Pregnancy Outcomes in Bauchi Central Zone: A Comparison of ANC Attendees and Non-Attendees in General Hospitals

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ABSTRACT

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| **Aims:** this study was designed to evaluate the pregnancy outcomes among pregnant women in Bauchi Central Zone of Bauchi State.**Study design:** The study employed a retrospective descriptive.**Place and Duration of Study:** The study was carried out among pregnant women who had ANC and also delivered their babies or were brought to the Hospital at the onset of labour or during child birth from 1st January 2022 to 31st December 2022.**Methodology:** The instrument for data collection was a designed proforma which was used to extract information from patient antenatal cards, ANC registers, labour and delivery registers. The collected data were analyzed via SPSS Version 22.**Results:** The findings of the study show that less than one-third of the respondents 60(30.30%) were between ages 21-25 years, while majority were married and 76(38.38%) attained secondary education. The outcome of the pregnancy showed fewer maternal and foetal deaths among the Booked than the Unbooked pregnancies.**Conclusion:** In conclusion, the study showed eventful pregnancy among women with booked antenatal when compared with women with unbooked pregnancy. The study therefore recommends improving the availability and accessibility of quality antenatal and delivery care services in our environment to improve pregnancy outcome. |

*Keywords: Antenatal Care, Booked Pregnancy, Unbooked Pregnancy, Pregnancy outcome*

1. INTRODUCTION

Globally, it is estimated that more than 61.8 million women suffer from significant ill health annually as a result of childbearing (Koblinsky et al., 2008). Effort to reduce maternal mortality and morbidity have so far focused on preventive approaches, such as antenatal care, tetanus toxoid immunization, training of traditional birth attendants (TBA), and family planning. Akhter (2006) observed that essentially, all pregnant women are at risk of serious complications during pregnancy and childbirth, and maternal mortality can be avoided if mothers with such complications receive adequate and timely medical management identified during ANC visits. It is important to look into the apparent connection that exists between quality antenatal care and pregnancy outcomes among mothers.

Many mothers in Bauchi State and in the country at large have to grapple with number of problems in having quality antenatal care services, some of these problems fall within the sphere of influence of the mothers, while others fall outside areas of their influence. For instance, mothers of child bearing age in Bauchi State can be faced with other problems that cause having poor quality antenatal care services. These problems may include: Lack of finance, lack of knowledge, inaccessibility to health facility and inadequate number of qualified staff at the health facilities.

Globally, it is estimated that approximately 15 percent of women will develop a life-threatening complication so every woman and her family should have a plan for skilled attendant at birth, the place of birth and how to get there including how to access emergency transportation if needed, items needed for the birth, money saved to pay the skilled provider and for any needed mediations and supplies, support during and after the birth (e.g. family, friends) and potential blood donors in case of emergency (WHO/UNICEF, 2013).

**Problems associated with pregnant women**

Hypertensive Disorders of Pregnancy

Hypertensive disorders of pregnancy represent a group of conditions associated with high blood pressure during pregnancy, proteinuria and in some cases convulsions. It is estimated worldwide that approximately 12% of all maternal deaths is caused by hypertension, particularly eclampsia (convulsions) (WHO, 2013).

**Safe Motherhood Initiative (SMI)**

Safe motherhood is a situation in which no woman going through physiological processes; of pregnancy/childbirth suffers any injury, loose her life or that of her baby.

The incidence of maternal mortality and morbidity has become a public health concern which led to the first international conference on safe motherhood in Nairobi, Kenya in 1987. The WHO, UNICEF, WORLD BANK, UNFPA, USAID, etc, spearheaded the launching of Safe Motherhood Initiative (SMI). The program goal was to reduce by half maternal mortality rates by the year 2010. Eight years later, when a review was made, progress was said to be negligible, this was the consequence of strategic misjudgments, lack of obvious evidence of change and political apathy.

In Bauchi State there is paucity of information on pregnancy outcomes. Therefore, this study is an attempt to identify the quality antenatal care services received by pregnant women in Bauchi Central Zone of Bauchi State.

**Objective of study**

To identify pregnancy outcomes of women attended ANC and those that did not attend ANC but brought during the onset of labor and delivered at the Hospital in Bauchi Central zone

Ho1, There is no significant relationship between quality antenatal care (ANC) and pregnancy outcomes

2. material and methods

**Study Design**

 Retrospective cohort study was used for this study.

**Scope of Study**

This study was limited to pregnant women (15-49 years) attended ANC at General Hospitals in Bauchi Central Zone of Bauchi State

**Study Area**

Bauchi Central Zone comprised six (6) LGAs but the study was restricted in four main LGAs that includes Ningi LGA, Ganjuwa LGA Darazo LGA and Misau LGA, with a total population of 1,448386 as at 2006 National Population Census

**Study Population**

The population for this study was women who had (ANC) and who also delivered their babies or were brought to the Hospital at the onset of labor or during child birth between 1st January 2017 to 31st December 2017.

Source of data: Medical record office from various Local Government Areas (2017).

Sample Size

The minimum sample size was calculated based on the Yaro Yamane’s formula for sample size determinant

n = Z2 Pq

 d2

Where

n = minimum sample size

Z = 1.96 at 95% confidence interval

P = 11.3% i.e. the minimum acceptable quality of care received by ANC attendees from a previous study

q= 100 - p

d = degree of accuracy desired (0.05)

N = number of population

n = 3.8416 x 11.3 x 88.7

 52

n = 154

N = 48300

Using the finile correlation formula for proportions

n = n0

 (n0 – 1)

1 +

 N

Where

n0 = calculated sample size

n = 154

 (154 – 1)

 1 +

 48300

20 % will be added to the calculated sample size to adjust for non response

q = 1

 1 – f

q = 1.25

Multiplying the adjustment factor by the sample size will give us 153 x 1.25 = 191.25 approximately 200

Proportionate allocation (sample size for each facility)

Ningi General Hospital = 13500 x 200

 48300

 = 56

Ganjuwa General Hospital = 12800 x 200

 48300

 = 53

Darazo General Hospital = 11500 x 200

 48300

 = 48

Misau General Hospital = 10500 x200

 48300

 = 43

= 200

**Sampling Technique**

Method and instrument of Data collection: mixed methods approach was used including: (a) Retrospective cohort study of quality of care provided to women aged 15–49 years who had completed their ANC and delivered in 2017; (b) in-depth interviews with health professionals. The Instrument for the data collection will be antenatal cards, ANC registers, labor and delivery registers.

**Research Instrument**

 A structured questionnaire was used for this study

**Method for Data Analysis**

Data was manually selected out and coded for analysis using the statistical package for social science (SPSS) version 22, it was summarized using descriptive statistics and chi-square test associations between categorical variables

**Validity**

To determine the validity of the instrument, the researcher gave the questionnaire to his supervisors to ascertain the face validity of the instrument.

**Reliability**

The reliability index was determined using cronbach’s alpha test of internal consistency (SPSS Version 22).

3. results and discussion

According to Table 1 below, less than one-third 60(30.30%) of the respondents were between the ages of 15-20 years followed by respondents in ages 26-30 years 51(25.76%), 21-25 years 50(25.25%) and 31-35 years 28(14.14%) respectively. Furthermore, majority of the respondents 188(94.95%) were married, while most 170(85.86%) practice Islam as their religion and above half of the respondents 102(51.52%) were from Hausa tribe. In addition, more than one-third of the respondents 76(38.38%) attained secondary education, followed by Primary education 57(28.79%) and 40(20.20%) had no formal education. Similarly, more than half of the respondents 106(53.54%) were unemployed, followed by self-employed 61(30.81%) and 31(15.66%) were civil servants.

**Table 1: Socio-demographic characteristics of the respondents**

|  |  |  |
| --- | --- | --- |
| Variables | Frequency (N=198) | Percentage |
| Age (Years)15-2021-2526-3031-3536-40 | 605051289 | 30.3025.2525.7614.144.55 |
| Marital StatusMarriedDivorced | 18810 | 94.955.05 |
| ReligionChristianIslamTraditional | 1817010 | 9.0985.865.05 |
| EthnicityHausaFulaniIgboYoruba | 1028574 | 51.5242.933.542.02 |
| Educational StatusNo formal EducationPrimarySecondaryTertiary | 40577625 | 20.2028.7938.3812.63 |
| OccupationUnemployedSelf employedCivil servant | 1066131 | 53.5430.8115.66 |

As shown in Table 2 below, the mode of delivery of booked pregnancy were spontaneous vertex delivery 41(66.13%) and caesarean section 21(33.87%). The outcome of the pregnancies was mother alive and well 181(91.41%) and maternal death 17(8.59%). The maternal death of the booked pregnancies was caused by eclampsia 2(11.76%), severe malaria 2(11.76%) and severe anaemia 1(5.88%), while the maternal death for the unbooked pregnancy were caused by postpartum haemorrhage and eclampsia 4(23.53%), severe anaemia 3(17.65%).

The fetal outcome for the booked pregnancy were baby alive and well 132(66.67%), fresh still birth 2(1.01%) and low birth weight 1(0.51%). In addition, the fetal outcome for the unbooked pregnancy were baby alive and well 52(26.26%), fresh still birth 5(2.53%) and low birth weight 3(1.52%).

**Table 2: Pregnancy Outcome**

|  |  |  |
| --- | --- | --- |
| Variable | Frequency | Percentage |
| Mode of delivery of booked pregnancySpontaneous vertex deliveryCaesarean section | **N=136**12214 | 89.7110.29 |
| Mode of delivery of unbooked pregnancySpontaneous vertex deliveryCaesarean section | **N=62**4121 | 66.1333.87 |
| Outcome of these pregnanciesMother alive and wellMaternal Death | **N=198**18117 | 91.418.59 |
| If the outcome was maternal death, what caused it(Booked)EclampsiaSevere MalariaSevere AnaemiaIf the outcome was maternal death, what caused it(Unbooked)Postpartum hemorrhageEclampsiaSevere AnaemiaUnknown Cause | **N=17**2214431 | 11.7611.765.8823.5323.5317.655.88 |
| What was the outcome of pregnancy (fetal outcome) (Booked)Baby alive and wellFresh still birthLow Birth WeightPreterm What was the outcome of pregnancy (fetal outcome) (Unbooked)Baby alive and wellFresh still birthLow Birth WeightPreterm  | **N=198**13221152532 | 66.671.010.510.5126.262.531.521.01 |

**Hypotheses**

**Hypothesis one:** There was no significant difference between the quality of ANC and maternal pregnancy outcome.

According to Table 3 below, all the pregnant women with desirable quality of antenatal care 149(75.30%) had good maternal outcome with the mother alive and well as compared with the pregnant women with undesirable quality of antenatal care who had 17(8.60%) maternal death. In addition, there was a significant association between the quality of antenatal care and the maternal outcome of the pregnancy at P<0.05.

**Table 3: Association between the quality of ANC and Maternal Pregnancy Outcome**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Quality of ANC | Maternal outcome of the pregnancy | Chi-Square Value | df | Sig. |
|  | Mother alive & well | Maternal Death | 56.549 | 1 | 0.000 |
| Undesirable | 32(16.20%) | 17(8.60%) |
| Desirable | 149(75.30%) | 0(0.0%) |

P = 0.05

 **Hypothesis two:** There was no significant difference between the quality of ANC and fetal outcome of the pregnancy

Similarly, Table 4 shows that as it was with the maternal outcome majority of the pregnant women 143(72.20%) with desirable quality of ANC had good fetal outcome with their babies alive and well. Furthermore, there was a significant association between the quality of ANC and fetal outcome of the pregnancy with a pregnant woman having desirable ANC is more likely to give birth to a baby alive at P<0.05.

**Table 4:** **Association between the quality of ANC and Fetal Pregnancy Outcome**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Quality of ANC | Fetal outcome of the pregnancy | Chi-Square Value | df | Sig. |
|  | Baby alive & well | Fresh Still Birth | Low Birth Weight | 8.490 | 2 | 0.014 |
| Undesirable | 41(20.70%) | 4(2.0%) | 4(2.0%) |
| Desirable | 143(72.20%) | 3(1.50%) | 3(1.50%) |

P = 0.05

**Hypothesis three:** There was no significant difference between the booked and unbooked pregnancy and maternal pregnancy outcome

According to Table 5 below, more than two third of the pregnant women 133(67.20%) with booked pregnancy had good maternal outcome with the mother alive and well after giving birth as compared pregnant women with unbooked pregnancy who recorded some 14(7.10%) maternal death. Furthermore, there was a significant association between whether a pregnant woman had booked or unbooked pregnancy with the maternal outcome after giving birth at P<0.05.

**Table 5:** **Association between the type of pregnancy and Maternal Pregnancy Outcome**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type of pregnancy | Maternal outcome of the pregnancy | Chi-Square Value | df | Sig. |
|  | Mother alive & well | Maternal Death | 22.524 | 1 | 0.000 |
| Booked | 133(67.20%) | 3(1.50%) |
| Unbooked | 48(24.20%) | 14(7.10%) |

P = 0.05

**Hypothesis four:** There was no significant difference between the booked and unbooked pregnancy and fetal outcome of the pregnancy

As shown in Table 6 below, pregnant women with booked pregnancy and almost all with unbooked pregnancy had good fetal outcome after giving birth. However, the association was not significantly different at P>0.05.

**Table 6:** **Association between the type of pregnancy and Fetal Pregnancy Outcome**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type of pregnancy | Fetal outcome of the pregnancy | Chi-Square Value | df | Sig. |
|  | Baby alive & well | Fresh Still Birth | Low Birth Weight | 3.359 | 2 | 0.002 |
| Booked | 124(62.60%) | 7(3.50%) | 5(2.50%) |
| Unbooked | 60(30.30%) | 0(0.0%) | 2(1.0%) |

P = 0.05

**Discussion**

The findings of the study show that most of the patients were between the ages of 15-30 years. This is the reproductive age of most women, however with almost one-third of the patients being in ages 15-20 years is not surprising as early and child marriage has been shown to be very common in Northern Nigeria where the study was carried out (Okafor and Oyakhiromen, 2014). The finding of the study was similar to the findings of a previous study in Gindiri in North Central Nigeria which reported a mean age of 24.89 ± 5.77 years (Chingle et al., 2017). The finding of the study was also similar to the findings of a study in Kiambu Kenya which reported more of their respondents to be between ages 16-24 years (Kihara et al., 2015). Furthermore, the study showed most of the women were married. This was also similar to the findings of the study in Gindiri which reported 97.80% to be married (Chingle et al., 2017). In addition, most of the women were Muslims and were Hausa and Fulani. This finding was not surprising as Islamic religion, Hausa and Fulani tribes are the predominant religion and tribes in Northern Nigeria. Furthermore, more than one-third of the women 38.38% attained secondary education with few 12.63% attaining tertiary education. The findings was slightly different from the study in Gindiri which reported about 59.0% of their respondents not having formal education. This is not also surprising as it has been reported that across Northern Nigeria states more than 50% of young women ages 15-24 years have no experience with formal education (FHI 360, 2012).

The study showed that there was a significant relationship between quality of ANC and maternal outcome of the pregnancy at P<0.005. Consequently, women with desirable ANC are more likely to be alive and well when compared with women with undesirable ANC. Furthermore, there was a significant relationship between the quality of ANC and the foetal outcome of the pregnancy at P<0.05. Thus, mothers with desirable quality of ANC are more likely to give birth to babies that are alive and well with lower chances of fresh still birth and low birth weight when compared with mothers with undesirable quality of ANC. The findings were similar to previous study (Kuhnt and Vollmer, 2017; Tuladhar and Dhakal, 2011).

 The skilled attendant is an accredited health professional who possesses the knowledge and a defined set of cognitive and practical skills that enable the individual to provide safe and effective health care during childbirth to women and their infants in the home, health center, and hospital settings. Skilled attendants include midwives, doctors, and nurses with midwifery and life-saving skills.  This definition excludes traditional birth attendants whether trained or not (World Health Organisation, 2006). Going by the definition most of the respondents were attended to by a skilled birth health personnel. This is good and it should be sustained as it would go a long way to reduce the high maternal mortality rate in the Northern part of the country.

The study showed that women with booked pregnancy had fewer caesarean section 14(10.29%) when compared with women with unbooked pregnancy 21 (33.87%). Similarly, out of the 17(8.59%) maternal death recorded, 11 of them where among the unbooked pregnancy when compared with 5 among the booked pregnancy. The finding was similar to a study in Nepal which recorded more maternal mortality among unbooked pregnancy when compared with booked (Pokharel et al., 2007). The finding was also similar to the findings of the study in Abia State University Teaching Hospital (Chigbu et al., 2009).

In the same vein, foetal outcome shows that women with unbooked pregnancies had higher fresh still birth 5(2.53%), low birth weight 3(1.52%) and preterm 2(1.015) when compared with women with booked pregnancies fresh still birth 2(1.01%), low birth weight 1(0.51%), preterm 1(0.50%). The finding was similar to previous study (Osungbade and Ayinde, 2011; Pokharel et al., 2007; Chigbu et al., 2009).

In addition, the study showed that women with booked pregnancy are more likely to be alive and well after giving birth when compared with women with unbooked pregnancy. Women with unbooked pregnancy had more maternal death than women with booked pregnancy.

Furthermore, women with booked pregnancy tend to have baby that are alive and well as compared with women with unbooked pregnancy. This finding was similar to previous studies (Chigbu et al., 2009; Pokharel et al., 2007; Shahina et al., 2016, Nwonu and Ifidon, 2014).

4. Conclusion

The findings of the study showed majority of the women had an acceptable minimum antenatal package and desirable quality of antenatal. Furthermore, more than two-third of the pregnancies were booked. The study showed eventful pregnancy among women with booked antenatal when compared with women with unbooked pregnancy. In addition, both maternal and foetal outcome was better among the women with booked pregnancy when compared with the women with unbooked pregnancy. The findings show that women with desirable quality of antenatal and booked pregnancy are more likely to have better pregnancy outcome when compared with women with undesirable quality of antenatal and unbooked pregnancy.

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Details of the AI usage are given below:

1.Recomendation should include promotion of group Antenatal care, which is evidence based and goal oriented,so that pregnant women can support each other psychologically, and plan for birth preparedness in terms of finance, transportation and emergency readiness for better pregnancy and delivery outcome.

Early marriage should discouraged too through advocacy and awareness on its concequences.

2.

3.

References

Akhter, H.H., Chowdhury, M., and Sen, A. (2006). A cross – section study Maternal Morbidity in Bangladesh; Dhaka. Bangladesh institute of research for promotion of essential and reproductive health and technology, (BIRPERHT publication, H2)

Chigbu, B., Onwere, S., Kamanu, C. I., Aluka, C., Okoro, O., and Adibe, E. (2009). Pregnancy outcome in booked and unbooked mothers in South Eastern Nigeria. East African Medical Journal, 86(6), 267-71.

Chingle, M. P., Bupwatda, J. M. and Zoakah, A. I. (2017). Antenatal Care and Pregnancy Outcomes among Mothers Who Delivered in a Rural Hospital in Nigeria. International Journal of Innovative Research and Development, 6, 3.

Family Health International 360 (2012). Schooling in northern Nigeria: Challenges for girls' education. A brief written by Rachel Hatch Research Associate, Education Policy and Data Center.

Kihara, A. B., Harries, A. D., Bissell, K., Kizito, W., Van Den Berg, R., Mueke, S., Mwangi, A., Sitene, J. C., Gathara, D., Kosgei, R. J., Kiarie, J. and Gichangi, P. (2013). Antenatal care and pregnancy outcomes in a safe motherhood health voucher system in rural Kenya, Public Health Action, 5, 1.

Koblinski, M.A., Campbell, O. and Heichelhei, M.J (2009). Organizing delivery care: what works for safe motherhood? Bulletin of the World Organization. 77 (5): 399-406, (pubmed)

Kuhnt, J., and Vollmer, S. (2017). Antenatal care services and its implications for vital and health outcomes of children: evidence from 193 surveys in 69 low-income and middle income countries. BMJ Open, 7:e017122. doi:10.1136/ bmjopen-2017-017122.

Nwonu, C. O., and Ifidon, O. (2014). Nigeria and Child Marriage: Legal Issues, Complications, Implications, Prospects and Solutions. Journal of Law, Policy and Globalization, 29.

Osungbade, K. O, Shaahu, V. N., and Uchendu, O. C. (2011). Clinical audit of antenatal service provision in Nigeria. Health Care Women International, 32(5):441-52.

Osungbade, K. O., and Ayinde, O. O. (2011). Birth outcomes among booked and unbooked women at a secondary health facility in Southwest Nigeria. Journal of Child Health Care, 15(4), 320-328.

Pokharel, H. P., Lama, G. J., Banerjee, B., Paudel, L. S., and Pokharel, P. K. (2007). Maternal and perinatal outcome among the booked and unbooked pregnancies from catchments area of BP Koirala Institute of Health Sciences, Nepal. Kathmandu Univ Med J (KUMJ).5(2), 173-6.

Shahina, I., Urooj, M., and Ayesha, J. (2016). Obstetric outcome in booked and unbooked mothers. Isra Medical Journal, 8(3), 182-186.

Tuladhar, H., and Dhakal, N. (2011). Impact of Antenatal Care on Maternal and Perinatal outcome: A Study at Nepal Medical College Teaching Hospital. NJOG, 6(2), 37-43.

WHO (2012). The WHO international classification of diseases 10th revision. Geneva. WHO

World Health Organization Regional Office for Europe's Health Evidence, (2006). What is the efficacy/effectiveness of antenatal care and the financial and organizational implications? [online]. Copenhagen: World Health Organization; 2003. Available from: http://www.euro.who.int/\_\_data/assets/pdf\_file/0007/74662/E82996.pdf (accessed 2014 June 6).

World Health Organization (2013). Making pregnancy safer: the critical role of skilled attendants. www.who.int/making\_pregnancy\_safer/documents/9241591692/en

World Health Organization, (2002). WHO Antenatal Care Randomized Trial: Manual for the Implementation of the New Model [online]. Geneva: World Health Organization; 2002. Available from: http://whqlibdoc.who.int/hq/2001/WHO\_RHR\_01.30.pdf

World Health Organization, (2006). Reproductive health indicators: guidelines for their generation, interpretation and analysis for global monitoring.