IMPACT OF SMALL AND MEDIUM TOWN DEVELOPMENT PROGRAMME OF UNICEF ON WOMEN AND CHILDREN WITH SPECIAL REFERENCE TO THE NUTRITION STATUS

BY

JAYASREE, M. J.

THESIS

SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENT FOR THE DEGREE OF
MASTER OF SCIENCE
IN FOOD SCIENCE AND NUTRITION
FACULTY OF AGRICULTURE
KERALA AGRICULTURAL UNIVERSITY

COLLEGE OF RURAL HOME SCIENCE
VELLAYANI, TRIVANDRUM

1987

DECLARATION

I hereby declare that this thesis entitled "Impact of Small and Medium Town Development programme of UNICEF on women and children with special reference to the nutrition status" is a bonafied record of research and that the thesis has not formed the basis for the award to me of any degree, diploma, associateship, fellowship or other similar title of any other University or Society.
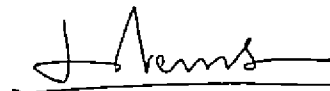
Vellayani.

JAYASREE M.J.

CERTIFICATE

Certified that this thesis entitled
"Impact of Small and Medium Town Development
programme of UNICEF on women and children with
special reference to the nutrition status" is a
record of research work done independently by
Smt. Jayasree, M.J. under my guidance and super-
vision and that it has not previously formed the
basis for the award of any degree, diploma, fellow-
ship or associateship to her.

Dr.L.PREMA, 3|10|87 .
Chairman,
Advisory Committee,
Professor and Head,
College of Rural Home Science

Vellayani

10-9-1987.

APPROVED BY

CHAIRMAN

   Dr.L.PREMA

                       3\10\87

MEMBERS:

1. Dr.P.SRASWATHI

2. Smt.MARY UKKURU, P.

3. Smt.S.CHELLAMMAL

EXTERNAL EXAMINER   3. 10 . 87

ACKNOWLEDGEMENT

CONTENTS

--:--

LIST OF TABLES

LIST OF TABLES (Contd.)

LIST OF TABLES (Contd.)

—:0:—

LIST OF FIGURES

--

APPENDICES

I. Schedule for socioeconomic and food consumption.

II. Schedule for weighment method

III. Schedule for clinical examination

IV. Estimation of haemoglobin-Cyanmethaemoglobin method.

V. Schedule to test the mothers knowledge in health and nutrition.

VI. Schedule to assess the attitude of women towards the programme.

VII. Organizational chart.

INTRODUCTION

INTRODUCTION

The pace of urbanization in the industrialized countries seems to have passed its peak during the past few years. Urban experts had. estimated that by the year 2000, 50 per cent of the population in Asia will be urban (Mandl 1982). During 1971-81 for the first time, the urban population of India began to grow faster (4.6 per cent) than the overall natural growth rate (2.5 per cent) Kimali (1985).

A large part of the urban population consists of imigrants, who live as squatters in slums. Patel (1986) pointed out that these urban dwellers consist of government workers, business-men, industrialists, workers of private sector of which a good number are rural poor who move from rural areas to urban locations mainly in search of work and to enjoy urban amenities, which are rare in many rural situations. Migration from rural to urban invite a dynamic change in the economic structure and ecological set up and act as a breaker in the field of culture (Rao 1977). These migrants are mostly occupants of shanty towns that spring up on the periphery of the cities as a menace to public health.

The urban slum dwellers are the same poor people as the rural poor, but their socioeconomic conditions are

much worse. Moreover many developmental agencies
including government have neglected the urban slum
dwellers for a long time which aggravated the situation.
The quality of life of the urban population is progressively
diminished by an inhospitable physical environment.
Majority of these urban population are living below the
poverty line and the health situations of the urban
population are appaling.

The effect of rapid urbanization affects mostly the
vulnerable groups viz, women and children. Nearly 2,00,000
urban children die annually due to diarrhoeal dehydration.
Large numbers of urban children who either die or become
disabled daily, as a result of malnutrition or due to
combined force of infection and malnutrition. National
Nutrition Monitoring Bureau (1984) reports that 79.3 per
cent children of the slum dwellers are suffering from mild
to moderate degress of malnutrition. Maternal mortality
and morbidity rate in urban population is also high.
Unless a series of immediate imaginative and well co-
ordinated actions are taken on a war footing by the
government to arrest the present trend, the urban popula-
tion will continue to be cooped in shacks and humiliating
hovels on the margins of life. Improving the conditions
of the urban poor children and their families require major

economic/social and physical development efforts that
address the problems of unemployment, shelter, health,
land tenure and other basic services. To meet this
challenge, approach has to become nonconventional and
innovative and should be able to bring communities
together, with the full involvement of the various
government and nongovernment organizations.

The draft VIth plan provides that the thurst of
urbanization policy during the next decade must be to
slow down and if possible reverse the rate of growth of
metropolitan cities and increase the rate of growth of
small and medium towns, enabling them as growth and
service centres for the rural hintherland. With this
view the government of India has given shape to a centrally
sponsered scheme of Integrated urban development for
small and medium towns having a population of less than
one lakh.

The Small and Medium Town Development Programme
(SMTD) is implemented in Kerala in the three towns namely
Alleppey, Kayamkulam and Shertallay from 1982 onwards.
This programme is a practical and effective system through
which health and nutrition services could be delivered to
low socioeconomic groups, in the urban areas, using the
existing resources to the maximum extent possible and
using minimal additional inputs.

Impact of such developmental programmes on the community is to be evaluated periodically to suggest modifications and mid term corrections. In this context, the present study is designed to evaluate the impact of SMTD in the selected municipalities by assessing its effect on beneficiaries with special reference to their nutritional status and attitude towards the programme.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

The rate of urban growth had reached such a
level that by the year 2000 AD, 44 per cent of the
population in less developed regions would infact be
living in urban agglormerations, and 50 per cent of
these city dwellers would be struggling for survival
in slums and shanty towns (Donohue 1982). In India
total urban population is 160 million and out of this
30 to 40 million are slum dwellers and 40 per cent of
the urban families live in just one room (UNICEF, 1985).
Wishwakarma (1976) reported that the urban population
of India had grown considerably from 34 million in 1901
to 109 million in 1971 and it is expected to rise to a
level of 300 million by 2001 due to an increase in the
tempo of economic development and modernisation.
According to Belisle (1987) complications in the urban
equation is due to the fact that a large portion of the
urban growth is totally unplanned.

Desai (1972) reported that the rapid development of
industrial and urban economy had opened employment oppor-
tunities which pulled the rural masses to adjacent small
towns. A close examination of the conditions in the cities
by Saxena (1978) showed that much of the urban growth is

the result of migration of people from villages to
cities. According to Barik (1984) most slum dwellers in
Oriya were rural immigrants. Mukharjee (1979) found that
the more an individual is poor, and less socio-economi-
cally deprived, greater is the chance of his migration
from rural to urban areas. According to Singh (1986)
rural to urban migration is a significant factor of
growth in the area of perpetual concentration of urban
population. The study also showed that Bihar and Kerala
were out migrating States whereas West Bengal was an in
migrating State.

Rao and Singh (1974) revealed that previous migrants
worked as motivation by supplying the rural people food,
shelter and other necessaries at initial stages. Consider-
ing only the internal migration, 58 million males, consti-
tuting 18 per cent of all male population and 138 million
females, accounting for 44 per cent of all females, were
classified as migrants in 1981 (Census of India, 1981).
According to a study conducted by Bose (1978) adolescents
and adults were excessive among the migrants of internal
migration in India and most of the migrants were from
short distance. In case of long distance migration the
male migrated first for employment purposes and then
carried his family members depending upon the distance of
migration (Kamble 1980). A study conducted by Singh (1986)

in Bihar showed that more married people migrated to
urban areas whereas in Kerala the singles had higher
propensity to migrate. According to Dhanadaye (1982)
in Gulburga city, Karnataka, the sex ratio was higher
in the slums than in the general population of the city
and it was 901 females per 1000 males in general popula-
tion of the city and in the slums it was 977 females
per 1000 males. He had also showed that the slums in
the city mostly consisted of nuclear type of families
and 71.9 per cent of the slum dwellers were illiterate.
A survey conducted in Bombay by Nukhood (1970) had
revealed that the city alone had 144 slums with a popula-
tion of about a million and another 2,00,000 on foot paths
and swamps. Migration in search of employment had given
rise to female headed households, and these women represented
the poorest among the poor (Tinker 1976). In Kerala urban
agglormeration was felt in districts like Trivandrum,
Quilon, Cochin, Trichur, Palghat, Calicut, Tellicherry
and Cannanore (Resource Atlas of Kerala, 1984). Desouza
(1978) reported that half of India's population was esti-
mated to be poor in 1977-78 on the basis of a minimum
income of Rs.65 per capita per month for rural areas and
Rs.75 per capita per month for urban areas. He had also
reported that the States with the highest levels of urban
poverty are Kerala (51.44 per cent) Uttar Pradesh (49.24
per cent) Madhya Pradesh (48.09 per cent) and Bihar

(46.07 per cent). Kopardekar (1986) pointed out that the proportions of unemployed persons to the total labour force was higher in the urban areas than in the rural hintherland, leading to increasing urban poverty.

According to a study conducted by Madavo (1978) in most of the cities one fourth to one half of the urban population lived in intense deprivation and denial of their basic needs. Hoskin (1987) reported that the cities and towns in developing countries were growing 10 per cent or even more each year creating enormous health, sanitation, water supply and housing problems. Nukhood (1970) had also stated that the conditions in the shanty towns were so filthy that streets were littered with garbage and people live without electricity, water supply and sanitary conveniences. Hollnsteiner (1982) pointed out that children born into urban slums and shanty towns were forced into a situation of constant deprivation, poor and overcrowded housing, open sewage and uncollected garbage and few opportunities for schooling or health care. Desai and Pillai (1986) were of the opinion that large scale migration to city increased housing problem and the migrants took shelter in slum areas in a precarious condition in a small room prepared out of mud and covered by palm leaves or even gunny bags, broken wooden pieces etc.

Sharma and Davis (1986) opined that the rapid urban
growth in India had led to improvised housing, sanita-
tion and inadequate provision of services of all kinds
and it provided the necessary social and physical condi-
tions in which disease and misery multiply. According
to Shah (1975) the urban poor were deprived of basic
civic amenities, such as water, road, drainage, lavatories
and electricity. The urban slum dwellers of the third
world cities faces a daily struggle to obtain even the
minimal amount of water necessary for drinking, cooking,
cleaning and washing (Hollnsteiner 1974). Austin (1980)
stated that the urban poor lacked adequate water, sweage
and the health care and the congestion and crowding
exaggerated the health environment and increased the
probability of infectious diseases. A study conducted
by Basta (1977) in Manila and Philippines showed that the
infant mortality rate was nearly 3 times higher in the
slums than in the rest of the city, the rate of tuber-
culosis per 1,00,000 inhabitants was 7000 against 800,
and that of gastroenteritis 1352 against 780; twice as
many people suffered from anaemia and three times as
many from third degree malnutrition. McNamara (1976)
commented that malnutrition was simultaneously and
especially severe contribution to the urban poverty

syndrome. According to him urban poor suffering from calorie deficits were estimated between 200 to 360 million and might reach 260 to 910 million by 1990. Reutlinger and Selowsky (1976) reported that there were more malnourished in rural areas but the incidence of mal- nutrition was accelerating more rapidly in urban areas and the degree of malnutrition among urban dwellers was frequently more severe than among the rural counterparts. Katona (1977) found that in South India, the urban poor spent as much as 80 per cent of their earnings on food.

According to the reports of UNICEF (1982) fertility rates, being higher among low income groups, the fastest growing numbers in the urban areas were the children of the poor people. Haxton (1985) had stated that urban population in India grew faster than the national rate. He had also stated that around 32 to 40 million people presently live on the margin of urban life of which 13 million are children. Jelliffee (1966) reported that although all segments of the population evidently suffered nutritional deficiencies, specific segments more severely affected were preschool children, infants and pregnant women. Jivani (1978) reported that nutritional problems were very common in infants and young children of Asian migrants. According to Berg (1973) 59 million children

under 5 and 22 milion pregnant and lactating women in
urban areas were suffering from caloric deficiency. The
report further stressed that by the year 2000 the number
would rise to 122 million and 40 million respectively.
Incidence of diarrhoea, night blindness and iron defici-
ency anaemia were common in about 60 per cent of the
children residing in the slums of India and the high
infant mortality rate was due to lack of trained medical
attention and immunization (UNICEF 1985). According to
a study conducted by Singh (1976) in the urban slums of
New Delhi at least 55 per cent of the children between
the ages one and five suffer from malnutrition and the
overall child mortality rate (0-5 years) was 221 per
1000 children, but reached 444 per 1000 among the group
in which all the women worked in unskilled jobs.
Cohen et al. (1985) claimed that 27 per cent children
suffered from night blindness in urban Bangladesh.
Mahadevan (1977) stated that the most critical nutri-
tional problem in poor urban areas was the feeding of
infants upto the age of three years. UNICEF (1977) pointed
out that child malnutrition in poor urban areas had been
shown to have a high correlation with the mothers income
and it was also reported that efforts to alleviate child
malnutrition necessitated the creation of income genera-

ting activities for women. In Kerala by Kumar (1978) found participation in the income generating activities by the women gave more control over the budget. He had also stated that higher income from maternal employment was likes to alleviate economic distress and to improve nutritional status of children.

Urban planners and decision makers had adopted varied practices and approaches concerning the urban poor, but since the mid 1960s most of them had shown design of a shift from instransigent stance of denying basic services to the slums and squatter settlements (UNICEF, 1984).

During the 7th Five Year Plan, the government had decided to expand urban infrastructural facilities judiciously and equitably among the metropolitan cities, small and medium towns and in other centres with high levels of urbanization. (Minister of Works and Housing 1985). The concern for the urban poor had been reflected in the income of the scheme for environmental improvement of slums as one of the points in the 20 point programme (Minister of Works and Housing 1985). A review of the UNICEF field experiences around 40 developing countries over past 10 years has revealed that community based

strategy is viable and has the capacity to reach the poorest families (UNICEF 1985).

To achieve the aim of natural planning strategy which emphasises the growth and expansion of the rural economy as the principal instalment, the urban development had to concentrate on the growth and development of smaller towns (UNICEF 1985). With this in view the Government of India had given shape to a centrally sponsored scheme of integrated urban development for small and medium towns having a population of less than one lakh.

To enable the intensification of the urban programme and sharper focus on problems of urban poor, especially women and children, the three UNICEF programmes viz. urban community development, small and medium town development and low cost sanitation have been merged with a single integrated programme known as the programme for urban basic services under the master plan of operation, (UNICEF 1985).

Berg and Mowery (1978) reviewed the impact of Indian sanitation facilities and found that the installation of latrines and waste disposal facilities had a measurable effect on health, and the morbidity rates of the members of equiped homes when compared to nonequiped homes.

The programme of immediate benefit like primary
health care, day care centres and nutritional support'
provided by the Ministry of Welfare in the urban areas
of Guayaquil in Equador and the Integrated Child Develop-
ment Services in India do not require unbearably heavy
public investments and they had a prompt effect in
reducing infant and child morbidity and mortality and
enhancing child and maternal health and nutrition in
urban areas (UNICEF, 1985).

Bengoa (1964) rightly pointed out that supplementary
feeding programmes were most effective in reaching all
those in need, when they are carried out as part of
nutritional surveillance on primary health care programmes.
Gopaldas (1980) specified that any programme to be self
generating should have an education component since more
than economic poverty, poverty in knowledge was the
cause of poor nutrition in many people.

The nutritional well being of a community or nation
is an important determinant of its health status(PAG 1976)
Gupta (1966) had the opinion that the knowledge on nutri-
tional status helps in the care and prevention of defici-
ency diseases and in the improvement of health status.
According to Browne and Nomani (1978) nutritional assess-
ment is a necessary tool of any attempt to identify and

analyse the nutritional problems of a community.

Various nutrition intervention programmes imple-
mented in the State aimed at improving the health status
of the vulnerable sections especially women and preschool
children, including the small and medium town development
programme (SMTD). Nutritional well being of beneficiaries
of the programme or a community very well depict the
impact of such programme implemented and the nutritional
status of an individual or a community could be assessed
through dietary survey, anthropometry, biophysical and
biochemical tests and vital statistics (Jelliffee 1966;
Davidson and Passmore 1973 and Blackburn 1977).

Diet surveys constitute an essential part of any
complete study of nutritional status of individual or
groups, providing essential information on nutrient
intake levels and sources of nutrients, food habits and
attitudes (Gopalan and Rao (1972) and Swaminathan 1974).

Flores (1972) reported that the competence of the
interviewer, personal visits to the individual homes and
direct observations and weighing of the foods were essen-
tial for such community studies. According to Pekkarinen
(1970) the interview method was the cheapest for collect-

16

ing food consumption data of large population groups selected at random. It was also reported that both recall and diet history gave fairly reliable mean results of the nutrient intakes of groups of individuals, but they were less suitable for surveying the food consumption of individuals. Sundara raj et al. (1971) indicated that consumption coefficients were useful when diets of large communities were studied and for the assessment of individual intakes the weighment method was the choice. Evans and Deon (1985) found that there was no significant difference among different methods like oral recall, printed questionnaire and interview method. Quiogue (1970) found that for large scale surveys the 24 hour recall method had the advantages of relative cheapness and simplicity but check weighings on a small sample were recommended.

The pattern of growth and the physical state of the body though genetically determined were profoundly influenced by diet and nutrition and hence the anthropometric measurements were useful criteria for assessing nutritional status (Jelliffee 1966).

Martbrell et al. (1980) reported that height and weight were the simplest and the most sensitive and

useful indicator for the evaluation of nutrition inter-
ventions. Choudhry and Rao (1984) used a combination of
anthropometric measurements to evaluate various grades
of undernutrition in children. Measurements of the
circumference of the mid-upper arm proved to be useful
and practical means of assessing protein-calorie defici-
ency of early childhood (Swaminathan 1974). Rao et al
(1970) found that the upper arm circumference of child-
rent were associated with age and nutritional status.
They found that the measurement was significantly lower
in children with protein calorie malnutrition as compared
to that in normal children. Arm circumference related
to height had been used as an indicator for a quick
classification of malnourished children (Florentino and
Dican, 1975). Rati·l et al. (1978) reported that all
measurements were found to be less for Indian children
of both sexes at all ages when compared to American
children.

Clinical examination was one of the most essential
and the simplest tool used in the evaluation of human
nutritional status (Garn, 1962; Plough 1962; Rao 1977;
and Gupta et al. 1978) This method had been found to be
relatively inexpensive rapid and not requiring elaborate
field equipment or a costly laboratory (Jelliffee, 1966).

Nelson (1963) and Swaminathan (1969) pointed out
that clinical examination adopted in nutritional
survey was a careful examination including medical
history where special attention given to various
symptoms and signs that were more or less associated
with nutritional deficiencies.

Biochemical estimations of nutritional signi-
ficance could be carried out on a variety of body
tissues, liver, muscle and bone and in field surveys
tests were confined to easily obtainable body fluids
blood, and urine (Jelliffee 1966). The most objective
mean for assessing the nutritional status and to evolve
some normal patterns of deficiency would be based on
biochemical analysis an blood and urine (Sabrycan 1973
and Sauberlich et al. (1974). According to Soof (1967),
Swaminathan (1969) and Gupta et al. (1972) the haemo-
globin levels formed satisfactory nutritional indices
for survey purposes.

MATERIALS AND METHODS

MATERIALS AND METHODS

A study was undertaken to assess the impact of small and medium town development programme of UNICEF on women and children, with special reference to the nutrition status. The study was designed to evaluate the operational flexibility, efficiency, impact and economic aspects of the project with reference to the nutritional status of women and children to study various aspects of nutrition programmes implemented under the small and medium town development project in order to suggest modifications wherever necessary and to assess the impact of the programme on the attitude of the beneficiaries with special reference to women.

A. Area of the study

Small and medium town development programme of UNICEF was implemented in three municipalities viz, Kayamkulam, Shertallay and Alleppey from July 1982 onwards. Shertallay and Kayamkulam municipalities were of comparable nature and hence selected for the study. Alleppey municipality was deleted from the study because of the following reasons.

1. There was a lag in the project activities due to the absence of project officer

2. There was overlapping of integrated child development services with the small and medium town development programme.

3. Compared to Kayamkulam and Shertallay, Alleppey
   is a much developed area.

B. Plan of action

Inorder to achieve the objectives, following action
programmes were envisaged and conducted as detailed below:

1. Collection of details on the demographic and
   ecological features of the municipalities.

2. Study of the target activities planned and imple-
   mented under small and medium town development
   programme by the two municipalities.

3. Socioeconomic and food consumption survey of
   selected beneficiaries of the programme

4. Dietary intake of selected beneficiaries by
   recall and weighment method.

5. Assessment of nutritional status of selected
   pre-school children in the project area through
   anthropometric clinical and biochemical studies.

6. Assessment of the exposure of women to the sources
   of information on health and nutrition by measuring
   the knowledge gained and retained by selected
   beneficiaries from the two municipalities.

7. Assessment of the attitude of selected beneficiaries
   towards the programme.

C. Selection of samples

1. Socioeconomic and food consumption survey

   100 families each from Shertallay and Kayamkulam municipalities were selected by simple random sampling for the conduct of socioeconomic and food consumption survey.

2. Diet survey

   10 beneficiaries each from the two municipalities were selected for the conduct of dietary survey by weighment method. The families were selected by random sampling from the 100 samples surveyed.

3. Assessment of nutritional status

   From each municipality 100 preschool children (beneficiaries) were selected for assessing their nutritional status.

4. A survey to assess the knowledge of women on health and nutrition

   100 beneficiaries each from Kayamkulam and Shertallay municipalities were selected by simple random sampling for the survey.

5. A survey to assess the attitudes of beneficiaries towards the programme

   100 beneficiaries each from Kayamkulam and Shertallay municipalities were selected by simple random sampling for the survey.

D. Selection of methods of study

1. Details regarding the municipalities and their
   target activities were collected through verifi-
   cation of records available in the municipality.

2. Information on the occupation, income and educational
   level of family members, family size, monthly expen-
   diture pattern, frequency of purchase and use of
   foods, methods of preparation and preservation of
   foods, meal pattern and foods given under special
   conditions and special occasions by the selected
   families in each municipality were collected
   through socioeconomic and food consumption survey.
   A schedule, prepared and pretested for this is
   presented in Appendix I and the data were collected
   by the interview method from 100 families each,
   from the two municipalities.

3. Nature and quantities of foods consumed during the
   past 24 hours by the 100 families each in the two
   municipalities were collected by recall method.
   Rasanen (1979) reported that 24 hour recall method
   is most useful, when relatively large numbers of
   subjects were involved. The data threw light on
   the amount of various foods consumed by the benefi-
   ciaries for a day and their dietary habits. The

data was calculated using adult consumption unit
coefficients. According to Swaminathan (1974) since
all the families vary in size and consists of persons
of different age groups, the calculation of the diets.
consumed per individual of a family will not yield
accurate data and to overcome this difficulty the
results could be expressed in terms of adult consumption
unit. Consumption coefficients of different family
members were added to obtain total consumption units
for the families surveyed. Using this index quantity of
food consumed by the beneficiaries in the family name
of woman or preschool child were calculated. Nutritive
value of their diets were calculated using food consump-
tion tables of ICMR (1982).

4. For a more reliable estimation, all the foods used for
cooking or consumption for a day by selected beneficiaries
(ten each) from the two municipalities were assessed by
weighment method. The weight of raw foods used for every
meal and the weight of raw foods taken in between meals
were also weighed by the investigator. The nutritive value
of these foods for the beneficiaries was calculated using
food consumption tables of ICMR (1982) and was compared
with recommended daily allowance of women and pre-school
children. The schedule used for this is presented in
Appendix II.

5. Nutritional status of the pre-school children was determined through anthropometric, clinical and biochemical studies. Anthropometric measurements namely height, weight, mid arm circumference, head circumference and chest circumference were taken according to the techniques outlined by Jelliffe (1966). All the anthropometric measurements were collected by trained personnel. The height of the children was measured using a studiometer. The children were made to stand on a flat floor by the scale with feet parallel and with heels, buttocks, shoulders and back of the head touching the upright. The head was held comfortably erect with the lower border of the orbit in the same horizontal plane as the external auditory meters. The arms were hanging at the sides in a natural manner. A wooden block was used as head piece which was gently lowered crushing the haif and making contact with the top of the head (Fig.1). The measurements were done to 0.5 cm accuracy.

Children were weighed wearing very light clothing. The weight was measured using a beam balance. Beam balance scales were used for measuring weight as they are less likely to be inaccurate if carefully

FIG. 1. HEIGHT MEASUREMENT OF PRE-
SCHOOL CHILD
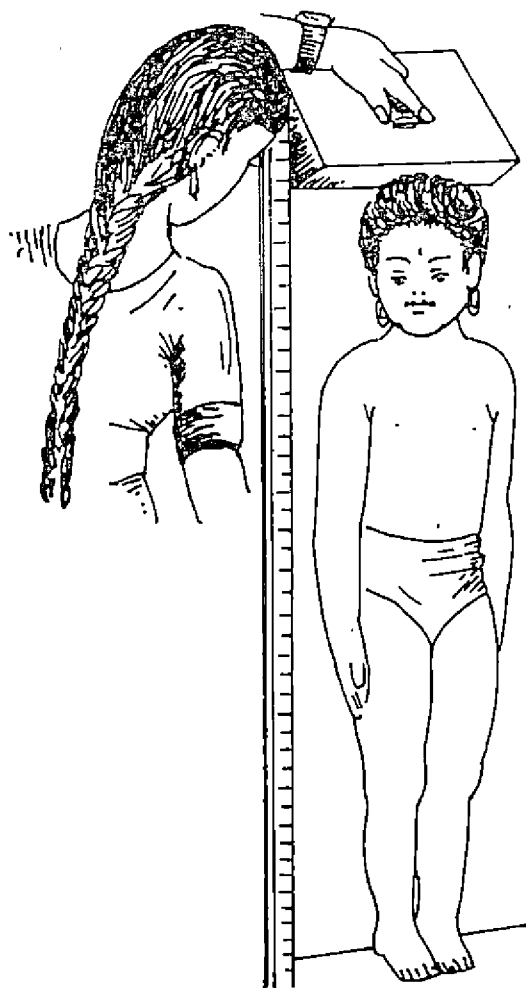
looked for. This was checked frequently at least twice daily during the conduct of the survey. The child was made to stand on the centre of the platform without touching anything else (Fig.2). Care was taken to use the balance on a firm non-tilted surface and it was checked before use. The measurements were done to an accuracy of upto 0.1 kg.

Head circumference was measured with a narrow flexible non-stretch tape made of fibre glass. Head circumference is related mainly to brain size and to a small extent to the thickness of scale tissues and skull. It is a standard procedure in paediatric practice to detect pathological conditions. For taking measurements the childs head was steadied and the greatest circumference was measured by placing the tape firmly round the frontal bones just superior to the supraorbital ridges, passing it round to the head at the same level on each side and laying it over maximum occipital prominance at the back (Fig.3). Measurements are made to the nearest 0.1 cm.

Flexible nonstretch fibre glass tape was used to measure the chest at nipple line (Fig.4). The average of the inspired and expired chest measurement to the nearest 0.1 cm was taken.

FIG.2. WEIGHT MEASUREMENT OF A PRE-SCHOOL CHILD
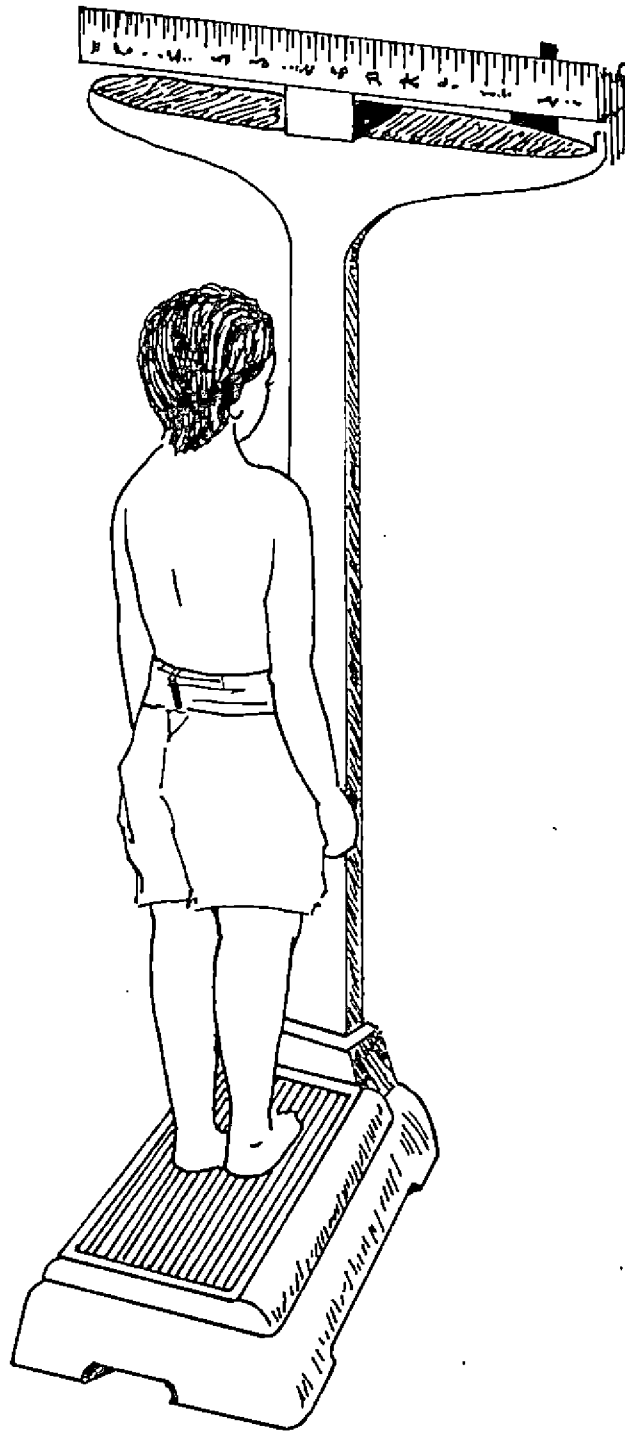
FIG. 3. MEASUREMENT OF HEAD CIRCUMFERENCE

FIG. 4. MEASUREMENT OF CHEST CIRCUMFERENCE
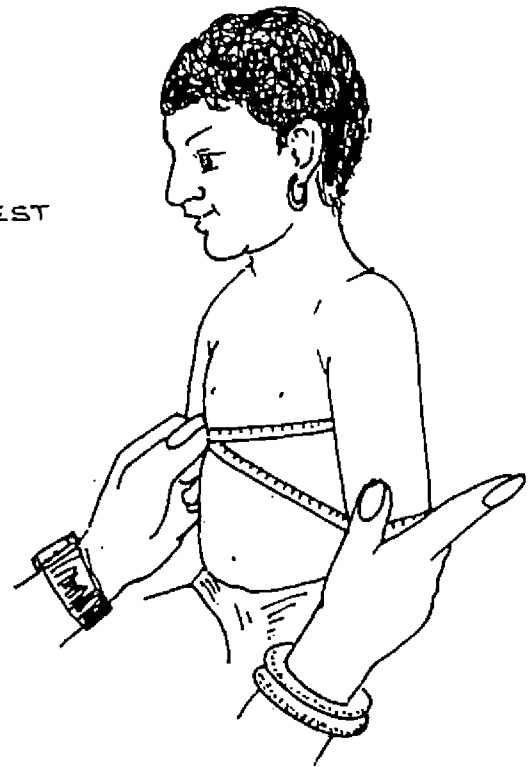
FIG. 5. MEASUREMENT OF MID-UPPER-ARM CIRCUMFERENCE
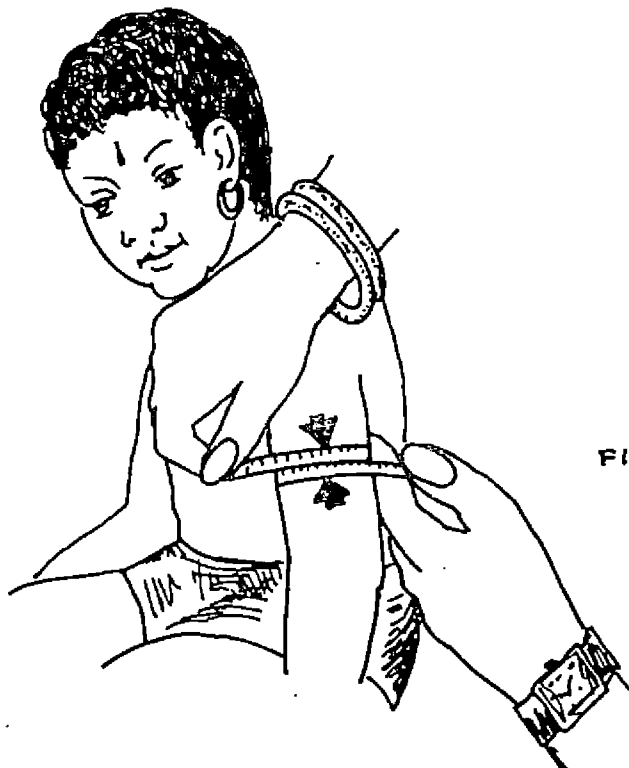
Midarm circumference is measured to the nearest
0.1 cm with a fibre glass tape by placing gently but
firmly round the limb to avoid compression of the soft
tissues. The leaft arm was measured while hanging at
its mid point (Fig.5).

Gupta et al.(1978) and Swaminathan (1974) had
stated that clinical examination is one of the most
essential and the simplest tool used in the evaluation
of human nutritional status. The absence of clinical
deficiency symptoms attributable to malnutrition was
assessed by a qualified physician from the project
itself in the broad day light. The proforma suggested by
National Institute of Nutrition for clinical surveys
was used as model for preparing the schedule. The
schedule is presented in Appendix III.

Under biochemical studies haemoglobin estimation of
pre-school children was conducted by a cyanmetmoglobin
method (Jelliffee 1966). Details of the method are
presented in Appendix IV.

6. The exposure of women to sources of information on
health and nutrition was carried out using a suitably
prepared schedule. Twenty eight statements on nutrition,
health, personal hygiene and environmental sanitation

were included in this schedule. The data were collected
through interview. The schedule is presented in Appendix V .

7. The attitude of the beneficiaries towards the pro-
gramme was assessed by interview method using a suitably
structured and pretested schedule. In this schedule 50
statements on various aspects of small and medium town
development programmeswere prepared. These items were
collected from relevant literature and through informal
interviews with the workers in the field. These statements
were circulated among specialists, administrators and
field level change agents involved in the implementation
of the programme to suggest modifications if found
necessary. In the light of the suggestions made by the
specialists, 27 statements were selected from the fifty
statements. Each statement selected was provided with
five response categories, namely very useful, often use-
ful, sometimes useful, rarely useful and not useful with
the scores of 4, 3, 2, 1 and 0 respectively. The women
were asked to respond towards statements, on the above
five rating points. The general attitude towards the
programme was assessed by finding out the mean attitude
scores. As the final scale had 27 statements the highest
possible score that any respondent could make on the

scale was 108. The total scores of a respondent was obtained by summing the weights of individual items responded. The schedule used for this is presented in Appendix VI. .

RESULTS AND DISCUSSION

RESULTS AND DISCUSSION

The three towns namely Alleppey, Kayamkulam and Shertallay in Alleppey District in Kerala were selected by both Government of India and UNICEF to implement Small and Medium Town Development Programme (SMTD) which aims to concentrate the package of basic services to the urban poor and to improve their quality of the life of vulnerable sections of the community namely mother and child. Kayamkulam and Shertallay municipalities were selected for the present study.

A. Demographic and ecological features of the municipalities

Shertallay town is bounded on the north by NES Block Thycattussery, on the west and south by NES Block Kanjikuzhy and Vembanad lake on the east. Shertallay is divided into 24 wards. The town is low lying and water logged. It contains a population of 40486 with female | male sex ratio 1011 and has a density of 2501 person per sq. km. The town has an acute drinking water problem.

Kayamkulam town is centered around by NES Block Muthukulam in the west NES Block Bharanicavu in the east, NES Block Mavelikara in the north and Quilon district in

the south. The town has 32 wards. The population of
this municipality is 61,330 with a sex ratio of 1036
and with a density of 2815 persons per sq. km.

A sample survey was conducted in these munici-
palities with the help of trained local volunteers by the
Directorate of Municipalities before the implementation
of Small and Medium Town Development programme. One
hundred houses where the majority of the urban poor
was concentrated were selected and subjected from each
town to the survey (2400 in Shertallay and 3200 in
Kayamkulam). The questionnaire designed for the survey
was to gain an insight into the demographic structure
of the population and the availability of basic services
to such families. The demographic profile of this
survey were gathered from the Municipal Office records
and are presented in Table 1.

Table 1. Demographic profile in Shertallay and Kayamkulam before the introduction of Small and Medium Town Development Programme (in percentage)

Different parameters	Shertallay	Kayamkulam
Population density	2501/Sq.Km[*]	2815/Sq.Km[*]
Population ratio Male/Female	1011[*]	1036[*]
Male	33.54	29.13
Female	35.35	31.25
Children	31.11	39.63
Pregnant and lactating women	10.00	26.57
Literacy level	75.48	47.66
Employment Male	62.74	75.49
Female	8.90	22.84
Monthly income		
Below 200	75.49	79.27
200-500	23.56	19.83
Above 500	0.99	0.91
Expenditure on food	70.20	66.60
Drinking water facilities	40.38	30.59
Latrine facilities	37.04	19.48
Lack of proper housing	54.66	87.50

[*] Not in percentage

As depicted in Table 1 in Shertallay as well as in Kayamkulam towns, density of the population was high.

In Shertallay 66.46 per cent and in Kayamkulam 70.88 per
cent of the total population constituted the culnerable
section such as women and children. During the survey
period 10 per cent of the women in Shertallay and 26.57
per cent of the women in Kayamkulam were either pregnant
or nursing mothers. Literacy level of the population in
Shertallay was 75.48 per cent and in Kayamkulam it was
47.66 per cent. In Shertallay 89 per cent and in Kayamkulam
22.84 per cent of the women were economically independent
and 99.01 per cent of the families surveyed in Shertallay
and 99.1 per cent of the families surveyed in Kayamkulam
were below the poverty line. Above 65 per cent of the
income was spent on food by the families residing in both
the municipalities. Lack of proper housing, drinking water,
drainage systems and scavenging systems were found to be
the most acute problems faced by the people residing in the
slum areas of these towns. The coverage of families
through maternal and child health centres, was much below
the State average especially in the case of prophylatic
services and immunization programmes. Occurence of water
born diseases like diarrhoea, gastroentritis, cholera etc.
were as permanent seasonal features. The facilities for
pre-primary education for children of the poor families
were not satisfactory. Facilities such as nonformal educa-
tion centres, preschool education, creches, day care centres
etc. were absent. The results of the survey clearly indicated

the need for developmental programmes like SMTD in these towns.

B. **Study of the target activities planned and implemented under SMTD by the two municipalities**

The SMTD programme was started in July 1982 in these two municipalities with the following major action programmes.

i) Establishing maternal and Child health centres.

ii) Extending medical expertise to reduce infant and maternal mortality and morbidity.

iii) Assisting in low cost methods of supplying safe drinking water.

iv) Installing water seal latrines in public places, schools and houses.

v) Improving the drainage facilities in the slum areas.

vi) Imparting nutrition and health education to women.

vii) Starting of demonstration feeding centres to function as a model centre and a nucleus of women and children's activities.

viii) Starting balawadies, creches and day care centres.

ix) Extending assistance for community economic activities

x) Providing seed money to nongovernmental organizations for the starting of production centres.

For carrying out these programmes listed to coordinate the activities of the various Government departments and to channelise the flow of funds from the schemes to the target

group, an efficient management set up was evolved at the municipality level. This management organization included official and nonofficial representation to ensure community participation and feed back. The function at various levels of administration of this management organisation was defined clearly and the details are presented in Appendix VII.

The details regarding target activities implemented under the Small and medium town development programme is given in Table 2.

Table 2. Details regarding the target activities implemented in the two municipalities

	Kayamkulam	Shertallay
1. Total families benefitted	25822	2372
2. Safe drinking water facilities		
a) Total wards benefitted	30/32	11/24
b) Newly installed taps	98	42
c) Hand pumps	-	10
d) Extension of pipe water to schools	3	-
3. Drainage facilities	Earthen and concrete drains	Earthen and concrete drains
4. Soakage pit	250	-
5. a) Construction of roads	6 km	3 km
b) newly gravelled roads	27 km	7 km

	Kayamkulam	Shertallay
6. Construction of latrines	1634	1166
7. Training for volunteers	58	75
8. Urinals and latrines for L.P.Schools	8	4
9. Shelter improvement	254	104
10. Establishment of MCH Centres	6	4
	(2 centres are newly constructed)	
a) Auxiliary nurse	1	1
b) Attender	1	1
c) Doctor	1	1
11. Community Centres	1	–
12. Immunization programmes	Adequate	Adequate
13. Economic activities		
a) Goat rearing	974	650
b) Mat weaving	500	350
c) Construction of Readymade garmets	1 centre	–

Table 2 throws light into the programmes implemented in Kayamkulam and Shertallay municipalities under the Small and Medium town development programme. In Kayamkulam 25822 families and in Shertallay 2372 families get benefitted by the Small and Medium town development programme.

Under this programme in both the municipalities Safe drinking water facilities were enhanced. In Kayamkulam municipality 93.75 per cent and 45.83 per cent beneficiaries in Shertallay municipality were reported to be benefitted by this programme. It was found that both the municipalities had spent the whole amount allotted for the above purpose. Ninty eight taps in Kayamkulam municipality and 42 taps in Shertallay municipality were newly installed as a part of the project. In Shertallay 8 hand pumps supplied by UNICEF had installed in 8 schools of the town and 2 installed in the wards, whereas in Kayamkulam municipality the pipe water supply was extended to 3 schools of the town. Facilitiesfor Safe drinking water is one of the direct intervention programme in order to reduce child morbidity and mortality.

Under the SMTD programme concrete and earthen drains were constructed in all the wards in both the municipalities for the disposal of waste water. In Kayamkulam municipality 250 soakage pits were newly constructed while in Shertallay this programme was not taken up.

Improvement of transportation facilities is one of the target activities of Small and medium town development programme. In Kayamkulam municipality 2 roads of 8 Kms were newly constructed and 9 roads of 3 Kms were gravelled whereas

in Shertallay 3 Kms road was newly constructed and 7 Kms of road were gravelled under this programme.

The environmental pollution and epidemics through human excreta was a serious problem. Control of various infectious diseases and maintenance of environmental sanitation could be achieved by providing sanitary type individual latrines to the poor people. In Kayamkulam municipality 1634 and in Shertallay municipality 1166 latrines were newly constructed. It was reported that the beneficiaries were availed this facility properly. Fifty eight volunteers in Kayamkulam municipality and 75 volunteers in Shertallay were given training for the need and proper use of latrines by the T.D. Medical College, Alleppey. Assistance was given for the construction of urinals and latrines in 8 schools in Kayamkulam and 4 schools in Shertallay municipality under this programme.

Shelter improvement assistance was given for 254 houses in Kayamkulam and 104 in Shertallay municipalities. The houses were pucca type and onstructed with bricks and tiles. There were 6 maternal and child health centres functioning in Kayamkulam and 4 in Shertallay municipality as a part of the Small and medium town development project. Two MCH centres were established in 1983 in Kayamkulam municipality in

addition to the 4 MCH centres already present, whereas in Shertallay 4 MCH centres existing was sufficient to meet the needs of the people. The MCH centres were provided with drug supplements in both the municipalities. Paramedical training was given to health assistants and ANMS at the Alleppey Medical College under SMTD programme.

Balwadies in the two municipalities were provided with growth charts and balwadi teachers were given training for the proper use of these charts. The health standards of the children in the balwadies were checked periodically so also the growth and weight of the children. Immunization programme was intensily taken up by both the municipalities under this programme.

Assistance was given to women for improving the economic status in the two municipalities. Nine hundred and seventy four families in Kayamkulam and 650 families in Shertallay municipality were given assistance for goat rearing. The families returned one kid to another needy family and thus 231 kids in Kayamkulam and 98 kids in Shertallay munici- pality were redistributed among the families. The kids born in second and third delivery were allowed to be sold out and it provides an additional income to the family. Besides the above programme assistance was given for mat weaving through Mahila mandals in 500 families in Kayamkulam and

350 families in Shertallay municipality. In Kayamkulam
municipality assistance was also given for garment making
under SMTD. These garments were sold out among the urban
poor on instalment.

Play equipments to Balwadies, Schools, and for Children's
park were given by UNICEF. Besides equipment for MCH centres
and utensils for Balwadies were also given by UNICEF in both
the municipalities.

Under the SMTD programme Balwadi teachers of both the
municipalities were given training by the Kerala Agricultural
University. Besides institutional training various education
programmes implemented by the Kerala Agricultural University
in the two municipalities are listed in Table 3.

Table 3. List of programmes

1. Camps and Campaigns

    1. One day camp on the use of growth charts for the
       benefit of balwadi teachers

    2. One day Nutrition education camp for women on growth
       monitoring and functions of food.

    3. One day campaign on better infant feeding practices.

2. Exhibition and demonstrations

    1. Exhibition on infant feeding practices

    2. Demonstration on preparation of weaning food.

3. Training programmes

 a) Training programmes for the benefit of balwadi teachers.

 1) Three day training programme on prevention of food adulteration and creating consumer consciousness.

 2) Reorientation training on growth monitoring for the benefit of balwadi teachers.

 b) Training programmes for the benefit of the members of nutrition forum.

 i) Training on first aid and home nursing

 2) Training on communication methods.

4. Discussion classes for the benefit of the members of nutrition forum

 1) Discussion classes on better infant feeding practices

 2) Discussion classes on first aid and home nursing, nutrition and infection and juvenile deliquency.

 3) Discussion classes on importance of breast feeding and weaning and hazards of artificial feeding.

 4) Discussion classes on health and nutrition.

 5) Discussion classes on nutrition for a child suffering from diarrhoea.

5. Seminars

 1) One day seminar on survival and development interventions.

6. Distant education programmes

 1) Correspondence course on better infant feeding practices for the benefit of balwadi teachers and women in the municipality.

2. Monthly nutrition news letters

3. Publication of leaflets and pamphlets for the benefit of balwadi teachers and women.

C. The SMTD programme was implemented for the last four years in these two municipalities. In the present study the impact of the above programme was determined by

1. Conducting socio-economic and food consumption survey in 100 families in each of the two municipalities to assess the influence of nutrition and health, education implemented under the programme.

2. Assessing the food intake of selected beneficiaries by recall method and by weighment method.

3. Assessing the nutritional status of selected preschool children beneficiaries of the programme through anthropometric, clinical and biochemical studies.

4. Assessing the gain and retention of knowledge on health and nutrition by women beneficiaries.

5. Assessing the attitude of women beneficiaries towards the programme.

1. Socioeconomic and food consumption survey conducted in 100 families each in the two municipalities to assess the influence of nutrition and health education implemented under the SMTD programme.

    This was determined by assessing:

   i) Socioeconomic and personal characteristic of the family
   ii) Food consumption pattern of the families.
   iii) Infant feeding practices prevailed in the municipalities
   iv) Foods given during special occasions.

(i) <u>Socio-economic and personal characteristics of the families</u>

Under Socio-economic and personal characteristics of the families surveyed in Kayamkulam and Shertallay municipalities, details related to religion, type of family, size of family, age and sex of family members and educational level, occupation, income and expenditure pattern of families were collected.

Table 4 presents information regarding religion and type of families surveyed.

Table 4. Religion and type of the families (in percentage)

Religion	Kayamkulam	Shertallay
Hindu	70	93
Christian	5	7
Muslim	25	-
Total	100	100
Type of family		
Nuclear family	62	73
Joint family	38	27
Total	100	100

As indicated in Table 4 majority of the families, surveyed from both the municipalities belonged to Hindu religion, Christian were also found in the two munici- palities while Muslims were found only in Kayamkulam. Out of the 100 families studied in the two municipalities, 62 per cent in Kayamkulam and 73 per cent in Shertallay were of nuclear type. Joint families were not very common in the urban and suburban areas of the country and this finding agrees with earlier studies. Kolenda (1976) reported that joint families were rare in the urban slums of India and 90 per cent of the families were basically nuclear in structure.

Table 5 presents the details of the pattern of the families surveyed.

Table 5. Pattern of the families surveyed (in percentage)

Number of family members	Kayamkulam	Shertallay
3-5	44	47
5-8	40	32
9-11	11	17
12-14	5	4
Total	100	100

As indicated in the table more than 50 per cent of
the families had more than 5 members. The average. size of
the families surveyed in Kayamkulam and Shertallay munici-
palities was 6. Reason for the large families in Kayamkulam
municipality might be attributed to the fact that 25 per
cent of the families surveyed belonged to Muslim community.
Joint family systems prevailed (38 and 27 per cent) in the
two municipalities might also contribute to the size of
the families.

Age-wise distribution of members of the families
surveyed are presented in Table 6.

Table 6. Age-wise distribution of members of the families
surveyed

Age (in years)	Kayamkulam		Shertallay	
	Number	Percentage	Number	Percentage
0-10	203	31.62	202	35.63
11-20	120	18.69	68	11.99
21-30	140	21.81	124	21.87
31-40	97	15.11	78	13.76
41-50	39	6.08	33	5.80
51-60	20	3.10	18	3.19
61-70	15	2.34	32	5.64
71-80	5	0.78	9	1.59
81-90	3	0.47	3	0.53
Total	642	100	567	100

As depicted in the table, about half of the population in the families surveyed were in the growing stage. In Kayamkulam 46.10 per cent and 44.60 per cent in Shertallay were in the earning age group (21-60 years). Comparatively geriatric population constituted only a negligible number in Kayamkulam and Shertallay municipalities.

Sex-wise distribution of the families surveyed are presented in Table 7.

Table 7. Sex-wise distribution of the members of the families surveyed

Sex	Kayamkulam		Shertallay	
	Number	Percentage	Number	Percentage
Male	312	48.59	287	50.62
Female	330	51.41	280	49.38

As depicted in Table 7 in Kayamkulam female population was slightly dominated while in Shertallay it was male population.

Educational level of the families surveyed are presented in Table 8.

Table 8. Educational level of the families survyed

	Kayamkulam								Shertallay							
	Male		Female		Children		Total		Male		Female		Children		Total	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Pre-primary	–	–	–	–	55	100	55	9.79	–	–	–	–	78	100	78	14.97
Lower primary	39	30	20	15.39	71	54.61	130	23.13	34	23.94	18	12.68	90	63.38	142	27.26
Upper primary	21	20	23	21.91	61	58.1	105	18.68	29	30.53	22	23.16	44	46.32	95	18.23
High school	26	15.76	21	12.73	118	71.52	165	29.36	36	33.03	45	41.28	28	25.69	109	20.92
College	11	32.35	6	17.65	17	50	34	6.05	6	33.33	4	22.22	8	44.44	18	3.46
Illiterate	25	34.25	48	65.75	–	–	73	12.99	28	35.44	51	64.56	–	–	79	15.16
Total							562								521	

As indicated in Table 8 majority of the members of the families surveyed in both the municipalities were moderately educated 12.99 per cent in Kayamkulam and 15.16 per cent in Shertallay were illiterates.

Occupational status of the families surveyed are presented in Table 9.

Table 9. Occupational status of the members of the families surveyed

Occupational status	Kayamkulam		Shertallay	
	Number	Percentage	Number	Percentage
Permanent job	33	24.44	18	14.29
Self employment	21	15.56	12	9.52
Daily wages	64	47.41	87	69.05
Traditional employment	17	12.59	9	7.14
Total	135	100	126	100

Table 9 revealed that 33 per cent in Kayamkulam and 18 per cent in Shertallay had permanent jobs. Most of the people in both the municipalities were on daily wages as coolies and coir factory labourers. Traditional employments like fishing, carpentry, welding and farming were popular among negligible number of families. Twenty one per cent of the family members surveyed in Kayamkulam and 12 per cent of the families surveyed in Shertallay were

self employed in business, tailoring and fishing.

Table 10 presents the economic status of the families surveyed in the two municipalities.

Table 10. Economic status of the families surveyed
(in percentage)

Monthly income (in Rupees)	Kayamkulam	Shertallay
201-400	49	34
401-600	19	38
601-800	12	10
801-1000	12	12
Above 1000	8	6
Total	100	100

As depicted in Table 10 49 per cent of the families surveyed in Kayamkulam and 34 per cent surveyed in Shertally were found to be below the poverty line. Majority of the remaining families surveyed in the two municipalities belonged to low and low . middle income group of the community.

Monthly expenditure pattern of the families surveyed in the two municipalities are presented in Table 11.

Table 11. Monthly expenditure pattern of families in the two municipalities (in percentage)

Percentage of income	Food		Clothing		Shelter		Journey		Education		Entertainment		Health		Savings	
	K	S	K	S	K	S	K	S	K	S	K	S	K	S	K	S
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	86	84
1 - 5	-	-	69	46	52	62	74	81	53	39	74	43	60	73	8	12
6 -10	-	-	28	54	31	36	26	19	47	61	26	53	40	27	6	4
11 -15	-	-	3	-	10	-	-	-	-	-	-	4	-	-	-	-
16-20	-	-	-	-	6	2	-	-	-	-	-	-	-	-	-	-
21-25	-	-	-	-	.1	-	-	-	-	-	-	-	-	-	-	-
26-50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51-55	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56-60	9	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
61-65	10	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
66-70	23	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-
71-75	42	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-
76-80	13	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-

K - Kayamkulam   S- Shertallay

As revealed in . Table 11 in both the municipalities above 50 per cent of the income of all the families were spent on food. In Kayamkulam 78 per cent and in Shertallay 80 per cent of the families spent more than 65 per cent of their income on food. Only 14 per cent of the families in Kayamkulam and 16 per cent of that in Shertallay had savings and the savings was also below 10 per cent of the total income.

11) Food Consumption pattern of the families.

Percentage of income spent on food by these families are presented in Table 12.

Table 12. Percentage of income spent on food

Income (in percentage)	Income (in Rupees)									
	200-400		401-600		601-800		801-1000		Above 1000	
	K	S	K	S	K	S	K	S	K	S
51-55	-	-	-	-	-	-	-	-	3	1
56-60	-	-	-	-	1	-	3	3	5	5
61-65	-	-	-	1	2	1	8	9	-	-
66-70	3	-	11	5	8	8	1	-	-	-
71-75	39	13	2	32	1	1	-	-	-	-
76-80	7	21	6	-	-	-	-	-	-	-

K- Kayamkulam   S - Shertallay

As is evident from the table, 46 per cent of the families in Kayamkulam spent 70 per cent or more of their income on food. Majority of the families were in the income range of Rs.201-400. In Shertallay 34 per cent of the families spent more than 70 per cent of their income and these families were also found to be in the income range of Rs.201-400 per month.

Table 13 details the food purchasing habits of the families surveyed in the two municipalities.

Table 13. Food purchasing habits of the families surveyed (in percentage)

Foods	Daily		Once in a week		Once in a month		Occasion-ally	
	K	S	K	S	K	S	K	S
Cereals	47	48	39	47	14	5	-	-
Pulses	9	12	31	36	28	24	32	28
Leafyvege-tables	10	-	31	13	8	31	51	56
Roots and tubers	18	37	32	20	12	17	38	26
Other vege-tables	24	18	13	16	18	9	45	57
Milk & milk products	44	45	11	8	-	5	41	42
Fruits	-	-	8	14	21	26	71	60
Meat & Fish	77	48	11	10	-	10	12	32
Egg	-	-	6	2	31	13	63	85
Nuts & oil-seeds	25	40	33	47	17	13	25	-
Spices & condiments	37	40	28	47	23	13	12	-

K - Kayamkulam   S - Shertallay

As revealed in the table, cereals, milk and fish were purchased daily by majority of the families in the two municipalities. Fourteen per cent of the families in Kayamkulam and 5 per cent of the families in Shertallay were found to buy cereals once in a month for the whole month. Forty four per cent of the families in Kayamkulam and 45 per cent of families in Shertallay purchased milk daily, but the quantity purchased was found to be less. Leafy vegetables were used daily by 10 per cent families in the Kayamkulam municipality while 31 per cent of the families in Kayamkulam and 13 per cent families in Shertallay municipalities were found to use green leafy vegetable once in three weeks. More than 50 per cent of the families were in the habit of using green leafy vegetables occasionally. Nuts and oil seeds were also found to have a place in the daily diet of many of the families. Roots and tubers and vegetables were purchased daily by a few families. Purchasing habits of these families especially in foods like green leafy vegetables, nuts and oilseeds and vegetables indicate that they were aware of the need for nutritious foods.

Data on foods produced at home by these families are given in Table 14.

Table 14. Food produced at home (in percentage)

Range in Rupees	Leafy vegetables		Roots and tubers		Milk		Coconuts	
	K	S	K	S	K	S	K	S
0-5	10	4	1	-	-	-	-	-
6-10	-	-	7	9	-	-	-	-
11-15	-	-	-	-	-	-	2	6
16-20	-	-	-	-	-	-	3	3
21-25	-	-	-	-	-	-	-	2
26-30	-	-	-	-	-	-	-	-
31-35	-	-	-	-	-	-	-	-
36-40	-	-	-	-	2	3	-	-

K - Kayamkulam   S- Shertallay

As indicated in Table 14 home production of foods by the families in the two municipalities were negligible.

Green leafy vegetables, roots and tubers, milk and coconuts were the few foods produced at home by these families (25 per cent of the families in Kayamkulam and 27 per cent of the families in Shertallay). As indicated in the table, only 10 per cent of the families in Kayamkulam and 4 per cent in Shertallay were cultivating green leafy vegetables. Eight per cent of the families in Kayamkulam and 9 per cent of the families in Shertallay cultivate roots and tubers like tapioca, Colocasia, Yam etc. For cultivating roots and tubers and green leafy vegetables very little amount was spent by these families when compared to coconut culti- vation. Five per cent of the families in Kayamkulam munici-

pality and 11 per cent families in Shertallay municipality were having coconut palms and they spent about 11 and 25 per cent of their annual income respectively for the cultivation of this crop. Two per cent of the families in Kayamkulam and 3 per cent of the families in Shertallay municipalities had animals to get milk for their home use.

Frequency of use of various food articles by the families are presented in Table 15.

Table 15. Frequency of use of various food articles by the families (in percentage)

Foods	Daily		Three times in a week		Twice in a week		Once in a week		Occasionally		Not at all	
	K	S	K	S	K	S	K	S	K	S	K	S
Cereals	100	100	-	-	-	-	-	-	-	-	-	-
Pulses	14	19	17	12	8	13	32	24	29	32	-	-
Roots & Tubers	23	30	26	10	37	-	5	33	11	27	-	-
Other vege tables	26	14	17	17	22	13	-	24	35	32	-	-
Green leafy vegeta bles	12	3	5	5	11	7	20	17	52	68	-	-
Fruits	-	-	11	19	17	5	16	15	56	61	-	-
Meat	-	-	-	-	11	-	42	23	47	77	-	-
Fish	55	47	22	27	9	11	11	8	3	7	-	-
Egg	-	-	12	2	13	7	31	22	44	75	-	-
Oil	100	100	-	-	-	-	-	-	-	-	-	-
Sugar & Jaggery	100	100	-	-	-	-	-	-	-	-	-	-
Processed foods	-	-	-	-	-	-	-	-	10	14	90	86
Bakery items	-	-	-	-	6	-	4	-	62	21	28	79

K= Kayamkulam   S=Shertallay

As indicated in the table, cereals are found to be
the staple foods in the diets. Pulses were daily used
by a few families (14 and 19 per cent) in both the munici-
palities. Except 29 per cent of the families in Kayamkulam
and 32 per cent of the families in Shertallay, the remaining
families were in the habit of using pulses weekly. The
survey conducted by the municipality before the implementation
of the programme reported that in Kayamkulam, 88 per cent
of the families used rice, tapioca and fish daily.   In
Shertallay 80 per cent of the families ate rice and fish
daily. In Kayamkulam 45 per cent of the women ate pulses
daily but they very rarely ate protective foods like eggs,
meat and fruits. In Shertallay 14.7 per cent of pregnant
and lactating women ate pulses daily. In the present study
after the implementation of the programme more than 50 per
cent of the families in both the municipalities used leafy
vegetables occasionally. Only 23 per cent in Kayamkulam and
30 per cent in Shertallay used roots and tubers daily to
supplement cereals. Twenty six per cent of the families
in Kayamkulam and 14 per cent of the families in Shertallay used
other vegetables in their daily diet. But 35 per cent of
the families in Kayamkulam and 32 per cent of the families
in Shertally were not in the habit of using other vegetables
very frequently. This is mainly because of their poor

economic condition. None of the families used fruits daily and more than half of the families used fruits only occasionally in both the municipalities. Forty five per cent of the families in Kayamkulam and 46 per cent of the families in Shertallay used milk daily even though the quantity might be less. Meat and egg were rarely used. Fish was included in the daily diet by majority of the families. Sugar or juggery and oil were found to be used by all the families. Bakery items and processed foods were not popular in both the municipalities probably because of their cost and unavailability.

Table 16 presents data on cooking practices of the families in the two municipalities.

Table 16. Cooking practices of the families surveyed
(in percentage)

	Cereals		Pulses		Roots & Tubers		Leafy vegeta-bles		Other vege-tables		Meat & Fish		Egg	
	K	S	K	S	K	S	K	S	K	S	K	S	K	S
Absorption	8	16	100	100	–	–	100	100	–	–	–	–	–	–
Straining	92	84	–	–	24	38	–	–	–	–	–	–	–	–
Curries	–	–	–	–	14	27	–	–	84	76	88	72	8	–
Straining and Curries	–	–	–	–	62	35	–	–	16	24	–	–	–	–
Boiling	–	–	–	–	–	–	–	–	–	–	–	–	18	23
Frying	–	–	–	–	–	–	–	–	–	–	12	28	22	36
Boiling and frying	–	–	–	–	–	–	–	–	–	–	–	–	52	41

K – Kayamkulam   S – Shertallay

As indicated in the table, 92 per cent of the families in Kayamkulam and 84 per cent of the families in Shertally were in the habit of cooking cereals by straining method, which is the most popular method in Kerala. Absorption method which helps to retain water soluble nutrients in the cooked rice was adopted by very few families. Pulses and leafy vegetables were the two foods which were cooked by absorption method by almost all the families surveyed in the two municipalities. Roots and tubers especially tapioca were cooked and strained first and then made into curries by 62 per cent of the families in Kayamkulam. In Shertally this method was used only by 35 per cent of the families and the rest adopted either cooking and straining or made curries without straining. Other vegetables were used mainly in the form of curries. Roots and tubers, vegetables, meat and fish were the foods generally used by the families to prepare curries. Boiling or frying method was used only for cooking egg or meat by few families. Fifty two per cent of the families in Kayamkulam and 41 per cent of the families in Shertally used either boiling or frying method for cooking eggs.

Table 17 presents different processing methods common among the families.

Table 17. Different processing methods used by the
families (in percentage)

Foods	Drying with salt		Pickling	
	Kayamkulam	Shertallay	Kayamkulam	Shertallay
Other vegetables	-	-	6	14
Fish	27	36	-	-
Meat	6	2	-	-

As revealed in Table 17 pickling and drying with salt were the two common methods used to preserve foods. As majority of the people were non-vegetarians fish and meat were dried under sun with salt and stored in jars and tins for a period of two weeks to 3 months. Fish was processed and used by 27 per cent of the families in Kayamkulam and 36 per cent of the families in Shertallay. Six per cent and 2 per cent of the families preserved meat in Kayamkulam and Shertallay respectively. The processing was done according to the availability of these food materials. But this was commo only among very few families.

iii) <u>Infant feeding practices prevailed in the two</u>
<u>municipalities</u>

About 55 women at Kayamkulam municipality and 34
women at Shertallay municipality were nursing mothers,
during the period of survey. Most of the women fed their
infants by breast milk. Cows milk was fed by 14 per cent
women in Kayamkulam and 23.53 per cent of women in Shertallay
along with breast-milk 14.56 per cent of the women intro-
duced rice in the form of porridge during weaning period
at Kayamkulam while in Shertallay 11.76 per cent of the
women observed this system. This food was generally given
during lunch or supper time. The food consumption pattern
of the infant started with breast milk in the morning and
ends with breast milk. Even if foods like banana (5.88
per cent in Kayamkulam and 3.64 per cent in Shertallay)
egg (1.82 per cent in Kayamkulam) and biscuits (12.73 per
cent in Kayamkulam and 32.36 per cent in Shertallay) were
introduced as supplementary foods in addition to these
foods, all mothers give breast milk at frequent intervals
as and when the infant demanded. These observations clearly
indicated that women were influenced to an extent to the
continuous exposure of informations of scientific infant
feeding practices. During adolescence, pregnancy and
lactation, no special foods were given by these mothers.

Even though the women were taught about these aspects
also during their education programmes they had not
attempted to inculcate these aspects into their daily
pattern. It is also observed that only in the case of
infants who are in very vulnerable condition, women are
influenced by the education programmes while they do not
seem to bother about the nutrition hazards to be faced
due to the ill balanced diets probably because of their
economic situation they are unable to consume a balanced
diet. Another notable point is that continuous nutrition
education programmes have not influenced the fads and
fallacies prevalent among these communities. Since women
still feel that papaya, egg and excess sugar may harmfully
affect the foetal growth and may cause foetal death.

iv) <u>Foods given during special occasions</u>

Birth of a child, marriage and death were social
functions in which feast was an essential item. Similarly
all religious functions observed by these families were
followed by a sumptuous feed. Sweet items were the essential
components of all these functions. Hindus are in the habit
of preparing vegetarian feast during these occasions while
among nonhindus nonvegetarian preparations dominated as
essential items in the feast. Many of these functions were
a social get-together where relatives and friends attended.

Death ceremonies generally started with rice gruel
by the families belonging to all the communities.
However, the ceremonies observed during the first
fortnight, were generally accompanied by vegetarian
feast with sweets, especially if the dead person was
an old or senior member of the family. According to
the women, the significance of the feast during this
occasion, was to please the heavenly bodies and to
bring peace to the dead person. Local festivals
in the local religious centres were also celebrated
by the people and generally these festivals were
celebrated by the families by preparing special foods.

v. One day meal pattern of the families.

One day meal pattern of the families assessed
by 24 hour recall method is presented in Table 18.

Table 18. One day meal pattern of the families surveyed
(in percentage)

	Break fast		Lunch		Evening Tea		Dinner	
	Kayam kulam	Sherta llay	Kayam kulam	Sherta llay	Kayam kulam	Sherta llay	Kayam kulam	Sherta llay
Rice, coconut	2	17	-	-	-	-	12	38
Rice, Pulse and coconut	54	67	-	-	-	-	-	-
Wheat and roots	8	-	-	-	-	-	6	-
Rice and Roots	16	5	-	-	-	-	-	-
Rice and pulse	20	11	6	6	-	-	30	21
Rice and fish			44	47			42	35
Rice and vegetables	-	-	18	26	-	-	-	-
Rice, fish & vegetables	-	-	24	9	-	-	10	6
Rice, fish and butter milk	-	-	6	12	-	-	-	-
Rice and egg	-	-	2	-	-	-	-	-
Pulses and Tea	-	-	-	-	4	3	-	-
Fruit and Tea	-	-	-	-	4	12	-	-
Tea	-	-	-	-	92	85	-	-
Total -	100	100	100	100	100	100	100	100

In most of the families three meals a day system
(in the morning, afternoon and night) was observed.
Rice was found to be the staple cereal in all the
diets. Food was cooked twice a day in most of the
families eventhough the pattern was three meals a day.
Evening snacks were prepared in addition to three
main meals, by very few families(8 per cent in
Kayamkulam and 15 per cent in Shertallay) Seventy four
per cent of the families in Kayamkulam and 78 per cent
in Shertallay used cereal pulse combination for break-
fast. The cereal pulse mixture was the combination
where protein present in the two vegetable food might
complement each other. Either cereal alone or cereal
root or cereal coconut combinations were used by the
rest of the families for breakfast in both the munici-
palities. Like cereal pulse combination cereal nuts
mixture might also supply a better quality protein.
Seventy four per cent of the families in Kayamkulam
and 68 per cent of the families in Shertallay used
rice fish combination for lunch. In this mixture also,
even if fish was consumed in little quantity their
animal protein may help a lot to improve the protein
quality of cereals. Out of the 100 families surveyed
in the two municipalities 24 and 9 per cent used

vegetables and 6 and 12 per cent used butter milk along with rice and fish at Kayamkulam and Shertallay respectively. Rice-pulse, rice-vegetable and rice-egg combinations were taken by a few of the families in the two municipalities. Fifty two per cent of the families in Kayamkulam and 41 per cent of the families in Shertallay municipality consumed rice and fish at dinner. Ten and six per cent of the families at Kayamkulam and Shertallay used vegetables along with fish for dinner. Thirty per cent of the families in Kayamkulam and 21 per cent of the families in Shertallay used rice in the form of kanji and pulse preparation as side dish at dinner. Four per cent of the families prepared snacks out of pulses and another 4 per cent of the families used fruits as snacks in Kayamkulam municipality, whereas in Shertallay only 3 per cent of the families used pulses for evening snacks and 12 per cent of the families used fruits as snacks. Many of the observations of the survey indicated that the food habits of these families were different from those observed earlier in families placed in similar situations. Rao et al. (1986) found that cereals and millets formed staple and bulk of the food consumed by the slums of the urban whereas protective foods like pulses, milk,

vegetables and flesh foods showed the opposite trend.
Probably the continuous nutrition education programmes
implemented through the small and medium town develop-
ment programme had played a vital role in influencing
the changes now observed in their food habits.
Devadas et al. (1978) evaluated the impact of nutrition
education in a village in Coimbatore and reported that
exposure to nutrition education helped to change food
habits and to include cereals other than rice in the
diet. She also reported that the training in Applied
Nutrition for convenors of women's clubs had increased
their knowledge of specific foods needed for specific
functions, knowledge concerning selection, preparation
and serving of foods, and also recognition of indigenous
nutritious supplementary foods. Nabarro (1984) reported
that children's nutrition could be impaired through an
intensive and well administered child health and nutri
tion programmes. Devadas et al.(1970) found that the
nutritional status of expectant women increased as a
result of the nutrition education of ANP in Coimbatore.

2. Food intake of selected beneficiaries

This was determined by

(i) Recall method

(ii) Weighment method

(1) <u>Food intake assessed by recall method</u>

Nature and quantities of foods consumed by 100 women and 69 preschool children in Kayamkulam and 100 women and 56 preschool children in Shertallay municipality were assessed by recall method. Comparisons were made with the recommended daily allowance of ICMR (1982).

The average quantity of food consumed by women in the two municipalities are given in Table 19.

Table 19. Average quantity of foods consumed by the women in Kayamkulam and Shertallay municipalities

Food groups	RDS	Kayamkulam N = 100		Shertallay N = 100	
		Amount consumed (g)	Percentage of RDA met	Amount consumed (g)	Percentage of RDA met
Cereals	350	337	96.29	317	90.57
Pulses	55	26	47.27	30	54.55
Leafy vegetables	125	13	10.4	4	3.2
Roots and tubers	75	47	62.67	30	40
Other vegetables	75	30	40	7.5	10
Fruits	30	12	40	6.96	23.2
Milk and Milk products	100	41	41	39	39
Fats and oils	40	36	90	22	55
Flesh Foods	30	39	*	43	*
Sugar	30	25	83.33	18	60
Egg	30	0	0	0	0

* Consumption of flesh foods exceeds the recommended daily allowance in Kayamkulam and Shertallay municipalities.

69

As revealed in Table 19 the diets of the women in
Kayamkulam and Shertallay municipalities were inadequate
and were not met by the recommended daily allowance, except
for flesh foods (mainly fish) . Ninty to Ninty six per cent
of requirement of the cereals were met in both the munici-
palities. In both the municipalities, the inclusion of
green leafy vegetables in the diets were found to be least
and eggs were completely lacking. Requirements of pulses,
roots and tubers, other vegetables, fruits, milk and milk
products did not reach, even 50 per cent of the recommended
daily allowance in both the municipalities, except for the
intake of pulses in Shertallay municipality. The consumption
of fats and oils was higher in Kayamkulam municipality than
Shertallay. It may be due to the higher proportion of muslim
community in Kayamkulam municipality.

The average nutrient intakes of women were calculated
using food consumption tables (ICMR 1982). The average nutri-
ent intakes of the women are given in Table 20.

Table 20. Average nutrient intake of the women in Kayamkulam and Shertallay municipalities

Nutrients	RDA	Kayamkulam N = 100		Shertallay N = 100	
		Average nutrient in take	Percen- tage of RDA met	Average nutrient in take	Percentage of RDA met
Protein (g)	45	38	84.4	45	100
Fat (g)	40	38	95	25	62.5
Energy (Kcal)	2200	1593	72.41	1614	73.36
Ca (g)	0.4	0.2	50	0.2	50
Iron (mg)	30	17	56.67	19	63.33
Vitamin A (μg)	3000	196	6.53	296	9.87
Thiamine (mg)	1.1	0.87	79.09	0.98	89.09
Riboflavin(mg)	1.2	0.48	40	0.45	37.5
Niacin (mg)	15	13	86.67	14	93.33
Vitamin C (mg)	50	17	34	17	34

As revealed in Table 20 the average protein intake of women in Shertallay municipality was met fully, while only 84.4 per cent was met in Kayamkulam municipality. The adequate protein intake of women in Shertallay municipality might be due to increased consumption of pulses and fish than the women in Kayamkulam municipality. The energy intake of women was found to be 72 to 73 per cent in both the municipalities. Vitamin A was the most limiting nutrient in the diets of women in Kayamkulam and Shertallay municipalities. This was due to less intake of milk. Riboflavin and vitamin C were

the other two limiting nutrients in the diets of the women. In Kayamkulam municipality 40 per cent and 34 per cent of recommended daily allowance of the riboflavin and vitamin C were met respectively while in Shertallay only 37.5 and 34 per cent of the requirements of these nutrients were met. The diets of the women in Shertallay contained 63.33 per cent of iron while in Kayamkulamit was only 56.67 per cent. In both the municipalities the diets of the women met the requirements of nutrients like protein, thimaine and niacin moderately.

The average quantity of the foods consumed by the pre-school children (3-5 years) in the two municipalities are given in Table 21.

Table 21. Average quantity of foods consumed by pre-school children in Kayamkulam and Shertallay municipalities

Food groups	RDA (g)	Kayamkulam N = 69		Shertallay N = 56	
		Amount consumed (g)	Percentage of RDA met	Amount consumed (g)	Percentage of RDA met
Cereals	200	194	97	205	*
Pulses	50	13	26	16	32
Green leafy vegetables	75	2	2.67	4.06	5.41
Other vegetables) Roots and tubers) 50		40	80	15.56	31.12
Fruits	50	7	14	3.6	7.2
Milk	200	28	14	23	11.5
Fats and oils	25	15	60	15	60
Flesh foods	30	31	*	30	100
Sugar	40	12	30	12	30

* Consumption of cereals in Shertallay and of flesh foods in Kayamkulam exceed the recommended daily allowance.

As indicated in Table 21 the consumption of cereals and flesh foods (mainly fish) by preschool children in both the municipalities were adequte. Green leafy vegetables, fruits and milk was lacking very much in the diets of the preschoolers in the two municipalities. In Kayamkulam municipality the requirements of other vegetables and roots and tubers met 80 per cent of the recommended daily allowance but in Shertallay it met only 31.12 percentage. The inclusion of pulses in the diets of the preschool children of these municipalities were 26 and 32 percentage respectively. Eggs were completely lacking in the diets as in the case of the women. This reveals that the preschoolers in the two municipalities are straight away introduced to adult food.

Average nutrient consumption of the preschool children (3-5 years) is given in Table 22.

Table 22. Average nutrient consumption of preschool children in Kayamkulam and Shertallay municipalities

Nutrients	RDA	Kayamkulam N = 69		Shertallay N = 56	
		Average intake of nutrient	Percentage of RDA met	Average intake of nutrient (g)	Percentage of RDA met
Protein (g)	22	24	*	26	*
Fat (g)	25	25	100	19	76·0
Energy(kcal)	1500	1052	70.13	1026	68.4
Ca (g)	0.4	0.12	30·00	0.13	32.5
Iron (g)	15	11	73.33	12	80·0
Vitamin A(g)	1200	144	12·00	196	16.3
Thiamine (mg)	08	0.55	68.75	0.63	78.7
Riboflavin (mg)	08	0.26	32.50	0.32	40·0
Niacin (mg)	10	9	90·00	9	90·0
Vitamin C (mg)	30	10	33.33	10	33.33

* The intake protein exceeds the recommended daily allowance in Kayamkulam and Shertallay municipalities.

As indicated in Table 22, 70 per cent of the energy requirement were met in the diets of the preschool children of Kayamkulam municipality whereas in Shertallay 68 per cent of the requirement was met. Protein intake of the preschool children was above the recommended daily allowance in both the municipalities. Gross deficiencies were found in the diets of the preschool children with respect to calcium, vitamin A, riboflavin and vitamin C in Kayamkulam and Shertallay municipalities. The preschool children received 90 per cent of the recommended daily allowance of niacin in both the municipalities.

(ii) Food intake assessed by weighment method

Dietary intakes of women and preschool children were assessed by one day weighments method. Comparisons of their diets were made with the recommended daily allowance of ICMR (1982)

The average quantity of foods consumed by the women (10 each in the two municipalities) is given in Table 23.

Table 23. Average quantity of foods consumed by the women
in Kayamkulam and Shertallay municipality

Food Groups	RDA (g)	Kayamkulam		Shertallay	
		Amount consumed (g)	Percentage of RDA met	Amount consumed (g)	Percentage of RDA met
Cereals	350	339	96.86	329	94.00
Pulses	55	26	47.27	29	52.73
Leafy vegetables	125	13	104.0	5	4.00
Roots and tubers	75	30	40.00	23	30.67
Other vegetables	75	47	62.67	38	50.67
Fruits	30	12	40.00	16	53.33
Milk	100	41	41.00	46	46.00
Fats and oils	40	36	90.00	23	57.50
Flesh foods	30	39	*	36	*
Sugar	30	25	83.33	38	*
Egg	30	-	-	-	-

* In Kayamkulam and consumption of flesh foods and in Shertallay
consumption of flesh foods and sugar exceed recommended daily
allowance.

As shown in Table 23 the diets of the women were inadequate
in all the foods except in fish in Kayamkulam municipality and
fish and sugar in Shertallay municipality. Pulses were met approxi-
mately 47 per cent and 53 per cent of the requirements in Kayamkulam
and Shertallay municipality respectively. The requirement of
other vegetables were met about 50 to 62 per cent of the require-
ments. Green leafy vegetables were included in negligible amounts
in both the municipalities.

The average nutrient consumption of women is given in
Table 24.

Table 24. Average nutrient consumption of the women in Kayamkulam and Shertallay municipalities

Nutrients	RDA	Kayamkulam		Shertallay	
		Average nutrient intake	Percentage of RDA met	Average nutrient intake	Percentage of RDA met
Protein (g)	45	46	*	40	88.89
Fat (g)	40	47	*	28	70·00
Energy (K cal)	2200	1843	83.77	1716	78·00
Calcium (g)	0.4	0.27	67.50	0.25	62.50
Iron (mg)	30	23	76.67	19	63.33
Vitamin A(μ g)	3000	528	17.60	516	17.20
Thiamine (mg)	1.1	1.04	94.55	0.9	81.82
Riboflavin (mg)	1.2	0.5	41.67	0.42	40·00
Niacin (mg)	15	16	*	15	100·00
Vitamin C(mg)	50	30	60·00	43	86·00

* The intake of protein fat and niacin exceeded the recommended daily allowance in Kayamkulam municipality

As revealed in Table 24 the intake of protein, fat and niacin were found to be adequate in the diets of the women in Kayamkulam municipality whereas in Shertallay only niacin was found to be adequate in the diets of the women. Vitamin A was the most limiting nutrient in the two municipalities. Seventy eight to eighty four per cent of the daily requirement was met for the nutrients like energy in the two municipalities. Iron requirement of the women in Kayamkulam and Shertallay municipality were met by 77 and 63 per cent. Thiamine and niacin requirement of the women were met above 80 per cent.

Results obtained by the weighment method with respect to the inclusion of cereals, flesh foods and fats in the diets of women both the municipalities were similar to that of obtained by recall method.

The average amount of foods consumed by children in the two municipality is given in Table 25.

Table 25. Average food consumption of the preschool children in Kayamkulam and Shertallay municipalities.

od groups	RDA	Kayamkulam		Shertallay	
		Amount consumed	Percentage of RDA met	Amount consumed	Percentage of RDA met
reals	200	208	*	218	*-
lses	50	17	34	22	44
afy vegetables	75	5	6.67	5	6.67
her vegetables ots and tubers	50	33	66	50	100
uits	50	10	20	12	24
lk	200	25	12.5	31	15.5
ts and Oils	25	15	60	16	64
esh foods	30	29	96.67	22	78.33
gar	40	18	45	20	50

* The consumption of cereals in both municipalities exceeded the recommended daily allowance.

As revealed in Table 25 the diets of the preschool children was adequate only in cereals and other vegetables in Shertallay. But in Kayamkulam municipality the diets were adequate only in cereals. Consumption of milk and leafy vegetables was found far below the recommended daily allowance. In Shertallay 44 per cent of the recommended daily allowance for pulses and 64 per cent of fats were met in the children's diet while in Kayamkulam, only 34 and 60 per cent of the requirements of fats and oils and pulses respectively were met. In Kayamkulam 96.67 per cent of the requirement for fish was met whereas only 73.33 per cent of the requirement in Shertallay was met.

The average nutrient intake of preschool children is presented in Table 26.

Table 26. Average nutrient intake of preschool children in Kayamkulam and Shertallay municipalities

Nutrients	RDA	Kayamakulam		Shertallay	
		Average nutrient intake	Percentage of RDA met	Average nutrient intake	Percentage of RDA met
Protein (g)	22	25	*	23	*
Fat (g)	25	25	100	20	80
Energy (K cal)	1500	1146	76.4	1131	75.4
Calcium (g)	0.4	0.19	47.5	0.16	40
Iron (mg)	15	14	93.33	13	86.67
VitaminA(u g)	1200	212	17.67	504	42
Thiamine (mg)	0.8	0.67	83.75	0.56	70
Riboflavin (mg)	0.8	0.29	36.25	0.31	38.75
Niacin (mg)	10	11	*	10	100
Vitamin C (mg)	30	13	31	35	*

* The intake of protein and niacin in Kayamkulam municipality and protein and vitamin C in Shertally municipality is more than recommended daily allowance.

As revealed in Table 26 in both the municipalities, preschool children received optimum amount of proteins from their diet. Seventy five and seventy six per cent of their energy requirement was met in Shertallay and Kayamkulam municipalities. In Kayamkulam only 43 per cent of the vitamin C requirement was met in the diet while in Shertallay the requirement was met in optimum. The iron requirement of the preschool children was moderately met at Kayamkulam municipality (93 per cent) while 86.6 per cent of the requirement was met in Shertallay municipality. Gross deficiency in vitamin A was found in Kayamkulam municipality.

In the case of diets of preschool children the results obtained by the weighment method were well comparable with the results obtained by recall method in the case of nutrients such as protein, fats, energy, riboflavin and niacin.

3. The Nutritional status of selected preschool children

Nutritional status of the selected preschool children was assessed by collecting baseline information on anthropometric measurements, clinical tests and haemoglobin estimation. Baseline anthropometric data were collected through a cross sectional survey on child health in the age group of 3 to 5. The anthropometric measurements of preschool children thus collected were compared with standards suggested by Rao et al. (1976).

Weight for age profile of the preschool children
surveyed in the two municipalities are presented in
Table 27.

Table 27. Weight for age profile

Age in ranges (months)	Sex	Number of children		Observed values (kg)		Standard (kg)	t value	
		K	S	K	S		K	S
31-36	M	19	7	12.03	12.79	12.40	1.799	0.653
	F	14	5	10.75	10.70	11.00	1.203	0.399
37-42	M	6	7	12.50	11.86	13.40	1.561	4.775*
	F	2	14	11.50	11.14	12.00	1.000	2.579*
43-48	M	14	16	13.04	13.69	14.25	1.587	1.841
	F	15	13	12.00	12.31	13.00	3.055*	1.865
49-54	M	3	17	14.67	14.18	15.50	0.691	2.005
	F	4	5	12.88	14.00	14.25	1.712	0.457
55-60	M	13	8	14.81	15.44	16.40	2.669*	2.204
	F	10	8	15.15	14.75	15.25	0.229	1.280

* Significant at 0.05 level

K - Kayamkulam   S - Shertallay

The weight for age profile of the preschool children
when compared with reference standard depicted that there
was no significant difference between the study sample in
Kayamkulam municipality and standards in weight except in the

age groups of 43-48 months old female and 55-60 months old male children. In Shertallay municipality there was no significant difference between the study sample and standards of weight except in the children of 37-42 months age group. The children were classified by Gomez system (NIN 1975) which termed young children, who were between 90 per cent and 75 per cent of the Harward standard, of body weight as first degree malnutrition, between 75 per cent and 61 per cent as second degree malnutrition and 60 per cent and below as third degree malnutrition respectively and the results obtained by Gomez grading are presented in Table 28 and Fig.6.

Among the children comprising all age groups, approximately 68 per cent in Kayamkulam municipality and 60 per cent in Shertallay municipality showed evidence of first degree malnutrition. This observation was confirmed by the survey of dietary intake. Second degree malnutrition was more prevalent in 37 to 42 months age group in Shertallay municipality and in Kayamkulam municipality. It was more or less uniform except in the age groups 37 to 42 and 55 to 60 months. The incidence of third degree malnutrition is only found in the age group of 43-48 months in Shertallay municipality while in Kayamkulam it was observed in the age groups of 43 to 48 and 49 to 54 months.

Table 28. Percentage distribution of preschool children surveyed according to their weights in each age group.

Age group in ranges (months)	Total children		Normal				1st degree malnutrition				IInd degree malnutrition				IIIrd degree malnutrition			
			K		S		K		S		K		S		K		S	
	K	S	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P
31–36	33	12	1	3.03	2	16.67	23	69.7	7	58.33	9	27.27	3	25.00	–	–	–	–
37–42	8	21	–	–	–	–	7	87.5	12	57.14	1	12.5	9	42.86	–	–	–	–
43–48	29	29	3	10.35	6	20.69	15	51.72	15	51.72	8	27.59	6	20.70	3	10.35	2	6.70
49–54	7	22	1	14.29	4	18.18	3	42.86	14	63.64	2	28.57	4	18.18	1	14.29	–	–
55–60	23	16	7	30.44	14	25.00	13	56.52	11	68.75	3	13.04	1	6.25	–	–	–	–

K – Kayamkulam   S– Shertallay   N – Number   P – Percentage

FIG. 6. PERCENTAGE DISTRIBUTION OF CHILDREN SURVEYED IN KAYAMKULAM AND SHERTALLAY MUNICIPALITIES ACCORDING TO THEIR WEIGHTS IN EACH AGE GROUP

K - KAYAMKULAM   S - SHERTALLAY

ABOVE 90 PERCENT HARWARD STANDARD (NORMAL)

60-75 PERCENT II nd DEGREE MALNUTRITION

75-90 PERCENT I st DEGREE MALNUTRITION

BELOW 60 PERCENT III rd .. MALNUTRITION
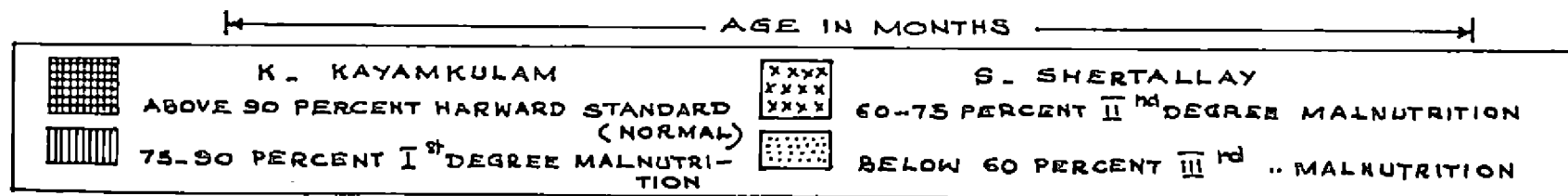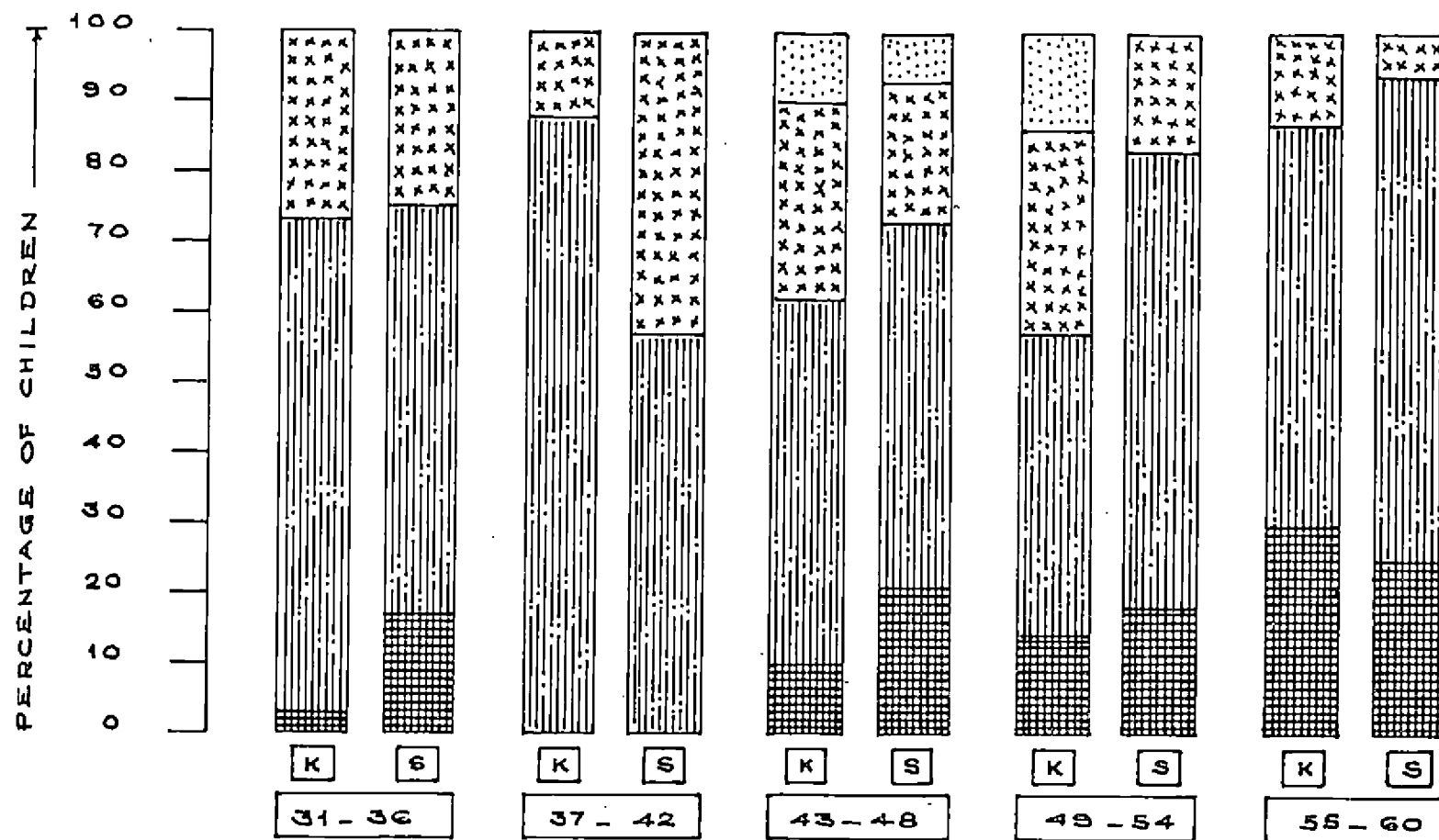
Height for age profile is presented in Table 29.

Table 29. Height for age profile

Age in ranges (months)	Sex	Number of children		Observed values(cm)		Standard (cm)	t value	
		K	S	K	S		K	S
31-36	M	19	7	94.26	94.14	92.9	1.421	0.791
	F	14	5	89.55	94.30	92.9	3.287*	1.373
37-42	M	6	7	96.38	98.93	92.9	4.592	2.879
	F	2	14	92.00	92.71	92.9	0.450	0.163
43-48	M	14	16	99.93	97.81	99.2	0.619	1.417
	F	15	13	97.55	96.81	99.2	1.379*	2.257*
49-54	M	3	17	104.83	102.56	99.2	7.717*	4.294*
	F	4	5	99.13	102.50	99.2	0.038	2.119
55-60	M	13	8	104.44	106.44	106.4	1.127	0.022
	F	10	8	103.65	105.80	106.4	1.528	0.328

* Significant at 0.05 level

K — Kayamkulam   S— Shertallay

As revealed in Table 29 there was no significant difference between the study sample in Kayamkulam and standards of height except in female children of 31 to 36 months of age and male children of 37 to 42 months and 49 to 54 months of age. In Shertallay municipality, significant difference between study sample and standards of height was seen in the male children of 37 to 42 months of age, female children of 43 to 48 months of age, and male children of 49 to 54 months age.

Profile of arm circumference for preschool children is presented in Table 30.

Table 30. Profile of arm circumference of preschool children

Age in ranges (months)	Sex	Number of children		Observed values		Standard (cm)	t value	
		K	S	K	S		K	S
31-36	M	19	7	14.82	15.14	16	4.080*	1.535
	F	14	5	14.43	15.00	15.9	4.905*	5.696
37-42	M	6	7	15.00	15.21	16	2.743*	4.259
	F	2	14	15.50	15.18	15.9	0.800	4.107*
43-48	M	14	16	15.18	15.66	16.3	2.537*	3.805
	F	15	13	15.08	16	16.4	3.348*	1.548
49-54	M	3	17	15.67	15.88	16.3	0.949	1.793
	F	4	5	15.5	15.7	16.4	2.543	2.064
55-60	M	13	8	16.12	15.47	16.4	1.336	2.485*
	F	10	8	15.85	16.13	16.5	1.857	1.428

* Significant at 0.05 level

K - Kayamkulam   S- Shertallay

As revealed in Table 30 in the Kayamkulam municipality there was no significant difference between the study sample and the standards of arm circumference in the age group of above 49 to 54 months of children in both sexes and below this age group all the children except female children of 37 to 42 months of age showed significant difference. In Shertallay municipality there was no significant difference between the study sample and the standards of arm circumference in the age group above 43 to 48 months except in male children of 43 to 48 months of age and 55 to 60 months of age. Male children in the age group of 31 to 36 months also showed no significant difference.

Profile of chest circumference for different age groups is presented in Table 31.

Table 31. Profile of chest circumference for preschool children

Age range in months	Sex	Number of children		Observed value		Stand-ard (cm)	t value	
		K	S	K	S		K	S
31-36	M	19	7	50.36	49.5	50.9	1.559	2.055
	F	14	5	48.57	48.8	49.5	2.128	1.027
37-42	M	6	7	50.25	51·0	51.9	3.724*	1.893
	F	2	14	49.75	48.71	50.5	2.943	4.543*
43-48	M	14	16	51.75	50.72	52.6	3.131*	4.668*
	F	15	13	50.33	50·0	51.3	1.729	3.280*
49-54	M	3	17	52.33	52.21	53.1	1.752	2.106
	F	4	5	50.75	51.3	52.1	0.931	1.311
55-60	M	13	8	52.81	51.81	53.4	1.603	1.956
	F	10	8	51.65	51.25	52.6	1.539	1.296

* Significant at 0.05 level

K - Kayamkulam   S- Shertallay

As indicated in Table 31 there was significant difference between the study sample and the standards of chest circumference except in the male children of 37 to 42 months of age and 43 to 48 months of age groups in Kayamkulam municipality. In Shertallay municipality there was no significant difference between the study sample and standards of chest circumference except in female children of 37 to 42 months of age and male and female children of 43 to 48 months of age group.

Profile of head circumference for preschool children is presented in Table 32.

Table 32. Profile of Head circumference for preschool children

Age in ranges (months)	Sex	Number of children		Observed value		Stand- ard (cm)	t value	
		K	S	K	S		K	S
31-36	M	19	7	49.52	48.07	49.1	1.570	3.804*
	F	14	5	47.86	48.7	47.8	0.888	1.398
37-42	M	6	7	49.92	48.5	50.5	1.354	6.481*
	F	2	14	48.5	47.75	48.3	0.400	1.923
43-48	M	14	16	50.11	49.91	50.7	1.578	2.062
	F	15	13	48.33	48.08	48.6	0.631	2.896*
49-54	M	3	17	51.5	50.9	50.9	2.080	1.978
	F	4	5	49.13	48.4	48.6	0.757	0.607
55-60	M	13	8	50.5	51.19	51.0	1.613	0.184
	F	10	8	48.25	48·0	48.9	0.323	1.284

* Significant at 0.05 level

K - Kayamkulam   S- Shertallay

As revealed in Table 32 there was no significant difference between the study sample in Kayamkulam municipality and the standards of head measurements in all the age groups. While in Shertallay municipality significant difference between the study sample and standards of head circumference was seen in the children of 31 to 36 months old male, 37 to 42 months old male and female children of 43 to 48 months age group.

Heights and weights are the most commonly used measurements and in the present study, heights and weights of preschool children

were compared with standard value for their age.

Therefore the rate of height to weight is taken to consideration and presented in Table 33.

Table 33. Weight for height profile of preschool children

Weight (kg)	Number of children		Average observed height		Standard height (cm)	t value	
	K	S	K	S		K	S
9.5	–	5	–	92.7	87	–	2.478
10	8	5	89	93.4	89.5	0.392	1.832
10.5	5	–	92.6	–	92	0.911	–
11	8	5	91.41	91	94.75	2.547	4.412
11.5	6	3	93.5	97	97.5	2.163	0.222
12	13	17	95.98	96.94	100	4.785	2.662
12.5	9	7	96.57	93.92	102.5	2.101	5.394
13	8	10	98.26	97.6	105	2.659	10.091
13.5	7	4	100.14	97.75	106	4.183	7.314
14	13	7	101.79	104.36	110.5	9.408	3.888
14.5	5	9	105.6	98.72	113	6.528	6.897
15	5	18	101.1	102.25	115.5	7.855	12.547
15.5	–	4	–	101.62	118.5	–	7.834
16	5	5	103.5	107.5	121	3.235	8.715

* Significant at 0.05 level

K – Kayamkulam   S – Shertallay

The height for weight profile of preschool children when compared with reference standard indicated that the heights of selected children were below the standard height for weight. There was significant difference between the heights of study sample in Kayamkulam municipality and the reference standard except in the

FIG.7. DIFFERENCE IN PHYSICAL STATURE BETWEEN STANDARD AND STUDY SAMPLES
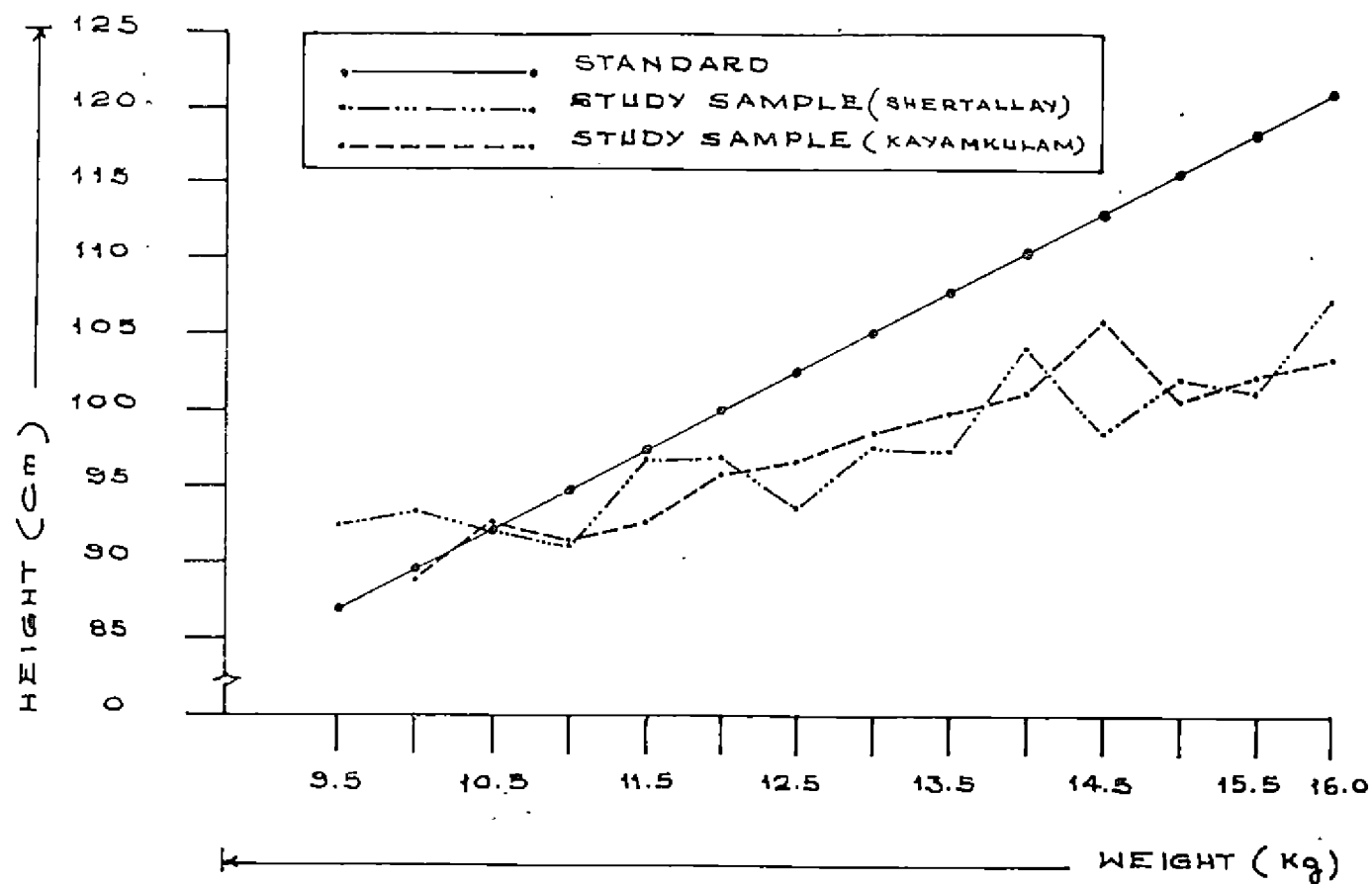
children weighing 10, 10.5, 11.5 and 12.5 kg. In Shertallay muni-
cipality significant difference between the heights of study sample
and reference standard was seen except in children weighing 9.5, 10
and 11.5 kg (Fig.7). Difference in physical stature between the
standards and the samples studied is shown in the figure.

Chest/head ratio of preschool children are assessed to have
an idea about the body built of the children and is given in
Table 34.

Table 34. Chest/head ratio of preschool children

Age in ranges (months)	Sex	Number of children		Percentage of children with chest/head ratio less than 1.	
		K	S	K	S
31-36	M	19	7	26.32	14.29
	F	14	5	21.43	60
37-42	M	6	7	16.67	-
	F	2	14	-	14.29
43-48	M	14	16	7.14	-
	F	15	13	-	-
49-54	M	3	17	-	17.65
	F	4	5	25	-
55-60	M	13	8	-	12.5
	F	10	8	10	12.5

As indicated in Table 34 in Kayamkulam municipality in the
age groups of 37 to 42 months old female, 43 to 48 months old
female, 49 to 54 months old male and 55 to 60 months old male
there was no children with chest/head ratio less than one. In
Shertallay municipality there was no children with chest/head
ratio less than one in the age groups 37 to 42 months old male

43 to 48 months old male and female and 49 to 54 months old male.

Clinical examination is the most essential part of nutritional surveys, since the ultimate objective is to assess levels of health of individuals and population groups as influenced by the diet they consume (Swaminathan 1974). In the present study clinical assessment by a physician was assessed on the general appearance of preschool children like skin changes, changes in the tongue, shining eyes etc and these clinical symptoms were recorded and the details are presented in Table 35.

Table 35. Prevailance of clinical signs of malnutrition among preschool children in the two municipalities surveyed

Clinical signs	Kayamkulam				Shertallay			
	36-48 months		49-60 months		36-48 months		49-60 months	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
	N = 59		N = 41		N = 62		N = 38	
Anaemia	14	23.73	7	17.07	14	22.58	8	21.05
Angular stomatitis	2	3.39	1	2.44	-	-	-	-
Tongue: Papillae atrophic	3	5.09	2	4.88	-	-	-	-
Dental carries	12	20.34	7	17.07	19	30.65	13	34.21
Mottled enamel	4	6.78	2	4.88	9	14.52	7	18.42
Firm liver	1	1.69	1	2.44	2	3.23	-	-
Emaciation	-	-	-	-	2	3.23	1	2.6
Cheilosis	-	-	-	-	1	1.61	-	-
Bleeding gums	-	-	-	-	2	3.23	-	-

Table 35 reveals the clinical signs shown by the preschool children in the two municipalities surveyed. Anaemia was the common deficiency disease in the children of both the municipalities. Results obtained for food consumption survey clearly indicated gross deficiencies in iron among preschool children. Angular stomatitis and tongue papillae atrophic were seen in a very few percentage of children in Kayamkulam municipality while in Shertallay municipality it was completely absent. Eventhough dental carries and mottled enamel was not a deficiency disease it was also prevalent in the two municipalities.

Morbidity profile of the preschool children are presented in Table 36.

Table 36 Morbidity profile of preschool children

Episodes of illness	Kayamkulam				Shertallay			
	36-48 months		49-60 months		36-48 months		49-60 months	
	Number N = 59	Percentage	Number N = 41	Percentage	Number N = 62	Percentage	Number N = 38	Percentage
Dryskin	8	13.56	6	14.63	4	6.45	6	15.79
Rhinorhoea	4	6.78	3	7.32	4	6.45	2	5.26
Scabies	2	3.39	3	7.32	-	-	-	-
Tineavers color	4	6.78	3	7.32	-	-	-	-
Primary complex	1	1.7	-	-	-	-	-	-
Wheezing	-	-	-	-	2	3.23	-	-
Miliaria	-	-	-	-	1	1.61	-	-

Table 36 reflects the actual incidence of illness. Dryskin and rhinorhoea was seen in the children of both the munici-

palities. Scabies, tineaversicolor and primary complex were not observed in Shertallay municipality whereas these wore present to a small percentage in the children of Kayamkulam. According to Swaminathan (1974) biochemical assessment can reveal sub-clinical states of deficiency due to lowered intake or absorption or impaired transport or abnormal utilization of a nutrient.

Data on haemoglobin estimation carried out in the children are presented in Table 37.

Table 37. Haemoglobin level of preschool children
(in percentage)

Haemoglobin mg/100 ml.	Kayamkulam	Shertallay
8-9	16	9
9.1 - 10	12	16
10.1 -11	24	19
11.1 - 12	18	27
12.1 - 13	13	14
13.1 - 14	9	5
14.1 - & above	8	10
Total	100	100

Table shows that 28 per cent of the preschool children in Kayamkulam municipality and 25 per cent in Shertallay munici pality had haemoglobin levels below 10 mg/100 ml.

4. Gain and retention of knowledge on health and nutrition
by women beneficiaries

Knowledge on health and nutrition gained and retained
by the women beneficiaries of the programmes in Kayamkulam
and Shertallay municipalities were assessed.

The statements on health were mainly pertaining to
environmental sanitation, personal hygiene and health care
needed during vulnerable conditions such as pregnancy, lacta-
tion, infancy and preschool age.

Table 38 presents the number of women who had answered
correctly to the statements on health.

Table 38. Number of women who answered correctly to the
statements on health.

No.	Statements on health	Kayamkulam		Shertallay	
		Number of women who answered correctly	Ranking order	Number of women who answered correctly	Ranking order
1.	Infections can be controlled by keeping the environment clean	100	1	100	1
2.	Flies are not the cause of spreading infection	100	1	100	1
3.	Wells and surroundings should be kept clean	100	1	100	1
4.	Hands should be washed before meals	100	1	100	1
5.	Long dirty nails are not unhygienic to health	100	1	100	1
6.	Surroundings can be kept clean by using water seal latrines	95	2	100	1

No.	Statements on health	Kayamkulam		Shertallay	
		Number of women who answered correctly	Rank ing order	Number of women who answered correctly	Rank ing order
7.	Proper drainage ensures environmental sanitation	92	3	94	2
8.	Regular health check up is needed during pregnancy.	92	3	71	5
9.	Immunization should be given to the baby at the specified intervals	75	6	86	3
10.	Physical exertion is not advisable during the first four months of pregnancy.	83	4	74	4
11.	Antitetanus injection is not needed for pregnant women	78	5	69	6

As revealed in Table 38 most of the women in the two municipalities had answered correctly to statements related to personal hygiene and environmental sanitation. The table also depicted that all the women were not fully aware of the significance of mass immunization during infancy and special care needed during pregnancy.

The statements on nutrition were mainly pertaining to the need of nutritious foods during vulnerable conditions. The number of women who had answered correctly for each statement is presented in Table 39.

Table 39. Number of women answered correctly for the statements on nutrition

No.	Statements on nutrition	Kayamkulam		Shertallay	
		Number of women who answered correctly	Rank ing order	Numberof women who answered correctly	Rank ing order
1.	Pregnant women need more food	100	1	88	1
2.	Vitamin C prevents swelling and bleeding of gums	100	1	82	4
3.	Weaning foods should be introduced to the child only after 2 years	97	2	63	10
4.	There is no need to give plenty of water to a child with diarrhoea.	95	3	88	1
5.	Pregnant and lactating mothers require supplementary feedings	93	4	66	9
6.	The preschool children should be fed at least 5 to 6 times a day	91	5	87	2
7.	Iron rich foods prevent anaemia	85	6	81	5
8.	Protein deficiency can cause night blindness	84	7	82	4
9.	Carbohydrate rich foods are necessary for growth	81	10	84	3
10.	Pulses are the best sources of carbo hydrate	83	8	84	3
11.	Green leafy vegetables and liver are rich in iron	82	9	73	6
12.	Green leafy vegetables and animal foods are rich source of vitamin A.	70	14	82	4
13.	Calcium is necessary for the proper growth of bones and teeth	72	13	81	5
14.	Breast feeding is needed only upto six months.	79	11	66	9
15.	Vitamin C is necessary for healthy eyes	78	12	69	8
16.	A child with diarrhoea should not be given breast milk	61	15	71	7
17.	Breast feeding can be started immediately after delivery	51	16	62	11

As revealed in Table 39 the statements on the importance of food during vulnerable condition was answered correctly by majority of the women in the two municipalities.

Table 38 and 39 also depicted that the frequent exposure of women to health and nutrition education programmes had helped them to understand the significance of health and nutrition in daily life.

The details regarding the maximum score that can be obtained for 28 statements on health and nutrition by 100 women each in the two municipalities and the total scores obtained by these beneficiaries is presented in Table 40.

Table 40. Details on the maximum and total scores obtained for the statements on health and nutrition by the women beneficiaries

Aspects	Maximum score	Kayamkulam		Shertallay	
		Scores obtained	Percentage	Scores obtained	Percentage
Statements on health	1100	1015	92.27	1010	91.82
Statements on nutrition	1700	1402	82.27	1309	77

As revealed in Table 40 the women beneficiaries scored high for the statements on health when compared to the statements on nutrition in both the municipalities. The percentage of scores obtained by the women beneficiaries in Kayamkulam municipality for the statements on health as well as nutrition were higher when compared to the scores obtained by the women beneficiaries of Shertallay municipality. Probably the women beneficiaries of the Kayamkulam municipality were better recipients of nutrition and health education programmes than the women beneficiaries of Shertallay municipality.

Table 41 presents details regarding the women benefi-ciaries who had gained maximum score, scores above and below neutral scores. The maximum score a respondent could secure for the statement on health as well as nutrition is 28 and minimum score was zero. The theoretical mid point of 28 viz. 14 was taken as neutral score.

Table 41. Percentage of women who gained maximum score and scores below and above neutral score for the statements on health and nutrition

| Municipality | Percentage of women | | |
	Above neutral score	Below neutral score	Maximum score
Kayamkulam	99	1	7
Shertallay	93	7	16

As revealed in Table 41, 99 per cent of the women surveyed in Kayamkulam municipality and 93 per cent of the women in Shertallay municipality had scores above the neutral score. Maximum score of 28 was obtained by 7 per cent and 16 per cent of the women surveyed in Kayamkulam and Shertallay municipalities respectively. This revealed that the majority of the women surveyed were able to retain the knowledge on health and nutrition they had gained through various educa-tion programmes implemented under small and medium town develop ment programme in the two municipalities.

The capacity to gain and retain knowledge is generally influenced by the age of an individual. Effect of age on the gain and retention of the knowledge of the women beneficiaries

were assessed and the results are presented in Table 42.

Table 42. Effect of age on retention of knowledge among the women surveyed (in percentage)

Age in ranges	Kayamkulam			Shertallay		
	Above neutral score	Below neutral score	Maximum score	Above neutral score	Below neutral score	Maximum score
21-30	48	-	6	39	-	12
31-40	29 .	-	1	36	-	4
41-50	9	1	-	11	-	-
51-60	13	-	-	7	7	-

As indicated in table 42 moderately young women of 21-30 years in Kayamkulam as well as in Shertallay municipalities were able to gain scores above neutral score as well as maximum score. These findings were similar to the stucies conducted under A.N.P. and CPWP of the State Development Training in NES Blocks of Trivandrum (Prema and Menon 1974).

Education level of an individual is another factor which may influence his or her capacity to gain and retain knowledge. The effect of education level of the women beneficiaries on knowledge gained and retained is presented in Table 43.

Table 43. Effect of education on retention of knowledge among the women surveyed (in percentage)

Education level	Kayamkulam			Shertallay		
	Above neutral score	Below neutral score	Maxi-mum score	Above neutral score	Below neutral score	Maxi-mum score
Illiterate	36	–	–	26	2	–
Lower primary	18	–	–	14	5	–
Upper primary	20	1	–	13	–	–
High school	19	–	1	36	–	12
College	6	–	6	4	–	4

As revealed in Table 43, the women coming under the category of above neutral score belonged to different categories of education level and there was uniform distribution in all the categories. From this it can be assumed that education level of the women beneficiaries surveyed in Kayamkulam and in Shertallay municipalities were not directly influencing scores obtained by them. However in Kayamkulam as well as in Shertallay municipalities, maximum score of 28 was gained by women who had college and High school level education.

Family size is an important factor which may influence the leisure time available for women at home. It is generally agreed that women with a bigger family may have strenuous domestic chores causing drudgery. Women who have such busy

domestic schedule may find education programmes less
interesting.

Therefore the effect of family size on the knowledge
of women was assessed and details are presented in Table 44.

Table 44. Effect of family size on retention of knowledge
among the women surveyed (in percentage)

Family size	Kayamkulam			Shertallay		
	Above neutral score	Below neutral score	Maxi- mum score	Above neutral score	Below neutral score	Maxi- mum score
3-5	44	-	6	44	-	8
5-8	39	1	1	35	-	5
9-11	11			13	2	3
12-14	5	-	-	1	5	-

As shown in Table 44 the size of the family was
found to have a direct influence on the knowledge gained
and retained by the women. Higher percentage of women in
the smaller families were found to have gained scores above
neutral score. Similarly women who obtained maximum score of
28 in the two municipalities were having small families.

The effect of income on the retention and gain in
knowledge by the women was assessed and details are presented
in Table 45.

Table 45. Effect of income on retention of knowledge among the women surveyed (in percentage)

Monthly income in Rupees	Kayamkulam			Shertallay		
	Above neutral score	Below neutral score	Maxi mum score	Above neutral score	Below neutral score	Maxi mum score
201-400	49	-	2	30	4	3
401-600	19	-	2	35	3	3
601-800	11	1	-	10	-	2
801-1000	12	-	2	12	-	8
Above 1000	8	-	-	6	-	-

As revealed in Table 45 there was no direct relation between the retention of knowledge gained by the women and the income level of their families. There was uniform distribution of the women who had gained scores above neutral score as well as who had gained maximum score in all the income levels.

5. Attitude of women beneficiaries towards the programme

Results of research have indicated that the attitude that an individual holds towards an innovation, exercise significant influence on his or her accepting or rejecting that innovation. The attitude of women beneficiaries towards various programmes implemented under small and medium town development programme will to a great extent influence their nature and extent of their participation in the programme. It is therefore essential to identify the attitude of the women beneficiaries towards the programme. The attitude of 100 women beneficiaries towards various programmes under SMTD were assessed.

Table 46 presents the number of women responded towards each programme as per the ratings of the scale.

Table 46. Number of women responded towards each programme implemented under SMTD

Different programmes implemented under SMTD	Kayamkulam						Shertallay					
	Very useful	Often useful	Some-time useful	Rarely useful	Not useful	Total	Very useful	Often useful	Some time useful	Rarely useful	Not useful	Total
1. Establishment of maternal and child health centres	100	0	0	0	0	100	100	0	0	0	0	100
2. Nutrition programmes for the benefit of women	100	0	0	0	0	100	100	0	0	0	0	100
3. Service of medical and para-medical staff	100	0	0	0	0	100	93	7	0	0	0	100
4. Starting of demonstration feeding centres	90	4	6	0	0	100	96	1	3	0	0	100
5. Low cost water supply programmes including extension of pipe water supply	93	6	0	1	0	100	92	5	3	0	0	100
6. Assistance to Balawadies	88	11	0	0	1	100	94	2	1	0	3	100
7. Drug supplement kits to maternal and child health centres	85	5	6	4	0	100	94	3	0	0	3	100
8. Hand surfacing and paving of lanes in slum areas	83	4	4	9	0	100	92	4	1	3	0	100
9. Shelter improvement schemes in slums	88	1	6	4	1	100	94	3	0	0	3	100
10. Conducting melas and exhibition	90	6	3	1	0	100	91	5	1	0	3	100

103

(contd..)

Table 46 (contd.)

Different programmes implemented under SMTD	Kayamkulam						Shertallay					
	Very useful	Often useful	Some times useful	Rarely useful	Not useful	Total	Very useful	Often useful	Some times useful	Rarely useful	Not useful	Total
11. Distribution of play equipment to primary schools	73	10	12	5	0	100	86	5	6	3	0	100
12. Assistance in putting up water seal latrines in houses and lower primary schools and the service of volunteers in the construction of latrines	74	8	9	9	0	100	86	7	4	0	3	100
13. Assistance for the income generating activities like poultry, goat rearing, paper making and coir spinning	87	1	6	6	0	100	77	9	3	11	0	100
14. Supply of utensils to the feeding centres	88	0	4	8	0	100	76	10	7	0	7	100
15. Assistance for setting up of creches and day care centres	75	4	9	6	6	100	84	4	7	5	0	100
16. Establishment of play grounds and children's park	85	2	8	2	3	100	66	8	0	0	26	100
17. Assistance for setting up community centres	84	0	9	7	0	100	51	6	8	12	23	100

104

(contd..)

Table 46 (contd.)

Different programmes implemented under SMTD	Kayamkulam						Shertallay					
	Very useful	often useful	some-times useful	Rarely useful	Not useful	Total	Very useful	Often useful	Some-times useful	Rarely useful	Not useful	Total
18. Setting up of an audio-visual unit	62	4	11	8	15	100	82	2	6	10	0	100
19. Provision of seed money to NGOs for starting of production centres	77	7	9	4	3	100	58	6	6	12	18	100
20. Assistance to the Cottage industry for women	79	5	6	6	4	100	74	4	4	10	8	100
21. Improved drainage facilities	75	5	8	0	12	100	83	4	0	0	13	100
22. Functional literacy centres for women	60	3	9	14	14	100	62	2	1	0	35	100
23. Assistance for putting up smokeless ovens	54	5	0	0	41	100	64	0	0	13	23	100

As revealed in Table 46 programmes like establishment of maternal and child health centres, conduct of nutrition education and service of medical and paramedical staff were responded as very useful by the 100 women in the two municipalities except for the service of medical and paramedical staff in Shertallay municipality. It had indirectly indicated the favourable attitude of the women beneficiaries towards the programmes. The attitude of women beneficiaries towards programmes such as hard surfacing and paving of lanes, creches and day care centres and setting up of audiovisual units was found to be more popular in Shertallay than in Kayamkulam while the attitude of women beneficiaries towards income generating programmes were found favourable in Kayankulam municipality when compared to the women beneficiaries of Shertallay municipality. But many useful programmes like assistance for putting smokeless ovens and functional literacy centres were found to be less popular among the women beneficiaries in both the municipalities.

Maximum score a respondent can secure for 27 programmes included in the rating scale was zero. The theoretical mid point of 108 is 54 and it was taken as neutral score.

Details regarding the neutral score, percentage of women who had gained score, above and below neutral score, maximum score and mean score obtained on the scale are presented in Table 47.

Table 47. Details on neutral score, maximum score and mean attitude score

Munici- palities	Maxi- mum score	Percent- age of women who had gained maximum score	Neutral score	Percent age of women whc had gained neutral score	Mean score	Atti tude
Kayam- kulam	108	3	54	100	96	
Shertallay	108	2	54	100	96	Favour- able

As depicted in the table, maximum score of 108 is obtained by very few women beneficiaries in the two munici-palities (3 per cent in Kayamkulam and 2 per cent in Shertallay). However all the women who were surveyed had obtained scores above neutral score and the mean score for the two municipalities were 96 which was much above neutral score of 54. This indicated the beneficiaries in both the municipalities had a favourable attitude towards the pro-grammes implemented under SMTD.

The attitude of an individual towards any object is influenced by many factor. Among that is socio-economic

characteristic of an individual such as age, education, family size and income. Mean attitude scores obtained by the women beneficiaries in the two municipalities were tested for association in relation to their age, education level, family size and income. The women beneficiaries were also classified into 4 groups according to the scores secured viz. the women beneficiaries secured 0-27, 28-54, 55-81 and 82-108.

According to age the women beneficiaries were classified into four groups. Effect of age on the attitude of these women beneficiaries is presented in Table 48.

Table 48. Mean attitude scores of women classified according to age

No. Age group	Kayamkulam			Shertallay		
	55-81	82-108	Mean score	55-81	82-108	Mean score
1 21-30	1	47	100	-	39	100
2 31-40	1	28	97	-	36	100
3 41-50	3	7	87	5	6	81
4 51-60	4	9	86	6	8	81

As indicated in Table 48 all the women beneficiaries had secured scores above neutral viz. 54. The maximum score secured by the women beneficiaries of different age groups indicated that there was a steady decrease in the scores

obtained by the women beneficiaries as the age advanced in both the municipalities. Majority of the women beneficiaries who had secured higher scores belonged to the younger age group.

The analysis of variance of attitude scores of the women beneficiaries according to their age is presented in Table 49.

Table 49. The analysis of variance of attitude scores of women according to their age

Source	df	Kayamkulam			Shertallay		
		SS	MS	F	SS	MS	F
Total	99	10043.04			13026.18		
Treatment (age group)	3	2796.06	932.02	12.35*	6724.94	2241.64	34.15*
Error	96	7247	75.49		6301.25	65.64	

* Significant at 0.01 level

As depicted in Table 49 the age of the women beneficiaries appeared to be positively and significantly related to attitude towards the different programmes implemented under SMTD in both the municipalities.

The critical difference among the different age groups in the two municipalities is presented in Table 50.

Table 50. Critical differences in the attitude of women
among the different age groups.

Group	Different age groups (years)	Treatments (age)		Critical difference	
				Kayamkulam	Shertallay
T_1	21-30	T_1 Vs T_2		4.07 *	3.73 *
T_2	31-40	T_1 Vs T_3		6.01 *	5.51 *
T_3	41-50	T_1 Vs T_4		5.41 *	5.02 *
T_4	51-60	T_2 Vs T_3		6.34 *	5.55 *
		T_2 Vs T_4		5.78	5.08
		T_3 Vs T_4		7.27	6.50

* Significant at 0.01 level

As revealed in Table 50 there was significant difference
in the attitude towards various programmes under SMTD when
compared among different age groups in the two municipalities
except between age groups viz. 21 to 30 and 31 and 40 and 41 to
50 and 51 to 60.

Based on the level of education the respondents were
classified into five groups. Mean attitude score obtained for
each group is presented in Table 51.

Table 5/.. Mean attitude scores of women classified according to education level (in percentage)

Groups	Education level	Kayamkulam			Shertallay		
		55-81	82-108	Mean score	55-81	82-108	Mean score
1. Illiterate		3	33	94	6	27	91
2. Lower primary		4	14	96	2	12	96
3. Upper primary		2	19	96	-	13	100
4. High School		-	19	99	3	33	96
5. College		-	6	102	-	4	103

As indicated in Table 5/ all the women beneficiaries had scored above the neutral score viz. 54. There was steady increase in the mean scores obtained by the women beneficiaries belonging to different groups in Kayamkulam municipality. However, much clear cut pattern emerged from the Kayamkulam when compared to the mean scores obtained by the women beneficiaries of different groups in Shertallay municipality.

The analysis of variance of attitude scores of women beneficiaries classified according to their educational level is given in Table 52.

Table 52. Analysis of variance of attitude scores classified
according to the education level of women

Source	df	Kayamkulam			Shertallay		
		SS	MS	F	SS	MS	F
Total	99	10043.06	—	—	13026.19	—	—
Treatment (education level)	4	443.75	110.94	1.097	1280.4	320	2.589
Error	95	9599.31	101.05	—	11745.75	123.64	—

As indicated in Table 52 the women beneficiaries belong-
ing to different educational status did not differ signifi-
cantly in respect of their attitude towards the various
programmes implemented under SMTD in the two municipalities.

Based on the economic status the women beneficiaries
were classified into 5 groups and the mean attitude scores
obtained by each group is presented in Table 53.

Table 5\$. Mean attitude scores of women classified
according to income (in percentage)

Income (in Rs.)	Kayamkulam			Shertallay		
	55-81	82-108	Mean score	55-81	82-108	Mean score
201-400	4	45	99	1	33	99
401-600	1	18	96	6	32	94
601-800	1	11	95	0	10	99
801-1000	1	11	94	2	10	92
Above 1000	1	7	89	2	4	85

As depicted in Table 5\$ all the women beneficiaries had secured above the neutral score of 54. As shown in the table the attitude of the women beneficiaries was found to be indirectly influenced by the family income level in the Kayamkulam municipality while in Shertallay municipality, the women beneficiaries in the income group of 201-400 secured 99 as mean score while the women beneficiaries in the income group of 401-600 secured only 94 as mean score. Probably the women of better earning families were not much attracted by the welfare programmes offered under SMTD in the two municipalities.

The significant difference among these groups with regard to attitude were studied by assessing the analysis of

variance of attitude scores of the women beneficiaries of
different groups and the results are presented in Table 54.

Table 54. Analysis of variance of attitude scores classified
according to the income level of women

Source	df	Kayamkulam			Shertallay		
		SS	MS	F	SS	MS	F
Total	99	10043.06	-	-	13026.19	-	-
Treatment (income)	4	759.57	189.89	1.943	1475.6	368.9	3.034
Error	95	9283.47	97.72	-	11550.56	121.59	-

As revealed in Table 54 the women beneficiaries of
different income level did not differ significantly in respect
of their attitude towards various programmes implemented under
SMTD.

The respondents were classified according to their family
size and the mean score obtained for each group is presented in
Table 55.

Table 55. Attitude scores of women classified according to
the family size (in percentage)

Family size	Kayamkulam			Shertallay		
	55-81	82-108	Mean score	55-81	82-108	Mean score
3-5	-	44	100	-	44	99
5-8	1	39	97	4	31	97
9-11	3	8	86	5	10	83
12-14	2	3	81	2	4	90

As evident from the Table 5$ there was a steady decrease in the scores obtained by the women beneficiaries having big families in Kayamkulam municipality. However, such clear cut pattern did not emerge from the mean scores obtained by the women beneficiaries of different groups of Shertallay municipality.

The influence of family size on their attitude towards the various programme implemented under SMTD was statistically tested and the results are presented in Table 5$.

Table 5$. Analysis of variance of attitude scores of women classified according to the family size

Source	dF	Kayamkulam			Shertallay		
		SS	MS	F	SS	MS	F
Total	99	10043.04	-	-	13026.19	-	-
Treatment (Family size)	3	2964.94	988.31	13.40*	3148.17	1046.06	10.19*
Error	96	7078.13	73.73	-	9878	102.90	-

* Significant at 0.01 level

As indicated in the table 56 the mean score obtained by the women beneficiaries in general were significantly influenced by the family size and it depicted that family size positively influenced the attitude of individual towards the programme. Since the women from a small family may get more

time to get themselves involved in the various programmes implemented and hence had a more favourable attitude towards the programme.

The critical difference among the different income groups is given in Table 57.

Table 57. Critical difference of attitude towards programme among the women with different family sizes

Groups	Different family size	Treatment (Family size)	Critical difference	
			Kayamkulam	Shertallay
T_1	3-5	T_1 Vs T_2	3.78 *	4.57 *
T_2	5-8	T_1 Vs T_3	5.76 *	6.04 *
T_3	9-11	T_1 Vs T_4	8.07 *	8.79 *
T_4	12-14	T_2 Vs T_3	5.82 *	6.23
		T_2 Vs T_4	8.11	8.92
		T_3 Vs T_4	9.22	9.75

* Significant at 0.01 level

As revealed in Table 57 there was significant difference in the attitude towards the programme between the women with different family sizes except between the groups T_1 and T_2 and T_3 and T_5 in both the municipalities and between the groups T_2 and T_4 in Shertallay municipality.

SUMMARY

SUMMARY

In India total urban population is 160 million
and out of this 130 million are slum dwellers. These
slum settlements are a menace to the public health.

During the Seventh Five Year Plan, the Govern-
ment have decided to expand urban infrastructural
facilities judiciously and equitably. Small and medium
town development programme is one of such programmes
introduced in selected small and medium towns. In Kerala
this programme is implemented in Alleppey, Kayamkulam
and Shertallay municipalities.

The present study on the impact of small and
medium town development programme of UNICEF on women
and children with special reference to the nutrition
status was conducted in Kayamkulam and Shertallay munici-
palities. Data required under the study was collected
through surveys on the demographic and ecological features
of municipalities, on the target activities planned and
implemented under small and medium town development
programme, on socio-economic and dietary pattern of
selected families, on anthropometric, clinical and bio-
chemical studies among selected beneficiaries and a

survey to assess the impact of various programmes implemented on the women beneficiaries and their attitude towards the programme.

The survey on socio-economic food consumption and dietary pattern of the beneficiaries of the two municipalities impart information on religion, type of family, family size, education, occupation and income of their families. The expenditure pattern of the families, frequency of purchase and frequency of use of foods, foods produced at home, cooking practices and processing methods, use of foods during special conditions and special occasions were other information available from the above survey.

The survey revealed that most of the families in both municipalities were Hindus and the families were of nuclear type. The average size of the families was 6 in Kayamkulam as well as in Shertallay municipalities. About half of the population was found in earning age group (21-60 years) in the two municipalities. Majority of the members of the families surveyed in both the municipalities were moderately educated. Most of the people in both the municipalities were on daily wages as coolies and coir factory labourers and a few percentage

had permanent jobs. Nearly half of the families belonged to low and low middle income group of the community while the other half were below the poverty line in the two municipalities. In Kayamkulam 78 per cent and in Shertallay 80 per cent of the families spent more than 65 per cent of their income on food. The higher percentage of income was spent on food by low income groups. The purchasing habits of the families in the two municipalities especially foods like green leafy vegetables, nuts and oilseeds and vegetables indicate that they were aware of the need for nutritious foods. Cereals were found to be the staple foods in the diets in the two municipalities. Fish was included in the daily diet by majority of the families while meat, egg and fruits were rarely used. Vegetables were not used frequently and milk was used by most of the families daily eventhough the quantity is less. Most of the families were found to use straining method for cooking cereals. The processing of foods was common only among very few families. 12.73 per cent in Kayamkulam 32.36 per cent in Shertallay were found to introduce supplementary foods during infancy in addition to milk and it clearly indicated the influence of women to the continuous exposure of information on health and nutrition.

Three meals a day system was observed by majority of the families surveyed. Protein, fat and niacin requirements were met above the daily requirement in Kayamkulam whereas they were adequate in Shertallay municipality. Vitamin A was most limiting nutrient in the diets of the families surveyed in the two municipalities.

The weight for age profile of the preschool children when compared with reference standard did not show significant difference in all the age groups. Similar trend was shown other anthropometric measures such as arm circumference, chest circumference and head circumference. The ratio of chest/head was found above one in most of the children. Anaemia was the common deficiency disease in the children. 28 per cent in Kayamkulam and 25 per cent in Shertallay municipality had hemoglobin level below 10 mg/100 ml.

The assessment of knowledge on health and nutrition revealed that the women in the two municipalities were fully aware of the importance of nutritious foods, health, personal hygiene and environmental sanitation in daily life. Gain and retention of knowledge on health and nutrition was found to be influenced by age and family size of the beneficiaries. Moderately young women and women with smaller families were found to obtain higher

score. Income and education were found to have no relation with the gain and retention of knowledge on such practical aspect.

The survey on the attitude towards the programme revealed that majority of the women beneficiaries had favourable attitude towards different programmes implemented under SMID programmes, like establishment of maternal and child health centres and conduct of nutrition education were found to score maximum while programmes like assistance for putting smokeless ovens and functional literary centres scored minimum. Income generating programmes were found to be better accepted by the women beneficiaries in the two municipalities. Significant difference in the attitude towards the programme was observed among the women with different age groups and family sizes. Moderately young women and women with smaller families showed favourable attitude towards the programme.

REFERENCES

REFERENCE

Austin, J.E. (1980). In Confronting urban malnutrition: the design of nutrition programmes. The Johns Hopkins University Press, London:119.

Barik, B.C. (1984). Rural urban migration and economic development: A case study of Oriya Agricultural laboures in Surat. Man and Development VI: 14

*

Basta, S. (1977). Nutrition and health in low income urban areas of the Third World. Ecology of Food and Nutrition. 6:115.

Belisle, F. (1987). Moulding the urban landscape. Reports 16: 14-15.

Bengoa, J.M. (1964). Nutritional rehabilitation Centres. Journal of Tropical Pediatrics 10: 326-329.

Berg, A. (1973). In The Nutrition Factor. D.C.Bookings Institution, Washington: 253-275.

*

Berg, L.E. and Mowery, T.M. (1973). Health programme evaluation: Impact study of the Indian sanitation facilities, Nutrition Planning. 1: 63.

Blackburn, G.L. (1977). Nutritional assessment and support during infection. American Journal of Clinical Nutrition. 30: 1493-1500.

Bose, A. (1978). Migration streams in India: In Indian urbanization, 1901-2000. Tata Mg Graw Hill Publishing Co. Ltd., New Delhi: 39.

Browne, M.S. and Nomani, M.Z.A. (1978). Nutritional assessment of virgin islands school children. Journal of the American Dietetic Association 73: 411-415.

*

Census of India (1981). India :1.

Choudhry, M. and Rao, K.V.(1984). Use of Composite anthropometric indices as an alternative to body weight for evaluation of nutritional status. Indian Journal of Nutrition and Dietetics. 21: 261-264.

Cohen, N., Measham, C., Khanum, S., Khatun, M. and Ahamed, N. (1985). Xeropthalmia in urban Bangladesh, implications for vitamin A deficiency, preventive strategies. Nutrition Planning. 17: 51.

Davidson, S. and Passmore, R. (1973). In Human Nutrition and dietetics. The English language book society, Living Stone: 472-481.

*
Desai, A.R. and Pillai, D. (1986). Slums and urbanization. Social Change. 16: 36.

*
Desai, P. (1972). The pattern of migration and occupation in a South Gujarath Village. Social change. 16: 37.

Desouza, A. (1978). In the Indian City: poverty, ecology and urban development. Manohar Publications, New Delhi: 28-31.

Devadas, R.P. (1978). Rethinking food and nutrition education under changing socioeconomic conditions. Report on International union of National Services Workshop, Tanzania. 1978: 17-26.

Devadas, R.P., Shenbagavalli, P.N. and Vijayalakshmi, R. (1970). The impact of an Applied Nutrition Programme on the nutritional status of selected expectant women. Indian Journal of Nutrition and Dietetics 7: 293-296.

Dhandave, M.S.(1982). Integration of slums into the community: A case study of Gulbarga City (Karnataka). Indian Dissertation Abstracts. XI: 16-18.

Donohue, J.J. (1982). Some facts and figures on urbanization in the developing world. Assignment Children. 57/58: 22-41.

*

Evans, H.K. and Deon, J.G. (1985). Dietary recall method, comparison for hospitalized elderly subjects. Journal of the American Dietetic Association. 85: 202-205.

Florentino, R.F. and Dican, B.A.(1975). Report on the use of arm Circumference for rapid screening of under nourished children. The Phillippine Journal of Nutrition. XXVII: 12-14.

Flores, M. (1972). Methods of diet surveys among pre-school children. Archieves of Latin American Nutrition. 22: 359-384.

*

Garn (1962). Anthropometry in clinical appraisal nutritional status. American Journal of Clinical Nutrition; 11: 418-433.

Gopalan, C. and Rao, V.K. (1972). Family size and nutritional status. Proceedings of Asian Congress on Nutrition. National Institute of Nutrition, Hyderabad: 339-348.

Gopaldas, T. (1980). Chief causes for failure of nutrition education. Proceedings of the Workshop on nutrition education, communication material, media and agencies; National Institute of Nutrition. Hyderabad: 175.

Gupta, M. (1966). Role of Voluntary organizations in comprehension child health care programme. Journal of Pediatrics 33: 214.

Gupta, M., Agarwal, K.N. and Manvani, A.H. (1972). Nutritional status of preschool children. Indian Pediatrics: 9: 450-453.

Gupta, M., Jain, A. and Singh, R.N. (1978). Nutritional status of urban and rural preschool children in Western Rajasthan (in and around Bikaner city) 1. Anthropometric study. Indian Journal of Pediatrics. 45: 247-254.

Haxton, D.P.(1985). A report of the conference on Extending basic services to the urban poor, New Delhi, 1985, April: 2.

Hegsted, D.M. (1972). Problems in the use of interpretation of the recommended dietary allowance. Ecology of Food and Nutrition 1: 225-265.

Hollnsteiner, M.R.(1979). The unwashed urban multitidues. Assignment children. 45/46: 79-92.

Hollnsteiner, M.R.(1982). Government strategies for urban areas and community participation. Assignment Children 57/58: 44-64.

Hoskin, F. (1987). Women, urbanization and shelter. Development Forum. XV: 8-9.

ICMR. (1982). Gopalan, C., Ramasastri, B.V. and Balasubramanian, S.C. In Nutritive value of Indian Foods. NIN. ICMR, Hyderabad. 60-110.

Jellifee, D.B. (1966). The assessment of the nutritional status of the community. W.H.O. Monograph Series. Geneva: 10-78.

Jivani, S.K.M.(1978). The practice of infant feeding among Asian immigrants. Archieves of Disease in Childhood. 53: 69-73.

*
Kamble, N.D.(1980). In Structure and Determination of manpower resources. Asia Publishing house, 137.

Katona, J. (1977). Urbnization income and Sociocultural factors relevent to nutrition in Tamil Nadu. Social Action. 27: 266.

Kimati, P.V. (1985). Situation of urban poor in India. Health Service. 2: 639.

Kolenda, P.M. (1976). Regional difference and family structure. In Regions and regionalism in South Indian Studies. Duke University: 147-172.

Kopardekar, H.D. (1986). Social aspects of urban development: A case study of the pattern of urban development in the developing countries. Social Action. 4: 53-55.

Kumar, S. (1978). Role of the household economy in child nutrition at low incomes-a case study in Kerala. Occasional paper No.95, Cornell University, New York:2

Madavo, C.E. (1978). Uncontrolled settlements. Finance and Development. 13: 16.

Mahadevan, M. (1977). The mobile creches in India. Assignment Children. 40/41: 68-86.

Mandl, P.E.(1982). Social Planning with the urban poor: new Government strategies. Assignment Children. 57/58: 10-18.

Martorell, R., Robert, E.K. and Herman, D. (1980). Improved nutrition and its effects on anthropometric indicators of nutritional status. Nutrition Reports International 21: 219-220.

Mc Namara, R. (1976). The significance of habitat. Finance and Development 13: 5.

Minister of Works and Housing (1985). A report of the Conference on services to the urban poor, New Delhi, 1985, April: 4.

Mukharjee, S. (1979). Understanding colonial analysis and its application through human mobility research. Geographical Review of India. XXXXI: 245.

Nabarro, D. (1984). Social economic, health and environ-
mental determinants of nutritional status. Food and
Nutrition Bulletin. 6: 18.

*

Nelson, R.W.(1963). In Text book of Pediatrics. Philadelphia:
12-13.

NIN (1975). National Nutrition Monitoring Bureau. Report
for the year 1975, Hyderabad: 8.

NNMB (1984). Report for the year 1984. National Institute
of Nutrition, Hyderabad: 5-8.

Nukhood, Z. (1970). Focus on slums in Bombay. Social Welfare.
XVII: 15-18.

PAG (1976). Anthropometry in nutritional surveillance. PAG
Bulletin 6: 12-14.

Patel, R.B. (1986). Nutrition in urban slum population
(All India), Malnutrition in Bombay slums. Proceedings
of the Nutrition Society of India 32: 100-108.

Pekkarinen, M. (1970). Methodology in the collection of
food consumption data. World Review of Nutrition and
Dietetics. 12: 145-171.

Plough, A. (1962). Clinical Evaluation of nutritional status
under field conditions. American Journal of Clinical
Nutrition 17: 413.

Prema, L. and Menon, A.G.G. (1974). Study on the effective-
ness of training for farm women on their gain in
knowledge in human nutrition. Indian Journal of Home
Science 8: 52-57.

Quiogue, E.S.(1970). Comparison between weighing and
interview methods in food consumption surveys.
Philippine Journal of Nutrition 23: 18-37.

Rao, D.H., Sathyanarayana, J. and Gowrinath, S. (1976). Growth pattern of well to do Hyderabad Preschool Children. Indian Journal of Medical Research. 64:

Rao, M.S.A. and Singh (1974). The migrant to city. Yojana XVIII: 24-28.

Rao, N.P., Ramanath, P. and Gowrinath, S.T.(1986). Diet and nutrition in urban areas. Proceedings of Nutrition Society of India 32: 91-100.

Rao, R. (1977). Migration experience and urban slum dwellers. Indian Journal of Social Work. XXVII: 17.

Rao, V.K. (1977). Analysis of relative importance of factors affecting body weight changes in preschool children by nutritional status. Bulletin of the International Statistical Institute Proceedings 47: 710-717.

Rao, V.K., Reddy, P.J. and Narayana, T.P. (1970). Comparison of arm and calf circumference as indicators of protein-Caloric malnutrition of early childhood. Indian Journal of Nutrition and Dietetics 15: 112.

Rasanen, L. (1979). Nutrition Survey of Finnish Rural Children: Methodological study comparing the 24 hour recall and the dietary history interview. American Journal of Clinical Nutrition 32: 638.

Ratil, B., Ghosh, S., Mohan, M. and Ramanujacharyulu, T.K. T.S. (1978). Anthropometric indices of children (5-15 years) of a privileged community. Indian Pediatrics 15: 653-665.

*

Reutlinger, S. and Selowsky, M. (1976). Malnutrition and poverty: magnitude and policy options.World Bank Occasional Paper No.23: 31.

Resource Atlas of Kerala (1984). Centre for Earth Science Studies Publishers. Trivandrum, Kerala : 17.

Sabrycan, L.I. (1973). Assessment of Nutritional status of children, Survey as a technique. Journal of Public Health: 64: 265-269.

Sauberlich, A.E., Dowdy, R.P. and Sukala, J.R. (1974). In laboratory tests for assessment of nutritional status. C.R.L.Press, England: 1-3.

Saxena, A.P. (1978). In Ruruban migration in India; Causes and Consequences. Popular Prakshan, Bombay: 1.

Shah, G. (1975). The City and slum.Report of a Seminar on urbanisation in India and Gujarat, processes and problems. Gujarat University, Ahamedabad, 1975: 4.

Sharma, S. and Davis, A.R.S.(1986). Impact of Social change on mental health in India. Social Change. 16: 104-111.

Singh, A.M. (1976). Women and the family: Coping with poverty in bastis of Delhi. Social Action. 4: 257-259.

Singh, J.P. (1986). Patterns of rural-urban migration in India. Social Action , 3: 216-217.

Soof, S.K.(1967). Iron deficiency anaemia. Proceedings of Nutrition Society of India 2: 41.

Sundararaj, S., Shiela, J. and Shiela, M.D.(1971). Diets of preschool children: A comparison of two methods. Indian Journal of Nutrition and Dietetics 8: 137-141.

Swaminathan,M. (1974). In Essentials of food and nutrition Vol.II. Applied aspects, Ganesh and Co., Madras: 217-223.

Swaminathan, M.S. (1969). Assessment of the nutritional status of the community. Indian Journal of Nutrition and Dietetics 6: 134.

Tinker, I. (1976). Development and the disintegration of the family. Assignment Children 36|37:37.

UNICEF (1977). Report on feasibility survey of productive/income generating activities for women in Bangladesh. Daccq, 1977: 64.

UNICEF (1982). Urban basic services. A report by the executive director of UNICEF, 1982: 11.

UNICEF (1984). Reaching children and women of the urban poor. A report by executive director of UNICEF, 1984: 19.

UNICEF (1985). Families in the face of urbanization. A report of IUFO Conference, New Delhi., 2-5 December, 1985: 8-10.

UNICEF (1985). Expansion of basic services to the urban poor during the Seventh Five Year Plan. Urban basic services, Occasional Paper No.5:1-11.

Wishwakarma, R.K. (1976). Urbanization policy, a master plan for master plans. Social Welfare xxiii:4-7.

* Original not seen.

APPENDICES

COLLEGE OF RURAL HOME SCIENCE
VELLAYANI

Schedule to assess the Socioeconomic status and food consumption pattern of the selected families in Kayamkulam and Shertallay municipalities.

1) House No.   2) Ward No.   3) Place

4) Head of the family   5) Address

6),Religion   7) Caste   8) Type of family

                                              a) Joint family

                                              b) Nuclear family

No.	Relationship with the head of the family	Age	Sex	Education	Occupation	Monthly Income

Total Income

Monthly expenditure pattern

No.	Items	Expenditure Rs. ps
1.	Food	
2.	Clothing	
3.	Shelter	
4.	Transport	
5.	Education	
6.	Entertainment	
7.	Health	
8.	Savings	
9.	Others	

Items	Frequency of purchase				Puchased from shop		Producted at home	
	Daily	Weekly	Monthly	Occasionally	Qty.	Amount spent	Qty.	Amount spent
Cereals								
Pulses								
Leafy vegetables								
Roots and tubers								
Other vegetables								
Milk and milk products								
Fruits								
Meat and Fish								
Egg								
Nuts and oilseeds								
Spices and condiments								

Frequency of use of different food materials

Foods	Frequency of use of food stuffs					
	Daily	Weekly thrice	Weekly twice	Once in a week	Occasionally	Not at all
Cereals						
Pulses						
Roots and tubers						
Other vegetables						
Green leafy vegetables						
Fruits						
Milk and Milk products						

3

Foods	Frequency of use of food stuffs					
	Daily	Weekly thrice	Weekly twice	Once in a week	Occa- siona- lly	Not at all
Meat						
Fish						
Egg						
Fats and oils						
Sugar and Jaggery						
Readymade processed foods like Jam, squash, Pickles noodles etc.						
Bakery items						

Different methods of cooking

Foods	Boiling		Steaming	Frying	Others
	Absorption	Straining			
Cereals					
Pulses					
Roots and tubers					
Other vegetables					
Fruits					
Fish and meat					
Egg					
Milk					
Others					

Different methods of preservation of foods

Items	Methods	Remarks
Cereals		
Pulses		
Leafy vegetables		
Other vegetables		
Fruits		
Milk		

4

Items	Methods	Remarks
Meat Fish Others		

Meal pattern

Menu	Previous days menu		
	Preparations	Ingredients	Weight before cooking (gm)
Break-fast			
Lunch			
Tea			
Dinner			
Other snacks			

Meal pattern during special conditions

Conditions	Break-fast	Lunch	Dinner	Remarks
Infancy				
Preschool period				
School going period				
Adolescent				
Pregnancy				
Lactation				

Preparations on psecial occasions

Occasions	Special preparations	Significance
Birth		
Marriage		
Death		
Local festivals		
Religious functions		

APPENDIX II

NATIONAL NUTRITION MONITORING BUREAU
(Indian Council of Medical Research)
FAMILY DIET SURVEY — ONE DAY WEIGHMENT

Family No.. . . . . . Name of the Head of the
Family . . . .   Dt. . . . .

VILLAGE . . . . District . . . . State. . . . .

Age and Sex composition of those who have partaken the meal

Age	Adult	12-21	9-12	7-9	5-7	3-5	1-3	Below 1	Guests (Ages
M									
F									

WEIGHT OF RAW FOODS IN GRAMS

FOOD STUFF	FOOD STUFF
CEREALS	17. Other vegetables
1. Bajra	
2. Jowar	**ROOTS & TUBERS**
3. Maize, dry	18. Carrot
4. Ragi	19. Onion, big
5. Rice	20. Potato
6. Wheat flour	21. Tapioca
7. Others.	22. Others
PULSES	**NUTS & OILSEEDS**
8. Bengalgram	23. Cashewnut
9. Blackgram	24. Coconut, dry
10. Khesari dal	25. Coconut, fresh
12. Lentil	26. Groundnut
13. Redgram	27. Others
14. Soyabean	
15. Others.	28. Condiments & spices.
16. Leafy vegetables.	

WEIGHT OF RAW FOODS IN GRAMS

FOOD STUFF (Fruits)

29. Amla
30. Apple
31. Banana, Ripe
32. Lime & Orange
33. Mango, Ripe
34. Melon, Water
35. *Papaya*, Ripe
36. Tomato, Ripe
37. Others.

FISH

38. Fish, Fresh
39. Fish, Dry
40. Prawns

OTHER FLESH FOODS

41. Meat
42. Chicken
43. Liver, Goat.
44. Egg, Hen

FOOD STUFF(Milk & Milk Products)

45. Milk
    Curds
    Butter Milk

46. Skimmed milk, Liquid
47. Cheese

Fats & Oils

48. Butter
49. Ghee
50. Hydrogenated oil
51. Cooking oil

OTHER FOOD STUFFS

52. Betel leaves
53. Biscuit, Sale
54. Biscuit, Sweet
55. Bread, White
56. Sugar
57. Jaggery
58. Papad
59. Sago
60. Toddy
61. Horlicks
62. Farex
63. Amul
    Amulspray
    Others

9 Dietary Information:

Meal Pattern	Type of preparation	Ingredients used	Raw amount used (g/ml)
a	b	c	d
Early Morning:			
Breakfast			
Mid-Morning			
Lunch			
Evening Tea & snacks			
Dinner			
Others			

NATIONAL INSTITUTE OF NUTRITION
Nutritional Assessment Schedule   Date:

State: District: Taluk: Village:

Serial No.   Family No.   Block

Name of the subject: Sex: Male/Female

Name of the Father/Guardian   Occupation:

Income (Per annum)   Date of birth:

                              Age . . . . . Yrs.......Months.....

Source: Parents/Record

Breast fed/BF + Supplements| Not BF   Pregnant/Lactating......Mths.

ANTHROPOMETRY:

Heights (cm)   Fat fold at triceps (mms)

Weight(kg)   Head circumference (cms)

Arm circumference (cms)   Chest circumference (cms)

CLINICAL EXAMINATION:

Hair Sparse   Night blindness

     Discoloured   Photophobia

     easily plucked   Anaemia

     Moon face   Nasolabial
                                   dyssebacea
     Parotid enlargement
     (bilateral, painless)   Angular stomatitis

     Oedema   Cheilosis

     Emaciation   Tongue: Red & raw

     Marasmus   Papillae-atrophic

     Conjunctival   Papillae-hypertrophic
        xerosis
                                   Pellagra
     Bitot's spots
                                   Craz pavement dermatosis
     Corneal xerosis/
     Keratomalacia   Pigmentation at
                                   knuckles/fingers/toes
     Corneal opacity
                                   Phrynoderma

Koilonychia

Gums-spongy bleeding

Craniotabes

Epiphyseal enlargment

Beading of ribs

Knowck-knees/bow legs

Frontal parietal boosing.

     : Caries

Teeth: Mottled enamel

Enlargement of spleen

Enlargement of liver

       Soft

       Firm

       Hard

Thyroid enlargement

Others

---

* For children below 5 years only.

Haemoglobin-cyanmethaemoglobin method

Principle

Haemoglobin is converted into cyanmethaemoglobin by the addition of potassium cyanide and ferricyanide. The colour of cyanmethaemoglobin is read in a photoelectric calorimeter at 540 n.m. against a standard solution. Since cyanide has the maximum affinity for haemoglobin, this method estimates the total haemoglobin.

Reagent

Drabkin's solution: Dissolve 0.05 g of potassium cyanide, 0.2 g of potassium ferricyanide and 1 g of sodium bicarbonate in 1 litre distilled water.

Procedure

20 μl of blood are measured accurately from a haemoglobin pipette and delivered on to a Whatman No.1 filter paper disc. The filter paper is air dried labelled and can be stored upto one week. The portion of filterpaper containing the blood is cut and dipped on 5 ml Drabkins solution taken in a test tube wait for 30 minutes and mix the contents on a vortex mixture and take the readings.

Construction of standard curve

If the blood drawn from the subject contain haemoglobin 15 g/dl after estimation then prepare three reference standards as follows:

1. Reference standard A.

4 ml blood in 1000 ml Drabkins reagent contain haemoglobin 15 g/dl.

2. Reference standard B.

300 ml of reference standard A + 200 ml Drabkins reagent contain haemoglobin concentration of 10 g/dl.

3. Reference standard C.

200 ml of reference standard A and 300 ml Drabkins reagent contain a haemoglobin concentration of 7.5 g/dl.

Thus we have three reference standards at three levels of haemoglobin concentration. Use 5 ml from each standard whenever haemoglobin estimations are done.

COLLEGE OF RURAL HOME SCIENCE
VELLAYANI

Schedule to test mothers knowledge on Health and Nutrition

1. Name of the respondent

2. House No.   3. Address

No.	Statements	Right	Wrong
1.	Pregnant women need more food		
2.	Regular health check up is needed during pregnancy.		
3.	Physical exertion is not advisable during the first four months of pregnancy.		
4.	Antitetanus injection is not needed for pregnant women.		
5.	Breast feeding can be started immediately after delivery.		
6.	Breast feeding is needed only upto six months.		
7.	Immunization should be given to the babay at specified intervals.		
8.	The school children should be fed atleast 5 to 6 times a day.		
9.	Protein deficiency can cause night blindness in children.		
10.	Carbohydrate rich foods are necessary for growth.		
11.	Calcium is necessary for the proper growth of bones and teeth.		
12.	Pulses are best source of carbohydrate.		
13.	Iron rich foods prevent anaemia.		
14.	Greenleafy vegetables and animal foods are rich source of vitamin A.		
15.	Vitamin C is necessary for healthy eyes.		
16.	Green leafy vegetables and liver are rich in iron.		

Appendix V (contd.)

No.	Statements	Right	Wrong
17.	Vitamin C prevents swelling and bleeding of gums.		
18.	There is no need to give water for a child with diarrhoea.		
19.	Breast milk should not be given for a child with diarrhoea.		
20.	Pregnant and lactating mothers require supplementary feeding.		
21.	Weaning food should be introduced only after 2 years.		
22.	Infectious diseases can be prevented by keeping the environment clean.		
23.	Flies are not the cause of spreading infection.		
24.	Proper drainage ensures environmental sanitation.		
25.	Surroundings can be kept clean by using water seal latrines.		
26.	Wells and surroundings should be kept clean.		
27.	Hands should be washed before meals.		
28.	Long dirty nails are not unhygienic to health.		

APPENDIX VI

COLLEGE OF RURAL HOME SCIENCE
VELLAYANI

Schedule to assess the attitude of women towards the programme

1. Name of the Respondent
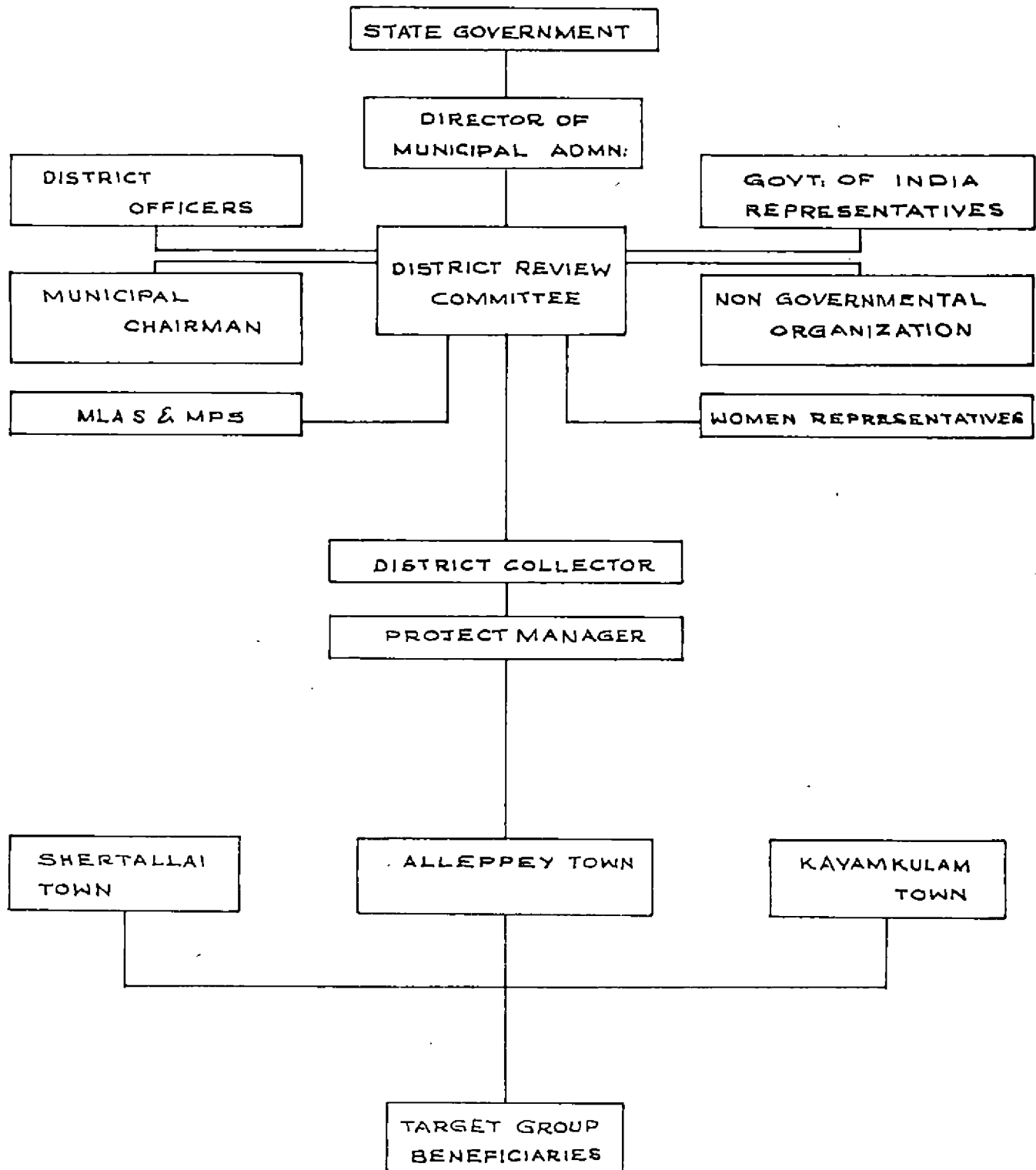
2. House No.   3. Address

No.	Programmes	Very use-ful	Often use-ful	Some-time useful	Rarely useful	Not useful
1.	Establishment of maternal and child health centres.					
2.	Drug supplement kits to MCH centres.					
3.	Service of medical and paramedical staff.					
4.	Extension of pipewater supply.					
5.	Low cost water supply programmes					
6.	Assistance in putting up water seal latrines					
7.	Latrines and urinals in L.P.Schools.					
8.	Service of volunteers in the Construction of latrines.					
9.	Assistance for putting up smoke less ovens.					
10.	Improved drainage facilities.					
11.	Hard surfacing/paving of lanes in slum areas.					
12.	Nutrition education to women.					
13.	Starting of Demonstration feeding centres.					
14.	Supply of utensils to the feeding centres.					

No.	Programmes	Very use-ful	Often use-ful	Some-time use-ful	Rarely use-ful	Not use-ful
15.	Assistance to Balawadies					
16.	Assistance for setting up of creches and day care centres.					
17.	Functional literacy centres for women.					
18.	Assistance for setting up community centres.					
19.	Melas and exhibitions.					
20.	Assistance for the income generating activities like poultry and goat rearing.					
21.	Income generating programme like papad making and coir spinning.					
22.	Assistance to the cottage industry for women.					
23.	Provision of seed money to NGOs for starting of production centres.					
24.	Establishment of play grounds and children's park					
25.	Distribution of play equipments to primary schools.					
26.	Shelter improvement schemes in slums.					
27.	Setting up of an Audio visual aid unit.					

APPENDIX

ORGANIZATIONAL CHART

STATE GOVERNMENT

DIRECTOR OF MUNICIPAL ADMN:

DISTRICT OFFICERS

GOVT: OF INDIA REPRESENTATIVES

DISTRICT REVIEW COMMITTEE

MUNICIPAL CHAIRMAN

NON GOVERNMENTAL ORGANIZATION

MLAS & MPS

WOMEN REPRESENTATIVES

DISTRICT COLLECTOR

PROJECT MANAGER

SHERTALLAI TOWN

ALLEPPEY TOWN

KAYAMKULAM TOWN

TARGET GROUP BENEFICIARIES

IMPACT OF SMALL AND MEDIUM TOWN DEVELOPMENT PROGRAMME OF UNICEF ON WOMEN AND CHILDREN WITH SPECIAL REFERENCE TO THE NUTRITION STATUS

BY

JAYASREE, M. J.

IMPACT OF SMALL AND MEDIUM TOWN DEVELOPMENT PROGRAMME OF UNICEF ON WOMEN AND CHILDREN WITH SPECIAL REFERENCE TO THE NUTRITION STATUS

BY
JAYASREE, M. J.

ABSTRACT OF THE THESIS
SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENT ·FOR THE DEGREE OF
MASTER OF SCIENCE
IN FOOD SCIENCE AND NUTRITION
FACULTY OF AGRICULTURE
KERALA AGRICULTURAL UNIVERSITY

COLLEGE OF RURAL HOME SCIENCE
VELLAYANI, TRIVANDRUM

1987

ABSTRACT

A study on the impact of small and medium town development programme of UNICEF on women and children with special reference to the nutrition status was conducted at Kayamkulam and Shertallay municipalities to assess the nutritional status of the beneficiaries of the programme, through diet survey, anthropometric, clinical and biochemical methods, Knowledge on health and nutrition gained and retained by the women benefici- aries and their attitude towards different programmes implemented under SMTD were also assessed.

The result of the diet survey conducted in the two municipalities among 100 families each, depicted that most of the families were of nuclear type with moderate literacy level. Nearly half of the families surveyed were below poverty line in both the municipalities. Seventy eight per cent of the families in Kayamkulam and 80 per cent of the families in Shertallay spent more than 65 per cent of their income on food. Cereals and fish were included in adequate amounts in the daily diets of the families in the two municipalities. Meat, egg and fruits were the food articles which were rarely used by the families. Supple- mentary food was introduced during infancy in the two munici- palities. Results of the weighment survey clearly indicated that the diets of mothers and children were adequate with respect to protein, fats and niacin in Kayamkulam and in

Shertallay. Vitamin A was the most limiting nutrient in the two municipalities.

Regarding the nutritional status of children, the weight for age profile of the preschool children when compared with reference to standard did not show significant difference in all the age groups. Similar trend was shown in other anthropometric measures such as arm circumference, chest circumference and head circumference. The ratio of chest/head was found above one, in most of the children. Sixty eight per cent of preschool children in Kayamkulam and 60 per cent in Shertallay showed the evidence of first degree malnutrition. Anaemia was the common deficiency disease in the children. Twenty eight per cent in Kayamkulam and 25 per cent in Shertallay municipality had haemoglobin level below 10 mg/100 ml.

The assessment of knowledge of women on health and nutrition revealed that the women in the two municipalities were aware of the significance of nutritional needs, health, personal hygiene and environmental sanitation in daily life.

The assessment of the attitude of women towards various programmes implemented under SMTD in general showed a favourable attitude. Establishment of maternal and child health centres, and conduct of nutrition education programmes are better accepted by the women in the two municipalities while

the programmes for installing smokeless ovens and organizing functional literacy centres were less accepted by the women beneficiaries of both the municipalities. Income generating programmes were scored higher in Kayamkulam when compared to Shertallay while hard surfacing and paving of lanes, establishment of creches and child care centres and establishment of audiovisual aid units scored higher in Shertallay than Kayamkulam. The attitude towards the programme in general was significantly different among different age groups and beneficiaries belonging to different family sizes unlike different income and education levels. Moderately young women and women from small families showed more favourable attitude towards the programme.