

SOCIO ECONOMIC AND DEMOGRAPHIC FACTORS ASSOCIATED WITH BIRTH WEIGHT

**A study in Kadakampally,
Thiruvananthapuram**

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CERTIFICATE

This to certify that, the dissertation entitled, '**Socio-economic and demographic factors associated with birth weight: a study in Kadakampally, Thiruvananthapuram**' being submitted by Mr. Radhakrishnan.T, to Achutha Menon Centre for Health Science Studies, Sree ChitraTirunal Institute for Medical Sciences and Technology, Thiruvananthapuram in partial fulfilment of the award of Master of Public Health degree, is a bonafide work carried out by him.

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INTRODUCTION

1:1 Background

Birth weight is one of the prime indices of health status of a region. It is a broad indicator of health as well as socio-economic development of a population. The birth weight of an infant is the most important determinant of new-born survival, growth and development. Birth weight is an indicator of maternal and child health and a significant determinant of neonatal and post neonatal morbidity and mortality (Bhargava et al). Poor physical growth, impairment of, cognitive function and intellectual development and even later adulthood diseases such as diabetes and coronary artery disease are long-term adverse effects of low birth weight (Bhargava et al).

Low birth weight is a world wide public health problem, especially in developing countries (Goodburn et al, 1994) such as India. According to the definition of World Health Organisation (WHO) committee, 1961, new-born babies weighing less than 2500 grams at birth are classified as low birth weight, irrespective of their period of gestation. Previously, low birth weight infants were distinguished from premature babies (World Health Assembly 1948 and Expert Group on Prematurity, WHO 1950). In addition, it was later found that the mean birth weight criterion of 2500 grams is not appropriate to babies of developing countries, where mean birth weight tends to

be lower compared to that of developed countries. Despite this issue, in 1976, the Twenty ninth World Health Assembly agreed on the following definition: "Low birth weight is the weight at birth of less than 2500 grams (up to and including 2499 grams) irrespective of gestation age." The World Health Organisation specified less than 2000 grams as 'very low birth weight' and less than 2500 grams as 'low birth weight.' Low birth weight contributes to the estimated 9.1 million infant deaths that occur each year (Grummer et al, 1995). Globally, one in six live births, almost 25 million of the 142 million infants born in 1990, had low birth weight (WHO 1992 a).

The World Health Organisation estimates that 17 per cent of births in the world are of low birth weight infants. The incidence of low birth weight varies between regions, countries and areas of the same country. The incidences of low birth weight infants range from 4 to 5 per cent in most of the developed countries to almost 50 per cent in some of the least developed countries (WHO 1992 b).

Regional data shows that, the incidence of low birth weight is highest in Asia (21 per cent) followed by Oceania (20 per cent), Africa (15 per cent), Latin America (11 per cent), North America (7 per cent) and Europe (6 per cent) (WHO 1992 b). The incidence of low birth weight infants of various regions are shown in the Table 1.1.

TABLE 1.1

Global Incidence of Low birth weight

Country	% of low birth weight	
	1985*	1990#
India	30	33
Pakistan	25	16
Nigeria	25	25
Costa Rica	7	9
Zimbabwe	15	14
USA	7	7
Sweden	4	3
Developing countries	NA	19
Developed countries	NA	7
WORLD	NA	17

Sources : * World Development Report 1993

WHO 1992 , Across age and Frontier (p 9-10)

NA- Not available

In India, the National Family and Health Survey (1992-93) reports that 26.02 per cent of births in India are of low birth weight infants. The per cent of low birth weight of various Indian states is tabled in Table No 1.2

TABLE 1.2

Low birth weight in various Indian states

STATE	% OF LBW
Kerala	18.2
Tamil Nadu	22.5
Orissa	22.0
Gujarat	21.1
Utter Pradesh	27.2
Bihar	23.3
West Bengal	24.5
Punjab	28.6
INDIA	26.2

Source : National Family and Health Survey 1992-93

Various studies in Kerala relating to birth weight show that, about 17-20 per cent of live births are of low birth weight. The National Family and Health Survey (NFHS) reports (1992-93) show that in rural Kerala the rate of low birth weight is 19 per cent and in urban areas it is 17 per cent. According to Child

Development Centre estimates based on Sree Avitam Thirunal Hospital (Women and Children wing of Medical college), Thiruvananthapuram, between 18.9 and 27.4 per cent of the total live births were recorded as low birth weight (Table 1.3) A study in two Government hospitals in Thiruvananthapuram (Kurup 1997) found 17 per cent low birth weight in one hospital and 12.2 per cent in another hospital.

TABLE 1.3

Yearly incidence of LBW in Sree Avitam Tirunal Hospital, Thiruvananthapuram

Year	Total deliveries	% of LBW
1990	12756	25
1991	12837	20
1992	12089	18.9
1993	12117	20.2
1994	12072	27.4
1995	13420	26.7

Source : Medical records, S A T Hospital , Thiruvananthapuram

Among the Indian states, Kerala has achieved tremendous success in the health sector and the foremost position in various positive health indices (Table 1.4). Health conditions of Kerala have historically been better than those in other parts of India, however, the most dramatic differences have occurred in the last 40 years (Zachariah et al, 1994). The extent of this difference is indicated by the child

mortality rate 4.6 in Kerala and 26.3 in India (Economic review, 1997). Kerala's crude death rate (CDR), infant mortality rate (IMR), neonatal mortality rate (NNMR), post neonatal mortality rate (PNNMR) and under five mortality rate are the lowest, and life expectancy at birth is highest in India. The levels of these health indicators are comparable to that in the developed countries. Kerala has made remarkable advances in these measures of health status with one of the lowest rates of per capita income in India. Kerala has been credited with achieving 'good health at low cost' (Halstead and Walsh Worren, 1984, Thankappan and Valiyathan, 1998).

TABLE 1.4

Profile of health indicators of Kerala state

<u>Year</u>	<u>Birth rate</u>		<u>Death rate</u>		<u>IMR</u>	
	<u>Kerala</u>	<u>India</u>	<u>Kerala</u>	<u>India</u>	<u>Kerala</u>	
1970	32.3	36.8	9.2	15.7	61.0	129
1980	26.8	33.7	7.0	12.6	42.0	117
1985	22.9	32.9	6.9	11.8	33.0	97
1990	20.3	30.5	6.1	14.2	21.0	80
1995	17.7	28.8	6.0	9.0	16.0	74

Source : State Planning Board , Kerala , Thiruvananthapuram

Many factors have been found to affect birth weight, for example, genetic, socio-economic, demographic, environmental and nutritional factors have all been associated with birth weight. Kramer (1987), analysed 43 determinants of birth

weight in both developed and developing countries. The factors were categorised as genetic and constitutional, demographic and psycho social, obstetric, nutritional, maternal morbidity during pregnancy, toxic exposure and ante natal care, etc. In developed countries the most important factors were cigarette smoking and pre-pregnancy weight. In developing countries like India, malnutrition is indirectly related to socio-economic status, which is one of the primary factors for low birth weight of babies. Oslen and Frischer (1993) found that low birth weight negatively correlates with socio-economic classes (Kramer, 1987, ICMR, 1990 and Mavalanker et al., 1992). Other Indian authors stated that high incidence of low birth weight is reported in mothers who belong to lowest socio-economic status (Makhija and Murthy, 1990). The WHO studies show no reliable relation between income and birth weight.

related to have contributed to the low birth weight.

Berner et al (1996) observed that risk factors associated with low birth weight infants were mothers' occupation, housing conditions and ante natal care. A study by Lawoyin and Oyediran (1992) pointed out that mothers' parity, height, maternal weight gain as well as birth interval were each significantly related to the incidence of low birth weight. Studies in both developed and developing countries show that age at delivery of mothers' below 20 is a risk factor for low birth weight. (Mavalanker, 1991, Premakumari, 1993. Fraser and Bockert, 1995).

is a paradox that

From 50's onwards, hospital records have been used for analysis of birth weight of children, in relation to the mother's characteristics like education, occupation, age at delivery, mode of delivery, gestation period, etc. The Demographic

Research Centre, Trivandrum had conducted a study relating to birth weight (1959) and found that, lower ages of women (<20), higher age of women and higher parity births (above 40 years and high order births), low social class, low literacy status, etc were related to low birth weight. More or less, similar conclusions were arrived at by other studies conducted by Ramankutty et al (1991 a, 1991 b), Premakumari (1992), Jaya et al (1995), Kurup (1997). Most of the authors concluded education as a component of socio-economic status.

Kannan et al (1991) pointed out that socio-economic factors have a very vital influence on the health of populations, especially in the case of Kerala. There are many socio-economic conditions unique to Kerala, which have been postulated to have contributed to the health achievements. The improvement of health conditions of the people has been tied to their educational attainment and health policies, which have brought medical facilities within their reach and their means. The health achievements of Kerala are attributed to the state government's policy in the fields of land reforms, education especially of women, public distribution of food grains, infrastructure development, health care programmes, etc (Soman and Panikkar, 1984).

It is a paradox that, even though most of the basic health indicators of Kerala are comparable to that of developed countries, the birth weight of new-borns show the characteristics of developing nations and is almost the same as other Indian states.

World Health Organisation (1986) has suggested reduction in the portion of low birth weight babies as one of the targets for achieving 'Health For All by 2000 AD'. The State Plan of Action for Children in Keralas' (1995) goal is to reduce the per cent of low birth weight of babies to 7 per cent and to increase the mean birth weight of babies to 3.2 Kg by 2000 AD. Even though many of the national goals of 'Health for All by 2000 AD' have been achieved, low birth weight remains as a public health problem even in Kerala. Hence a study is required to find out the genesis of the high per cent of low birth weight babies in Kerala.

Over the last few decades, although there has been studies documenting birth weight of new-borns in Kerala, almost all of them were based on Government hospitals, especially referral hospitals, which is unlikely to be a representative sample, because of the referral. Even though most of the deliveries in Kerala are taking place in hospitals, the deliveries that take place in private hospitals were not included in these studies. Considering the widespread use of private hospitals(49 per cent of deliveries were in private hospitals according to the NFHS, Kerala, 1992-93), the data of Government hospital deliveries are not representative of the general population. A community based study can overcome this limitation, by collecting data on birth weight, directly from the population.

A further limitation of the hospital based studies is the classification of socio-economic groups on the basis of income recorded in the hospital records. This

is biased data because people have a propensity to understate their income so as to claim concessions. In a community based study, it is possible to classify socio-economic groups by observing material aspects like housing conditions.

All the factors combined together, give the problem of birth weight a much wider dimension than previously envisaged. The lack of community based studies focusing on, the various socio-economic and demographic factors associated with birth weight, have left this very vital field virtually unexplored.

Keeping in view the above factors and issues, this research project seek to investigate the socio-economic and demographic factors associated with birth weight in Kadakampally village (Grama Panchayath) in Thiruvananthapuram district, Kerala state.

1:2 Objectives

The following are the general and specific objectives of the study.

1:2:1 General objectives

To assess the socio-economic and demographic factors associated with birth weight in Kadakampally village Panchayath in Thiruvananthapuram district, Kerala state.

1:3:2 Specific objectives

(1) To assess the prevalence of low birth weight in the panchayath area

(2) To determine risk factors associated with low birth weight of infants in the community

1.4 Scope and limitations

The focus of the study is on the socio-economic and demographic determinants of birth weight of new-borns. Government hospital data have traditionally been used for analysing the socio-economic status associated with the low birth weight. In this study the researcher uses population data for exploring the socio-economic factors.

One of the limitations of the study is the small sample size, which is not a suitable representation to explain the prevalence of the low birth weight. The accuracy and standard of the weighing machine used to measure the birth weight of the new-borns and the way in which the weight is taken are not known to the researcher. Due to the short duration of time, total number of births apart from the two anganwadi areas were collected from the records of anganwadi. The classifications of socio-economic groups are based on certain variables, which may not be applicable to all circumstances. The qualitative methods were only used to assess the pre pregnancy diet and health problems.

Part II

METHODOLOGY

The study was non-experimental in design. It was planned to contain two components, one is cross sectional component and another is retrospective component. In this section, approaches and methodology adopted for data collection and analysis has been explained.

2.1 Setting

For realising the objectives of the study, primary data were collected from all 21 anganwadis of, Integrated Child Development Services (ICDS) Project, Thiruvananthapuram Rural, located in Kadakampally panchayath. Thiruvananthapuram district. Kadakampally village panchyath is located close to Thiruvananthapuram city corporation. It is found that a large proportion of mothers have the practice of keeping records especially hospital records, allowing the researcher to take the birth weight from hospital discharge cards of the mother. The study population consisted of women who had experienced child birth with in the previous calendar year prior to the date of house hold survey. The survey has been conducted during 7th January 1998 to 10th March 1998.

2.2 Materials and methods

To identify the mothers who had delivered in the last one year, the list of mothers and their addresses were collected from the anganwadi centres, because of the non-availability of needed information in the records of Kadakampally Primary Health Centre and Birth Register of Kadakampally village Panchayath. Details of the anganwadi centre in turn, were collected from the office of the Child Development Project Officer, Integrated Child Development Project, Thiruvananthapuram Rural. To verify the cases recorded in the anganwadi, at the outset of the survey, all households of one ward (area of two anganwadis) of the Panchayath were visited. It was found that the anganwadi records and information from the field were same, except the case of one mother who moved into a rented house one week before the survey. Apart from this, details of childbirth have been collected from the natives to confirm the anganwadi records, and it was found that there were no disparities between them. For the rest of the area in the panchayath monthly reports of the anganwadis were used to enlist the details of child birth. This was a case study in the kadakampally village panchayath and so the sample size was not calculated. Two hundred and ninety-four mothers delivered in the panchayath area during the study period of one year. Seven twin deliveries were excluded from the study. Out of 287 mothers who delivered single babies, only those who had, recorded birth weight, on the hospital discharge card of the mother or the infant's health card, was included in the analysis. There were seven mothers who did not have

the records of birth weight, so two hundred and eighty births were included in the study.

2.3 Data collection

The researcher explained the aims and objectives of the study, to all the participants, and surveyed the households using a pre-designed questionnaire. The questionnaires were pre-tested and necessary modifications were made before it was applied in the field. The household schedule collected socio-economic and demographic details of mother's such as age, education, occupation, caste, religion, housing condition, income, land holding, etc. In addition, information was also sought on birth order, birth interval, mode of delivery, place of delivery, ante natal care, etc. In the midst of the fieldwork, the researcher included questions related to the use of medical technology, health problems during pregnancy, intake of food and work during pregnancy {see appendix I}. Therefore, data relating to these variables could be collected from 136 mothers only.

The birth weight of the child was recorded from the hospital discharge card of the mother or the Mother and Child immunisation card. Since many people may not keep hospital records for more than one year, the cases of child birth included in the study sample has been restricted for the period January 1st to December 31st, 1997. The elements of housing conditions were collected by observation. The height of the mother was recorded from the hospital card, and if not found, a metal tape was used by the investigator to measure the height. Even though

the heights of the mothers are taken, after few months of delivery, a significant change in height would not be there since more than 95 per cent of mothers were older than 20 years. In the appendix II, the place of anganwadis with anganwadi number is presented.

2.4 Analysis

In most social researches, the socio-economic status of respondents has consistently been found to be related with various aspects of social life. There is no uniform pattern or procedure for the measurement of socio-economic status. It was decided to classify the interviewed mothers into three socio-economic status (SES) groups namely, Low, Middle and High. The characteristics included are (i) educational level of mother (ii) family income and (iii) household conditions like roof of the house, wall of the house, floor of the house and floor area of the house. Considering the weights assigned, each of the characteristics of the households were divided into the following three groups. In grouping households according to educational attainments of mothers, the households were given weightage as follows.

- | | |
|---|---|
| a. Mother having education below higher secondary level | 1 |
| b. Mother having higher secondary education | 2 |
| c. Mother having education above higher secondary | 3 |

The figures relating to family income are calculated by the investigator according to the amount of income and source of income reported by the mother. The family income was worked out and given weightage as follows.

- | | |
|---|---|
| a. Monthly family income < Rs. 2000 | 1 |
| b. Monthly family income > Rs. 2000 to < Rs. 4000 | 2 |
| c. Monthly family income > Rs. 4000 | 3 |

Four elements of housing condition were considered ; 1) roof of the house 2) wall of the house 3) floor of the house 4) floor area of the house. The details of the weightage assigned to the housing conditions are given below.

Roof of the house

- | | |
|---------------------------------|---|
| a. Roof was made of thatch | 1 |
| b. Roof was made of tiled/sheet | 2 |
| c. Roof was made of concrete | 3 |

Wall of the house

- | | |
|--|---|
| a. Wall of the house was thatch or mud | 1 |
| b. Wall of the house was brick/stone | 2 |
| c. Wall of the house was plastered with cement | 3 |

Floor of the house

- | | |
|------------------------------------|---|
| a. Floor was made of mud /cow dung | 1 |
| b. Floor was made of cement | 2 |
| c. Floor was made of mosaic | 3 |

Floor area of the house

- a. Floor area was <500 sq. 1
- b. Floor area was 500 sq. to 1000 sq. 2
- c. Floor area was >1000 sq. 3

All the three characteristics namely, educational status of mother, family income and household condition were used for the construction of socio-economic status groups, the underlying reason being that no single indicator could be able to design the socio-economic status unbiasedly. The score of the low socio-economic group is <13, the score of middle socio-economic group is 13-16 and the range of the high socio-economic group is >16.

Based on the World Health Organisation specification, in this study the birth groups are divided in to two : (1) <2.5 Kg as low birth weight and (2) \geq 2.5 Kg as normal weight.

In order to test the association between birth weight and socio-economic and demographic variables, Chi-square test and Chi-square trend test were applied.

Part III

SOCIO ECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF KADAKAMPALLY

Kadakampally panchayath in Thiruvananthapuram has been chosen as the area of study. The Integrated Child Development Services (ICDS) programme is functioning in this panchayath, which helped to locate the mothers and check the birth weight of the children.

This section discusses the socio-economic and demographic characteristics of the general population of the panchayath, as well as the study population of mothers who delivered during 1997.

3.1 General features of the setting

The Kadakampally panchayath was constituted in 1961. It is located in central most part of Thiruvananthapuram district and it is surrounded on three sides by the corporation of Thiruvananthapuram and Attipra Panchayath is the northern boundary. The panchayath has a total area of 8.14 sq. Kms.

According to 1991 census, the total population of the panchayath is 24,541, including 12,516 females and 12,025 males. The literacy rate of the population is 93.26 per cent, which is slightly higher than state average(90 per cent).

The average family size in the panchayath is 5.07, which is very close to the state average of 5.06. Among the population, about 20 percent are scheduled caste.

With regard to the health facilities, a Mini Primary Health Centre and a Homeopathic Hospital operate in the panchayath. The Block Primary Health Centre is located in Punthura, which is 12 Kms away from Kadakampally. The Medical college hospital, Women and Children's hospital, District hospital, etc are very close to this panchayath. There is no private hospital in this panchayath.

3.2 Socio-economic and demographic characteristics of the Respondents

This information provides the background for analysis on birth weight. The following socio-economic characteristics are presented in this section. (1) Socio-economic status (SES) (2) age of mother (3) education of mother (4) occupation of mother (5) education of husband (6) occupation of husband (7) household by caste (7) household by religion (8) type of family (9) housing condition (10) place of delivery (11) mode of delivery (12) ante natal check-ups (13) birth interval (14) intake of iron and folic acid tablets and (15) birth order.

3.2.1 Socio-economic status

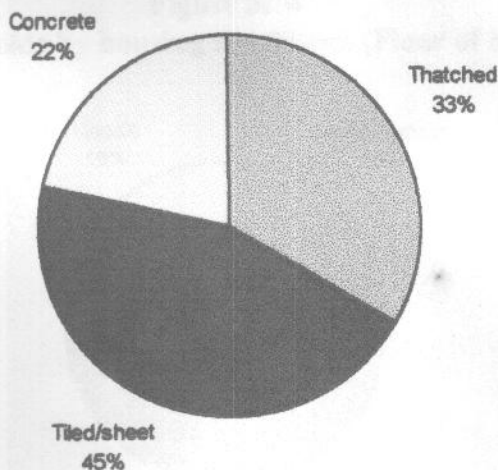
The educational level of mother, family income and housing conditions are used to assess the socio-economic status. The classification of mothers by educational level shows that 163 (58.2 per cent) mothers have education below higher secondary level. Among the population, only one mother had not completed

her primary education. Fifty-seven (20.4 percent) mothers completed higher secondary education and sixty (21.41 per cent) hold at least one degree.

Thirty-eight (13.6 per cent) household's family income was less than Rs. 2000 and they are considered as low income group. One hundred and twenty seven (45.3 per cent) have the income in between Rs. 2000 to Rs. 4000 and they are treated as middle income group. The high income category consists of 115 (41.1 per cent) having monthly family income above Rs.4000.

Figure 3. 2

Households by housing conditions (Roof of house)



Twenty-two per cent of houses had concrete roof. One hundred and twenty-six (45 per cent) roofs of households are tiled and 33

per cent of roofs are thatched. It shows the coexistence of different socio-economic groups with clear distinctive features.

Figure 3. 3
Households by housing conditions (Wall of house)

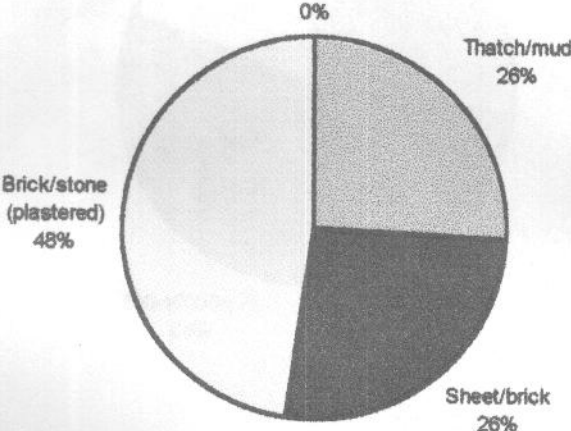


Figure 3. 4
Households by housing conditions (Floor of house)

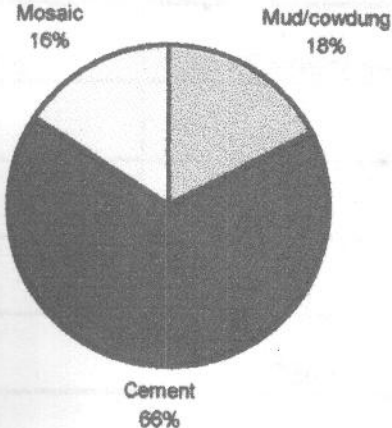


Figure 3. 5

Households by housing conditions (Floor area of house)

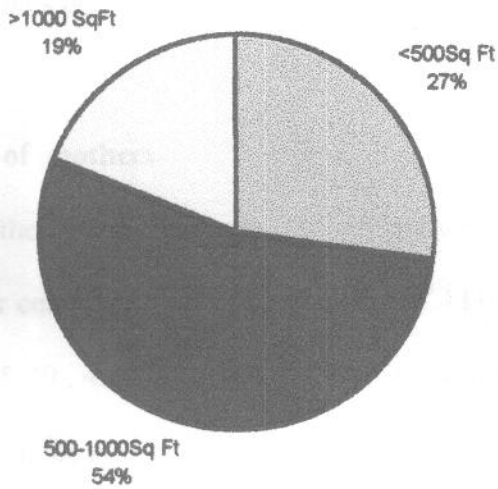


Table 3. 1

Socio-economic status groups of households

Status	No of households	%
Low	141	50.36
Middle	79	28.21
High	60	21.43
Total	280	100

Table 3.1 show that 141(50.36 per cent) belongs to low socio-economic group, 79 (28.21 per cent) in the middle socio-economic group and 60 (21.43 per cent) in the high socio-economic group. Over the fifty per cent of households belongs to low SES group.

3.2.2. Age at delivery of mothers

Out of the 280 respondents, 11 (3.9 per cent) are below 20 years, 104 (37.1 per cent) in the age group of 20-24, 111 (39 per cent) in the age group of 25-29 , 42 (15 per cent) in the age group of 30- 34, and 12 (14.3 per cent) in the age group of 35 and above.

3.2.3 Religion

3.2.3 Occupational status of mothers

Two hundred sixty-six (95 per cent) mothers were housewives and only five per cent engaged in any income earning job. Ten (3.6 per cent) working in government service . Four (1.4 per cent) were agriculture labours and casual labours.

3.2.4 Husband's educational level

The literacy status of respondent's husbands shows that, only 8 (2.9 per cent) have primary education alone and 1 person was illiterate. One hundred ninety-nine (71.1 per cent) were below the higher secondary level. Forty-four (15.7 per cent) have higher secondary education and 37 (13.2 per cent) completed at least graduation. Data

shows that educational status of respondent mothers was relatively higher than their husbands.

3.2.5 Husband's occupational status

Nine (3.2 per cent) husbands were agriculture labourers. Ninety-four (33.6 per cent) were service persons, majority of whom were government servants. One hundred twenty-three (43.9 per cent) are classified as casual labourers, including head load workers, helpers to masons, etc.

3.2.6 Religion

Majority of respondents were Hindus, 259 (92.5 per cent). The other religious groups in the study were Christians 13 (4.6 per cent) and Muslims 8 (2.9 per cent).

3.2.7 Caste

Fifty-four (19.3 per cent) belonged to scheduled caste. One hundred seventy-four (62.1 per cent) belonged to the backward castes, the majority of them were Ezhava and Viswakarma .

3.2.8 Type of family

One hundred twelve (40 percent) families were nuclear and One hundred sixty-six (59.3 per cent) were extended nuclear families. Only 2 households were having two or more ever married couples and their off springs with or without other dependants.

3.2.9 Place of delivery

Eighty-nine (31.8 per cent) mothers delivered in private hospital, while 67.5 percent delivered in government hospitals, the majority of them in Sree Avitam Tirunal Hospital, Thiruvananthapuram. Two cases (0.7 per cent) home deliveries were also reported; one with the service of the Junior Public Health Nurse (from the PHC) and the other received immediate assistance from the hospital after delivery. It shows that, 99.3 per cent of deliveries were institutional deliveries.

3.2.10 Ante natal care

All the mothers have visited Gynaecologist during their pregnancy period for check up. They consulted doctors in government hospitals or government doctors privately or visited other doctors at private hospitals. Most of the mothers in very low socio-economic classes visited the government hospitals for check ups and delivery. Two hundred eleven (75.3 per cent) mothers visited a doctor more than ten times. Fifty-nine (21.1 per cent) consulted in the range of 5 to 10 times, eight (2.9 per cent) in the range of 3 to 5 times and two (0.7 per cent) at least 3 times.

Twenty-six (96 per cent) received two doses of anti tetanus vaccine during the pregnancy period, while 11 (3.9 per cent) received only one dose of tetanus vaccine. But in the case of Iron and folic acid tablets 265 (98.1 per cent) have taken these supplements regularly. Five mothers (1.9 per cent) also reported taking I & F tablets, but they did not remember the number of tablets taken.

3.2.11 Birth order

Out of 280 mothers, 144 are primi, 117 delivered second time, 16 mothers delivered their third child and 3 mothers gave birth to their fourth child.

3.2.12 Birth interval

Out of 280 mothers, 136 of mothers delivered second or third or fourth child. Among this 40 (29.4 per cent) delivered their next child after 36 months and before 48 months of the previous child births. Only 4 cases (2.9 per cent) mothers delivered their next child before 12 months.

In this part, the socio-economic and demographic variables of interviewed mothers of the Kadakampally panchayath were presented.

Part iv

DETERMINANTS OF BIRTH WEIGHT AN EMPIRICAL ANALYSIS

This section examines the association of the birth weight with the socio-economic and demographic variables. The results are presented in the form of bivariate tables and Chi-square value.

4.1 Prevalence of birth weight

The study shows that the prevalence of low birth weight in Kadakampally panchayath is 50, out of 280 cases (17.9 per cent). Twenty cases (7.14 per cent) recorded exactly 2.5 Kg and 41 (14.64) 3 Kg. This gives room for suspicion that there is an error or lack of precision in measuring or recording of birth weight. Ninety-seven (34.6 per cent) infants have a birth weight ≥ 2.5 Kg -3 Kg. The greatest number of new-borns, One hundred and thirty three (47.5 per cent) weighed more than 3 Kg.

TABLE 4.1
Prevalence of birth weight

Birth weight	No	%
< 2 Kg	13	4.7
<2 Kg - < 2.5 Kg	37	13.2
≥ 2.5 Kg -3 Kg	97	34.6
≥ 3 Kg	133	47.5
Total	280	100

4.2 Socio-economic status and birth weight

The analysis of socio-economic status and birth weight found a significant association between socio-economic status and birth weight ($p < .05$). In table 4. 2, low birth weight was observed as 34 (24.1 per cent) in those with low socio-economic status and it decreases to 10 (12.8 per cent) in the case of middle and 6 (10 per cent) in high socio-economic status group.

TABLE 4.2

Socio-economic status and birth weight

Socio-economic Status	Birth weight		Total %
	<2.5 Kg (%)	≥2.5 Kg (%)	
Low	34 (24.1)	107 (75.9)	141 (50.36)
Middle	10 (12.8)	69 (87.2)	79 (28.21)
High	6 (10.0)	54 (90.0)	60 (21.43)
Total	50 (17.9)	230 (82.1)	280 (100)

$p = .008$ (χ^2 trend)

4.3 Mothers education and birth weight

It is observed in table 4.3 that, the educational level tends to have a relation with the birth weight. Low birth weight is less among the mothers who have higher education. However, this relationship is not statistically significant(chi-square value is 1.637). Among the mothers, those who have higher education (graduation and above) have less incidence of low birth weight compared to mothers with education below graduation.

TABLE 4. 3
Educational level of mothers and birth weight

Educational level	Birth weight		Total (%)
	<2.5 Kg (%)	≥2.5 Kg (%)	
Below Higher secondary	33 (20.2)	130 (79.8)	163 (58.2)
Higher secondary	8 (15.8)	48 (84.2)	57 (20.4)
Graduation and above	8 (13.3)	52 (86.7)	60 (21.4)
Total	50 (17.9)	230 (82.1)	280 (100)

p=.182 (χ^2 trend)

4.4 Occupation and birth weight

Table 4. 4 presents the occupation of mother by birth weight. In this sample, the number of mothers engaged, in any income earning occupation was small (n=14), and there was no incidence of low birth weight children among them. Only housewives delivered low birth weight infants, although this difference was not statistically significant.

TABLE 4. 4
Mothers occupation and birth weight

Occupation	Birth weight		Total (%)
	<2.5 Kg (%)	≥2.5 Kg (%)	
House wives	50 (18.8)	216 (81.2)	266 (95)
Service	-	10 (100)	10 (3.6)
Others	-	4 (100)	4 (1.4)
Total	50 (17.9)	230 (82.1)	280 (100)

P =. 3612

4.5 Age at delivery and birth weight

Table 4. 5 presents the birth weight status by the age of mother at delivery. The mother's age at delivery has been categorised into five groups.

TABLE 4. 5
Age at delivery and birth weight

Age at delivery	Birth weight		Total (%)
	<2.5 Kg (%)	≥2.5 Kg (%)	
<20 years	5 (45.5)	3 (54.5)	11 (3.90)
20-24	26 (25)	78 (75)	104 (37.10)
25-29	13 (11.7)	98 (88.3)	111 (39.6)
30-34	5 (11.9)	37 (88.1)	42 (15)
35 +	1 (8.3)	11 (91.7)	12 (4.4)
Total	50 (17.9)	230 (82.1)	280 (100)

$p = .0007$ (χ^2 trend)

The highest percentage of low birth weight is observed in those who delivered at an age less than 20 years. The tendency shows that, as age at delivery of mothers increases, the percentage of occurrence of low birth weight babies decreases. It is observed that age of mother at delivery is significantly related to birth weight.

4.6 Husband's education and birth weight

The education of husband and birth weight of the infant are not statistically significant.

TABLE 4. 6
Husband's education and birth weight

Educational level	Birth weight		Total (%)
	<2.5 Kg(%)	≥2.5 Kg (%)	
Below Higher secondary	40 (20.1)	159 (79.9%)	199 (71.1)
Higher secondary	4 (9.1)	40 (90.9%)	44 (15.7)
Graduation and above	6 (16.2)	31 (83.8%)	37 (13.2)
Total	50 (17.9)	230 (82.1)	280 (100)

$p = .267$ (χ^2 trend)

4.7 Husband's occupation

TABLE 4. 7
Husband's occupation and birth weight

Occupation	Birth weight		Total (%)
	<2.5 Kg (%)	≥2.5 Kg (%)	
Agriculture labour	2 (22.2)	7 (77.8)	9 (3.2)
Causal labour	23 (18.7)	100 (81.3)	123 (33.9)
Service	10 (10.6)	84 (84.4)	94 (33.6)
Business	6 (23.1)	20 (76.29)	26 (9.3)
Artisan	9 (32.1)	19 (67.9)	28 (100)
Total	50 (17.9)	230 (82.1)	280 (9100)

p value = .095

Table 4.7 shows that husbands who were employed in service, both in government and private, have relatively less low birth weight infants compared to others. The rate of low birth weight is higher among artisans, although these differences were not statistically significant.

4.8 Caste and birth weight

Table 4.8 presents the birth weight by caste. The castes have been grouped into three categories (i) scheduled caste (ii) backward caste and (iii) forward caste. It is assumed that the order in which they are considered here is the ascending order of the social status.

TABLE 4. 8
Caste and birth weight

Caste	Birth weight		Total (%)
	<2.5 Kg(%)	≥2.5 Kg (%)	
Scheduled caste	14 (25.9)	40 (974.1)	54 (19.3)
Backward caste	30 (17.2)	144 (82.8)	174 (62.1)
Forward caste	6 (11.5)	46 (88.5)	52 (18.6)
Total	50 (17.9)	230 (82.1)	280 (100)

P= . 1453

Table 4.8 shows that, low birth weight is highest (N=14, (25.9 per cent) in the scheduled caste. 17.2 per cent (N=30) low birth weight is recorded in the backward caste. The low birth weight is less among the forward caste. These difference were not found significant.

4.9 Religion and birth weight

The birth weight by religion of parents shows that among the Hindus, 46 (17.8 per cent) were low birth weight babies, while in Muslims, 2 (25 per cent) babies were low birth weight infants. The percentage of low birth weight babies was less among Christians, compared to other groups, 2 (15.4 per cent). These differences were also not significant.

TABLE 4.9

Religion and birth weight

Religion	Birth weight		Total (%)
	<2.5 Kg(%)	≥2.5 Kg (%)	
Hindus	46 (17.8)	213 (82.2)	259 (92.5)
Christian	2 (15.4)	11 (84.6)	13 (4.6)
Muslims	2 (25)	6 (75)	8 (2.9)
Total	50 (17.9)	230 (82.1)	280 (100)

p = .846

4.10 Type of family and birth weight

The table 4.10 presents the classification of type of family by birth weight, the prevalence of low birth weight is less in extended family than nuclear family.

TABLE 4. 10

Type of family and birth weight

Type of family	Birth weight		Total (%)
	<2.5 Kg(%)	≥2.5 Kg(%)	
Nuclear family	25 (22.3)	87 (77.7)	112 (40)
Extended nuclear	25 (15.1)	141 (84.9)	166 (59.3)
Joint family	-	2 (100)	2 (0.7)
Total	50 (17.9)	230 (82.1)	280 (100)

P= . 241

4.12 Sex and birth weight

TABLE 4. 11

Sex of the new born and birth weight

Sex of new born	Birth weight		Total (%)
	<2.5 Kg(%)	≥2.5 Kg (%)	
Male	20 (14.2)	121 (85.8)	141 (50.4)
Female	30 (21.6)	109 (78.4)	139 (49.6)
Total	50 (17.9)	230 (82.1)	280 (100)

p= . 106

The table present the birth weight of new born in relation to sex. The distribution of birth weight by sex shows that, out of 50 low birth weight children 20, (40 per cent) were male and 30 (60 per cent) were female. In the

normal grade (≥ 2.5 - 3 Kg), 50 (51.55 per cent) were male infants and 47 (48.45 per cent) were female infants. Among the infants with birth weight of 3 Kg or above, 71 out of 133 (53.38 per cent) were males and 62 (46.62 per cent) were female children.

4.12 Place of delivery and birth weight

Table 4.12 presents the place of delivery and birth weight. The low birth weight is high among those mothers delivered in government hospitals 36 (19.15 per cent). Out of 90, 13 (14.44 per cent) who delivered in private hospitals, were low birth weight babies. Two mothers delivered in home and one baby's weight is recorded as low birth weight.

Table 4.12

Place of delivery and birth weight

Place of delivery	Birth weight		Total (%)
	<2.5 Kg (%)	≥ 2.5 Kg (%)	
Home	1 (50)	1 (50)	2 (0.7)
Government hospital	36 (19.15)	152 (80.85)	188 (67.5)
Private hospitals	13 (14.44)	77 (85.66)	90 (31.8)
Total	50 (17.9)	230 (82.1)	280 (100)

$p = .3196$

4.14 Mode of delivery and birth weight

Table 4.13 presents the mode of delivery and birth weight. Out of 280 deliveries, 213 (76.07 per cent) were normal deliveries. Among them low birth weight was higher in normal birth than child birth by caesarean. From the data, it was found that, 40 (59.7 per cent) births of more than or equal to 3 Kg category were caesarean.

TABLE 4.13
Mode of delivery and birth weight:

Mode of delivery	Birth weight		Total (%)
	<2.5 Kg(%)	≥2.5 Kg(%)	
Normal	43 (20.2)	170 (76.1)	213 (76.07)
Caesarean	7 (10.4)	60 (89.6)	67 (23.93)
Total	50 (17.9)	230 (82.1)	280 (100)

$p = .069$

4.15 Height of the mother and birth weight

There is no association between birth weight and height of the mother

TABLE 4.14
Height of mother and birth weight

Height of the mother	Birth weight		Total (%)
	<2.5 Kg (%)	≥2.5 Kg (%)	
<140	-	3 (100)	3 (11.1)
140 – 150	11 (14.3)	66 (85.7)	77 (27.5)
150-160	35 (18.7)	152 (81.3)	187 (66.8)
≥160	4 (30.8)	9 (69.2)	13 (4.6)
Total	50 (17.9)	230 (82.1)	280 (100)

$p = .408$

4.16 Check-ups and birth weight

It is found that out of 280 mothers, 211 (75.3 per cent) had more than ten ante natal check-ups. Among them, 41 (19.4 per cent) mothers had low birth weight babies. There is an association found between birth weight and ante natal check-ups.

TABLE 4. 15

Ante natal check-ups and birth weight

Number of check-ups	Birth weight		Total (%)
	<2.5 Kg(%)	≥2.5 Kg(%)	
3 – 5	-	10 (100)	10 (3.6)
5 – 10	9 (15.3)	50 (84.7)	59 (21.1)
>10	41 (19.4)	170 (80.6)	211 (75.3)
Total	50 (17.9)	230 (82.1)	280 (100)

$p = .030$ (χ^2 trend)

All the mothers received at least one dose of tetanus vaccine. Two hundred and sixty-eight (96.1 per cent) of mothers received 2 doses, while 11 (3.9 per cent) received one dose. Out of 268 mothers, 45 (16.8 per cent) mothers received two doses of tetanus vaccine had low birth weight babies. It may be due to the fact that, women who had their second or third child within 3 years of the previous child, did not record second dose of TT, which was not calculated separately in this study. We found a significant association between, the birth weight and tetanus vaccine received by the mother. All the mothers received Iron and Folic acid tablets. These

factors show the extent of coverage of ante natal care. Forty-six (17.6 per cent) mothers, those who received full doses of I&F had low birth weight babies.

4. 17 Gestation age and birth weight

In the case of gestation age, out of 280 mothers, 276 (98.57 per cent) mothers know the date of gestation age. Table 4.16 show the details.

TABLE 4. 16

Gestation age and birth weight

Gestation age	Birth weight		Total (%)
	<2.5 Kg(%)	≥2.5 Kg (%)	
34 -37 weeks	4 (44.4)	5 (55.6)	9 (3.3)
37- 40 weeks	33 (16.8)	163 (83.2)	196 (71.0)
> 40 weeks	10 (14.1)	61 (85.9)	71 (25.7)
Total	47 (17)	229 (83)	276 (100)

$p = .136$ (χ^2 trend)

High rates of low birth weight is reported among mothers who had not completed 37 weeks of gestation. Among 9 (3.3 per cent) mothers who delivered before 37 weeks, 4 (44.4 per cent) cases were low birth weight. The percentage of low birth weight was less, 33 (26.8 per cent), in the case of mothers who delivered after 37 -40 weeks and 10 (14.1 per cent) after 40 weeks. The study found that, the association between gestation period and birth weight are very close to the significance.

4.18 Birth order and birth weight

The percentage of LBW babies were more in the case of fourth para, (35.3 per cent) and the study shows that among the primi gravida 26 (18.1 per cent) were low birth weight babies. But the prevalence of low birth weight is lower in the case of second and third para.

TABLE 4. 17
Birth order and birth weight

Birth order	Birth weight		Total (%)
	<2.5 Kg (%)	≥2.5 Kg (%)	
First	26 (18.1)	118 (81.9)	144 (51.4)
Second	21 (17.9)	96 (82.1)	117 (41.8)
Third	2 (12.5)	14 (87.5)	16 (5.7)
Fourth	1 (33.3)	2 (66.7)	3 (1.1)
Total	47 (17.9)	229 (82.1)	280 (100)

$p = .959$ (χ^2 trend)

4. 19 Birth interval and birth weight

High prevalence of low birth weight is found among the mothers who delivered after 24 months and before 48 months of previous delivery. Three cases of (11.5 per cent) LBW are reported by those who delivered with in 12-24 months after the last childbirth. The birth weight of babies who were delivered after 24-36 months

and 36-48 months after the previous delivery of mothers had 3 (23.5 per cent) and 9 (22.5 per cent) low birth weight respectively (see Table 4.18). After 48 months of the previous child birth the percentage of low birth weight was found decreasing.

TABLE 4. 18
Birth interval and birth weight

Birth interval	Birth weight		Total (%)
	<2.5 Kg (%)	≥2.5 Kg (%)	
< 12 months	-	4 (100)	4 (2.9)
12-24 months	3 (11.5)	23 (88.5)	26 (19.1)
24-36 months	8 (23.5)	26 (76.5)	34 (25.0)
36-48 months	9 (22.5)	31 (77.5)	40 (29.4)
48+	4 (12.5)	28 (87.5)	32 (23.5)
Total	24 (17.6)	112 (82.4)	136 (100)

$p = .844(\chi^2 \text{ trend})$

4. 20 . Season and birth weight

The data shows that, there was seasonal variation in the prevalence of low birth weight, the risk being highest during the peak of dry season and lowest during the rainy season.

TABLE 4.19
Season and birth weight

Season	Birth weight		Total (%)
	<2.5 Kg(%)	≥2.5 Kg (%)	
Winter	14 (16.3)	72 (83.7)	86 (30.7)
Summer	13 (21.0)	49 (79.0)	62 (22.1)
Rainy	23 (17.4)	109 (82.6)	132 (47.1)
Total	50 (17.9)	230 (82.1)	280 (100)

$p=.751$

Table No 4.19 shows that, thirteen (21 per cent) of the 62(22.1 per cent) mothers delivered during summer had low birth weight babies. Twenty three (17.4 per cent) of the 132 (47.1 per cent) mothers delivered during rainy season had low birth weight infants.

Results of subsequent sample

The subsequent sample of 136 mothers were asked about the number of sonogram tests done during the pregnancy period and reasons. The study found that 100 (73.52 per cent) mothers were tested by sonogram at least one time. It was revealed that 87 (63.97 per cent) had done the ultrasound scanning as per the direction of the consultant Gynaecologist although they had no health problems. In the category of mothers who delivered LBW babies, 21 out of 36 (58.33 per cent)

tested and in mothers who delivered normal babies 79 out of 100 (79 percent) tested at least once during the pregnancy period.

A sample of 136 mothers were selected to find out the health problems associated with pregnancy and LBW. In this group, 33 mothers delivered LBW infants and 103 were those mothers who delivered normal babies. It was found that, 6 (24 per cent) mothers who delivered low birth weight babies, had been experiencing vomiting, stomach pain, urinary infection during the initial months of pregnancy. Fourteen, (42.42 per cent) mothers faced a single or multiple problems like bleeding, back pain etc during 3-6 months. Twelve (36.36 per cent) mothers had problems such as blood pressure variation during 6-9 months of pregnancy. The level of abnormality was less among mothers who delivered normal babies.

The intake of rice, the staple food of Kerala, was less during the initial weeks of pregnancy by both mothers who delivered normal and LBW babies. But during 3-6 months and 6-9 months, there was variation between these two groups. The qualitative data collected shows that, mothers who gave birth to LBW babies took less quantity of rice during this period.

The mother's intake of other food like milk, eggs, fruits, etc, were less during the first three months in both the categories. The mothers who delivered normal babies consumed more quantity of such food from third month onwards. The

mothers who delivered less than 2.5 Kg infants, received same quantity during 3-6 months as they had received in the first three months.

Part v

DISCUSSION

Same as the previous studies on low birth weight in Kerala, the present study also shows that the prevalence of low birth weight is high. The study found that the prevalence of low birth weight is as 17.9 per cent in the village panchayath. The study found significant association between birth weight and socio-economic status groups. The prevalence of low birth weight babies was higher in the low socio-economic status group. It was found that, as socio-economic status becomes higher the low birth weight rate becomes lower. The tendency is that, in the middle socio-economic group the prevalence of low birth weight is less than that of low socio-economic class and more than that in the high socio-economic status group. Jaya et al (1995) found that the prevalence of low birth weight was high among low socio-economic group in a hospital based study in Kerala. The other studies investigating birth weight in Kerala, based on government hospital data also arrived at the conclusion that low birth weight is related to social variables such as social class, low literacy status and higher parity births (Ramankutty et al, 1991 a and 1991 b, Premakumari, 1992). A study by Lawoyin and Oyediran (1992) found that mother's parity, height, maternal weight gain as well as birth interval were each significantly related to the incidence of low birth weight, while maternal education and socio-economic classes were not significant.

The study found significant association between age at delivery and birth weight. High prevalence of low birth weight babies were recorded among mothers below 20 years. The percentage of low birth babies was found decreasing in correspondence to the age at delivery of mothers. A study conducted by Premakumari (1992) based on hospital data, found that women of younger (below 20 years) and older age groups (above 30 years) have higher rates of low weight babies. This study found that 52 per cent of mothers under 20 years gave birth to babies below 2.5 Kg birth weight. Fraser and Bockert (1995) found that, mothers 13-17 years of age had a significantly higher risk than mothers who were 20-24 years of age, of delivering an infant who had low birth weight. According to Mavlankar (1991) mothers age of below 20 years is considered as an important factor for prematurity and low birth weight.

The ante natal care received by the mothers, reflects the extensive utilisation of medical care during the time of pregnancy. All the mothers had their consultation with Obstetrician. The study shows that, a significant association found between birth weight and ante natal check-ups; but the relation between ante natal check-ups and birth weight is negative. The high number of ante natal check-ups may be due to the directions of the Gynaecologist for periodical check-ups. This may be due to the low fertility rate which makes all pregnancies precious. All the mothers had undergone medical check-ups by a Gynaecologist and received tetanus vaccine and I&F tablets.

The literacy rate of the mothers in the panchayath was higher than the state average, (89 per cent) in both the sexes. Most of the respondent mothers were higher educated than their husband. It was found that, as education of the mother increase, the percentage of low birth weight decreased. It may be due to the awareness mothers obtained through their education which influences their ante natal care, age of marriage and diet habits. WHO study analyse maternal education separately and found an increased incidence of LBW in illiterate and primary class mothers as against low rate of LBW for mothers with higher education.

Regarding the occupational status of mothers, those who had income earning jobs, tend to have normal birth weight infants. All low birth weight babies were delivered by housewives, who had no income earning occupation. Berner et al (1996) observed the risk factors associated with low birth weight infants as mothers' occupation, house conditions and ante natal care. In the present study majority of the husbands of the respondents were casual labours. The prevalence of low birth weight was lower among the husbands who were working in service sector.

The percentage of low birth weight was higher among scheduled caste followed by backward class. The Christians have been reported lower prevalence of low birth weight, compared to Hindus and Muslims. In the extended nuclear families and joint families the rate of low birth weight was lower than the nuclear families, which may be due to the assistance and advice received the pregnant mother from other members in the family.

It is seen that, among the low birth weight new-borns, there were more female infants and in normal birth weight infants, the percentage of both the sexes were more or less same. In a study focusing on socio-biologic factors influencing low birth weight, Makhija et al (1990) found that female infants had a higher incidence of low birth weight.

In the present study, the deliveries in private hospitals shows that, the incidence of low birth weight is less; because the high socio-economic class used private hospitals more than government hospitals.

In the study, most of the deliveries took place in government hospitals which is a deviation from the state as a whole. It may be due to the close location of Sree Avitam Tirunal hospital, Thiruvananthapuram and Women and Children's hospital, Thycaud. It was observed that, the low birth weight was high in government hospitals than in private hospitals. It may be due to the fact that, high socio-economic group use private hospitals more than it was used by lower and middle classes.

Amin and Sampath Kumar (1993), found an association between maternal height and maternal weight with low birth weight. Even though height is considered as a determining factor for low birth weight of new-born, the present study found negative relation between maternal height and birth weight.

Amin and Sampath Kumar (1993), also found an association between maternal risk factors like age of mother, parity and gravida with low birth weight. In this study, the tendency of relation between birth order and birth weight shows, the rate of LBW decreasing up to 3rd deliveries and increasing there after. This may be due to malnutrition and less spacing..

With regard to season and birth weight, the prevalence of low birth weight was found highest when in childbirth during the peak of dry season and lowest during the rainy season, as same as the study on low birth babies in Nigeria, by Lawoyin and Oyediran (1992). Erriksson et al (1997) found that the place of birth(home, hospital) is strongly associated with birth weight. Two hundred and seventy eight (99.28 per cent) deliveries were institutional in the present study. Out of two home deliveries one was of low birth weight. There were no cases of delivery reported below 34 weeks.

The study shows the extensive use of medical technology in obstetrics. Eighty-seven percentage of mothers had done sonogram test with out any health problems. Detailed quantitative studies are required in this area.

It was found that those mothers who delivered low birth weight babies consumed less amount of nutritious food like milk, fruits, egg, etc compared to others, which shows the poor economic background and low purchasing power.

Despite having a very low rates of neonatal mortality, prenatal mortality, infant mortality and child mortality, Kerala is having high rate of low birth weight. But morbidity rates are higher in Kerala(Panikar and Soman, 1984, Kannan et al, 1991), which may be due to the adverse effect of low birth weight in the case of child morbidity. The high literacy rate, easy accessibility to health care and other infrastructure facilities are higher in Kerala. Timely medical treatment was thus possible giving Kerala a low mortality rate.

Part vi

CONCLUSIONS

The percentage of low birth weight is high in Kadakampally village panchayath. The prevalence of 17.9 percent low birth weight babies found in this study, is consistent with previous studies of birth weight in Kerala. The study found significant association between birth weight and socio-economic status. The prevalence of low birth weight is high in the low socio-economic class and very low in the high socio-economic class. All those mothers who have income earning job have normal birth weight infants. The percentage of low birth weight is high in the weaker sections viz. scheduled caste and backward caste. The study also found significant association between birth weight and mothers' age at delivery. The low birth weight was seen high among the mothers who were in the lower age group less than 20 years and percentage of LBW found decreasing with increase in age. All the deliveries except two were institutional deliveries and percentage of LBW babies was high among those mothers delivered in government hospitals. 75.4 per cent of mothers had more than 10 ante natal check ups and a significant association found between birth weight and ante natal check ups, but the relation is negative.

Further quantitative studies relates to this area with large sample size are needed for framing plan and policy options.

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Appendix I

SREE CHITRA TIRUNAL INSTITUTE FOR
MEDICAL SCIENCES AND TECHNOLOGY
Acutha menon centre for health science studies
Thiruvananthapuram

SOCIO ECONOMIC AND DEMOGRAPHIC
FACTORS ASSOCIATED WITH BIRTH WEIGHT

HOUSEHOLD SCHEDULE

Schedule No

- 1 Panchayath : _____
2 PHC : _____
3 Sub centre : _____
4 Village & Ward No : _____
5 House hold No : _____
6 Name of Father : _____
7 Name of Mother : _____
8 Address : _____
: _____

9 Family Background:

Sl No	Name	Relation	Sex	Age	Education	Occupation	Income
-------	------	----------	-----	-----	-----------	------------	--------

Total numbers of members - - Total income from occupation - - - - -

10 Religion

1 Hindu 2 Christian 3 Muslim 4 Others (specify)

11 Caste

1 SC 2 ST 3 BC 4 Others (specify)

12 Type of family

1 Nuclear 2 Joint 3 Extended Nuclear

- 13 Roof of House : ---
 1 Thatched 2 Asbestos/Sheet 3 Tiled 4 Concrete
- 14 Wall of the House :-
 1 Thatch & Mud 2 Sheet/ Wood 3 Brick/ Stone 4 Brick/Stone (plastered)
- 15 Floor :-
 1 Mud & Cowdung 2 Polished 3 Cement 4 Mosaic
- 16 Floor area (Sq. Ft.) :-
 1 0-500 2 501- 1000 3 1001- 1500 4 1500+
- 17 Total landed property of the family
 Land Field Others Total
 Area in cents
 Income from the land
- 18 Income from other Investments
 Cattle Rented buildings Deposits Others
 Rs per month
- 19 Total family income Rs per month : - - - - - - - - - -
- 20 Age at marriage : - -
- 21 Age at first delivery : - -
- 22 Do you have child / children below one year --- (1 Yes 2 No)
- 23 Date of present delivery : - - - - - - - - - -
- 24 Sex of the baby : - (1 Male 2 Female)
- 25 Birth Weight of the baby : _ Kg _ _ _ Gm
- 26 Mode of delivery : --- 1 Normal 2 Caesarean 3 Others
- 27 Place of delivery :-
 1 Home 2 Private hospital 3 Govt. Hospital 4 Others (Specify)

28 Mothers age at the time of delivery : __

29 Mothers Height ----- (date -----) Weight ----- (date -----)

30 Total No of antenatal check ups : --

31 By Doctor :- Non- doctor --

32 Did you receive TT :- (1 Yes 2 No)

33 No of doses :- (1 One dose 2 Two doses)

34 Did you take I & F acid tablets :- (1 Yes 2 No)

35 No of tablets taken : ---

36 Gestation period :- Months -- days

37 Birth Order :-

38 Intervals of delivery(in months) :-

39 Total number of births :-

40 No of living children :-

41 No of sonogram test done :-

42)Reasons for the test
1 to3 months 3 to 6 months 6 to 9 months

43) Health condition

44) Amount of rice consumed

45) Other food items

46) Working conditions

Date of Survey --/--/--

Name of Investigator -----

Appendix II
List of Anganwadis

Location	Anganwadi number	No of respondents
Kallummoodu	81	14
Mathil muuku	82	12
All Saints College	83	18
Oruvathil kottah	84	13
Anayara Jn	85	13
Chulla road	86	13
Ulankuzhi	87	5
Anayara	88	11
Erode	89	11
Chennilode	90	21
Avittam road	91	8
Pump house Jn	92	16
Kudavoor	93	11
Karikkakm vayanasala	94	20
Chennilode	95	13
Oruvathilkottah Jn	96	13
Charummoddu	97	22
Karikkakam Temble	98	9
Venpalavattam	99	7
Nr. All Saints Jn	100	23
Karikkakam	101	14
Total		287

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