



Frequency of Post Partum Haemorrhage at Term and Its Relation with Parity

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ABSTRACT

Background: Postpartum hemorrhage (PPH) is a leading cause of maternal morbidity and mortality worldwide, particularly in developing countries. **Objective:** To determine the frequency of postpartum hemorrhage at term and assess its association with parity. **Methodology:** This cross-sectional study was conducted at Gynae Unit-I, PMC Hospital, Nawabshah, from 4 Sep 2024 to 4 March 2025. A total of 56 women aged 18–40 years with singleton term pregnancies were included through non-probability consecutive sampling. Women with placenta previa, bleeding disorders, or medical comorbidities were excluded. Data on maternal age, gestational age, BMI, parity, mode of delivery, booking status, and previous PPH were collected. PPH was defined as blood loss exceeding 500 mL after vaginal delivery or 1000 mL after cesarean section. **Results:** The mean maternal age was 28.4 ± 5.3 years, and mean gestational age at delivery was 38.7 ± 1.2 weeks. The majority of participants (37.5%) were primiparous, 35.7% multiparous, and 26.8% grand multiparous. The overall frequency of postpartum hemorrhage was 7.1% ($n = 4$). The incidence of PPH increased with parity, occurring in 4.7% of primiparous, 5.0% of multiparous, and 13.3% of grand multiparous women, showing a statistically significant association ($p = 0.042$). Higher PPH rates were also observed among cesarean deliveries (11.1%) compared to vaginal deliveries (5.3%), and among unbooked patients (12.5%) compared to booked patients (5.0%), though these differences were not statistically significant. **Conclusion:** The frequency of postpartum hemorrhage in this study was 7.1%, with a significant relationship between increasing parity and the risk of PPH. Grand multiparity was identified as an important risk factor. Strengthening antenatal care, ensuring institutional deliveries, and maintaining vigilance during the third stage of labor are essential measures to minimize the risk and complications associated with PPH.

INTRODUCTION

Postpartum hemorrhage (PPH) continues to compromise the health and lives of mothers, particularly in poorly resourced countries [1]. Defined as the loss of 500 mL of blood after vaginal delivery and 1000 mL after cesarean delivery in the first 24 hours, [2]. Several studies have explored the impact of parity on the occurrence of PPH, but the findings have been inconsistent [3,4,5]. Some studies suggest that multiparous women (those who have given birth to two or more children) may have a higher risk of PPH compared to nulliparous women (those who have not given birth before), while others report no significant association [6-8]. These conflicting results necessitate a comprehensive analysis of the available literature to clarify the relationship between PPH and parity specifically in term pregnancies. PPH is the major cause of maternal mortality and morbidity across the world, responsible for more than 25% of deaths annually. WHO statistics suggested that 60% of maternal deaths in

developing countries were due to PPH. Uterine atony after delivery accounts for 75–90% of primary postpartum haemorrhage [9]. Given these conflicting findings a literature review focusing specifically on PPH and parity in term pregnancies is warranted. Globally, postpartum hemorrhage (PPH) represents the leading contributor to paternal mortality and morbidity, constituting more than 25% of postpartum deaths annually [6]. According to the World Health Organization (WHO) 2020 report, over 60% of maternal PPH related deaths occurring within developing countries. Furthermore, Uterine atony is the most common cause of primary PPH and accounts for 75–90% of cases [7]. Other contributing factors are retained placental tissue, perineal and vaginal lacerations, uterine inversion, and ruptured uterus. Complications from PPH include shock, anemia, disseminated intravascular coagulation (DIC), and acute tubular necrosis and renal failure [8]. Maternal deaths related to PPH occur in 17% of primiparous mothers to 44% of mothers who have given

birth four or more times, indicative of the risk of postpartum hemorrhage on maternal morbidity and mortality increases with maternal age and parity [9]. PPH is a leading cause of maternal morbidity and mortality in the world and in Pakistan it accounted for 27.2% of maternal mortality [10]. A recent 2023 study in Pakistan by Shazia R et al. found the prevalence of postpartum hemorrhage to be 21.4% in women at term with induced labor and 7.6% in women with spontaneous labor. In the same year, Shazma S et al. conducted similar research to our study [11]. A study carried out in Peshawar, Pakistan, showed that the frequency of postpartum hemorrhage was reported as 26.9% [12]. The active management of the third stage of labor (AMTSL) practices are one of the most effective interventions to minimize the incidence of PPH. It usually consists of the early use of uterotonics (most commonly oxytocin), controlled cord traction, and uterine massage following the delivery of the placenta [13]. The timely administration of uterotonics has proven to be effective in the prevention of atonic hemorrhage. However, the need to identify higher-risk women such as those with grand multiparity to guide anticipatory management, the planning of blood products and close postpartum observation is essential [14].

Objective

To determine the frequency of postpartum hemorrhage among women at term and its relation with parity.

METHODOLOGY

This cross-sectional study was conducted at Gynae Unit-I, PMC Hospital, Nawabshah from 4 Sep 2024 to 4 March 2025. Data were collected through Non-probability consecutive sampling. Based on the study conducted by *Shazia Rafiq et al.*, where the frequency of postpartum hemorrhage (PPH) was found to be 7.6%, a 7% margin of error and a 95% confidence interval were applied. Using the statistical formula:

$$n = Z^2 \times p(1-p) / d^2$$

a sample size of 56 women was determined.

Inclusion Criteria

1. Women aged 18 to 40 years.
2. Singleton pregnancies at term (37–42 weeks of gestation).
3. Women who delivered either vaginally or through cesarean section.
4. Any parity (primiparous or multiparous).
5. Women who provided written informed consent.

Exclusion Criteria

1. Women with a history of placenta previa or placental abruption.
2. Known bleeding or coagulation disorders.
3. Planned cesarean section for non-medical or elective reasons.
4. Women diagnosed antenatally with polyhydramnios, intrauterine fetal demise, coagulopathies (INR > 1.5), or preeclampsia (BP > 140/90 mmHg on two occasions 6 hours apart with proteinuria).
5. Women undergoing instrumental deliveries using forceps or vacuum.

6. Women with medical comorbidities such as liver disease, heart disease, or those on anticoagulant therapy, and women with a history of perineal tears (as per medical records).

Data Collection

The study was initiated after obtaining ethical clearance from the Institutional Review Board of Peoples University of Medical and Health Sciences (PUMHS), Nawabshah, and approval of the synopsis by the College of Physicians and Surgeons Pakistan (CPSP). After detailing the objectives and procedure of the study, as well as the assurance of confidentiality surrounding participants' data, written informed consent was secured from every participant. During the study period, all pregnant women who met the inclusion criteria and were either admitted via the emergency department or outpatient department to the labor room were included. A complete obstetric and medical history was obtained, as well as the general and obstetric examination. These data included maternal age, gestational age at delivery, height, weight, BMI, number of previous pregnancies, parity, mode of admission (emergency or OPD), whether she was booked or unbooked, mode of delivery (either vaginal or cesarean), previous history of PPH, educational status, and PPH (categorised as either the presence or absence of PPH). Estimation of blood loss during delivery was done objectively through the use of calibrated collection drapes, weighing of soaked pads, and visual assessment, which was cross validated with the clinical assessment. PPH was defined as blood loss exceeding 500 mL within 24 hours after vaginal delivery or more than 1000 mL after cesarean delivery. All deliveries were actively managed according to hospital protocol, which included Active Management of the Third Stage of Labor (AMTSL) comprising the administration of 10 IU of oxytocin intramuscularly within one minute of birth of the baby, controlled cord traction, and uterine massage. Women diagnosed with PPH received care per institutional guidelines, including administration of additional uterotonics (ergometrine, misoprostol, etc.) and fluid resuscitation, if necessary. The principal investigator or a trained research assistant documented all information on a pre-designed proforma. The study fully guaranteed confidentiality and anonymity of all participants.

Data Analysis

The collected data were entered and analyzed using SPSS version 21.0. Quantitative variables such as maternal age, gestational age, height, weight, BMI, and parity were first tested for normality using the Shapiro–Wilk test. If data followed a normal distribution ($p > 0.05$), they were expressed as mean \pm standard deviation (SD); otherwise, they were presented as median (range). Categorical variables such as booking status, mode of delivery, previous history of PPH, educational level, and PPH outcome (Yes/No) were summarized using frequencies and percentages. To determine associations between parity and postpartum hemorrhage, stratification was performed for maternal age, gestational age, BMI, booking status, mode of admission, mode of delivery, and prior PPH history. The Chi-square test was applied to compare categorical variables. When expected frequencies were

less than 5, the Fisher’s Exact Test was used. A p-value ≤ 0.05 was considered statistically significant.

RESULTS

Data were collected from 56 participants, mean age of the study participants was 28.4 ± 5.3 years, indicating that most women were in their late twenties. The average gestational age at delivery was 38.7 ± 1.2 weeks, reflecting that the study population primarily comprised term pregnancies. The mean BMI was 25.6 ± 3.1 kg/m², suggesting that most participants were within the normal to slightly overweight range. Regarding parity, 21 (37.5%) women were primiparous, 20 (35.7%) multiparous, and 15 (26.8%) grand multiparous. A large proportion, 40 (71.4%), were booked cases who had received antenatal care, while 16 (28.6%) were unbooked. Most admissions were through the emergency department (60.7%), with 39.3% admitted via the outpatient department. Vaginal delivery was the predominant mode of delivery in 38 (67.9%) women, while 18 (32.1%) underwent cesarean section. Only 5 (8.9%) participants reported a previous history of postpartum hemorrhage.

Table 1
Baseline Characteristics of the Study Participants (n = 56)

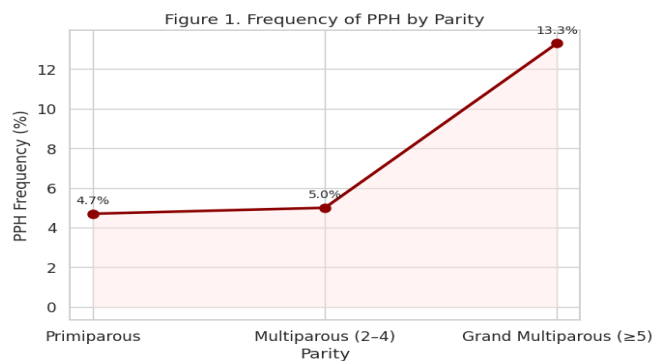
Variable	Mean ± SD / n (%)
Age (years)	28.4 ± 5.3
Gestational age (weeks)	38.7 ± 1.2
BMI (kg/m ²)	25.6 ± 3.1
Parity	Primiparous 21 (37.5%)
	Multiparous (2-4) 20 (35.7%)
	Grand multiparous (≥5) 15 (26.8%)
Booking status	Booked 40 (71.4%)
	Unbooked 16 (28.6%)
Mode of admission	Emergency 34 (60.7%)
	OPD 22 (39.3%)
Mode of delivery	Vaginal 38 (67.9%)
	Cesarean section 18 (32.1%)
Previous PPH	5 (8.9%)
Educational level	Primary or below 20 (35.7%)
	Secondary 24 (42.9%)
	Graduate or above 12 (21.4%)

The overall frequency of postpartum hemorrhage (PPH) was 7.1% (4 out of 56 cases). PPH occurred in 1 (4.7%) primiparous woman, 1 (5.0%) multiparous woman, and 2 (13.3%) grand multiparous women.

Table 2
Frequency of Postpartum Hemorrhage According to Parity (n = 56)

Parity	Total (n)	PPH (n)	Frequency (%)
Primiparous	21	1	4.7
Multiparous (2-4)	20	1	5.0
Grand multiparous (≥5)	15	2	13.3
Total	56	4	7.1

Figure 1



Women who developed PPH had a slightly higher mean age (29.5 ± 4.7 years) compared to those without PPH (28.3 ± 5.4 years), although this difference was not statistically significant (p = 0.47). Similarly, the mean BMI was marginally higher in women with PPH (26.4 ± 2.8 kg/m²) than in those without (25.5 ± 3.2 kg/m²), with no significant difference (p = 0.36). Unbooked patients accounted for half (50.0%) of the PPH cases, compared to 26.9% among those without PPH (p = 0.29). PPH occurred more frequently in cesarean deliveries (50.0%) than in vaginal deliveries (30.8%), though this difference was not statistically significant (p = 0.18). Previous PPH history was found in 25.0% of women who experienced current PPH, compared to 7.7% among those who did not (p = 0.08).

Table 3
Association of PPH with Maternal and Obstetric Variables (n=56)

Variable	PPH Present (n=4)	PPH Absent (n=52)	p-value
Mean Age (years)	29.5 ± 4.7	28.3 ± 5.4	0.47
Mean BMI (kg/m ²)	26.4 ± 2.8	25.5 ± 3.2	0.36
Unbooked cases	2 (50.0%)	14 (26.9%)	0.29
Cesarean delivery	2 (50.0%)	16 (30.8%)	0.18
Previous PPH	1 (25.0%)	4 (7.7%)	0.08
Grand multiparity	2 (50.0%)	13 (25.0%)	0.042*

Among vaginal deliveries (n = 38), 2 women (5.3%) developed PPH, while among cesarean sections (n = 18), PPH occurred in 2 women (11.1%). Although the frequency was higher in cesarean deliveries, this difference was not statistically significant (p = 0.18). Similarly, unbooked women showed a higher incidence of PPH (12.5%) compared to booked women (5.0%), though this relationship also did not reach statistical significance (p = 0.29).

Table 4
Comparison of Mode of Delivery and Booking Status with Postpartum Hemorrhage (n = 56)

Variable	Category	Total PPH Present (n)	PPH Frequency (%)	p-value
Mode of Delivery	Vaginal	38	2 (5.3)	0.18
	Cesarean Section	18	2 (11.1)	
Booking Status	Booked	40	2 (5.0)	0.29
	Unbooked	16	2 (12.5)	

Women aged >30 years had a slightly higher PPH rate (9.1%) than those ≤30 years (5.9%), but this was not

statistically significant ($p = 0.63$). Women with BMI ≥ 25 kg/m² experienced PPH in 9.1% of cases compared to 4.3% among those with BMI < 25 ($p = 0.41$). Gestational age between 37–39 weeks had a PPH rate of 7.0%, while those delivering between 40–42 weeks had 7.7% ($p = 0.71$). Regarding education, women with primary or below education had a PPH rate of 10.0%, compared to 5.6% in those with secondary or higher education ($p = 0.54$).

Table 5

Stratification of PPH with Respect to Risk Factors (n = 56)

Risk Factor	Category	PPH		p-value
		Present (n)	Absent (n)	
Maternal Age (years)	≤ 30	2	32	0.63
	> 30	2	20	
BMI (kg/m ²)	< 25	1	22	0.41
	≥ 25	3	30	
Gestational Age (weeks)	37–39	3	40	0.71
	40–42	1	12	
Educational Level	\leq Primary	2	18	0.54
	\geq Secondary	2	34	

DISCUSSION

This study sought to assess the prevalence and relationship of postpartum hemorrhage (PPH) with parity among women of childbearing age delivering in a tertiary care facility located in Nawabshah. The case of PPH during the study period was 7.1%. This coincides with reports of PPH frequency around 5–10% in developing countries. PPH represents an ongoing risk in obstetrics due to potential delays in recognition and treatment. 28.4 years was the average age of the women participants and the majority were in the late childbearing age. The incidence of PPH was highest for grand multiparous women at 13.3%, which is considerably greater than for primiparous (4.7%) and multiparous women (5.0%). This demonstrates the relationship of grand multiplicity and PPH frequency which agrees with the literature on grand multiparity as an independent risk factor. Overall the evidence shows an increase in the likelihood of PPH with an increase in parity. These women represented, in part, a study population with the risk of PPH. Increasing rates of PPH demonstrated within a greater population continuum of care and access to the direct obstetric procedures of PPH are critical. The challenge remains in access to PPH interventions. In women who have had multiple pregnancies, muscle fibers in the uterus undergo repeated cycles of stretching and thinning, which can lead to decreased efficiency in muscle contraction [15]. Consequently, this makes uterine atony more likely to occur, which the most frequent cause of postpartum hemorrhage. The physiological driving forces behind this conclusion has been outlined extensively in literature. As pregnancies are carried to term, prolonged gestation causes remodeling of the uterine structure, and the receptor response to oxytocin may become desensitized, resulting in deficits in uterine contractility immediately postpartum [16]. Such deficits in contractility evident as tone and sustained relaxation of the uterus, which occurs postpartum, causes the uterus to be more vascular, therefore increasing the likelihood of hemorrhage in the third stage of labor. Conversely, primiparous women,

despite being at lesser risk of uterine atony, may still suffer PPH due to prolonged labor, genital tract trauma, and instrumented delivery. Thus, both ends of the parity scale need appropriate and close supervision, although the risks are far more significant in the case of grand multiparas [17]. This study also noted that PPH rates were higher after cesarean deliveries (11.1%) compared to vaginal deliveries (5.3%), although this difference was not significant. This finding has been noted in previous literature as well, in which the risk of hemorrhage rises during cesarean deliveries because of the enlarged incision area, extended time of surgery, and the use of tocolytics during anesthesia. More so, in emergency cesarean deliveries, where the indications can include uterine atony or obstructed labor, the risk of significant hemorrhage increases even more. It showed a higher frequency of PPH (12.5%) compared to booked cases (5.0%). Unbooked patients often enter labor without any booked case [18]. This finding underlines the importance of antenatal care. Most booked cases do. Unbooked women present late before the labor with little to no time Antenatal care. Unbooked women present late before the labor with little to no time Antenatal care Regular antenatal PPH recognized. Higher rates PPH unbooked women. This clearly indicates that PPH unbooked women indicates that community PPH community awareness campaigns to encourage encourage. PPH community awareness campaigns to encourage. facility based deliveries. While the other variables in this study did not show any significant correlation with PPH, the study recognized the clinical importance of maternal age, BMI, gestational age, and educational level [19]. Higher BMI and older maternal age correlate with increased maternal PPH due to increased associated comorbidities such as hypertension, prolonged labor, and prolonged labor. This study size may not provide enough evidence to draw statistically significant relationships for the remaining variables [20]. In this case, there is an overall frequency of PPH observed, which is 7.1% and is comparable to 7.6% frequency reported by Shazia Rafiq et al. It is, however, slightly lower than the rates reported in studies conducted in rural regions where accessibility to skilled attendance continues to be an issue. This indicates adherence to institutional protocols for AMTSL at the study site may have contributed to lower rates of hemorrhage. As the prevention of atonic PPH is such a globally documented issue, the implementation of uterotonic prophylaxis, which is primarily oxytocin administered within a minute of delivery, continues to be a cornerstone. Of women with a prior history of hemorrhage, 20% were documented as recurrence of PPH. This supports the international literature which states that women with a history of PPH in a previous pregnancy are at an increased risk for the same in subsequent pregnancies. This result suggests the importance of close surveillance and preparedness during labor, which may include early cross-match blood and the controlled availability of uterotonics [21].

Limitations

The study's main limitation lies in its relatively small sample size ($n=56$), which may limit the generalizability of findings. Additionally, the estimation of blood loss was

partly based on visual assessment, which is inherently subjective despite efforts to standardize measurement using calibrated drapes. Future studies with larger cohorts, objective quantification methods (such as gravimetric or photometric estimation), and inclusion of more diverse populations would provide stronger evidence for policy and clinical practice improvements.

CONCLUSION

It is concluded that postpartum hemorrhage (PPH) remains an important cause of maternal morbidity among

women delivering at term. The overall frequency of PPH observed was 7.1%, indicating that despite routine preventive measures, the condition continues to occur at a notable rate. A significant association was found between increasing parity and the risk of PPH, with grand multiparous women exhibiting the highest frequency. Although mode of delivery and booking status did not reach statistical significance, higher rates of PPH were noted among women undergoing cesarean section and those who were unbooked, highlighting the need for improved antenatal surveillance and institutional delivery practices.

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