

Full Length Research Paper

The prevalence, management and outcome of primary postpartum haemorrhage in selected health care facilities in Nigeria

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One of the millennium development goals set by the United Nations is to reduce maternal mortality by three quarters by 2015. The achievement of this goal must focus on understanding the dynamics of the causes of maternal mortality and removing such causes. Postpartum haemorrhage ranks high among the causes of maternal mortality, especially in Nigeria. This study was designed to determine the prevalence, management and outcome of postpartum haemorrhage in selected health care settings. This study was a retrospective analysis of cases of postpartum haemorrhage (PPH) in selected health care facilities from primary, secondary and tertiary health care levels in Ile-Ife, Nigeria between January, 2004 and December, 2008. The prevalence of PPH during the study period was 1.6, 3.9 and 3.4% in the tertiary, secondary and primary health care institutions respectively. Chi square showed a significant association between booking status and occurrence of PPH ($\chi^2 = 18.51$, $df = 1$, $P = 0.001$), parity and PPH ($\chi^2 = 21.49$, $df = 3$, $P = 0.000$), and mode of delivery and PPH ($\chi^2 = 111.77$, $df = 2$, $P = 0.000$). Retained placenta and retained placental bits of tissue were major causes of PPH (52.4%). Major risk factors identified were multiple gestation (20%), antepartum haemorrhage (15%) and previous PPH (12.5%). Uterotonic (ergometrine and/or syntocinon) was widely used (100%) as first line of management with misoprostol being rarely used (7.3%). This study showed that prior booking of pregnant women for antenatal care was associated with lower prevalence of PPH as higher prevalence was recorded among unbooked clients. Therefore, midwives and other health care providers most especially at the rural area must ensure that women are mobilised and encouraged to register for antenatal care as early as possible for appropriate maternity care, early identification of risk and preparation to reduce the untoward effect.

Key words: Maternal mortality, labour, primary postpartum haemorrhage, uterotonic, retrospective study.

INTRODUCTION

Death as a result of pregnancy remains the chief cause of premature mortality worldwide (Fawcus et al., 1995). Every year, 536,000 women and girls die as a result of complications during pregnancy, childbirth or puerperal period. This amounts to one death every minute with an estimated quarter of these deaths occurring as a consequence of haemorrhage (World Health Organization,

WHO, 2007; Millennium Development Goals Report, 2009).

Postpartum haemorrhage (PPH) is a major cause of maternal morbidity and mortality worldwide. The traditional definition of PPH used in most textbooks is sequence of haemorrhage (World Health Organization, excessive bleeding from the genital tract after delivery of

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Table 1. Antenatal booking and number of deliveries in each hospital.

| Year | Tertiary facility | | Secondary facility | | Primary facility | | Total | |
|-------|-------------------|------------|--------------------|------------|------------------|------------|---------|------------|
| | Booking | Deliveries | Booking | Deliveries | Booking | Deliveries | Booking | Deliveries |
| 2004 | 1041 | 791 | 135 | 28 | 138 | 32 | 1314 | 751 |
| 2005 | 978 | 682 | 90 | 17 | 223 | 22 | 1291 | 721 |
| 2006 | 911 | 913 | 97 | 17 | 290 | 44 | 1298 | 974 |
| 2007 | 1042 | 910 | 80 | 14 | 404 | 47 | 1526 | 971 |
| 2008 | 1289 | 1144 | 83 | 23 | 435 | 32 | 1807 | 1203 |
| Total | 5261 | 4340 | 485 | 103 | 1490 | 177 | 7236 | 4620 |

a child and it could be primary or secondary. It is primary when there is a blood loss of 500 ml or more within the first twenty four hours after child birth and secondary if the excessive loss of blood occurred at any time after first day to 42 days of puerperium. In the developing world, several countries have maternal mortality rates in excess of 1000 women per 100,000 live births, and WHO statistics suggest that 25% of maternal deaths are due to PPH, accounting for more than 100,000 maternal deaths per year (Abouzahr, 1998). Increasing incidence of PPH over the years, imbalance between resource-rich and resource-poor areas are probably due to a combination of increased prevalence of risk factors such as grand multiparity, lack of safe blood banking, non-routine use of prophylaxis against haemorrhage, and lack of measures for drug and surgical management of atony are all documented in literature (Chelmow, 2011).

Realisation of the fifth millennium development goal requires interventions directed at preventing the occurrence of PPH and adequate case management for aversion of unfavourable obstetrics outcome most especially in Nigeria and other sub-Saharan African countries where PPH remains a major cause of maternal death (Lazarus and Lalonde, 2005; Ujah et al., 2006; Adetoro, 2006).

Rapid recognition of clients at risk of PPH and early diagnosis is essential to successful management and favourable outcome of labour. The major factor in the adverse outcomes associated with severe haemorrhage is the delay in initiating appropriate management. Midwives are the closest healthcare providers to women, most especially at the primary healthcare level where they have autonomy in taking decision relating to the health of the woman. One of the Millennium Development Goals set by the United Nations in 2000 is to reduce maternal mortality by three-quarters by 2015. If this is to be achieved, maternal deaths related to PPH must be significantly reduced. In support of this, health workers in developing countries need to have access to appropriate information to ensure identification of risk, early diagnosis and provision of appropriate management.

Identification of risk factors before and during labour is of utmost importance in ensuring optimal maternal care

and prevention of complication of childbirth such as PPH which is a leading cause of maternal morbidity and mortality. This is key in reducing the prevalence of PPH and forms the premise on which this study is based.

The overall aim of this study was to determine the prevalence, management and outcome of primary PPH. Exploring the prevalence, management and outcome of PPH will provide health care providers with information for prompt decision making in the care of women and provide a premise for improved care during pregnancy, labour and after delivery.

METHODOLOGY

The study employed retrospective design with the objectives of determining the prevalence of primary PPH, the risk factors associated with the occurrence of primary PPH, as well as the management protocols employed for the mothers and, the outcomes of management. This study was conducted in three health care facilities in Ile-Ife, a semi-urban town in South-Western Nigeria. The facilities selected covered the three levels of health care delivery system in Nigeria which are tertiary, secondary and primary health care facilities. These study settings were selected using purposive sampling technique to compare the different variables under study at the different levels of health care.

As part of the study, the authors reviewed the total number of deliveries during the study period (Table 1). Seventy-eight case files of mothers, who had primary PPH between January, 2004 and December, 2008 were retrieved from the medical record departments of the three health care facilities and reviewed extensively. The focus was on primary PPH, because an initial assessment of the case notes and discussion with some of the medical personnel showed that most cases of PPH were reported within 24 h. The researchers developed a structured study proforma which had five sections. Section A assessed the mothers' socio-demographic characteristics, section B assessed the obstetric history of the mothers, section C assessed the risk factors for primary PPH, section D assessed the management protocols for the mothers following primary PPH and section E assessed the outcome of the management. The content validity of the research instrument was examined by experts in maternal and child health while the Cronbach's alpha result for reliability was found to be 0.9. Approval for the study was obtained from the management board of the institutions involved in the study. Data was extracted from the case notes over a period of three weeks and was analyzed using the Statistical Package for Social Sciences version 16. Descriptive and inferential statistics were employed in analysing the

significance level of $P < 0.05$ data. Association between variables was determined using χ^2 at significance level of $P < 0.05$.

RESULTS

Sample characteristics

A total number of 7236 women booked for antenatal care in the selected hospitals within the study period out of which 4620 women came back to deliver in the same hospitals (Table 1). Booking in this study referred to registration for and attendance of antenatal care by women during pregnancy. Observation from Table 1 showed that not all women who booked at the health care facilities delivered their babies in the same facilities. The proportion of defaulters was highest at the primary level of care (88.12%), followed by the secondary health care facilities (78.8%) and tertiary health care facilities (17.5%), respectively.

Case notes of women who delivered in the hospitals were further explored to identify the women with primary PPH and 78 women were identified. Therefore, the result of this study focussed on the 78 cases of women with primary PPH during the 5-year-study period. The age range of the women was between 15 and 42 with a mean age of 29.1 (± 6.03) years. The ethnic distribution of respondents was such that all but one was a Nigerian with the Yorubas predominating (89.7%), followed by Igbos (7.7%), other ethnic groups (1.3%) and non-Nigerian (1.3%). Three quarter (75.6%) of the women were unskilled; mainly traders, while 10.3% were skilled and 14.1% of them were not employed (Table 2).

Prevalence and risk factors associated with PPH

The average prevalence of PPH at the tertiary level for the study period was 1.6% (68; $n = 4340$). For both secondary and primary facilities, it was 3.9% ($n = 103$) and 3.4% ($n = 177$), respectively (Table 3). For most of the PPH cases in the tertiary institution, the women were mostly referred from primary health care centres (20; 34.5%), state hospitals (2; 3.5%), private hospitals (12; 20.7%), mission/homes/traditional birth attendants (14; 24.1%) and 10 (17.2%) patients who had delivered at home or on their way to the hospital. From information in the case notes and interactions with the health care providers at the secondary and primary levels of care, referrals were made when the attempt to control haemorrhage did not seem to yield any positive result.

Occurrence of PPH was unusually high in women who had one child (Para 1) (37.2%) followed by Para 3 (34.6%), primip (24.4%) and grand multiparas (3.8%). Significant association was found between parity and occurrence of PPH ($\chi^2 = 21.49$, $df = 3$, $P = 0.000$). Of the 78 cases with primary PPH, only 14.7% were booked at the antenatal clinic of the hospital while the remaining 85.3% of the PPH occurred in unbooked women.

Table 2. Socio-demographic characteristics.

| Variable | Frequency | Percentage |
|------------------------------|-----------|------------|
| Age | | |
| 15 – 20 | 9 | 11.5 |
| 21 – 25 | 10 | 12.8 |
| 26 – 30 | 30 | 38.5 |
| 31 – 35 | 21 | 26.9 |
| >35 | 8 | 10.3 |
| Ethnicity | | |
| Yoruba | 70 | 89.7 |
| Igbo | 6 | 7.7 |
| Others | 2 | 2.6 |
| Socioeconomic Status | | |
| High (skilled professionals) | 8 | 10.3 |
| Low (unskilled) | 59 | 75.6 |
| Unemployed | 11 | 14.1 |
| Occupation | | |
| Trading | 41 | 52.6 |
| Cleaner | 3 | 3.8 |
| Civil servant | 6 | 7.7 |
| Teaching | 2 | 2.6 |
| Farming | 2 | 2.6 |
| Artisan | 13 | 16.6 |
| Unemployed | 11 | 14.1 |
| Parity | | |
| Primip | 19 | 24.4 |
| 1 – 2 | 29 | 37.2 |
| 3 – 5 | 27 | 34.6 |
| >5 | 3 | 3.8 |

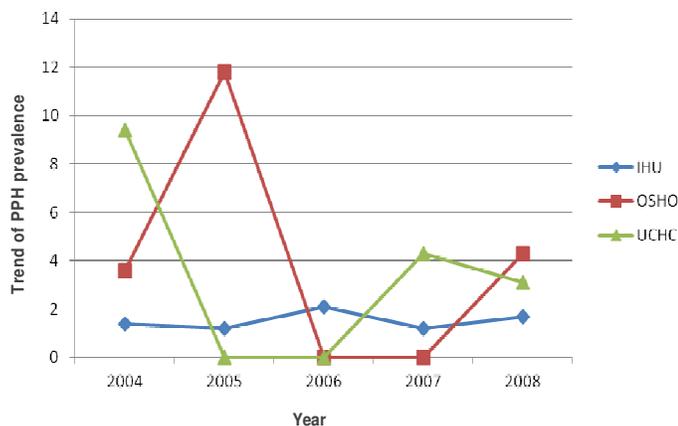
A chi-square test reflected a significant association between booking status and occurrence of PPH ($\chi^2 = 18.51$, $df = 1$, $P = 0.001$). This study also showed that there was a significant association between mode of delivery and PPH

($\chi^2 = 111.77$, $df = 2$, $P = 0.000$) where PPH was recorded more in women with spontaneous vaginal delivery followed by women whose labour were augmented and lastly those who had caesarean section in this order.

The leading associated risk factors for primary PPH was multiple pregnancies (20% $n = 8$), followed by antepartum haemorrhage (15%; $n = 15$). Others include, previous history of PPH (12.5%; $n = 5$), anaemia (12.5%; $n = 5$), previous caesarean section (7.5%; $n = 5$), abnormal lie/presentation (7.5%; $n = 5$), birth weight >3.5 (7.5%; $n = 5$), while chorioamnionitis and preeclampsia accounted for 2.5% ($n = 1$), respectively. In addition, retained placenta and retained placental bits of tissue was

Table 3. PPH cases and prevalence in each hospital between 2004 and 2008.

| Hospital | Variable | 2004 | 2005 | 2006 | 2007 | 2008 | Total |
|--------------------|------------------|------|------|------|------|------|-------|
| Tertiary facility | No. of PPH cases | 11 | 8 | 19 | 11 | 19 | 68 |
| | Total deliveries | 791 | 682 | 913 | 910 | 1144 | 4340 |
| | Prevalence | 1.4 | 1.2 | 2.1 | 1.2 | 1.7 | 1.6 |
| Secondary facility | No. of PPH cases | 1 | 2 | 0 | 0 | 1 | 4 |
| | Total deliveries | 28 | 17 | 17 | 14 | 23 | 103 |
| | Prevalence | 3.6 | 11.8 | 0 | 0 | 4.3 | 3.9 |
| Primary facility | No. of PPH cases | 3 | 0 | 0 | 2 | 1 | 6 |
| | Total deliveries | 32 | 22 | 44 | 47 | 32 | 177 |
| | Prevalence | 9.4 | 0 | 0 | 4.3 | 3.1 | 3.4 |

**Figure 1.** Trend of PPH prevalence in IHU (Tertiary facility), OSHO (Secondary facility) and UCHC (Primary facility) between 2004 and 2008.

the most common aetiological factor (52.4%; $n = 44$) for primary PPH in the women as presented in Figures 1 and 2.

Management of PPH

All the patients (100%; $n = 78$) had uterotonic (ergometrine and/or oxytocin) intravenous administration in the three hospitals. Misoprostol use was rare and limited to only 7.4% ($n = 5$) cases in the tertiary facility. Misoprostol was never used in both the secondary and primary facilities. Manual removal of placenta and placenta bits was done in 61.8% ($n = 41$) cases in the tertiary facility and in 25% cases in the secondary and primary facilities, respectively. However, repair of tear/laceration was only documented in 16.2% ($n = 11$) cases in the tertiary facility and in a single case in the secondary facility.

Considering degree of monitoring of clients vital signs, monitoring was done in 91.2% ($n = 62$) cases, 100% ($n =$

4) cases and in 33.3% ($n = 2$) cases in the tertiary, secondary and primary health care facilities, respectively. Intake and output monitoring was assessed in 55.9% ($n = 38$) and 16.7% ($n = 1$) of cases in tertiary and primary health care facilities, respectively. This was not done at the secondary level.

Also, transfusion of the patient only occurred at the tertiary facility for 75% ($n = 51$) of the PPH cases. It was also observed that throughout the study periods, the non-pneumatic antishock garment was not used in the control of haemorrhage in any of the settings used for the study.

Outcome of PPH

Outcome of PPH varied across the hospitals. In the tertiary health care facilities, there were 2.9% ($n = 2$) cases of renal failure, 5.9% ($n = 4$) cases of heart failure, 14.7% ($n = 10$) cases of hypovolaemic shock, 1.5% ($n = 1$) cases of intensive care unit (ICU) admission due to unconscious state of the patient as a result of severe hypovolaemic shock, 1.5% ($n = 1$), cases of sepsis, 1.5% ($n = 1$) cases of hysterectomy and 1.5% ($n = 1$) cases of maternal death. However, the outcomes of management were not documented at the secondary and primary health facilities. Out of the 78 women with PPH, bleeding was arrested without complications in 70.6% ($n = 48$), 100% ($n = 4$), and 33.3% ($n = 2$) of cases in the tertiary, secondary and primary facilities, respectively.

DISCUSSION

The findings from the study with the prevalence of PPH was found to be the lowest in the tertiary health care facility and the highest in the secondary health care facility was at variance with the reports of Fakoya (2007) and Ijaiya (2003) in their studies in two teaching hospitals in South-Western Nigeria where they found a prevalence of 3.1 and 4.5%, respectively. The observed trend at the

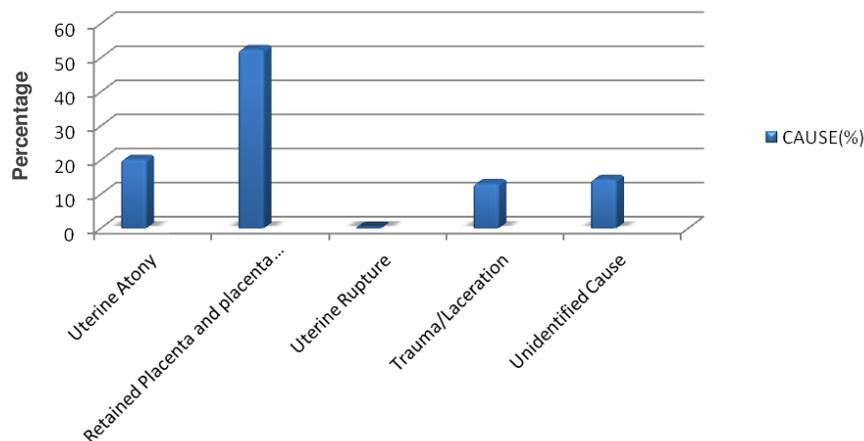


Figure 2. Causes of PPH across the hospital between 2004 and 2008.

tertiary health facility seems to be stable. The range was between 1 and 2%. This may be related to service intervention in the control of PPH by experts (Figure 1). However, the trend seems to be unstable across the other two levels of care during the study period (Figure 1). The number of women with PPH was the highest at the tertiary level of care, but the percentage when considered from the total number of deliveries taken within the time frame is low when compared with the figures from the other two clinical settings.

This study showed that there was a higher incidence of PPH among the unbooked pregnant women. A similar finding was found by Abasiattai and Umoyoho (2009) in a 6-year review of maternal death in a teaching hospital in South-South, Nigeria. They reported a higher incidence of maternal mortality in unbooked women (many of whom did not receive any antenatal care) than in booked women. The larger percentage of unbooked women who had PPH in this study further confirmed the importance of quality antenatal care in early recognition of risk and control of complications associated with pregnancy. The study observed that many women affected by PPH were from lower occupational status. Thus, it may be inferred that their non attendance of antenatal care may not be unconnected with their inability to afford quality obstetric care. This might be a risk factor for incidence of PPH as also documented by Olapade and Lawoyin (2008).

As opposed to other studies that uterine atony is the leading cause of PPH (Selo-Ojeme, 1997; Zaman et al., 2007; Al-Zirgi, 2008; Oyelese, 2010), this study had shown that retained placenta and placenta bits of tissue was the main cause of PPH. The findings of this study however supported the report of Dongol (2010). The control of uterine atony as a major cause of PPH could be attributed to the practice of active management of the third stage of labour in the study settings. This observation supported findings of Lalonde et al. (2006) on effectiveness of active management of third stage of labour in the prevention of PPH.

Furthermore, the findings of this study also showed that the occurrence of PPH was less in grandmultiparity (>5 deliveries) when compared with primipara. This was at variance with the findings of Tsu (1993), Xiong et al. (1994), Babinswzki et al. (1999), and Ijaiya et al. (2003), but interestingly at par with the findings of Selo-Ojeme (1997) in a study carried out in the same tertiary setting used for this study and other studies by Paterson and Sounders (1993) and Dongol (2010) whose studies did not demonstrate any relationship between grandmultiparity and major obstetric haemorrhage. Most studies reviewed in relation to association between grandmultiparity and PPH in this study did not report on the control of other confronting factors such as maternal age. However, Adetoro (1992) reported that PPH was high in both primipara and grand multipara. Also, Ohkuchi et al. (2003) found primiparity to be associated with excessive blood loss at vaginal delivery. In respect of the association between mode of delivery and PPH, the finding of this study corroborated Holm et al. (2012) that planned caesarean section reduced risk for PPH. However, what was not captured in this study was whether the caesarean sections recorded were planned or emergency caesarean sections.

The major risk factors associated with PPH in this study were multiple pregnancy, antepartum haemorrhage and previous PPH in this order. This result was comparable to the findings of Ujha (2007), Al-Zirgi (2008) and Oyelese (2010).

Regarding management of patient with PPH, uterotonic (ergometrine and/or oxytocin) therapy was used as the first line of management in all cases. Other treatments included manual removal of placenta/placenta bits and repair of tears/lacerations. Although, the use of misoprostol had been recommended by the WHO as a third line medication for the prevention and management of PPH (Mathai, 2007), it was not used within the period of this study in both the secondary and primary facilities.

Documentation of vital signs and intake and output

monitoring was generally fair in all the study settings, but this was expected to be comprehensive, accurate and complete. However, this was not so in all the settings. Inadequate record of treatments and nursing care given to women during labour must be well documented to enhance continuity of care as well as follow up care. Good records have been documented as an indication that the quality of care given to women was of a good standard NMC (2004).

Despite the usefulness of non-pneumatic antishock garment in reducing blood loss and maternal mortality caused by obstetric haemorrhage-related shock as documented by Miller and Ojengbede (2009), none of the facilities made use of this simple device in the management and control of PPH.

Hypovolaemic shock was the most common complication in this study. This was in contrast with the findings of Ijaiya et al. (2003) where postpartum anaemia was the most common complications. Other complications included heart failure, renal failure, ICU admission, sepsis and hysterectomy in this order. Osinaike (2006) identified obstetric haemorrhage (with uterine atony as a cause) as one of the reason for admission into the ICU. Heart failure was the cause of mortality for one of the unbooked case (1.5%) found in the study.

In respect to the aforementioned findings, the following recommendations are made to improve maternity care:

- 1) Ensuring that skilled attendants provide care to mothers at maternity service delivery points which are not necessarily under the control of the government, bearing in mind that many women received care from non-governmental health care facilities. This study had shown that retained placenta and placenta bits accounted for higher percentage of the risk factor for PPH and these could be readily managed by skilled attendants at the service delivery points at the community level.
- 2) Evolving mechanisms for supervisory and facilitatory monitoring of maternity service delivery points by independent experts could help provide information on capacity gaps that must be filled consistently for community based care providers.
- 3) With improved maternity care services, women would be better encouraged to contact skilled attendants but meanwhile, awareness about risk factors for PPH and the management should be raised among women.
- 4) This study has identified some of the risk factors associated with PPH. This information should be utilised by service providers to keep eye on such women during labour to prevent the occurrence of PPH by putting appropriate measures in place.
- 5) In addition to the aforementioned, wrong/incomplete reporting of many conditions was a major concern in this study. Hospital coders can only report what has been recorded in the case notes. Therefore, it is imperative that clinicians clearly document patient's diagnosis and take care to give a succinct discharge summary. Midwives attending to women should adequately monitor

and record vital indicators of health status of clients and ensure that records of nursing care given to client are kept as accurately as possible.

6) Management protocol for PPH should be well defined and blood transfusion services should be made accessible at the secondary level of health care in order to deal with unexpected severe PPH.

7) The use of misoprostol in the management of PPH should be promoted as it has wide range of advantage ranging from multiple route of administration to freedom from significant side effects and the fact that it can be administered safely at various level of health care including the primary health care by birth attendants.

IMPLICATIONS FOR PRACTICE

The findings of this study have a lot of implications for nursing practice in Nigeria and other low resource countries in Africa. The various government administrative bodies in each country should ensure that health care personnel, most especially those at the grassroots are professionally prepared for early identification of women at risk of PPH in order to ensure prompt referral.

There is a need to have protocols of monitoring quality of care at all maternity service delivery points at the community level with the intention of building capacities of care providers for early detection and quality management of women with risk factors associated with pregnancy and delivery. This is a needed intervention in Nigeria where little is done to work with non-governmental service providers to improve quality of care at the community level.

The observed prevalence across the three levels of health care may not be the true picture of the actual prevalence with the number of women who defaulted in the antenatal care schedule. These women might have gone to deliver at other non-governmental health care settings which were not capture in this study. This further confirms the need to ensure supervisory monitoring of maternity care services outside of the government owned hospitals and community settings. This will enhance data capturing in relation to maternal and child health indicators and the use of such for health care improvement.

Childbirth is a natural process that should occur without any major complication except in few cases of high risk women. Therefore, women should have access to quality maternity care services most especially at the grassroots level. This will only be possible if the facilities at the grassroots are adequately empowered in terms of equipment, materials and manpower.

The study also showed that there was a low patronage of delivery at the primary health care levels when compared with the other levels of health care. However, primary health care has been identified as a means of making health care available to people at the grassroots levels and if people are not making use of this facility, more researches need to be done to explore the reasons

for low utilisation of primary health care facilities. Therefore, midwives and all labour attendants at the different level of health care need to adopt strategies to reduce barriers contributing to underutilisation of hospital care for women throughout the maternity cycle.

This study also showed that majority of clients with PPH were unbooked patients referred from mostly non-governmental health care facilities from the community level. Empowerment of midwives and birth attendants at the community level will assist in early recognition of at risk women for prompt referral and specialise care prior to delivery.

This study being a retrospective study is limited by the available documented information which most time are incomplete as a result of the manual filling system. Another limitation of the study was the focus on primary PPH. Further study in this area should also consider the risk for secondary PPH. One other limitation observed in this study was that the researchers did not explore the pattern of human resource in relation to the outcome of care for women with PPH. Some of the observed associated risk factors for PPH observed in this study were indication for care of the mothers in the tertiary health care settings. Therefore, this study should have explored the basis for acceptance of these women at the primary level of care from the health care providers. These may also be in future studies.

Conclusion

To address morbidity and mortality, attention need be paid to the prevention of PPH with organization of continuous in-service training for all stakeholders to emphasize early identification of the patients at risk, anticipation and corresponding readiness to manage PPH cum active management of the third stage of labour.

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