus group discussion was organized for the respondents in every alternate slum. Not only was this opportunity used for clarifying more issues about practices and behaviour, but was also used as a feedback session to give the mothers a briefing on the information obtained. Further a lot of tips were provided on foods and feeding, treatment of minor ailments, sources of loan and government schemes. Except for one slum where no one participated, in all other slums about 1/3rd of the respondents attended the focus group discussion.

9. Plan of Analysis

Once the data was collected it was entered in the computer and checked for accuracy. Tables were generated with the SPSS Software.

The following approach was adopted in the analysis of data.

- The nutritional and growth status of male and female infants was analysed month wise using anthropometric measurements such as heights and weights to identify the pattern and prevalence of malnutrition.

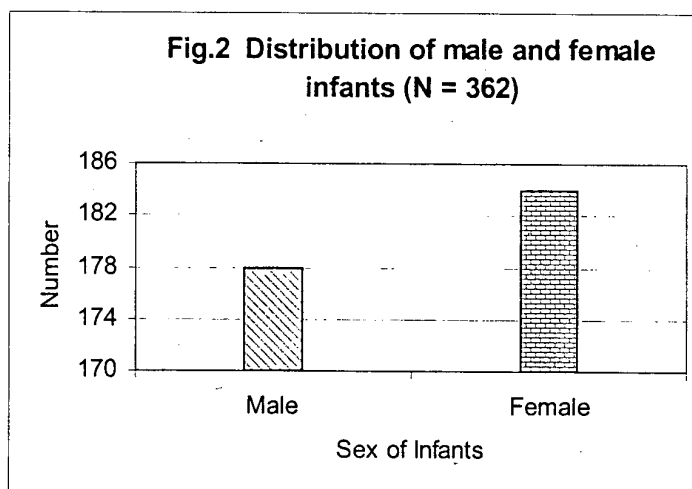
- The breastfeeding and supplementary feeding practices were analysed month wise. An attempt was made to understand the relationship between feeding practices and growth outcome.
- Healthcare practices of the care givers and the morbidity profile of the infants were also analysed in relation to each other.
- Women's economic role and children's nutritional status were studied.
- Role of other family members with regard to, certain specific activities such as feeding, putting the child to sleep, toileting and entertainment were studied.
- Infants' developmental level based on achievement of milestones were also analysed.

Bivariate tables were used to analyse the relationship between independent and dependent variables.

III. Analysis and Findings

1. Growth profile of infants in the study

In the given sample of 362 infants, the proportion of female infants was slightly higher with 184 girls and 178 boys respectively (Fig 2).



With increasing reports about declining biological sex ratio and missing female children suggestive of the practice of female foeticide and infanticide, (Agnihotri, 2000) the issue of the survival of the girl child is a matter of serious concern necessitating the analysis of gender disaggregated data in all research studies. However the near equal distribution of male and female infants in the study seems to suggest a favourable environment for the survival of the girl child. The sex wise and month wise distribution of infants is reported in Table 1.

From the point of view of survival and breastfeeding the first four months is of great importance. The above table shows that the number of infants in this group is 116 (61 boys and 55 girls respectively) which is slightly less than one third of the total sample. The five to twelve month age-group consisting of 246 children (117 boys and 129 girls) forms a little over $2/3^{\text{rd}}$ of the entire sample. While the number of female infants is slightly less than the number of male infants in the former category an exactly reverse picture is seen in the latter.

Table 1. Distribution of male and female infants age wise (N = 362)

Age in months	Sex		Age wise total
	Male	Female	
1	17	10	27
2	15	13	28
3	13	14	27
4	16	18	34
Total 1	61	55	116
5	20	14	34
6	15	14	29
7	15	16	31
8	9	13	22
9	14	11	25
10	15	20	35
11	15	22	37
12	14	19	33
Total 2	117	129	246
Grand Total (1 + 2)	178	184	362

The above findings are in accordance with the biological sex ratio theory which postulates that while slightly more member of male babies are born as compared to females, the ratio being 103 to 107 boys for every 100 girls, the ratio evens out at one year of age since girls are stronger with greater chances of survival (Visaria, 1971).

Growth begins from the moment of conception and is fastest during the intra uterine life period. The growth and development of the foetus is influenced by genetic factors as well as environmental factors such as the health and nutritional status of the mother and the care available to the mother during the antenatal period accompanied by a safe delivery with good obstetric case. This is manifested in the birth weight of the infant. The minimum birth weight considered to be normal is 2.5 kg. A birth weight less than this is suggestive of nutritional deprivation during the intra uterine period with the implication that the infant is already deprived at birth and is off to a poor start right from the beginning.

In India it is estimated that 1/3 rd of the babies are born with a low birth weight (LBW). Details of the birth weights of infants in the study is reported in Table 2.

Table 2. Birth weights of infants (N = 299)

Mean birth wt (Kgs) and SD	No < 2.5 Kg	No > or = 2.5 Kg	Total
2.7	56	243	299
± 0.469	(19%)	(81%)	(100%)

Out of the 362 infants birth weights were available for 299 (83%). The birth weight and other obstetric details about the antenatal period and delivery were found to be recorded in a note book by the hospital staff who had been in charge of the delivery and handed over to the mothers at the time of discharge. Sixty three mothers had either misplaced or lost the notebooks and data was not available for these infants. The mean birth weight was found to be 2.7 kg which is slightly above the minimum recommended weight. Only 19% (i.e) less than one third of the sample were found to be underweight at birth. Amongst the 81% with appropriate birth weight 23% just managed to touch 2.5 kg, while the remaining 77% were above the mark. Compared to the national statistic, the study infants showed a better nutritional status at birth.

While birth weight is a critical factor in determining the nutritional status at the beginning, the continued growth of the infant is determined by several other factors such as feeding, episodes of illnesses and care. The proportion of undernourished children of both groups (i.e) those born with low birth weight and those with satisfactory birth weight at the time of the study is presented in Table 3

Table 3. Prevalence of under nutrition amongst LBW and normal infants (N = 299)

Prevalence of under nutrition	LBW infants (N = 56)		Total	Normal infants (N = 243)		Total
	0-4 months (N = 20)	5-12 months (N = 36)		1-4 months (N = 77)	5-12 months (N = 166)	
No. under nourished	3 (15%)	18 (50%)	21 (38%)	1 (1%)	56 (33%)	57 (23%)
No. Normal	17 (85%)	18 (50%)	36 (62%)	76 (99%)	110(67%)	186
Total	20	36	56 (100%)	77	166	243 (100)

* Body weight <-2SD from median value

Since the number of LBW infants in the sample was only 56, conclusive inferences cannot be drawn about the picture presented by the LBW infants. However in comparison with those born with adequate birth weight who numbered 243, certain observations can nevertheless be made. Amongst the LBW infants, 85% of infants within four months of age have normal body weights while amongst the normal birth weight category practically the entire group (99%) is normal. In the 5-12 month age group 50% of the LBW's are normal while 67% are normal amongst the other group. The overall figures for under nutrition are 38% and 23% respectively for LBW infants and those with normal birth weight.

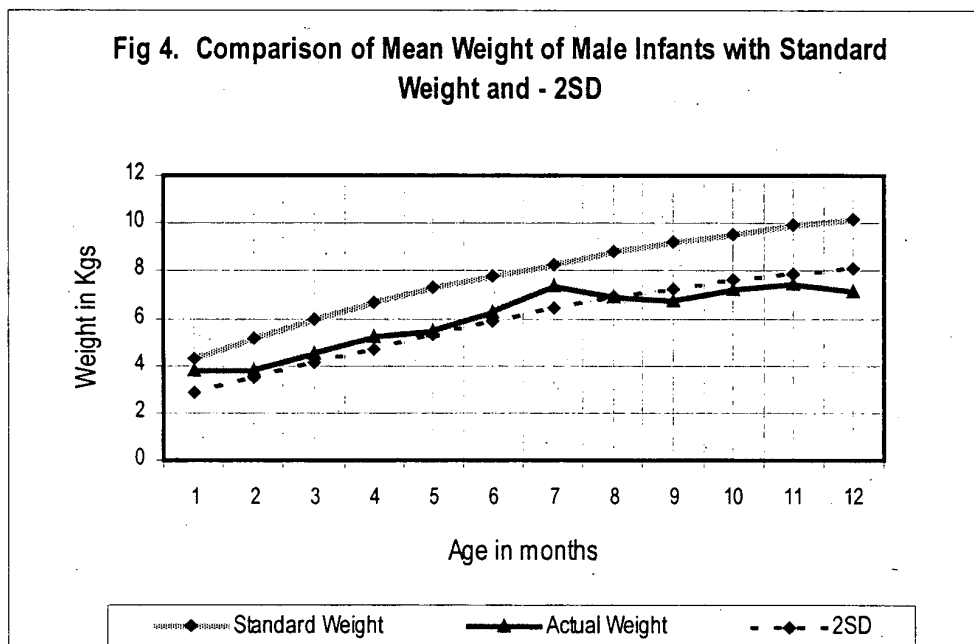
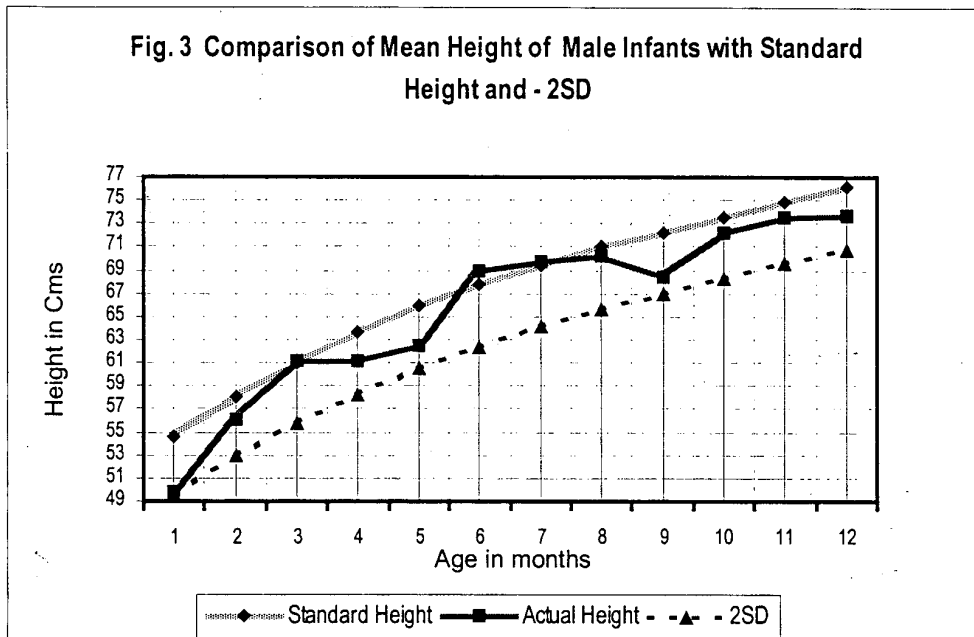
It is evident from the above data that children who are nutritionally disadvantaged at birth continue to grow up to be malnourished, more so in comparison with their luckier counterparts. However, in the LBW group nearly 50% have grown up to be normal. This suggests that even though they have had a poor start to begin with they have been exposed to a caring environment that is supportive of physical growth. In contrast among the other group which had nearly 100% normal infants under four months of age, there is a sharp fall in the percentage of normal infants with nearly one third becoming malnourished between 5 and 12 months of age. This is suggestive of deprived environmental and care facilities available to infants within the household who are otherwise born normal.

While it is important to understand whether the environment is conducive or detrimental to growth, it is equally important to know if there is any difference in the growth pattern of male and female children. The mean heights and weights of boys are presented in Figures 3 and 4.

In the above figures the straight gray lines represent the standard (i.e) the 50th percentile of NCHS standard for height and weight respectively. The broken lines represent $-2SD$ away from the standard and below which the child would be considered to be malnourished. The actual mean heights and weights of infants for each month of age are represented as dots in the graph joined by dark thick lines .

In Figure 3, the average heights of male infants for each month of age are represented. A mean height below $-2SD$ limit indicates the prevalence of stunting. It is evident that all the groups from the first to the twelfth month are normal with no group falling below the

standard. However a critical look at the data reveals that there is variability amongst groups with regard to their growth status.



Except for infants at one, five and nine months of age all other groups have mean values which either correspond to or are very close to the recommended levels. The mean height of one month old infants, though not falling within the range of malnutrition, still lies perilously close to the $-2SD$ mark and those of the other two groups, though quite clearly above the critical level are not so impressive as the rest of the group. The comparatively lower mean value for these three groups could be due to various reasons, which could have temporarily caused a setback to optimal increase in height, though the data can only be considered as suggestive and not conclusive due to the small sample size (refer Table 1). The lower value at one month could have been due to intrauterine assault during pregnancy or perhaps due to the fact that the sample included infants from the twenty first day of birth onwards, who had not yet completed one month.

Similarly the comparatively lower means at five and nine months could have been due to episodes of illnesses which in turn affect food intake and inappropriate food or feeding practices. However, the data by and large shows that the infants on the whole at all ages have been receiving adequate nourishment to enable them to grow satisfactorily without getting stunted, since stunting implies prolonged periods of inadequate food intake.

With regard to the mean weights of male infants shown in Figure 4, all the groups from the first month to the seventh month have mean weights which are clearly above the $-2SD$ limit with the one month old and seven month old infants having weights closest to the recommended levels. The eight month old infants are just about normal, while beyond this age, they are clearly undernourished with the mean weights below $-2SD$ limit especially at eleven and twelve months of age.

Taking into account both the mean heights and weights, it is evident from the data that infants from all age groups have mean heights which are normal indicating that there is no long term history of lack of food or malnutrition in the given sample. However with regard to weight, the age groups from eight to twelve months are clearly malnourished indicating short term prevalence of malnutrition which could have been due to a host of other factors, such as quantity and quality of supplementary food or frequent attacks of illnesses. The mean heights and weights of female infants are presented in Figures 5 and 6.

Fig. 5 Comparison of Mean Height of Female Infants with Standard Height and -2SD

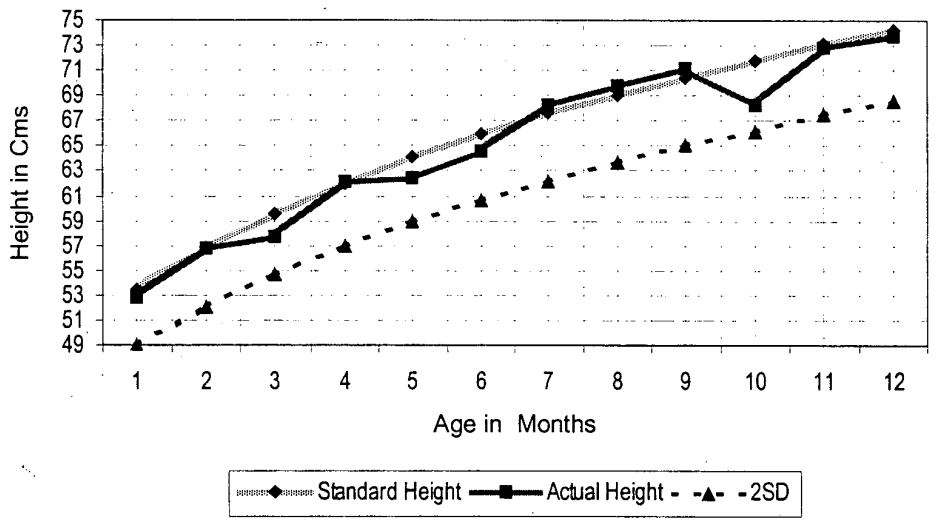
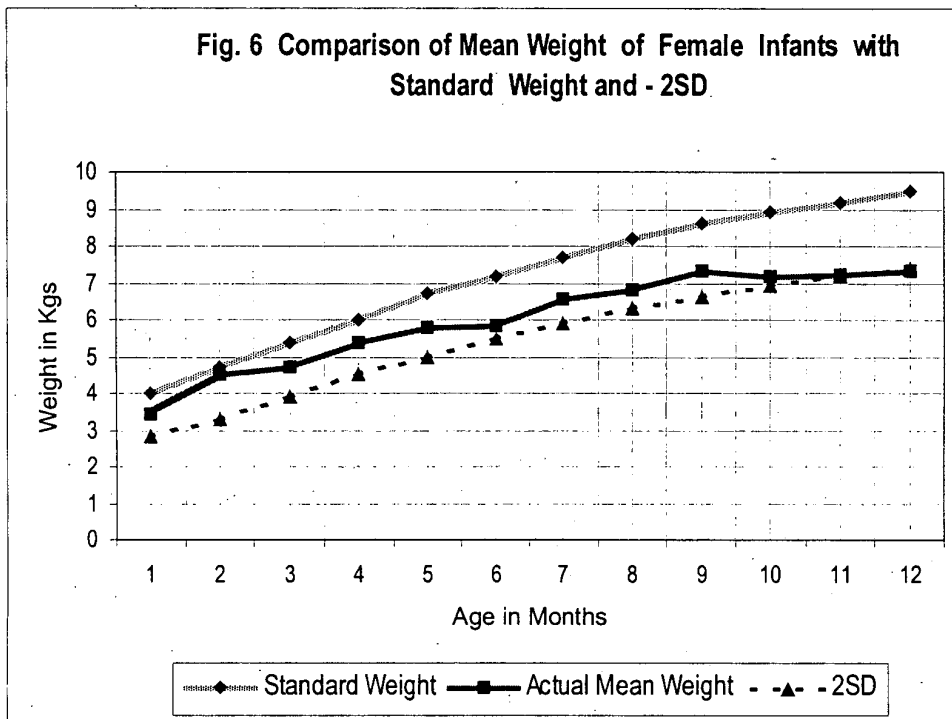


Fig. 6 Comparison of Mean Weight of Female Infants with Standard Weight and -2SD



The growth performance of girls is better when compared to those of boys. With regard to height, from Figure 5, it is clear that girls are off to a good start right from the beginning with their mean heights the same as the recommended levels for eight groups. It is only the ten month old infants whose mean height though normal is quite below the recommended level when compared to the other groups. With regard to weight, the infants are completely normal till nine months of age though they tend to move further and further away from the recommended level after the fourth month. They are just about normal at ten and eleven months of age and slightly below par at twelve months.

Though girls in the sample have a slightly better growth profile when compared to boys, the pattern of linear growth exhibited by both the groups is more or less same. None of the groups as a whole exhibit stunting, though there may be some individual cases as seen elsewhere in this report, which signifies that there has not been the problem of prolonged hunger. Further, both groups show an initial upward trend, in the early months, with some stagnation at the third month, another upward trend which is maintained up to the eighth and ninth months, then a sharp decrease followed by improvement thereafter.

However, with regard to weight there are differences between both the groups. Amongst the female infants there is a marginal but steady increase in mean weight with increasing month of age up to the ninth month. While the ten and eleven months old infants are not exactly malnourished, they are close to being so and the twelve-month-old infants are clearly underweight though not very severely. On the other hand male infants have appropriate body weights only up to seven months of age. While there is a steady increase up to the third month with some faltering amongst the four and five-month-old infants, the six-month-old group has a higher mean weight close to that of the recommended level. Infants between the eighth and the tenth month as well as the twelve-month-old infants are clearly underweight though not very severely. The eleven-month infants are far more malnourished than the other groups. Boys are undernourished at eight months of age, while in girls it appears at eleven months.

The mean heights and weights of infants have established the fact that on the whole under weight rather than stunting was the problem and that too beyond seven months of age. With regard to wasting, which is the weight-for-height index it was found to be of the

order of 33%. The percentage prevalence of underweight, stunted and wasted infants is presented in Table 4.

Table 4. Prevalence of malnutrition among the study infants * (N = 362)

Category	Number
Stunted	22 (6%)
Wasted	120 (33%)
Underweight	101 (28%)
Normal	212 (59%)
Total	362

* Percentage will not add to 100, since some stunted and wasted infants will get included in the underweight category.

From the above table it is clear that the prevalence of stunting is the least at 6 %, that of underweight is 28% and of wasting 33%. Since increase in height is a slower process than growth in body mass, a significant degree of stunting takes longer to be established. The low prevalence of stunting is probably due to the fact that the infants have not lived long enough in a malnourished state, to exhibit stunting. Given the same environment conditions the prevalence of stunting in the sample could increase, as the infants become older. The prevalence of wasting is much higher than that of stunting, which implies that while children have the adequate height for their age, they do not have the corresponding weight for their height. These observations are more or less consistent with those of Sachdev and Choudhury (1995) who consider the prevalence of wasting to be greatest between 12 and 24 months of age, whereas the prevalence of stunting increases over time, up to the age of 24 and 36 months. Using underweight as the criterion 28% of the total sample are found to be malnourished. However a month wise analysis of the prevalence of underweight is important to understand the nutritional status of different age groups. The nutritional status of the sample using underweight as the criterion is presented in Table 5.

The overall figure of 72% of normal infants implies that only about one third of the entire group is malnourished. However, monthwise analysis reveals that while 96% of infants are normal at one month of age, at twelve months only one third have normal body weight. Thus it seems reasonable to presume that majority of the infants start off normally but become progressively malnourished with increasing month of age. The drop in the percentage of normal infants is clearly visible at eight and ten months of age while it is very steep at eleven and twelve months of age. While 57% of the children are

normal at ten months there is a nearly 20% drop soon after, with only 35% being normal at eleven month of age. These findings suggest that malnutrition sets in gradually and could be due to improper feeding practices, lack of adequate supplementary foods or frequent attacks of illnesses. These are discussed in the subsequent sections.

Table 5. Prevalence of malnutrition amongst study infants (N = 362)

Age in months	Underweight	Normal	Total
1	1 (4%)	26 (96%)	27
2	--	28 (100%)	28
3	2 (7%)	25 (93%)	27
4	4 (12%)	30 (88%)	34
5	8 (24 %)	26 (76%)	34
6	4 (14%)	25 (86%)	29
7	7 (23%)	24 (77%)	31
8	7 (32%)	15 (68%)	22
9	8 (32%)	17 (68%)	25
10	15 (43%)	20 (57%)	35
11	24 (65 %)	13 (35%)	37
12	21 (64%)	12 (36%)	33
Total	101 (28%)	261 (72%)	362

The major conclusions of this section are as follows:

- The slightly higher percentage of female infants in the total sample is in accordance with the biological sex ratio theory that while higher proportion of male infants are born, the ratio evens out at one year of age.
- Stunting as measured by the height for age index was very low at 6% indicating that there was no long term history of malnutrition.
- Wasting as measured by the weight for height index was of the order of 33% indicating short term history of malnutrition.
- The mean weights in the case of male infants fell below the -2SD level from the seventh month onwards, while in girls this was just below par at the twelfth month. On the whole girls exhibited a better nutritional status as compared to boys.
- Using underweight (weight for age) as the criterion 28% of infants in the entire sample were malnourished. However monthwise analysis of age revealed that while 96% of the infants were normal at one month of age only one third were normal at twelve months.

- Nineteen percent of the infants were born with a low birth weight. However half of them between the ages of 5 – 12 months had normal body weight indicating good caring practices of mothers which enabled catch up growth.

2. Feeding Practices

While infancy is the most critical period in the whole life of an individual the vulnerability is greatest during the first six months of life since survival is at stake. The feeding and care of infants ultimately determine whether or not the individual will grow up to be a human being sound in both mind and body.

Paediatricians recommend four months of exclusive breastfeeding during which period neither water nor vitamins should be administered, since breastmilk alone is sufficient to take care of all the infant's needs. Supplementary feeding is advised to begin after four months while breastfeeding should continue upto two years of age.

The issue of perceived decline in breastfeeding has been a major cause for concern amongst health and nutrition professionals throughout the world during the past two decades. This was attributed to the aggressive marketing strategies of the manufacturers of infant foods. Several studies all over the world have pointed to the decline in breastfeeding as caused by advent of baby foods. In India, several studies have recorded different observations and the following patterns of feeding have been reported.

- a. Exclusive breastfeeding is not practised during the first four months with the bottle replacing the breast, leading to growth faltering and repeated attacks of illnesses.
- b. Exclusive breastfeeding is prolonged. Supplementary feeding is introduced very late, well beyond the first year, leading to growth retardation.
- c. The prevalence of breastfeeding exclusive or otherwise and the time of introduction of supplements depends to a large extent on the socio economic class of mothers.
- d. Colostrum (early milk) rich in immune factors is discarded.
- e. Prelacteal feeds especially sugar water are frequently given.

Notwithstanding the fact that in India different feeding practices are likely to prevail in different regions of the country given the diversity of the people, several studies have suffered from quite a few deficiencies, namely, lack of perception of women's roles and their lack of empowerment and insensitivity to the cultural context in which data has to be collected and interpreted. In Western countries, the term "bottle feeding" has been

used synonymously with feeding the child with artificial foods as well as feeding it by means of the bottle. However, in India several devices for feeding children have existed long before the advent of the bottle, the "Gindi" (a kettle like device with a spout) and the "Paladai" (a small cup elongated at one end like a beaker to facilitate feeding without spilling) being the most common in Tamil Nadu. In addition tumblers and spoons are also used. The traditional feeding devices as well as spoons and tumblers are recommended by health professionals over the bottle since the latter if not cleaned and sterilised properly can harbour bacteria on a much larger scale leading to diarrhoea, with disastrous consequences. In the Indian context the term bottle-feeding has to be carefully used since anyone of the following conditions can prevail:

- The child can be breastfed, but given vitamins medicines, water etc., through devices other than a bottle.
- The child can be breastfed but given water through a bottle.
- The child can be breastfed, given baby food or other food items through a bottle, but given medicines etc. through traditional feeding devices.
- With regard to older infants (about 12 months) in addition to all above, the child can be fed by hand by the primary care givers.

Thus bottle-feeding cannot be equated to feeding the baby with artificial food. By the same token feeding with baby food need not be done through the bottle and should not be termed bottle feeding.

According to health personnel and professionals, the time of initiation of breastfeeding soon after the birth plays a critical role in determining the exclusivity and duration of breastfeeding. In cases of normal delivery the mothers have a natural and more advantageous early start and therefore tend to feed longer than those who deliver through the Caesarean section. In the given sample it was found that 98% of mothers had a normal delivery. Practices of mothers in the study with regard to giving colostrum and prelacteal feeds are presented in Tables 6 and 7.

Table 6. Initiation of breastfeeding by mothers (N = 362)

Time of initiation	No. of mothers
Never gave breastmilk	4 (1%)
First day	303 (84%)
Within three days	39 (11%)
After three days	16 (4%)
Total	362

It is evident that majority of the mothers start breastfeeding right from the first day of birth. When the first three days are considered together 95% are found to have initiated breastfeeding. Thus the recommended practice appears to be widely prevalent auguring a good start for the newborn. In contrast feeding the infant with other foods prior to starting with breast milk doesn't seem to be in vogue since 71% of the mothers have reported giving only breastmilk, right from the beginning (Table 7).

Table 7. Administration of prelacteal foods (N = 362)

Status	Number of Mothers
Given	105 (29%)
Not given	257 (71%)
Total	362

Details about the feeding practices, foods & devices for feeding are discussed below.

Table 8. Feeding practices of mothers (N= 362)

Age in months	Food given at time of study			Total
	Only breast milk	Only supplementary food	Both	
1	24 (89%)	-	3 (11%)	27
2	21 (75%)	1	6 (25%)	28
3	18 (67%)	-	9 (33%)	27
4	18 (53%)	2	14 (41%)	34
Total 1	81 (80%)	3 (2%)	32 (18%)	116
5	8 (24%)	4 (12%)	22 (65%)	34
6	2 (7%)	3 (10%)	24 (83%)	29
7	5 (16%)	1 (3%)	25 (81%)	31
8	-	2 (9%)	20 (91%)	22
9	2 (8%)	2 (8%)	21 (84%)	25
10	1 (3%)	5 (14%)	29 (83%)	35
11	1 (3%)	4 (11%)	32 (86%)	37
12	1 (3%)	6 (18.1%)	26 (79%)	33
Total 2	20 (8%)	27 (11%)	199 (81%)	246
Total (1+2)	101 (28%)	30 (8%)	231 (64%)	362

With regard to infant feeding practices, three types of feeding practices could be identified. Those who exclusively breastfed, those who gave only supplementary food and those who gave a combination of both. Paediatricians recommend that infants should be exclusively breastfed from birth up to the age of four months, after which they should be given supplementary food along with breastfeeding which should continue upto 2 years of age.

A glance at the above table shows that out of the 362 mothers, 331 (92%) were breastfeeding their infants either exclusively or along with supplementary foods. Only thirty (8%) had completely stopped breastfeeding and were giving only supplementary food. The broad trends in feeding behaviour are quite evident when analysed for each month of age. A majority of mothers of infants upto four months of age (80%) were exclusively breastfeeding their babies. About 18% were using supplements along with breast milk.. Thus the total percentage of mothers of this group who breastfed is nearly 98% with only 2% of mothers resorting to complete withdrawal of breastfeeding. The available evidence indicates the universal practice of breastfeeding among mothers with infants under four months of age. Beyond four months a majority of mothers had started introducing supplementary food, along with breastfeeding. Eighty one percent of mothers of infants at 12 months subscribed to this practice while 11 % gave only supplementary food and 8% only breast milk.

Since the first four months of infancy are considered to be very critical in the context of exclusive breastfeeding, the feeding behaviour of mothers of children during this period and for the rest of the group are presented separately in the following tables:

Table 9. Feeding practices of mothers of infants upto 4 months of age (N = 116)

Age in months	Food now given			Total
	Only breast milk	Only supplementary food	Both	
1.	24 (89%)	-	3 (11%)	27
2.	21 (75%)	1 (4%)	6 (21%)	28
3.	18 (67%)	-	9 (33%)	27
4.	18 (53%)	2 (6%)	14 (41%)	34
Total	81 (80%)	3 (2%)	32 (18%)	116

As can be seen from the above table all mothers of one month old infants are breastfeeding with 89% doing so exclusively. However exclusive breastfeeding starts decreasing steadily with increasing age of infants. At two months, three fourths of

mothers are still breastfeeding exclusively. At three months about two thirds are doing so. At the fourth month only 53% are breastfeeding exclusively. The drop in the percentage is of the order of 14%, 8% and 14% respectively. Correspondingly, the proportion of mothers who start introducing supplementary food increases steadily by about 10%, with each increasing month of age.

While the overall prevalence rate of 80% exclusive breastfeeding amongst mothers with infants upto four months of age is not very low, this camouflages the fairly steep and steady decline in the rate of exclusive breastfeeding, when analysed for each increasing month of age. Thus it may be summarised that while 98% of mothers are breastfeeding with 89% doing so exclusively, at one month of age, the proportion of those who start introducing other foods thereafter increases steadily. The maximum decline occurs between first and second and between third and fourth months.

Table 10. Feeding practices of mothers of infants from 5 – 12 months (N = 246)

Age in months	Food given at the time of study			Total
	Only breast milk	Only supplementary food	Both	
5	8 (24%)	4 (12%)	22 (64%)	34
6	2 (7%)	3 (10%)	24 (83%)	29
7	5 (16%)	1 (3%)	25 (81%)	31
8	-	2 (9%)	20 (91%)	22
9	2 (8%)	2 (8%)	21 (84%)	25
10	1 (3%)	5 (14%)	29 (83%)	35
11	1 (3%)	4 (11%)	32 (86%)	37
12	1 (3%)	6 (18%)	26 (79%)	33
Total	20 (8%)	27 (11%)	199 (81%)	246

The most desirable practice, to be followed by mothers of infants above four months of age, with regard to feeding is to start with supplementary feeding and continue with breastfeeding. Eighty one percent of mothers subscribe to this practice. When analysed month-wise it is found that except at 5th, 8th and 12th months where the prevalence rates are 64%, 91% and 79% respectively, in the rest of the groups the rates are fairly steady between 81% to 86%. These observations suggest that majority of mothers introduce supplementary feeding along with breastfeeding by about the sixth month, and this is maintained up to the 11th month with a 7% fall in the end when presumably some give up breastfeeding.

Breastfeeding is considered to be exclusive when mother's milk alone is given without anything else such as vitamins, water etc. Breastmilk alone is considered sufficient and water is considered unnecessary and if unboiled highly unsafe. The administration of other fluids such as water and gripe water / vitamins is discussed below.

Table 11. Percentage of infants aged 1 – 12 months given water (N=362)

Age in months	Water given		Total
	Yes	No	
1	6 (22%)	21 (78%)	27
2	13 (46%)	15 (54%)	28
3	10 (37%)	17 (63%)	27
4	13 (38%)	21 (62%)	34
Total 1	42 (36%)	74 (64%)	116
5	28 (82%)	6 (18%)	34
6	24 (83%)	5 (17%)	29
7	30 (97%)	1 (3%)	31
8	22 (100%)	-	22
9	25 (100%)	-	25
10	35 (100%)	-	35
11	37 (100%)	-	37
12	33 (100%)	-	33
Total 2	234 (76%)	12 (24%)	246
Total 1 + 2	276 (76%)	86 (24%)	362

In the first month the proportion of mothers giving water is of the order of 22%. This proportion increases afterwards. An average of 36% mothers of infants within four months of age were giving small quantities of water to the child everyday for drinking. Though the reasons for giving water were not asked, in the focus group discussion many mothers said that they had to give water when medicines were prescribed to the child, during illness. Some doctors prescribe tablets, which need to be powdered and administered along with water. Even when syrups are given mothers felt that they had to give water "to remove the strange taste of the medicine and to reduce the heat that the medicines will generate".

From the fifth month onwards there is a sizeable jump (82%) in the percentage that gives water, and this could be due to the fact that more than two thirds start supplementary feeding by then. From seven months of age practically all infants are being given water to drink. While breast milk alone does not need the use of any feeding

device, the administration of supplements and other fluids necessitate the use of a feeding device.

In the following tables the devices used for giving water and supplementary foods are discussed.

Table 12. Devices for administration of water (N = 362)

Age in months	Device			Total
	NA.	Bottle	Otherwise	
1	21	1	5	27
2	15	1	12	28
3	17	1	9	27
4	21	1	12	34
5	6	8	20	34
6	5	7	17	29
7	1	5	25	31
8			22	22
9		6	19	25
10		5	30	35
11		9	28	37
12		2	31	33
Total	86	46	230	362
	24%	13%	63%	

As can be seen from the above table only 46 mothers (13%) in the entire sample used a bottle for feeding water to their infants. Even in this category a majority of forty two mothers used the bottle only after the fourth month, probably because when children are younger the small quantities given to them are managed through a "paladai" or a spoon. Methods adopted for feeding infants with supplementary food are presented below:

Table 13. Use of feeding devices by mothers (N=261)

Feeding device	Only supplementary feeding (n=30)	Breastfeeding and supplementary feeding (n=231)	Total
Bottle	19 (63%)	53 (23%)	72 (28%)
Others	10 (33%)	141 (61%)	151 (58%)
Both	1 (4%)	.5 (2%)	6 (2%)
By hand	---	32 (14%)	32 (12%)
Total	30	231	261

The above table shows that in the overall sample while 28% of the mothers use a bottle for feeding their infants, more than half (58%) use other devices and about 2% use both.

Twelve percent don't use anything. They feed the children by hand. Thus 70% of infants are not under any threat of infection through the bottle.

When the practice of bottle feeding is seen in the light of the food given to infants, certain trends, emerge. In the group of infants who are given only supplementary feeding, 63% are fed through the bottle. However in the group given both the breast and the supplements only 23% use the bottle.

In the focus group discussion, as well as in the interviews with these mothers who gave only supplementary feeding for whatever reason, it was said that at birth or within the first two months it is very difficult to feed the baby, except for one or two spoonfuls, a larger quantity of liquid using spoon, for fear of suffocation. Further the sucking reflex of the baby was satisfied only through the bottle. Infants were calmer and were more easily managed when fed through the bottle. The question on whether the bottles were sterilised was not asked since it was felt that a correct response to such a question could be elicited only through observation. The use of bottles as a feeding device is actively discouraged by paediatricians since bottles are a far more potential source of infection than any other feeding device. The nutritional status of infants who are given either food or water through a bottle and that of those who were not being given the bottle are compared below.

Table 14. Relationship between feeding devices and nutritional status (n=362)

Feeding Device	Nutritional Status		Total
	Malnourished	Normal	
NA	3	55	58
Bottle	28 (31%)	62 (69%)	90
Others	70 (33%)	144 (67%)	214
Total	101	261	362

The above table shows that the distribution of malnourished infants in the two groups fed either through a bottle or some other device is near equal at 31% and 33% respectively. This suggests that the causes of malnutrition in the sample cannot be attributed to bottle feeding. The low prevalence of malnutrition among the bottlefed group could probably be due to the adoption of appropriate hygiene practices by mothers such as sterilization of the bottle. However no conclusive decision can be made without direct observation. Information on the supplementary foods given to children is presented below.

Table 15. Supplementary Foods given to children (N=261)*

Food	Number
Biscuit	152 (58%)
Rice / dhal etc	139 (53%)
Milk	123 (47%)
Baby food	90 (35%)
Coffee / Tea	71 (27%)
Ragi Porridge	31 (12%)
Tiffin items (Idli etc.)	20 (8%)
Any other	11 (4%)

*Multiple choice question

The food items given as supplements to children ranged from coffee and tea, to biscuits, baby food and regular food cooked in the family. The item most used was biscuits since 58% of children were given the same. The staple food of the family namely rice and dhal were given to 53% of the children. Forty seven percent of the infants drank milk. More than one food was given to the infants and about 39 combinations existed. The worst was biscuit, coffee, tea and baby food. While it is gratifying to know that baby food occupies only the fourth place at 35%, it is a matter of concern that only 12% give Ragi porridge, which is one of the most nutritious foods. Rather than baby food manufacturers, biscuit manufacturers seem to pose a greater threat to the feeding of young children.

The issue of how the infant got initiated to these foods was probed in the focus group discussions. There appears to be three types of important players in the scenario, namely the adults in the family, the child itself and the doctor. The introduction of supplements to the child starts in a very casual manner, by some family member or the other sticking a piece of food in the child's mouth. The child appears to get slowly initiated to the family food, through such informal interaction with family members. Biscuits are very often munched by the adults and the left over drops of tea or coffee are just put in the child's mouth. It is quite possible that through such action the child's taste buds get stimulated and gradually the child starts initiating a demand for such foods.

One mother in an interview said that it was dangerous to leave the empty biscuit wrappers around since if the child saw the wrappers he would start demanding a biscuit and would not rest until he got one. In one of the interviews, during which time the child was sleeping, the mother suddenly became restless and sent the older child out to buy tea. She feared that if there was no tea readily available when he woke up he would

scream the place down. Children seem to get introduced to the other foods that the family prepared namely the rice, and rarely still the ragi kanji only after the fifth or the sixth month. Biscuits soaked in tea are the easiest to feed and most relished by infants.

During illnesses, especially diarrhoea the advice of the doctor is sought on the foods to be given. Many of them have been suggested to switch over to Nestum since a rice based food is good during diarrhoea. Only one mother was found to be feeding rice kanji and she said that she did so on the advice of the doctor. Most mothers of children above six months of age complained of lack of appetite on the part of children and said that they spat a lot while eating. Thus starting supplementary foods to children appears to arise largely out of interaction between the child and the family rather than by any conscious decision.

It has been postulated that exclusive breastfeeding during the first four months promotes optimal growth and that the inclusion of supplements during this period is not only unnecessary but also dangerous since if prepared in an unhygienic way it could lead to illnesses such as diarrhoea and consequent growth retardation. The relationship between the type of food given to the infants and their nutritional status is presented in tables 16 and 17.

Table 16. Relationship between food and nutritional status amongst infants 1-4 months (N = 116)

Food	Nutritional status		Total
	Malnourished	Normal	
Only breastmilk	4 (5%)	77 (95%)	81
Only supplement	-	3 (100%)	3
Breastmilk & supplement	3 (9%)	29 (91%)	32
Total	7 (6%)	109 (94%)	116

From Table 16 it is evident that there is no threat of malnutrition due to supplements since in both the exclusively breastfed group and in the group which also receives supplement a majority of children (95% and 91% respectively) are normal. The number that is given only supplementary food with no breastfeeding is too small for any analysis. Thus mothers, even if they give up exclusive breastfeeding within four months and resort to giving the infants other foods in addition to breast milk seem to be managing quite well in ensuring optimal growth of their children.

In the 5-12 month old age group (Table 17) the number of mothers giving either exclusive breastfeeding or only supplementary feeding is small (i.e) 26 and 27 (8% and 11% respectively) when compared to 199 (80%) mothers who -give both.

Table 17. Relationship between food and nutritional status amongst infants 5 – 12 months (N=246)

Food	Nutritional status		Total
	Malnourished	Normal	
Only breastmilk (n=20)	5 (25%)	15 (75%)	20
Only supplement (n=27)	15 (56%)	12 (44%)	27
Breastmilk & supplement (n=199)	74 (37%)	125 (63%)	199
Total	94	152	246

In the group that is given both breastmilk and supplementary food, slightly more than one third of the infants are found to be malnourished. Information on the quantity and quality of food was not collected. Since biscuits were the choice of food of majority of mothers, with nutritious foods like Ragi taking a back seat it is not surprising that one third is malnourished. With regard to the group given exclusive breastfeeding a majority of the infants were normal. They were all within the sixth month which perhaps made exclusive breastfeeding still adequate. However, with regard to the only supplemented group the effect of complete lack of breastmilk was evident with only 44% being normal.

The major conclusions of this section are as follows:

- Practically all infants were exclusively breastfed at birth
- Eighty two percent of mothers in the entire sample were breastfeeding
- In the case of mothers with infants upto four months of age the overall prevalence of exclusive breastfeeding was 80%. When analysed for each month of age 89% breastfed exclusively at one month. This number steadily declined with increasing month of age and at four months of age of the infants, only 53% of mothers practised exclusive breastfeeding.
- In the 5-12 month old age group, 60% of mothers introduced supplementary feeding at fifth month. This percentage increased to 83% at the sixth month and remained fairly steady upto the twelfth month.
- A majority of mothers in both groups conformed to the recommended feeding behaviour.

- With regard to administration of water 76% of infants in the entire sample were being given water. In the 1-4 month old age group only 36% were given water and in the 5-12 month group nearly 95% were drinking water.
- With regard to feeding devices the use of the bottle either for administering water for liquid foods was of the order of 25% with more than half using other devices.
- The prevalence of malnutrition amongst bottlefed infants and those fed otherwise was near equal at 31% and 33% respectively. Thus bottle feeding did not seem to be a primary cause of malnutrition amongst the study infants.
- With regard to supplementary food biscuit was given by majority (58%) of mothers. Fifty three percent of the mothers gave rice and dhal. Thirty five percent gave baby food and only 12% gave ragi porridge.

3. Healthcare Practices of Care Givers and Morbidity Profile of Infants

The health seeking behaviour of individuals is influenced by several factors such as the type of family they belong to, the community in which they live, and area such as rural or urban. In India along with allopathic system of medicine, several ancient systems of medicine such as ayurveda exist along with indigenous medical practices. Home remedies for minor ailments also exist which are handed down from one generation to the other. Healthcare facilities provided by the government by and large follow the Western system of medicine and those pertaining to maternal and child health are well organised and defined.

Of the 362 mothers 86% had delivered their babies in government hospitals while 11% at private clinics. Only 3% had resorted to home delivery. Since all the mother were urban-based they preferred to stay either in their marital home or go their natal home if it was within Chennai, for delivery. Mothers reported that the availability of hospitals and transport facilities were much better in Chennai than in rural areas and therefore they preferred to stay here than go elsewhere. All home based deliveries had taken place in rural areas where the mothers had gone according to the traditional custom of visiting the natal home for the arrival of the first child.

With regard to vaccination, in the Expanded Programme of Immunisation of the Government, a child is immunised against tuberculosis, poliomyelitis, diphtheria, pertussis, tetanus (DPT) and measles. The immunisation status of the children is presented in Table 18.

Table 18. Immunisation status of infants (N = 362)

Vaccination	Immunisation Status		
	Not applicable	Immunised	Not immunised
BCG (n = 362)	-	345 (95%)	17 (5%)
Polio at birth (n = 362)	-	345 (95%)	17 (5%)
DPT / Polio	37 (10%)	314 (87%)	11 (3%)

A majority of mothers had got their children immunised for BCG and oral polio at birth. While the actual coverage was 87% for DPT and polio, 10% mothers of infants, which had not yet reached the minimum age for vaccination said that they would do so at the appropriate time. Thus this figure is also likely to go upto 95% once the infants are immunised. There is near universal coverage of immunisation with regard to BCG, OPV and DPT/Polio. Details about measles immunisation is given in Table 19.

Table 19. Compliance with measles vaccination (N = 109)

Status	
Yes	No
72 (66%)	37 (34%)

Measles vaccination is administered during the tenth month and it is seen from the above table that the compliance of 66% is not so impressive as the coverage for the previous ones. A few mothers said that their children had got the disease even prior to immunisation thus rendering the exercise futile; but most of the mothers reported that due to some indisposition in the infant such as cold or fever the date of administration of the vaccine had been postponed.

With regard to health seeking behaviour in the event of any illness in the infants 29% reported that they went to government hospital, while 41% sought the help of private practitioners. Twenty-eight percent used both the services. The main reason why a majority sought private doctors was because, doctors were not available in Government hospitals at any time and comparatively better attention and standard were prevalent in private hospitals. Only one mother was found to be using native medicine and about 38% believed in going to the mosque.

There is a strong association between malnutrition and ill health which is cyclic in nature. While poor nutritional status increases susceptibility to illnesses, each episode of illness further weakens the nutritional status of the infant. Morbidity profile during the whole life history of the infants in relation to their nutritional status is presented in Tables 20 and 21.

Table 20. Nutritional status and morbidity history among 1–4 month old infants* (N = 116)

Nutritional status	Cold	Diarrhoea
Malnourished (n=7)	5 (71%)	2 (29%)
Normal (n=109)	73 (67%)	25 (23%)
Total	78 (67%)	27 (23%)

* Multiple choice question

Table 21. Nutritional status and morbidity history among 5 – 12 month old infants* (N = 246)

Nutritional status	Cold	Diarrhoea
Malnourished (n = 94)	90 (96%)	77 (82%)
Normal (n = 152)	143 (94%)	99 (63%)
Total	233 (95%)	176 (72%)

*Multiple choice question

In the case of 1-4 month old infants the percentage of undernourished infants is too small (only 7) to warrant a separate analysis. This in itself is a significant finding. A majority of normal infants (67%) had suffered from cold at some point of time or the other while 23% had suffered from diarrhoea. Thus respiratory tract infection (RTI) rather than diarrhoea seemed to be a major problem, in this group. However these illnesses do not seem to have affected their nutritional status. Either the duration of these illnesses had not been long enough to have caused a deterioration in the nutritional status or the coping strategies of the mothers had offset the negative impact.

In the 5–12 month old infants a majority have had cold in both the normal and malnourished categories. However a higher percentage among the malnourished group has had diarrhoea attacks when compared to the normal infants. It is not clear whether the poor nutritional status had made the former group more susceptible to diarrhoea attacks or whether repeated attacks and lack of proper management of diarrhoea had

made the group malnourished. Prevalence of illness at the time of survey is presented in Table 22.

Table 22. Morbidity profile at the time of survey (N=362)

Illness	Number
None	187 (52%)
Cold	123 (34%)
Diarrhoea	20 (6%)
Any other	32 (8%)

More than half of the children at the time of the survey were apparently healthy. Thirty four percent of mothers at the time of the study reported that their infants were having cold while only 6% were reportedly having diarrhoea. The causal factors of diarrhoea are very often considered to be unhygienic and faulty feeding practices and to some extent the environment in the home, particularly the cleanliness of the floor once the child becomes mobile. The administration of water if unboiled is very often a causal factor in the onset of diarrhoea. The practice of giving gripe water is also considered to be unnecessary and harmful and is actively discouraged by paediatricians.

The percentage of infants being administered water in both age groups (i.e.) 1-4 and 5-12 months as well as those given protected water is presented in Tables 23 and 24.

Table 23. Percentage of infants given water (N=362)

Age in months	Water given	Water not given	Total
0-4 (n=116)	42 (36%)	74 (64%)	116
5-12 (n=246)	234 (95%)	12 (5%)	246
Total	276	86	362

Table 24. Percentage of infants given protected water (N=276)

Age in months	Boiled water	Unboiled water
0-4 (n=42)	40 (95%)	2 (5%)
5-12 (n=234)	171 (73%)	63 (27%)

Thirty six percent of infants in the 1-4 month age group and 95% in the 5-12 month age group were given water. Nearly all the mothers had been advised by the doctors

to boil the water before giving it to the child for drinking. Barring two mothers the rest of the mothers of infants upto 4 months of age (95%) were boiling the water. (Table 24) Beyond the fact that "it was good" they could not say why they were doing it. Most of the mothers knew the difference between hot water and boiled water. However, beyond the fifth month the practice of boiling comes down considerably. Even then 73% were giving protected water. Several mothers did say that at times when they forgot or had no time to boil water, they simply gave unboiled water to the children. While some mothers knew about the germ theory of disease, many thought of boiling as a special activity undertaken for the sake of children or sick people just as foods are specially prepared or modified for children or during illnesses.

In addition to water, information was sought on the administration of other items such as vitamins, native medicine and gripe water. Only one out of the three hundred and sixty two mothers was found to be administering native medicine. A negligible thirteen (3%) was found to be giving vitamins. However a majority of the mothers were giving gripe water. (Tables 25 and 26).

Table 25. Administration of gripe water to infants 1 – 4 months (N=116)

Age in months	Gripe water		Total
	Administered	Not administered	
1	21 (78%)	6 (22%)	27
2	26 (93%)	2 (7%)	28
3	24 (89%)	3 (11%)	27
4	29 (85%)	5 (15%)	34
Total	100 (86%)	16 (14%)	116

Overall, eighty six percent of mothers were found to be giving gripe water. The practice starts right at birth irrespective of exclusive breastfeeding or not. Mothers felt that children needed something for digestion since many children while burping threw up considerable amount of milk. Some others felt that since they cried incessantly at night, they ought to be having a stomach ache and therefore needed to be given some medicine.

Even in the 5-12 month old group, gripe water continues to be utilised by a majority of mothers, though in varying degrees of prevalence over each month of age. On an average 74% of mothers in the entire group were found to be administering grape water.

In the focus group discussion mothers said that with the introduction of supplementary food it was important to introduce a digestive mixture for proper digestion.

Table 26. Administration of gripe water to infants 5-12 months (N=246)

Age in months	Gripe water		Total
	Administered	Not administered	
5	30 (88%)	4 (12%)	34
6	22 (76%)	7 (24%)	29
7	25 (81%)	6 (19%)	31
8	14 (64%)	8 (36%)	22
9	19 (76%)	6 (24%)	25
10	26 (74%)	9 (26%)	35
11	22 (59%)	15 (41%)	37
12	24 (73%)	9 (27%)	33
Total	182 (74%)	64 (26%)	246

Information about the management of diarrhoea was sought from mothers. The important components of diarrhoeal management are administration of oral re-hydration salt, continuation of breastfeeding and other foods if given and medical intervention if needed. While oral re-hydration salt is freely available it can also be easily made at home by the mother and given to the infants. Information on awareness about ORS and actual practice is given below (Table 27).

Table 27. Knowledge and practice regarding ORS (N = 362)

Status	Number
Aware	271 (75%)
Administration of ORS	68 (19%)

While only 19% were actually found to be using ORS nearly 75% knew about it. However most mothers thought ORS to be a medicine rather than a household therapy for preventing dehydration. Some mothers reported that ORS "did not work" by which they meant that it did not arrest diarrhoea. Mothers said that whenever there was an onset of diarrhoea they waited for a day for the diarrhoea to arrest itself failing which they took the infant to the doctor. Ninety three percent of the mothers had sought medical intervention for arresting diarrhoea, while about 30% also reported going to the mosque to offer prayers. They were emphatic on the issue that diarrhoea had to be

controlled at any cost. Nearly 89% of the mothers continued to breastfeed while 93% of those who had started off with supplementary feeding continued to give the supplements. About 27% modified the diet, by including "arrowroot" porridge.

During the focus group discussion mothers said that they usually got the child out of the diarrhoea syndrome within a day or two and medical intervention was quite effective in controlling diarrhoea. Thus arresting diarrhoea at the earliest was the major concern rather than replenishing the child with fluids during each bout. The continued feeding with both breastmilk and supplements also seem to suggest that in the management of diarrhoea except for administration of ORS, all other practices seemed to comply with what is usually recommended.

Conclusions regarding healthcare practices of mothers can be summarised as follows:

- Ninety seven percent of the deliveries were institutional and had taken place at Chennai.
- Immunisation coverage was 95% for BCG and oral polio at birth and 87% for subsequent administration of DPT/polio. Coverage of measles vaccination was 66%.
- With regard to morbidity profile nearly half the infants were apparently healthy. Thirty four percent were suffering from respiratory tract infection while 6% had diarrhoea.
- In the 1-4 month old category only 7 infants (6%) were malnourished. Amongst the 94% who were normal, 67% and 23% respectively have had a history of cold and diarrhoea in the entire life period.
- In the above age group the episodes of illnesses do not seem to have affected the nutritional status.
- In the 5-12 month old age group 38% of the infants were malnourished while 62% were normal. No reported differences were observed in the prevalence of respiratory tract infection amongst malnourished and normal infants during their whole life history. However the prevalence of diarrhoea was reportedly high amongst the malnourished group since 82% of mothers of malnourished infants said that their infants had experienced diarrhoea while this was of the order of 63% amongst normal infants.

- Thirty six percent of infants in the 1-4 month age group were being given water and 95% of the mothers reportedly gave boiled water.
- However in the 5-12 month age group 95% of the mothers gave water and only 73% amongst them reported giving boiled water.
- With regard to gripe water in both age groups majority of mothers (86% and 74% respectively) administered the same since they believed that it improve the digestion.
- In the management of diarrhoea, mother reported that arresting diarrhoea was of primary concern rather than the administration of re-hydration salts. Though 75% were aware of ORS, only 19% administered it. There was no withdrawal of food and breastmilk and supplements were given as before.

4. Multiple Roles of Mothers

Women perform multiple roles very often simultaneously, which can be classified as follows:

- Domestic chores which include cooking, cleaning and household maintenance activities for which there is no monetary return.
- Care of children, elderly and animals in the homestead which also has no monetary return.
- Economic or income earning activity either in the organised or the unorganised sector which supplements the family income.

In disadvantaged households women very often contribute to the household income by engaging themselves in economic activity. This economic contribution of women can take several forms. The work could be done within the home or outside, during fixed working hours or flexible ones, be part-time or full-time, be carried out for an employer or self, be paid in cash or kind and so forth.

The arrival of a child in the family necessitates several adjustments. Women stay away from work for some period of time and even when work is resumed it has to be combined with child care. Support to working mothers of young children is hence a crucial factor in the well being of the young child. The trade off between economic activity and the child's health and nutritional status have been researched. While women's economic role influences child's growth, the reverse is also true, in determining women's employment options. (Popkin. etal 1989, Leslie 1989) The economic role of mothers and the nature of child care support systems are described below:

Table 28. Proportion of economically active mothers (N=362)

Number economically active	Number Not economically active	Total
26 (7%)	336 (93%)	362 (100%)

Only a small minority (7%) of the mothers were economically active at the time of the study, which by itself is a significant finding. One of the usual reasons put forth for mothers not being engaged in economic activity is the lack of child care support. In this argument there is an underlying assumption that women had been 'working' before child birth and they have "dropped out" of work to take care of the child. However on questioning, it was found that out of the 336 non-working mothers, only 55 (16%) had been working prior to the birth of the child and the remaining 84% had never ever been in the workforce. Even if these (16%) mothers had continued to work after the birth of the study child the percentage of working mothers in the study would have increased only to an overall figure of 22%, emphasising that the majority of young mothers were not working.

When the fifty five previously employed mothers were asked why they had dropped out of work 17 (31%) said that they had done so because there was no one to take care of their children. Twenty five (45%) said that employment came in the way of taking proper care of the child even with child care support and the remaining thirteen (24%) cited other reasons. Except for two, fifty three had stopped working before child birth.

Reasons for not working were sought from economically non-active mothers both individually as well as in the focus group discussions. The following reasons were given.

- Income-earning work is sought only in situations when the family is hungry. This could happen even if the spouse / other family members are earning & contributing, provided there is a mismatch between number of "earners" and the number of "dependants".
- Deserted women, widows and those with alcoholic husbands or "useless" husbands (the non-contributing males) were the ones who most often sought income-earning work.
- The arrival of the third child in a nuclear family (said doubtfully)

In yet another study conducted by Tamil Nadu Forum for Crèche and Child Care Services, (TN-FORCES 1999) in Chennai slums, at the same time when this study was done, the percentage of mothers of children 0 –3 years engaged in income earning work

was 40%. The study does not however distinguish between mothers with infants (under one year) and those with children above one year of age. Fifty three percent of the non-working mothers in the study cited lack of child care facilities for unemployment. However, the study does not throw light on whether the mothers had been employed prior to the birth of the child and had dropped out for reasons of child care or whether they were contemplating employment now and could not do so because of lack of child care facilities.

The nature of economic activity undertaken by currently working mothers as well as those who were working prior to childbirth are given below.

Table 29. Type of economic activity engaged in by mothers (N = 81)

Type of work	Presently working (N=26)	Previously working (N=55)
Domestic service	10 (38%)	15 (27%)
Construction	2 (8%)	11 (20%)
Beedi folling	2 (8%)	--
Helper in an	1 (4%)	7 (13%)
Office /institution Hawking / vending	2 (8%)	5 (9%)
Factory	6 (23%)	17 (31%)
Any other	3 (11%)	-
Total	26 (100%)	55 (100%)

The results indicate that the majority of currently working mothers were engaged in domestic service. This could be because this avenue provides maximum opportunity for employment while allowing flexibility of timings. The number of mothers engaged in construction work after the arrival of the baby is very negligible, though slightly more numbers were employed prior to child birth. The heavy work involved in construction labour as well as unsuitable condition for child care at the work site have already been recorded by other researchers (Arulraj and Samuel, 1997). About 23% of currently employed women were in factories while in the previously employed group the percentage was of the order of 31%. Though the work hours and timings were not conducive for child care, it was found that these women preferred to work here since the daily wages was higher than what they earn would in any other occupation.

Among the twenty six mothers who were currently engaged in economic activity many were not "continuously" employed and they were constantly in and out of the work force. The following illustrations highlight the situation.

- a. Krishnamma – She is the second wife of a construction worker. She has two step children aged 12 and 8 and has her own biological child about 9 months of age. With the arrival of the baby her husband's income alone was not sufficient to feed five people and therefore she started going out for work as a construction coolie leaving the child in the care of the older children. On the first day when we visited the house we did not find her, but only the children. The infant was highly malnourished and was suffering from diarrhoea. The next day when we visited the house again we found Krishnamma at home since she had stayed away from work in order to take the child to the hospital. She told us that she had been going for work only for a month or so and now contemplated leaving the job since the doctors had scolded her for not taking care of the child properly.
- b. In the case of Jaya, again with three children, she had gone out for work on the day we collected data since her mother had come over and was able to take care of the child. Her husband, a tailor was a drunkard and contributed to the family economy sparingly. Whenever the situation reached an acute stage she would stop the two older children from going to school to take care of the baby and go for work as a casual labourer. Once she augmented some money she would again send the children back to school.

With regard to place of work five mothers were working within the home while twenty were working outside. One mother who was a flower seller would string the flowers within the home and take it out later for marketing. Only ten mothers worked with breaks while the others worked continuously.

The child care strategies of 'working' mothers are presented in Table 30.

Table 30 Child care strategies of working mothers (N = 26)

Care givers	Within home (n = 5)	Outside home (n = 21)
Marital relatives	3	3
Natal relatives	-	8
Neighbours	-	2
Older child	2	4
Taken to workspot	-	4
Total	5	21

From the above table it is evident that even the five mothers who worked within the home needed the support of another care giver to take care of the infant while at work. However the arrangement was an adhoc one since the infant was taken care of by whosoever who was around as an additional support to the mother. Due to this three out of five infants had multiple care givers sometimes even within the same day. With regard to mothers who worked outside the home, it was found that they had a fairly regular arrangement for child care. Multiple care givers were involved in only one case. A majority of mothers (8) depended on natal relatives such as their own mothers, while half the number utilised the services of an older child. Only four mothers who worked as domestic helpers took the children to the workspot. These observations confirm those of Arulraj and Samuel (opcit) and Narayanan (1996) who found that the child care support to working mothers primarily came from natal and marital relatives and comparatively very few women took their children to the workplace.

With regard to the relationship between malnutrition and maternal work status, varied observations have been reported in several studies. Some studies have found that formal employment outside the home interferes with the feeding thereby rendering the children malnourished, while others conclude that women are able to combine economic work with child care without any adverse effect on the nutritional status of their young children. (Popkin etal, 1989 and Leslie, J. 1989) The nutritional status of infants of mothers who are working and that of those who are not working is presented Table 31.

Table 31. Maternal work status and infants nutritional status (n=362)

Mothers' work status	Malnourished infants	Normal infants	Total
Working (n = 27)	9 (33%)	18 (67%)	27
Not working (n=335)	92 (27%)	243(73%)	335
Total	101	261	362

The above table shows that there was only slight difference in the proportion of malnourished infants amongst working and non-working mothers in the given sample, with less than one third being malnourished in the latter group and exactly a third in the former. However for any conclusive decision far more evidence is needed with a larger sample of working mothers.

The major conclusions are:

- Only 7% of the mothers were economically active at the time of the study while 93% were non-working
- Even prior to child birth only 16% had been in the workforce thereby suggesting that child care was not the reason for mothers not being economically active.
- About 38% of the currently working mothers were engaged in domestic service. Only 8% were engaged in construction work while the percentage was 20% amongst those who were working prior to child birth indicating the unsuitability of the job for mothers with young children.
- Only 5 mothers worked within the home and even they needed some support for child care while at work. Amongst the 21 mothers who worked outside of home a majority of 15 mothers depended on family support for child care only 4 took the infants to the workspot.
- There was not much difference in the prevalence of malnourished infants amongst working and non-working mothers though no conclusive decision could be arrived at due to the small number of working mothers.

5. Role of family members in child care

During infancy adult child interaction forms an important basis for development. In the first few months of life the child recognises its mother through the sense of smell and touch. Gradually as it grows older the immediate family members start interacting with the infant thereby increasing the scope for interaction and stimulation. The "social smile" at the third month forms a significant milestone since it is not only a visible evidence of an infants' cognitive development but also very rewarding to the care givers who then begin to recognise the infant as an independent individual with whom they are ready to play and interact.

The nature and pattern of adult child interaction varies from one culture to another. There are several opportunities available to mothers and other family members to interact with the child during the day. They are bathing, feeding, putting the child to sleep, playing and in entertaining. Rocking the child to sleep on the lap or in a hammock is a very common practice. Very often this is accompanied by the singing of lullabies, which not only comforts the infant but also gives it an opportunity to listen to the human voice. Practices of mothers with regard to putting the infant to sleep and in singing lullabies is presented in Tables 32.

Table 32. Methods used for putting the child to sleep (N = 362)

Methods	Age group	
	0 – 4 months (n = 116)	5 – 12 months (n = 246)
On the lap	34 (29%)	58 (24%)
Hammock	27 (23%)	73 (30%)
Both	48 (41%)	74 (30%)
Sleeps on its own	27 (23%)	80 (33%)

Multiple choices were given

More than one option was given by the mothers when asked about the method of putting the infant to sleep. In the younger age group a majority of the mothers said that they either rocked the child on the lap or used the hammock. Mothers also said that sometimes after a feed or after some period of wakefulness in which the infant had been active it went off to sleep on its own probably because it was very tired. With the older age group an equal proportion follows each option interchangeably. About 82% of the mothers said that no lullabies were sung. They felt that the music from the radio or TV which were constantly played was quite sufficient to put the child to sleep. Singing of lullabies was thought to be a "village practice" and out of place in an urban environment.

The role of other family members in some selected child care activities is presented below.

Table 33. Role of family members in child care (N = 362)

Activity	Infant's mother only	Paternal or maternal grandmother	Infant's father and mother	Others with or without infant's mother
Toileting	259 (72%)	33 (9%)	-	70 (19%)
Taking to doctor	130 (36%)	4 (1%)	212 (59%)	Sz34 (9%)
Outing	189 (52%)	17 (5%)	100 (28%)	117 (33%)
Entertainment	110 (29%)	8 (2%)	25 (7%)	106 (29%)
Response to cry	158 (44%)	35 (10%)	34 (9%)	141 (39%)

The five common child care activities in which mothers' opinions were solicited were

- a) Attending to the infants' toilet needs
- b) Taking the infant to the doctor / hospital for routine visits or during illness
- c) Taking the infant while going out for shopping or to the temple and likewise
- d) Playing with the child or entertaining it while the mother is busy
- e) Attending to the child on hearing its cry.

Seventy two percent of the mothers reported that they alone attended to the infants' toilet needs and the role of the spouse is conspicuous by its absence. About 19 % said that other family members did help them while 9 % reported the participation of the infants' paternal or maternal grandmother. The spouse's participation is maximum at the time of illness when a visit to the doctor is made. According to 39% and 33 % of the mothers, responding to a child's cry and taking the child out were activities in which families' participation was the maximum.

As far as the 1-4 month old infants were concerned many mothers reported that the question of "entertaining" the child or playing with it did not arise since it was not old enough for that. Even outings were very limited and restricted to the hospital or the local shop. Most mothers reported that taking care of the young child should preferably be done by older or experienced persons such as the mother or mother-in-law and the child could not be entrusted alone to anyone else in the family.

6. Infant Development

Infancy is the period when growth is at its maximum. The new born which has only a set of reflexes to start with learns to walk and talk at the end of one year. Growth is a complex process. Several enabling and assaulting influences occur and the end result as measured by a single parameter may not adequately capture the complexity or show a straight forward one to one relationship.

While child development experts have defined five domains of development namely physical/motor, cognitive, emotional, social and language, during infancy it is very difficult to differentiate between the various domains. The brain controls all activities and movements and the development of one is influenced by the other (ie) Language development takes place only in conjunction with cognitive development since listening, absorbing and articulating is a mental process.

Nevertheless under 4 months of age an infant is supposed to have well defined reflexes essential for survival. Beyond the age of four months distinct developmental milestones appear, though over a range. As mentioned in the earlier section on methodology, the check list of developmental levels developed by the Madhuram Narayanan Centre was used after suitable modification and field test. There was a maximum of five or six items for every infant. Since a wide range in age is shown by infants with regard to level of development, the infants were grouped together in the following six age groups. :

- First and second month - 1st age-group
- Third months - 2nd age-group
- Fourth and fifth months - 3rd age-group
- Sixth and seventh months - 4th age-group
- Eighth and ninth months - 5th age-group
- Tenth, eleventh and twelfth months - 6th age-group

For each item mothers were questioned as to whether the infants had attained the level of development or not. The percentage of infants who had successfully achieved the level of development for each age-group, as reported by the mothers was then calculated. The reported performance of the children on the developmental items are presented in the following tables.

Table 34. Reported developmental levels of one and two month old infants (N = 55)

Age in months	No. of infants	Score			Total
		2	3	4	
1	27	-	-	27	27
2	28	1	2	25	28
Total	55	1 (1%)	2 (4%)	52 (95%)	55

In the first age-group consisting of one and two month old infants the maximum score obtainable was four and it can be clearly seen that all the one month old infants and most of the two month olds were reported to have secured the maximum score.

Table 35. Reported developmental level of three month old infants (N = 27)

No. of Infants	Score				Total
	2	3	4	5	
27	2 (7%)	14 (52%)	8 (30%)	3 (11%)	27

The third month is a very distinct and important stage in terms of development since during this period the infant recognises and smiles at the primary care giver. This visible response in the infant motivates the care giver to respond thereby initiating a reciprocal adult child interaction. Smiling at the primary care giver was one of the five items. Only three children as reported by the mothers have got a full score while slightly more than half the group have secured a score of three. Thirty percent have reportedly got four out five scores. On the whole nearly 93% of the infants have got three out of five scores or more.

Table 36. Reported developmental levels of infants at four and five months (N=68)

Age in months	No.	Scores				Total
		2	3	4	5	
4	34	2 (5%)	6 (18%)	11 (32%)	15(44%)	34
5	34	--	2 (5 %)	7 (21%)	25 (74%)	34
Total	68	2 (3%)	8 (12%)	18 (26 %)	40 (59%)	68

From the above table it is clear that when the same developmental items were commonly applied to both the groups, the older children could reportedly perform better with 74% of them getting a full score as against 44% in the younger age group. This suggests that perhaps some items are far more relevant to this group than to the younger group. By and large even in the younger group about 95% of the infants have reportedly secured a score of three and above.

Table 37. Reported developmental level of infants at six and seven month (N=60)

Age in months	No.	Scores					Total
		2	3	4	5	6	
6	29	3 (10%)	4 (14%)	7 (24%)	6 (21%)	9 (31%)	29 (100%)
7	31	1 (3%)	2 (6%)	7 (23%)	10 (32%)	11 (35%)	31 (100%)
Total	60	4 (7%)	6 (10%)	14 (23%)	16 (27%)	20 (33%)	60

For this category there were six items. While about one fourth of the infants in both the groups have reportedly got full scores, 52% in the younger group have got a score of five and above while in the latter it is reported to be of the order of 67%. Thus it appears

that just as in the previous age group one or two developmental items seem to be more achievable by the older infants.

Table 38. Reported developmental level of infants at eight and nine months (N=47)

Age in months	No.	Scores				Total
		2	3	4	5	
8	22	2 (9%)	7 (32%)	5 (23%)	8	36%
9	25	2 (8%)	1 (4%)	7 (28%)	15	60%
Total	47	4 (9%)	88 (17%)	12 (26%)	23	49%

This age group also reportedly presents a similar picture as the previous age group. A greater percentage of nine month old infants have reportedly achieved the maximum developmental level, when compared to the eight month old infants, probably because the levels are more appropriate to this group. However in both the age groups the lowest scores were reportedly attributable to less than 10% of the entire sample.

Table 39. Reported developmental level of infants from 10 to 12 months (N=105)

Age in months	No	Scores				Total
		2	3	4	5	
10	35	--	5 (14%)	8 (23)	22 (63%)	35
11	37	--	1 (2%)	5 (14%)	31 (84%)	37
12	33	--	-	7 (21%)	26 (79%)	33
Total	105	--	6 (6%)	20 (19%)	79 (75%)	105

In this age-group as a whole three fourths of the infants had reportedly achieved the maximum developmental level set out for this age. Within this group the levels attained by eleven and twelve month old infants as reported by the mothers, were more or less comparable than those for ten month old infants. This is probably due to the fact that the items were more appropriate and easily attainable by the older group.

The above data seems to suggest that majority of children through all age groups are reportedly normal from the point of view of development. This has to be seen in light of the fact that severely malnourished children in the sample were few and far between, while the proportion of wasted children was much higher. Since wasting signifies only temporary setback, it is quite possible that wasted children may not show readily observable signs of developmental delay.

However these results have to be read with caution since the data on the developmental level of infants was obtained through interviewing the mothers and not through direct field observations of the infants by the investigator. For conclusive evidence direct observation of well nourished and malnourished infants by trained investigators is necessary.

Conclusion

Majority of infants at all age groups seem to have attained satisfactory levels of development as reported by the mothers. However, conclusive evidences as to differences in levels of development amongst well nourished and malnourished children can be arrived at only through direct field observation and testing of infants.

IV. Conclusions and Implications

While research in the area of infancy is comparatively less, that which has looked at the relationship between the quality of care offered and the growth and development of infants is even rarer. The understanding that the totality of care is what affects various aspects of growth and development such as nutritional status, cognitive and psychological development is of fairly recent origin. Consequently methodologies to study care and its various dimensions have still to be well defined and refined.

Seen from this context the present study is an attempt at identifying and documenting the care practices of mothers or primary care givers with specific reference to feeding, healthcare and interaction with the infant. The relationship of these practices to growth and development have also been broadly looked at. Some of the major findings of this study and the issues they raise for future research and action are discussed below:

1. While low birth weight is considered as a major problem to be addressed by developing nations, the present study has pointed to the high degree of malnutrition which progressively sets in during infancy, resulting in nearly two thirds of the infants being underweight at twelve months of age. Since undernutrition during infancy can cause irreversible damage haunting the individual during the rest of his/her life period, the issue of combating malnutrition during infancy is equally worthy of attention as low birth weight.
2. According to the pattern of growth discerned in the study infants could be grouped into four major categories
 - Those born with low birth weight but who grew up to have normal physical growth
 - Those born with low birth weight and who continued to remain undernourished even later

- Those born with adequate body weight but who became malnourished later
- Those born with adequate body weight and who continued to be healthy even later

For the first category of infants there has been a continuum of assault while in the mother's womb and deprived environmental conditions with sub optimal care after birth, leading to malnutrition throughout the whole life period. However with regard to the second group, though they had started with a disadvantage, they had obviously received more than adequate care enabling them to have catch up growth and reach normalcy. Amongst the children who were born with adequate body weight some had slipped into malnutrition pointing to the lack of adequate care while some had continued to grow up normal implying adequate care.

The presence of such positive and negative deviants within the same community can be directly related to the varying coping strategies and caring behaviour of the households in which the infants are born. Since the study looked only at certain broad dimensions of caring behaviour the nuances of why and how some households differ from the others and the differences in behaviour patterns need to be researched further in depth. This will throw light on the areas in which interventions need to be planned.

With regard to feeding and health care practices the following were identified.

- Practically all infants were breastfed at birth and 82% of mothers in the entire sample were breastfeeding at the time of the study.
- In the 1-4 month old age group 81% were exclusively breastfeeding and 18% were giving both supplementary food and breastmilk. Only 2% had completely withdrawn breastmilk,
- In the 5-12 month old category 81% were breastfeeding as well as giving supplementary food to their infants. Eight percent were exclusively breastfeeding and 11% were giving only supplementary food.
- Thirty six percent of mothers in the 1-4 month old age group were giving water while in the 5-12 month old age group this was of the order of 76%. Ninety five percent in the former category and 73% in the latter were reportedly giving protected water to the infant.

- A majority (86% and 74% respectively) in both groups gave gripe water
 - Tumblers, spoons and bottles were the commonly used feeding devices. Bottle at 35% was the least used of all feeding devices.
 - Bottle feeding was not associated with malnutrition since the distribution of malnourished infants was practically equal in both the bottlefed group and the group for which other feeding devices were used.
3. During the last decade the campaigns mounted for reducing the prevalence of malnutrition in early childhood have mainly concentrated on promoting breastfeeding, discouraging the use of the bottle and the timing of supplementary feeding. The findings of this study have indicated the universal nature of breastfeeding the relatively low use of bottle and the preference for other feeding devices over the bottle and the timely initiation of supplementary feeding in most cases. These findings highlight the possibility that other causes for malnutrition may exist than the ones usually attributed. More studies are needed to look at other issues such as the quantity and quality of supplementary foods, adult child interaction while feeding and the home environment in which the child is growing.

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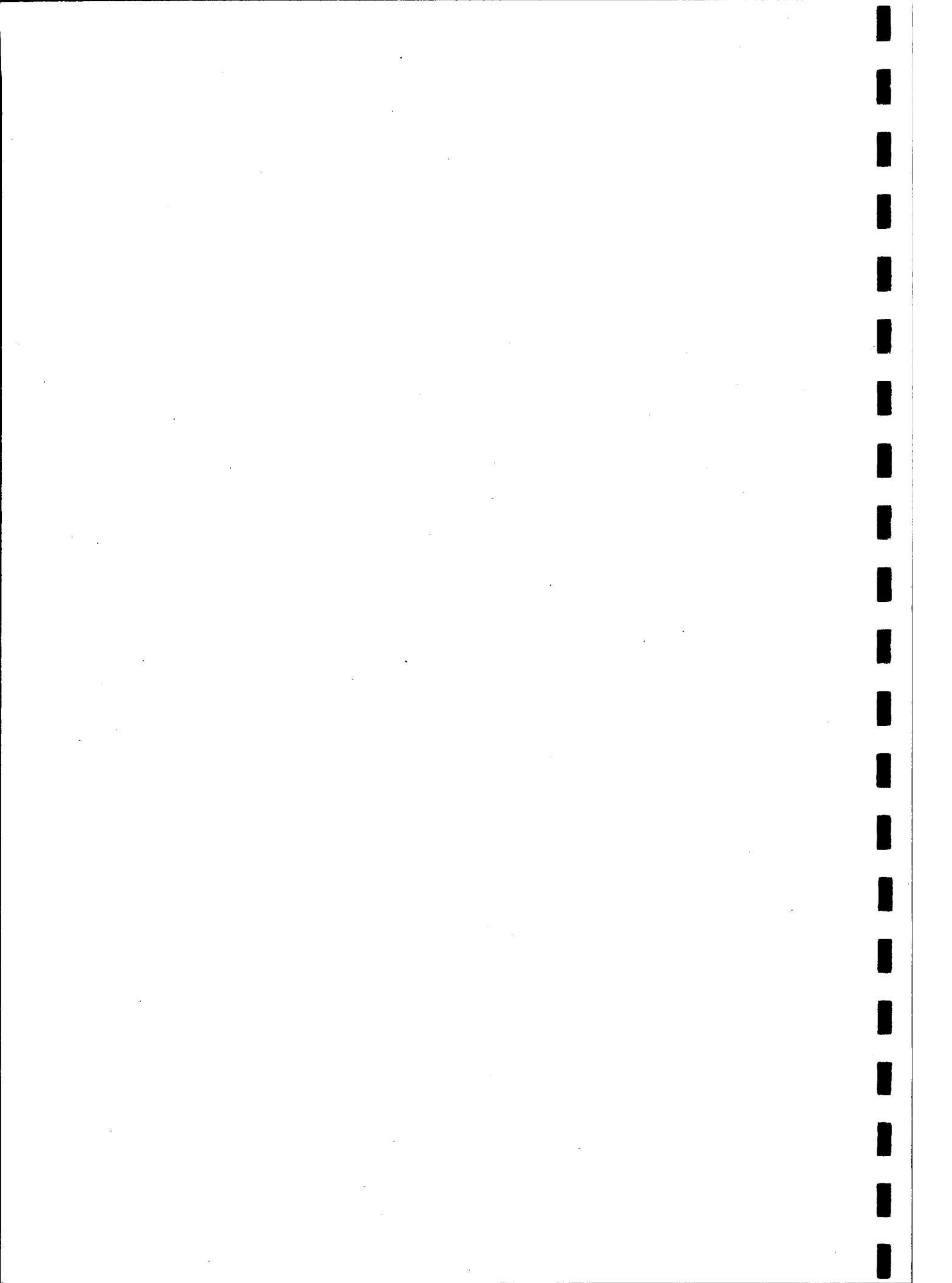
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Annexure I

Zonal Divisions of Chennai City According to the MMDA (Madras Metropolitan Development Authority)

Zone 1	Extended areas of Madras city which are: Thiruvanmiyur Velacheri Kodambakkam Virugambakkam Saligramam Koyambedu Tirumangalam Villivakkam Erukkancheri Kodungaiyur
Zone II	Madras City – South
Zone IV	Madras City - North

Annexure II

Density of Population in Slums of Chennai City in 1987*

Zones	Area	Population	Slums	Population per slum
1	Extended areas	77790	68	1143
3	South Madras	246828	437	564
4	North Madras	326242	491	664

* As per the MMDA survey

Child Care Practices of Mothers and the Growth and Development of infants in Urban Slum

I. Basic Details

--	--	--

1. Mother's Name :
2. Age :
- 15-20 (1)
- 21-25 (2)
- 26-30 (3)
- 31-35 (4)
- >35 (5)
3. Address :
4. Marital Status :
- Married and living with husband (1)
- Divorced / Separated (2)
- Husband migrated for economic work (3)
- Widow (4)
- Polyandrous marriage (5)
5. Educational :
- Did not go to school (1)
- Attended non formal/Adult education (2)
- Went to school (3)
- Diploma / College (4)
6. Class up to which studied :
7. Literacy :
- Literate (1)
- Illiterate (2)
8. Current place of stay :
- Mother's house (1)
- Inlaws / non home (2)
9. Whether Pregnant :
- Yes (1)
- No (2)
10. Whether accepted sterilization :
- Yes (1)
- No (2)
- Signature of investigator :
- Date & Time :

II Child Details

- | | | | |
|---|---|-----------------------|-----|
| 1. Child's Name | : | | |
| 2. Sex | : | Male | (1) |
| | | Female | (2) |
| 3. Birth order | : | First | (1) |
| | | Second | (2) |
| | | Third | (3) |
| | | Fourth | (4) |
| | | Fifth | (5) |
| 4. Gap between this child and older sibling | : | NA | (1) |
| | | Less than three years | (2) |
| | | Three years / or more | (3) |
| 5. Immunisation details | : | | |
| BCG at birth | : | Yes | (1) |
| | | No | (2) |
| Oral polio drops | : | Yes | (1) |
| | | No | (2) |
| 6. What disease does BCG prevent | : | Don't know | (1) |
| | | TB | (2) |
| | | Any other | (3) |
| 7. Mention the vaccination given to the child | : | | |
| | | NA | (1) |
| | | DPT Polio I dose | (2) |
| | | DPT Polio II dose | (3) |
| | | DPT Polio III dose | (4) |
| | | DPT Polio IV dose | (5) |
| 8. Was measles vaccination given? | : | NA | (1) |
| | | Yes | (2) |
| | | No | (3) |
| 9. Do you know why this is given? | : | NA | (1) |
| | | Don't know | (2) |
| | | Polio | (3) |
| | | Any other | (4) |

10. Has the child had any of the following illnesses

- None (1)
- Cold (2)
- Fever (3)
- Diarrhoea (4)
- Any communicable disease (5)
- Any other (6)

11. How often does the child fall ill?

- NA (1)
- Weekly once (2)
- Monthly once (3)
- Once in a fortnight (4)
- Once in four days (5)
- Any other (6)

12. In the event of illness whom do you approach?

- Govt. hospital (1)
- Private hospital (2)
- Relatives / neighbours (3)
- Going to the mosque / trying talisman (4)
- Indigenous medical practitioner (5)
- Simply buy medicines across the counter (6)
- Any other (7)

13. Is the child suffering now from any illness?:

- None (1)
- Cold (2)
- Diarrhoea (3)
- Fever (4)
- Vomiting (5)
- Any other (6)

14. What do you do when there is diarrhoea?:

- Take the child to the doctor (1)
- Religious approach etc (2)
- Don't know (3)
- Continue with breastfeeding (4)
- Modified diet such as Kanji (5)
- RS (6)
- Withdraw food (7)
- Stop breastfeeding (8)
- Any other (9)
- Don't know (10)

15. Do you know about the packet (ORS) given in the hospital for diarrhoea?

- Yes (1)
- No (2)

16. How often do you give a bath to the child?:

- Daily (1)
- Twice or thrice a week (2)
- On alternate days (3)

III. Anthropometric measurements of mother and child

- 1. Date of birth of the child : _____
- 2. Age in months :

1	(1)
2	(2)
3	(3)
4	(4)
5	(5)
6	(6)
7	(7)
8	(8)
9	(9)
10	(10)
11	(11)
12	(12)

in days _____

- 3. Actual birth weight _____

<2.5kg.	(1)
2.5 kg.	(2)

- 4. Birth weights taken after that

Date	Weight
_____	_____
_____	_____
_____	_____

- 5. Mother's Weight _____ kg.
- 6. Mother & child's Weight _____ kg.
- 7. Child's Weight alone _____ kg.
- 8. Child's Height _____ cm.
- 9. Arm Circumference _____ cm.
- 10. Skin fold thickness _____ cm.

IV. Family Details

1.

S.No.	Name	Sex	Age	Relationship to the respondent	Education	Occupation

2. Family Size : 2 (1)
 3 (2)
 4 (3)
 5 (4)
 >5 (5)
3. Total No of Males _____
4. Total No of Females _____
5. Ratio of Males, Females & Children _____
6. Are relatives living nearby Yes (1)
 No (2)
7. If Yes, Who? NA (0)
 Mother (1)
 Mother-in-Law (2)
 Natal relatives (3)
 Marital relatives (4)
8. Type of family : Nuclear (1)
 Nuclear & Relatives (2)
 Nearby (2)
 Joint / Extended (3)
 Joint / Extended & Relatives nearby (4)
9. Total no of earning members in the family :

V. Only for Families with Older Children

S. No	Details	Child 1	Child 2
1	Age	NA (0) <3 yrs (1) 3-5 yrs (2) 6-14 yrs (3)	NA (0) <3 yrs (1) 3-5 yrs (2) 6-14 yrs (3)
2	Sex	NA (0) Male (1) Female (2)	NA (0) Male (1) Female (2)
3	Pre-school	NA (0) Goes to balwadi (1) Does not go (2)	NA (0) Goes to balwadi (1) Does not go (2)
4		If does not go what reasons NA (0) For away (1) Unsatisfactory care (2) Child refuses to go (3) Any other (4)	If does not go what reasons? NA (0) For away (1) Unsatisfactory care (2) Child refuses to go (3) Any other (4)
5		NA (0) Goes to school (1) Doesn't go to school (2)	NA (0) Goes to school (1) Doesn't go to school (2)
6	Reasons for not going to school	NA (0) Child care (1) Employed (2) Refuses to go to school (3) Any other (4)	NA (0) Child care (1) Employed (2) Refuses to go to school (3) Any other (4)

VI. Tasks done by respondent

- | | | | |
|---|---|-------------------------|-----|
| 1. Have you resumed household chores? | : | Yes | (1) |
| | | No | (2) |
| 2. For how long did you rest? | : | 1 month | (1) |
| | | 2-3 months | (2) |
| | | 3-4 months | (3) |
| | | 5-6 months | (4) |
| | | more than that | (5) |
| | | 1 month | (6) |
| | | Continues to be in rest | (7) |
| 3. Who helps you out with household chores? | : | Husband | (1) |
| | | In-laws | (2) |
| | | Mother | (3) |
| | | Natal relatives | (4) |
| | | None | (5) |
| | | Neighbours | (6) |
| | | Child | (7) |
| 4. Are you engaged in income generating activity? | | Yes | (1) |
| | | No | (2) |
| 5. How often do you fall sick? | | Occasionally | (1) |
| | | Once or twice a month | (2) |
| | | Every week | (3) |
| | | Constantly sick | (4) |
| 6. What illness? | | Major | (1) |
| | | Minor | (2) |

VII. Only for those doing economic work

1. What work do you do?

NA	(0)
Domestic work	(1)
Construction work	(2)
Rolling bodies	(3)
Helper in an office / institution	(4)
Self employed	(5)
Factory worker	(6)
Any other	(7)

2. Where do you work?

NA	(0)
Within the home	(1)
Outside the home	(2)

3. Approximately for how many hours do you work each day?

NA	(0)
2 hours	(1)
5-6 hours	(2)
7-8 hours	(3)

4. Do you work continuously or intermittently?

NA	(0)
Continuously	(1)
With gap	(2)

5. Who is the caregiver when you are at work?

NA	(0)
Husband	(1)
Mother-in-law / Other-in-laws	(2)
Mother, other natal family members	(3)
Neighbours	(4)
Older child	(5)
I carry child to workplace	(6)
I take care myself	(7)
Creche	(8)
Child left unattended	(9)

6. Is the workplace nearby?

NA	(0)
Yes	(1)
No	(2)

A. Only for those who are taking the children to the workplace

1. Is there opportunity to approach the child while at work?

- | | |
|-----|-----|
| NA | (0) |
| Yes | (1) |
| No | (2) |

2. If yes, do you breastfeed while working?

- | | |
|-----|-----|
| NA | (0) |
| Yes | (1) |
| No | (2) |

3. If no, what are the reasons?

- | | |
|------------------------------|-----|
| NA | (0) |
| Employer does not allow | (1) |
| Work gets affected | (2) |
| Environment is unsustainable | (3) |
| No time | (4) |
| Any other | (5) |

4. Is it possible to give supplementary feeding at the work place?

- | | |
|-----|-----|
| NA | (0) |
| Yes | (1) |
| No | (2) |

5. If no, why?

- | | |
|------------------------------|-----|
| NA | (0) |
| Employer does not allow | (1) |
| Work gets affected | (2) |
| Environment is unsustainable | (3) |
| No time | (4) |
| Any other | (5) |

VIII. Only for those not engaged in economic activity

1. Were you working when you were pregnant?

Yes	(1)
No	(2)

2. If yes, what work were you doing?

NA	(0)
Domestic work	(1)
Construction work	(2)
Seedy rolling	(3)
Helper in an office / institution	(4)
Self employed	(5)
Factory worker	(6)
Any other	(7)

3. Why did you stop working?

NA	(0)
No one to take care of the child	(1)
Because it is not possible to take care of the child properly	(2)
Any other	(3)

4. When did you stop?

NA	(0)
Before the child was born	(1)
After the child was born	(2)

IX. Feeding Practices

1. What do you give the child at present?

Only breast milk	(1)
Only supplementary feeding	(2)
Both	(3)

2. When did you start breastfeeding after child birth?

First day	(1)
Within the first three days	(2)
After that	(3)

3. Was the child given any thing before being put to the breast?

Yes	(1)
No	(2)

4. Who helped you to initiate breastfeeding?

Mother	(1)
Other natal relatives	(2)
Marital relatives	(3)
Health workers	(4)
Self initiated	(5)

5. Do you give water to the child?

Yes	(1)
No	(2)

6. Is the water boiled?

NA	(0)
Yes	(1)
No	(2)

7. How do you give?

Bottle	(1)
Any other	(2)

8. Do you give anything else to the child?

Nothing	(1)
Vitamin drops	(2)
Gripe water	(3)

A. For only breastfeeding mothers

1. How after do you feed in a day?
 - NA (0)
 - Less than 6 times (1)
 - 7-12 times (2)
 - More than 12 times (3)

2. When do you feed more?
 - NA (0)
 - During day time (1)
 - At night (2)

3. Is it sufficient?
 - NA (0)
 - Yes (1)
 - No (2)
 - Very recently it has become in sufficient (3)

4. If 'no' What are the reasons?
 - NA (0)
 - The child is constantly trying to drink milk (1)
 - Cries frequently (2)
 - Is thin (3)
 - Any other (4)

5. Why have you not started supplementary feeding?
 - NA (0)
 - Mother's milk is sufficient (1)
 - No time (2)
 - Don't have the means to feed (3)
 - Child did not eat (4)
 - Don't know what to give (5)
 - Started but stopped because it did not agree (6)
 - Will start at any time (7)

6. Is there any difficulty in feeding?
 - None (0)
 - Nothing (1)
 - Core nipple (2)
 - Any other (3)

7. Do you give / Have you given anything else to eat besides breast milk?

- | | |
|----------------|-----|
| NA | (0) |
| Nothing | (1) |
| Biscuit / Idly | (2) |
| Coffee / Tea | (3) |
| Baby food | (4) |
| Any other | (5) |

8. What is the reason?

- | | |
|------------------------------|-----|
| NA | (0) |
| Because I had to go out | (1) |
| Insufficient breast milk | (2) |
| We used to indulge the child | (3) |
| Whenever we ate | (4) |

9. When should supplementary feeding begin?

- | | |
|---------------------|-----|
| NA | (0) |
| Within three months | (1) |
| Within four months | (2) |
| After 6 months | (3) |
| After 7 months | (4) |
| Any other | (5) |

B. Only for those who give supplementary feeding

1. Why did you stop breast feeding?

- | | |
|-----------------------------|-----|
| NA | (0) |
| Mother's ill health | (1) |
| Child refused to eat | (2) |
| Child's ill health | (3) |
| Lack of milk | (4) |
| Had to start household work | (5) |
| Had to go out for work | (6) |
| Any other | (7) |

2. When did you stop?

- | | |
|---------------------|-----|
| NA | (0) |
| Within three months | (1) |
| 4 - 6 months | (2) |
| 7-9 months | (3) |
| 9-12 months | (4) |

3. What food do you give?

- NA (0)
- Liquid food (1)
- Semisolid food (2)
- Both (3)

4. Mention the food?

- NA (0)
- Milk (1)
- Coffee, Tea (2)
- Baby food (3)
- Ragi Kanji (4)
- Rice (5)
- Tiffin items (6)
- Biscuit (7)
- Any other (8)

5. How many times do you feed?

- NA (0)
- Once or twice (1)
- 3 - 4 times (2)
- More than that (3)

6. Who gives?

- NA (0)
- Child's mother (1)
- Mother in law/mother (2)
- Other family members (3)
- Neighbours (4)
- Older child (5)
- Husband (6)

7. How is it given?

- NA (0)
- Bottle (1)
- Otherwise (2)

8. When should one start supplementary feeding?

- NA (0)
- Within 3 months (1)
- At 4 months (2)
- After 6 months (3)
- After 7 months (4)
- Any other (5)

C. Those who give bother breast milk and supplements

1. When did you start supplementary feeding?

- NA (0)
- As soon as the child was born (1)
- Within three months (2)
- 4 - 6 months (3)
- More than that (4)

2. Why do you give supplementary feeding?

- NA (0)
- Lack of mother's milk (1)
- Because household work is resumed (2)
- Mother has to go out to work (3)
- Any other (4)

3. How often do you breastfeed?

- NA (0)
- Once or twice (1)
- 3-6 times (2)
- More than that (3)

4. How often do you give supplementary feeding?

- NA (0)
- Once or twice (1)
- 3-6 times (2)
- More than that (3)

5. Name the food?

- NA (0)
- Solids (1)
- Liquids (2)
- Both (3)

6. What food do you give?

- NA (0)
- Milk (1)
- Coffee, tea (2)
- Baby food (3)
- Juice (4)
- Ragi kangi (5)
- Rice / Dhal / Idly / Vegetable (6)
- Biscuit (7)
- Any other (8)

7. Who gives?

- | | |
|------------------------|-----|
| NA | (0) |
| Child's mother | (1) |
| Mother in law / mother | (2) |
| Other family members | (3) |
| Neighbours | (4) |
| Older child | (5) |
| Husband | (6) |

8. When should you begin supplementary feeding?

- | | |
|---------------------|-----|
| NA | (0) |
| Within three months | (1) |
| At 4 months | (2) |
| After 6 months | (3) |
| After 7 months | (4) |
| Any other | (5) |

XI. Child Development

A. Role of family members

1. Is the child taken out?

- Yes (1)
No (2)

2. Who does the following activities ?

- Attending to child's toilet needs ()
Talking to the doctor ()
Carrying the baby when going out ()
Talking the child out for entertainment ()
Picking up and pacifying the baby when crying ()

Child's mother (1), (respondent) Husband (2), Mother-in-law/ mother (3),
Older children (4), Other women in the family (5), Other men in the family (6)

3. How do you put the child to sleep?

- Rocking it to sleep on the lap (1)
Rocking it to in a hammock (2)
Combination of both (3)
Child sleeps on it own (4)
Any other way (5)

4. Do you sing to the child?

- Yes (1)
No (2)

B. Mile Stones

For children up to two months of age (<1 month, 1+2+)

1. Does the child turn its head this way and that while lying down?

- NA (0)
Yes (1)
No (2)

2. Does it cry when hungry or when there is discomfort? Does it jerk on hearing a loud noise?

NA	(0)
Yes	(1)
No	(2)

3. Does it get comforted when picked up / sing to / talked to?

NA	(0)
Yes	(1)
No	(2)

4. Is the rooting reflex well developed?

NA	(0)
Yes	(1)
No	(2)

For children who have completed three months of age

1. Does it move its limbs in response to seeing a moving object or hearing a sound?

NA	(0)
Yes	(1)
No	(2)

2. Does it swipe at objects within reach?

NA	(0)
Yes	(1)
No	(2)

3. Does it prattle when content?

NA	(0)
Yes	(1)
No	(2)

4. Does it give a social smile?

NA	(0)
Yes	(1)
No	(2)

5. Does it try to hold / touch known objects (e.g. bottle)?

NA	(0)
Yes	(1)
No	(2)

Only For children who have completed 4 months or 5 months (4+, 5+)

1. Is the child able to hold its head steadily without shaking when lifted?

NA	(0)
Yes	(1)
No	(2)

2. Does it turn over on its stomach?

NA	(0)
Yes	(1)
No	(2)

3. Does it prattle? Does it recognise when called by name?

NA	(0)
Yes	(1)
No	(2)

4. Does it take small objects held in hand to its mouth?

NA	(0)
Yes	(1)
No	(2)

5. Does it smile and play with family members? Does it stop crying on seeing them?

NA	(0)
Yes	(1)
No	(2)

Only For children who have completed 6 months, 7 months (6+, 7+)

1. Does it turn on its stomach and back again?

NA	(0)
Yes	(1)
No	(2)

2. Does it move as far as its body length either backwards or forwards?

NA	(0)
Yes	(1)
No	(2)

3. Does it try to repeat sounds heard by it?

NA	(0)
Yes	(1)
No	(2)

4. Does it imitate simple gestures? (example clapping) ?

NA	(0)
Yes	(1)
No	(2)

5. Does it show willingness to be lifted by known individuals? (Does it try to pull the facial features of adults)

NA	(0)
Yes	(1)
No	(2)

6. Does it consume mashed food when fed by adults?

NA	(0)
Yes	(1)
No	(2)

Only for children who have completed 8,9 months (8+, 9+)

1. Does it game a little to reach out to objects?

NA	(0)
Yes	(1)
No	(2)

2. Does it look at an object when the object is named?

NA	(0)
Yes	(1)
No	(2)

3. Does it respond to a gesture with gesture?

NA	(0)
Yes	(1)
No	(2)

4. Does it find out hidden objects?

NA	(0)
Yes	(1)
No	(2)

5. Can it drink from a tumbler when held to its mouth?

NA
Yes
No

Only for children who have completed 10,11,12 months of age (10+, 11+, 12+)

1. Does it sit without support? Gets up on its own?

NA	(0)
Yes	(1)
No	(2)

2. Does it stop doing an activity when told not to do so? Does it refer to objects/ individuals using mono syllables?

NA	(0)
Yes	(1)
No	(2)

3. Is it able to pick up articles and fill bones? Does it scatter them? Does it find out hidden objects?

NA	(0)
Yes	(1)
No	(2)

4. Does it pick up foodstuff fruits own and eat?

NA	(0)
Yes	(1)
No	(2)

XII. Communication

1. Do you listen to radio?

- | | |
|---|-----|
| No | (1) |
| Occasionally | (2) |
| Daily | (3) |
| Often | (4) |
| Can't avoid hearing when neighbours play it | (5) |

2. If yes what programmes do you like to listen?

- | | |
|---------------------------|-----|
| NA | (0) |
| Cinema | (1) |
| Programmes about children | (2) |
| News | (3) |
| Health / Hygiene | (4) |
| Women's programme | (5) |
| Anything | (6) |

3. Do you watch TV?

- | | |
|--------------|-----|
| No | (1) |
| Occasionally | (2) |
| Daily | (3) |
| Often | (4) |

4. If yes what programmes do you watch?

- | | |
|--------------------------|-----|
| NA | (0) |
| Cinema | (1) |
| Programme about children | (2) |
| News | (3) |
| Health / Hygiene | (4) |
| Women's Programme | (5) |

5. Do you read any magazines?

- | | |
|--------------|-----|
| No | (1) |
| Occasionally | (2) |
| Daily | (3) |
| Often | (4) |

Checklist of Skills from Birth to Two Years

Socialization Skills 1 to 50

1. Responds to visual stimulation. New born
2. Responds to tactile stimulation. 1st month
3. Quietens when picked up. 1st month
4. Follows object usually moved past midline of the body. 3rd – 4th month
5. Maintains eye contact for three seconds. 1 ½ month
6. Looks at person attempting to gain attention. 3rd – 4th month
7. Smiles spontaneously. 4th month
8. Watches person moving directly in line of vision. 4th month
9. Looks at own hands, often smiles or vocalizes. 4th month
10. Follows object with eyes across 180 degrees (one semi circle). 4th month.
11. Seeks eye contact when attended to 2-3 minutes. 4th month.
12. Quietens or changes body position in response to presence of persons. 4th month
13. Smiles in response to attention. 4th month
14. Responds to being in family circle by smiling, vocalling or ceasing to cry. 4th month
15. Plays with own feet and toes. 4th month
16. Looks at preferred person or object pointed to. 6th month
17. Reaches for familiar persons. 6th month
18. Vocalizes to gain attention 6th month.
19. Laughs. 6th month
20. Pats and pulls at adult facial features. 7th month
21. Shakes or squeezes object in hand making sound unintentionally. 8th month
22. Offers toy or object, but does not always release it. 10th month.
23. Accepts parental absence by continuing activity, may momentarily fuss. 10th month.
24. Plays unattended for 10-15 minutes. - 10th month - 1 year.
25. Imitates peek A Boo. 10th month – 1 year.
26. Waves "Bye – Bye" in imitation of adult. 10th month – 1 year.
27. Squeezes or shakes toys to produce sound, In imitation. 10th month
28. Repeats action that produces laughter and attention. 10th month – 1 year.
29. Smiles and vocalizes to mirror image. 1 year.
30. Reaches for and pats mirror image or another infant. 1 year.
31. Extends toy to adult and releases it. 1 year.
32. Raises arm "so big" in imitation of adult. 1 ½ years.
33. Plays with another child each engaged in different activity 1 ½ year
34. Hugs, pats, kisses familiar persons. 1 ½ years
35. Withdraws hand says, "No No" when near forbidden object, with reminder 1 ½ years.
36. Waits for needs to be met when placed on chair / mat. 1 ½ years.
37. Greets peers and familiar adults when reminded. 1 ½ years.
38. Accedes to parental requests 50% of the time. 1 ½ - 2 years.
39. Hugs and carries soft doll or toy. 2 years
40. Imitates movement of another child at play. 2 years
41. Takes part in manipulates, games (turns handle, pulls string) with another person, 2-5 minues. 2 years

42. Pulls at another person to show some action or object. 2 years
43. Hands a book to adult for a story to be read / shared. 2 years
44. Takes part in game, pushing car or rolling ball with another child for 2-5 minutes. 2 years
45. Imitates adult in simple tasks. 2 years
46. Shares object or food, when requested, with one other child. 2 years.
47. Leads adult to what is wanted. 2 years
48. Plays with two or three peers. 2 years
49. Helps with household tasks. 2 years
50. Listens to story, answers to simple questions relating to it. 2 years

Cognition Skills 1 to 50

1. Opens mouth prior to nipple touching the mouth. New born. 1st month
2. Looks for object that has been removed from direct line of vision. 1st month
3. Removes cloth from face that obscures vision. 2nd - 6th month.
4. Holds and explores objects with mouth, toys and so on - 4th month.
5. Turns a bottle upside down to feed himself (Inverted 180 degrees) 4th month
6. Vocalizes displeasure when favourite / needed / toy is withdrawn or preferred activity is stopped. 4th month
7. Regards any new object using all senses. 4th month
8. Holds and examines the offered object for atleast a minute. 5th month.
9. Responds differently to friendly and angry talking. 6th month.
10. Looks at the floor when something falls down. 6th month.
11. Performs simple gesture on request - clapping hands. 6th month.
12. Opens mouth when sees spoonful of food. 6th month.
13. Attains partially hidden object. 8th month
14. Shakes a sound making toy on a string. 8th month.
15. Finds objects hidden under container. 10th month.
16. Indicates wants, not crying. 10th month
17. Removes object from open container by reaching into container. 10th month.
18. Places object in container in imitation. 10th month.
19. Drops and picks up toys. 10th month
20. Places ring on stand. 10th month
21. Attains completely hidden object. 1 year.
22. Places object in container. 1 year.
23. Puts objects in container, empties container. 1 year.
24. Individually takes out the objects from container. 1 year.
25. Pushes three blocks, train style. 1 year.
26. Attends to easy /familiar task for 1-5 minutes when supervised. 1 year.
27. Transfers object from one hand to another to pick up another object. 1 1/2 years.
28. Points three body parts on shelf. 1 1/2 years.
29. Points to self when asked, "where is(Name) ? " 1 1/2 years.
30. Actively explores his environment. 1 1/2 years.
31. Points to named picture. 1 1/2 years.
32. Points in answer to questions. 1 1/2 years.
33. Initiates sounds, words, body movements spontaneously. 1 1/2 years.
34. Stacks any three objects on request. 2 years.
35. Places five round pegs in pegboard on request. 1 1/2 2 years
36. Removes circle from form board. 2 years.
37. Inverts a small vial in order to retrieve materials. 2 years.
38. Labels objects in his environment. 2 years.
39. Matches like objects. 2 years.
40. Follows simple instructions to locate objects. 2 years

41. Scribbles. 2 years.
42. Matches object with picture of the same object. 2 years.
43. Turns pages of a book, 2 to 3 at a time, to find named picture. 2 years.
44. Places the different shapes in a three piece form board. 2 years.
45. Performs new activities / tasks when required. 2 years.
46. Finds specific personal item on request. 2 years.
47. Locates objects using indirect visual clues. 2 years.
48. Uses a stick to retrieve an object. 2 years.
49. Uses new object differently from other objects. 2 years.
50. Relates to cause effect situation correctly. 2 years.

Languages Skills 1 to 50

1. Responds to sound by quietening, by attention, by following direction of sound, by eye and body movement. 1st month.
2. Cries differently due to different discomforts. 1st month.
3. Follows sound, moving head. 2nd month.
4. Quietens at the sound of humming, singing and talking. 2nd month.
5. Coos and gurgles when content. 3rd - 4th month.
6. Vocalizes, producing sounds on his own initiative. 4th month.
7. Initiates vocal play with toys. 4th month.
8. Initiates vocal play with people. 4th month.
9. Babbles. 4th - 5th month.
10. Responds to name by looking up or by stopping activity. 4th - 5th month.
11. Repeats sounds, vocalizes. 5th - 6th month.
12. Looks at mouth to get cues for sound production. 5th - 6th month.
13. Vocalizes to music. 5th month.
14. Presses, purses or rounds lips in imitation or on request to produce sounds. 5th month.
15. Looks at person name. 6th month.
16. Places tongue against roof of mouth to produce sounds. 6th month.
17. Imitates, speech sounds. 7th month.
18. Looks at an object that has been named. 8th month.
19. Imitates sounds and syllables in songs and rhymes. 8th month.
20. Imitates mouth movements, through mirror aided instruction. 8th month.
21. Combines two different syllables in vocal play. 8th month.
22. Responds to gesture with gesture. 8th month.
23. Imitates individual sounds and phrases spoken by others. 9th month.
24. Imitates voice intonation patterns of others. 10th month.
25. Stops activity when said "No". 10th month - 1 years.
26. Uses one syllable sound for an object/person. 11th month - 1 year.
27. Points in response to simple questions. 1 year.
28. Articulates, using sounds, to indicate, preferred objects on needs. 1 ½ years.
29. Carries out simple directions when accompanied by gestures. 1 ¼ years.
30. Answers simple questions with non-verbal response. 1 ¼ years.
31. Points to familiar objects when named. 1 ¼ years.
32. Can respond to "give me" or "show me" upon request. 1 ¼ years.
33. Asks for more. 10th - 15th month.
34. Says, "All-gone". 10th - 15th month.
35. Combines use of words and gestures to make wants known. 10th - 15th month.
36. Vocalizes in response to speech of other persons. 1 ½ years
37. Says first intelligible spontaneous word. 1 ½ years.
38. Produces animal sounds or uses sounds for animal names. 1 ½ years.
39. Answers 'Yes' or 'No' to questions with affirmative or negative reply. 1 ½ years

40. Uses single word meaningfully to label. 1 ¾ years
41. Says different words. 10th – 21st month.
42. Points to pictures when named. 18th month – 2 years
43. Names three body parts on doll or on person. 18th month – 2 years.
44. Names five other family members. 2 years
45. Asks for some common food item by name when shown. 2 years
46. Follows three different one-step direction without gesture. 2 years.
47. Asks questions by rising intonation. 2 years
48. Carries out simple commands / directions containing personal pronouns. 2 years
49. Says own name upon request. 2 years
50. Carries out simple one-part commands or directions containing adjectives that denote differences in visual forms. 2 years.

Self-help Skills 1 to 50

1. Sucks and swallows liquid. New born
2. Open mouth and turns head for bottle / breast when nipple touches mouth. 1st month.
3. Vocalizes / cries when wet. 1st month
4. Reaches for bottle. 3rd – 4th month.
5. Directs bottle by guiding it towards mouth or pushing it away. 4th month.
6. Eats strained food fed by parents. 4th month
7. Falls asleep at appropriate times. 4th month.
8. Closes lips over spoon / glass while feeding. 4th month.
9. Eats mashed food fed by parent. 6th month.
10. Eats semi solid food fed by parent. 7th month.
11. Holds bottle without help while drinking. 8th month
12. Drinks from cup held by parent. 8th month
13. Ceases drooling 10th month.
14. Holds and drinks from cup using two hands. 1 year.
15. Dressing – holds out arms and legs while being dressed / undressed. 1 years.
16. Sits on potty/infant toilet for 5 minutes. 1 year.
17. Co-operates when hands and face are washed. 1 year. \
18. Feeds self using fingers. 10th month – 1 year.
19. Uses words/gestures to make wants known. 1 year.
20. Puts hat / cap on head, takes it off. 1 year
21. Stirs with spoon in imitation. 1 ¼ years.
22. Bites and chews well. 1 ¼ years.
23. Takes spoon filled with food to mouth with help. 1 ½ years.
24. Licks food around moutn. 1 ½ years.
25. Remains dry for one or two hours. 1 ½ years.
26. Has bowel control. 1 ½ years.
27. Eats a little food with had/spoon independently - some spilling. 1 ½ years
28. Chews and swallows only edible substances. 1 ½ years.
29. Puts hands in water and wets face in imitation. 1 ½ years.
30. Imitates various grooming actions with specific objects. 1 ½ years.
31. Brushes teeth with aid. 1 ½ years.
32. Washes hands with aid. 1 ½ years.
33. Dries hand with a towel. 1 ½ years.
34. Holds and drinks from cup with one hand. 1 ¾ years.
35. Takes off shoes when laces are untied and loosened. 1 ¾ years.
36. Takes off pants/panties (with elastic) 1 ½ - 2 years.
37. Pulls of socks. 2 years.
38. Pushes arms though sleeves and legs through pants. 2 years.

39. Takes off shirt/blouse (front open) when unfastened. 2 years.
40. Unzips and zips large zips without working catch. 2 years.
41. Travels to toilet with aid. 2 years.
42. Washes hands after toileting, with assistance. 2 years.
43. Sucks liquid from glass/cup using straw. 3 years
44. Locates toilets in familiar setting. 2 years
45. Wears shirt / frock with aid. 2 years
46. Combs hair with aid. 2 years.
47. Wipes face with damp cloth with aid. 2 years
48. Washes self when being bathed. 2 years
49. Unwraps chocolates, peels banana. 2 years
50. Slips on shoes with aid. 2 years.

Motor Skills 1 to 50

1. Moves head to side while on back. New born.
2. Moves head while on back. 1st month.
3. Thrusts arms and legs in response to sounds and moving objects (all four limbs involved) New born – 3rd month.
4. Attempts to hold head up when pulled to sitting. 2nd – 3rd month.
5. Swipes at objects. 3rd month.
6. Holds head up and steady when, held against shoulder / rocked on thigh. 3rd–4th month.
7. Attempts to roll over using shoulders. 3rd month.
8. Kicks vigorously while on back. 4th month onwards.
9. Controls head and shoulders, when support is withdrawn. 4th – 5th month.
10. Turns from stomach down to side. 4th month.
11. Rolls from back to side. 4th month onwards.
12. Reaches for objects in front. 6th month.
13. Reaches and grasps objects in front. 6th – 7th month.
14. Rolls from stomach to back, back to stomach. 6th month.
15. Reaches for preferred objects. 8th month.
16. Turns head when body is supported. 7th month
17. Holds head and chest supported on arms while on stomach. 7th month.
18. Holds head and chest supported on arm. 7th month.
19. Moves forward one body length, creeps, 6th – 7th month.
20. Sits with support. 7th – 8th month.
21. Rocks on hands and knees. 8th month.
22. Crawls one body length to obtain object. 9th month.
23. Bounces up and down in standing position while being supported. 8th month.
24. Pulls to sitting position grasping adult fingers. 8th month.
25. Releases small objects and play things. 10th month.
26. Flings objects haphazardly. 10th month.
27. Moves from stomach down to sitting position. 10th month.
28. Maintains sitting position for two minutes. 10th month.
29. Sits without support. 10th month
30. Pulls self to standing position. 10th month – 1 year
31. Stands with maximum support. 10th month – 1 year.
32. Picks up and drops object on purpose. 10th month – 1 year
33. Lowers self from standing to sitting position. 10th month.
34. Uses pincer grasp to pick objects. 1 year.
35. Cruises around furniture. 10th month – 1 year
36. Stands with minimum support. 1 year – 1 ¼ year
37. Stands alone for one minute. 1 ¼ years.

38. Takes a few steps without aid. 1 years.
39. Bends at waist to pick up objects, without falling. 1 ½ years
40. Walks independently. 1 ½ years.
41. Squats and returns to standing position. 1 ¾ years – 2 years
42. Retains two one-inch cubes in one hand. 1 ½ years – 1 ¾ years
43. Creeps downstairs, feet first. 2 years
44. Creeps upstairs. 2 years
45. Walks upstairs with aid. 2 years
46. Squeezes by curling fingers around an object. 1 ½ years
47. Holds thumb two fingers in apposition. 1 ½ years
48. Moves thumb in opposition to four fingers. 1 ¾ years
49. Pushes and pulls toys while walking. 2 years
50. Imitates circular motion. 2 years.



