International Journal on Science and Technology (IJSAT)
E-ISSN: 2229-7677 ● Website: www.ijsat.org ● Email: editor@ijsat.org

"A study to assess the knowledge regarding prevention of low birth weight babies among antenatal mothers attending antenatal clinic in a selected hospital, Mangaluru."

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Abstract

Background: Low birth weight (LBW) is one of the most serious challenges in maternal and child health, especially in developing countries such as India**.** The World Health Organization (WHO) defines Low birth weight as a birth weight of less than 2,500 grams, irrespective of the period of gestation. Low birth weight estimates shows that globally in 2020, 1 in 7 newborns (14.7% or 19.8 million newborns) were born with low birth weight. The 2025 global target of a 30% reduction of low birth weight compared to levels in 2012 levels is not on track to be met.

Objectives: The objectives of the study was to assess the knowledge regarding prevention of low birth weight babies among antenatal mothers attending antenatal clinic in a selected hospital, Mangaluru and to find the association of knowledge score with socio-demographical variables such as age, religion, educational qualification, occupation, monthly income, type of family, social habits, dietary patterns, previous history of baby born with low birth weight, number of children in the family, and source of information on prevention of low birth weight babies.

Materials and Methods: A non-experimental descriptive study. Purposive sampling technique was used to select 30 antenatal mothers. Data was collected using a self-structured knowledge questionnaire. The study was conducted in Antenatal clinic of selected Hospital at Mangaluru. Data was analysed by using descriptive and inferential statistics.

Results: The study findings revealed that among 30 antenatal mothers, 5(17%) had inadequate knowledge, 21(70%) had moderate knowledge and 4(13%) had adequate knowledge regarding prevention of low birth

weight babies. The mean knowledge score and standard deviation was 25.66±6.11 and mean knowledge score percentage was 64%. The majority of 21(70%) of antenatal mother had moderate knowledge regarding prevention of low birth weight babies. Significant association was found between the antenatal mothers knowledge with the education $x^2 = 15.86$ and previous history of baby born with low birth weight $x^2 = 6.084$ at P=0.05 level of significance. Hence the research hypothesis H_1 was accepted.

Conclusion

The study highlights the urgent need for effective educational programs to enhance antenatal mothers understanding of maternal nutrition, antenatal care and healthy practices during pregnancy to reduce risk of low birth weight.

Keywords: Low Birth Weight Babies, Prevention, Assess, Knowledge, Antenatal Clinic, Antenatal Mothers.

INTRODUCTION

Motherhood is a beautiful and joyous experience to a woman. The health of the mother during pregnancy is important to give birth to a healthy baby. The best and most precious gift a mother can give her baby is the gift of health. A healthy newborn infant is born between 38 and 40 weeks cries immediately after birth, establishes independent rhythmic respiration, quickly adapts with the extrauterine environment, has a normal birth weight of 2.5 to 3.9 kg and has no congenital anomalies. The period from birth to 28 days of life is called neonatal period and the infant in this period is termed as neonate or newborn baby. Low birth weight (LBW) is one of the most serious challenges in maternal and child health, especially in developing countries such as India**.** The World Health Organization (WHO) defines Low birth weight as a birth weight of less than 2,500 grams, irrespective of the period of gestation.

According to the WHO 2023 approximately 20 million low birth weight babies are born globally each year, representing 15.5% of all live births, with nearly 95.6% occurring in developing countries. The burden of low birth weight is concentrated in two major regions, Asia (72%) and Africa (22%), with India alone accounting for about 40% of low birth weight births in the developing world. Approximately 80% of all neonatal deaths and nearly 50% of infant deaths are associated with low birth weight. The United Nations children's Fund (UNICEF) and WHO in collaboration with the London School of Hygiene and Tropical Medicine (LSHTM) 2023 has released annual country, regional and global low birth weight estimates for 2000-2020. Low birth weight estimates shows that globally in 2020, 1 in 7 newborns (14.7% or 19.8 million newborns) were born with low birth weight. The 2025 global target of a 30% reduction of low birth weight compared to levels in 2012 levels is not on track to be met.

Low birth weight is a multifactorial phenomenon. both maternal and fetal factors are found significantly to be associated with the low birth weight .[13] The maternal factors responsible for low birth weight are preterm labour, multiple pregnancies, poor maternal nutrition, chronic health conditions (high blood pressure, diabetes, heart, lung, kidney problem), infection during pregnancy (cytomegalovirus, rubella, chickenpox, toxoplasmosis and sexually transmitted infections), not gaining enough weight during pregnancy, previous pregnancy with low birth weight baby , smoking , alcohol or drug abuse, age less than 17 or more than 35 years (between 15 and 19 years and between 35 and 40 years of age). Fetal factors include congenital anomalies, intrauterine growth restriction, genetic conditions, infections acquired in utero.

A cross-sectional study was conducted to describe the magnitude and associated factors of low birth weight in different districts of West Bengal. The sample was 2,611 pregnant women selected by multistage stratified cluster sampling technique. Semi structured questionnaires were used to collect the data. The study findings revealed that 21.49% infants were born with low birth weight. The risk of low birth weight was higher among women age less than 20 years and BMI less than 18.5 kg/m^2. The odd of giving low birth weight baby were higher among women having weight less than 45kg and height less than 150 cm. Anaemic (AOR 3.33) and hypertensive (AOR 1.69) women were more likely to develop low birth weight infant. Preterm delivery (AOR 1.93) and history of chronic illness (AOR 2.09) were the determinants of low birth weight. The odd of low birth weight was higher among women who never followed antenatal clinic visit (AOR 1.35). The likelihood of giving low birth weight baby was higher among women who did not consume iron and folic acid tablets and additional diet during pregnancy. More low birth weight babies were observed among women from low socioeconomic family, rural residence and illiterate. The study concluded that various sociodemographic, maternal and household environmental variables were risk factors for low birth weight.

The management of a low birth weight baby often involves NICU care, exclusive breastfeeding, maintaining proper temperature, kangaroo mother care, specialized feeding (sometimes through a tube), infection prevention, and consistent home care, which is best provided by the mother. Preventing premature birth remains, one of the most effective ways to reduce low birth weight. Regular prenatal check-ups are essential to monitor the health of both mother and baby, while a balanced diet and adequate weight gain during pregnancy support healthy fetal growth. Avoiding alcohol, smoking, and harmful drugs is crucial, as these can negatively affect the mother and increase the risk of low birth weight.

The investigator during clinical experience observed that many mothers unaware about the care during pregnancy and the measures to prevent many pregnancy complications including low birth weight babies. The researcher reviewed various research articles and found that improper antenatal care, imbalanced nutrition and lack of antenatal clinic visits are key predictors to having low birth weight baby. Hence, the investigator felt the need to assess the knowledge of antenatal mothers regarding prevention of low birth weight babies and the necessity to provide an information booklet on prevention of low birth weight babies.

The objectives of the study were to:

- Assess the knowledge regarding prevention of low birth weight babies among antenatal mothers.
- Find the association of knowledge score with socio-demographical variables such as age, religion, educational qualification, occupation, monthly income, type of family, social habits, dietary patterns, previous history of baby born with low birth weight, number of children in the family, and source of information on prevention of low birth weight babies.
- Prepare an information booklet regarding prevention of low birth weight babies.

Materials and Methods

The present study was a quantitative descriptive research study conducted in antenatal clinic of a selected hospital at Mangaluru from January 2024 to September 2025. The study population comprised of antenatal mothers who have met inclusion criteria, including 1st 2nd and 3rd trimester pregnancy and mothers who are not willing to participate were excluded. A total of 30 antenatal mothers were selected using a non-probability purposive sampling technique to ensure feasibility and timely data collection. Structured

knowledge questionnaire in either Kannada or English was administered based upon their language comprehension. The questionnaire consists of two parts. First part was the socio-demographic data of antenatal mothers and the second part was structured knowledge questionnaire regarding prevention of low birth weight babies. The collected demographic data and knowledge score of the antenatal mothers were analysed using descriptive statistics such as percentage, frequency, mean and standard deviation. The "chi-square test" was used to find the association of knowledge scores with various demographic variables. The data obtained was coded, tabulated and analysed using both descriptive and inferential statistics. P value less than or equal to 0.05 level was considered statistically significant.

Results:

- Frequency and percentage distribution of 30 antenatal mothers according to their socio-demographic data showed that the Majority of 15(50%) were in the age group of 26-30 years, 27 (90%) belonged to Muslim religion, 15 (50%) had graduate level of education, 21(70%) were engaged as homemakers, 12 (40%) had a monthly income of above Rs 25001/-, 17 (57%) belonged to joint family, 30(100%) none of them had any bad habits, 30(100%) were non vegetarians, 27(90%) were not having previous history of baby born with low birth weight, 18(60%) were having no children, 13(43%) got information by other sources like family and friends. (Table 1)
- Frequency and percentage distribution of antenatal mothers' knowledge level revealed that, among 30 antenatal mothers 5(17%) had inadequate knowledge, 21(70%) had moderate knowledge and 4(13%) had adequate knowledge regarding prevention of low birth weight babies. (figure 1)
- The knowledge distribution of prevention of low birth weight babies among 30 antenatal mothers showed that mean knowledge score with standard deviation was 25.66±6.11 and the mean knowledge score percentage was 64% regarding prevention of low birth weight babies. (Table 2)
- Item wise analysis of knowledge score among 30 antenatal mothers regarding knowledge of low birth weight babies revealed that, 25(83%) antenatal mothers lacked knowledge about meaning of low birth weight, 20(67%) had no knowledge about low birth weight babies more common among, 19(63%) were not aware about the ideal total weight gain during pregnancy, 17(57%) did not know about a sexually transmitted disease leads to a low birth weight baby. 29 (97%) possessed knowledge about prominent maternal factor of low birth weight. 24 (80%) were aware about maternal factors which causes low birth weight, 21(70%) had knowledge about factor contributing to low birth weight baby, 20(67%) were aware about characteristics of low birth weight.
- Item wise analysis of knowledge score among 30 antenatal mothers regarding importance of antenatal diet revealed that 27(90%) did not know about the recommended intake of protein, 25(83%) were not aware about the recommended intake of carbohydrates,21(70%) were unaware about primary role of folic acid in antenatal diet and recommended intake of iron in antenatal diet , 16(53%) did not know regarding the recommended daily intake of folic acid in antenatal diet and the good source of vitamin D. 28 (93%) were knew about good source of protein in antenatal diet, 27(90%) were aware about good source of folic acid in antenatal diet, 25(83%) were possessed knowledge about good source of calcium in antenatal diet, 23(77%) were knew about the term antenatal refers to, good source of carbohydrate in antenatal diet and antenatal diet is the diet taken, 22 (73%) were aware about deficiency of iron in diet during pregnancy, 19(63%) were know about good source of iron in antenatal diet.

- Item wise analysis of knowledge score among 30 antenatal mothers regarding antenatal checkup revealed that 26(87%) did not know that anaemia occurs when haemoglobin level is less than, 24(80%) were unaware about minimum number of antenatal checkups, 27(90%) were knew about purpose of antenatal checkup and haemoglobin is checked to rule out, 26 (87%) were aware about benefit of regular antenatal checkup and administration of TT injection to prevent, 19(63%) were knew about first dose of TT given.
- Item wise analysis of knowledge score among 30 antenatal mothers regarding care during antenatal period revealed that, 18(60%) were unaware about frequency of drinking water during pregnancy. 30(100%) were knew about frequency of brushing teeth, 29(97%) were aware about following exercise benefit for pregnant women, 26(87%) were knew about recommended position of sleeping, mother can used to get support, and importance of brushing teeth during pregnancy, 24(80%) were aware about number of hours pregnant women should sleep, pregnant women should avoid sleeping at back, and type of water recommended during bathing, 21(70%) were knew about importance of drinking water during pregnancy.
- Significant association was found between the antenatal mother's knowledge with the education $\mathbf{x^2}$ = 15.86 and previous history of baby born with low birth weight $\mathbf{x^2}$ =6.084 at P=0.05 level of significance. Hence the research hypothesis H_1 was accepted (Table 3)

Table 1: Sociodemographic data of antenatal mothers

N=30

Characteristics	**categories**	**N**	**%**
Age(years)	21-25	8	27
	26-30	15	50
	31 and above	7	23
Religion	Hindu	3	10
	Muslim	27	90
Educational qualification	Secondary	3	10
	Undergraduate	12	40
	Graduate	15	50
Occupation	Homemaker	21	70
	Private Job	9	30
Monthly income	Less than 15000/-	3	10
	Rs 15001-20000/-	10	33
	Rs 20000-25000/-	5	17
	Rs 25001 and above	12	40
Type of family	Nuclear	12	40
	Joint	17	57
	Extended	1	3
Social habits	No bad habits	30	100
Dietary pattern	Non vegetarian	30	100

Previous history of baby born with low birth weight	Yes	3	10
	No	27	90
No of children in the family	1	7	23
	2	3	10
	3 or more than 3	2	7
	No	18	60
Source of information	Mass media	10	33
	Health care profession	5	17
	Newspaper	2	7
	others	13	43

Figure. 1 Assessment of knowledge regarding prevention of low birth weight babies among antenatal mothers

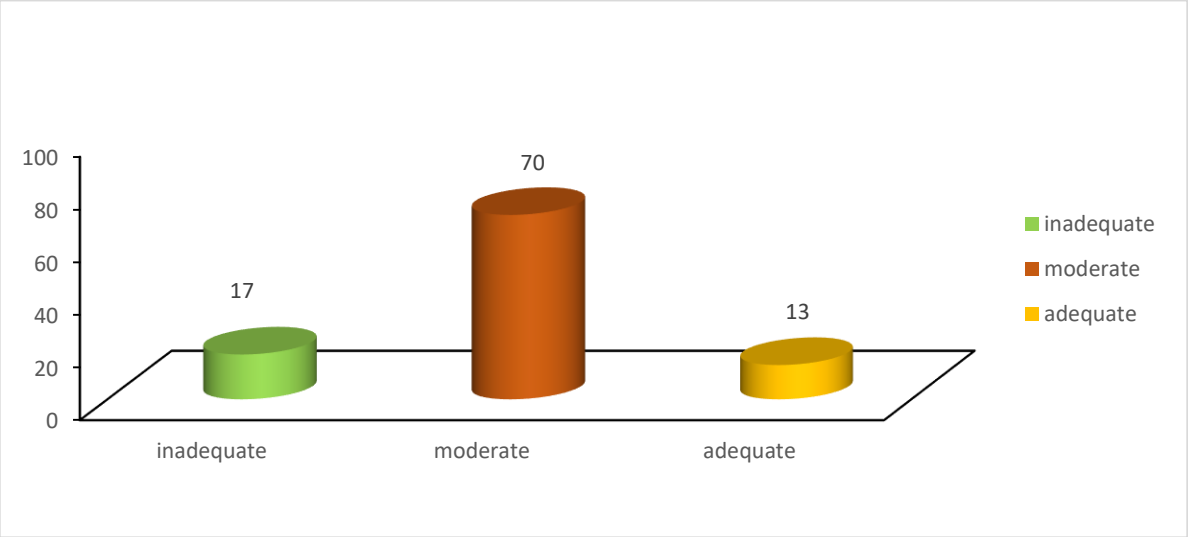

Table. 2 Area wise knowledge score of prevention of low birth weight babies among antenatal mothers

N=30

SI No	Area	Max Score	Mean Score	Standard deviation	Mean percentage%
1.	Knowledge regarding low birth weight babies	8	4.4	1.4	55
2.	Knowledge regarding importance of antenatal diet	14	8.2	2.03	58

3.	Assessment of knowledge regarding antenatal checkup	8	5.0	1.09	62.5
4.	Knowledge regarding care during antenatal period	10	8.06	1.59	80
	Total	40	25.66	6.11	64

Table. 3 Association between the knowledge of antenatal mothers and sociodemographic variables.

N=30

Variables	**Adequate**	**Moderate**	**Inadequate**	**Df**	**Chi square value (x^2)**	**Result**
Age in years						
Less than 20	0	0	0	6	1.542	NS
21-25	2	6	1			
26-30	1	11	3			
31 and above	1	4	1			
Religion						
Hindu	0	2	1	6	0.9945	NS
Christian	0	0	0			
Muslim	4	19	4			
Any other	0	0	0			
Educational qualification						
Primary education	0	0	0	6	15.868	S
Secondary education	0	2	1			
undergraduate	0	10	2			
Graduate	3	10	2			
Occupation						
Cooli worker	0	0	0	6	0.374	NS
Homemaker	3	14	4			
Private job	1	7	1			
Government job	0	0	0			
Monthly income						
< 15000	0	3	0	6	5.718	NS
15001-20000	0	7	3			

20001-25000	1	3	1			
>25001	3	8	1			
Type of family						
Nuclear	2	9	1	6	5.921	NS
Joint	2	12	3			
Extended	0	0	1			
Specify any other	0	0	0			
Social habits						
Drug abuse	0	0	0	6	0	NS
smoking	0	0	0			
Alcohol consumption	0	0	0			
No bad habits	4	21	5			
Dietary pattern						
Vegetarian	0	0	0	2	0	NS
Non vegetarian	4	21	5			
previous history of baby born with low birth weight						
Yes	0	1	2	2	6.084	S
No	4	20	3			
No of children in the family						
1	0	4	3	6	4.498	NS
2	1	2	0			
3 or more	1	1	0			
No	2	14	2			
Source of information						
Mass media	3	6	1	6	7.948	NS
Health care profession	1	2	2			
newspaper	0	2	0			
Others	0	11	2			

Note: S- Significant, NS- No Significant.

DISCUSSION

- In the present study, distribution of 30 antenatal mothers according to their socio-demographic data showed that the Majority of 15(50%) were in the age group of 26-30 years, 27 (90%) belonged to Muslim religion, 15 (50%) had graduate level of education, 21(70%) were engaged as homemakers, 12 (40%) had a monthly income of above Rs 25001/-, 17 (57%) belonged to joint family, 30(100%) none of them had any bad habits, 30(100%) were non vegetarians, 27(90%) were not having previous history of baby born with low birth weight, 18(60%) were having no children, 13(43%) got information by other sources like family and friends. The findings was consistent with the study conducted in the Maharashtra among mothers revealed that the majority, 61 (61%), were in the age group of 21–25 years, 51 (51%), had completed secondary education. 50 (50%), reported medical personnel as their primary source of health information. In terms of income, 48 (48%) belonged to families earning ₹5,000–10,000 per month. With respect to occupation, most of the participants, 79 (79%), were housewives, and the majority, 72 (72%), belonged to joint families.
- In the present study, assessment of knowledge regarding prevention of low birth weight babies among antenatal mothers revealed that, among 30 antenatal mothers 5(17%) had inadequate knowledge, 21(70%) had moderate knowledge and 4(13%) had adequate knowledge aligned with the study conducted in Nellore among antenatal mothers revealed that 12(40%) mothers had average knowledge, 16(53%) had inadequate knowledge and 2(6.7%) had adequate knowledge.
- The present study revealed that significant association was found between the antenatal mother's knowledge with the education $\mathbf{x^2}$ = 15.86 and previous history of baby born with low birth weight $\mathbf{x^2}$ =6.084 at P=0.05 level of significance. There was no association between the other variables and knowledge level of antenatal mothers. Hence the research hypothesis H1 was accepted. This is supported by a Maharashtra study, found a statistically significant association (x^2=13.60) (p=0.05) found with educational qualification and knowledge level.

DELIMITATIONS

The study was limited to mothers who can read and write Kannada or English, willing to participate in the study, present at the time of data collection.

CONCLUSION

The investigator during clinical experience observed that many mothers unaware about the care during pregnancy and the measures to prevent many pregnancy complications including low birth weight babies. The researcher reviewed various research articles and found that improper antenatal care, imbalanced nutrition and lack of antenatal clinic visits are key predictors to having low birth weight baby. Hence, the investigator felt the need to assess the knowledge of antenatal mothers regarding prevention of low birth weight babies and the necessity to provide an information booklet on prevention of low birth weight babies.

ACKNOWLEDGEMENT

The authors thank the study participants who are actively participated in this study and cooperated throughout the study process. The authors also thank the management of Yenepoya specialty hospital for giving permission to conduct this study.

DECLARATIONS

Disclosure of conflict of interest- No conflict of interest

Statement of informed consent- informed consent was obtained from all individual participants included in the study.

Funding- self funding sources

Ethical approval- the study was approved by the institutional ethics committee

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