

MATERNAL EMPLOYMENT AND NUTRITIONAL STATUS OF PRESCHOOL CHILDREN

By

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THESIS

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1998

DECLARATION

I hereby declare that the thesis entitled '**Maternal employment and nutritional status of preschool children**' is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the award to me of any degree, diploma, fellowship or other similar title, of any other University or Society.

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CERTIFICATE

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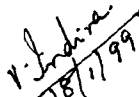
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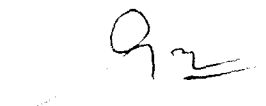
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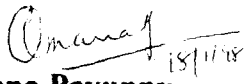
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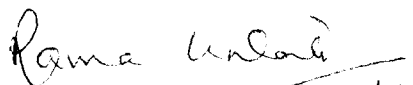

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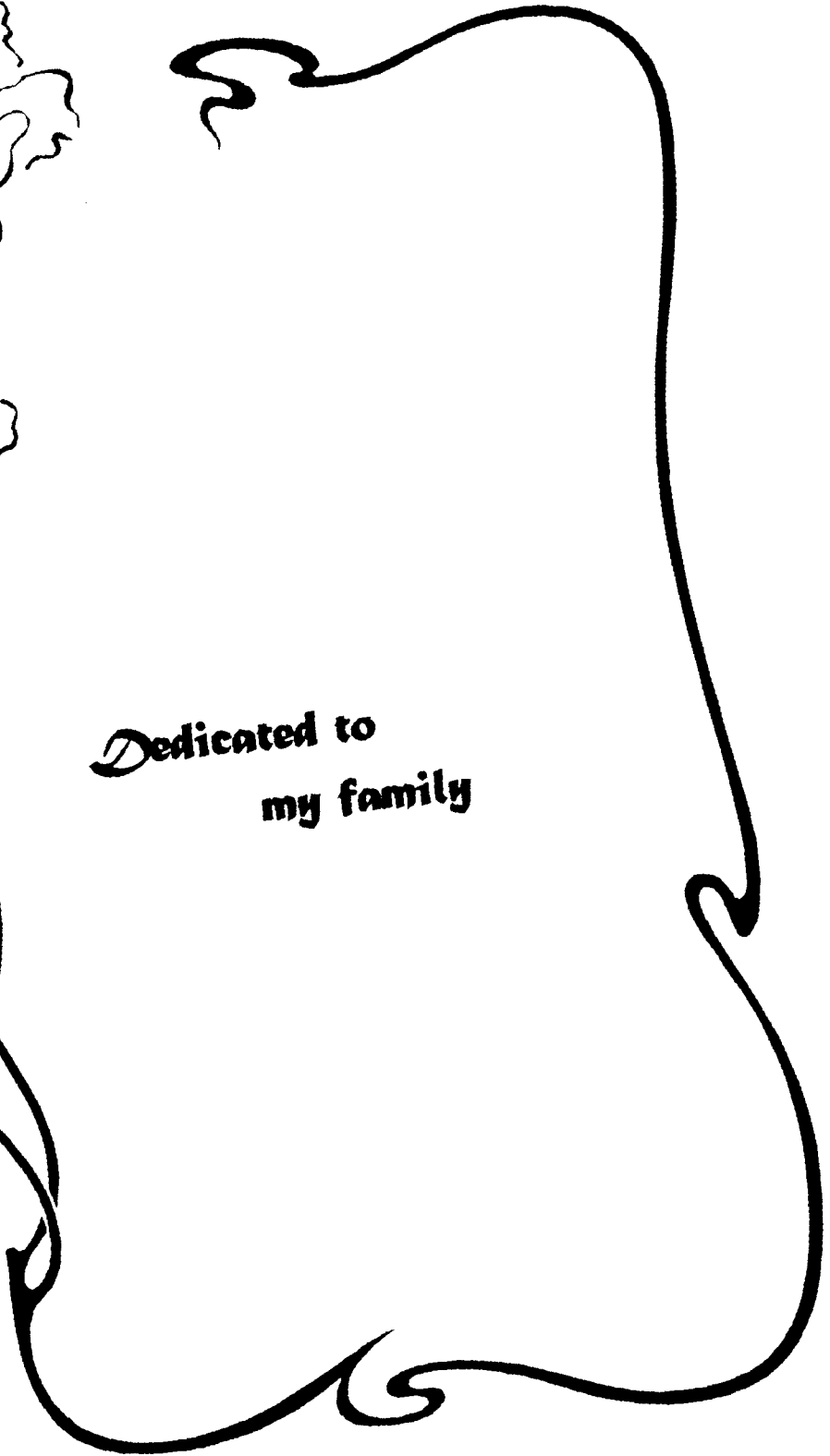
Thank you one and all.



Mimi P. Jose



***Dedicated to
my family***



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Introduction

INTRODUCTION

Nutritional well-being is a prerequisite for the achievement of full social, mental and physical potential of a population so that people can lead fully productive lives and contribute to the development of the community and nation with dignity. Nutrition is one of the foundations of human society and solidarity (FAO and WHO, 1992).

As today's children are the citizens of tomorrow's world, their survival and protection are the prerequisite for the future development of humanity. Empowerment of the younger generation with knowledge and resources to meet their human needs should be the primary goal of national development (UNICEF, 1990). As the development and social contribution of children will shape the future of the world, investment in children's health and nutrition is very important for the progress of the nation.

Preschool years are the most vulnerable period when the child has to get adequate nutrition. The foundation and sustenance of good health are laid during this period. Malnutrition among preschool children is one of the most important health problems of developing countries. According to Dube (1998) malnutrition accounts for over half of the deaths occurring among young children in the developing world. Since the nutritional status of preschoolers reflect the general nutritional status of the community, optimum nutrition of children in terms of quality and quantity should be considered as a nation's priority.

Among the several contributory factors influencing the nutritional status of children, the role of mother is central in importance. Women's role is no longer limited to the household chores. In recent years a transition has taken place in their

role from wife and mother to member of the workforce. The latest statistics (Alva, 1998) reveal that women working in the organised sector constitute 10 per cent of the workforce while in the unorganised sector it is 90 per cent. This entry of women in the labour force results in higher family income making them economically independent.

The wages earned by women enable them to purchase more food resulting in better family health and nutritional status. Moreover, working women may also have access to information and knowledge which help in better utilization of health care services. On the other hand, women's work for income decreases the time available for child care and this may adversely affect the health and nutritional status of the child (NIN, 1993). Very few studies have been attempted to get an insight into this complex situation and to understand the influence of maternal employment on the nutritional status of children. Hence, the present study was undertaken with the objective of assessing the impact of maternal employment on the nutritional status of preschool children from 4 to 5 years of age.

Review of Literature

REVIEW OF LITERATURE

Children, particularly preschool children, are victims of most health and nutrition related problems. Global efforts are on to protect the world's children from onslaughts of malnutrition, infection and exploitations. Of the innumerable factors affecting the child's health and nutritional status, the role of women as a mother and employee is of central importance. The literature pertaining to the study on maternal employment and nutritional status of preschool children has been reviewed under the following subheadings:

- 2.1 Role of women - A changing scenario
- 2.2 Prevalence of malnutrition among preschool children
- 2.3 Factors affecting the nutritional status of children
- 2.4 Impact of maternal employment on the nutritional status of children
- 2.5 Health and nutritional awareness of mothers

2.1 Role of women - A changing scenario

In recent years, women have made the transition from wives and mothers to participants of the workforce, taking themselves away from their homes and have become an economic force of the family. This entry of the women in the labour force is a survival strategy especially in poor households (UNICEF, 1985, Malik, 1987 and Augustine, 1993).

Economic necessity, economic independence, raising the standard of living, occupying time, utilizing education and dislike of household work were some of the reasons for the home makers seeking employment (Devadas, 1994 and Rao, 1997).

UNICEF (1985) stated that women constitute more than a third of the world's economically active population. According to Mankekar (1980) and Batra (1982) women constituted about 33 per cent of labour force in India. However, India's working women constituted about 90 per cent of the informal labour sector (Arunachalam, 1985 and Alva, 1998).

Saieka and Gogi (1981) indicated that in India, one fifth of the total labour of a family comes from women and one third of the women labour was engaged in agriculture. According to Achanta (1983) women played a pivotal role in agricultural activities from time immemorial.

Bhatt (1988) reported that 36 per cent of the female workers in India contributed over 50 per cent of the total family income.

The results of the study conducted by Patnaik and Debi (1987) in Orissa showed that participation of female labour is higher in every field that is farm, nonfarm and household, than that of male labour.

In Kerala it was revealed by Jose (1988) to be as high as 11.87 per cent whereas it was less than 2 per cent in Punjab (Shatrugna *et al.* 1993)

The different occupations under the unorganised sector included agriculture, animal husbandry, fisheries, crafts like bamboo, cane or mat weaving, spinning, cashew processing, beedi rolling, embroidery, zari work, agarbati making,

construction of building, vending of vegetables, fruits, flowers and many others (Arunachalam, 1985; Nair, 1990; Ramachandran, 1994 and NIN, 1996).

According to the National Community of Self Employed Women (1992) and Alva (1998) 94 per cent of the total female work force operate within the highly exploited informal sector characterised by low wage earnings, long hours of work, low productivity, low skills and lack of security with limited legal safeguards.

A study carried out by Devadas and Sekar (1990) to find out the impact of income generation by women revealed that income of women increased to the tune of 38 per cent and along with the increased income there was an increase in the amount spent on food especially on milk, millets, greens and other vegetables. This is in line with the findings of Vijayalakshmi and Jayanthi (1990) and Devadas (1994) in Tamil Nadu. These authors also revealed that the intake of convenience foods were higher among the employed women families.

Women are the most undernourished economically, the most vulnerable, and socially, the most depressed groups of workers in society (Patel, 1982 and Devadas, 1994). However, employment outside the house may bestow upon the working women and her family benefits such as increase in purchasing power and standard of living with consequent improvement in nutritional status. According to Stokes and Peyton (1986); Devadas and Sekar (1990) and Devadas (1994), working women had easier access to maternal and child health centres and family welfare facilities with opportunities to utilise the same more effectively.

Mean family size also was somewhat smaller in the gainfully employed women and was possibly due to reluctance of women to lose wages on account of pregnancy (Vijayalakshmi and Jayanthi, 1990).

According to Devadas (1994), empowering women would ultimately lead to better nutrition for the family. However, studies conducted at NIN (1995a) showed that the empowering effects of employment may be small since the type of work available to women are not usually associated with autonomy control.

Managing both a career and a family is indeed a stupendous task especially when the women has to work overtime and in the absence of domestic help (UNICEF, 1985; Devadas, 1988; Kevany *et al.*, 1990; McGuire and Popkin, 1990; Houston *et al.*, 1992; Ramachandran, 1992; Kurz and Sapir, 1993 and Rao, 1997).

Women are restrained by parameters placed around them by domestic responsibilities which on the whole do not affect men. The glass ceiling or the invisible barrier which prevent women and the maternal wall increases the tension for women trying to be professionals and mothers at the same time (Rao, 1997).

Women performed tasks which are essential for the survival of the society, from raising children, to feeding their families (UNICEF, 1985).

NIN (1995a) indicated that income generating activities and child care responsibilities can both be intensely time consuming. The most effective intervention for improving child health - improved breast feeding and supplementary feeding practices, the administration of Oral Rehydration Salt (ORS) during episodes of diarrhoea, the use of preventive and curative health services depend on substantial inputs of time, most often by the mother.

The multiple roles played by women inside and outside the house formed a part of their role (Jhurani, 1985). In a report published by NIN (1985) it has been

stated that, stress and conflicting demands on the women inside and outside the house had adverse effects on their health status.

According to Sujatha (1990) the difficulties imposed on the homemakers due to their dual role were improper care of their family, inability to cope with the household work and lack of time for care of children.

Employed women and girls have less leisure time than men, making them less able to participate in social, decision making and educational activities (Ottesen *et al.*, 1988, NIN, 1995a and Sarin, 1998).

Joseph (1998) reported that majority of the working women were dissatisfied with work mainly due to health hazards and partly due to the meagre wages and heavy workload.

Kaur and Sharma (1988) observed that the rural women's social and economic role inside and outside the home had not received due recognition

In India, the wages of female agricultural labourers remained at less than 80 per cent of the male wage rate in 10 states and in 3 states it rarely exceeded 65-70 per cent (Banerjee, 1983; Jose, 1988 and Sudhari, 1990).

Vimal (1984) observed that in the Philippines women workers are being overworked by compulsory overtime. It was also observed that women worked from 8 to 10 hours per day and spent around 4 to 6 hours in domestic work and farming. This is supported by Vazquez *et al.* (1991) who found that Mexican women worked between 66 and 78 hours a week. Similar findings were observed by Mehrotra,

(1983), Alaka and Chetna (1983), Nandini (1986), Gillespie and Mason (1991), Augustine (1993) and Shah and Rathore (1993) among different communities

2.2 Prevalence of malnutrition among preschool children

Malnutrition is a major nutritional problem in several developing countries. Despite the general improvement in food availability, health and social services, the number of undernourished in developing countries is appalling. More than 230 million of all preschoolers in developing countries are stunted (Murray and Lopez, 1994).

According to Carlson and Wardlow (1990) about 36 per cent of children under five in developing world are malnourished, i.e., 39 per cent are stunted and 8 per cent wasted. One in six malnourished children is severely malnourished. In a recent report, Reddy (1997) observed that the percentage of under weight children below 5 years contributed nearly 53 per cent of the child population.

Malnutrition accounted for 56 per cent of deaths among children below five years (Dube, 1998).

In India, out of 130 million preschool children 40 million have moderate to severe weight deficit (Uvin, 1994 and NIN, 1994a). However, there has been a decline in malnutrition from 47.5 per cent to 40.8 per cent during 1975 to 1990 (WHO, 1992).

It was reported by NIN (1995b) that in Kerala 34 per cent of children are moderate to severely malnourished. In Gujarat it is almost double (67%). The prevalence of marasmus ranged from 0.4 per cent in Tamil Nadu and Andhra Pradesh to 1.4 per cent in Madhya Pradesh and Orissa. The proportion of preschoolers with severe undernutrition was about 4 per cent in Punjab, Haryana and Himachal Pradesh

In Andhra Pradesh the incidence of severe forms of malnutrition was three fold in post drought condition than the predrought period (NIN, 1988). Krishnamachari (1989) in a study conducted during the drought period of 1987 in Rajasthan indicated that 17.3 per cent of boys and 13.1 per cent of girls below five years suffered from Grade III malnutrition. Sarma (1993) on the performance of ICDS observed the presence of around 2 per cent of severely malnourished children.

Different grades of malnutrition was reported among preschool children in other countries also. Zaghloul (1988) found that one-third of the children in Bahrain had PEM, 4.6 and 0.2 per cent had moderate and severe malnutrition. 12.3 per cent were over weight and 23.5 per cent were stunted. Geefhuysen and Soetrisno (1988) observed that undernutrition amongst Indonesian children ranged from 3 per cent to 48 per cent. In Chile there was a decline from 15.5 per cent in 1975 to 8.8 per cent in 1987 (Grieber, 1990).

A review of WHO (1990) on the extend of malnutrition in Africa pointed out that 3 million children of 1 to 4 years suffered from severe PEM. A study by Martinez and Fernandez (1995) in Mexico indicated that 46 per cent of children were malnourished, 30 per cent exhibited mild malnutrition, 13 per cent moderate and 3 per cent were severely malnourished. Tuncbilek *et al.* (1995) reported that

20.5 per cent of Turkish children were stunted, 10.4 per cent under weight and 2.9 per cent wasted

The most widespread micronutrient deficiencies in the world today are that of iron, iodine and vitamin A (Devadas, 1994 and Scrimshaw, 1994).

Anemia of iron deficiency is a major nutritional problem in the world affecting 2170 million people (WHO, 1992) of which 90 per cent are in developing countries with South East Asia having the highest prevalence. World Bank Statistics stated that 43 per cent of children under four years of age had anemia (DeMaeyer and Tegman, 1985)

Iron deficiency anemia is a major nutritional problem in India affecting almost all segments of the population, the most affected groups being women, pregnant or otherwise and preschool children (Sarma and Ramana, 1990, Gopalan, 1994 and Rao, 1994).

According to UNICEF (1991) 50 per cent of children under five years are suffering from nutritional anemia.

Vitamin A deficiency leading to xerophthalmia requires immediate action. According to Vijayaraghavan (1989) about 5-10 per cent of children belonging to poor socio-economic groups particularly in rural areas suffered from xerophthalmia.

Reddy *et al.* (1993) indicated that the proportion of nutritional blindness in India has reduced drastically to 0.04 per cent from 2 per cent since 1973

Among the vitamin A deficiency the most evident condition is conjunctival xerosis (Gopalan *et al.*, 1989; UNICEF, 1991; WHO, 1991; Reddy *et al.*, 1993; Devadas, 1994 and Scrimshaw, 1994).

Hussain *et al.* (1991) in his study on Sudanese malnourished children observed different manifestations of vitamin A deficiency like conjunctival xerosis (56%), Bitot's spots (12%), corneal xerosis (11%), corneal ulceration (11%), nyctalopia (4%) and corneal scar (2%).

NIN (1994a) reported Bitot's spots among 5.8 per cent of preschool children. According to NIN (1996), 5-10 per cent of children with vitamin A deficiency had xerophthalmia and 40 per cent had decreased serum retinol levels.

Iodine deficiency, another significant nutritional problem has been viewed with serious implications. It is widespread in India and has become a public health problem (UNICEF, 1990; Gopalan, 1992; Kodyat and Latief, 1994; Sarkar and Poddar, 1994; Scrimshaw, 1994; Rao, 1994 and Kochupiullai, 1997). It is estimated that nearly 800 million are at the risk of iodine deficiency disorders (IDD) of which 170 million are in India and no state is completely free from IDD (Rao, 1994). According to Vir (1994) goitre is the most common visible ill effect of iodine deficiency and its prevalence varied from 40-60 per cent with as much as 20 per cent prevalence of Grade II goitre.

Vitamin B complex deficiencies amongst preschoolers manifested as angular stomatitis was not uncommon though there has been a decline from 5 to 10 per cent to about 2 to 5 per cent (Rao *et al.*, 1991; Reddy *et al.*, 1993 and Devadas, 1994). since 1973.

2.3 Factors affecting the nutritional status of children

There is particular interest in the determinants of the nutritional and health status of preschool children, because they are at the greatest nutritional risk, they account for a disproportionately large share of deaths and are less able to cope physiologically with nutritional deficiencies.

Nutritional problems of developing countries are due to the fact that majority of the population subsist on inadequate diet both with respect to quantity and quality of food, necessary for the physiological needs and welfare (Gopalan, 1991). Poverty and food deprivation are the root causes of malnutrition (World Development Report, 1990 and Bhaskaram, 1996).

Studies conducted by several scholars had indicated that the inadequate calorie intake was due to poor purchasing power (Vazir, 1990; Saibaba, 1991; NIN, 1993 and Devi and Geervani, 1994).

Hunger and undernutrition at the household level is dependent on such factors as the total income, on who in the family earned and who controlled the expenditure (Islam, 1989 and Vazir, 1990).

A study in rural Bangladesh showed that family income along with mother's education affected nutritional status of children. A higher family income was of relatively greater benefit to the children of literate mothers than to those of illiterate mothers in improving the nutritional state of child (Abdullah *et al.*, 1982).

Gopalan (1991) observed that the level of female literacy is about the most important single indicator of social development of a community. Female

literacy apparently holds the key to the success of health and nutrition of the family. In rural areas problems of under educated mothers, taboos and customary food practices were reported as the significant causative factors of malnutrition in young children. A positive association between parental literacy and nutritional status was reported by Vazir (1990), Devadas *et al.* (1991), Devadas (1994) and NIN (1994a).

In contrast, a study by Abaheseen *et al.* (1981) among Arabian children failed to observe any consistent relation between mother's education and nutritional status.

A large household is widely regarded as a risk factor for malnutrition in developing countries particularly for infants and young children (Pelto *et al.*, 1991; Devi and Geervani, 1994 and Tuncbilek *et al.*, 1995). Poor child spacing has been the major reason for the apparent risk at higher birth orders (Vazir, 1988 and Sichieri *et al.*, 1993). Sichieri *et al.* (1993) stated that the birth weight was significantly correlated to the nutritional status of children.

The higher morbidity and mortality in the undernourished are due to lack of sanitation, impaired immunity and infectious diseases. According to the authors Horner *et al.* (1981), Bhaskaram (1985), Bhaskaram (1989), Gopalan *et al.* (1989), Islam (1989), Reddy (1989), Vazir (1990), Gopalan (1991), Mamdough (1991), Saibaba (1991), Devi and Geervani (1994), Scrimshaw (1994), Tuncbilek *et al.* (1995) and Bhaskaram (1996), the severity of undernutrition in a community can be significantly reduced if the superceding factor of infection is held in check.

Various infections common during childhood like diarrhoea, whooping cough, tuberculosis and measles, precede and precipitate malnutrition in children (Guerrant *et al.* (1992). A survey conducted by Cohen *et al.* (1985) in Bangladesh

revealed that a high proportion of children with xerophthalmia had diarrhoea in the preceding month. Similar findings were reported by Mathai (1997). According to Bhaskaram (1996) measles reduced the absorption and increased the requirement of nutrients and led to malnutrition.

Abaheseen *et al.* (1981) in a study among Arabian children found that teenage mothers had lighter children than older mothers. Vazir (1988) reported that children born to teenage mothers generally are at higher risk. Saibaba (1992) observed that mother's welfare plays a critical role in the growth and development of the child.

Studies by Jain and Choudhry (1993), Tuncbilek *et al.* (1995) and Devi and Geervani (1994) revealed that the child cared by own mother had better nutritional status than those of children who were cared by servants and other family members, thus indicating that no one can substitute for the care provided by the mother.

NIN (1994b) and Chandrasekar (1994) opined that the nutritional status of children participating in nutritional intervention programmes were better off than the non-beneficiaries.

Saibaba (1991) and Mathai (1997) reported that lack of health services like immunization facilities, maternal and child health (MCH) services had a negative effect on the nutritional status of children.

Studies by Immink *et al.* (1981) in rural Puerto Rico showed that preschool children seemed to benefit from garden produce. The possession of cattle and poultry was also positively linked to the nutritional status of the family.

2.4 Impact of maternal employment on the nutritional status of children

The net impact of maternal employment on the nutritional status of children has been a controversial issue. Various studies conducted on employed mothers and nutritional status of children had shown inconsistent results ranging from maternal employment having a negative effect, to no effect and to a positive effect.

Ramachandran (1986) opined that the additional income generated by working women improved the purchasing power and standard of living with consequent improvement in the nutritional status of children. Choudhary *et al.* (1986) reported a higher prevalence of malnutrition among children of working mothers.

A higher prevalence of deficiency signs was found among the children of slum dwellers and industrial labourers when compared to the children of white collared workers (Brahman *et al.*, 1987). Malik (1987) reported that an educated and earning housewife would take better care of her family and child in terms of nutrition, education, shelter and clothing.

According to FAO (1987) children of part-time working women had better nutritional condition than children of full-time working women. Kaiser and Dewey (1991) stated that women's income was not related to the nutritional status of preschoolers.

A study conducted by Johnson *et al.* (1992) on maternal employment and nutrient adequacy indicated that maternal employment had no significant positive or negative effect on the intake of essential nutrients. This was supported by studies of NIN (1995a) which revealed that there is no significant or consistent positive or negative link between women's work and child health and development. However, Johnson *et al.* (1992) revealed that children of part-time and full-time employed mothers ate more meals at schools and at day care centres and at other localities.

A study conducted by Chen (1978) among Malaysian women found that the incidence and duration of breast feeding among working and non-working mothers were insignificant. However, studies in the USA among mothers showed that maternal employment decreased the incidence and duration of breast feeding (Bramble, 1979; Martinez and Dodd, 1983 and Kurinji *et al.*, 1989). Similar trends were observed by Usha *et al.* (1991) in Kerala.

According to Suradi *et al.* (1980) the main constraint for breast feeding amongst Indonesian women was employment. Studies by Gielen *et al.* (1991) in the urban population of Baltimore city, USA indicated that employed mothers ceased to breast feed as early as 6 months whereas two-third of unemployed women continued to breast feed. Among the employed mothers, the part-time workers gave a better picture. Similar trends were noted by Villa and Pela (1989) in South America, Yashpal *et al.* (1992) in India and Taren and Chen (1993) in China.

Engle (1991) opined that children in Guatemala taken care by pre-teen siblings had lower weights for height than those in other situations even when socio-economic status and maternal employment were controlled. This is supported by studies conducted by Jain and Choudhry (1993) and NIN (1995a) in India and Tuncbilek *et al.* (1995) in Turkey.

According to D'Iribane (1981) women who worked for more than 45 hours a week spent more time with their families, reduced their physiological recreation which included rest, sleep and personal care. The time devoted for meal preparation was less for employed mothers when compared to unemployed mothers (Johnson *et al.*, 1992).

Jyothi and Sheela (1993) opined that Indian non-working mothers used to spend a major part of their time in child care and other activities. The authors also reported that the time spent for cleaning the house, cooking, attending to other family members, travel, leisure, washing clothes was significantly greater amongst partly working mothers. In contrast, NIN (1995a) reported no clear difference in the average number of hours per day that a working and non-working mother spent on child care.

Mubarak *et al.* (1990) found that children of Indian working women had significantly higher immunisation rates, shorter duration of illness and lower morbidity than the non-working group. However, studies at NIN (1995a) revealed that working conditions had no consistent effect either on the prevalence of infection or morbidity or the treatment seeking behaviour. Women's earning and labour force participation do not also lead to increased expenditure for curative care.

2.5 Health and nutritional awareness of mothers

The high rate of mortality and morbidity in our country, has been attributed to a lack of awareness on health and nutrition among mothers and adolescent girls. Poor access to useful information, about the right to good health and how to improve their status are certainly important factors responsible for this unfortunate situation. Creating an awareness among women will not only improve their health, but also improve the health of future generations (Mathai, 1997). It is rightly said -

**“Train a man and you train an individual
Train a woman and you build a nation”.**

Ghosh (1977) pointed out that, the reason for malnutrition is not so much due to lack of food as to the child's dependence on his mother who had no knowledge of his nutritional needs. He further pointed out that vast majority of mothers including those who are well educated were starkly ignorant about nutrition concepts.

According to Kumar (1986) and Chandrasekar (1994) simple actions initiated at home or in the community had a positive impact on health status of mothers and children. The authors further stressed that preparation of healthy and literate women must be a priority in the intervention programmes so that a motivated and capable health volunteer exist in every family.

In a CARE Preschool Nutrition Project, the nutrition knowledge of the mothers in Colombia and India was compared and results indicated that mothers in Colombia had more knowledge than the Indian mothers with respect to nutrition (Anderson, 1976).

In a study conducted by Kumar *et al.* (1989) to assess the knowledge, attitude and practice of mothers towards various aspects of nutrition, it was revealed that 48.7 per cent had adequate information, 25 per cent had moderate information and 26.3 per cent had inadequate information. More than half (65%) had a very favourable attitude while none had an unfavourable attitude towards nutrition. Seventy four per cent of the respondents had good nutrition practice while 26 per cent were under the poor category. A positive and significant correlation existed between nutrition, knowledge, attitude and practice, but non-significant correlation was found between attitudes and practices indicating that knowing is not always practising. This was also supported by the findings of Dumlao and Onnate (1980) on elementary school teachers.

A cross sectional case control study conducted by Mubarak *et al.* (1990) among working and non-working women revealed that working women's families had significantly higher immunisation rates, 73 per cent Vs. 55 per cent. According to the authors 48 per cent of the working women had a dominant role in family health decision making against 12 per cent of the non-working women. It was concluded that the working women had a different set of beliefs and practices than non-working women and this may be one important factor responsible for the lower morbidity in their children.

A study conducted by Yashpal *et al.* (1992) indicated that a greater percentage of working mothers (40%) in Haryana had a positive attitude with regard to the immunity of breast milk in contrast to 11.5 per cent of non-working mothers. Another study conducted by Dahiya and Kapoor (1992) in the same area revealed that majority of the mothers discarded colostrum and 70% of them believed that it is not good for the child's health.

Kennedy and Khudsen (1988) and Solon (1996) opined that an integrated health and nutrition intervention programme providing a cadre of health, nutrition, family planning and sanitation services is the most effective means of treating the tragedy of malnutrition among the vulnerable groups.

The impact of nutrition education was reviewed by Devadas (1993) and Chandrasekar (1994) and it was indicated that those who received nutrition education had better knowledge, newer and improved practices and attitudes when compared to the non-beneficiaries.

A study by Pullikkottil (1993) to assess the nutritional status of the beneficiaries of the Integrated Child Development Service (ICDS) found that the knowledge and practice aspects of mothers were independent of participation, and adoption of nutrition messages among the beneficiaries were associated with their participation levels in the programme. Similar results were also reported among the ICDS beneficiaries of Andhra Pradesh (NIN, 1990) as well as the beneficiaries of Rajasthan, Uttar Pradesh and Madhya Pradesh (Mathai, 1997).

A comparative study among the beneficiaries of ICDS and Chief Minister's Noon Meal Programme (CMNMP) in Tamil Nadu revealed that the former had better knowledge when compared to the latter (Devadas, 1993).

It was indicated by Yegammai and Nivargi (1993) that 52 per cent and 42 per cent of ICDS beneficiaries in Tamil Nadu and Andhra Pradesh respectively had correct knowledge about the importance of breast feeding, 74 per cent and 61 per cent had knowledge about the duration of breast feeding while 55 per cent and 29 per cent of beneficiaries respectively stated the correct age of weaning. Similar findings were reported by Bai (1991) in Kerala.

A recent survey by Mallik *et al.* (1998) to test knowledge, attitude and practice of mothers in Nicobar regarding iodine deficiency, revealed that no one had correct knowledge of the cause of goitre and 44 per cent believed that it affected only females.

Educating the people especially women in the families about nutrition, making them nutrition conscious and helping them to utilise the local resources seems to be a practical approach to improve family diets (Chandrasekar, 1994).

Material and Methods

MATERIALS AND METHODS

This chapter presents the details in respect to the locale of the study, sample and sampling procedures, data collection and statistical procedures used in the analysis of the data. The details are presented under six sections as detailed below:

3.1 Selection of the area

3.2 Selection of the sample

3.3 Plan of study

3.4 Methods adopted for the study

3.5 Development of tools and conduct of the study

3.6 Analysis of data

3.1 Selection of the area

The Ollukkara Block of Thrissur District was selected for the study. All the seven panchayats under this block namely, Ollukkara, Madakkathara, Pananchery, Nadathara, Kolazhy, Vilvattom and Puthur were selected.

From each panchayat, three nursery schools and three balwadies were selected randomly to conduct a pilot survey among mothers of preschool children. Thus a total of 21 nursery schools and 21 balwadies were selected for the study.

3.2 Selection of the sample

From the selected nursery schools and balwadies, the name and date of birth of the child, name and occupation of the father and mother, total family income

and home address of all the preschool children in the age group of 4 to 5 years were collected.

From the list, the children were categorised into three groups on the basis of maternal employment ie. labourers (CL), employed (EM) and housewives or unemployed (HW). From each group 40 preschool children in the age group of 4 to 5 years residing in Ollukkara block and having similar socio-economic status of the family were selected randomly. Thus, a total of 120 preschool children in the age group of 4 to 5 years of age comprised the sample for the study.

Out of the 40 preschool children in each group 10 preschool children were randomly selected for indepth study. Thus 30 preschool children were selected for detailed study. This constituted the subsample for the study.

3.3 Plan of study

Based on the objective, the plan of study was designed. The study comprised

- i) A baseline survey to monitor the socio-economic and cultural background of the families of selected children.
- ii) A dietary survey to assess the food consumption pattern of the families of selected children.
- iii) Assessing the nutritional status of selected preschool children through
 - a) Anthropometric measurements namely, weight, height, mid upper arm circumference (MUAC), head circumference (HC) and chest circumference (CC).
 - b) Food weighment survey to assess the actual food and nutrient intake of the subsample.

- c) Clinical examination of the subsample.
- iv) Knowledge, Attitude and Practice (KAP) of mothers with respect to health and nutrition.
- v) Analysis of data using suitable statistical techniques.

3.4 Methods adopted for the study

The data regarding socio-economic status, dietary habits of the families and KAP of mothers were collected by direct interview method. Interview method according to Lindzey (1954) is a face to face verbal exchange by which the interviewer attempts to elicit information or expression of opinion or belief from the other person. Interview method is reported to be the most suitable way to collect data since it proceeds systematically and enables quick recording (Devadas and Kulandaivel, 1975 and Bass *et al.*, 1979).

According to Aebi (1983), anthropometric indices, presence of clinical deficiency signs, dietary assessment as well as biochemical estimations are direct parameters to assess the nutritional status of preschool children.

For assessing the nutritional status of preschool children, the following methods were employed

- a. Recording of anthropometric measurements
- b. Monitoring actual food and nutrient intake
- c. Conducting clinical examination

Anthropometry has been accepted as an important tool for assessment of nutritional status. It is a simple, useful, practical index and has been widely used to assess the nutritional status of children in developing countries (Jelliffe, 1966; Weisell and Francois, 1982; Cooper and William, 1982; McLaren *et al.*, 1984;

Vijayaraghavan, 1987; Sharma and Kalia, 1990; Reddy *et al.*, 1993 and Rao and Vijayaraghavan, 1996).

According to Rao and Vijayaraghavan (1996) anthropometry could help in the assessment of sub-clinical stages of malnutrition.

Body weight is the most widely used and the simplest reproducible anthropometric measurement for the evaluation of nutritional status of young children (Swaminathan, 1987; Rao and Vijayaraghavan, 1996)

Comparison of weight for age values with regional standards at corresponding ages would help to determine the degree of underweight in a community (Gopaldas and Seshadri, 1987) According to Rao and Vijayaraghavan (1996) body weight is sensitive even to small changes in nutritional status due to childhood morbidities and rapid loss of body weight in children could be considered as an indicator of potential malnutrition.

Height^{deficit} is an indicator of long term malnutrition. The extent of height deficit in relation to age as compared to regional standards could be regarded as a measure of malnutrition (Gopaldas and Seshadri, 1987)

Among the environmental factors which influence the height of an individual, nutrition and morbidity are very important because inadequate dietary intake and or infections reduce nutrient availability at cellular level leading to growth retardation and stunting (Rao and Vijayaraghavan, 1996).

Weight/height² is a reliable age independent index because it takes into consideration weight in relation to height. This index has advantages over using either height or weight singly as an index of growth (Rao and Singh, 1970; Babu

and Chuttani, 1979). According to Sen *et al.* (1980) weight/height² ratio is 83.3 per cent sensitive and 80 per cent specific in identifying malnutrition

Mid upper arm circumference is an indicator of muscle development and reflects protein calorie malnutrition of early childhood (Jelliffe, 1966 and Kamath, 1986). It is considered as a simple, useful and more feasible method to assess the nutritional status of children (Voorhoea, 1983 and Rao and Vijayaraghavan, 1996)

Head circumference relates mainly to size of the brain which increases quite rapidly during infancy. The chest in a normally nourished child grows faster than the head during the second and third year of life. In a malnourished state, due to poor growth of the chest, the head circumference may remain greater than the chest (Rao and Vijayaraghavan, 1996).

In the present study anthropometric indices like weight, height, mid upper arm circumference, head circumference and chest circumference of all the children were recorded to assess their nutritional status

Diet surveys constitute an essential part of any complete study of nutritional status of individuals or groups and provide essential information on nutrient intake levels, source of nutrition, food habits and attitudes (Gopaldas and Seshadri, 1987)

Weighment method of diet survey according to Gore *et al.* (1977) could give accurate values of dietary intake

According to Swaminathan *et al.* (1967) and Thimmayamma and Rau (1996) it is ideal to conduct the survey for seven consecutive days to capture a true picture of the diet. However, according to the authors depending on the purpose of

the investigation the period of survey can either be reduced or increased. On the contrary Rao (1975) stated that any single day or two day weightment method would be as efficient a tool as that of seven days. According to Mari (1985) actual food consumption within the family by one day weightment could be better mentioned in micro samples. Hence in this study one day weightment survey was conducted among the subsamples to determine their actual food and nutrient intake.

Clinical examination is an important and sound method of assessing the nutritional status of a community (Jelliffe, 1966 and Kamath, 1986). According to Swaminathan (1986), it provides direct information of signs and symptoms of dietary deficiencies prevalent among people.

Rao and Vijayaraghavan (1996) opined that clinical examination reveals the anatomical changes due to malnutrition that can be diagnosed by naked eye.

In the present study, the subsample was clinically examined for deficiency manifestations.

Knowledge, Attitude and Practice (KAP) of the mothers in relation to health and nutrition were assessed using pre-tested questions. The procedure adopted for assessing KAP is detailed below.

Knowledge

To test the knowledge, a pool of questions called items was prepared by reviewing literature and through discussions with subject matter specialists. The selection of the items was done on the basis of the following criteria.

1. The items should promote thinking.

2. The items should differentiate the well informed mothers from the poorly informed ones.
3. The items should have a certain difficulty index.

Forty items (questions) which covered all aspects of health and nutrition were selected to carry out item analysis to develop a standardised knowledge test. The details are given in Appendix-I. They were analysed to check item difficulty and item discrimination. The index of item difficulty reveals how difficult an item is whereas the index of discrimination indicates the extent to which an item discriminates the well informed individuals from the poorly informed ones.

Scores of value one and zero were given to correct and incorrect responses respectively. There was a possibility of respondents scoring a maximum of forty points for all correct answers and zero for all wrong answers. This was then given to 39 respondents. These respondents were selected randomly and were altogether different from the sample selected for the main study and at the same time had identical conditions. The scores obtained by the 39 respondents were arranged in descending order of total scores. This was divided into three groups namely G_1 , G_2 and G_3 with 13 respondents in each group. For item analysis, the middle group namely G_2 was eliminated retaining only the terminal ones with high and low scores.

The items in groups G_1 and G_3 were tabulated and the difficulty and discrimination indices were calculated.

Calculation of difficulty index (P)

The index of item difficulty as worked out in this study refers to the percentage of the respondents answering an item correctly. According to Coombs

(1950), the difficulty of an item varied for different individuals. In the present study, items with P value ranging from 25 to 75 were considered for final selection for knowledge test.

Calculation of discrimination index (E 1/3)

The second criterion for item selection was the discrimination index indicated by E 1/3. Index of discrimination was calculated by using the following formula

$$E\ 1/3 = \frac{(S_1) - (S_3)}{N/3}$$

where S_1 and S_3 are the frequencies of correct answers in the group G_1 and G_3 respectively.

N = Total number of respondents in the sample.

Mehta (1958) in using E 1/3 method to find out item discrimination values emphasised that this method was somewhat analogous to and therefore, a convenient substitute for the phi coefficient as formulated by Perry and Michael (1951). In the present study the items with E 1/3 value above 0.4 were considered for final selection as definite criteria of selection are not advocated by any researchers. Thus 10 items with satisfactory P and E 1/3 value were selected for the final format of the knowledge test (Appendix-I)

Method of scoring

Ten items selected for the knowledge test were given to the mothers of index children. Each respondent was given one score for correct answer and zero

score for incorrect answer. Thus the total knowledge score of each respondent was computed. Maximum knowledge score that could be obtained by a respondent was ten and the minimum zero.

Attitude

To check the attitude of the mothers, 30 statements covering different aspects of health and nutrition were chosen after discussion with the experts and review of literature. This included both positive and negative statements. These statements were administered to the respondents (not the sample). They were asked to respond in terms of agreement or disagreement with the statements in a 5 point Likerts scale - strongly agree (SA), agree (A), undecided (UD), disagree (DA) and strongly disagree (SDA) (Likerts, 1932).

These statements were subjected to item analysis to examine how well each statement discriminates between respondents with different attitudes

Item analysis

The total score obtained by each respondent was summed up. Each response was numerically scored 5, 4, 3, 2 and 1; reversing the order for negative statements. The respondents were arranged in descending order of the total scores. 25 per cent of subjects with the highest score and 25 per cent of subjects with the lowest score were selected for item analysis. To evaluate the responses of the high and low group to each statement, the 't' value as suggested by Edwards (1957) was calculated and is given below.

$$t = \frac{\bar{x}_{H} - \bar{x}_{L}}{\frac{\sqrt{S_H^2 + S_L^2}}{\sqrt{\frac{n_H}{n} + \frac{n_L}{n}}}}$$

- where \bar{x}_{H} = the mean score on a given statement for the high group
 \bar{x}_{L} = the mean score on a given statement for the low group
 SH^2 = the variance of the distribution of responses of the high group to the statement
 SL^2 = the variance of the distribution of responses of the low group to the statement
 nH = the number of subjects in the high group
 nL = the number of subjects in the low group

The value of 't' is a measure of the extent to which a given statement differentiates between the high and low groups. Any value of 't' equal to or greater than 1.75 was considered. The selected statements were arranged in ascending order of magnitude and 10 statements having maximum 't' value were selected for the final scale. This consisted of 7 positive and 3 negative statements. The selected statements are given in Appendix-II.

Practice

Questions pertaining to various practices with respect to health and nutrition were prepared. This was administered to the mothers of the index child. A score of one was given for correct practice and zero for an incorrect one and the total scores were summed up. The selected questions are given in Appendix-III.

3.5 Development of tools and conduct of the study

To collect information on socio-economic and cultural background of the families a questionnaire was developed. The schedule comprised of information pertaining to the type of family, family size, educational and occupational status of

family members, monthly income and expenditure, details of land holdings, crops cultivated, kitchen garden, domestication of animals, water and sanitary facilities, living conditions, indebtedness, social participation and information source utilization. This also included details regarding index child like the birth weight, birth order, use of health care facilities, frequency and duration of disease and participation in feeding programmes.

The details pertaining to maternal employment included working hours per day, number of years of experience, reason for working, number of off days, use of salary, distance between work area and home, conveyance used, transfers, mother surrogate, attitude of family members and atmosphere at workplace. The time taken for various household, child care and personal activities were also elicited (Appendix-IV).

Another schedule was prepared to elicit information on dietary habits and food consumption pattern of the families. It included details regarding food expenditure pattern, frequency of use of foods, daily meal pattern, methods of preparing foods, cooking methods, foods included and avoided during special conditions, storage and preservation practices and actual intake of food of the index child using 24 hour recall method (Appendix-V).

The above two questionnaires were pre-tested before field application.

Anthropometric measurements like weight, height, mid upper arm circumference, head and chest circumferences of the selected 120 preschool children were recorded as suggested by Jelliffe (1966) and Rao and Vijayaraghavan (1996).

One day food weighing survey was conducted among the subsample consisting of 30 preschool children and the schedule used to monitor the actual food intake is given in Appendix-VI. The nutrients available from the food consumed were computed using Food Composition Tables (Gopalan *et al.*, 1989).

Clinical examination of the subsample was conducted with the help of a qualified physician. Schedule used for this purpose is given in Appendix-VII.

A questionnaire was developed to ascertain the Knowledge, Attitude and Practice of mothers with respect to health and nutrition. The details of the questionnaire are given in Appendices-I, II and III.

3.6 Analysis of data

The various statistical techniques used in this study to analyse the results are percentage analysis, analysis of variance, 't' test and chi-square tests.

Results

RESULTS

The results of the study on maternal employment and nutritional status of preschool children are presented in this chapter under the following sub-headings:

1. Socio-economic and cultural background of the families
2. Food consumption pattern of the families
3. Maternal employment and time expenditure pattern
4. Details of index child
5. Nutritional status of index child
6. KAP of mothers with respect to health and nutrition

4.1 Socio-economic and cultural background of the families

Socio-economic and cultural background of the families were assessed in terms of religion, caste, type of family, family size, educational status of parents, occupational status of father, possession of land, domestication of animals, details of kitchen garden, monthly income, monthly expenditure pattern, indebtedness, housing conditions, epidemics prevalent in the community, social participation and source of general information.

Information on religion, caste, type of family and family size of the casual labourers (CL), employed mothers (EM) and housewives (HW) are furnished in Table 1.

The above table reveals that among the CL, Hindus and Christians were equal in number and they constituted 95 per cent of the total, while in the EM and HW categories, majority were Hindus. Muslims were a minority in all the three groups.

Table 1 Details of religion, caste, type and size of family

Details	Number of families		
	CL (n=40)	EM (n=40)	HW (n=40)
<u>Religion</u>			
Hindus	19 (47.5)	22 (55.0)	24 (60.0)
Christians	19 (47.5)	15 (37.5)	9 (22.5)
Muslims	2 (5.0)	3 (7.5)	7 (17.5)
<u>Caste</u>			
Forward	22 (55.0)	23 (57.5)	16 (40.0)
Other Backward Communities	14 (35.0)	13 (32.5)	19 (47.5)
Scheduled caste	4 (10.0)	4 (10.0)	5 (12.5)
<u>Type of family</u>			
Nuclear	23 (57.5)	15 (37.5)	18 (45.0)
Joint	17 (42.5)	25 (62.5)	22 (55.0)
<u>Family size</u>			
Upto 4	21 (52.5)	18 (45.0)	13 (32.5)
5-8	11 (27.5)	18 (45.0)	23 (57.5)
9-12	8 (20.0)	4 (10.0)	3 (7.5)
>13	-	-	1 (2.5)

n = number of families

Number in parentheses are percentages

CL - Casual labourers

EM - Employed mothers

HW - Housewives

Majority of the families in the CL (55%) and EM (57.5%) groups belonged to forward caste while in the CL group, only 40 per cent belonged to the forward caste. Families belonging to other backward communities comprised 35 per cent, 32.5 per cent and 47.5 per cent in the CL, EM and HW categories and the rest of the families belonged to scheduled caste.

Of the families surveyed in each category majority of the families in the EM (62.5%) and HW (55.0%) followed a joint family system while 57.5 per cent of the families of CL were of the nuclear type.

Regarding the family size, it is seen that 52.5 per cent of the families in CL group had upto four members, 27.5 per cent had 5 to 8 members and the rest of the families had 9 to 12 members .

In the EM category 45 per cent each had upto four members and 5 to 8 members in their families and 10 per cent had 9 to 12 members.

Regarding the family size of HW group majority (57.5%) of the families had 5 to 8 members and 32.5 per cent comprised upto four members and the rest (10%) had more than nine members in their families.

4.1.2 Number of adults and children

Details of the number of adults and children are presented in Table 2.

Table 2. Details of adults and children

Details	Number of families		
	CL (n=40)	EM (n=40)	HW (n=40)
Number of adults			
2	23 (57.5)	20 (50.0)	18 (45.0)
3-4	3 (7.5)	11 (27.5)	10 (25.0)
5-6	7 (17.5)	6 (15.0)	7 (17.5)
≥7	7 (17.5)	3 (7.5)	5 (12.5)
Number of children			
1	2 (5.0)	6 (15.0)	8 (20.0)
2	23 (57.5)	24 (60.0)	17 (42.5)
3	10 (25.0)	7 (17.5)	12 (30.0)
≥4	5 (12.5)	3 (7.5)	3 (7.5)

n = number of families, CL - Casual labourers, EM - Employed mothers, HW - House wives
Number in parentheses are percentages

Majority of the families in the CL (65.0%), EM (77.5%) and HW (70.0%) groups had 2 to 4 adult members and 35 per cent, 22.5 per cent and 30 per cent of the families in the CL, EM and HW categories had more than five adult members.

Regarding the number of children (Table 2) in each category, 57.5 per cent (CL), 60 per cent (EM) and 42.5 per cent (HW) of the families had only two children while only a small segment of the families in the three categories had more than four children.

4.1.3 Educational status of parents

Table 3 indicates the details of the educational status of parents.

Table 3. Educational status of parents

Educational status	CL		EM		HW	
	F	M	F	M	F	M
Illiterate	1 (2.5)	-	-	-	-	-
Lower primary	19 (47.5)	16 (40.0)	-	3 (7.5)	15 (37.5)	6 (15.0)
Upper primary	14 (35.0)	4 (10.0)	5 (12.5)	-	10 (25.0)	8 (20.0)
High school	2 (5.0)	16 (40.0)	9 (22.5)	5 (12.5)	8 (20.0)	12 (30.0)
College and higher education	3 (7.5)	4 (10.0)	25 (62.5)	32 (80.0)	7 (17.5)	14 (35.0)
Not available	1 (2.5)	-	1 (2.5)	-	-	-
Total	40 (100)	40 (100)	40 (100)	40 (100)	40 (100)	40 (100)

F - Father; M- Mother, CL - Casual labourers, EM - Employed mothers, HW - Housewives
Number in parentheses are percentages

As depicted in Table 3, highly educated fathers were more in the EM group (62.5%) while majority of the fathers in CL (82.5%) and HW groups (62.5%) had studied only upto the upper primary level. In the case of mothers also, it is clear from the table that 80 per cent of the employed mothers had better educational status while 50 per cent of the mothers in the CL and 35 per cent in the HW groups had studied only upto the upper primary level.

4.1.4 Occupational status of father

Details regarding the occupational status of the father are given in Table

4.

Table 4. Occupational status of father

Occupation	CL	EM	HW
Casual labourers	30 (76.9)	7 (17.9)	12 (30.0)
Employed	9 (23.1)	32 (82.1)	25 (62.5)
Uemployed	-	-	3 (7.5)
Total	39 (100)	39 (100)	40 (100)

Number in parentheses are percentages , **CL - Casual labourers**
EM - Employed mothers
HW - Housewives

From the table it is seen that in the CL group, most of the fathers (76.9%) were labourers and in EM and HW categories 82.1 and 62.5 per cent of the fathers respectively, were employed.

4.1.5 Possession of land

Table 5. The availability of land

Area (in cents)	Number of families		
	CL	EM	HW
0	37 (92.5)	27 (67.5)	29 (72.5)
1-50	-	7 (17.5)	3 (7.5)
51-100	-	2 (5.0)	6 (15.0)
>100	3 (7.5)	4 (10.0)	2 (5.0)
Total	40 (100)	40 (100)	40 (100)

Number in parentheses are percentages, CL - Casual labourers
EM - Employed mothers
HW - Housewives

Majority of the families in the three groups were landless and only 7.5 per cent, 15 per cent and 20 per cent of the CL, EM and HW groups respectively owned more than 50 cents of land (Table 5).

4.1.6 Possession of livestock and kitchen garden

Among the three groups surveyed majority of the families in all the three groups did not possess any livestock (Table 6) and the rest of the families who had domestic animals reared mainly cattle and poultry.

Table 6. Details of possession of livestock and kitchen garden

Details	Number of families		
	CL (n=40)	EM (n=40)	HW (n=40)
Possession of livestock			
Present	10 (25.0)	10 (25.0)	6 (15.0)
Absent	30 (75.0)	30 (75.0)	34 (85.0)
Presence of kitchen garden			
Present	34 (85.0)	32 (80.0)	39 (97.5)
Absent	6 (15.0)	8 (20.0)	1 (2.5)
Total	40 (100)	40 (100)	40 (100)

Number in parentheses are percentages

Of the 120 families, 85 per cent of CL, 80 per cent of EM and 97.5 per cent of HW families had kitchen garden and cultivated mainly vegetables (Table 6).

4.1.7 Monthly income of the families

Table 7. Monthly income of the families

Monthly income (Rs.)	Number of families		
	CL	EM	HW
Upto 2000	4 (10.0)	-	1 (2.5)
2000 - 4000	18 (45.0)	5 (12.5)	26 (65.0)
4000 - 6000	9 (22.5)	2 (5.0)	11 (27.5)
6000 - 8000	9 (22.5)	33 (82.5)	2 (5.0)
Total	40 (100)	40 (100)	40 (100)

Number in parentheses are percentages,

CL - Casual labourers
EM - Employed mothers
HW - Housewives

From Table 7, it can be ascertained that 67.5 per cent of the families in the CL and 92.5 per cent in the HW groups had an income ranging between Rs.2000 to Rs.6000 per month while in EM group majority (82.5%) earned between Rs.6000 and Rs.8000 per month.

4.1.8 Monthly expenditure pattern of the families

Table 8 depicts the percentage of income spent on food, clothing, education, water, health, transport, fuel, electricity, shelter, recreation, personal expenses, savings and remittance.

From Table 8, it is clear that majority of families in the CL (87.5%), EM (65.0%) and HW (67.5%) categories spent between 30 and 59.99 per cent of their income on food. Thirty per cent in the HW category and 5 per cent in CL group spent more than 60 per cent of their income on food.

Besides 5 per cent in CL and 10 per cent in HW categories all others spent less than 10 per cent of their monthly income for the purchase of cloth.

With regard to education, water, fuel, electricity and recreation all the households in the three groups spent less than 10 per cent of their monthly income

Majority of the households in CL (72.5%), EM (92.5%) and HW (82.5%) categories spent less than 10 per cent of their monthly income for health. Ten per cent in the CL group spent between 20 and 29.99 per cent for the same purpose compared to 2.5 per cent in HW group and none in the EM group.

Table 8. Monthly expenditure pattern of the families

Item	Groups	<10%	10-19.99 %	20-29.99 %	30-30.99 %	40-49.99 %	50-59.99 %	>60 %	Total
1	2	3	4	5	6	7	8	9	10
Food	CL	-	3 (7.5)	-	16 (40.0)	10 (25.0)	9 (22.5)	2 (5.0)	40 (100)
	EM	-	1 (2.5)	13 (32.5)	12 (30.0)	10 (25.0)	4 (10.0)	-	40 (100)
	HW	-	-	1 (2.5)	8 (20.0)	14 (35.0)	5 (12.5)	12 (30.0)	40 (100)
Clothing	CL	38 (95.0)	2 (5.0)	-	-	-	-	-	40 (100)
	EM	40 (100)	-	-	-	-	-	-	40 (100)
	HW	36 (96.0)	4 (10.0)	-	-	-	-	-	40 (100)
Education	CL	40 (100)	-	-	-	-	-	-	40 (100)
	EM	40 (100)	-	-	-	-	-	-	40 (100)
	HW	40 (100)	-	-	-	-	-	-	40 (100)
Water	CL	40 (100)	-	-	-	-	-	-	40 (100)
	EM	40 (100)	-	-	-	-	-	-	40 (100)
	HW	40 (100)	-	-	-	-	-	-	40 (100)

Contd.

Table 8. Continued

1	2	3	4	5	6	7	8	9	10
Health	CL	29 (72.4)	7 (17.5)	4 (10.0)	-	-	-	-	40 (100)
	EM	37 (92.5)	3 (7.5)	-	-	-	-	-	40 (100)
	HW	33 (82.5)	6 (15.0)	1 (2.5)	-	-	-	-	40 (100)
Transport	CL	26 (65.0)	12 (30.0)	2 (5.0)	-	-	-	-	40 (100)
	EM	31 (77.5)	7 (12.5)	2 (5.0)	-	-	-	-	40 (100)
	HW	37 (92.5)	3 (7.5)	-	-	-	-	-	40 (100)
Fuel	CL	40 (100)	-	-	-	-	-	-	40 (100)
	EM	40 (100)	-	-	-	-	-	-	40 (100)
	HW	40 (100)	-	-	-	-	-	-	40 (100)
Electricity	CL	40 (100)	-	-	-	-	-	-	40 (100)
	EM	40 (100)	-	-	-	-	-	-	40 (100)
	HW	40 (100)	-	-	-	-	-	-	40 (100)

Contd

Table 8. Continued

1	2	3	4	5	6	7	8	9	10
Shelter	CL	38 (95.0)	2 (5.0)	-	-	-	-	-	40 (100)
	EM	39 (97.5)	1 (2.5)	-	-	-	-	-	40 (100)
	HW	38 (95.0)	1 (2.5)	1 (2.5)	-	-	-	-	40 (100)
Recreation	CL	40 (100)	-	-	-	-	-	-	40 (100)
	EM	40 (100)	-	-	-	-	-	-	40 (100)
	HW	40 (100)	-	-	-	-	-	-	40 (100)
Personal expenses	CL	36 (90.0)	4 (10.0)	-	-	-	-	-	40 (100)
	EM	34 (85.0)	6 (15.0)	-	-	-	-	-	40 (100)
	HW	37 (92.5)	3 (7.5)	-	-	-	-	-	40 (100)
Savings	CL	32 (85.0)	3 (7.5)	3 (7.5)	-	2 (5.0)	-	-	40 (100)
	EM	22 (55.0)	11 (27.5)	6 (15.0)	-	-	-	1 (2.5)	40 (100)
	HW	37 (92.5)	3 (7.5)	-	-	-	-	-	40 (100)

Contd.

Table 8. Continued

1	2	3	4	5	6	7	8	9	10
	CL	14 (35.0)	19 (47.5)	6 (15.0)	1 (2.5)	-	-	-	40 (100)
Remittance	EM	23 (57.5)	11 (27.5)	3 (7.5)	3 (7.5)	-	-	-	40 (100)
	HW	33 (82.5)	2 (5.0)	4 (10.0)	-	1 (2.5)	-	-	40 (100)

Numbers in parentheses are percentages

CL - Casual labourers
 EM - Employed mothers
 HW - Housewives

Sixty five per cent of the families in the CL, 77.5 per cent in the EM and 92.5 per cent in the HW groups spent less than 10 per cent of their monthly income for transport and five per cent each in the CL and EM groups spent between 20 and 29.99 per cent of their income for transport.

Besides one family in the HW group, all other families in the three groups spent below 20 per cent of the income for shelter.

Majority in the CL (90.0%), EM (85.0%) and HW (92.5%) categories spent below 10 per cent of their income as personal expenses, and the rest spent between 10 and 19.99 per cent.

Only a few families (5% in the CL group) saved between 40 and 49.99 per cent of their income, while majority in CL (87.5%), EM (82.5%) and all the HW categories saved below 19.99 per cent of their income. All the rest saved between 20 and 29.99 per cent.

Majority of the families in CL group (97.5%), EM group (92.5%) and HW group (97.5%) spent below 29.99 per cent of their income as remittance

Analysis of variance showed significant difference on the amount spent on food, transport, recreation, electricity, fuel, savings and remittance among the three groups (Appendix - IX).

4.1.9 Indebtedness

Table 9. Details of indebtedness

Details	Number of families		
	CL	EM	HW
Loan taken			
Yes	32 (80.0)	28 (70.0)	28 (70.0)
No	8 (20.0)	12 (30.0)	12 (30.0)
Total	40 (100)	40 (100)	40 (100)
Source of loan			
Government agencies	24 (75.0)	22 (78.6)	23 (82.3)
Private agencies	8 (25.0)	4 (14.3)	4 (14.2)
Government and private agencies	-	2 (7.1)	1 (3.5)
Total	32 (100)	28 (100)	28 (100)
Purpose			
Purchase of household articles	12 (37.5)	5 (17.9)	4 (14.2)
Construction of house	9 (28.3)	12 (42.8)	7 (25.0)
Debt clearance	3 (9.3)	-	-
Purchase of domestic animals	1 (3.1)	-	1 (3.6)
Personal expenses	4 (12.5)	8 (28.6)	8 (28.6)
Others	3 (9.3)	3 (10.7)	8 (28.6)
Total	32 (100)	28 (100)	28 (100)

Number in parentheses are percentages

CL - Casual labourers
EM - Employed mothers
HW - Housewives

From the survey it was found that majority of the families in the three categories borrowed money either from government or private agencies (Table 9). About 66 per cent in CL group borrowed money for the construction of the house and purchase of household articles while 60.7 per cent of EM and 39.2 per cent of HW families also borrowed money for the same purpose. Only a few families in the CL (3.1%) and HW (3.6%) groups borrowed money to purchase domestic animals.

4.1.10 Living conditions

Living conditions of the families were assessed by observing their housing conditions like ownership of the house, type of house, type of wall and roof, kitchen, drinking water, lavatory, drainage, electricity and recreational facilities and mode of transport.

Table 10. Living conditions of the families

Facilities	Number of families		
	CL (n=40)	EM (n=40)	HW (n=40)
1	2	3	4
Ownership of house			
Own	29 (72.5)	19 (47.5)	29 (72.5)
Rented	11 (27.5)	21 (52.5)	11 (27.5)
Number of rooms			
< 3	-	-	2 (5.0)
3-5	40 (100.0)	23 (57.5)	28 (70.0)
≥ 6	-	17 (42.5)	10 (25.0)

Contd

Table 10. Continued

	1	2	3	4
Type of house				
Single storeyed		40 (100.0)	37 (92.5)	40 (100.0)
Double storeyed		-	3 (7.5)	-
Type of wall				
Brick		39 (97.5)	35 (87.5)	37 (92.5)
Mud		1 (2.5)	4 (10.0)	3 (7.5)
Thatched		-	1 (2.5)	-
Type of roof				
Concrete		1 (2.5)	25 (62.5)	11 (27.5)
Tiled		22 (55.0)	14 (35.0)	28 (70.0)
Thatched		5 (12.5)	-	-
Asbestos		12 (30.0)	1 (2.5)	1 (2.5)
Separate kitchen				
Yes		40 (100.0)	40 (100.0)	40 (100.0)
No		-	-	-
Source of water				
Own well		16 (40.0)	16 (40.0)	26 (65.0)
Public tap		11 (27.5)	5 (12.5)	1 (2.5)
Hand pump		4 (10.0)	1 (2.5)	-
Own tap		4 (10.0)	18 (45.0)	10 (25.0)
Nearby house		5 (12.5)	-	3 (7.5)

Contd.

Table 10. Continued

	1	2	3	4
Lavatory facilities				
Own		39 (97.5)	39 (97.5)	38 (95.0)
Public		-	1 (2.5)	1 (2.5)
Open		1 (2.5)	-	1 (2.5)
Drainage facilities				
Present		24 (60.0)	28 (65.0)	26 (62.5)
Absent		16 (40.0)	12 (35.0)	14 (37.5)
Details of drains				
Open		24 (60.0)	25 (62.5)	23 (57.5)
Closed		-	3 (7.5)	3 (7.5)
Nothing		16 (40.0)	12 (30.0)	14 (35.0)
Electricity facilities				
Present		40 (100.0)	40 (100.0)	38 (95.0)
Absent		-	-	2 (5.0)
Number of electrical gadgets				
0		13 (32.5)	-	5 (12.5)
1		12 (30.0)	3 (7.5)	2 (5.0)
2		8 (20.0)	5 (12.5)	8 (20.0)
>3		7 (17.5)	32 (80.0)	25 (62.5)
Recreational facilities				
Present		17 (42.5)	29 (72.5)	27 (67.5)
Absent		23 (57.5)	11 (27.5)	13 (32.5)

Contd.

Table 10. Continued

	1	2	3	4
Mode of transport				
Private vehicle		4 (10.0)	29 (72.5)	13 (32.5)
Public transport		36 (90.0)	11 (27.5)	27 (67.5)

n = number of families, CL - Casual labourers, EM - Employed mothers, HW - Housewives
 Number in parentheses are percentages

Table 11. Details of epidemics prevalent in the community

Epidemics prevalent in the community	Number of families		
	CL	EM	HW
Whooping cough	3 (7.5)	-	1 (2.5)
Measles	7 (17.5)	5 (12.5)	8 (20.0)
Chickenpox	16 (40.0)	8 (20.0)	7 (17.5)
Mumps	1 (2.5)	3 (7.5)	8 (20.0)
None	13 (32.5)	24 (60.0)	16 (40.0)
Total	40 (100)	40 (100)	40 (100)

Number in parentheses are percentages

As revealed in Table 10 majority in the CL and HW groups (72.5% each) were living in their own houses whereas 52.5 per cent of the families in the EM group lived in rented houses.

Majority of the families in all the three categories had more than 3 to 5 rooms with brick walls and were single storeyed. Most of the houses in the CL

(55%) and HW groups (70%) had tiled roof while 62.5 per cent of the houses in the EM category had concrete roofs. Asbestos was used as roofing material only in 30 per cent of CL households.

All the families in the three groups had separate kitchen.

In the CL group, 40 per cent of the families had their own well and 10 per cent had pipe water facilities while 37.5 per cent of the families depended on public tap and hand pumps. Forty five per cent of the families in the EM group had their own pipe water facilities while 40 per cent had their own well. Majority of the families in the HW category (65%) had their own well and 25 per cent had pipe water facilities. None of the families in the EM group depended on nearby houses for water while 12.5 per cent of the families in the CL and 7.5 per cent in the HW categories depended on nearby houses for water.

Majority of the families in the three group had their own lavatory and drainage facilities and most of them had open drains. Except for two families in the HW category, all households had electricity facilities and the percentage of families with more than three electrical gadgets were more in the families of EM group (80.0%) than HW (62.5%) and CL (17.5%) categories. More than half of the CL (57.5%) had no recreational facilities, while 72.5 per cent and 67.5 per cent of the families in the EM and HW groups respectively enjoyed recreational facilities.

Most of the families in the CL (90.0%) and HW (67.5%) categories used public conveyance while in EM group, 72.5 per cent travelled by private vehicles.

4.1.11 Epidemics prevalent in the community

Various contagious diseases like whooping cough, measles, chickenpox and mumps were more prevalent in the CL and HW community (67.5% and 60% respectively) than in the EM (40.0%) category during the past one year (Table 11).

4.1.12 Social participation

Table 12 furnishes details of social participation of the three groups.

Table 12. Details of social participation

Details	Number of families		
	CL (n=40)	EM (n=40)	HW (n=40)
Member of			
Mahila Samajam	5 (12.5)	-	-
Co-operative Society	2 (5.0)	11 (27.5)	2 (5.0)
Youth Club	-	1 (2.5)	-
Others	1 (2.5)	2 (5.0)	1 (2.5)
None	32 (80.0)	26 (65.0)	37 (92.5)
Frequency of attending the meetings			
Always	5 (62.5)	5 (35.7)	1 (33.3)
Sometimes	1 (12.5)	3 (21.4)	-
Never	2 (25.0)	6 (42.9)	2 (66.7)

n = number of mothers, CL - Casual labourers, EM - Employed mothers, HW - Housewives
Number in parentheses are percentages

From Table 12 it is clear that extent of participation in social activities was highest in the EM group (35%) compared to CL (20%) and HW groups (7.5%). CL group (62.5%) attended the meetings always compared to 35.7 per cent and 33.3 per cent in the EM and HW groups.

4.1.13 Source of information

Table 13. Source of general information

Details	Number of families		
	CL	EM	HW
* General	8 (20.0)	1 (2.5)	2 (5.0)
** Media	9 (22.5)	-	16 (40.0)
*** Official	1 (2.5)	1 (2.5)	-
General and media	19 (47.5)	34 (85.0)	22 (55.0)
Media and official	1 (2.5)	-	-
General, media and official	2 (5.0)	4 (10.0)	-
Total	40 (100)	40 (100)	40 (100)
* General includes friends, neighbours, relatives	CL - Casual labourers		
** Media includes T.V., radio, cinema, newspaper, magazines	EM - Employed mothers		
*** Official includes meetings, officials, colleagues at work	HW - Housewives		

Number in parentheses are percentages

Majority of the families (85%) in the EM category obtained informations related to health, nutrition, politics etc. mainly from friends, neighbours and relatives as well as different media like newspaper, radio, TV, cinema etc. when compared to 47.5 per cent in the CL group and 55 per cent in the HW groups (Table 13). The rest of the families in the three categories used different media, general as well as official sources and a combination of different sources to obtain informations.

4.2 Food consumption pattern of the families

The food consumption pattern of the families was assessed with respect to the food habits, food expenditure pattern, frequency of purchase and use of different food items, accounting system, meal pattern, methods of cooking, cooking pattern, details of food preservation and foods given during special conditions.

4.2.1 Food habits of the families

All the families surveyed in CL and EM groups and 95 per cent in the HW groups were non-vegetarians. All the families in the three categories consumed rice as their staple food.

4.2.2 Food expenditure pattern

From Table 14, it is seen that only a small per cent in CL (10%), EM (15.0%) and HW (2.5%) groups spent less than 10 per cent of food expenses on cereals. The majority in CL (65%) spent between 20 and 40 per cent on cereals while majority in EM (70%) and HW (63.5%) spent between 10 and 30 per cent on cereals.

In the case of pulses, green leafy vegetables, roots and tubers, fruits, spices and condiments, fats and oils, sugar and jaggery, majority of the families in all three groups spent less than 10 per cent of the food expenses.

Majority in CL, EM and HW spent upto 20 per cent on other vegetables, milk and flesh foods. The rest spent between 20 and 40 per cent.

Table 14. Monthly expenditure pattern of the families on different food items

Food items	Groups	Expenditure (per cent)						Total
		0-9.99	10-19.99	20-29.99	30-39.99	40-49.99	50-59.99	
1	2	3	4	5	6	7	8	9
Cereal	CL	4 (10.0)	5 (12.5)	17 (42.5)	9 (22.5)	5 (12.5)	-	40 (100)
	EM	6 (15.0)	14 (35.0)	14 (35.0)	6 (15.0)	-	-	40 (100)
	HW	1 (2.5)	13 (33.5)	12 (30.0)	8 (20.0)	3 (7.7)	3 (7.5)	40 (100)
Pulses	CL	30 (75.0)	10 (25.0)	-	-	-	-	40 (100)
	EM	38 (95.0)	-	-	2 (5.0)	-	-	40 (100)
	HW	35 (87.5)	2 (5.0)	2 (5.0)	1 (2.5)	-	-	40 (100)
Green leafy vegetables	CL	40 (100)	-	-	-	-	-	40 (100)
	EM	40 (100)	-	-	-	-	-	40 (100)
	HW	40 (100)	-	-	-	-	-	40 (100)
Roots and tubers	CL	40 (100)	-	-	-	-	-	40 (100)
	EM	40 (100)	-	-	-	-	-	40 (100)
	HW	37 (92.5)	3 (7.5)	-	-	-	-	40 (100)
Other vegetables	CL	27 (67.5)	11 (27.5)	2 (5.0)	-	-	-	40 (100)
	EM	23 (57.5)	14 (35.0)	3 (7.5)	-	-	-	40 (100)
	HW	26 (65.0)	13 (32.5)	1 (2.5)	-	-	-	40 (100)

Contd.

Table 14. Continued

1	2	3	4	5	6	7	8	9
Fruits	CL	29 (72.5)	11 (27.5)	-	-	-	-	40 (100)
	EM	37 (92.5)	3 (7.5)	-	-	-	-	40 (100)
	HW	37 (92.5)	3 (7.5)	-	-	-	-	40 (100)
Milk and milk products	CL	27 (67.5)	7 (17.5)	6 (15.0)	-	-	-	40 (100)
	EM	15 (37.5)	19 (47.5)	3 (7.5)	3 (7.5)	-	-	40 (100)
	HW	20 (50.0)	16 (40.0)	4 (10.0)	-	-	-	40 (100)
Flesh foods	CL	13 (32.5)	15 (37.5)	9 (22.5)	3 (7.5)	-	-	40 (100)
	EM	14 (35.0)	14 (35.0)	9 (22.5)	3 (7.5)	-	-	40 (100)
	HW	6 (15.0)	15 (37.5)	15 (37.5)	4 (10.0)	-	-	40 (100)
Fats & oils	CL	36 (90.0)	4 (10.0)	-	-	-	-	40 (100)
	EM	36 (90.0)	4 (10.0)	-	-	-	-	40 (100)
	HW	34 (85.0)	5 (12.5)	1 (2.5)	-	-	-	40 (100)
Sugar and jaggery	CL	40 (100)	-	-	-	-	-	40 (100)
	EM	40 (100)	-	-	-	-	-	40 (100)
	HW	40 (100)	-	-	-	-	-	40 (100)
Spice and condiments	CL	39 (97.5)	1 (2.5)	-	-	-	-	40 (100)
	EM	40 (100)	-	-	-	-	-	40 (100)
	HW	37 (92.5)	3 (7.5)	-	-	-	-	40 (100)

Number in parentheses are percentage of food expenditure

CL - Casual labourers, EM - Employed mothers

HW - Housewives

Analysis of variance revealed that the three groups differed with respect to the expenditure pattern for all items of food at 5 per cent level except in the case of other vegetables, jaggery and fruits. (Appendix-X).

4.2.3 Frequency of purchase of food items

Table 15 furnishes information on the frequency of purchase of various food items by the families.

Table 15. Frequency of purchase of various food items by the families

Food items	Group	Daily	Weekly	Monthly	Occasionally	Never	Total
1	2	3	4	5	6	7	8
Cereals	CL	1 (2.5)	32 (80.0)	7 (17.5)	-	-	40 (100)
	EM	-	15 (37.5)	25 (62.5)	-	-	40 (100)
	HW	1 (2.5)	18 (45.0)	21 (52.5)	-	-	40 (100)
Pulses	CL	1 (2.5)	26 (65.0)	13 (32.5)	-	-	40 (100)
	EM	-	20 (50.0)	20 (50.0)	-	-	40 (100)
	HW	1 (2.5)	9 (22.5)	30 (75.0)	-	-	40 (100)
Green leafy vegetables	CL	4 (10.0)	24 (60.0)	4 (10.0)	8 (20.0)	-	40 (100)
	EM	2 (5.0)	25 (62.5)	5 (12.5)	4 (10.0)	4 (10.0)	40 (100)
	HW	1 (2.5)	27 (67.5)	5 (12.5)	2 (5.0)	5 (12.5)	40 (100)

Contd

Table 15. Continued

1	2	3	4	5	6	7	8
Roots and tubers	CL	-	32 (80.0)	3 (7.5)	5 (12.5)	-	40 (100)
	EM	-	30 (75.0)	5 (12.5)	-	5 (12.5)	40 (100)
	HW	1 (2.5)	27 (67.5)	6 (15.0)	3 (7.5)	3 (7.5)	40 (100)
Other vegetables	CL	20 (50.0)	18 (45.0)	-	2 (5.0)	-	40 (100)
	EM	17 (42.5)	22 (55.0)	-	1 (2.5)	-	40 (100)
	HW	21 (52.5)	17 (42.5)	1 (2.5)	1 (2.5)	-	40 (100)
Fruits	CL	9 (22.5)	26 (65.0)	1 (2.5)	4 (10.0)	-	40 (100)
	EM	5 (12.5)	25 (62.5)	2 (5.0)	8 (20.0)	-	40 (100)
	HW	1 (2.5)	26 (65.0)	1 (2.5)	8 (20.0)	4 (10.0)	40 (100)
Milk and milk products	CL	33 (82.5)	1 (2.5)	-	4 (10.0)	2 (5.0)	40 (100)
	EM	32 (80.0)	1 (2.5)	-	-	7 (17.5)	40 (100)
	HW	36 (90.0)	1 (2.5)	-	-	3 (7.5)	40 (100)
Egg	CL	6 (15.0)	28 (70.0)	3 (7.5)	1 (2.5)	2 (5.0)	40 (100)
	EM	1 (2.5)	32 (80.0)	2 (5.0)	2 (5.0)	3 (7.5)	40 (100)
	HW	4 (10)	10 (25)	10 (25)	6 (15)	10 (25)	40 (100)
Meat	CL	-	26 (65.0)	11 (27.5)	3 (7.5)	-	40 (100)
	EM	-	22 (55.0)	9 (22.5)	6 (15.0)	3 (7.5)	40 (100)
	HW	-	16 (40)	16 (40)	5 (12.5)	3 (7.5)	40 (100)

Contd.

Table 15. Continued

1	2	3	4	5	6	7	8
Fish	CL	5 (12.5)	32 (80.0)	3 (7.5)	-	-	40 (100)
	EM	5 (12.5)	30 (75.0)	1 (2.5)	3 (7.5)	1 (2.5)	40 (100)
	HW	9 (22.5)	23 (57.5)	4 (10)	2 (5)	2 (5)	40 (100)
Fats and oils	CL	4 (10.0)	14 (35.0)	22 (55.0)	-	-	40 (100)
	EM	-	5 (12.5)	35 (87.5)	-	-	40 (100)
	HW	-	10 (25.0)	26 (65.0)	-	4 (10.0)	40 (100)
Sugar	CL	-	17 (42.5)	23 (57.5)	-	-	40 (100)
	EM	-	14 (35.0)	26 (65.0)	-	-	40 (100)
	HW	-	10 (25.0)	30 (75.0)	-	-	40 (100)
Jaggery	CL	-	1 (2.5)	2 (5.0)	7 (17.5)	30 (75.0)	40 (100)
	EM	-	-	10 (25.0)	12 (30.0)	18 (45.0)	40 (100)
	HW	-	2 (5.0)	7 (17.5)	3 (7.5)	28 (70.0)	40 (100)
Spices and condiments	CL	-	-	38 (95.0)	2 (5.0)	-	40 (100)
	EM	-	1 (2.5)	39 (97.5)	-	-	40 (100)
	HW	-	4 (10.0)	34 (85.0)	2 (5.0)	-	40 (100)

Number in parentheses are percentages, CL - Casual labourers
EM - Employed mothers, HW - Housewives

From the table it is clear that majority of the families in the CL group purchased cereals (80%), pulses (65%), green leafy vegetables (60%), roots and

tubers (80%), fruits (65%), meat (65%), egg (70%) and fish (80%) on a weekly basis while 82.5 per cent and 50 per cent of the families purchased milk and other vegetables daily.

In the EM category, green leafy vegetables, roots and tubers, fruits, egg, meat and fish were purchased weekly by 62.5 per cent, 75 per cent, 62.5 per cent, 80 per cent, 55 per cent and 75 per cent of the families respectively, while 62.5 per cent of the families purchased cereals monthly.

Weekly purchase was made by majority of the families of the HW category in the case of green leafy vegetables (67.5%), roots and tubers (67.5%), fruits (65.0%) and fish (57.5%) whereas cereals, pulses, fats and oils, sugar and spices and condiments were purchased monthly by 52.5 per cent, 75 per cent, 65 per cent, 75 per cent and 85 per cent of the families monthly. Majority of the families in the CL (75%) and HW (70.0%) groups never bought jaggery while 55 per cent of the EM families purchased jaggery monthly or occasionally. Milk was bought daily in majority of the households in the CL (82.5%), EM (80.0%) and HW (90.0%) groups.

It was also observed that a higher percentage in the EM (32.5%) group purchased cooked foods occasionally compared to CL (15.0%) and HW (5.0%) groups.

4.2.4 Frequency of use of different food items

The details of frequency of use of various food items by the three groups are presented in Table 16.

The table reveals that all families in the three groups used cereals, spices, fats and oils and sugar in their daily diet.

Majority of the families in the CL group used pulses (65%), green leafy vegetables (65%), roots and tubers (77.5%), fruits (70%), egg (62.5%), meat (65%) and fish (80%) once in a week.

In the EM group, 62.5 per cent, 87.5 per cent, 77.5 per cent, 50.0 per cent, 55.0 per cent and 75.0 per cent of the families used pulses, green leafy vegetables, roots and tubers, egg, meat and fish respectively on a weekly basis.

In HW category, 67.5 per cent, 70 per cent, 72.5 per cent, 65.0 per cent, 42.5 per cent and 57.5 per cent used pulses, green leafy vegetables, roots and tubers, fruits, meat and fish on a weekly basis.

Other vegetables and milk were used daily by majority of the households in the CL (55.0% and 80.0%), EM (87.5% and 80.0%) and HW categories (72.5% and 100.00%).

Most of households in CL (75.0%) and HW (70.0%) groups never used jaggery while in the EM group 55 per cent used it occasionally.

Majority of the families in the CL (82.5%), EM (82.5%) and HW (57.5%) consumed vegetables in the raw state and this included tomatoes, carrot, onion, ladies finger, tapioca and cucumber.

Table 16. Frequency of use of different food items by the families

Food items	Group	Daily	Weekly	Monthly	Occasionally	Never	Total
1	2	3	4	5	6	7	8
Cereals	CL	40 (100.0)	-	-	-	-	40 (100)
	EM	40 (100.0)	-	-	-	-	40 (100)
	HW	40 (100.0)	-	-	-	-	40 (100)
Pulses	CL	10 (25.0)	26 (65.0)	-	4 (10.0)	-	40 (100)
	EM	11 (27.5)	25 (62.5)	1 (2.5)	3 (7.5)	-	40 (100)
	HW	11 (27.5)	27 (67.5)	-	2 (5.0)	-	40 (100)
Green leafy vegetables	CL	3 (7.5)	26 (65.0)	7 (17.5)	4 (10.0)	-	40 (100)
	EM	-	35 (87.5)	2 (5.0)	3 (7.5)	-	40 (100)
	HW	1 (2.5)	28 (70.0)	3 (7.5)	6 (15.0)	2 (5.0)	40 (100)
Roots and tubers	CL	3 (7.5)	31 (77.5)	-	6 (15.0)	-	40 (100)
	EM	3 (7.5)	31 (77.5)	-	6 (15.0)	-	40 (100)
	HW	1 (2.5)	29 (72.5)	2 (5.0)	8 (20.0)	-	40 (100)
Other vegetables	CL	22 (55.0)	16 (40.0)	-	2 (5.0)	-	40 (100)
	EM	35 (87.5)	5 (12.5)	-	-	-	40 (100)
	HW	29 (72.5)	11 (27.5)	-	-	-	40 (100)

Contd.

Table 16. Continued

1	2	3	4	5	6	7	8
Fruits	CL	7 (17.5)	28 (70.0)	1 (2.5)	4 (10.0)	-	40 (100)
	EM	25 (62.5)	6 (15.0)	-	5 (12.5)	4 (10.0)	40 (100)
	HW	1 (2.5)	26 (65.0)	1 (2.5)	8 (20.0)	4 (10.0)	40 (100)
Milk and milk products	CL	32 (80.0)	6 (15.0)	-	2 (5.0)	-	40 (100)
	EM	32 (80.0)	8 (20.0)	-	-	-	40 (100)
	HW	40 (100.0)	-	-	-	-	40 (100)
Egg	CL	9 (22.5)	25 (62.5)	2 (5.0)	2 (5.0)	2 (5.0)	40 (100)
	EM	16 (40.0)	20 (50.0)	-	1 (2.5)	3 (7.5)	40 (100)
	HW	8 (20.0)	18 (45.0)	-	6 (15.0)	8 (20.0)	40 (100)
Meat	CL	-	26 (65.0)	11 (27.5)	3 (7.5)	-	40 (100)
	EM	-	22 (55.0)	9 (22.5)	6 (15.0)	3 (7.5)	40 (100)
	HW	-	17 (42.5)	17 (42.5)	3 (7.5)	3 (7.5)	40 (100)
Fish	CL	5 (12.5)	32 (80.0)	3 (7.5)	-	-	40 (100)
	EM	5 (12.5)	30 (75.0)	1 (2.5)	3 (7.5)	1 (2.5)	40 (100)
	HW	9 (22.5)	23 (57.5)	4 (10.0)	2 (5.0)	2 (5.0)	40 (100)
Fats & oils	CL	40 (100.0)	-	-	-	-	40 (100)
	EM	40 (100.0)	-	-	-	-	40 (100)
	HW	40 (100.0)	-	-	-	-	40 (100)

Contd.

Table 16. Continued

1	2	3	4	5	6	7	8
Sugar	CL	40 (100.0)	-	-	-	-	40 (100)
	EM	40 (100.0)	-	-	-	-	40 (100)
	HW	40 (100.0)	-	-	-	-	40 (100)
Jaggery	CL	-	1 (2.5)	2 (5.0)	7 (17.5)	30 (75.0)	40 (100)
	EM	-	2 (5.0)	2 (5.0)	18 (45.0)	18 (45.0)	40 (100)
	HW	-	1 (2.5)	2 (5.0)	9 (22.5)	28 (70.0)	40 (100)
Spices and condiments	CL	40 (100.0)	-	-	-	-	40 (100)
	EM	40 (100.0)	-	-	-	-	40 (100)
	HW	40 (100.0)	-	-	-	-	40 (100)

Number in parentheses are percentages, CL - Casual labourers
EM - Employed mothers, HW - Housewives

The frequency of use of different food items among the selected families was assessed by the formula suggested by Reaburn *et al.* (1979) (Appendix VIII) and the percentage score is presented in Table 17.

The results indicated that the maximum score of 100 per cent was obtained for food items like cereals, fats and oil sugar and spices and condiments for all the three groups. The food frequency scores obtained for pulses and milk and milk products were higher in the HW category (79.38% and 100%) compared to CL (76.25% and 92.5%) and EM groups (77.5% and 89.4%). In the case of green leafy vegetables, other vegetables, fruits and egg, EM group scored the highest score compared to CL and HW groups. CL and EM groups had a higher score in the case

Table 17. Frequency score (%) on different food items

Food items	Scores (%)		
	CL	EM	HW
Cereals	100.00	100.00	100.00
Pulses	76.25	77.50	79.38
Green leafy vegetables	67.50	70.00	62.50
Roots and tubers	69.38	69.38	60.63
Other vegetables	86.25	96.88	94.38
Fruits	73.75	76.88	57.50
Milk and milk products	92.5	89.4	100.00
Egg	72.38	78.13	57.50
Meat	64.38	56.25	55.00
Fish	76.25	71.88	71.88
Fats and oils	100.00	100.00	100.00
Sugar	100.00	100.00	100.00
Jaggery	8.75	17.50	10.00
Spices and condiments	100.00	100.00	100.00

CL - Casual labourers, EM - Employed mothers
 HW - Housewives

of roots and tubers (69.38%) compared to HW group (60.63%). The CL group had a higher frequency score in the use of meat (64.38%) and fish (76.25%) compared to EM (56.25% and 71.88%) and HW groups (55.0% and 71.88%). Lowest percentage score was obtained for jaggery for all the three groups.

Based on the percentage frequency scores obtained for different food items, the foods were classified into three groups viz., most frequently used (% score - above 75%), medium frequently used (percentage score 50 to 75%) and less frequently used (percentage score below 50%) food stuffs.

Table 18. Frequency of use of food items

Frequency of use	CL	EM	HW
Most frequently used	Cereals, pulses, other vegetables, fish, milk and milk products, fats and oils, sugar and spices and condiments	Cereals, pulses, other vegetables, fruits, egg, milk and milk products and milk products, fats and oils, sugar, spices and condiments	Cereals, pulses, other vegetables, milk and milk products, fats and oils, sugar, spices and condiments
Medium frequently used	Green leafy vegetables, roots and tubers, fruits, egg, meat	Green leafy vegetables, roots and tubers, meat, fish	Green leafy vegetables, roots and tubers, fruits, egg, meat, fish
Less frequently used	Jaggery	Jaggery	Jaggery

CL - Casual labourers, EM - Employed mothers
HW - Housewives

The results (Table 18) indicated that cereals, pulses, other vegetables, milk and milk products, fats and oils, sugar and spices and condiments were the most frequently used food items in all the three groups. Fruits and egg were used most frequently by the EM group while fish was the most frequently used

non-vegetarian item in the CL group. Green leafy vegetables, roots and tubers and meat were moderately used by all the groups. Fruits and eggs were used by CL and HW groups in moderation. Fish was used moderately by EM and HW categories. Jaggery was the least frequently used food item in all the three groups.

4.2.5 Maintenance of accounting system

Table 19. Details of accounting

Details	CL	EM	HW
Maintenance of accounts			
Yes	1 (2.5)	6 (15.0)	6 (15.0)
No	39 (97.5)	34 (85.0)	34 (85.0)
Total	40 (100)	40 (100)	40 (100)
Form of accounting			
Written	1 (100.0)	4 (66.7)	5 (83.3)
Memory	-	2 (33.3)	1 (16.7)
Total	1 (100)	6 (100)	6 (100)
Frequency of accounting			
Daily	-	6 (100.0)	1 (16.7)
Weekly	1 (100.0)	-	3 (50.0)
Monthly	-	-	2 (33.3)
Total	1 (100)	6 (100)	6 (100)

Number in parentheses are percentages, CL - Casual labourers
EM - Employed mothers, HW - Housewives

From the table (Table 19) it is clear that majority of the families in the three groups did not keep accounts of their income and expenditure and majority of those who maintained the accounts kept written accounts on a daily or weekly basis.

4.2.6 Meal pattern

Table 20 furnishes details on meal planning, basis for meal planning, number of meals per day, time schedule if followed, food distribution pattern and order of importance given to the family members in feeding.

Table 20. Details of meal pattern

Details	CL	EM	HW
1	2	3	4
Advanced meal planning			
Yes	20 (50.0)	39 (97.5)	29 (72.5)
No	20 (50.0)	1 (2.5)	11 (27.5)
Total	40 (100)	40 (100)	40 (100)
Basis for meal planning			
Food availability	8 (40.0)	16 (41.0)	12 (41.3)
Money available	3 (15.0)	2 (5.2)	5 (17.2)
Likes and dislikes of the family members	9 (45.0)	20 (51.0)	11 (37.9)
Family requirement	-	1 (2.8)	1 (3.6)
Total	20 (100)	39 (100)	29 (100)

Contd

Table 20. Continued

	1	2	3	4
Number of meals per day				
3		11 (27.5)	31 (77.5)	5 (87.5)
>3		29 (72.5)	9 (22.5)	35 (12.5)
Total		40 (100)	40 (100)	40 (100)
Time schedule				
Routine		22 (55.0)	39 (97.5)	32 (80.0)
As and when they like		18 (45.0)	1 (2.5)	8 (20.0)
Total		40 (100)	40 (100)	40 (100)
Equality in food distribution				
Present		28 (70.0)	33 (82.5)	29 (72.5)
Absent		12 (30.0)	7 (17.5)	11 (27.5)
Total		40 (100)	40 (100)	40 (100)
Order of importance				
Elders		1 (8.3)	2 (28.6)	4 (36.4)
Male members		9 (75.0)	2 (28.6)	5 (45.4)
Children		2 (16.7)	3 (42.8)	2 (18.2)
Total		12 (100)	7 (100)	11 (100)

Number in parentheses are percentages, CL - Casual labourers
EM - Employed mothers, HW - Housewives

As revealed in the table advance meal planning was more common in the EM group (97.5%) and was based on the likes and dislikes of the family members in 51 per cent of the households. Fifty per cent of the households of CL group planned meals in advance compared to 72.5 per cent of HW group. Meal planning was based mostly on the availability of foods in 40 per cent and 41.3 per cent of the CL and HW families and likes and dislikes of the family members was the criteria used by 45 per cent and 37.9 per cent families in CL and HW groups for planning the daily menu. Majority of the households in the EM (77.5%) and HW (87.5%) groups took only three meals while in the CL group, 72.5 per cent took more than three meals a day.

Regarding the specific time schedule for taking meals it was observed that 97.5 per cent of EM group and 80 per cent of HW group adopted a specific time schedule compared to 55 per cent in the CL group. The rest of the families consumed foods as and when they liked.

In majority of the households in the CL (70.0%), EM (82.5%) and HW (72.5%) groups, there was equality in food distribution. Amongst those families where there was inequality, it was seen that elders were given first preference in 8.3 per cent in CL, 28.6 per cent in EM and 36.4 per cent in HW categories. Male members of the family was given importance in 75.0 per cent, 28.6 per cent and 45.4 per cent of families in CL, EM and HW groups respectively. Rest of the families gave preference to children.

4.2.7 Methods of cooking

Table 21 gives the details of various cooking methods adopted by the families.

Table 21. Details on the methods of cooking

Food items	Group	Boiling and straining	Absorption	Boiling	Boiling and frying	Frying	Steaming	Steaming and frying	As such	Total
1	2	3	4	5	6	7	8	9	10	11
Cereals	CL	40 (100)	-	-	-	-	-	-	-	40 (100)
	EM	40 (100)	-	-	-	-	-	-	-	40 (100)
	HW	40 (100)	-	-	-	-	-	-	-	40 (100)
Pulses	CL	-	-	40 (100)	-	-	-	-	-	40 (100)
	EM	-	-	40 (100)	-	-	-	-	-	40 (100)
	HW	-	-	40 (100)	-	-	-	-	-	40 (100)
Green leafy vegetables	CL	-	40 (100)	-	-	-	-	-	-	40 (100)
	EM	-	40 (100)	-	-	-	-	-	-	40 (100)
	HW	-	38 (100.0)	-	-	-	-	-	-	38 (100)

Contd.

Table 21. Continued

1	2	3	4	5	6	7	8	9	10	11
Roots and tubers	CL	-	-	40 (100)	-	-	-	-	-	40 (100)
	EM	-	-	40 (100)	-	-	-	-	-	40 (100)
	HW	-	-	40 (100)	-	-	-	-	-	40 (100)
Other vegetables	CL	-	-	40 (100)	-	-	-	-	-	40 (100)
	EM	-	-	40 (100)	-	-	-	-	-	40 (100)
	HW	-	-	40 (100)	-	-	-	-	-	40 (100)
Fruits	CL	-	-	-	-	-	15 (37.5)	-	25 (62.5)	40 (100)
	EM	-	-	-	-	1 (2.7)	12 (33.3)	14 (39.0)	9 (25.0)	36 (100)
	HW	-	-	-	-	2 (5.6)	16 (44.4)	10 (27.8)	8 (22.2)	36 (100)
Milk	CL	-	-	40 (100)	-	-	-	-	-	40 (100)
	EM	-	-	40 (100)	-	-	-	-	-	40 (100)
	HW	-	-	40 (100)	-	-	-	-	-	40 (100)

Contd.

Table 21. Continued

1	2	3	4	5	6	7	8	9	10	11
Egg	CL	-	-	4 (10.5)	22 (57.9)	12 (31.6)	-	-	-	38 (100)
	EM	-	-	14 (37.9)	18 (48.6)	5 (13.5)	-	-	-	37 (100)
	HW	-	-	31 (96.8)	1 (3.2)	-	-	-	-	32 (100)
Meat	CL	-	-	-	-	33 (82.5)	7 (17.5)	-	-	40 (100)
	EM	-	-	-	5 (13.5)	25 (67.6)	7 (18.9)	-	-	37 (100)
	HW	-	-	-	2 (5.5)	30 (81.0)	5 (13.5)	-	-	37 (100)
Fish	CL	-	-	27 (67.5)	4 (10.0)	9 (22.5)	-	-	-	40 (100)
	EM	-	-	4 (10.3)	30 (76.9)	5 (12.8)	-	-	-	39 (100)
	HW	-	-	33 (86.8)	2 (5.3)	3 (7.9)	-	-	-	38 (100)

Numbers in parentheses are percentages, CL - Casual labourers, EM - Employed mothers, HW - Housewives

The table revealed that in all families cereals were cooked in excess water which was later drained off. Absorption method was adopted in the case of green leafy vegetables by all the families in the three groups while boiling was the method of cooking adopted for pulses, other vegetables and roots and tubers. Majority of the CL (62.5%) ate fruits as such without cooking and the rest after steaming or frying. Milk was boiled before use by all the three categories.

Boiling method was adopted by 96.8 per cent of the families of the HW group to cook eggs while 57.9 per cent of the CL and 48.6 per cent of EM families used boiling and frying methods. Majority of the families in the CL (82.5%), EM (67.6%) and HW (81.0%) categories used frying method to cook meat while the rest adopted steaming as well as frying.

Boiling was the method used by 67.5 per cent of CL group and 86.8 per cent of HW group to cook fish whereas 76.9 per cent in EM group adopted boiling as well as frying to cook fish.

4.2.8 Cooking pattern

The details regarding the number of times cooking is done, person who cooks, cooking media and use of boiled water by the families are presented in Table 22.

From the table, it is clear that in majority of the CL (60.0%), EM (70.0%) and HW (55.0%) families, cooking was done twice a day. About 38 per cent in CL, 23 per cent in EM and 30 per cent in the HW categories cooked once a day and rest of the families cooked food three times a day.

Cooking was done by the respondents in majority of the families in the CL (75.0%), EM (82.5%) and HW (82.5%) groups.

Table 22. Cooking pattern adopted by the families

Details	Number of families		
	CL (n=40)	EM (n=40)	HW (n=40)
No. of times cooking is done			
1	15 (37.5)	9 (22.5)	12 (30.0)
2	24 (60.0)	28 (70.0)	22 (55.0)
3	1 (2.5)	3 (7.5)	6 (15.0)
Person who cooks			
Mother alone	30 (75.0)	33 (82.5)	33 (82.5)
Mother & other family members	10 (25.0)	7 (17.5)	7 (17.5)
Cooking media			
Ordinary chullah	16 (40.0)	4 (10.0)	11 (27.5)
LPG stove	-	11 (27.5)	3 (7.5)
Kerosene stove	-	2 (5.0)	1 (2.5)
Ordinary chullah & LPG stove	1 (2.5)	4 (10.0)	2 (5.0)
Ordinary chullah & kerosene stove	23 (57.5)	10 (25.0)	18 (45.0)
Ordinary chullah & kerosene stove & LPG stove	-	8 (20.0)	5 (12.5)
Ordinary chullah & electricity & LPG stove	-	1 (2.5)	-
Use of boiled water			
Yes	20 (50.0)	33 (82.5)	24 (60.0)
No	20 (50.0)	7 (17.5)	16 (40.0)

n = Number of families
Number in parentheses are percentages

CL - Casual labourers
EM - Employed mothers
HW - Housewives

Majority in the CL (57.5%) used ordinary chullah and kerosene stove for cooking compared to 25 per cent in EM and 45.0 per cent in the HW categories. LPG stove was used by 27.5 per cent in EM and 7.5 per cent in HW groups. None of the families in the CL group used LPG stove.

It was found that 50 per cent, 82.5 per cent and 60 per cent of CL, EM and HW groups respectively were in the habit of drinking only boiled water while the rest drank water without boiling.

4.2.9 Preservation details

Table 23 gives details on preservation of foods and purchase of preserved foods.

Table 23. Details of preservation of foods

Details	CL (n=40)	EM (n=40)	HW (n=40)
Preservation of foods at home			
Yes	36 (90.0)	33 (82.5)	33 (82.5)
No	4 (10.0)	7 (17.5)	7 (17.5)
Purchase of preserved foods			
Yes	11 (27.5)	31 (77.5)	27 (67.5)
No	29 (72.5)	9 (22.5)	13 (32.5)

n = Number of families

Number in parentheses are percentages

CL - Casual labourers

EM - Employed mothers

HW - Housewives

From the table it is clear that majority of the families in the CL (90.0%), EM (82.5%) and HW (82.5%) categories preserved foods at home. Mango, lime and gooseberry were most commonly preserved as pickles. Majority in the EM (77.5%) group purchased preserved foods compared to CL (27.5%) and HW (67.5%) categories.

4.2.10 Foods given during special conditions

The foods given during special conditions, occasions and illnesses were studied and the results are presented in Table 24.

From the table it is clear that majority of the households in the three categories gave adult foods to children as well as to the adolescents. Extra food was consumed by 42.5 per cent (CL), 60.0 per cent (EM) and 17.5 per cent (HW) of the families during pregnancy. Majority of the families in the EM (60.0%) group consumed more food during lactation compared to 27.5 per cent in CL and 7.5 per cent in HW categories.

Special foods like cake, payasam, snacks, non-vegetarian foods and sadhya were prepared on birthdays and other festive occasions by all the families in the three categories. Rice gruel, pickles, pappad, black tea or coffee, rusk, bread etc. were consumed by all the three group of families during various illnesses.

Various weaning foods were prepared in majority of the households for feeding the infants and this included banana flour porridge, ragi porridge, sooji porridge, arrowroot porridge, fruit juices, bread and milk, steamed banana, steamed and mashed apple. Commercial infant formulas like cerelac, lactogen, nestum and farex were also used by the families.

Table 24. Details of foods given during special conditions

Details	CI (n=40)	EM (n=40)	HW (n=40)
Preschool age			
Same as adult diet	23 (57.5)	34 (85.0)	31 (77.5)
Bland and same as adult diet	17 (42.5)	6 (15.0)	9 (22.5)
School age and adolescents			
Same as adult diet	40 (100)	40 (100)	40 (100)
Pregnancy			
Usual foods	23 (57.5)	16 (40.0)	33 (82.5)
Special foods	17 (42.5)	24 (60.0)	7 (17.5)
Lactation			
Usual foods	29 (72.5)	16 (40.0)	37 (92.5)
Special foods	11 (27.5)	24 (60.0)	3 (7.5)
Birthdays			
Special foods	40 (100)	40 (100)	40 (100)
Other festive occasion			
Special foods	40 (100)	40 (100)	40 (100)
Illness			
Modified diet	40 (100)	40 (100)	40 (100)

n = Number of families
Number in parentheses are percentages

CI - Casual labourers
EM - Employed mothers
HW - Housewives

4.3 Maternal employment and time expenditure patten

Details of maternal employment and time expended for various activities were studied and the results are furnished below.

4.3.1 Details pertaining to maternal employment

Details pertaining to maternal employment like number of working hours, number of working days, experience, salary of the mother and its expenditure, reasons for going to work, details of income, conveyance used and working conditions of the casual labourers and employed mothers are furnished in Table 25.

Table 25. Details pertaining to maternal employment

Details	CL (n=40)	EM (n=40)
1	2	3
No. of working hours per day		
0-2	2(5.0)	-
2-4	6(15.0)	-
4-6	2(5.0)	1(2.5)
6-8	14(35.0)	15(37.5)
8-10	12(30.0)	17(42.5)
>10	4(10.0)	7(17.5)
No. of working days per month		
<15	1(2.5)	-
16-20	10(25.0)	1(2.5)
21-25	11(27.5)	37(92.5)
>25	18(45.0)	2(5.0)
Experience (years)		
<2	19(47.5)	4(10.0)
3	3(7.5)	4(10.0)
4	6(15.0)	4(10.0)
5	6(15.0)	2(5.0)
6	-	-
≥7	6(15.0)	26(65.0)

Contd.

Table 25. Continued

	1	2	3
Reason for going to work			
For money		37(92.5)	35(87.5)
Independence		-	3(7.5)
Others		3(7.5)	2(5.0)
Salary of the mother (Rs/month)			
<2000		33(82.5)	10(25.0)
2001-4000		4(10.0)	25(62.5)
4001-6000		3(7.5)	5(12.5)
Use of salary			
Solely for household purposes		33(82.5)	14(35.0)
Partly saved and partly used for household purposes		7(17.5)	26(65.0)
Type of job			
Permanent		8(20.0)	35(87.5)
Temporary		32(80.0)	5(12.5)
Conveyance used			
Bus		15(37.5)	23(57.5)
Walk		25(62.5)	11(27.5)
Bus and walk		-	4(10.0)
Others		-	2(5.0)
Working conditions			
Satisfactory		38(95.0)	37(92.5)
Unsatisfactory		2(5.0)	3(7.5)
n = Number of respondents			
Number in parentheses are percentages		CL - Casual labourers	EM - Employed mothers

From table 25 it is observed that about 43 per cent in the EM group worked for 8 to 10 hours a day compared to 30.0 per cent in the CL group. Ten per cent in CL and 17.5 per cent in the EM groups worked for more than 10 hours daily.

Regarding the monthly working days 45 per cent of the respondents in the CL group worked for more than 25 days a month compared to 5 per cent in the EM

group. In the EM group, majority (92.5%) worked between 21 and 25 days in a month compared to 27.5 per cent in the CL group. A small percentage in the CL group (2.5%) worked for less than 15 days a month.

It was revealed that 47.5 per cent of respondents in CL group had been working since two years when compared to 10 per cent in the EM group. In the EM group, majority (65%) had been working for more than seven years.

Majority of the mothers in the CL (92.5%) and EM groups (87.5%) worked for money and 7.5 per cent in the EM group worked to be more independent.

While majority of the CL mothers (82.5%) earned less than 2000 rupees per month, majority in the EM (62.5%) earned between 2000 and 4000 rupees per month. All mothers in the EM group received payment on time compared to 87.5% in CL group.

About 83 per cent of mothers in CL group used their salary solely for household purposes whereas in the EM group, majority (65.0%) used it for household purposes and also saved some amount.

Permanent jobs were more in the EM group (87.5%) compared to the CL group (20.0%). Frequent transfers was seen in 17.5 per cent of EM group compared to none in CL group.

Majority of the respondents in the CL group (62.5%) did not use any transport facilities when compared to 27.5 per cent in the EM group. Nearly 58.0 per cent of the EM group used the local transport facilities to go to their work place compared to 37.5 per cent in the CL group.

The distance between home and work place was less than or equal to 2 km in 60 per cent of the CL mothers compared to 37.5 per cent of employed mothers. Thirty per cent of mothers in EM group travelled more than 10 km compared to 5.0 per cent in CL group.

Majority in the CL (95.0%) and EM (92.5%) categories found the job satisfying and did not face any problems at the work place. The family members were co-operative and had a favourable attitude towards maternal employment in 92.5 per cent in the CL group compared to 77.5 per cent in the EM group.

Details with respect to child care practices followed by the employed mothers in the two categories revealed that majority of children in the CL (67.5%) and EM (70.0%) groups were looked after by elders. In the EM group 5 per cent of the children were looked after by maids. While elder siblings looked after 5 per cent in CL and 2.5 per cent in EM groups, the rest were looked after in the creche.

Forty five per cent of children in CL group were trained to be independent compared to 55 per cent in the EM group. Majority of children in the EM group (62.5%) complained when mother went to work compared to 27.5 per cent in the CL group.

The analysis of variance was done to compare the duration of work by mothers, their number of working days and experience. It was revealed that there was a significant difference between the two groups for the number of working hours and experience. The mothers in EM group had longer working hours and more work experience than mothers of CL group (Appendix-XI).

4.3.2 Details of time expenditure

The time taken by the mothers in each group for household, child care and personal activities were analysed and is presented in Table 26.

Table 26. Details of time expenditure for different activities by the respondents

Details of time expended (hrs)	CL (n=40)	EM (n=40)	HW (n=40)
Household activities			
0-2	5 (12.5)	7 (17.5)	0 (0.0)
2-4	19 (47.5)	20 (50.0)	17 (42.5)
4-6	15 (37.5)	13 (32.5)	16 (40.0)
6-8	1 (2.5)	0 (0.0)	4 (10.0)
>8	0 (0.0)	0 (0.0)	3 (7.5)
Child care activities			
0-2	25 (62.5)	29 (72.5)	19 (47.5)
2-4	11 (27.5)	10 (25.0)	18 (45.0)
4-6	4 (10.0)	1 (2.5)	3 (7.5)
Time for personal activities			
0-1	33 (82.5)	40 (100.0)	30 (75.0)
1-2	4 (10.0)	0 (0.0)	7 (17.5)
2-3	3 (7.5)	0 (0.0)	3 (7.5)

n = Number of respondents
Number in parentheses are percentages

CL - Casual labourers
EM - Employed mothers
HW - Housewives

From the above table, it is clear that majority of the respondents in the CL (85.0%), EM (82.5%) and HW (82.5%) groups spent between 2 and 6 hours for household activities. Regarding child care activities 62.5 per cent (CL) 72.5 per cent (EM) and 47.5 per cent (HW) of mothers spent less than two hours. Forty five per cent of mothers in the HW category spent more than two hours for the same. All the respondents in the EM group and 82.5 per cent in the CL and 75 per cent in the HW categories spent less than one hour for personal purposes and the rest spent 1-3 hours for personal activities.

Analysis of variance revealed a significant difference between EM and HW groups in time spend for personal and child care activities, with mothers in HW group spending more time. With regard to household activities it was found that mothers of HW group spent the most time. (Appendix-XII).

4.4 Details of the index child

The preschool child in the family was considered as the index child and details like sex, birth weight, birth order, morbidity, immunisation status, use of health care facilities and participation in feeding programmes were assessed and the results are given in Table 27.

With regard to birth weight majority of the children in the CL (77.5%); EM (80%) and HW (70.0) categories had a weight above 2.5 kg. Rest of the children had less than 2.5 kg.

Birth order of the index children revealed that 50 per cent in the EM and HW groups and 45 per cent in CL group belonged to the first birth order. Forty five per cent of children in the CL and EM and 40 per cent in the HW categories belonged to the second birth order. Rest of the children which comprised of 10 per

Table 27. Details of the index child

Details	CL (n=40)	EM (n=40)	HW (n=40)
Sex			
Male	19 (47.5)	19 (47.5)	28 (70.0)
Female	21 (52.5)	21 (52.5)	12 (30.0)
Birth weight			
Below 2.5 kg	9 (22.5)	8 (20.0)	12 (30.0)
Above 2.5 kg	31 (77.5)	32 (80.0)	28 (70.0)
Birth order			
1st	18 (45.0)	20 (50.0)	20 (50.0)
2nd	18 (45.0)	18 (45.0)	16 (40.0)
3rd	4 (10.0)	2 (5.0)	2 (10.0)
Major illness			
Yes	5 (12.5)	7 (17.5)	12 (30.0)
No	35 (87.5)	33 (82.5)	28 (70.0)
Immunisation status			
Complete	35 (87.5)	40 (100.0)	36 (90.0)
Incomplete	5 (12.5)	-	4 (10.0)
Use of health care facilities			
Present	40 (100.0)	40 (100.0)	40 (100.0)
Absent	-	-	-
Participation in feeding programmes			
Yes	2 (5.0)	1 (2.5)	0
No	38 (95.0)	39 (97.5)	40 (100.0)

n = Number of children
 Number in parentheses are percentages

CL - Casual labourers
 EM - Employed mothers
 HW - Housewives

cent in CL and HW groups and 5 per cent in the EM groups belonged to the third birth order.

Regarding the morbidity of the index children, majority in the CL (87.5%), EM (82.5%) and HW (70%) categories were not affected by any major illnesses during the past one year. Rest of the children suffered from different illnesses like measles, chicken pox, whooping cough, mumps, diarrhoea, skin infections, respiratory infections, primary complex etc. of which respiratory infection was the most common.

All the children in the EM group and 87.5 per cent in the CL and 90 per cent in the HW groups had completed the immunisation schedule.

Regarding the health care facilities in the locality it was observed that all families in the three groups had medical facilities in their community and majority of the families in the three groups opted for allopathy treatment in the private sector.

Analysis of the participation in different feeding programmes indicated that only 5 per cent in the CL group and 2.5 per cent in the EM group participated in the supplementary feeding programmes.

4.5 Nutritional status of index child

4.5.1 Anthropometric measurements of index child

Anthropometric measurements namely weight, height, mid upper arm circumference (MUAC), chest circumference (CC) and head circumference (HC) of preschool children belonging to the three different groups (CL, EM and HW) were measured and compared with the Indian standards and classified according to their grades of malnutrition. The results are furnished below.

4.5.1.1 Weight for age

The mean weight of boys and girls in comparison with the Indian standards (ICMR, 1990) and its statistical interpretations are given in Table 28

From the table it can be observed that the weight of all children in the three groups were below the Indian standards suggested by ICMR (1990). Among the boys the reduction was found to be 3.4 kg in CL group compared to 3.87 kg in EM and 3.84 kg in HW groups. The girls in the CL group had a 4.67 kg deficit compared to 2.74 kg in EM and 3.77 kg in HW groups. Statistical analysis of the data revealed that the weight of boys and girls belonging to the three categories were significantly lower than the standard weight suggested for well to do Indian children.

Based on weight for age, the children were classified into various grades of malnutrition according to the classification suggested by Gomez *et al.* (1956) and the results are furnished in Table 29.

The results indicated that 35 per cent of children in the HW category had normal nutritional status compared to 30 per cent in the EM and 25 per cent in the CL group. Grade I malnutrition was present in 37.5 per cent of children in each group. Thirty five per cent in CL group had Grade II malnutrition compared to 32.5 per cent in EM and 25 per cent in HW categories. None of the children in the EM category had Grade III malnutrition against 2.5 per cent each in the other two categories (Fig. 1).

The chi-square test revealed that the nutritional status as measured by weight for age in accordance with Gomez classification was independent on maternal employment.

Table 28. Comparison of the mean weight of preschool children with the Indian standards

Group	Sample size (No.)		Mean weight \pm S.D. (kg)		Indian standards (kg)		Reduction from the standard (kg)		't' value	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
CL	19	21	15.8 \pm 3.18	14.02 \pm 1.83	19.2	18.69	3.40	4.67	6.76**	16.13**
EM	19	21	15.33 \pm 3.49	15.95 \pm 4.08	19.2	18.69	3.87	2.74	7.01**	4.25**
HW	28	12	15.36 \pm 2.83	14.92 \pm 1.97	19.2	18.69	3.84	3.77	8.58**	12.10**

**Significant at 1 per cent level, CL - Casual labourers, EM - Employed mothers, HW - Housewives

Table 29. Weight for age distribution of preschool children based on Gomez classification

Nutritional status	Weight for age (% of the standard)	CL			EM			HW		
		B	G	T	B	G	T	B	G	T
Normal	>90	6 (31.6)	4 (19.1)	10 (25.0)	5 (26.3)	7 (33.3)	12 (30.0)	11 (39.3)	3 (25.0)	14 (35.0)
Grade I malnutrition	76-90	7 (36.8)	8 (38.1)	15 (37.5)	9 (47.4)	6 (28.6)	15 (37.5)	9 (32.1)	6 (50.0)	15 (37.5)
Grade II malnutrition	61-75	6 (31.6)	8 (38.1)	14 (35.0)	5 (26.3)	8 (38.1)	13 (32.5)	7 (25.0)	3 (25.0)	10 (25.0)
Grade III malnutrition	<60	-	1 (4.7)	1 (2.5)	-	-	-	1 (3.6)	-	1 (2.5)
Total		19 (100)	21 (100)	40 (100)	19 (100)	21 (100)	40 (100)	28 (100)	12 (100)	40 (100)

B = Boys : G = Girls : T = Total
 $\chi^2 = 2.33$
 Numbers in parentheses are percentage

CL - Casual labourers
 EM - Employed mothers
 HW - Housewives

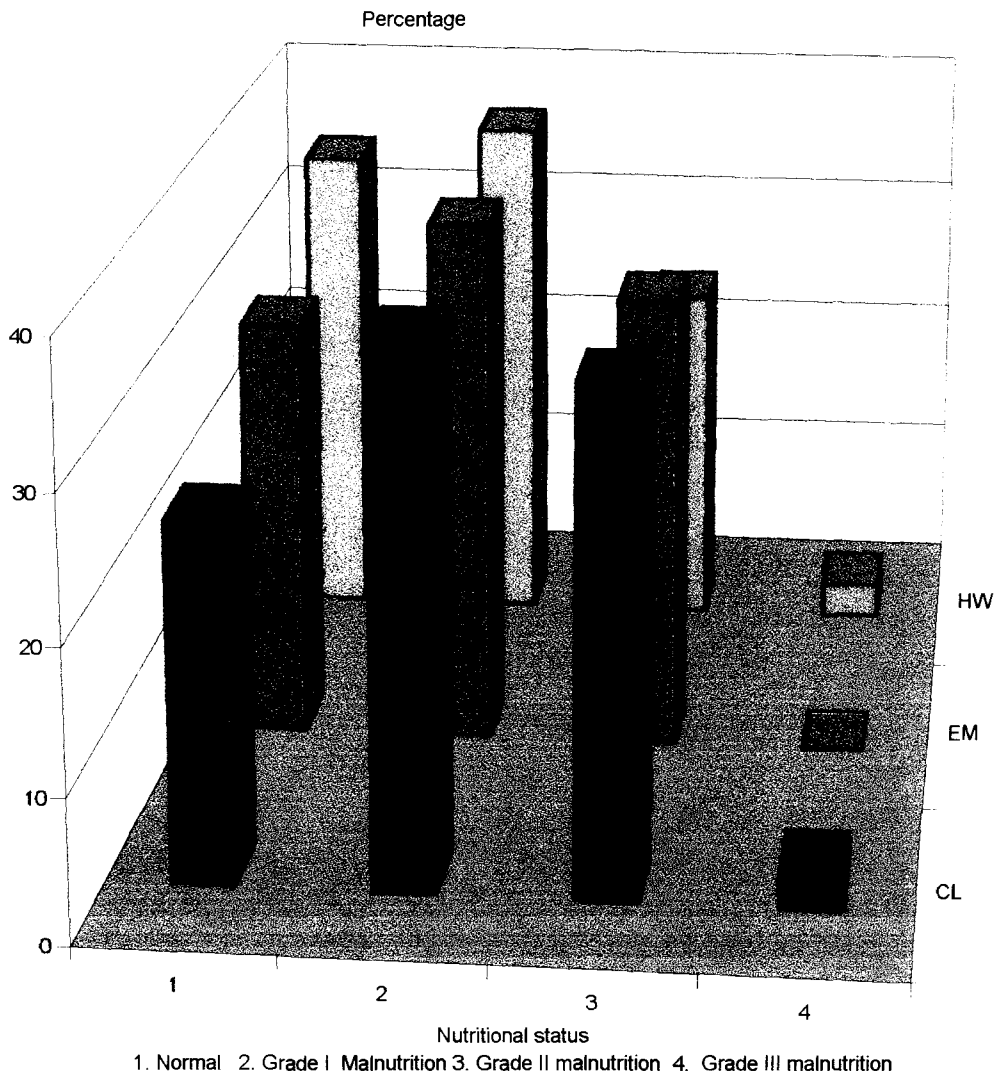


Fig.1 Nutritional status of preschool children on the basis of weight for age

Table 30. Comparison of the mean height of preschool children with the Indian standards

Group	Sample size (No.)		Mean height \pm S.D. (cm)		Indian standards (cm)		Reduction from the standard (cm)		't' value	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
CL	19	21	105.56 \pm 9.99	100.70 \pm 6.54	112.37	111.38	6.81	10.68	4.31*	10.32*
EM	19	21	103.84 \pm 10.63	106.01 \pm 8.24	112.37	111.38	8.53	5.37	5.07*	4.12*
HW	28	12	104.70 \pm 6.57	102.70 \pm 6.59	112.37	111.38	7.67	8.68	7.38*	8.33*

*Significant at 1 per cent level, CL - Casual labourers, EM - Employed mothers, HW - Housewives

4.5.1.2 Height for age

The mean height of boys and girls in comparison with the Indian standards (ICMR, 1990) and its statistical interpretations are given in Table 30.

From the table it is seen that the height of the children in all the three groups were significantly lower than the Indian standards. Among boys, the deviation from standard was 6.81 cm, 8.53 cm and 7.67 cm in CL, EM and HW groups respectively and among girls, deviation was 10.68 cm, 5.37 cm and 8.68 cm in CL, EM and HW groups, respectively.

Table 31. Height for age distribution of preschool children based on Waterlow's classification

Nutritional status	Weight for age (% of the standard)	CL			EM			HW		
		B	G	T	B	G	T	B	G	T
Normal	>90	8 (42.1)	8 (38.1)	16 (40.0)	5 (26.3)	13 (61.9)	18 (45.0)	14 (50.0)	5 (41.7)	19 (47.5)
Marginal malnutrition	90-95	5 (26.3)	8 (38.1)	13 (32.5)	10 (52.7)	4 (19.0)	14 (35.0)	11 (39.3)	5 (41.7)	16 (40.0)
Moderate malnutrition	85-90	6 (31.6)	3 (14.3)	9 (22.5)	2 (10.5)	3 (14.3)	5 (12.5)	2 (7.1)	1 (8.3)	3 (7.5)
Severe malnutrition	<85	-	2 (9.5)	2 (5.0)	2 (10.5)	1 (4.8)	3 (7.5)	1 (3.6)	1 (8.3)	2 (5.0)
Total		19 (100)	21 (100)	40 (100)	19 (100)	21 (100)	40 (100)	28 (100)	12 (100)	40 (100)

B = Boys : G = Girls : T = Total

$\chi^2 = 4.32$

Numbers in parentheses are percentage

CL - Casual labourers

EM - Employed mothers

HW - Housewives

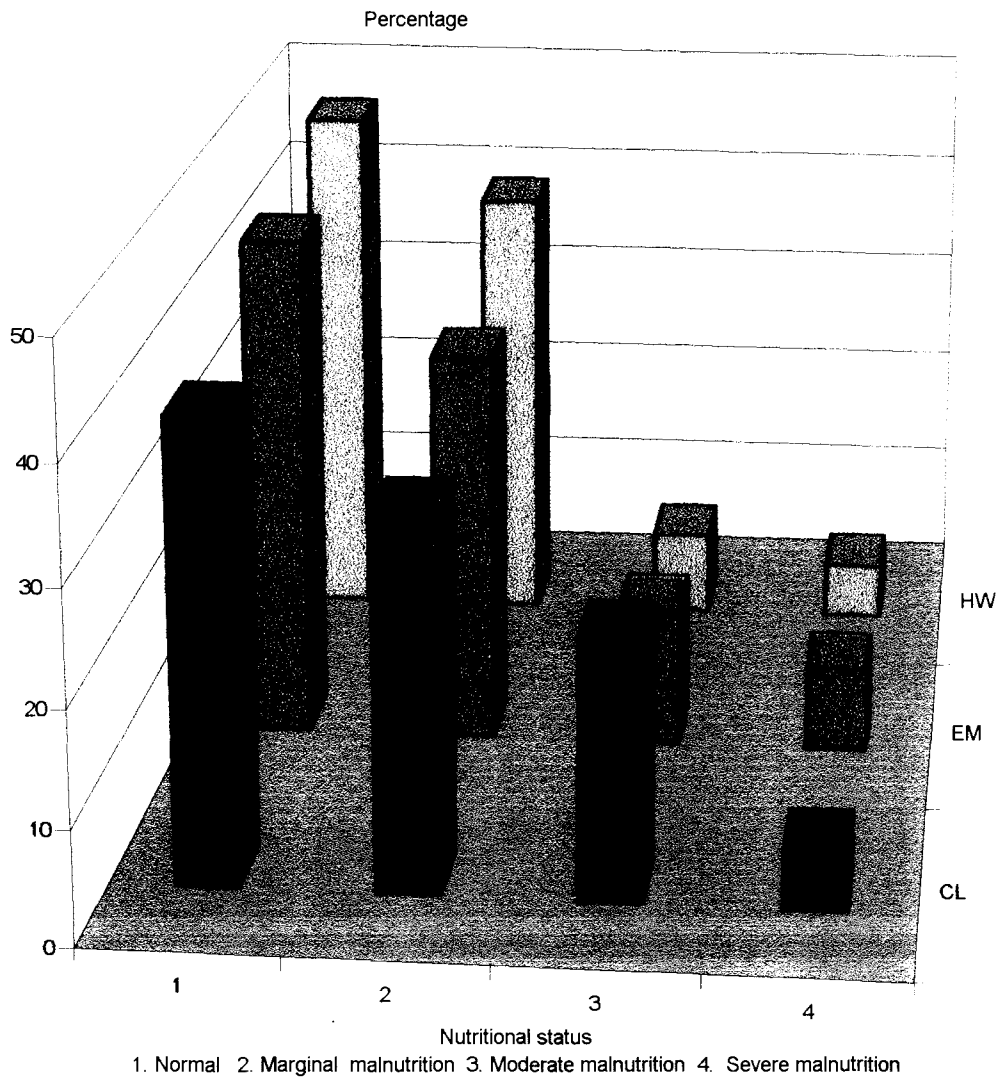


Fig. 2 Nutritional status of preschool children on the basis of height for age

On the basis of Waterlow's (1972) classification (Table 31), 40 per cent, 45 per cent and 47.5 per cent of children in the CL, EM and HW categories respectively were normal, and the rest of the children had different grades of malnutrition. Marginal malnutrition was seen in 32.5 per cent in CL, 35 per cent in EM and 40 per cent in HW groups respectively. Out of this 38.1 per cent in CL and 41.7 per cent in HW groups were girls. Twenty two point five per cent in the CL, 12.5 per cent in EM and 7.5 per cent in the HW groups were moderately malnourished. Severe malnutrition was present only in a small percentage of CL (5%), EM (7.5%) and HW (5.0%) categories. This is illustrated in Fig. 2.

Chi-square test revealed that height of the school children was independent of maternal employment.

4.5.1.3 Weight/height²

The nutritional status of children was also graded based on their weight for height² as suggested by Rao and Singh (1970).

Table 32. Weight/height² distribution of preschool children on the basis of Rao and Singh classification

Nutritional status	Weight/height ² ratio	CL			EM			HW		
		B	G	T	B	G	T	B	G	T
Normal	>0.0015	5 (26.3)	7 (33.3)	12 (30.0)	3 (15.8)	4 (19.0)	7 (17.5)	4 (14.3)	3 (25.0)	7 (17.5)
Moderate malnutrition	0.0013-0.0015	9 (47.4)	9 (42.9)	18 (45.0)	15 (78.9)	9 (42.9)	24 (60.0)	17 (60.7)	7 (58.3)	24 (60.0)
Under nourished	<0.0013	5 (26.3)	5 (23.8)	10 (25.0)	1 (5.3)	8 (38.1)	9 (22.5)	7 (25.0)	2 (16.7)	9 (22.5)
Total		19 (100)	21 (100)	40 (100)	19 (100)	21 (100)	40 (100)	28 (100)	12 (100)	40 (100)

B = Boys; G = Girls; T = Total; $\chi^2 = 3.26$; Numbers in parentheses are percentage
 CL - Casual labourers, EM - Employed mothers
 HW - Housewives

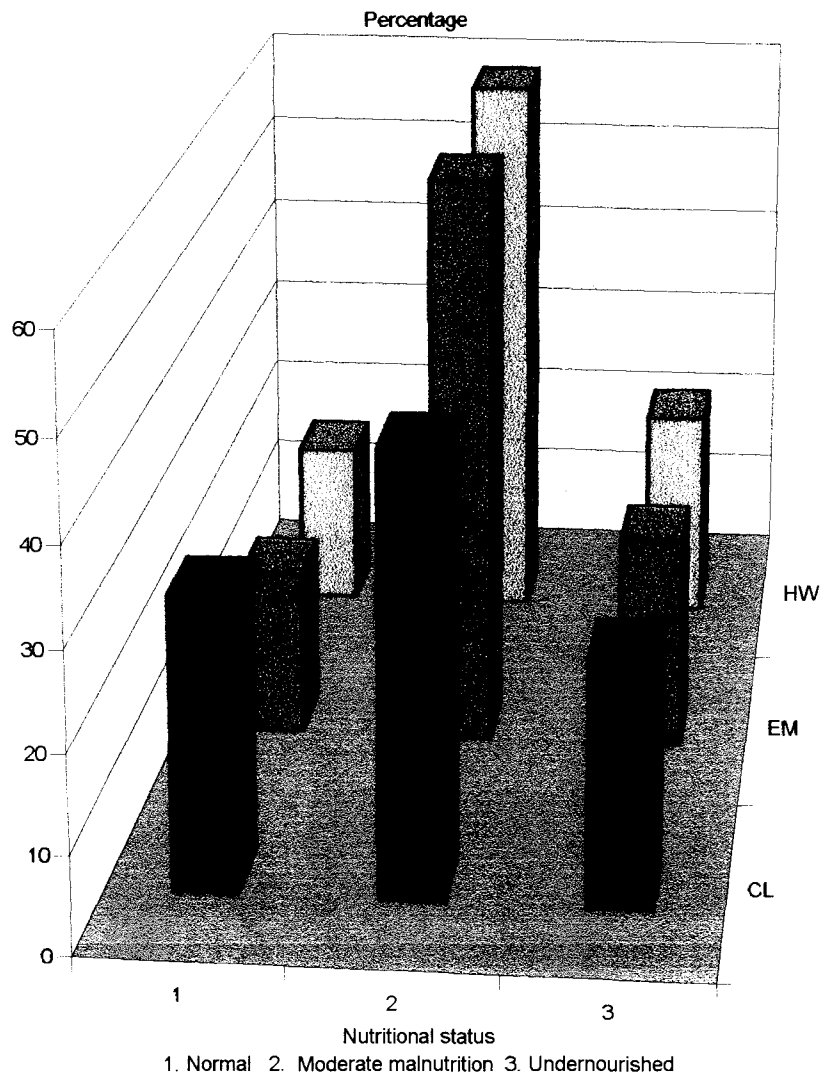


Fig.3 Nutritional status of preschool children on the basis of weight / height²



The results (Table 32) revealed that 30 per cent in CL group and 17.5 per cent each in EM and HW categories had normal nutritional status. Majority in CL (45.0%), EM (60.0%) and HW (60.0%) categories were moderately malnourished. The rest were undernourished (Fig. 3).

Chi-square test done showed that weight/height² is independent of maternal employment.

4.5.1.4 Mid upper arm circumference (MUAC)

From Table 33, it is seen that the MUAC of children in all three groups were significantly lower than the Indian standards for both sexes. The deficit in MUAC ranged from 0.36 cm (HW) to 1.17 cm (CL) for boys and 0.54 cm (HW) to 1.15 cm (CL) in the case of girls.

The chi-square test revealed that MUAC was dependent on maternal employment. Analysis of variance indicated that the three categories differed significantly (at 1% level) with respect to MUAC of children. The difference was found to be significant between HW and CL groups as well as EM and HW groups. The children of HW group had better MUAC than those in the other two groups.

Table 33. Comparison of the mean mid upper arm circumference of preschool children with the Indian standards

Group	Sample size (No.)		Mean MUAC ± S.D. (cm)		Indian standards (cm)		Reduction from the standard (cm)		't' value	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
CL	19	21	14.83±1.03	14.85±0.92	16	16	1.17	1.15	7.18**	7.90**
EM	19	21	14.97±1.42	14.97±1.76	16	16	1.03	1.03	4.58**	3.70**
HW	28	12	15.64±1.29	15.46±0.78	16	16	0.36	0.54	2.65**	4.37**

**Significant at 1 per cent level

F Value = 3.962

CD = 0.5596

CL - Casual labourers

EM - Employed mothers

HW - Housewives

Table 34. Distribution of preschool children according to mid upper arm circumference (Gopaldas and Seshadri)

Nutritional status	MUAC (cm)	CL			EM			HW		
		B	G	T	B	G	T	B	G	T
Normal	>13.5	18 (94.7)	20 (95.2)	38 (95.0)	17 (89.5)	17 (80.9)	34 (85.0)	28 (100)	12 (100)	40 (100)
Moderate malnutrition	12.5-13.5	1 (5.3)	1 (4.8)	2 (5.0)	2 (10.5)	4 (19.1)	6 (15.0)	-	-	-
Severe malnutrition	<12.5	-	-	-	-	-	-	-	-	-
Total		19 (100)	21 (100)	40 (100)	19 (100)	21 (100)	40 (100)	28 (100)	12 (100)	40 (100)

B = Boys : G = Girls : T = Total

$\chi^2 = 0.62$

Numbers in parentheses are percentage

CL - Casual labourers

EM - Employed mothers

HW - Housewives

The nutritional status of preschool children on the basis of MUAC classification suggested by Gopaldas and Seshadri (1987) revealed that majority of the children in CL (95.0%), EM (85.0%) and all in the HW groups belonged to the normal category. Moderate malnutrition was seen among 2 per cent and 6 per cent in CL and EM groups respectively (Fig. 4).

4.5.1.5 Head circumference (HC)

The mean HC of boys and girls were compared with Indian standards suggested by Nutrition Foundation of India (NFI, 1991) and were statistically analysed (Table 35).

The analysis of the data for boys and girls revealed that the HC was significantly lower than the standard values in the case of EM and HW groups while

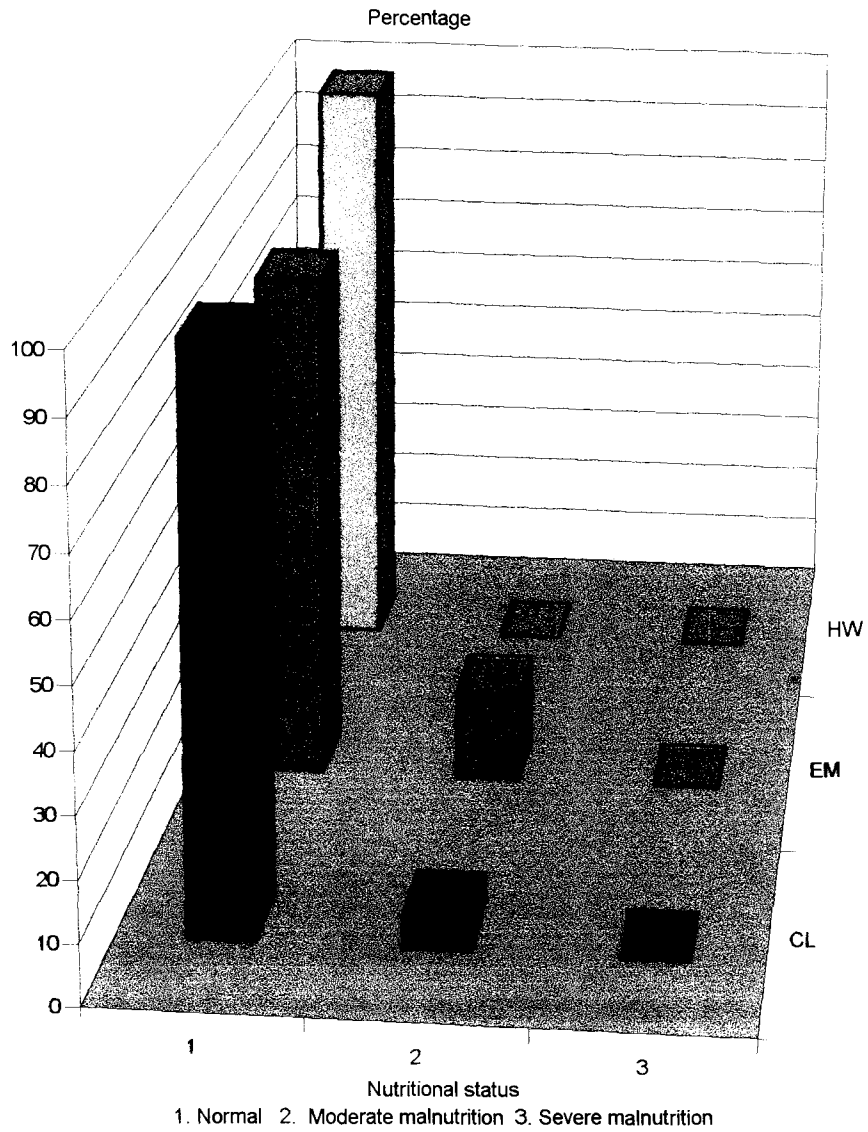


Fig. 4 Nutritional status of preschool children on the basis of mid upper arm circumference

Table 35. Comparison of the mean head circumference of preschool children with the Indian standards

Group	Sample size (No.)		Mean HC ± S.D. (cm)		Indian standards (cm)		Deviation from the standard (cm)		't' value	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
CL	19	21	50.62±2.97	49.26±2.36	50.00	49.10	+0.62	+0.16	0.34	0.43
EM	19	21	48.37±1.56	47.74±1.67	50.00	49.10	-1.63	-1.36	6.60**	5.15**
HW	28	12	48.48±2.73	47.36±3.16	50.00	49.10	-1.52	-1.74	3.52**	3.48**

**Significant at 1 per cent level

F value = 1.304

CD = 1.23

CL - Casual labourers

EM - Employed mothers

HW - Housewives

the HC of children in CL groups was not significantly different from the standard values.

The analysis of variance data indicated that the HC of children between the groups was statistically insignificant.

4.5.1.6 Chest circumference (CC)

The mean CC of boys and girls were compared with the Indian standards suggested by NFI (1991) and the results were statistically interpreted (Table 36).

The results revealed that except in the case of boys in the HW group, the CC of all others was significantly below the Indian standards. The reduction ranged from 2.75 cm (EM) to 6.56 cm (CL) in the case of girls and 0.92 cm (EM) to 1.74 cm (CL) in the case of boys.

Results of analysis of variance indicated that there was no significant difference in the CC of the children between the groups.

4.5.1.7 Head/chest circumference ratio

The head to chest circumference ratio as suggested by Gopaldas and Seshadri (1987) was used to interpret the grades of malnutrition among children. The results are furnished in Table 37.

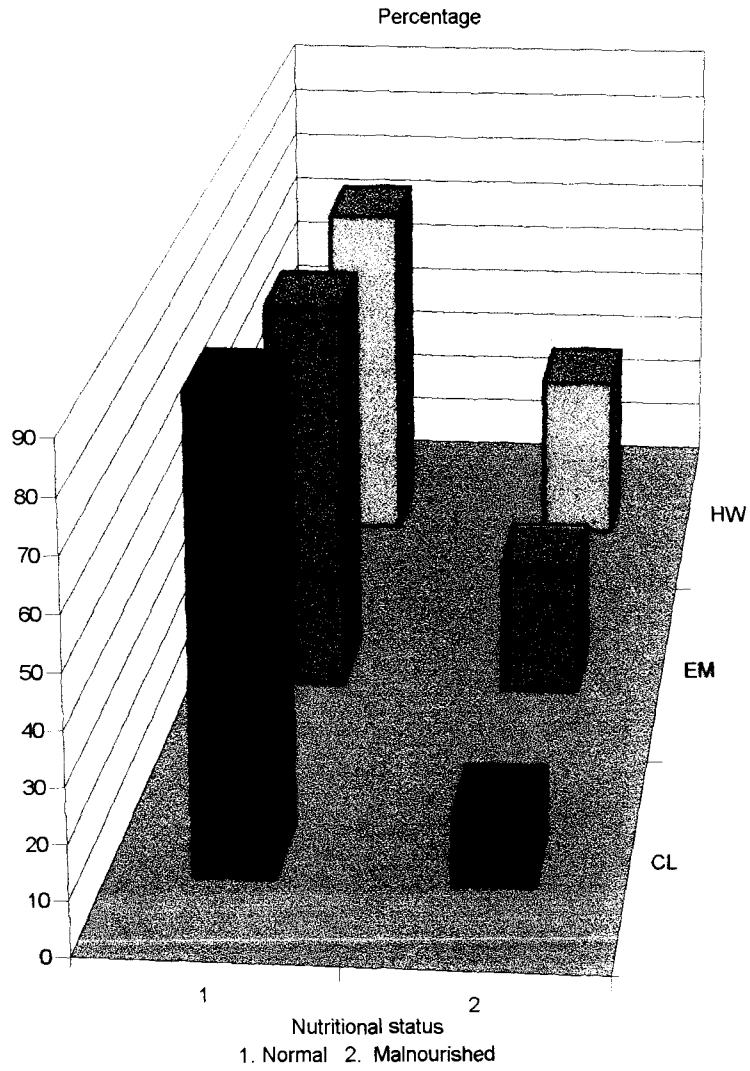


Fig. 5 Nutritional status of preschool children on the basis of head / chest circumference ratio

Table 36. Comparison of the mean chest circumference of preschool children with the Indian standards

Group	Sample size (No.)		Mean CC \pm S.D. (cm)		Indian standards (cm)		Deviation from the standard (cm)		t' value	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
CL	19	21	49.36 \pm 3.87	45.54 \pm 10.35	51.10	52.10	-1.74	-6.56	10.72*	6.55*
EM	19	21	50.18 \pm 3.77	49.35 \pm 3.67	51.10	52.10	-0.92	-2.75	4.61*	7.94*
HW	28	12	51.65 \pm 8.67	47.18 \pm 4.59	51.10	52.10	+0.55	-4.92	3.58*	5.30*

*Significant at 1 per cent level

F value = 1.304

CD = 1.23

CL - Casual labourers

EM - Employed mothers

HW - Housewives

Table 37. Distribution of preschool children according to head/chest circumference ratio

Nutritional status	HC/CC ratio	CL			EM			HW		
		B	G	T	B	G	T	B	G	T
Normal	<1	16 (84.2)	19 (90.5)	35 (87.5)	14 (73.7)	16 (76.2)	30 (75.0)	19 (67.9)	8 (66.7)	27 (67.5)
Malnutrition	>1	3 (15.8)	2 (9.5)	5 (12.5)	5 (26.3)	5 (23.8)	10 (25.0)	9 (32.1)	4 (33.3)	13 (32.5)
Total		19 (100)	21 (100)	40 (100)	19 (100)	21 (100)	40 (100)	28 (100)	12 (100)	40 (100)

B = Boys : G = Girls : T = Total

$\chi^2 = 4.56$

Numbers in parentheses are percentage

CL - Casual labourers

EM - Employed mothers

HW - Housewives

From the table it is seen that majority of the children in the CL (87.5%), EM (75.0%) and HW (67.5%) groups had normal nutritional status on the basis of HC/CC ratio. About 33 per cent in HW group was malnourished as against 12.5 per cent and 25 per cent in CL and EM groups respectively. This is illustrated in Fig. 5.

Chi-square test revealed that the HC/CC ratio was independent of maternal employment.

4.5.2 Actual food and nutrient intake of preschool children

Actual food and nutrient intake of all the children were determined by 24 hour recall method. An indepth study among 10 preschool children in each group was conducted by one day weighment method to determine the actual food intake and to assess the quality of the foods.

The quantity of each food item was compared with the quantity specified for a balanced diet suggested by ICMR (1984). The nutrients present in the diet of preschool children were calculated using the food composition tables (Gopalan *et al.*, 1989). The results were compared with the 1989 Recommended Dietary Allowances (RDA) of nutrients suggested by ICMR (1990). Both the food and nutrient intake of the children were statistically analysed. The results are furnished below.

4.5.2.1 Recall method

4.5.2.1.1 Food intake

From Table 38 it is observed that in all the three groups, the intake of cereals, green leafy vegetables, other vegetables, roots and tubers, fruits, fats and oils and sugar and jaggery was significantly lower than the recommended allowances. The consumption of pulses was found to be higher than the RDA among children of the CL group, while the children in the HW category had a lower intake. The intake of flesh foods met the recommended quantity among the three groups.

Analysis of variance was done to compare the intake of different food items between the three groups. The results indicated that significant difference existed in the intake of cereals between the three groups. Children in the EM group consumed the least. With regard to the intake of fruits and milk and milk products there was a significant difference between CL and EM groups with the latter consuming more.

The percentage intake of food stuffs in comparison with the RDA is illustrated in Fig.6.

Table 38. Mean food intake of children in comparison with RDA (Recall method)

Food items	RDA (g)	Mean food intake (g)						F-value	CD
		CL	't' value	EM	't' value	HW	't' value		
Cereals	270	205.88(76.3)	6.38*	155.88(57.7)	9.75*	187.13(69.3)	5.35*	4.059**	35.3484
Pulses	20	23.75(112.0)	0.64	16.75(83.8)	0.68	9.55(47.8)	4.00*	1.641	
Green leafy vegetables	50	14.25(28.5)	7.54*	3.63(7.3)	24.71*	15.30(30.6)	4.12*	1.321	
Other vegetables	30	12.00(40.0)	3.97*	25.25(84.2)	0.85	18.13(60.4)	2.19**	1.625	
Roots and tubers	20	12.75(63.8)	2.18**	12.13(60.7)	1.38	6.75(33.8)	4.32*	0.622	
Fruits	50	18.13(36.3)	5.37*	30.40(60.8)	1.77	34.38(68.8)	1.74	4.459**	24.9489
Milk	250	135.63(54.3)	5.76*	281.25(112.5)	1.13	137.75(55.1)	5.31*	12.517*	64.7485
Meat/fish/egg	30	35.63(118.8)	0.84	51.88(172.9)	0.09	40.63(135.4)	1.59	2.164	
Fats and oils	30	10.50(35.0)	19.95*	11.88(39.6)	26.22*	10.50(35.0)	16.48*	0.8111	
Sugar and jaggery	40	10.20(25.5)	27.39*	10.68(26.7)	12.59*	9.75(24.4)	24.54**	0.179	

* Significant at 1 per cent level

** Significant at 5 per cent level

Number in parentheses are percentage of RDA

CL - Casual labourer

EM - Employed mother

HW - Housewife

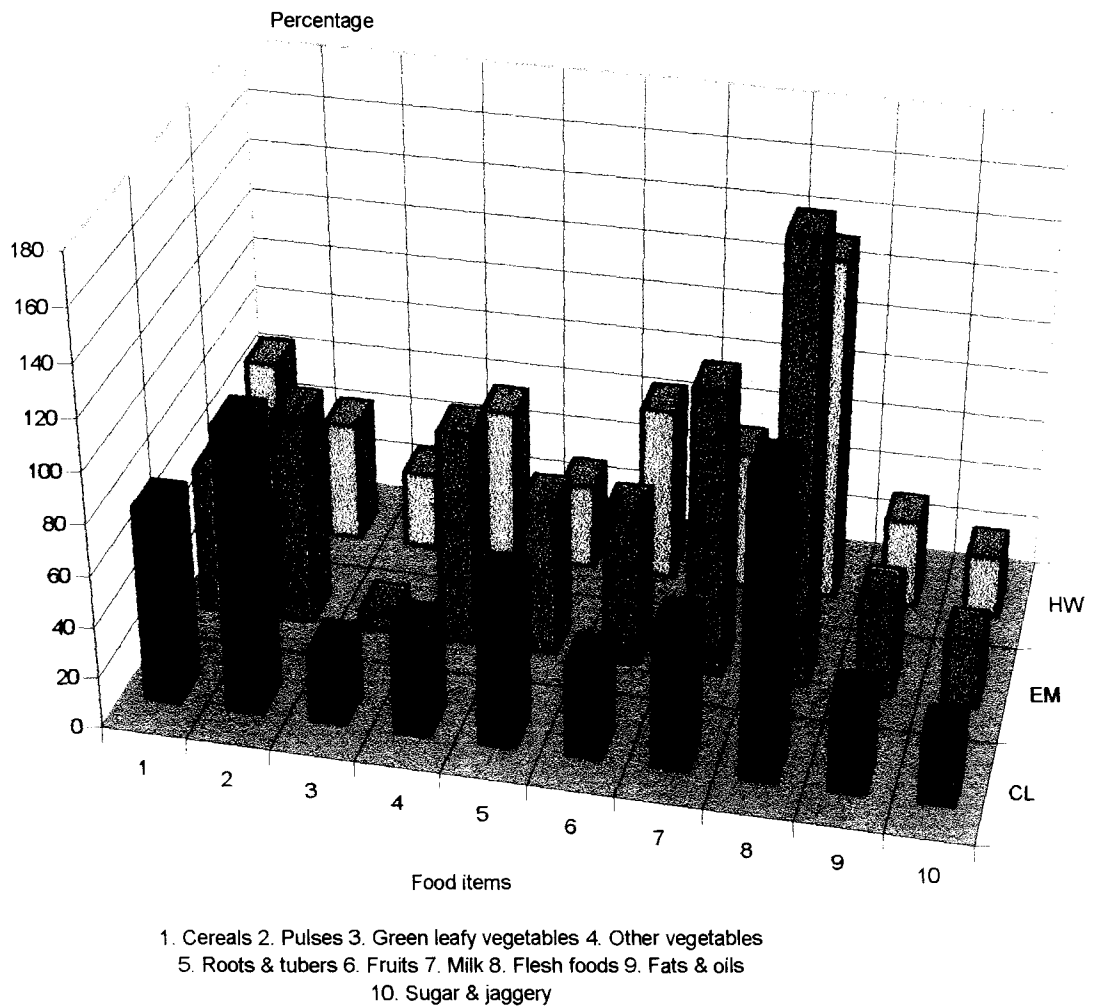


Fig. 6 Food intake of preschool children as percentage of RDA (recall method)

4.5.2.1.2 Nutrient intake

The nutrient intake of the children was compared with the RDA and the results are presented in Table 39.

The results indicated that the percentage intake of calories and iron was significantly lower than the RDA in all the three groups. The intake of protein and calcium was found to be higher than RDA in all the three groups. The vitamin A intake was found to be significantly higher only in the EM group and about 87 percent and 49 per cent of vitamin A requirement was met by the children belonging to the CL and HW groups, respectively. The vitamin C intake was significantly lower than the recommended levels in the HW group (Fig. 7).

4.5.2.2 Weighment method

4.5.2.2.1 Food intake

The mean food intake of the children (Table 40) assessed by one day food weighment method indicated that the intake of cereals, pulses, fruits, milk, fats and oils, sugar and jaggery was lower than the recommended allowances in all the three groups. The intake of cereals and fats and oils was found to be significantly lower than the RDA. Green leafy vegetables and other vegetables were not included in the diet of children by the CL group while the EM group did not include green leafy vegetables. The intake of roots and tubers by the children of CL group was higher than the RDA and it was found to be statistically significant, while in the other two groups, it was lower. The intake of non-vegetarian foods met the RDA (Fig. 8).

The analysis of variance done between the groups showed no significant difference in the intake of various food items.

Table 39. Mean nutrient intake of children in comparison with RDA (Recall method)

Nutrients	RDA	Mean nutrient intake						F-value	CD
		CL	't' value	EM	't' value	HW	't' value		
Energy (Kcal)	1690	1146.2(67.8)	10.44**	1168.8(69.2)	9.45*	1161.1(69.0)	8.24*	0.046	
Protein (g)	30	33.8(112.6)	1.65	40.7(135.7)	3.76*	33.7(112.3)	1.83	2.782	
Calcium (mg)	400	442.8(110.7)	0.87	721.0(180.0)	2.00	444.7(111.2)	0.71	2.391	
Iron (mg)	18	7.1(39.4)	15.12*	8.5(47.2)	4.92*	6.9(38.3)	8.89*	0.346	
Vitamin A (mcg)	400	347.3(86.8)	0.72	692.7(173.2)	4.59*	195.4(48.9)	7.23*	19.871*	160.162
Vitamin C (mg)	40	39.7(99.3)	0.03	33.9(84.8)	1.34	22.6(56.5)	3.00*	1.498	

* Significant at 1 per cent level

** Significant at 5 per cent level

Number in parentheses are percentage of RDA

CL - Casual labourer

EM - Employed mother

HW - Housewife

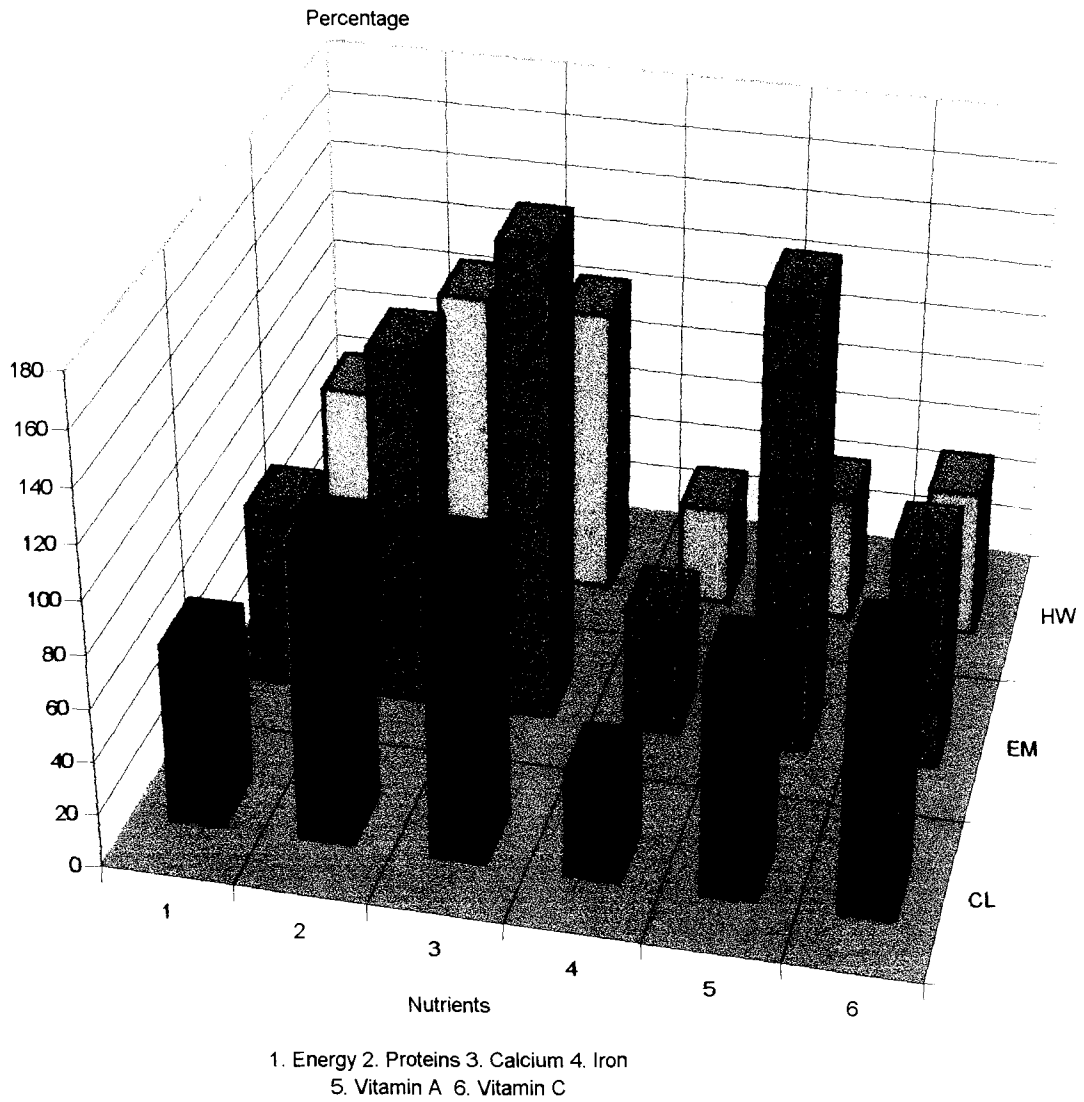


Fig. 7 Nutrient intake of preschool children as percentage of RDA (recall method)

Table 40. Mean food intake of children in comparison with RDA (Weighment method)

Food items	RDA (g)	Mean food intake (g)						F-value
		CL	't' value	EM	't' value	HW	't' value	
Cereals	270	183.8(68.1)	3.34*	145.4(53.9)	8.48*	172.0(63.7)	7.29*	1.094
Pulses	20	0.5(2.5)	39.03*	15.5(77.5)	0.69	15.5(77.5)	0.65	2.479
Green leafy vegetables	50	-	-	-	-	1.0(2.0)	3.22*	1.000
Other vegetables	30	-	-	15.0(50.0)	3.00*	13.5(45.0)	2.09	2.347
Roots and tubers	20	62.0(310.0)	99.66*	2.0(10.0)	-	10.0(50.0)	-	1.997
Fruits	50	40.0(80.0)	0.02	26.0(52.0)	1.75	46.0(92.0)	0.25	0.259
Milk	250	107.5(43.0)	5.06*	167.5(67.0)	1.53	164.0(65.5)	1.40	0.456
Meat/fish/egg	30	113.0(376.0)	1.97	45.0(150.0)	0.79	40.5(140.0)	0.70	2.095
Fats and oils	30	9.5(31.7)	19.47*	8.0(26.7)	11.85*	8.5(28.3)	14.30*	0.478
Sugar and jaggery	40	10.0(25.0)	-	13.0(32.5)	17.67*	11.0(27.5)	11.83*	0.360

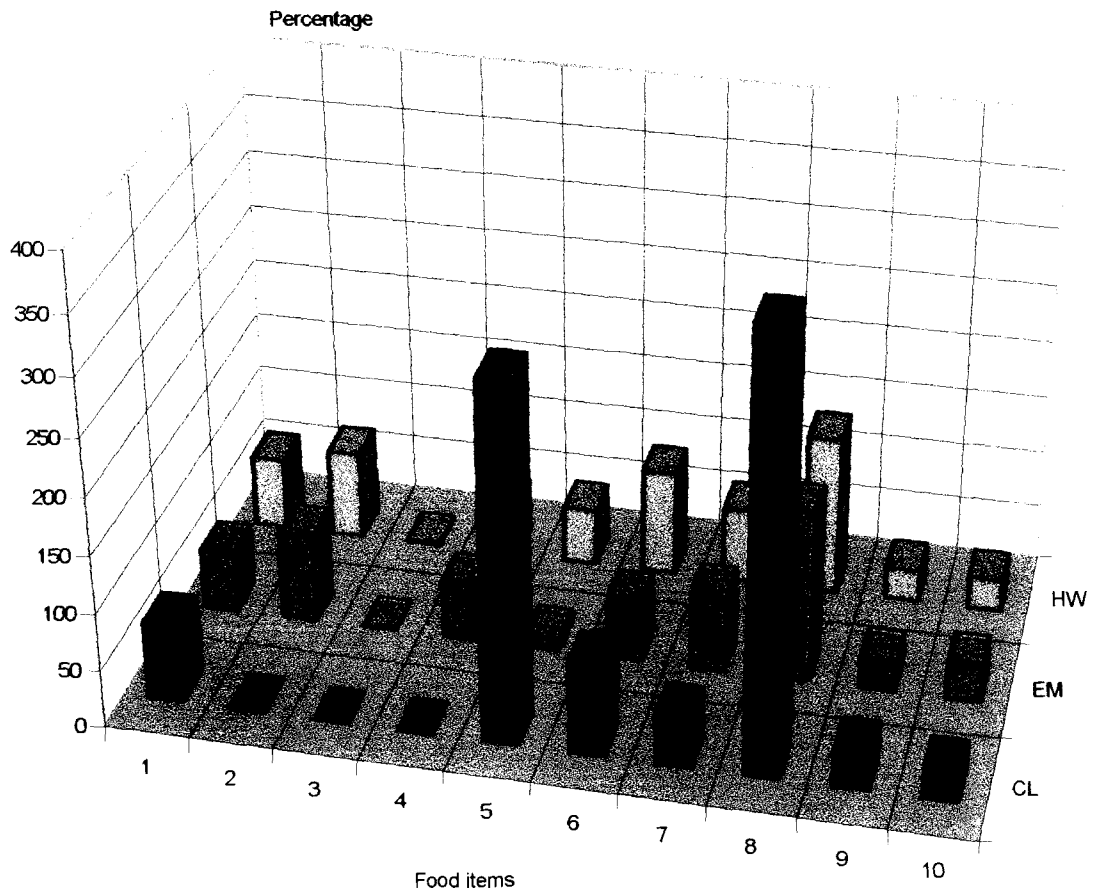
* Significant at 1 per cent level

Number in parentheses are percentage of RDA

CL - Casual labourer

EM - Employed mother

HW - Housewife



1. Cereals 2. Pulses 3. Green leafy vegetables 4. Other vegetables
 5. Roots & tubers 6. Fruits 7. Milk 8. Flesh foods 9. Fats & oils
 10. Sugar & jaggery

Fig. 8 Food intake of preschool children as percentage of RDA (weighment method)

4.5.2.2.2 Nutrient intake

The intake of nutrients by the children were calculated from the quantity of the food consumed and compared with the RDA. This is furnished in Table 41.

The mean nutrient intake of children in the 3 groups revealed that except proteins the intake of all nutrients were lower than the recommended levels and in most cases, results were statistically significant. The protein intake met the RDA in the three groups. Iron and vitamin A intake of the children belonging to the CL group was found to be far below the RDA. The details are illustrated in Fig.9.

Analysis of variance was done to compare the nutrient intake between the groups. It was found that there was a significant difference in vitamin A intake between CL and EM and CL and HW groups. The CL group consumed the least. In the case of iron, the difference was significant between CL and EM groups with the former consuming less. There was no significant difference in the intake of other nutrients between the groups.

4.5.3 Clinical examination of the children (sub sample)

The sub sample was clinically examined for manifestations of any clinical symptoms. The results are tabulated in Table 42.

From the table, it is seen that 10 per cent of children in all three groups manifested clinical symptoms. There were 25 per cent cases of phrynoderma each in CL and EM groups. Dental caries was seen in CL (50%), EM (25%) and HW (50%) groups. Both the above symptoms were seen together in 50 per cent of children in EM groups. Xerosis of the eye was present in 50 per cent of children in

Table 41. Mean nutrient intake of children in comparison with RDA (Weighment method)

Nutrients	RDA	Mean nutrient intake						F-value
		CL	't' value	EM	't' value	HW	't' value	
Energy (Kcal)	1690	1079.4(63.9)	3.23**	1174.7(69.5)	5.45**	1090.5(64.5)	5.69**	0.146
Protein (g)	30	40.1(133.7)	0.86	33.2(110.7)	1.02	51.7(172.3)	0.92	0.394
Calcium (mg)	400	136.3(34.1)	9.77**	351.1(87.8)	0.62	303.2(75.8)	1.36	3.196
Iron (mg)	18	3.3(18.3)	21.52**	7.3(40.6)	10.48**	5.5(30.6)	12.51**	4.972
Vitamin A (mcg)	400	60.8(15.2)	28.11**	304.5(76.1)	1.37	351.5(87.9)	0.54	5.638
Vitamin C (mg)	40	19.0(47.5)	2.06	34.6(86.5)	0.26	18.1(45.5)	3.41**	0.443

** Significant at 5 per cent level

Number in parentheses are percentage of RDA

CL - Casual labourer

EM - Employed mother

HW - Housewives

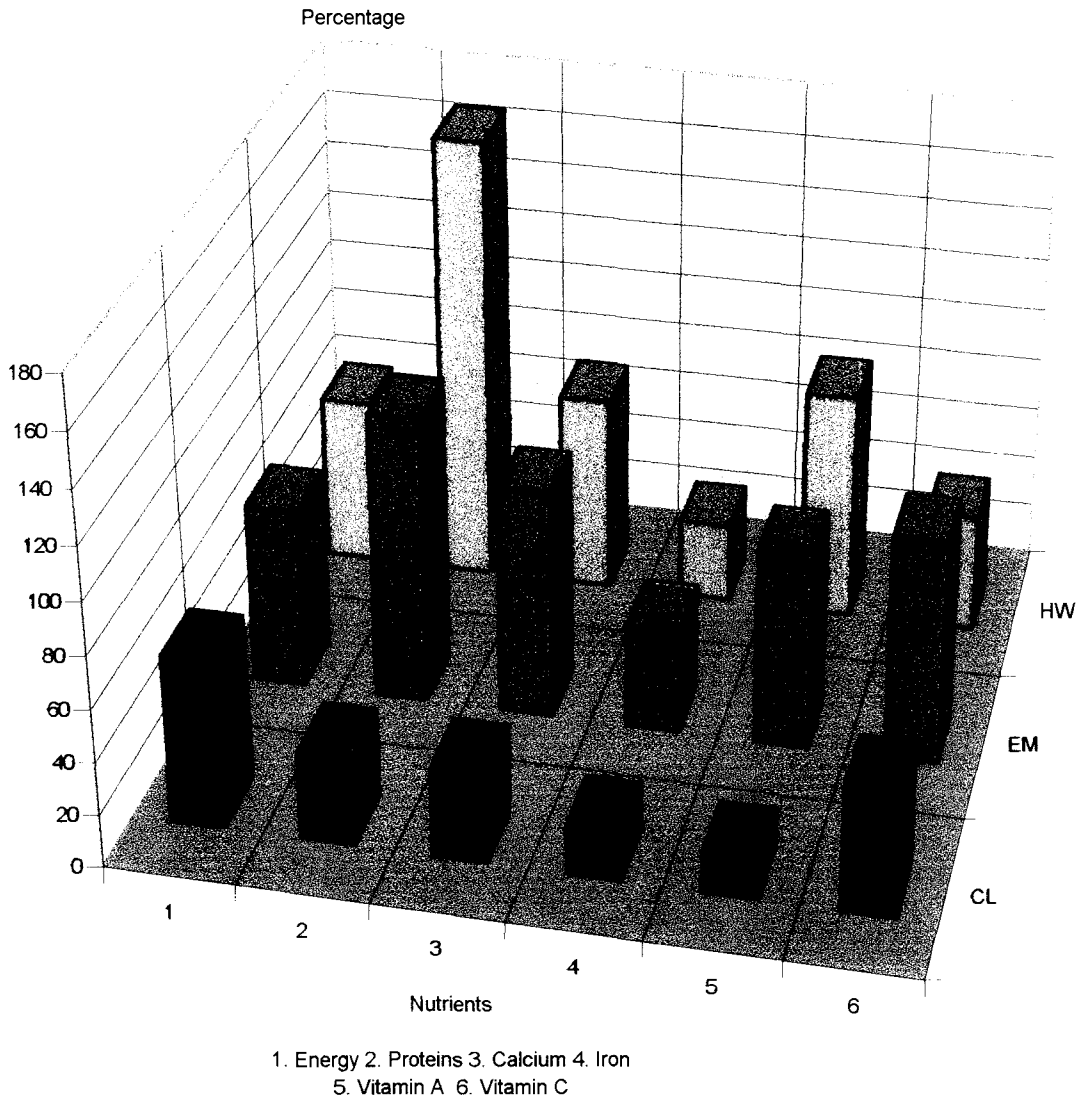


Fig. 9 Nutrient intake of preschool children as percentage of RDA (weighment method)

Table 42. Details of clinical examination

Presence of clinical symptoms	Number of children		
	CL	EM	HW
Present	4 (10.0)	4 (10.0)	4 (10.0)
Absent	36 (90.0)	36 (90.0)	36 (90.0)
Total	40 (100)	40 (100)	40 (100)
Type of clinical symptoms			
Phrynoderma	1 (25.0)	1 (25.0)	-
Dental caries	2 (50.0)	1 (25.0)	2 (50.0)
Phrynoderma and dental caries	-	2 (50.0)	-
Xerosis of the eye	-	-	2 (50.0)
Pale hair and thin built	1 (25.0)	-	-
Others	-	-	-
Total	4 (100)	4 (100)	4 (100)

CL - Casual labourers, EM - Employed mothers
 HW - Housewives

HW category, while one child in CL group was thin built with pale hair. All other children did not manifest any clinical symptoms.

4.6 KAP of mothers with respect to health and nutrition

The mean scores obtained by the mothers on Knowledge, Attitude and Practice with respect to health and nutrition are presented in Table 43.

Table 43. Mean score obtained by the respondents in KAP test

Test	Mean score \pm SD			F value	C.D.
	CL	EM	HW		
Knowledge	2.18 \pm 1.57	4.78 \pm 2.71	2.48 \pm 1.50	20.116*	0.8884
Attitude	36.03 \pm 2.39	37.98 \pm 3.05	36.48 \pm 2.87	14.406*	0.7321
Practice	12.58 \pm 1.50	14.55 \pm 1.55	13.73 \pm 1.88	5.458*	1.2243

*Significant at 1 per cent level, CL - Casual labourers
EM - Employed mothers, HW - Housewives

From the table it is clear that the EM category had an higher mean score (4.78) in knowledge test compared to CL (2.18) and HW (2.48) categories.

In attitude test also EM group scored the highest mean score of 37.98 when compared to the CL (36.03) and HW (36.48) categories. Similar trend was observed in the practice test also, with EM group scoring the highest mean score of 14.55 when compared to CL (12.58) and HW (13.73) categories.

Analysis of variance revealed that there is significant difference in the Knowledge, Attitude and Practice of mothers with respect to health and nutrition. The mothers of EM group scored the highest in KAP test.

The distribution of the mothers based on their Knowledge, Attitude and Practice about health and nutrition is shown in Table 44.

It is observed that in the case of knowledge test majority in the CL (80%) group fell in the medium category. In the EM group, 50 per cent were in the medium, compared to 92.5 per cent in the HW group. Forty five per cent in EM group had a high score compared to 7.5 per cent in CL and 2.5 per cent in HW (Fig.10).

With regard to the attitude score, 45 per cent in CL group fell in the medium category compared to 17.5 per cent in EM and 82.5 per cent in the HW groups. Majority in the EM (77.5%) belonged to the high attitude category (Fig.11).

In the case of practice, majority in CL (82.5%) and HW (65.0%) groups belonged to the medium category compared to 17.5 per cent in the EM group. Majority in the EM (80.0%) group belonged to the high category (Fig.12).

The χ^2 value revealed that the knowledge, attitude and practice of mothers with respect to health and nutrition was dependent on maternal employment.

Table 44. Distribution of mothers based on their Knowledge, Attitude and Practice about health and nutrition

Category	Knowledge score	Number of mothers		
		CL	EM	HW
Low (Below $\bar{x} - 1$ S.D.)	Below 0.83	5 (12.5)	2 (5.0)	2 (5.0)
Medium (Below $\bar{x} \pm 1$ S.D.)	0.83-5.45	32 (80.0)	20 (50.0)	37 (92.5)
High (Above $\bar{x} + 1$ S.D.)	Above 5.45	3 (7.5)	18 (45.0)	1 (2.5)
Total		40 (100)	40 (100)	40 (100)
$\bar{x} = 3.142$		$\chi^2 = 60.4$		
		SD = 2.31		
Category	Attitude score	CL	EM	HW
Low (Below $\bar{x} - 1$ S.D.)	Below 33.96	7 (17.5)	2 (5.0)	2 (5.0)
Medium (Below $\bar{x} \pm 1$ S.D.)	33.96-39.7	18 (45.0)	7 (17.5)	33 (82.5)
High (Above $\bar{x} + 1$ S.D.)	Above 39.7	15 (37.5)	31 (77.5)	5 (12.5)
Total		40 (100)	40 (100)	40 (100)
$\bar{x} = 36.83$		$\chi^2 = 67.4$		
		S.D. = 2.87		
Category	Practice score	CL	EM	HW
Low (Below $\bar{x} - 1$ S.D.)	Below 11.79	4 (10.0)	1 (2.5)	6 (15.0)
Medium (Between $\bar{x} \pm 1$ S.D.)	11.79-15.45	33 (82.5)	7 (17.5)	26 (65.0)
High (Above $\bar{x} + 1$ S.D.)	Above 15.45	3 (7.5)	32 (80.0)	8 (20.0)
Total		40 (100)	40 (100)	40 (100)
$\bar{x} = 13.62$		$\chi^2 = 101.9$		
		S.D. = 1.83		

CL - Casual labourers, EM - Employed mothers
HW - Housewives

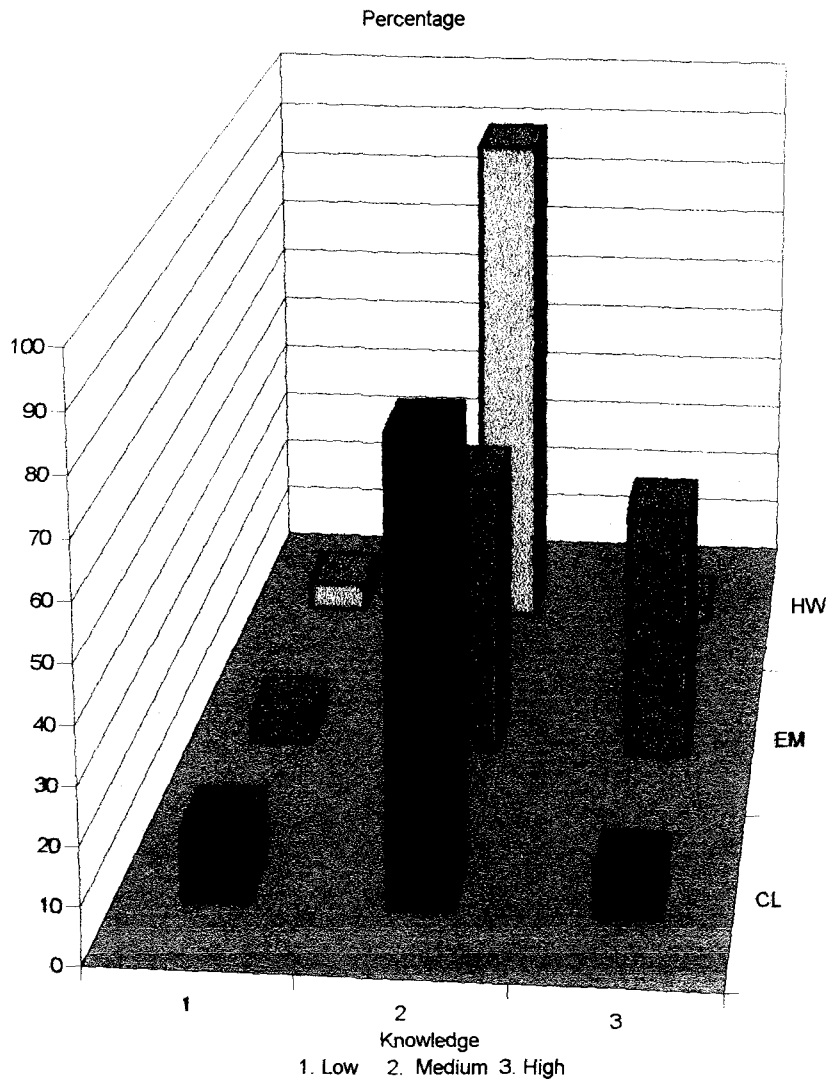


Fig.10 Grouping of mothers based on knowledge

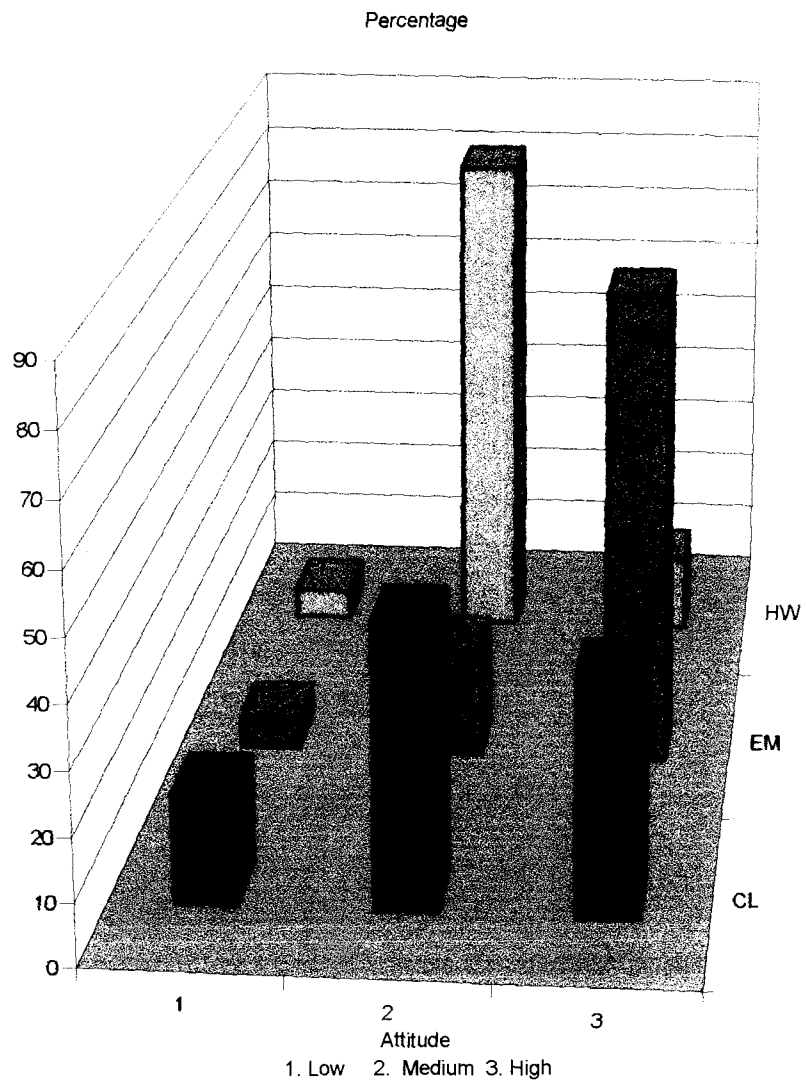


Fig.11 Grouping of mothers based on attitude

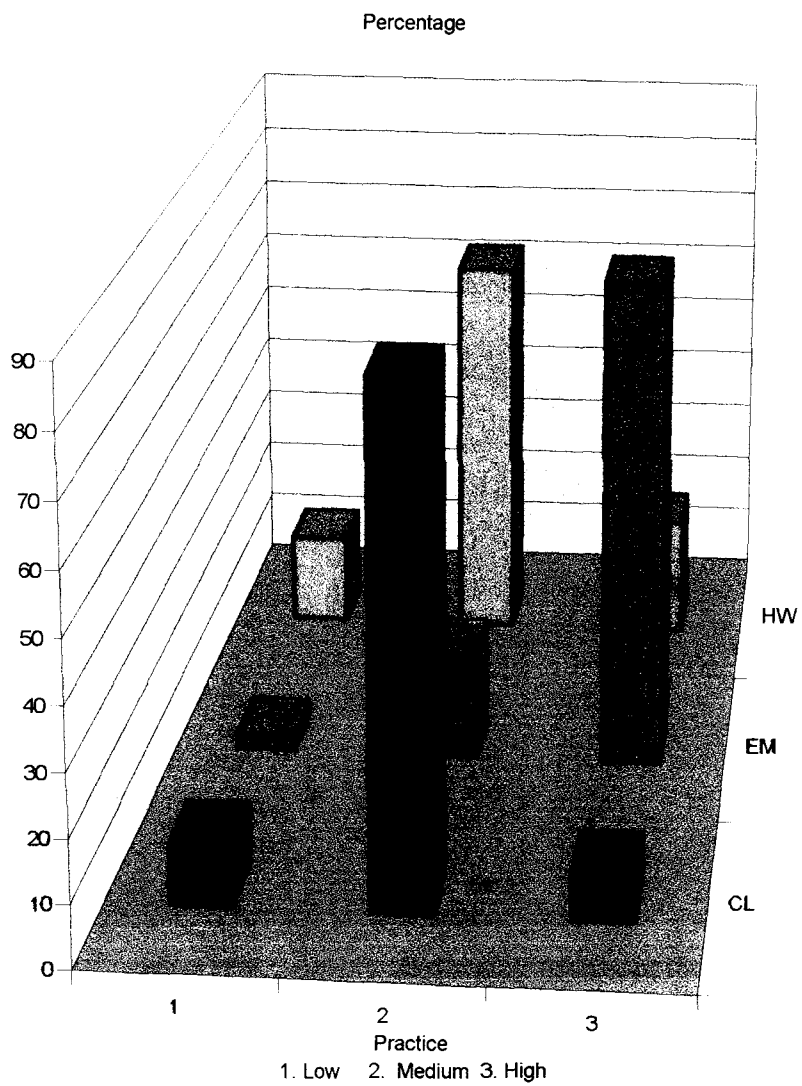


Fig.12 Grouping of mothers based on practice

Discussion

DISCUSSION

The present study was carried out to find out the effect of maternal employment on the nutritional status of preschool children. This chapter presents a critical discussion on the major findings and the details are presented under the following broad sections.

- 5.1 Socio-economic and cultural background of the families
- 5.2 Food consumption pattern of the families
- 5.3 Maternal employment and time expenditure pattern
- 5.4 Details of index child
- 5.5 Nutritional status of index child
- 5.6 KAP of mothers with respect to health and nutrition

5.1 Socio-economic and cultural background of the families

Socio-economic conditions prevailing in the family is one of the most important factors influencing the nutritional status of preschool children.

Nuclear family system was seen in majority of the households of casual labourers. Similar type of family system was observed among the different labour groups of Kerala by Thomas (1989); Seshadrinath (1993); Karuna (1993); Ranganathan (1996); Shyna (1996) and Udaya (1996). Though the joint family system is partly disintegrating in almost all communities of Kerala due to urbanisation and changes in social values, majority of the families of employed and unemployed mothers in the present study lived in joint families. In contrast to this Varghese (1989) and NIN (1995b) reported higher percentage of nuclear type

families in the households of working mothers in Kerala and in the urban areas of Gujarat and Andhra Pradesh

Large family size is regarded as a risk factor for malnutrition in developing countries particularly among infants and young children (Tuncbilek *et al.*, 1995). Most of the families in CL group had upto four members while in the EM and HW categories majority had upto eight members. Studies by Vijayalakshmi and Jayanthi (1990) found that the mean family size was somewhat smaller in gainfully employed women and was possibly due to the reluctance of women to lose wages on account of pregnancy.

Similar findings of a small family norm was observed among the farm families of Kerala by Cherian (1992); Jayanthakumari (1993) and Udaya (1996). Usha *et al.* (1990) and Prema (1996) reported that most of the labourer families in Thiruvananthapuram District of Kerala belonged to large families consisting of 5 to 9 members. NIN (1995a) reported that family size of employed mothers in the states of Gujarat, Haryana, Karnataka and Andhra Pradesh ranged from 5.4 to 7.

In Kerala, unlike other states, a small family norm has become very popular even among the low income groups probably because of the availability of medical and educational facilities as well as the constant exposure of the public, to small family norm through different medias. Gopalan (1989) and NNMB (1989) also reported a small family norm even among the low income groups. The present study also agrees with the above findings which revealed that 57.5 per cent of the CL, 60 per cent of EM and 42.5 per cent of HW families were with two children.

A positive association between parental literacy and nutritional status was reported by Devadas (1994). The study revealed that majority of the parents were

literate in all the three groups. This supports the reports of Census of India (1991) which ranked Kerala as the most literate state and this could be attributed to the Adult Education Programmes in Kerala. The study also revealed that the female members were more educated than the male members in all three groups. Similar results were reported by Augustine (1993) in Thiruvananthapuram District and Shyna (1996) and Udaya (1996) in Thrissur District. In contrast, studies by Sujatha (1990) and Mathen (1998) in Kerala and NIN (1996) in the States of Haryana, Andhra Pradesh, Karnataka and Gujarat reported a higher percentage of literacy among the male members than the female members.

Majority of the male members in the CL group were working in the unorganised sector while those in EM and HW groups worked in the organised sector. Similar results were observed by Sujatha (1990) in Thiruvananthapuram District who found that majority of the husbands of casual labourers worked in the unorganised sector.

The present study indicated that majority of families in CL (92.5%), EM (67.5%) and HW (72.5%) categories were landless. This is in line with the studies conducted by NIN (1995a) in Haryana, Gujarat, Andhra Pradesh and Karnataka. In contrast, Mathen (1998) reported that majority of the farm families in Thrissur District owned upto 20 cents of land.

Immink *et al.* (1981) opined that possession of cattle, poultry, kitchen garden and use of home produce was positively linked to the nutritional status of the family. Present study revealed that majority of the families in all the three groups did not possess livestock but possessed a kitchen garden. This is in contrast to the findings of Udaya (1996) who reported that majority of the farm families of Thrissur District did not possess kitchen garden.

The income in all the three groups ranged from Rs.2000 to Rs.8000 per month. Partly similar findings were reported by Prema (1996) and Ranganathan (1996) who observed that the monthly income of the casual labourers ranged between Rs.3000 and Rs.5000. In contrast, Karuna (1993) and Varma (1996) reported that the mean monthly income of such households ranged from Rs.1000 to Rs.3000.

Monthly expenditure pattern of the three groups indicated that majority of families in CL (87.5%) EM (65%) and HW (67.5%) categories spent between 30 and 59.99 per cent of their monthly income on food. Similar findings were reported by Usha *et al.*(1990) in Thiruvananthapuram District and Udaya (1996) and Mathen (1998) in Thrissur District. In contrast, studies by Augustine (1993), Karuna (1993), Prema (1996) and Ranganathan (1996) on labourers in various unorganised sectors in Thiruvananthapuram District revealed that the percentage spent on food was between 65 and 75 per cent of total income. NIN (1995a) reported that households of self employed mothers, wage labourers and housewives spent between 40 and 75 per cent of their income on food. The present study indicated that majority of the families spent less than 10 per cent of their income on clothing, education, water, health, transport, fuel, electricity, shelter, recreation, personal expenses and as savings and remittance. Similar results were observed by Usha *et al.* (1990); Augustine (1993) and Karuna (1993) in Thiruvananthapuram District and by Udaya (1996) and Mathen (1998) in Thrissur District.

Analysis of variance on percentage of income spent on various items showed a significant difference on the amounts spent on food, transport, recreation, electricity, fuel, remittance and savings between the groups.

Results highlighted that majority of the families in all the three groups took loans mostly from government agencies for the purchase of household articles and construction of house. In contrast, Ranganathan (1996) observed that workers in the coir industry borrowed loans from private agencies to meet daily household expenses and for medical treatment.

Results of the housing conditions revealed that majority of the families surveyed in CL (72.5%) and HW (72.5%) groups lived in their own houses while in EM group majority (52.5%) lived in rented houses. This may be because employed mothers worked in places far from their hometowns.

Majority of the houses had 3 to 5 rooms, was single storeyed with brick walls and tiled or concrete roofs. Similar results were obtained by Sujatha (1990) and Ranganathan (1996) in the unorganised sector of Kerala. In contrast, Karuna (1993) revealed that the fisherfolk of Kerala belonging to the unorganised sector lived in one room apartments.

The present survey revealed that all the households had a separate kitchen. The latrine and drainage facilities were satisfactory. In contrast, Sujatha (1990); Karuna (1993) and Ranganathan (1996) reported that majority of the families in different sectors had no separate kitchen or latrine facilities.

Water was obtained from taps and own wells by majority of the families in all the three groups. This is contradictory to the findings of Sujatha (1990) and Ranganathan (1996) who reported that wells and taps in the neighbourhood were the major sources of water for most of the families in the unorganised sector. Electricity facility was present in almost all houses. Similar results were obtained by Shyna (1996); Udaya (1996) and Mathen (1998) in Thrissur District. Use of

electrical gadgets was higher in the EM group. The modern day gadgets like mixies, refrigerators, washing machines etc. which saves time and energy has become a boon to working mothers who rely on them more and more.

CL group was involved in fewer recreational activities than the other two groups. This may be due to their nature of work which left them with little time and energy at the end of the day.

Majority in CL and HW groups depended on public transport compared to the EM group who relied on private vehicles.

Various infections common during childhood like diarrhoea, whooping cough, tuberculosis and measles precede and precipitate malnutrition in children (Guerrant, 1992 and Mathai, 1997). The present study revealed that majority of children in the EM group (60%) had not suffered from any major illnesses. This is in line with the findings of Mubarak *et al.* (1990) who found that children of Indian working women had significantly shorter duration of illness and lower morbidity than the non-working group. Contradictory to this NIN (1995a) reported that mother's employment had no consistent effect on the rate of morbidity in children.

Studies on social participation revealed that majority of the women in the three categories were not members of any social groups and majority of those who were, never attended any meetings. This is supported by studies by Varma (1996) who observed that in the farm households surveyed, 59.16 per cent of the women were not members of any social group and 72 per cent of the members did not attend any meetings.

Of those who were members participation was highest in EM (35%) compared to CL (20%) and HW (7.5%) groups. This higher rate of participation seen among the employed mothers may be due to their greater accessibility and exposure to such social groups.

The major source of information in the three categories were friends, neighbours and relatives as well as different media like newspaper, radio, cinema etc. Official sources like meetings, officers, colleagues at office etc. were additional source of information for EM and CL groups.

5.2 Food consumption pattern of the families

Precise information on the food consumption pattern of people is essential not only for assessing the nutritional status of the community but also for elucidating the food needs of population groups at national or regional levels (Thimmayamma and Rau, 1996).

The present study revealed that all the families in the CL and EM groups and 95 per cent in the HW groups were non-vegetarians. Rice was the staple food item in all three groups. Similar findings were reported by Sujatha (1990); Karuna (1993) and Ranganathan (1996) in Thiruvananthapuram District and Udaya (1996) and Mathen (1998) in Thrissur District. The findings of the present study is also in line with the observations of Stephanie (1984) who observed that in South India majority were non-vegetarians with only a small segment (28%) of the population being vegetarians.

Food expenditure is an important factor influencing the dietary habits. Food expenditure pattern of the families revealed that in all three groups maximum

amount was spent on cereals. While majority of families in the EM and HW groups spent between 10 and 30 per cent of their food expenditure on cereals, majority in the CL group spent between 20 and 40 per cent. This is in line with the findings of Sujatha (1990) and Ranganath (1996) who reported that majority of the families involved in casual labour in Thiruvananthapuram District spent between 26 and 50 per cent of their income on cereals.

With regard to the purchase of pulses, green leafy vegetables, other vegetables, roots and tubers, fruits, milk, fats and oils, sugar and jaggery, spices and condiments majority in the three groups spent less than 10 per cent. Most of the families in the three groups spent upto 20 per cent on flesh foods and milk and milk products.

There was significant difference on the amount spent on different items, except jaggery, other vegetables and fruits, between the groups.

Frequency of purchase of different food items revealed that cereals and pulses were bought on a monthly basis by most of the families in the EM and HW groups while in the CL it was bought on a weekly basis. Majority in the three groups bought green leafy vegetables, roots and tubers, fruits, egg, meat and fish once in a week while fats and oils, sugar and spices and condiments were bought on a monthly basis. Milk was bought daily in most of the households, while CL and HW groups bought other vegetables daily, it was purchased once in a week by the EM group. Purchasing pattern revealed that the employed mothers preferred bulk purchasing so as to reduce the trips to the shops and thereby saving time and energy. The CL group on daily wages however had to buy even cereals and pulses weekly.

Purchase of cooked foods was more in the EM group than the other two groups. This is in line with the findings of Vijayalakshmi and Jayanthi (1990) and Devadas (1994) in Tamil Nadu.

The economic status of the family and the availability of food articles locally are the two important factors which may influence the frequency of use of various foods. The frequency score with respect to the use of foods revealed that the most frequently used items were cereals, pulses, milk, other vegetables, fats and oils, sugar and spices and condiments. Partly similar results were reported by Ranganathan (1996). Fish was consumed most frequently by the CL group while it was used moderately by EM and HW groups. This is partly in line with the findings of Lina and Reddy (1989) who reported that the dietary pattern of Keralites was based on tapioca and fish. Fruits and eggs were most frequently used in EM group, while in the other two, it was used moderately. In all the three groups, green leafy vegetables, roots and tubers and meat were the medium frequently used food items. In contrast to this finding, Karuna (1993) reported that these food items were less frequently used while jaggery was a daily used item by the fish vending communities of Kerala. In contrast, this study indicated that jaggery was the least frequently used item in all the three groups.

Majority in all the three groups did not maintain any accounts for income and expenditure and those who did, maintained written accounts on a daily and weekly basis.

Meal planning was done by 97.5 per cent of the EM group compared to 50 per cent of the CL and 72.5 per cent of the HW groups. This advance meal planning in EM group helps in better organisation and faster completion of

household chores. Meal planning was based on food availability and likes and dislikes of the family members in most of the households in all three groups

Meal pattern of the family indirectly indicate their dietary habits. Analysis of the meal pattern of the families in the present study indicated that three meals a day was common in EM and HW groups. Majority in the CL group consumed more than three meals which is in contrast to the reports of Karuna (1993) and Udaya (1996) who claimed that families in unorganised sector consumed 3 meals a day

Majority in the three groups maintained a routine time schedule for consuming meals. However 45 per cent in the CL consumed meals as and when they liked. Similar findings were reported by Karuna (1993) and Ranganathan (1996) among rural households of Kerala.

It was observed that majority of the families in the three groups gave equal importance to all members with regard to food distribution and in those where there was inequality, male members were given preference in CL and HW groups while in EM preference in feeding was given to children. This indicates that the employed mothers were more aware for the need for good nutrition in childhood. This is in line with the findings of Devadas and Easwaran (1986) among the rural households of Coimbatore.

Regarding cooking methods followed, all families used boiling and straining for cooking cereals. Green leafy vegetables were cooked by absorption method by all the three groups. Fruits were eaten after steaming or frying especially in the case of bananas. This is in line with the findings of Karuna (1993), Shyna (1996) and Udaya (1996) in rural households.

Cooking was done twice a day in majority of the households by the mother alone. Similar results were indicated by Sujatha (1990) and Ranganathan (1996).

Ordinary chullah and kerosene stoves were more popular in the CL and HW households, while majority of the employed mothers used LPG stoves. This modern day cooking device which is more convenient and cooks faster is a boon to employed mothers who have a busy morning completing the household chores and rushing to the work place.

Boiled water was used by 82.5 per cent of employed mothers as against 50 per cent and 60 per cent in CL and HW categories respectively. This may be because of the greater exposure of the employed mothers and better awareness about the hazards of water borne diseases. Ranganathan (1996) revealed that only a few rural households of Kerala used boiled water for drinking.

Preservation of foods mainly mango, lime and gooseberries after salting and pickling was common in all the three groups. However purchase of preserved foods was more in EM group (77.5%) compared to CL (27.5%) and HW (67.5%) groups. This is in line with the findings of Ramachandran (1986) who opined that the additional income generated by working women improved the purchasing power of the families.

An indepth study of the foods given during various physiological stages indicated that weaning foods were prepared in all households while in EM households, commercial formulae were also bought. Preschool children consumed adult diets, though, the flavour was made bland by some of the families. No special food was given to school going children and adolescents. Bhat and Dahiya (1985)

also reported that majority of the preschool children in India received only ordinary home diets and their diets were deficient in many nutrients especially protective nutrients like vitamins and minerals. Usha *et al.* (1990) and Jayanthkumari (1993) also reported similar findings among preschool children of Kerala. Special foods were consumed by 60 per cent of EM group during pregnancy and lactation while in CL and HW groups, majority consumed the usual foods. This may be attributed to the awareness of employed mothers for the need for additional nutrients during these conditions.

Diet was modified during illness. Liquid foods were preferred to the solid diet. Rice gruel, pickle, pappad, black tea or coffee, rusk, bread, biscuits were most widely consumed during disease conditions.

Special foods like payasam, cake, non-vegetarian dishes and fried snacks were prepared on special occasions in all the three groups. Similar findings were reported by Sujatha (1990); Karuna (1993) and Mathen (1998).

5.3 Maternal employment and time expenditure pattern

5.3.1 Details pertaining to maternal employment

The present study revealed that majority of the mothers in EM group worked for longer hours compared to mothers in CL groups. Similar findings were reported by Sujatha (1990) and Karuna (1993) in Kerala and Vimal (1984) in Phillipines. In contrast, Vazquez *et al.* (1991) in Mexico and Augustine (1993) in India reported that women in the unorganised sector worked from 11 to 13 hours a day.

The number of working days for majority of the respondents was found to be between 16 and 25 days per month. Similar results were reported by Sujatha (1990). While Ranganathan (1996) reported that the labourers in the coir industry worked between 13 and 15 days a month. Majority in CL group (47.5%) had been working since 2 years while in the EM group majority (65.0%) had been working for more than 6 years

Monetary needs were the main reason for going to work. This is in line with the findings of Malik (1987) who observed that the entry of women in the labour force is a survival strategy especially in poor households. Economic necessity, economic independence, raising the standard of living, occupying time, utilizing education and dislike of household work were some of the reasons for homemakers seeking employment (Rao, 1997).

The monthly salary of most of the mothers in the CL group was less than Rs.2000 while in the EM group it was above Rs.2000. The money was used for household purposes by majority of the CL respondents while in EM group part of it was also saved. The higher income obtained by the EM groups and accessibility to various money saving schemes partially explains the higher percentage of savings in the EM group. As expected, mothers in CL group were employed in temporary jobs when compared to EM group

The findings of the present study with respect to the conveyance used by the respondents to go to their workplace is in line with the findings of Karuna (1993) and Ranganathan (1996) who reported that labourers in the unorganised sector in Kerala did not use any transport facilities to go to their workplace. Probably because the labourers in the unorganised sector work in and around the neighbourhood unlike those in the organised sector.

Majority in both working groups were satisfied with their jobs. Similar reports were published by Ranganathan (1996). On the contrary, Sujatha (1990) claimed that only 28.7 per cent of the labourers were satisfied with their jobs. According to Joseph (1998) higher workload, lack of safety measures and equipments, absence of incentives and meagre wages are some of the factors leading to dissatisfaction among working mothers.

Studies by Tuncbilek *et al.* (1995) revealed that the child cared by own mother had better nutritional status than those who were cared by others. In the present study, it was seen that elders were responsible for child care in majority of the households in all three groups. A small percentage (2.5%) in EM group sent their children to the creche. Similar findings were ascertained by Ranganathan (1996) who reported that 54.2 per cent were cared by elders, 12 per cent were taken to the work site and 25 per cent were cared for in creches. Though legislation calls for creches and day care centres to be provided to women in the unorganised sector, such requisites were not taken care of by the authorities.

5.3.2 Details of time expenditure

There was a significant difference on the time expenditure pattern between the three groups.

The time expenditure pattern in the three groups revealed that majority in the three group spent from 2 to 6 hours a day for household activities with mothers of HW group spending maximum time. However, none of the mothers in EM group spent more than 6 hours compared to 17.5 per cent in HW and 2.5 per cent in CL groups. This is in contrast to the observations reported by Jyothi and Sheela (1993) among partly working mothers who spent maximum time for household activities.

Majority of mothers in all the three groups spent less than two hours in child care activities. The HW mothers spent more time than EM mothers in child care activities. This is in tune with the findings of Sujatha (1990) who reported that working women spent only about 1 hour in child care. However, Jyothi and Sheela (1993) were of the opinion that Indian working mothers spent major part of their time in child care. NIN (1995a), on the other hand revealed that the difference in the time spent on child care between working and nonworking mothers was insignificant.

None of the mothers in EM group spent more than one hour for personal activities compared to 17.5 per cent in CL and 25 per cent in HW groups. Here again, it was found that HW mothers has more time than EM mothers for personal activities.

Thus the unemployed mothers had more time for household, child care and personal activities compared to mothers of the other groups.

5.4 Details of the index child

Engle (1991) and Sichieri *et al.* (1993) stated that the birth weight of children was significantly correlated to the nutritional status. Majority of the children in all the three groups had a normal birth weight of above 2.5 kg. Between the three groups, 30 per cent of children in HW groups was below the required levels when compared to 22.5 per cent and 20 per cent in the CL and EM groups respectively. Mathen (1998) reported that most of the children in Thrissur District had the desirable birth weight of 2.5 kg.

Increasing birth order is associated with poor nutritional status. In the present study it was revealed that majority of children in the three groups were of the first and second birth order.

Though the morbidity among children was lower in EM (17.5%) group when compared to the HW (30.0%) group, it was found to be higher than the CL (12.5%) group. In contrast, Brahman *et al.* (1987) found a higher prevalence of morbidity among industrial labourers when compared to children of white collared workers. Mubarak *et al.* (1990) found that children of Indian working women had significantly shorter duration of illness and lower morbidity than the non-working groups. On the other hand NIN (1995a) reported that working conditions had no consistent effect on the prevalence of infection or morbidity.

Lower percentage of childhood diseases were observed among the children of Kerala by Kutty (1990) who reported that Kerala occupied a unique position in the world's public health map. In the economic development, though Kerala occupies a place inferior to the other States, the health status of Keralites is much better and it is comparable to Western industrialised countries. Better literacy level of women and their greater status in the society might be the reasons for better child survival in our State.

It was interesting to note that while all the children in EM had completed the immunisation schedule to date, it was incomplete in 12.5 per cent in CL and 10 per cent in HW categories. It is in accordance to the findings of Mubarak *et al.* (1990). This could be due to the greater awareness with respect to health among the employed mothers.

All families utilised the health care facilities available in the community. NIN (1995a) also found no difference in the amount spent on treatment seeking behaviours between working women and others.

Participation in feeding programmes was poor in all the groups. None in the HW categories participated in any feeding programme compared to 5 per cent in CL and 2.5 per cent in EM group. This is in contrast to the reports of Johnson *et al* (1992) who stated that children of part-time and full time employed mothers ate more meals at schools and at day care centres.

5.5 Nutritional status of preschool children

In the present study, anthropometric indices, actual food and nutrient intake and clinical examinations were used to assess the nutritional status of preschool children.

5.5.1 Anthropometric indices

Anthropometric indices like weight, height, mid upper arm circumference (MUAC), head circumference (HC) and chest circumference (CC) were considered as the best tools for detecting various degrees of growth retardation among the population. Even before clinical illness manifests, the growth pattern provides information regarding changes in the nutritional status.

Comparison of weight for age values with regional standards at corresponding ages will help to determine the degree of underweight in a community and this index is used to determine nutritional status (Gopaldas and Seshadri, 1987).

In the present study it was found that the weight for age of children in the three groups was significantly lower than the National standards suggested by ICMR (1990). This is in line with the findings of Mathen (1998) who conducted studies among preschool beneficiaries of Integrated Child Development Service Scheme (ICDS). Reddy (1997) also observed that nearly 53 per cent of children under five years of age are underweight. There are nearly 40 million preschool children out of 130 million with moderate to severe weight deficit (Uvin, 1994 and NIN, 1994a) in India.

Distribution of children based on different grades of malnutrition as suggested by Gomez *et al.* (1956) revealed that the nutritional status of children was independent on maternal employment. This is a line with the findings of NIN (1995a) who reported that women's work had no significant influence on weight for age of preschoolers. In tune with the findings of Shyna (1996) it was seen that Grade I malnutrition was found in most of the children in the three groups. None of the children in EM group suffered from Grade III malnutrition as against 2.5 per cent each in CL and HW groups. Choudhary *et al.* (1986) however indicated higher prevalence of malnutrition among children of working mothers.

Height is an indicator of long term nutritional status. The present study revealed that the heights of the children in all three groups were significantly lower than the Indian standards. Similar observations were reported by Shyna (1996) and Mathen (1998) on preschoolers in Thrissur District.

Distribution of children according to Waterlow's classification based on height for age revealed that majority of the preschoolers were normal and others exhibited varying degrees of malnutrition. The maximum number of normal children was in the HW category with the highest percentage of severe malnutrition

in the EM group. According to NIN (1995b) moderate and severe malnutrition were observed among 34 per cent of children in Kerala. In Gujarat, it was double (67%). The proportion of preschoolers with severe undernutrition was about 4 per cent in Punjab, Haryana and Himachal Pradesh. According to FAO (1987) children of part-time working women had better nutritional conditions than children of full-time working women. In contrast, Kaiser and Dewey (1991) stated that women's income was not related to the nutritional status of preschoolers. NIN (1995a) also observed similarity in height for age among preschool children of self-employed, wage labourer and housewife categories. Chi-square test revealed that maternal employment had no influence on the long term nutritional status of the children. The study also indicated that inspite of women's increased time in the housewives category their children were no better than the other groups.

A composite age independent index namely weight/height² ratio also known as Quetlet's index suggested by Rao and Singh (1970) is another means used to detect the state of malnutrition among preschoolers since it indicates weight in relation to height.

Application of this index in the present study showed that most of the preschool children in all the three groups suffered from moderate malnutrition. Studies by Shyna (1996) and Mathen (1998) in Thrissur District also reported similar findings. The number of normal children was highest in CL group compared to EM and HW groups. The chi-square test showed weight/height² to be independent of maternal employment.

Mid upper arm circumference is a useful indicator to assess the nutritional status of children. According to Rao and Vijayaraghavan (1996) poor musculature and wasting are cardinal features of PEM in early childhood and indicate the status

of muscle development. The mean MUAC of children was significantly lower than the Indian standards in all the three groups. Classification of the children based on MUAC as suggested by Gopaldas and Seshadri (1987) showed that majority of children in all three groups were normal with a few cases of moderate malnutrition in CL and EM groups.

Studies by Martinez and Fernandez (1995) in Mexican children reported that 46 per cent of children were malnourished, 30 per cent exhibited mild malnutrition, 13 per cent moderate and 3 per cent were severely malnourished. According to Carlson and Wardlow (1990) one in every six malnourished child is severely malnourished. Partly similar findings were suggested by Shyna (1996) and Mathen (1998).

Analysis of variance indicated a significant difference in MUAC between the groups at 1 per cent level. The children in IIW group had better MUAC than those in the other groups. Chi-square test revealed that MUAC was dependent on maternal employment.

The HC of boys and girls in EM and HW groups was significantly lower than the Indian NFI (1991) standards. Except for the boys in HW group, the rest had a CC which was below the Indian standards. The deviation was statistically significant. Partly similar findings were reported by Shyna (1996).

Analysis of variance indicated that HC and CC of children between the groups was statistically insignificant.

The HC by CC ratio as suggested by Gopaldas and Seshadri (1987) showed that majority in the three groups were normal. Similar findings were

reported by Shyna (1996). The highest percentage of malnourished children was in the HW groups. The chi-square test however found that HC/CC ratio was independent of maternal employment.

5.5.2 Actual food and nutrient intake

The nutritional problems of developing countries are due to the fact that majority of the population subsist on an inadequate diet in terms of quantity and quality (Gopalan, 1991). Hence determination of the food and nutrient intake is of utmost importance.

The 24 hour recall method revealed that intake of cereals, green leafy vegetables, other vegetables, roots and tubers, fruits, fats and oils, sugar and jaggery was lower than the recommended daily allowances. Consumption of pulses was higher in the CL group while in the HW group it was lower. The intake of flesh foods was higher than the RDA in all three groups. Pullikkottil (1993) found that the intake of cereals and pulses alone met the RDA among preschool children in Malappuram District of Kerala. Shyna (1996) observed an inadequate intake of all food items among preschoolers in Thrissur District.

Analysis of variance revealed that there was a significant difference in the intake of food items between the three groups. Children in EM group consumed less cereals when compared to CL and HW groups. There was a significant difference in the intake of fruits and milk and milk products between CL and EM children with the latter consuming more. In contrast, NIN (1995a) found no significant difference in food intake between children of working and non-working mothers.

With respect to nutrient intake, calories and iron intake was lower than RDA in all three groups. Brahman *et al.* (1987); Gopalan (1989); Shyna (1996) and Mathen (1998) also stated that there is a calorie gap in the dietaries of preschool children in different States of our country. Iron intake was below the recommended allowances among preschoolers surveyed by Shyna (1996) and Mathen (1998) in Thrissur District. However, the intake of proteins and calcium was found to be higher than the RDA in all the three groups. Mathen (1998) reported similar findings among preschoolers. There was a significant difference in the intake of vitamin A between the three groups. The intake of vitamin A was significantly higher in EM group. While in HW it was significantly lower than the RDA. The vitamin C deficit was significant only in the HW groups. Shyna (1996) found that the intake of all micronutrients among preschoolers was below the RDA. In contrast Mathen (1998) reported that intake of micronutrients was either very close to or above the RDA for children attending the feeding programme of ICDS.

The one day food weighment survey indicated almost similar results. It pointed out that the intake of cereals, pulses, fruits, milk, fats and oils, sugar and jaggery was lower than the RDA in all three groups. Intake of vegetables was poor in all the three groups, while the intake of roots and tubers was significantly higher than the RDA in CL group. Intake of flesh foods was higher than the RDA in all three groups. There was no significant difference between the three groups in the intake of various food items.

The nutrient intake showed that only protein intake met the RDA. There was a deficit of energy, calcium, iron, vitamin A and vitamin C in all three groups. This in line with the findings of Pullikkottil (1993). There was significant difference in iron and vitamin A intake between the groups with the CL group consuming the least. In contrast, Johnson *et al.* (1992) and NIN (1995a) found that maternal

employment had no significant positive or negative effect on the intake of essential nutrients.

5.5.3 Clinical examination of the children

Clinical manifestations are important indicators of nutritional deficiencies. Clinical examination of the children revealed that 10 per cent in all three groups manifested clinical symptoms. Dental caries was the most commonly found clinical manifestation among the preschoolers. Mathen (1998) also reported dental caries and anemia among preschool children in Thrissur District. While Pullikkottil (1993) observed the presence of xerosis of the eye, angular stomatitis, scurvy, anemia, dental caries, fluorosis and scabies of which dental caries was most widespread.

5.6 KAP of mothers with respect to health and nutrition

One of the major causes of malnutrition in our country is the lack of awareness of health and nutrition aspects among mothers and adolescent girls. Creating such an awareness would undoubtedly pave the way for higher nutritional status in the community (Mathai, 1997).

All groups obtained a low mean score in the knowledge test. The highest mean score of 4.78 was obtained the EM group compared to 2.18 in CI and 2.48 in HW groups. This is in line with the findings of Ghosh (1977) and Pullikkottil (1993) who observed that majority of Indian mothers were starkly ignorant about health and nutrition concepts. Anderson (1976) revealed that Indian mothers rated poorer than Colombian mothers in nutritional knowledge test.

In the case of attitude and practice tests, majority of mothers in the three groups had medium to high scores. Similar findings were observed by Kumar *et al.* (1989) who reported that more than half (65%) had a favourable attitude towards nutrition and nearly 74 per cent followed good cooking practices. In contrast, Dahiya and Kapoor (1992) in a study in Haryana revealed that majority of the mothers had a biased set of beliefs and practices with respect to health and nutrition.

Analysis showed that between the groups EM scored the highest in KAP test. This might be due to their accessibility to different medias. Similar results were obtained by Mubarak *et al.* (1990) who observed that employed mothers had positive beliefs and practices. This is supported by studies by Yashpal *et al.* (1992) among working women in Haryana. Pullikkottil (1993) also observed that women who had an exposure to nutrition education programmes rated better in KAP test. Thus nutrition education should be made an integral part of the education system.

The chi-square test revealed that the knowledge, attitude and practice of mothers were dependent on maternal employment.

The results thus revealed that maternal employment had no significant positive or negative impact on the nutritional status of preschool children. Probably the income generated by the working mothers and their greater awareness due to better exposure compensated the extra time an unemployed mother spent in child care.

Summary

SUMMARY

The present study entitled 'Maternal Employment and Nutritional Status of Preschool Children' was conducted among 120 preschool children of 4 to 5 years of age. The sample was selected on the basis of maternal employment, equally and randomly from the three groups i.e., casual labourers (CL), employed mothers (EM) and unemployed mothers (HW).

The study carried out threw light on the socio-economic and food consumption pattern of the families, details of employment and time expenditure pattern of the mothers, details of index child, nutritional status of the preschool children, knowledge, attitude and practice of mothers with respect to health and nutrition.

Information regarding socio-economic condition of the families indicated that majority of the families were Hindus and belonged to the forward caste. Joint family system was followed by most of EM (62.5%) and HW (55%) families having upto eight members while most of the CL families followed a nuclear system with upto four members. Most of the parents in all the three groups were educated. Majority of the male members in the CL group were working in the unorganised sector while those in the EM and HW groups worked in organised sector. Majority in all the three groups owned a kitchen garden.

Monthly income of the families ranged from Rs.2000 to Rs.8000. The major expenditure of the families was for food. There was a significant difference on the amount spent on food, transport, recreation, electricity, savings and remittance between the three groups.

Majority in CL and HW groups had their own homes while most of the EM families lived in rented houses. Houses were single storeyed with 3 to 5 rooms, brick walled with tiled or concrete roofs. Lavatory, electricity and water facilities were satisfactory. Various contagious diseases were more widespread in the CL community.

Social participation was poor in all groups with maximum participation in EM groups.

Food consumption pattern of the families indicated that rice was the staple food and majority were non-vegetarians. There was significant difference in money spent on various food items between the groups. The most frequently used food items were cereals, pulses, other vegetables, milk and milk products, fats and oils, sugar and spices and condiments.

Advanced meal planning was popular in all three groups especially among the EM group. Boiling was the most common method adopted for cooking. Ordinary chullah and kerosene stoves were more popular in the CL and HW households, while majority in the EM group also used LPG stove.

Most of the households in the three categories gave only adult foods to children and adolescents.

Majority of the working mothers were employed between 6 and 10 hours per day for more than 21 days in a month. Financial needs was the major reason for going to work. Majority in CL group received less than Rs.2000 per month, while in EM group the monthly salary was between Rs.2000 and Rs.4000. It was used mainly for household purposes. Job satisfaction was present in majority of mothers.

The time expenditure pattern revealed that mothers in the HW group spent maximum time for household, child care and personal activities compared to mothers of EM and CL group.

Majority of children in the three groups had a normal birth weight of 2.5 kg with low morbidity and had completed the immunization.

Nutritional status of children revealed that majority of the children in all three groups were malnourished as classified by Gomez *et al.* (1956), Rao and Singh (1970) and Waterlows (1972). Their weight, height, mid upper arm circumference, chest circumference and head circumference were below the Indian standards. The intake of flesh foods met the RDA suggested by ICMR (1984) while the intake of other food groups were below the recommended allowances. The intake of proteins was adequate while the other nutrients were deficient in the diet of all three groups.

Clinical examination of the children indicated that dental caries, phrynoderma, xerosis of eyes and pale hair were present in the three groups. Dental caries was the most prominent.

The mothers of EM group scored the highest in KAP test.

The study revealed that maternal employment had no significant positive or negative impact on the nutritional status of preschool children.

Suggestions for future line of work

1. A comprehensive study at State level which would give a more accurate and vivid picture of the impact of maternal employment on the nutritional status of children upto 6 years of age.
2. Nutritional education programmes to enhance the nutritional awareness of the family especially the women folk.

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*Originals not seen

Appendices

APPENDIX-I

Schedule to elicit information regarding KAP of mothers with respect to health and nutrition

1. Serial No.
2. Occupation

To test knowledge

	P value	I ² /3 value
1. Should women eat more during pregnancy and lactation? Yes/No	76	
2. Is breast feeding good for your child? Yes/No	96	
3. What is the first food given to a baby?	85	
4. What is your opinion about the 1st milk? Good/Bad	92	
5. Is bottle feeding safer than breast feeding? Yes/No	100	
6. Should a child continue to breast feed even during illness like diarrhoea? Yes/No	65	0.385
7. Are costly foods more nourishing than the cheap and locally available foods? Yes/No	92	
8.* Name the disease which can be prevented by BCG	69	0.615
9. Is it necessary to include protein foods like milk, egg, nuts, pulses, meat, fish in one's diet? Yes/No	100	
10. Water from tap need not be boiled before drinking True/False	96	
11. Worm trouble can be prevented if the nails are kept clean and short True/False	92	
12. Does sprouting improve the quality of pulses? Yes/No	88	

	P value	E 1/3 value
13. Vegetables should be washed before cutting True/False	88	
14. During diarrhoea do not give food or water True/False	73	0.385
15. Commercial infant foods is better than home made foods True/False	96	
16.* DPT vaccine is given to protect against	50	1.0
17. Proper birth spacing protects mother's health True/False	96	
18.* The red colour of beetroot helps in the production of blood True/False	35	0.692
19. Milk should be given to children daily True/False	96.1	
20.* Name three foods rich in vitamin A	42	0.846
21. Gooseberry is better than an orange True/False	92.3	
22. The water used in cooking pulses and vegetables should be discarded True/False	80.7	
23. Raw egg is not advisable for children True/False	92.3	
24. The height and weight of children is indicative of their nutritional status True/False	92.3	
25.* Washing hands before eating with soap is not compulsory True/False	69.2	0.615
26.* Name a plant food rich in proteins	53.8	0.923
27.* Name an important mineral present in jaggery	42.3	0.692
28.* Name an important source of vitamin D	42.3	0.846

		P value	E 1/3 value
29.*	State whether amla or apple contains good amount of vitamin C Amla/Apple	69.2	0.615
30	Fruit juices should not be given to the children True/False	73	0.231
31	Supplementary foods can be prepared at home using pulses and cereals Yes/No	92.3	
32	Tetanus toxoid injection should not be given to pregnant mothers True/False	84.6	
33	Poor nutritional status of mothers affects the health of the babies Yes/No	100	
34	Repeated pregnancies will affect the health of the mother Yes/No	96.1	
35	Night blindness is due to vitamin A deficiency Yes/No	76.9	
36	Spoiled foods produce various diseases True/False	100	
37	Sugar and are added to water and given to a child with diarrhoea	73	0.385
38.*	Name two foods rich in proteins and	50	0.846
39	Cleanliness prevents many diseases True/False	100	
40	Is cow's milk better than buffalo's milk? Yes/No	23	

*The final questions selected for knowledge test

APPENDIX-II

To test the attitude

Against each question write any one of the following options: Strongly agree (SA)/agree (A)/undecided (UD)/disagree (DA)/Strongly disagree (SD)

	t-value
1. Breast feeding is good for baby	0
2 * Weaning should start by 3rd month of birth	2.09
3. Pregnancy and lactation requires extra foods	1.39
4 * Immunisation for children is not useful	2.8
5. <input checked="" type="checkbox"/> Males should be given greater importance in the family	1.3
6 * <input checked="" type="checkbox"/> Egg should be given to the children daily	2.75
7. <input checked="" type="checkbox"/> Milk should be given daily	0.83
8 * <input checked="" type="checkbox"/> Gooseberry is not as nutritious as the orange	2.56
9. <input checked="" type="checkbox"/> Vegetables should be cut very finely	1.02
10. <input checked="" type="checkbox"/> Green leafy vegetable is a good source of vitamins and minerals	2.0
11. Elderly people should take calcium rich foods	2.04
12. <input checked="" type="checkbox"/> Cold foods should be avoided in illness	0.2
13. Infant foods prepared at home are as good as those available in the market	0.21
14 * <input checked="" type="checkbox"/> Growing children need calcium	3.42
15 * <input checked="" type="checkbox"/> Germinating the pulses improves the nutritive value of pulses	3.8
16 * Deworming is necessary for the child	3.10

	t-value
17. Unhygienic conditions lead to diarrhoea ✓	1.77
18.* Do not give food during diarrhoea ✓	3.06
19. Cow's milk is better than mother's milk	1.38
20. Absorption method of cooking rice is good to retain nutrients ✓	0.98
21. Child should be encouraged to eat all foods	1.57
22. Milk is important for your child ✓	1.56
23. Worm trouble can be prevented if the nails are kept short and clean	1.70
24. Breast feeding should be stopped in case of subsequent pregnancy	0.97
25.* Parboiled rice is better than raw rice ✓	2.09
26. House and its surroundings should be kept clean	2.0
27.* Iron rich foods is necessary for blood formation ✓	2.72
28. Soyabean is good for health ✓	2.04
29. Sugar is rich in proteins ✓	1.66
30. Beef has more fat than chicken ✓	2.04

*The final questions selected for attitude test

APPENDIX-III

To test practice

(Write Yes/No)

1. Do you wash the vegetables before cutting?
2. Do you wash hands with soap before eating?
3. Do you breast feed the child during diarrhoea?
4. Do you give milk daily to your child?
5. Do you include green leafy vegetables in your diet (at least twice a week)
6. Do you properly sterilise the milk bottle before feeding?
7. Do you give equal importance to girls and boys?
8. Did you take the tetanus toxoid injection during pregnancy?
9. Do you germinate the pulses before cooking?
10. Do you use parboiled rice?
11. Do you use soda to cook pulses?
12. Do you give fruit juices to your infant?
13. Do you give the ORS (sugar-salt-water solution) during diarrhoea?
14. Do you deworm the child regularly?
15. Do you cut vegetables long before cooking?
16. Do you use any fuel saving devices to cook food?
17. Do you breast feed your child after one year?

APPENDIX-IV

INTERVIEW SCHEDULE TO ELICIT INFORMATION REGARDING THE SOCIO-ECONOMIC CONDITIONS OF THE FAMILIES

1. Serial No.
2. Name of the head of the family
3. Name of the respondent
4. Address
5. Place of survey
6. Panchayat
7. House no.
8. Religion
Caste:
9. Type of family : joint/nuclear

10. Composition, education and occupation of family members

No.	Name	Relationship to head of family	Age	Sex	Occupation	Educational status				
						Illiterate	L.P.	UP	High school	College

11. (i) Other sources of income of family

Side business

Agriculture

Poultry

Others (specify)

(ii) Total income of family (Rs./month)

12. Do you own land? Yes/No

If yes,

Total area	Area under cultivation	Specify how you got this land
		purchased inherited govt others

13. Do you have a kitchen garden? Yes/No

If yes, specify

Items of cultivation	Use of produce		
	By family	Gift	Sale

14. Do you have any domestic animals? Yes/No

If yes

Animal	No.	Specify how you got the animals
		Gift Purchased Govt Others

(iii) Details of produce from domestic animals

No.	Name of produce	Qty. got/month	Use of produce			Income	Profit
			By family	Gift	Sale		

15. Details of housing conditions

- (i) Type of house : Own / Rented / Quarters
- (ii) No. of rooms : 1 / 2 / 3 / 4 / 5 / 6 / or more
- (iii) Walls : Brick / Mud / Thatched
- (iv) Roof : Terraced / Tiles / Thatched
- (v) Single / Double storeyed
- (vi) Other characteristics
 - Separate kitchen : Yes/No
 - Source of drinking water : Own well / Public tap / Hand pump /
River / Nearby house
 - Lavatory facilities : Own latrine / Public latrine / Open field
 - Drainage facilities : Open drains / Closed drains / Nothing
 - Electricity : Yes/No
 - (i) If yes, no. of bulbs : 1/ 2/ 3/ or more
 - (ii) No. of tubes :
 - (iii) No. of fans :
 - (iv) Other electrical gadgets :

16. Recreational facilities : Yes/No

(i) If yes specify

17. Transport facilities : Cycle/Motorbike/Bus/Car/Auto/Jeep/
Van/By foot

18. Monthly expenditure pattern

Item	Amount spent/month	% of total income
Food		
Clothing		
Shelter		
Transport		
Water		
Recreation		
Education		
Electricity		
Furniture		
Health		
Fuel		

Luxury
Personal
Remittance
Savings
Others

19. Details regarding loan taken

(i) Have you taken any loan? : Yes /No

(ii) If Yes, specify

No.	Source of debt.	Debt. amount	Purpose
-----	-----------------	--------------	---------

20. Details regarding use of fuel

(i) Type of fuel used at home : Wood/Agri.waste/Kerosene/Electricity/
LPG/Others

(ii) Source of fuel for the family : Collected from surroundings/Purchased/
Others

21. Epidemics prevalent in the locality in the past one year

Measles
Chickenpox
Whooping cough
Typhoid
Mumps
Others (specify)

(ii) Was any member of family affected : Yes/No

(iii) If yes, specify

Name of disease :

Name of individual :

22. Social participation

(i) Are you a member of any organisation : Yes/No

If Yes, specify

Mahila Sangam

Co-operative Society

Youth Club

Others (specify)

(ii) How frequently do you attend the meeting?

Always

Sometimes

Never

23. General information source

(i) Which are the sources from which you get information on life, society, health, politics etc.

General

Friends / Neighbours / Family members / Relatives

Media

Newspaper / T.V. / Radio / Meeting / Cinema / Exhibitions

Official

Agricultural Officer / Block Officer / Bank Officer / Panchayat Member /
Colleagues at work / Others

(ii) What are the newspapers you subscribe to?

(iii) Any magazines? If yes, what are they?

(iv) Do you own a T.V. / VCR / Radio / Cable / Music player / Fridge

24. Details of maternal employment

1. Mother goes to work at _____ and is back home at _____
2. No. of working hours per days _____
3. No. of days in a week with wages _____
4. No. of days without work per week _____
5. No. of years since working _____
6. Do you go to work for

Money

Do not like to be at home

Others

7. Salary or wage of mother _____
8. For what is this money used for?
 - Household expenses
 - Partly saved & partly used for household
 - Used solely for child's needs
 - Totally saved
 - Others
9. Do you get the payment on time? Yes/No.
10. Is it permanent /temporary job?
11. Are there frequent transfers?
12. Distance between work place and home _____
13. Conveyance used _____
14. Does the child complain when you go for work? Yes/No.
15. Child is looked after by _____ when mother is away
16. Are you happy / satisfied with the arrangement? Yes/No.
17. Is your husband and other members of the family co-operative? Yes/No.
18. Are you satisfied with the job? Yes/No.
19. Are you happy at the workplace? Any problems? Yes/No.
20. Do you take any of your children to workplace? Yes/No.
21. Has the child being trained to be independent? If yes, specify
22. Resting hours during the day
23. Do you do all the household work? If no, specify
24. Time taken for different activities

Household work

Cooking

Cleaning house

Washing clothes

Washing others

Child care activities

Dressing the child

Feeding the child

Washing the child

Walking the child to school

Playing with the child

Helping the child with studies

Other activities

Personal activities

25. Details regarding index child

- (i) Name
- (ii) Age
- (iii) Male / Female
- (iv) Birth weight
- (v) Birth order
- (vi) Any major illness in the past?
- (vii) Does it occur frequently?
- (viii) Immunisation details of child
BCG/Polio(3)/DPT(3)/Measles/MMR/OPV & DPT Booster 1½/Booster 4½
- (ix) Complete/partially complete/Not taken
Reason

- (x) When anybody is ill do you make use of the facilities in the health centre?
Yes / No

- (xi) If yes where
Hospital : Govt. / Private
PHC
Maternal & Child Care Centre
Ayurvedic : Govt. / Private
Homoeo : Govt. / Private
Others

- (xii) How far is the nearest health centre from home?
- (xiii) Did any child die? Yes/No
- (xiv) If yes, how?
- (xv) Morbidity pattern

Details of epidemics that had affected the child during the past 1 year

Disease	Duration	Treatment
Measles		
Chickenpox		
Mumps		
Jaundice		
Typhoid		
Tuberculosis		
Diarrhoea		
Others		

(xvi) Participation in feeding programmes (index child)

Does the child attend any feeding programme ? Yes / No

If Yes

a. Name of the programme

b. Benefits the child get

Food/Immunisation/Medicines/Education/Others

APPENDIX-V

INTERVIEW SCHEDULES TO ELICIT INFORMATION ON THE FOOD CONSUMPTION PATTERN OF THE SELECTED FAMILIES

1. Serial No.
2. Name of respondent
3. Panchayat
4. House No.
5. Total income of family
6. Food habit . Veg. / Non-veg.
7. Staple food

8. Details of food expenditure

Food item	Frequency of purchase					Total cost	% of total income
	Daily	Weekly	Monthly	Occasionally	As required		
Cereals							
Pulses							
Green leafy vegetables							
Roots and tubers							
Other vegetables							
Fruits							
Milk & milk products							
Egg							
Meat							
Fish							
Fats & oils							
Sugar							
Jaggery							
Spices & Condiments							
Others (specify)							

9. Frequency of using various foods

Food item	Frequency of use				Monthly once	Occasionally	Never
	Daily	Weekly					
		1	2	3			

Cereals
Pulses
Green leafy vegetables
Roots & tubers
Other vegetables
Fruits
Milk & milk products
Egg
Meat
Fish
Fats & oils
Sugar
Jaggery
Spices & Condiments
Others (specify)

10. Do you maintain accounts for food expenditure . Yes / No
(i) If yes, in what form? Written / Memory
(ii) Daily / Weekly / Monthly

11. Details regarding meal planning

- (i) Do you plan your meals in advance? : Yes/No
(ii) If yes, what is the basis for planning?
Total family requirement
Money available
Likes & dislikes of family
Food availability
Others
- (iii) No. of meals per day . 1 / 2 / 3 / more than 3
- (iv) Do you maintain specific time schedule for taking food?
Specify with reasons

12. Do you use boiled water for drinking? Yes/No

13. Do you give equal importance for family in food distribution Yes/No

(i) If no, What is the order of importance?

Order	Reasons
1	
2	
3	
4	
5	

14. Details regarding cooking of foods

(i) How many times do you cook meals in a day? : Once / Twice / Thrice / More than thrice

(ii) Who does the cooking?

(iii) What is the type of cooking vessel used?

(iv) What is the cooking device used?

Smokeless chullah / Ordinary chullah / Gas stove / Heater / Kerosene stove

(v) Cooking methods followed

Food item	Boiling	Absorption	Straining	Steaming	Frying	Baking	Others
					Deep	Shallow	

Cereals

Pulses

Roots & tubers

Other vegetables

Leafy vegetables

Fruits

Meat

Fish

Egg

Milk and milk

products

Others, specify

(vi) Do you eat any raw foods? Yes / No

If yes, specify

15 Details of food preservation

(i) Do you preserve any foods in your house? Yes / No

(ii) If yes, specify

No.	Foods preserved	Method used	Storage period	Problems encountered
1	Cereals			
2	Pulses			
3	Vegetables			
4	Fruits			
5	Milk			
6	Meat			
7	Fish			
8	Others			

(iii) Do you buy any preserved food from outside? Yes / No

If yes, specify

(iv) How often do you buy cooked food from outside?

Once a week / Twice a week / Thrice a week / Once in a fortnight /
Occasionally / Others

16. Foods given during special conditions

Conditions	Foods given	Reason	Foods avoided	Reason
Infancy				
Preschoolers				
School children				
Adolescence				
Pregnancy				
Lactation				
Old age				

17 Foods prepared for special occasions

Occasion	Foods prepared	Reasons
Birthdays		
Death		
Marriage		
Feast		
Others		

18 Diet during illness

Illness	Foods given	Reasons	Foods avoided	Reasons
Cold				
Fever				
Diarrhoea				
Measles				
Chicken pox				
Whooping cough				

19. Dietary survey (24 hr Recall method)

Name of the meal	Menu	Ingredients	Quantity
Breakfast			
Lunch			
Evening tea			
Dinner			
Others (specify)			

APPENDIX-VI

Schedule for individual food consumption survey - weighment method

Date:

Name of the head of the family

Address

Name of subject

Age of subject

Food consumption

Name of the meal	Menu	Food consumption		
		Weight of raw ingredients used by family	Weight of cooked ingredients used by family	Weight of cooked ingredients used by individual

Breakfast

Lunch

Evening tea

Dinner

Others

APPENDIX-VII
Schedule for clinical assessment
(N.A.C.I.C.M.R.)

- 1 Sex
- 2 Age
- 3 Height
- 4 Weight
- 5 General appearance

0. Good
- 1 Fair
- 2 Poor
3. Very poor

6. Eyes

(a) Conjunctiva

i) Xerosis

0. Absent, glistening and moist
1. Slightly dry on exposure for a minute, lack of lustre
2. Conjunctiva dry and wrinkled
3. Conjunctiva very dry and Bitot's spots present

ii) Pigmentation

0. Normal colour
1. Slight discolouration
2. Moderate browning in patches
3. Severe earthy discolouration

iii) Discharge

0. Absent
1. Watery, excessive, lachrymation
2. Mucopurulent
3. Purulent

(b) Cornea

(i) Xerosis

0. Absent
1. Slight dryness and diminished sensibility
2. Haziness and diminished transparency
3. Ulceration

ii) Vascularization

- 0. Absent
- 1. Circumcorneal infection
- 2. Vascularization of cornea

(c) Lids

i) Excoriation

- 0. Absent
- 1. Slight excoriation
- 2. Blepharitis

ii) Folliculosis

- 0. Absent
- 1. A few granules
- 2. Lids covered with extensive granules
- 3. Hypertrophy

iii) Angular conjunctivitis

- 0. Absent
- 1. Present

(d) Functional

(i) Night blindness

- 0. Absent
- 1. Present

NB. Exclude other eye diseases not associated with nutritional defects

7. Mouth

(a) Lips

i) Condition

- 0. Normal
- 1. Angular stomatitis, mild
- 2. Angular stomatitis, marked

(b) Tongue

i) Colour

- 0. Normal
- 1. Pale but coated
- 2. Red
- 3. Red and raw

ii) Surface

0. Normal
1. Fissured
2. Ulcerated
3. Glazed and atrophic

(c) Buccal mucosa

i) Condition

0. Normal
1. Bleeding and/or gingivitis
2. Pyorrhoea
3. Retracted

(d) Gums

i) Condition

0. Normal

(e) Teeth

i) Fluorosis

0. Absent
1. Chalky teeth
2. Pitting of teeth
3. Mottled and discoloured teeth

ii) Caries

0. Absent
1. Slight
2. Marked

8. Hair

i) Condition

0. Normal
1. Loss of lustre
2. Discoloured and dry
3. Sparse and brittle

9. Skin

(a) General

i) Appearance

0. Normal
1. Loss of lustre
2. Dry and rough or crazy pavement
3. Hyperkeratosis, phrynoderma

ii) Elasticity

0. Normal
1. Diminished
2. Wrinkled skin

(b) Regional

i) Trunk

0. Normal
1. Collar-like pigmentation and dermatitis around the neck

ii) Face

0. Normal
1. Nasolabial seborrhoea
2. Symmetrical suborbit pigmentation
3. Moon face

iii) Perineum

0. Normal
1. Scrotal or pudendal dermatitis

iv) Extremities

0. Normal
1. Symmetrical dermatitis with pigmentation of glove or stocking is

10. Oedema

i) Distribution

0. Absent
1. Oedema on dependent parts
2. Oedema on face and dependent parts
3. Anasarca

11. Bones

i) Condition

0. Normal
1. Stigmata of past rickets

12. Heart

i) Size

0. Normal
1. Apex outside the nipple line
2. Enlarged

13. Alimentary system

i) Appetite

- 0. Normal
- 1. Anorexia

ii) Stools

- 0. Normal evacuation
- 1. Diarrhoea

iii) Liver

- 0. Not palpable
- 1. Palpable

iv) Spleen

- 0. Not palpable
- 1. Palpable

14. Nervous system

i) Calf tenderness

- 0. Absent
- 1. Present

ii) Paresis

- 0. Absent
- 1. Present

APPENDIX-VIII

The formula for the calculation of food frequency scores as suggested by Reaburn *et al.* (1979)

$$\text{Percentage of total score} = \frac{R_1S_1 + R_2S_2 + \dots + R_nS_n}{n}$$

S_1 - Scale of rating

R_n - Percentage of respondents selecting a rating

n - Maximum scale rating

Appendix-IX
Anova for percentage of income spent for various items

Variable	Source	Degree of freedom	Sum of squares	Mean squares	F value	Prob
1	2	3	4	5	6	7
Food	Between	2	3713.693	1856.846	16.591*	0.000
	Within	117	13094.187	111.916		
	Total	119	16807.880			
Clothing	Between	2	22.050	11.025	1.492	0.2292
	Within	117	864.620	7.390		
	Total	119	886.670			
Education	Between	2	12.214	6.107	2.257	0.1092
	Within	117	316.610	2.706		
	Total	119	328.823			
Water	Between	2	0.033	0.017	0.214	
	Within	117	9.061	0.077		
	Total	119	9.095			
Health	Between	2	133.299	66.647	2.940	0.0568
	Within	117	2652.101	22.668		
	Total	119	2785.400			
Transport	Between	2	331.267	165.634	5.687*	0.0044
	Within	117	3407.457	27.124		
	Total	117	3738.724			
Fuel	Between	2	67.723	33.861	8.461*	0.0004
	Within	117	468.233	4.002		
	Total	119	535.956			

Contd

Appendix-IX. Continued

1	2	3	4	5	6	7
Electricity	Between	2	9.198	4.599	5.99*	0.0033
	Within	117	89.695	0.767		
	Total	119	98.893			
Shelter	Between	2	7.859	3.929	0.320	
	Within	117	1437.761	12.289		
	Total	119	1445.620			
Recreation	Between	2	37.143	18.572	6.828*	0.0016
	Within	117	318.233	2.720		
	Total	119	355.376			
Savings	Between	2	1187.102	593.551	5.704*	0.0043
	Within	117	12175.037	104.060		
	Total	119	13362.140			
Remittance	Between	2	781.309	390.654	4.462*	0.0136
	Within	117	10243.823	87.554		
	Total	119	11025.131			

*Significant at 5 per cent level

Appendix-X
Anova for percentage of income spent on various food items

Variable	Source	Degree of freedom	Sum of squares	Mean squares	F value	Prob
1	2	3	4	5	6	7
Cereal	Between	2	646.025	323.013	11.807*	0.000
	Within	117	3200.913	27.358		
	Total	119	3846.938			
Pulse	Between	2	74.836	37.418	7.599*	0.0008
	Within	117	576.084	4.924		
	Total	119	650.920			
Green leafy vegetables	Between	2	8.230	4.115	7.619*	0.0008
	Within	117	63.192	0.540		
	Total	119	71.422			
Roots and tubers	Between	2	7.026	3.513	4.648*	0.0014
	Within	117	88.423	0.756		
	Total	119	95.450			
Other vegetables	Between	2	8.483	4.241	0.408	
	Within	117	1215.305	10.387		
	Total	119	1223.788			
Fruits	Between	2	15.892	7.946	2.378	0.0972
	Within	117	390.872	3.341		
	Total	119	406.764			
Milk and milk products	Between	2	146.128	73.064	7.422*	0.0009
	Within	117	1151.830	9.845		
	Total	119	1297.958			

Contd.

Appendix-X continued

Egg	Between	2	17.861	8.930	3.257*	0.400
	Within	117	320.790	2.742		
	Total	119	338.651			
Meat	Between	2	91.982	45.991	7.962*	0.0006
	Within	117	675.793	5.776		
	Total	119	767.775			
Fish	Between	2	100.958	50.479	5.676*	0.0044
	Within	117	1040.549	8.894		
	Total	119	1141.507			
Spices and condiments	Between	2	56.150	28.075	11.812*	0.0000
	Within	117	278.094	2.377		
	Total	119	334.244			
Fats and oils	Between	2	50.130	25.065	6.980*	0.0014
	Within	117	420.124	3.591		
	Total	119	470.254			
Sugar	Between	2	10.816	5.408	4.983*	0.0084
	Within	117	126.975	1.085		
	Total	119	137.792			
Jaggery	Between	2	0.021	0.010	0.034	
	Within	117	35.203	0.301		
	Total	119	35.224			

*Significant at 5% level

Appendix-XI

Anova for number of working hours, number of working days and number of years since working between the CL and EM group

Variables	Source	Degrees of freedom	Sum of squares	Mean squares	F value	Probability	CD
No. of working hours	Between	1	37.950	37.950	8.564*	0.0045	0.9385
	Within	78	345.629	4.431			
	Total	79	383.579				
No. of working days	Between	1	19.013	19.013	0.915		
	Within	78	1621.475	20.788			
	Total	79	1640.488				
No. of years since working	Between	1	270.112	270.112	13.186*	0.0005	2.0179
	Within	78	1597.775	20.484			
	Total	79	1867.888				

*Significant at 1 per cent level

Appendix-XII
Anova for time expenditure pattern between the three groups

Variables	Source	Degrees of freedom	Sum of squares	Mean squares	F value	Probability	CD
Household activities	Between	2	46.242	23.121	10.207**	0.0001	0.6666
	Within	117	264.992	2.265			
	Total	119	311.234				
Child care activities	Between	2	9.227	4.613	3.137*	0.0471	0.5372
	Within	117	172.089	1.471			
	Total	119	181.316				
Personal activities	Between	2	1.419	0.710	3.404*	0.0366	0.2020
	Within	117	24.386	0.208			
	Total	119	25.805				

*Significant at 5 per cent level

**Significant at 1 per cent level

**MATERNAL EMPLOYMENT AND NUTRITIONAL
STATUS OF PRESCHOOL CHILDREN**

By

MINI P. JOSE

ABSTRACT OF A THESIS

Submitted in partial fulfilment of the requirement for the degree of

**MASTER OF SCIENCE IN HOME SCIENCE
(FOOD SCIENCE AND NUTRITION)**

**Faculty of Agriculture
Kerala Agricultural University**

**DEPARTMENT OF HOME SCIENCE
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ABSTRACT

A study on “Maternal Employment and Nutritional Status of Preschool Children” was carried out among 120 children in the age group of 4 to 5 years. They were selected on the basis of maternal employment equally and randomly from the three groups i.e., casual labourers (CL), employed mothers (EM) and unemployed mothers (HW).

The results of the study indicated that Hindus were the majority in all the three groups. Majority of the parents were literate with family income ranging between Rs.2000 and Rs.8000. Most of the families in the EM and HW groups had a joint existence. Majority of the families did not own land or livestock but owned a kitchen garden.

Monthly expenditure pattern revealed that the greatest amount was spent on foods in which cereals had the major share. Various contagious diseases were more prevalent in the CL community. Social participation was low in all the three groups with highest participation in EM group.

Frequency of use of different foodstuffs revealed that cereals, pulses, other vegetables, milk and milk products, fats and oils, sugar and spices and condiments were the most frequently used items in all the three groups.

Advance meal planning was highest in the EM group. In majority of the families there was equality in food distribution.

Majority of mothers worked between 8 to 10 hours a day for more than 21 days per month. Financial constraint was the major reason for opting to work. Most of the working mothers were satisfied with their jobs.

There was a significant difference between the three groups with respect to the time spent for household, child care and personal activities.

Majority of children had desirable birth weight with complete immunisation status.

Nutritional status revealed that majority of the children were malnourished as classified according to Gomez *et al.* (1956), Rao and Singh (1970) and Waterlow (1972). Dietary profile revealed that the intake of all foods except flesh foods was inadequate. Intake of proteins met RDA while intake of other nutrients was inadequate. Clinical symptoms were found in all three groups. The EM group scored highest in knowledge, attitude and practice test. The results revealed that maternal employment had no positive or negative impact on the nutritional status of the preschool children.