

Assess the maternal factors associated with Birth weight of newborn

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Abstract

An exploratory study was conducted to assess maternal factors associated with Birth Weight of newborn in selected Hospital, Indore. A total of 50 antenatal mothers were selected through convenient sampling technique. An interview schedule was conducted using structured questionnaire to collect the data. Content validity of the tools determined by an expert. Both descriptive and inferential statistics were used for data analysis. The results of current study reveals that there were significant association found between Maternal factors like Monthly income of the family, weight gain during Pregnancy, Hemoglobin level of the mother, Total No. of ANC visits, anemia with birth weight of newborns. There is no significant association found among other factors. Study concluded that maternal factors (Socio demographic Variables, General Health Assessment, Obstetric History, Medical Ailments during Pregnancy, Nutritional Assessment) can affect the weight of the babies.

Keywords: Aases; Mothers; Maternal factors; Birth weight; Newborn.

1 Introduction

Birth weight is a major factor in determining child survival, future physical growth, mental development; it is also sensitive to changes in the physical and socio- demographic status of the mother. In addition, the incidence of LBW babies is linked to maternal nutritional status. The quality of the maternal diet is related to level of education and income, and affects the health status of the mother. Moreover, the fear of experiencing a difficult labor and birth prompts some pregnant women to restrict their food intake during the third trimester. There are other cases in which low income and /or demanding physical labor of expectant mothers seem to be significant factors that result in LBW babies. LBW occurred in 60% of prenatal deaths, and in those deaths occurring within the first week of life, the incidence of LBW was 71%. As a rule , LBW might constitute the single most important factor affecting neonatal mortality and morbidity, as evidenced by the fact that LBW babies are 40 times greater contributors to neonatal mortality and morbidity. Even if a LBW baby survives, it is likely to suffer a high incidence of malnutrition, diarrhea, acute respiratory infection, infectious disease, Neuro development problems such as cerebral palsy, and physical defects. In addition, LBW also determines the postnatal mental, physical and neurological development of children. (Hardeep Kaur, 2013)⁵.

A healthy mother brings forth a healthy baby. The well-being of the newborn depends upon the health of the mother. Throughout pregnancy every mother would have good health and every pregnancy may ultimately result in a healthy mother and a healthy baby¹. The mother has to take special care to make sure child is born healthy and happy. Newborns are the most vulnerable members of society². Preventing newborn deaths and improving newborn health and survival go hand in hand with promoting safer motherhood.

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1.1 Need of the study

Today's children are tomorrow's citizens of country. Numbers of factors like maternal socio-environmental and genetic factors are responsible for the normal health, development and survival of children. Birth weight is one of the important factors for the survival, growth and development of child

Krammer has identified 43 potential factors for low birth weight. The factors vary from one area to another area, depending on geographic area, socioeconomic and cultural factors. Thus it is important to identify factors prevailing in an area responsible for low birth weight, so as to plan a strategy to tackle this problem. The low birth weight is considered as a sensitive index of nation's health and development.

1.2 Problem statement

"An exploratory study to assess maternal factors associated with Birth Weight of newborn in selected Hospital, Indore".

Objectives

- To assess the general health status of the antenatal mother.
- To assess the obstetrical condition of antenatal mother.
- To determine the pregnancy induced medical ailments during pregnancy.
- To assess nutritional aspect of the mother.
- To find out the association between selected demographic variables with birth weight of newborn.
- To find out the association between selected general health status with birth weight of newborn.
- To find out the association between obstetric history with birth weight of newborn.
- To find out the association between pregnancies induced medical ailments with the birth weight of newborn.
- To find out the association between selected nutritional aspect with the birth weight of newborn.

1.3 Hypotheses

- H1:-There is significant association between selected socio demographic variables with birth weight of newborn at the level $p < .05$
- H2:-There is significant association between selected general health statuses with birth weight of newborn at the level $p < .05$
- H3:-There is significant association between obstetric histories with birth weight of newborn at the level $p < .05$
- H4:-There is significant association between pregnancy induced medical ailments with birth weight of newborn at the level $p < .05$
- H5:-There is significant association between selected nutritional aspects with birth weight of newborn at the level $p < .05$

1.4 Conceptual framework

The conceptual framework of the present study is based on the general system theory with input, process, output and feedback. This theory was first introduced by Ludwig Von Bertalanffy (1968) (Fig: 1, page no.8).

2 Material and methods

2.1 Research Design

Exploratory research design

2.2 Population

Antenatal Mothers in their ninth of pregnancy and going to be delivered in the selected hospital of Indore.

2.3 Sampling technique

The samples were selected from convenient sampling technique.

2.4 Sample size

50 mothers.

2.5 Setting

Govind Vallabh Panth District Hospital.

Tool: The tool for collection of data for this study consisted of three sections.

2.5.1 Section I: Socio demographic Variables

First part of the first section consisted of a structured interview schedule to collect baseline data, regarding socio demographic variables of antenatal women such as age, education, employment status of mother, type of family, religion, family income, gravida, parity, and contraceptive use before pregnancy

2.5.2 Section II: Structured questionnaire to assess maternal factors associated with birth weight of newborn.

It consists of four parts:

Section II (a) General health assessment

It consists of 10 items to assess general health status of antenatal mother.

Section II (b): Obstetric history of Multi Para mother

It consists of 6 items to assess obstetric history of Multipara mothers.

Section II (c): Medical ailment during pregnancy

It consists of 6 items to assess medical ailments during pregnancy.

Section II (d): Nutritional assessment

It consists of 12 items.

2.5.3 Section III: Outcome of pregnancy

- Low birth weight newborns
- Normal weight Newborns

2.6 Validity and reliability of tool

The prepared tool along with statement, objectives, and hypothesis and criteria checklists was given to 6 experts for establishing content validity. The reliability of the tool was obtained by split half method. It was calculated by Karl Pearson correlation coefficient i.e. =

2.7 Data collection procedure

Written permission was obtained from the Civil Surgeon, Medical officer of Govind Vallabh Panth District Government Hospital, Indore prior to the data collection. A total of 50 antenatal mothers coming to Labor room for Delivery were selected, by convenient sampling technique. The actual data collection period was from 4th April 2014 to 30th April 2014. The study was carried out as that in pilot study. Prior to the study, informed consent was obtained and confidentiality was assured to the subjects. The average time taken for each section was:

- Section A- 3 minutes,
- section B (I) – 7 minutes,
- section B (ii) – 4 minutes,
- section B (iii) – 4 minutes,
- section B (iv) – 7

The average time for interviewing each subject was 20 -25 minutes. After delivery of the mothers the birth weight of newborn was recorded.

3 Result

- The findings of the study indicated that that out of 50 antenatal mother's majority of mother's i.e. 49 (98%) belonged to age group 18-29 yrs. and whereas 1 (2%) mother belongs to age group \geq 30yrs.
- Out of 50 antenatal mothers 26 were having high school education, 11(22%) were not went to school, 7 (14%) were having higher sec and above education and 6(12%) were having primary education.
- Majority of antenatal mother's i.e. 43(86%) were housewives, less than 1/4th i.e. 4(8%) were employed and 3(6%) were laborer.
- Majority of mothers i.e. 32(64%) belongs to joint family while 18 (53%) belongs to Nuclear family.
- Out of 50 antenatal mothers' majority of mothers i.e., 37 (74%) were having family income between 5000-10,000Rs/month, 9 (18%) were having family income \geq 10,000Rs/month and 4 were having family income less than 5000 Rs/month.
- More than 3/4th i.e. 39 (78%) mothers belongs to Hindu religion, 1/4th i.e. 11(22%) belongs to Muslim religion and none of them belonged to other religion.
- Out of 50 antenatal mother's more than half of the mother's i.e. 27(54%) had I gravida, 16 (32%) had II gravida, 4(8%) had \geq IV gravida and 3 (6%) had III gravida.
- More than 1/2 of the mothers i.e. 30 (60%) were in I parity, more than 1/4th i.e. 16(32%) were in II parity, and 2(4%) in III and IV parity.
- Almost 40(80%) mothers said they were not using contraceptive before pregnancy and rest 10(20%) mothers said they were using contraceptive before pregnancy.
- Out of 50 antenatal mother's majority of antenatal mother's i.e.46 (92%) having Height greater than 145 cm whereas 4(8%) mothers having height less than 145 cm.
- More than 3/4th i.e. 35(70) % of antenatal mothers had weight gain between 7 to10kg whereas as 9(18%) mother had weight gain below 7 kg.4 (8%) had between 10 to < 12 kg and 2(4%) had 12 kg and above weight gain during pregnancy.
- Out of 50 antenatal mother halves of the mother i.e.,26 (52%) having Hemoglobin level less than 10 gm/dl whereas half the mother i.e., 24 (48%) having Hemoglobin greater than 10gm/dl.
- Nearly to 3/4th 32(64%) antenatal mother had BMI less than 19.8kg/m² whereas 17 (34%) had BMI between 19.8 to 26kg/m² and 1 (2%) had 26kg/m².
- Out of 50 antenatal mother's 26(52%) were taking adequate night rest whereas 24(48%) were taking night rest less than 8hrs.
- All the 50 (100%) antenatal mothers received T.T. vaccination.
- Almost all the 47 (94%) of antenatal mothers were not using tobacco whereas 3 (6%) were using it.
- More than half of the mothers i.e., 28(58%) were taking 2hrs rest during day time whereas 22(44%) of the mothers were taking less than 2hrs rest during day time.
- All the antenatal mothers had done their antenatal registration i.e. 50 (100%).
- Majority of the antenatal mother's had more than 4 Visits i.e., 44(88%) whereas 6 (12%) were had less than 4 visits.
- Out of 50 antenatal mothers 22 were multi-Para mothers and out of 22 antenatal mothers 16 (72.7%) mothers were not having any history of abortion whereas 6(27.3%) were having history of abortion.
- 21(95.45%) mothers were not having any history of preterm labor whereas 1(4.5%) mother having.
- None of the antenatal mothers i.e. 22(100%) were having any history of multiple pregnancies.
- Out of 22 multi mother 14 (63.65%) mothers were having history of LBW babies whereas 8(36.35%) were not having history of LBW Babies.
- None of the antenatal mothers i.e. 22(100%) were having any history of still birth.
- Half of the i.e., 12(54.55%) antenatal mothers having birth spacing more than three years between two children whereas 10(45.45%) mothers having less than three years spacing between two children.
- Out of 50 antenatal mothers 1/2 of the mothers i.e., 25(50%) were having anemia whereas 1/2th of the mother's i.e. 25(50%) were not having anemia during pregnancy.
- Majority of the antenatal mothers' i.e. 46 (92%) were not having PIH whereas 4(8%) mothers had PIH during pregnancy.
- None of the antenatal mother's i.e.50 (100%) was having Gestational Diabetes Mellitus during pregnancy.
- More than 3/4 mothers i.e.,48 (96%) was not having Antepartum hemorrhage whereas 2(4%) had during pregnancy.
- Almost all the mothers i.e., 44(88%) were not having Oligohydramnios whereas 6(12%) had during pregnancy.
- More than 3/4 mothers i.e.,48 (96%) was not having Polyhydramnios whereas 2(4%) had during pregnancy.

- Out of 50 antenatal mother's majority of the mothers i.e. 43(86%) were taking more than 8 cereals exchanges while 7(14%) mothers were taking less than 8 exchanges.
- Majority of the mothers i.e., 48(96%) were taking less than 2 exchange of pulses/ day whereas 2(4%) were taking greater than 2 exchanges. Almost all of the mothers i.e.,48 (96%) were taking greater than 2 exchanges of vegetables whereas 2(4%) were taking less than two exchanges per day.
- 29(58%) of the mothers were taking less than two fruit exchanges whereas 21(42%) were taking more than two exchanges/day.
- Most of the mothers i.e., 34 (69%) were taking less than 2 exchanges of milk and milk products exchanges whereas 16 (32%) were taking more than 2 exchanges /day.
- 36(32%) mothers were using 5 tsp of sugar /day whereas ¼ of the mothers using less than 5 tsp of sugar.
- Out of 50 antenatal mothers more than 1/2 of the mothers i.e. 28(56%) were using more than 8 tsp of oil for cooking whereas 22(44%) were using less than 8 tsp of oil.
- 36(72%) of mothers were not taking salad in their meal whereas 24(48%) were taking salad along with food.
- Most of the mothers i.e., 35(70%) were taking less than 8 glasses of water/day whereas 15(30%) were taking more than 8 glasses of water/day.
- Majority of mothers i.e., 49(98%) mothers had taken the iron and calcium supplement during their pregnancy whereas 1 mother (2%) had not taken it.
- Nearly half of the mothers i.e., 20(40%) were taking less than 1800 calorie /day, more than 1/4th i.e., 11(22%) were taking between 2000 to < 2200kcal/day, 8(16%) were taking between 1800 to <2000kcal/day whereas 4(8%) were taking greater than >2200 kcal/day.
- Out 50 antenatal mothers 15(30%) mothers gave birth to low birth weight newborns and 35(70%) mothers gave birth to normal weight newborns.
- All 50 (100%) antenatal mothers belong to age group 18-29yrs out of which 34(68%) mothers gave birth to normal weight newborns whereas 15(30%) gave birth to low birth newborns and the association between age of the mother and birth weight of newborns was found not significant.
- out of 50 antenatal mothers 19(38%) and 7(14%) mothers gave birth to normal weight newborns and low birth newborns respectively studied up to high school and the association between education and birth weight of newborns was found not significant.
- There is no significant association found between selected demographic variables i.e. with employment status of the mother, type of family and religion with birth weight of newborn at the level $p \leq 0.05$.
- Out of 37 (74%) mothers 28 (56%) and 9(18%) mothers gave birth to normal and low birth weight having monthly income between 5000-10,000Rs/month respectively while out of 9 mothers having monthly income equal to and more than 10,000 Rs/month 7(14%) and 2(4%) mothers gave birth to normal and low birth newborns whereas 4(8%) mothers having monthly income less than 5000Rs/month gave birth to low birth weight newborn it shows that as the monthly income of family increases the percentage of low birth decreases. There is significant association found between selected demographic level i.e., with monthly income of the family and birth weight of newborn at the level of $\leq .05$ at the df 2.
- There is no significant association found between selected demographic variables i.e. with gravida, parity, contraceptive use before pregnancy and birth weight of newborns.
- Out of 50 mothers 10(20%) mothers who had below 7 kg weight gain during pregnancy out of which 9(18%) and 1(2%) gave birth to low birth newborn and normal weight newborn.27(54%) and 7(14%) gave birth to normal weight newborn and low birth newborn who had weight gain between 7 to < 10 kg. There is significant association found between selected general health status with birth weight of newborn i.e., weight gain during pregnancy at the level $p \leq 0.05$ at df 3. It shows as the mother's weight increases during the pregnancy the chance of having low birth weight newborn decreases.
- Out of 50 antenatal mothers 14 (28%) and 12 (24%) gave birth to normal and low birth weight newborn respectively having Hb less than 10gm/dl while 21(42%) and 3(6%) having Hb more than 10 gm/dl gave birth to normal and low birth weight newborn respectively. There is significant association found between hemoglobin levels of the mother at the level of $p \leq 0.05$ at df 1. It shows as mothers Hemoglobin increases chance of having low birth newborn decreases.
- There is no significant association found between mother's heights with birth weight of newborn.
- Out of 50 antenatal mothers 23 (46%) and 9 (18%) mothers having BMI less than 19.8 kg/m² gave birth to normal weight newborn and low birth weight newborn respectively. There is no significant association found between the Mothers Pre pregnant BMI, Night rest and T.T vaccination with birth weight of newborns.
- Out of 50(100%) antenatal mothers 6(12%) were having less than 4 ANC visits out of which 5(10%) & 1 (2%) mother gave birth low birth weight newborn and normal weight newborn respectively and association found significant. It shows that as the No. Of ANC visits increases the incidence of having low birth weight newborn

decreases. There is no significant association found between using tobacco, day time rest (hrs/day), and antenatal registration with birth weight of newborn.

- There is no significant association found between selected obstetric history of Multipara mothers i.e. history of abortion, history of preterm labor and history of multiple pregnancy, history of previous low birth weight babies, history of still birth and birth spacing between two child less than 3 years with birth weight of newborn.
- Out of 50 antenatal mothers 25(50%) mothers not having anemia out of which 22(44%) & 3(6%) gave birth to normal and low birth newborn respectively. 25(50%) mothers who are having anemia out of which 13(26%) and 12 (24%) gave birth to normal weight and low birth newborns respectively and association found statistically significant. It shows that mothers who were anemic are prone to give low birth newborn. There is no significant association found selected medical ailments during pregnancy i.e. Pregnancy induced hypertension, gestational diabetes mellitus, Antepartum Hemorrhage, Oligohydramnios, Polyhydramnios with birth weight of newborn.
- There is no significant association between selected nutritional aspect i.e. with iron and calcium supplement with birth weight of newborns. Out of 50 antenatal mothers 12(24%) and 9(18%) mothers taking less than 1800 kcal/day gave birth to normal and low birth weight newborns respectively. 8(16%) and 4(8%) mothers taking between 1800 to < 2000 gave birth to normal and low birth weight newborns.

4 Discussion

4.1 Association between selected socio demographic variables with birth weight of newborns

The findings revealed that, there is significant association found between the selected socio demographic variables like monthly income of the family with birth weight of newborns at the level $P \leq 0.05$.

Above findings was supported by the study done by Naeem Aasma, Huma Zille et al. (2013) I conducted study conducted cross section descriptive case study in department of Obstetrics and Gynecology Unit-IV, Sir Ganga Ram Hospital, Lahore 20th March 2007 to 20th March 2008 to identify the association of maternal bio-social, medical and obstetric risk factors with low-birth-weight babies. 100 pregnant women by Non probability convenience sampling were selected. All pregnant women at term (between 37-42 week) pregnant women with previous history of chromosomally abnormal baby or congenital abnormal baby, diagnosed case of any autoimmune disorder were excluded. After obtaining consent from hospital ethic committee, informed written consent was taken from each patient before including her in study. The socio-demographic information like name, age, socio economic status, level of education and address were obtained. LMP, EDD, DOP calculation was taken, age of last born child was asked, history of gravidity, parity was recorded. The history of maternal illness like hypertension, diabetes, and anemia was obtained. BMI was calculated by recording weight and height. The subject was examined for positive signs of anemia, hypertension, and obesity. The fetal outcome was recorded in term of fetal weight. The factors like maternal education (inter-birth interval, low BMI, Maternal Socio-economic status had significant effect in causing low birth weight. It is concluded from this study that maternal malnutrition, illiteracy, low family income, close birth spacing have strong association with low birth weight.

4.2 Association between selected General health assessments with birth weight of newborns

The findings revealed that, there is significant association found between the selected general health assessments i.e. weight gain during pregnancy, hemoglobin level of the mother, and total no of ANC Visits with birth weight of newborns at the level $P \leq 0.05$.

Above findings were supported by the study done by Singh S. D., Shrestha S. et al. Conducted hospital based case control study in Dublike hospital to identify the risk factor of LBW among the babies, Kavre, Nepal from Jan 1st 2008 to 30th May 2010. A total of 401 cases and an equal number of age matched controls were taken to assess the different risk factors of the mother for LBW babies. Among the case and the control group, maternal hemoglobin ($p < 0.001$), maternal height ($p < 0.001$), maternal weight gain ($p < 0.0001$), number of ANC visits ($p < 0.0001$) were statistically significant. However with regards to ethnicity, nutrition during pregnancy, parity and age of the mother the association were insignificant. Ethnic group, nutrition during pregnancy, age of mother and parity was found to be statically insignificant for LBW. Study concluded that maternal height, hemoglobin, total weight gain and ANC visit to be the significant risk factors contributing to LBW.

4.3 Association between obstetric history of antenatal mothers with birth weight of newborns

The findings revealed that, there is no significant association found obstetric history i.e. history of abortion, history of preterm labor, history of multiple pregnancies, history of still birth, birth spacing between two child with birth weight of newborns at the level $P \leq 0.05$.

Above findings were supported by the study done by Idris Zafar Mohammad, Gupta Anuradha, (2000) conducted Cross-sectional study to study the incidence of low birth weight and its association with maternal health in Queen Mary Hospital, K G Medical College, Luck now An appropriate sample of 934 mothers was to be drawn by systematic random sample method by including all the mothers delivering on alternate days during the months of August to April Mothers were interviewed next day of delivery and the available health records were reviewed. A pre-tested schedule was used to record them information regarding identification of mothers, their relevant bio-social variables, past obstetrical history, complications of pregnancy, illness during pregnancy, utilization of antenatal care, history of dietary intake and nature of physical activity during pregnancy, along with the birth weight and sex of new born The information, thus collected, was analyzed and tested for statistical significance Overall incidence of low birth weight was 32.2% and mean birth weight 2669.7gmsk447 S D High incidence of LBW was found to be significantly associated with maternal complications of current pregnancy, past obstetric history, maternal diseases, ANC status, dietary intake and nature of work during pregnancy.

5 Conclusion

The results of current study reveals that there were significant association found between Maternal factors like Monthly income of the family, weight gain during Pregnancy, Hemoglobin level of the mother, Total No. of ANC visits, anemia with birth weight of newborns. There is no significant association found among other factors. Study concluded that maternal factors (Socio demographic Variables, General Health Assessment, Obstetric History, Medical Ailments during Pregnancy, Nutritional Assessment) can affect the weight of the babies.

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