

MATERNAL SOCIODEMOGRAPHIC FACTORS INFLUENCING LOW BIRTH WEIGHT BABIES: A HOSPITAL BASED STUDY

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Abstract

Background: Birth weight is known to influence the survival and development of neonates. According to the World Health Organization (WHO), Low Birth-Weight (LBW) is weight at birth that is less than 2.5 kg. A LBW infant can be born too small (small for gestational age), too early (preterm) or both. Several epidemiological studies have shown that neonates with LBW have a disproportionately higher mortality compared to those with weight higher than 2.5 kg. Non-seasonal factors such as increasing maternal age, socio-economic factors, have been associated with LBW by several researchers. Interventions to reduce LBW will require an understanding of the associated fetal, maternal, prevailing environmental and socio-demographic factors. In view of less literature on Maternal factors influencing low birth weight babies in India, the current study was undertaken.

Objectives: 1) To estimate prevalence of low-birth-weight babies.

2) To determine the association between maternal sociodemographic factors and low birth weight.

Methods A hospital based cross-sectional study done over a period of one month duration in a Tertiary care Hospital-ASRAM Medical college, Eluru, Andhra Pradesh with a time bound Sampling technique. Mothers of low-birth-weight babies were included as study population. A self-administered, pre tested questionnaire was used for data collection. Data entered in Microsoft excel 2019 and analyzed using IBM: SPSS trial version. Chi square test was used for categorical variables.

Results Female neonates (55%) had more LBW than Male neonates (45%), Illiterate mothers (28%) had more LBW babies than Literate mothers (72%), Maternal Age, Weight had significant association with low-birth-weight babies. ($p < 0.05$).

Conclusion Low birth weight is prone to increased respiratory, cognitive, neurological and psychological dysfunction. From this study, Maternal Age, Weight had significant association with low-birth-weight babies. Hence, it is mandatory to educate the women of reproductive age about the impact of mother's nutritional status on the neonate.

Keywords: Sociodemographic factors, Neonates, Low Birth weight, Incidence, Risk factors, Gestational age

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I. Introduction

According to the World Health Organization (WHO), Low Birth-Weight (LBW) is weight at birth that is less than 2.5 kg. A LBW infant can be born too small (small for gestational age), too early (preterm) or both¹. Birth weight is known to influence the survival and development of neonates. Interventions to reduce LBW will require an understanding of the associated fetal, maternal, prevailing environmental and socio-demographic

factors² Birth weight is single most important marker of adverse perinatal and neonatal outcome². LBW shares significant portion of global neonatal mortality which is approximately 60-80% of total child mortality.⁴

Birth weight is known to influence the survival and development of neonates³. A LBW infant can be born too small (small for gestational age), too early (preterm) or both. Several epidemiological studies have shown that neonates with LBW have a disproportionately higher mortality compared to those with weight higher than 2.5 kg⁵. Non-seasonal factors such as increasing maternal age, socio-economic factors, have been associated with LBW by several researchers⁶. In view of less literature on Maternal sociodemographic factors influencing low birth weight babies in India, the current study was undertaken.

II. Objectives

1. To estimate the prevalence of low-birth-weight babies at a tertiary care center.
2. To determine the association between maternal sociodemographic factors and low birth weight babies.

III. Materials And Methods

Type of study: A hospital based cross-sectional study

Source of data: Mothers of low-birth-weight babies admitted in inpatient postnatal ward during the study period

Place of study: Department of pediatrics at Asram medical college, Eluru, Andhra Pradesh

Duration of study: 1 month, January 2025 to February 2025

Sample size: the sample size is 111 Mothers and the sampling method is time bound sample.

Eligibility:

Inclusion Criteria:

All emergency and elective c-section mothers admitted in Asram ELURU during the study period.

All mothers delivered through normal vaginal delivery admitted in Asram ELURU during the study period

Exclusion Criteria:

Mothers who were known cases of congenital heart diseases, chronic cardiac and respiratory illnesses, systemic illnesses like diabetes or hypertension.

Mothers with twin gestation, still birth babies and babies with major congenital anomalies

Mothers with systemic illness are known to influence the birth weight of the babies and congenital abnormalities also affect the weight of babies so these mothers were excluded from current study

Methodology:

After written informed consent was obtained, a well-designed questionnaire was used to collect the data of the recruited patients. The questionnaire used in the study was pretested among people from different areas and necessary modifications were made to make it more understandable. Prior to data collection, an elaborative briefing about the purpose of the study was done to study subjects. Data was collected from each subject by Personal interview method.

The questionnaire was administered by a single interviewer, a postgraduate student from the pediatrics department, to all participants in the study. It was translated into Telugu (the local language), and pretested prior to administration

A hospital based cross-sectional study done over a period of one month duration in a Tertiary care Hospital with a time bound Sampling technique

Data was collected from all eligible mothers regarding general information like age, religion, residence dietary history, occupation, parity, socioeconomic status and height and weight were recorded.

Data collected include gestational age at delivery, weight of baby and gender of the neonate

The first weight of the new born was obtained after birth. The weight was measured preferably within the first hour of life before significant postnatal loss of weight has occurred. Heavy objects like metal forceps, for occluding umbilical cord were omitted. Weight scales were checked at intervals for accuracy. The details of mothers who had delivered infants within the last 24 hours below 2500 grams were taken from the labour room and postnatal ward.

Parameters Assessed:

Gender,

Birth weight

Gestational Age;

Maternal weight;

Parity;

Socioeconomic status

Maternal systemic illness

Ethical aspects: Informed consent was obtained from parent of every participant in the study.

Statistical analysis: The collected data entered in Microsoft Excel 2019 and analysed using IBM-SPSS version 26 software, trial version.

The results were presented in the form of charts, tables. p value less than 0.05 was considered as statistically significant. Chi-square test was used wherever required to find out association between different variables.

IV. Results

During the study period, 111 Mothers met the inclusion criteria. Among these, prevalence of low-birth-weight babies and the association between maternal socio-demographic factors and low birth babies was studied.

Prevalence of Low-birth-weight babies:

Prevalence of Low birth weight is 25.2%. The birth weights are compared using frequency distribution curve

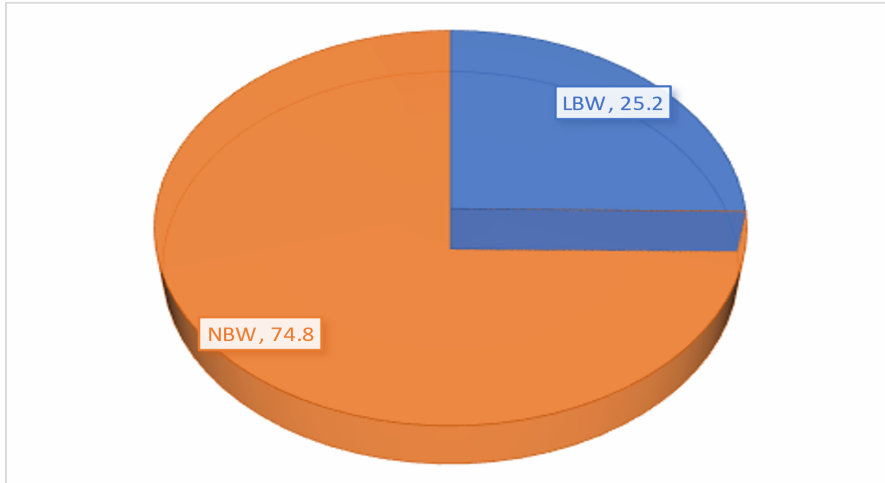


FIG:1: SHOWING THE FREQUENCY DISTRIBUTION OF STUDY SUBJECTS

ASSOCIATION BETWEEN MATERNAL SOCIODEMOGRAPHIC FACTORS AND LBW BABIES

TABLE.1: SHOWING ASSOCIATION BETWEEN MATERNAL AGE AND LBW BABIES

VARIABLE	LBW BABIES	NBW BABIES	CHI SQUARE VALUES(X ²)	DEGREE OF FREEDOM(df)	P VALUE
Maternal age					
≤ 25 yrs	19(37.3%)	32(62.7%)	7.239	1	0.01
>25 yrs	9(15%)	51(85%)			

TABLE.2: SHOWING ASSOCIATION BETWEEN MATERNAL HEIGHT AND LBW BABIES

VARIABLE	LBW BABIES	NBW BABIES	CHI SQUARE VALUES(X ²)	DEGREE OF FREEDOM(df)	P VALUE
Maternal height					
≤150 cm	17(85%)	3(15%)	46.21	1	0.01
>150 cm	11(12.1%)	80(87.9%)			

TABLE.3: SHOWING ASSOCIATION BETWEEN MATERNAL WEIGHT AND LBW BABIES

VARIABLE	LBW BABIES	NBW BABIES	CHI SQUARE VALUES(X ²)	DEGREE OF FREEDOM(df)	P VALUE
Maternal weight					
≤55 kgs	14(82.4%)	3(17.6%)	34.73	1	0.01
>55 kgs	14(14.9%)	80(85.1%)			

TABLE.4: SHOWING ASSOCIATION BETWEEN MATERNAL PARITY AND LBW BABIES

VARIABLE	LBW BABIES	NBW BABIES	CHI SQUARE VALUES(X ²)	DEGREE OF FREEDOM(df)	P VALUE
Maternal parity					
≤2	24(75%)	8(25%)	59.05	1	0.01
>2	4(51%)	75(94.9%)			

TABLE.5: SHOWING ASSOCIATION BETWEEN GESTATIONAL AGE AND LBW BABIES

VARIABLE	LBW BABIES	NBW BABIES	CHI SQUARE VALUES(X ²)	DEGREE OF FREEDOM(df)	P VALUE
≤37 wks	11(57.9%)	8(42.1%)	12.971	1	0.01
>37 wks	17(18.5%)	75(81.5%)			

TABLE.6: SHOWING ASSOCIATION BETWEEN SOCIOECONOMIC STATUS AND LBW BABIES

VARIABLE	LBW BABIES	NBW BABIES	CHI SQUARE VALUES(X ²)	DEGREE OF FREEDOM(df)	P VALUE
Socioeconomic status					
	2(11.1%)	16(88.9%)	29.203	3	0.01
	8(5.7%)	55(87.3%)			
	16(66.7%)	8(33.3%)			
	2(33.3%)	4(66.7%)			

TABLE.7: SHOWING ASSOCIATION BETWEEN MATERNAL EDUCATIONAL STATUS AND LBW BABIES

VARIABLE	LBW BABIES	NBW BABIES	CHI SQUARE VALUES(X ²)	DEGREE OF FREEDOM(df)	P VALUE
Maternal education					
Literate	6(9.2%)	59(90.8%)	21.081	1	0.01
Illiterate	22(47.8%)	24(52.2%)			

There is **no significant association** with maternal occupation, maternal dietary habits and sex of baby with low-birth-weight babies.

V. Discussion

As per the current study findings, the prevalence of low birth weight is 25.2%. and the risk factors for low birth weight include maternal age, height, weight, parity, socioeconomic status and educational status of mother. There is **no significant association** with maternal occupation, maternal dietary habits and sex of baby with low-birth-weight babies.

In a study conducted by Singh G et al at Armed forces medical college India as the BMI increase from <20 to >25, there is a fall in risk levels for LBW neonates similarly in my study there is association of maternal height and weight with low birth weight.

Isaiah Agorinya et al at identified maternal factors such as younger age, lower socio-economic status and single parenthood were major determinants of low birth weight⁶.

Borah M et al found high prevalence of LBW babies in rural areas of ASSAM and illiterate teenage mothers, grand multipara, anemic mothers were the important risk factors for LBW⁷.

There is a higher statistical significance when the maternal weight is compared to birth weight ($p < 50$ kg, low birth weight incidence is 59.3%, while the incidence in those weighing > 50 kg is 40.6%. This is similar to the studies done by Srinivas Prudhivi and Aras et al^{8,9}

There is higher significant association between height and low birth weight babies, our study showed that maximum number of low-birth-weight babies are delivered from short statured mother (height < 150 cm). This is similar to the studies done by S. Ganesh kumar¹⁰

The case-control study of 673 term LBW, 644 preterm LBW cases and 1465 controls showed that low maternal weight, poor obstetric history, lack of antenatal care, clinical anaemia and hypertension were significant independent risk factors for both term and preterm LBW. Short interpregnancy interval was associated with an increased risk of preterm LBW birth while primiparous women had increased risk of term LBW. Muslim women were at a reduced risk of term LBW, but other socioeconomic factors did not remain significant after adjusting for these more proximate factors. Estimates of the prevalence of risk factors from the population survey were used to calculate attributable risk. This analysis suggested that a substantial proportion of term and preterm LBW births may be averted by improving maternal nutritional status, anaemia and antenatal care^{11,12}

Limitations of the study:

study population is small and duration of study is less

Study conducted in Asram Eluru alone, so not a multicentric study hence the results cannot be generalized

VI.Conclusion

In present study there was significant association of low birth weight with mothers age (more common in younger age group <25), mothers weight and height, maternal parity (more common in primi). There is association with maternal socioeconomic status (more common in lower sections) and gestational age (more in preterms). Low birth weight is prone to increased respiratory, cognitive, neurological and psychological dysfunction. Hence, it is mandatory to educate the women of reproductive age about the impact of mother's sociodemographic factors on the neonate.

Conflicts of interest: Nil

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