International Journal of Reproduction, Contraception, Obstetrics and Gynecology
*Jafreen N et al. Int J Reprod Contracept Obstet Gynecol. 2025 Sep;14(9):2868-2873*
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20252712

**Original Research Article**

# Evaluation of clinical outcomes of primary postpartum haemorrhage cases referred to an Upazila health complex

**Nafisa Jafreen[1]*, Sultana Afroj[1], Shahana Ferdousi[2], Shah M. M. Billah[3], Ummay S. Sharkar[3], M. Rafi Akter[1], Suraiya Siddika[1], Kamrun Nahar[4], Moumita Basak[5]**

[1]Department of Obstetrics and Gynaecology, Shaheed Suhrawardy Medical College Hospital, Dhaka, Bangladesh
[2]Department of Obstetrics and Gynaecology, Manikganj Medical College Hospital, Manikgonj, Bangladesh
[3]Department of Radiology and Imaging, Sylhet Women's Medical College, Sylhet, Bangladesh
[4]Department of Obstetrics and Gynaecology, OGSB Hospital, Mirpur, Dhaka, Bangladesh
[5]Department of Obstetrics and Gynaecology, Nasirnagar Upazilla Health Complex, Brahmonbaria, Bangladesh

**Received:** 02 July 2025
**Accepted:** 02 August 2025

***Correspondence:**
Dr. Nafisa Jafreen,
E-mail: nafisajafreen99@gmail.com



## ABSTRACT

**Background:** Primary postpartum haemorrhage (PPH) is a leading cause of maternal mortality and morbidity, especially in low-resource settings. In Bangladesh, the burden of PPH is exacerbated by limited emergency obstetric care and delayed referral. Understanding the clinical profiles and outcomes of PPH at the primary care level is essential for improving maternal health. This study aimed to evaluate the clinical outcomes and associated risk factors of primary PPH cases referred to a rural Upazila Health Complex in Bangladesh.
**Methods:** A prospective observational study was conducted at the Department of Obstetrics and Gynaecology, Nasirnagar Upazila Health Complex, Brahmanbaria, from July 2022 to June 2024. A total of 75 women with primary PPH were enrolled in this study. Data on sociodemographic characteristics, obstetric history, clinical presentation, and pregnancy-specific risk factors were collected using structured forms. Statistical analyses were performed using statistical package for the social sciences (SPSS) version 25.0, with a significance threshold of $p \leq 0.05$.
**Results:** Most participants were aged 21–30 years (48%) and resided in rural areas (86.7%). Uterine atony (78.6%), prolonged labour (60%), and induction of labour (52%) were predominant risk factors. The most common complications were maternal anaemia (84%), hypotension (80%), and birth asphyxia (36%). The clinical presentations were dominated by per-vaginal bleeding (92%) and abdominal pain (40%).
**Conclusions:** Primary PPH in rural settings leads to significant maternal and neonatal complications. Early identification, prompt referral, and improved emergency care infrastructure are important for reducing its impact.

**Keywords:** Postpartum haemorrhage, Primary PPH, Maternal complications, Uterine atony, Rural healthcare, Bangladesh

## INTRODUCTION

Postpartum haemorrhage (PPH) is one of the most common causes of maternal death and morbidity in most parts of the world especially in low-income countries.[1] Primary PPH which is defined as a loss of 500 ml or more of blood after vaginal delivery or 1,000 ml or more after cesarean section within 24 hours of delivery presents an intense risk to maternal health.[2] The World Health Organization calculates that about 25 percent of the total maternal deaths are caused by PPH, and the burden is much higher in poor nations and countries, including Bangladesh.[3,4]

Primary PPH has a multifactorial etiology, which includes the following factors: uterine atony, retained tissue of the

placenta, trauma to the genital tract, as well as disorders of the coagulation. The most commonly reported cause of these is the occurrence of a uterine atony.[5] Many obstetric predisposing risk factors have been cited to associate women with PPH, including long labour (prolonged), induced or augmented labour, placenta previa, multiparity and obesity.[6,7] Besides these causes, some sociodemographic factors, such as residence in a rural area, poor nutritional status, and absence of antenatal care, could potentially worsen the risk.[8]

In Bangladesh, with the increase in the institutional delivery rate, the problem in managing obstetric emergencies, such as PPH in a health facility is still a challenge due to the delay in referral, lack of sufficient blood transfusion facilities, and limited emergency obstetric care reception in peripheral health centers.[9] Therefore, due to this fact, within no time, it leads to the reference of many women to the Upazila Health Complexes and higher institutions in severe condition once haemorrhage sets in. In tertiary hospitals' experiences, there have been reports of high case fatality rates and severe maternal morbidities such as hypovolemic shock, multi-organ failure, and peripartum hysterectomy related to PPH.[10]

Although several studies have been reported by tertiary care facilities, there is little information about the clinical outcomes of ladies referred to primary-level hospitals like Upazila Health Complexes with PPH. These facilities can be considered the initial level of emergent attention to the rural communities, and assessment of the quality of presentation and management outcome at this tier is important in enhancing the maternal health systems. The use of early detection and referral in decreasing maternal death related to PPH, with an indication that there is a need to fill the knowledge and resource gap at the primary setting.[11]

Although active management of the third stage of labour (AMTSL) helps prevent postpartum bleeding, it is not used regularly in poor rural areas because of problems with consistent implementation.[12] Knowledge of clinical properties and risk factors in those environments might be instrumental in the provision of prompt interventions and individualized management schools of thought.

The purpose of this study was to analyze the clinical outcomes of primary cases of PPH who have been referred to Nasirnagar Upazila Health Complex, Brahmanbaria, Bangladesh. Investigating patient details, obstetric risk factors, clinical presentations, and maternal complications, the study aims to make evidence-based advances towards the improvement of early diagnosis, the referral system, and resource allocation in primary healthcare facilities.

## METHODS

This was a prospective observational study conducted in the Department of Obstetrics and Gynaecology at Nasirnagar Upazila Health Complex, located in Brahmanbaria, Bangladesh. The study period extended from July 2022 to June 2024. A total of 75 women diagnosed with primary PPH and referred to the health complex were included.

### *Sample selection*

*Inclusion criteria*

Women who experienced primary PPH within 24 hours of delivery, patients referred to and admitted to Nasirnagar Upazila Health Complex, singleton pregnancies, and patients with willingness to participate with informed consent were included.

*Exclusion criteria*

Women with secondary PPH (bleeding after 24 hours of delivery), known bleeding disorders or pre-existing coagulopathy, and incomplete clinical data or medical records were excluded.

### *Data collection procedure*

Data were collected through structured clinical assessments, patient interviews, and medical record review. A pre-designed data collection form was used to record the sociodemographic details, obstetric history, clinical presentation, and outcomes. The attending medical staff and researchers ensured data accuracy and consistency through double-entry checks and regular cross-validation with the hospital records. Diagnostic evaluations and management protocols followed the standard clinical guidelines. Informed consent was obtained from all participants, and confidentiality was strictly maintained throughout the study period.

### *Statistical analysis*

Data were entered and analyzed using statistical package for the social sciences (SPSS) version 25.0. Descriptive statistics, such as frequency, percentage, mean, and standard deviation, were used to summarize categorical and continuous variables. Associations between variables were analyzed using inferential statistics, including the Chi-square test for categorical variables and independent t-tests for continuous variables. Statistical significance was set at $p \leq 0.05$.

## RESULTS

Table 1 presents the sociodemographic characteristics of the study participants. Most women were aged between 21 and 30 years (48.0%), followed by 28.0% aged 31–40 years and 24.0% aged ≤20 years. The mean age was 26.72±6.8 years. A large majority (86.7%) of the participants resided in rural areas. The predominant occupation was housewife (84.0%), and most belonged to the middle socioeconomic class (60.0%), with 32.0% in

the low and only 8.0% in the high class. Regarding education, 48.0% had primary-level education, 36.0% had no formal education, and only 16.0% attained secondary education or above.

**Table 1: Sociodemographic characteristics of women with primary postpartum hemorrhage (n=75).**

| Variables | Frequency (N) | Percentage |
|---|---|---|
| **Age (years)** | | |
| ≤20 | 18 | 24.0 |
| 21-30 | 36 | 48.0 |
| 31-40 | 21 | 28.0 |
| Mean±SD | 26.72±6.8 | |
| **Residence** | | |
| Rural | 65 | 86.7 |
| Urban | 10 | 13.3 |
| **Occupation** | | |
| Housewife | 63 | 84.0 |
| Others (e.g., service, farming) | 12 | 16.0 |
| **Socioeconomic status** | | |
| Low | 24 | 32.0 |
| Middle | 45 | 60.0 |
| High | 6 | 8.0 |
| **Education level** | | |
| No formal education | 27 | 36.0 |
| Primary | 36 | 48.0 |
| Secondary or above | 12 | 16.0 |

Table 2 describes the obstetric and reproductive histories of the women with primary PPH. A majority (85.3%) had regular menstrual cycles. In terms of gravidity, 54.7% were primigravida and 45.3% were multigravida.

Notably, 20.0% of women had a history of previous cesarean section, and 12.0% had a documented history of previous PPH.

**Table 2: Obstetric and reproductive history of primary PPH patients (n=75).**

| Variables | Frequency (N) | Percentage |
|---|---|---|
| **Menstrual cycle** | | |
| Regular | 64 | 85.3 |
| Irregular | 11 | 14.7 |
| **Gravidity** | | |
| Primigravida (G1) | 41 | 54.7 |
| Multigravida (G2–G4) | 34 | 45.3 |
| **Previous cesarean section** | | |
| Yes | 15 | 20.0 |
| No | 60 | 80.0 |
| **History of previous PPH** | | |
| Yes | 9 | 12.0 |
| No | 66 | 88.0 |

Table 3 outlines the clinical presentations and maternal complications observed among the patients. The most common symptom was per-vaginal bleeding (92.0%). Abdominal pain or tenderness was observed in 40% of patients. Clinical signs included anaemia in 84.0% of cases, maternal hypotension (systolic BP <90 mmHg) in 80.0%, and maternal tachycardia in 56.0%. Uterine atony, a major cause of PPH, was noted in 78.6% of the cases. Additionally, 14.7% had severe vaginal or perineal lacerations, and 36.0% of neonates experienced birth asphyxia.

**Table 3: Clinical presentation and maternal complications among women with primary PPH (n=75).**

| Variable | Frequency (N) | Percentage |
|---|---|---|
| **Per-vaginal bleeding** | 69 | 92.0 |
| **Abdominal pain or tenderness** | 30 | 40.0 |
| **Uterine atony** | 59 | 78.6 |
| **Anaemia** | 63 | 84.0 |
| **Maternal tachycardia (>100 bpm)** | 42 | 56.0 |
| **Maternal hypotension (SBP <90 mmHg)** | 60 | 80.0 |
| **Severe vaginal/ perineal laceration** | 11 | 14.7 |
| **Birth asphyxia** | 27 | 36.0 |

Table 4 shows the pregnancy-specific risk factors associated with primary PPH in the study population. Prolonged labour lasting more than 12 hours was the most prevalent factor (60.0%), followed by induction of labour (52.0%) and obesity (24.0%). Augmentation of labour was noted in 16.0% of cases. Placenta previa/accreta was suspected or known in 12.0% of cases, and pregnancy-induced hypertension was identified in 8.0%.

**Table 4: Pregnancy-specific risk factors associated with primary PPH (n=75).**

| Variables | Frequency (N) | Percentage |
|---|---|---|
| **Placenta previa/accreta (suspected/known)** | 9 | 12.0 |
| **Pregnancy-induced hypertension (PIH)** | 6 | 8.0 |
| **Induction of labour** | 39 | 52.0 |
| **Augmentation of labour** | 12 | 16.0 |
| **Prolonged labour (>12 hours)** | 45 | 60.0 |
| **Obesity (BMI ≥30)** | 18 | 24.0 |

## DISCUSSION

This study evaluated the clinical outcomes and risk factors of primary PPH among women referred to a primary

healthcare facility in Bangladesh. The findings demonstrate that PPH remains a significant obstetric emergency, predominantly affecting young, rural, and socioeconomically disadvantaged women. The study contributes valuable insights into the demographic profiles, clinical presentations, and obstetric risk factors associated with PPH at the primary care level.

Most of the patients were between 21-30 years old, and most of them were located in rural locations. A common sociodemographic pattern was found by Ramani and Vijaya, who noted that the lower level of education and lack of access to antenatal care made women overrepresented in PPH.[13] Rural-urban inequality accentuates the existing issues with the unavailability of healthcare services and the inadequacy of the emergency response time, particularly in low-income environments.

The majority of those patients were primigravida, without a history of previous PPH and with no history of caesarean section. These results imply that PPH may arise, even in low-risk pregnancies. Gora et al also indicated that uterine atony, which is the major cause of PPH, can develop in primigravid and multigravid women, so extra caution should be taken during deliveries.[14]

According to this study, Uterine atony was found in most likely 78.6 percent of cases. This is consistent with the evidence obtained by Sadaf et al, who observed that uterine atony is the leading cause in a significant portion of PPH cases, up to 60 percent, even in the third-level institutions.[15] Other contributing factors were prolonged labour (60.0%), induction of labour (52.0%) and obesity (24.0%). These results correlate with the results of Edhi et al, who stated that one of the significant predisposing conditions is obstructed labour and pharmacological stimulation.[16]

Notably, 80% of the women developed low blood pressure during pregnancy, while 84% were found to have clinical anaemia. Such complications highlight the fast rate of gradient that may occur after the onset of complications in PPH, particularly in circumstances like those where delays in referral and first management are the order of the day. Rasooli et al. hold that hypotension and shock are significant predictors of ICU admission and poor maternal outcomes in the case of PPH.[17]

The rate of birth asphyxia was also high, 36.0 percent of the babies had that problem, which demonstrates the fact that PPH affects the health of both the mother and the child. Similar effects of severe maternal bleeding on adverse neonatal outcomes, presented by Menezes et al as low Apgar scores and perinatal mortality, were also found.[18]

This is further complicated by 12 percent of pregnancies being characterized by placenta previa or accreta. Majid et al observed that unrecognized placental abnormalities are a major cause of uncontrolled PPH, especially where there is no prenatal ultrasound.[19] Such cases usually require surgery, which may not be possible at the lower-level facilities.

A key revelation here is the large percentage (52.0%) of women who have been subjected to labour induction. Uterine rupture and atony have been linked with excessive or inappropriate use of uterotonics. Chong et al emphasize that attention to detail during induced labour and readiness to intervene quickly are of great importance in avoiding complications.[20]

The prevalence of known previous PPH was only 12.0% in this study. This is significantly less compared with other studies performed at tertiary centers like Albina, which reported a rate of 25-30% recurrences.[21] The observation can be attributed to underreporting, poor documentation or lack of patient recall, thus supporting the claim that in-depth obstetric history-taking is essential.

The present study also confirms the results provided by Kebede et al, in which the low access to antenatal care and late arrival to the hospital were the key factors influencing the occurrence of severe maternal outcomes in Ethiopia.[22] In spite of the study being carried out in various countries, the similarities bear testimony to gaps evident in the maternal health system infrastructures in developing nations.

Though not discussed in detail in the management and outcome data, it indicates the most serious need to intensify emergency obstetric care at the Upazila level. According to Shah and Panchal, early diagnosis, optimal referral mechanisms, access to blood transfusion, and surgery during PPH are critical elements in minimizing PPH-related morbidity.[23]

Lastly, some of the complications seen in the present study, such as severe anaemia and shock, are consistent with some of the findings of Farzi et al, who conducted a review of ICU admissions due to obstetric emergencies and concluded that PPH is one of the leading conditions requiring intensive care.[24]

This study adds to the growing body of literature highlighting that primary PPH is a preventable yet life-threatening condition. Its high prevalence and complication rates at primary healthcare centers demand a robust policy response encompassing prevention, early recognition, and timely referral strategies. There is also an urgent need for capacity building among frontline healthcare workers, particularly in the active management of the third stage of labour.

### *Limitations*

This study was conducted at a single Upazila Health Complex with a small sample size, limiting result generalizability. The observational design precluded

causal inferences, and clinical records may have introduced reporting bias.

## CONCLUSION

Primary postpartum haemorrhage remains a significant maternal health challenge in rural Bangladesh. This study identified uterine atony, prolonged labour, and labour induction as major contributing factors among referred cases. The findings highlight the maternal complications, including hypotension, anaemia, and neonatal birth asphyxia. Early identification of risk factors and timely referral remain critical in reducing adverse outcomes. Strengthening primary-level facilities and enhancing frontline providers' skills in managing obstetric emergencies are vital. These results underscore the importance of targeted interventions and system improvements in maternal healthcare delivery at Upazila health centers.

## ACKNOWLEDGEMENTS

The authors would like to express their sincere gratitude for the invaluable support and cooperation provided by the staff, participants, and colleagues who contributed to this study.

*Funding: No funding sources*
*Conflict of interest: None declared*
*Ethical approval: The study was approved by the Institutional Ethics Committee*

## REFERENCES

1. Ahmadzia HK, Grotegut CA, James AH. A national update on rates of postpartum haemorrhage and related interventions. Blood Transfusion. 2020;18(4):247.
2. McLintock C. Prevention and treatment of postpartum hemorrhage: focus on hematological aspects of management. Hematology 2014, the American Society of Hematology Education Program Book. 2020;2020(1):542-6.
3. Shahbazi Sighaldeh S, Nazari A, Maasoumi R, Kazemnejad A, Mazari Z. Prevalence, related factors and maternal outcomes of primary postpartum haemorrhage in governmental hospitals in Kabul-Afghanistan. BMC Pregnancy Childbirth. 2020;20:1-9.
4. Gulumser C, Engin-Ustun Y, Keskin L, Celen S, Sanisoglu S, Karaahmetoglu S, et al. Maternal mortality due to hemorrhage: population-based study in Turkey. J Maternal-Fetal Neonat Med. 2019;32(23):3998-4004.
5. Ramejo BB, Ramejo MA, Soomro S, Tunio MA, Ramejo MA. Frequency and Clinical Outcomes of Women with Postpartum Hemorrhage at a Tertiary Care Hospital. Pak J Med Health Sci. 2022;16(11):778.
6. Mazhar SB, Batool M, Batool A. Post partum hemorrhage and its predisposing factors: In WHO Multi-Country Survey on Maternal and Newborn Health, Pakistan. J Soc Obstet Gynaecol Pak. 2018;8(2):104-9.
7. Davey MA, Flood M, Pollock W, Cullinane F, McDonald S. Risk factors for severe postpartum haemorrhage: A population-based retrospective cohort study. Aust N Zeal J Obstet Gynaecol. 2020;60(4):522-32.
8. Goodburn EA, Gazi R, Chowdhury M. Beliefs and practices regarding delivery and postpartum maternal morbidity in rural Bangladesh. Stud Fam Planning. 1995;1:22-32.
9. Begum N, Khanum E, Islam MA, Khanam T, Haque MR, Rahman NT. Outcomes of Postpartum Haemorrhage among Women admitted at ICU in a Tertiary Care Centre in Bangladesh. J Nat Institute Neurosci Bangl. 2022;8(1):79-83.
10. Shah AH, Panchal DN. A study of maternal and perinatal outcome in patients of postpartum hemorrhage in a tertiary care hospital, Gujarat. Int J Reprod Contracept Obstet Gynecol. 2021;10(6):2286-91.
11. Nahar S, Roy JS. The Causes of Post-Partum Hemorrhage in Patients Attending in a Tertiary Care Hospital. Sch Int J Obstet Gynec. 2022;5(7):338-44.
12. Leduc D, Senikas V, Lalonde AB, Ballerman C, Biringer A, Delaney M, et al. Active management of the third stage of labour: prevention and treatment of postpartum hemorrhage. J Obstet Gynaecol Canad. 2009;31(10):980-93.
13. Ramani S, Vijaya B. Prevalence and outcome of primary postpartum haemorrhage in a tertiary care hospital: a hospital record-based study. N Indian J OBGYN. 2023;9(2):308-13.
14. Gora K, Depan A, Yadav K, Benwal D. Causes and management of post-partum hemorrhage at tertiary care center, Rajasthan, India. Int J Reprod Contracept Obstet Gynecol. 2019;8:2425-9.
15. Sadaf A, Brohi ZP, Parveen U. Primary postpartum hemorrhage and maternal health-effects and outcome. Ann Punjab Med Coll. 2020;14(4):345-8.
16. Edhi MM, Aslam HM, Naqvi Z, Hashmi H. Post partum hemorrhage: causes and management. BMC Res Notes. 2013;6:1-6.
17. Rasooli S, Moslemi F, Tagavi S, Baybordi A. Outcome Postpartum Hemorrhage Admitted to Obstetric Intensive Care Unit. Med J Tabriz Univ Med Sci Health Serv. 2015;37(1).
18. Menezes RM, Cardoso PM, Pednecar G. Study of Primary Postpartum Hemorrhage at Term in a Tertiary Care Hospital. IOSR J Dent Med Sci. 2021;9(5):35-41.
19. Majid E, Malik S, Huma Z, Fatima S, Yasmeen H, Korejo R. Frequency and Clinical Outcomes of Women with Postpartum Haemorrhage at a Tertiary Care Hospital Karachi. J Soc Obstet Gynaecol Pak. 2022;12(2):95-9.

20. Chong YS, Su LL, Arulkumaran S. Current strategies for the prevention of postpartum haemorrhage in the third stage of labour. Curr Opin Obstet Gynecol. 2004;16(2):143-50.
21. Albina A. Study the incidence, management and outcome of primary postpartum hemorrhage in a tertiary care hospital. Int J Res Med Sci. 2022;10(11):2622.
22. Kebede BA, Abdo RA, Anshebo AA, Gebremariam BM. Prevalence and predictors of primary postpartum hemorrhage: An implication for designing effective intervention at selected hospitals, Southern Ethiopia. PloS One. 2019;14(10):e0224579.
23. Shah AH, Panchal DN. A study of maternal and perinatal outcome in patients of postpartum hemorrhage in a tertiary care hospital, Gujarat. Int J Reprod Contracept Obstet Gynecol. 2021;10(6):2286-91.
24. Farzi F, Mirmansouri A, Roshan ZA, Nabi BN, Biazar G, Yazdipaz S. Evaluation of admission indications, clinical characteristics and outcomes of obstetric patients admitted to the intensive care unit of a teaching hospital center: a five-year retrospective review. Anesthesiol Pain Med. 2017;7(3):e13636.

**Cite this article as:** Jafreen N, Afroj S, Ferdousi S, Billah SMM, Sharkar US, Akter MR, et al. Evaluation of clinical outcomes of primary postpartum haemorrhage cases referred to an Upazila health complex. Int J Reprod Contracept Obstet Gynecol 2025;14:2868-73.