

Correlation between Maternal Parameters and Obstetric Outcome among Women Admitted in Antenatal Wards

Anjali KA¹, Aneesha VB²

Author Affiliation: ¹PG Scholar (M.Sc. Nursing), ²Assistant Professor, Obstetrics and Gynaecological Nursing, Amala College of Nursing, Thrissur, Kerala 680555, India.

Abstract

Pregnancy is a unique, exciting and often joyous time in a woman's life, as it highlights the woman's amazing creative and nurturing powers while providing bridge to the future. The growing foetus depends entirely on its mother's healthy body for all needs. Consequently, pregnant women must take steps to remain as healthy and well-nourished as they possibly can [1]. Maternal health is the health of women during pregnancy, childbirth, and the postpartum period. Generally, adequate prenatal care encompasses medical care, educational, social, and nutritional services during pregnancy [1].

The present study was aimed to assess the correlation between selected maternal parameters and obstetric outcome among women admitted in antenatal wards for delivery in Amala Institute of Medical Sciences, Thrissur District. The objectives of this study were to assess the selected maternal parameters of women admitted in antenatal wards for delivery, to assess the obstetric outcome among women after delivery, to find the correlation between selected maternal parameters and obstetric outcome, to find the association between selected maternal parameters and selected baseline variables and to find the association between obstetric outcome and selected baseline variables. The research approach was quantitative and the research design adopted was descriptive correlational design. One hundred and thirty antenatal women were selected by convenience sampling technique. Data was collected using structured questionnaire to assess the selected baseline variables and data sheet to assess the maternal and neonatal variables. The study was based on Nola J Pender's Health Promotion Model (HPM). The result showed that there is a positive correlation between parity and birth weight ($r = 0.16$), period of gestation & gestational age of baby which is significant at $p < 0.001$, period of gestation & birth weight ($r = 0.02$), BMI & gestational age of baby ($r = 0.02$) and BMI & birth weight significant at $p < 0.05$ ($p = 0.02$). There is an association between period of gestation & mode of delivery ($p < 0.05$), parity & age in years ($p < 0.001$), period of gestation & age in years ($p < 0.05$), BMI & economic status of the family ($p < 0.05$) and mode of delivery & age in years ($p < 0.05$).

Keywords: Selected Maternal Parameters; Obstetric Outcome; Antenatal Women; Health Promotion Model; Bmi.

Reprint Request: Aneesha VB, Assistant Professor, Obstetrics and Gynaecological Nursing, Amala College of Nursing, Thrissur, Kerala 680555, India.

E-mail: aneeshasadan@gmail.com

Introduction

Maternal and child health is very important in public health, influencing the development of the family and the community. Mother and infant protection has a priority in the health field because these groups are the most exposed to sickness and death, consequently to their low reactivity to the environmental factors and to their high responsiveness to the disorders [8].

In 2015 there were about 135 million births globally. About 15 million were born before 37 weeks of gestation, while between 3-12% were born after 42 weeks of gestation. Preterm complications are the leading cause of death among children under 5 years of age. Advanced maternal age has been associated with an increased risk of obstetrical complications [4].

Malnourished women are more prone to deliver low birth weight babies and have pregnancy complications. Perinatal mortality and prematurity rates were found to be high among short statured women. Women among developing countries like India are undernourished, and their dietary energy intake is not adequate to compensate their heavy physical workload during pregnancy [5].

India has reported high prevalence of anemia in pregnancy. The incidence of low birth weight babies was significantly more in mothers who were anemic in their third trimester. Preterm deliveries occurred more frequently in mothers who were anemic in their second and third trimesters. The incidence of low birth weight babies was significantly more in mothers who were anemic in their third trimester. Preterm deliveries occurred more frequently in mothers who were anemic in their second and third trimesters. Due to physiological changes during pregnancy, iron requirements increases, thus exacerbating the prevalence of anaemia [8].

A retrospective cohort study was conducted on association between maternal anemia and pregnancy outcomes among 1007 pregnant women who delivered in 5 medical colleges at Assam, India. Study showed that maternal anaemia was associated with low birthweight, small-for-gestational age babies and perinatal death. 35% (n=351) pregnant women had moderate to severe anaemia [15].

An observational study was conducted on maternal body mass index with maternal and perinatal outcome in Ballari, Karnataka with 500 cases for a period of one year. Result showed that 15% were underweight, 68% had normal BMI, 12%

were over-weight and 5% cases were obese (BMI >30kg/m²). The patients with low BMI had higher incidence of low birth weight (40%) and perinatal deaths. Increased BMI category was associated with higher incidence of macrosomal babies (32%), low APGAR (24%) and perinatal deaths (12%) [12].

Birth weight is an important parameter, which could be indicative of the immediate viability of the neonate and the state of maternal health and nutrition during pregnancy. The survival of infants and their growth and development largely depend on birth weight [9].

Understanding the effect of maternal parameters on obstetric outcome has public health importance because these indicators are associated with infant health and survival and influence the development and health in their later life [4].

Statement of the Problem

A study to assess the correlation between selected maternal parameters and obstetric outcome among women admitted in antenatal wards for delivery in Amala Institute of Medical Sciences, Thrissur District.

Objectives

1. Assess the selected maternal parameters of women admitted in antenatal wards for delivery
2. Assess the obstetric outcome among women after delivery.
3. Find the correlation between selected maternal parameters and obstetric outcome.
4. Find the association between selected maternal parameters and obstetric outcome.
5. Find the association between selected maternal parameters and selected baseline variables
6. Find the association between obstetric outcome and selected baseline variables.

Hypotheses

H1: There will be significant correlation between selected maternal parameters and obstetric outcome.

H2: There will be significant association between selected maternal parameters and obstetric outcome.

H3: There will be significant association between selected maternal parameters and selected baseline variables.

H4: There will be significant association between obstetric outcome and selected baseline variables.

Methodology

Research approach: Quantitative research approach.

Research design: Descriptive correlational design.

Setting: Amala Institute of Medical Sciences, Thrissur.

Sample: women admitted in the antenatal wards for delivery who meet the inclusion criteria in Amala Institute of Medical Sciences, Thrissur District.

Sample size: 130 samples.

Sampling technique: Convenience sampling technique.

Inclusion Criteria: All antenatal women who have completed 37 weeks of gestation admitted in antenatalwards for delivery in Amala Institute of Medical Sciences, Thrissur District.

Exclusion Criteria: Antenatal women with high risk conditions such as- gestational diabetes mellitus, pregnancy induced hypertension, thyroid disorders, rheumatic heart disease.

Data collection Tools

Three tools were used in the study.

Tool I: Consist of two sections

Section A: Selected baseline variables consist of age in years, educational status, occupational status, economic status of family and dietary pattern.

Section B: Maternal variables- LMP, EDD, parity, BMI, gestational age and haemoglobin level.

Neonatal variables- mode of delivery, gestational age of baby, APGARscore and birth weight.

Tool II: Ballard scoring

Tool III: APGAR scoring.

Data collection method

Data collection is the gathering of information from the sample unit. A formal permission was obtained from the Director, Amala Institute of Medical Sciences Thrissur District, Principal Amala College of nursing Thrissur District to conduct the study. The samples were collected according to the inclusion criteria using convenience sampling technique. 130 samples were selected. After a brief introduction, the investigator explained the purpose of the study and obtained informed consent from the samples. The structured questionnaire, to assess the selected baseline variables were recorded by the investigator. Haemoglobin level, LMP, EDD were recorded from the medical

records of the antenatal women. Height and weight measurement were taken by the investigator. BMI and period of gestation were calculated by the investigator and entered in the datasheet to assess maternal variables. After the delivery, mode of delivery, birth weight and Apgar score of the baby at 1st minute were recorded from the medical records of the antenatal women. Gestational age of baby was calculated from the Ballard scoring and entered in the data sheet to assess the neonatal variables. The subjects were comfortable and cooperated well during the study. The investigator expressed her sincere gratitude for their co-operation.

Results

The major findings of the study are as follows

1. Findings related to selected baseline variables of the study population.

- In the study population majority of antenatal women (43.1%) belongs to the age group of 20-24 years and 25-29 years.
- Considering the educational status (43.1%) antenatal women were having degree education.
- Regarding the occupational status (55.4%) antenatal women were housewives.
- Regarding the economic status of the family (63.8%) antenatal women were in APL category.
- Among 130 antenatal women (97.7%) were taking mixed diet.

2. Findings related to selected maternal variables of the study population.

- In the study population majority of antenatal women (45.4%) were second parous.
- Regarding the period of gestation majority of antenatal women (78.5%) were with 39-40 weeks of gestation.
- Regarding BMI (48.5%) antenatal women were having over weight.
- Among 130 antenatal women (69.2%) were having normal level of haemoglobin.

3. Findings related to the obstetric outcome of the study population.

- In the study population majority of antenatal women (71.5%) had normal vaginal delivery.
- Regarding the gestational age of baby (83.1%)

babies were full term.

- Among 130 babies all (100%) were having normal weight.
- Regarding Apgar score at 1st minute all (100%) babies were with no depression.

4. Findings related to correlation between selected maternal parameters and obstetric outcome.

Table 1: Correlation between parity and gestational age of baby and birth weight. (n=130)

Variables	Mean	SD	Spearman's rank Correlation (rs)	p-Value
Gestational age of baby	39.377	0.799	-0.236	0.007*
Birth weight	3.0896	0.339	0.163	0.063

* Significant at 0.05 level.

Table 1 reveals that Rank Correlation Coefficient (rs) value of parity with gestational age of baby is -0.236 and p value is 0.007. There is a negative correlation between parity and gestational age of baby which is statistically significant. It also shows that parity with birth weight is 0.163 and p value is 0.063. There is a positive correlation between parity and birth weight.

Table 2: Correlation between period of gestation and gestational age of baby and birth weight. (n=130)

Variables	Mean	SD	Pearson's Correlation Coefficient (r)	p-Value
Gestational age of baby	39.377	0.799	0.802	0.0001**
Birth weight	3.0896	0.339	0.021	0.812

**significant at 0.001 level.

Table 2 reveals that Correlation Coefficient (r) value of period of gestation with gestational age of baby is 0.802 and p value 0.0001 and of birth

5. Findings related to association between selected maternal parameters and obstetric outcome.

Table 5: Association between parity and period of gestation with mode of delivery. (n=130)

Variables	Mode of delivery			Fisher's exact test value	P-Value
	Normal vaginal delivery	Instrumental delivery	Caesarean section		
Parity					
Primi	40	3	12	5.87	0.053
Multi	53	0	22		
Period of gestation					
37-38 weeks	15	0	2	9.556	0.049*
39-40 weeks	72	1	29		
41-42 weeks	6	2	3		

*significant at 0.05 level.

weight is 0.021 and p value is 0.812. There is a positive correlation between period of gestation with gestational age of baby and birth weight. Period of gestation with gestational age of baby is statistically significant.

Table 3: Correlation between BMI and gestational age of baby and birth weight. (n=130)

Variables	Mean	SD	Pearson's Correlation Coefficient (r)	p-Value
Gestational age of baby	39.377	0.799	0.016	0.860
Birth weight	3.0896	0.339	0.203	0.021*

*significant at 0.05 level.

Table 3 reveals that Correlation Coefficient (r) value of BMI with gestational age of baby is 0.016 and p value is 0.860 and birth weight is 0.203 and p value is 0.021. Hence there is a positive correlation between BMI with gestational age of baby and birth weight. BMI with birth weight of baby is statistically significant.

Table 4: Correlation between haemoglobin level and gestational age of baby and birth weight. (n=130)

Variables	Mean	SD	Pearson's Correlation Coefficient (r)	p-Value
Gestational age of baby	39.377	0.799	-0.077	0.383
Birth weight	3.0896	0.339	-0.165	0.812

Table 4 reveals that Correlation Coefficient (r) value of haemoglobin level with gestational age of baby is -0.077 and p value 0.383 and of birth weight is -0.165 and p value is 0.061. Hence there is a negative correlation between haemoglobin level with gestational age of baby and birth weight.

Table 5 shows the fisher’s exact value of mode of delivery with parity is 5.87 and p value is 0.053 and period of gestation is 9.56 and p value is 0.049. There is an association between period of gestation with mode of delivery and statistically significant. The association between parity with mode of delivery is not statistically significant.

Table 6 shows the fisher’s exact value of mode of delivery with BMI is 5.151 and p value is 0.272 and haemoglobin level is 1.130 and p value is 0.889. The association between BMI and haemoglobin level with mode of delivery is not statistically significant.

6. Findings related to association between maternal parameters and selected baseline variables.

Table 7 shows the Fisher’s exact value of parity with age in years is 31.45 and p values is 0.0001 and educational status is 7.438 and p value is 0.114. Hence the association between parity with age in years is

statistically significant. The association between parity with educational status is not statistically significant.

Study findings revealed that

- There is an association between parity and age in years.
- There is an association between period of gestation and age in years.
- There is an association between BMI and economic status of the family.

7. Findings related to association between obstetric outcome and selected baseline variables

- Study findings revealed that
- There is an association between mode of delivery and age in years.

Table 6: Association between BMI and haemoglobin level with mode of delivery. (n=130)

Variables	Mode of delivery			Fisher’s exact test value	P-Value
	Normal vaginal delivery	Instrumental delivery	Caesarean section		
BMI					
Normal	30	0	10	5.151	0.272
Over weight	45	3	15		
Obesity	18	0	9		
Haemoglobin level					
Normal range	63	2	25	1.130	0.889
Mild anemia	26	1	7		
Moderate anemia	4	0	2		

Table 7: Association between parity with age in years and educational status.

Variables	Parity		Fisher’s exact test value	p-Value
	Primi	Multi para		
Age in years				
20-24	38	18	31.45	0.0001**
25-29	17	39		
≥30	0	18		
Educational status				
High school	2	8	7.438	0.114
Pre-degree/higher secondary school	9	22		
Degree	30	26		
Postgraduate	8	11		
Professional/ technical	6	8		

**significant at 0.001 level.

Recommendations

1. A similar study can be conducted with retrospective and prospective research design.
2. A longitudinal study can be conducted on association between selected baseline variables and selected maternal parameters, selected baseline variables and obstetric outcome.
3. A similar study can be replicated with larger samples from different settings.

Conclusion

Based on the study findings, it is concluded that selected maternal parameters such as parity, period of gestation, BMI and haemoglobin levels are correlated with obstetric outcome such as mode of delivery, gestational age of baby, birth weight and Apgar score of the baby. During the reproductive period and pregnancy, creating awareness among women regarding the nutritional intake, weight gain and prevention of complications important to prevent maternal, perinatal and infant morbidity and mortality and to promote a healthy obstetric outcome.

References

1. Maternal health care in India: A crisis beyond control. Posted on February 2, 2011. Available from: <https://www.youthkiawaaz.com/2011/02/maternal-health-care-india/>.
2. WHO. National strategies for overcoming micronutrient malnutrition. Document EB 1991; 89/27. Executive Board, 89th Session.
3. Bisai S. Maternal anthropometry and birth outcome among Bengalis in Kolkata. Institute of development studies Kolkata; April 2009.
4. Kaur M, Chauhan M, Manzar MD and Rajput M M. Maternal anaemia and neonatal outcome: A prospective study on urban pregnant women. Res. 2015 Dec;9(12):QC04-QC08. Published online 2015 Dec1. Doi: 10.7860/JCDR/2015/14924.6985. PMID: PMC4717682.
5. Kumar A, Chaudhary K, Prasad S. Maternal indicators and obstetric outcome in the north Indian population: a hospital-based study. J Postgrad Med. 2010 Jul-Sep;56(3):192-5.
6. Iron deficiency anemia: Re-examining the nature and magnitude of the publichealth problem. Proceedings of a conference. Belmont, Maryland, USA; J Nutrition 2001;131:5635-7038. May 21-24, 2000.
7. Selma M, Taffel. Maternal Weight Gain and the Outcome of Pregnancy. Division of vital statistics. The national vital statistics system series 21, No. 44. United States; 1980.
8. Child birth. Available from: <https://en.wikipedia.org/wiki/Childbirth>.
9. Tharihalli C, Thathagari V. Study of correlation between maternal body mass index with maternal and perinatal outcome. Received: 21 October 2016. DOI: Available from: <http://dx.doi.org/10.18203/2320-1770.ijrcog20164650>. Accepted: 17 November 2016.
10. Srinivasan P. The relationship between maternal anemia and birth weight in new born. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS). 2015 Dec;14(12 Ver. IV):09-11. Available from: www.iosrjournals.org.
11. Polit DF, Beck CT. Nursing Research: Generating and assessing evidence for Nursing practice, Ninth edition, Lippincott Williams and Wilkins, 487-492.
12. Giri A, Srivastav V R, Suwall A and Tuladhar A S. Advanced maternal age and obstetric outcome. Nepal Medical College Journal. 2012;15(2):87-90.
13. Khalil A, Syngelaki A, Maiz N, Zinevich Y and Nicolaidis K H. Maternal age and adverse pregnancy outcome: a cohort study. Ultrasound Obstetrics & Gynaecology. 2013;42:634-43. Published online in Wiley Online Library (wileyonlinelibrary.com). DOI: 10.1002/uog.12494.
14. Verma A, Shrimali L. Maternal body mass index and pregnancy outcome. Journal of Clinical and Diagnostic Research. 2012 Nov;6(9):1531-33. DOI: 10.7860/JCDR/2012/4508.2551.
15. Addo VN. Body mass index, weight gain during pregnancy and obstetric outcomes. Ghana medical journal;2010;44(2).