

Postpartum Hemorrhage: Maternal Profile, Etiologies, and Interventions in a Normal Birth Center

Hemorragia Pós-parto: Perfil Materno, Etiologias e Intervenções em um Centro de Parto Normal
Hemorragia Posparto: Perfil Materno, Etiologías e Intervenciones en un Centro de Partos Normales

RESUMO

OBJETIVO: Avaliar fatores clínicos, obstétricos e assistenciais associados à ocorrência de hemorragia pós-parto (HPP) em mulheres atendidas na Casa de Parto de São Sebastião (CPSS). **MÉTODO:** Estudo observacional, retrospectivo e quantitativo, baseado na análise de 109 prontuários de atendimentos realizados entre 2020 e 2024. **RESULTADO:** As participantes apresentaram idade média de 26 anos, predomínio de união estável e escolaridade de ensino médio completo, além de alta conformidade aos critérios de admissão. A atonia uterina foi a principal etiologia da HPP, e a maioria dos casos foi manejada no próprio serviço, com baixa taxa de remoção. **CONCLUSÃO:** Os resultados indicam elevada capacidade resolutiva e segurança do modelo assistencial, ressaltando a necessidade de estudos prospectivos com amostras ampliadas.

DESCRIPTORIOS: Parto Humanizado; Centros de Assistência à Gravidez e ao Parto; Hemorragia pós-parto; Parto normal

ABSTRACT

OBJECTIVE: To evaluate clinical, obstetric, and care factors associated with the occurrence of postpartum hemorrhage (PPH) in women treated at the São Sebastião Birth Center (CPSS). **METHOD:** Observational, retrospective, quantitative study based on the analysis of 109 medical records from care provided between 2020 and 2024. **RESULTS:** The participants had a mean age of 26 years, predominantly in stable relationships, and had completed high school, in addition to high compliance with admission criteria. Uterine atony was the main etiology of PPH, and most cases were managed at the facility itself, with a low removal rate. **CONCLUSION:** The results indicate high resolvability and safety of the care model, highlighting the need for prospective studies with larger samples.

DESCRIPTORS: Humanized childbirth; Pregnancy and Childbirth Care Centers; Postpartum hemorrhage; Normal childbirth.

RESUMEN

OBJETIVO: Evaluar los factores clínicos, obstétricos y asistenciales asociados a la aparición de hemorragia posparto (HPP) en mujeres atendidas en la Casa de Parto de São Sebastião (CPSS). **MÉTODO:** Estudio observacional, retrospectivo y cuantitativo, basado en el análisis de 109 historias clínicas de atendidos entre 2020 y 2024. **RESULTADO:** Las participantes tenían una edad media de 26 años, predominantemente en relaciones estables y el nivel educativo completo de secundaria, además de un alto cumplimiento de los criterios de admisión. La atonía uterina fue la principal etiología de la HPP, y la mayoría de los casos se gestionaron en el propio servicio, con una baja tasa de derivación. **CONCLUSIÓN:** Los resultados indican una alta capacidad de resolución y seguridad del modelo de atención, lo que destaca la necesidad de estudios prospectivos con muestras más amplias.

DESCRIPTORES: Parto humanizado; Centros de atención al embarazo y al parto; Hemorragia posparto; Parto normal.

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INTRODUCTION

Postpartum hemorrhage (PPH) is characterized by blood loss ≥ 300 mL associated with hemodynamic instability or ≥ 500 mL in the first 24 hours after delivery, constituting one of the main obstetric emergencies and

the leading cause of maternal death worldwide^{1, 19}. It is a serious event that may require blood transfusion, surgical interventions, or lead to maternal death, even in services intended for pregnant women at normal risk, such as Normal Delivery Centers (NDCs).

The main causes of PPH include

uterine atony, retained placental remains, placental accreta, lacerations and hematomas of the birth canal, uterine inversion, and congenital or acquired coagulation disorders². About 70% of cases are attributed to uterine atony, justifying the adoption of active management of the third stage of la-

bor, with prophylactic use of oxytocin and controlled traction of the umbilical cord³⁻⁸, although its routine application in low-risk women is still controversial⁹. In the absence of atony, trauma to the birth canal should be investigated¹⁰.

The identification of PPH is based mainly on visual estimation of blood loss, an imprecise but widely used method, requiring continuous monitoring and immediate initiation of management according to the presumed cause^{3,8}. In CPNs, episodes of PPH may require transfer to tertiary care services to ensure advanced support.

CPNs, integrated into the Stork Network, offer care led by obstetric nurses, a model associated with reduced obstetric interventions, lower cesarean rates, and better maternal and neonatal outcomes, including a lower incidence of PPH¹¹⁻¹³. In this context, the study aimed to evaluate clinical, obstetric, and care factors related to the occurrence of PPH in women treated at the São Sebastião Birth Center, considering the care protocol and clinical evolution of the patients.

METHODOLOGY

This is an observational, retrospective, quantitative study, structured according to the STROBE checklist recommendations. The study was conducted at the São Sebastião Birth Center, a peri-hospital normal birth center located in the Federal District. The data collection period covered the years between 2020 and 2024. The sample included 109 medical records of women who presented with postpartum hemorrhage (PPH) and were admitted to the São Sebastião Birth Center. Medical records of patients who underwent PPH management were included, regardless of whether or not they met the institutional protocol admission criteria, and incomplete records were excluded. Subjects were selected using a census method, including all eligible medical records availa-

ble during the study period.

The study variables included sociodemographic, obstetric, etiological, and care aspects, including age, parity, cause of PPH, and therapeutic interventions performed in accordance with the institutional protocol. Data were extracted directly from institutional clinical records and organized into a structured database. The collection instrument covered all items relevant to PPH, allowing for detailed analysis of the clinical and care context, as well as the procedures adopted in response to complications.

For statistical analysis, descriptive statistics were used—absolute and relative frequencies, mean, median, standard deviation, variance, 95% confidence intervals, asymmetry, and kurtosis—to characterize the sample. The distribution of continuous variables was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The association between categorical variables, such as the etiology of PPH and interventions adopted, was analyzed using Pearson's chi-square test or Fisher's exact test, when appropriate, ensuring robustness in small subgroups. All analyses were performed using IBM SPSS Statistics software. Participants were informed about the objectives, risks, benefits, and rights, signing the Free and Informed Consent Form (FICF), ensuring anonymity and freedom to withdraw at any time. The study was approved by the Research Ethics Committee, opinion

No. 7,345,217, and registered with the CAAE No. 83884524.0.0000.5553.

RESULTS

Between 2020 and 2024, 2,110 deliveries were performed at the São Sebastião Birth Center (CPSS), of which 109 developed postpartum hemorrhage, corresponding to 5.17% of cases, with no maternal deaths.

The sociodemographic and obstetric analysis of the 109 participants indicated a mean age of 26 years (SD = 6.2), ranging from 16 to 41 years. Women in stable relationships predominated (45.0%), followed by single women (33.9%) and married women (21.1%). Regarding education, the largest proportion had completed high school (40.4%), while those with higher education were less frequent. Most had various occupations (66.1%), and 33.9% were housewives. All participants underwent prenatal care, and 85.3% met the admission criteria of the unit's institutional protocol, as shown in Table 1.

Table 1. Sociodemographic profile and prenatal care.

Variable	n	%
Age (years)		
Mean ± SD	26,0 ± 6,2	-
Min–Max	16–41	-
Marital status		
Common-law marriage	49	45,0
Single	37	33,9
Married	23	21,1

Education		
No education	1	0,9
Elementary school	1	0,9
Secondary education	16	14,7
Incomplete high school	23	21,1
High school completed	44	40,4
Incomplete higher education	5	4,6
Complete higher education	13	11,9
Occupation		
Housewife	37	33,9
Other occupations*	72	66,1
Prenatal care		
Yes	109	100,0
Number of prenatal consultations		
≤ 6 consultations	0	0
7–9 visits	0	0
≥ 10 consultations	0	0
Complies with protocol		
Yes	93	85,3
No	16	14,7

*Includes informal activities, service provision, commerce, public and private sectors.

SD: standard deviation; Min–Max: minimum–maximum.

Source: own work (2025)

uterine atony was the main cause of postpartum hemorrhage, accounting for 96.3% of cases (n=105), followed by retained placental tissue with 2.8% (n=3) and laceration with 0.9% (n=1). Regarding the care outcome, 96.3% of

patients (n=105) were fully managed at the unit, while 3.7% (n=4) required transfer to more complex services due to the severity of their condition, as shown in Table 2.

Among the 109 women evaluated,

Table 2. Distribution of causes of postpartum hemorrhage and need for transfer

Variable	Category	Frequency (n)	Percentage (%)
Cause of PPH	Uterine atony	105	96.3
	Retention of ovular remains	3	2.8%
	Laceration	1	0.9
Removal by HPP	Yes	4	3.7
	No	105	96.3

Source: own work (2025)

To assess the relationship between the cause of postpartum hemorrhage and the interventions adopted (Table 3), association tests were performed using Pearson's chi-square and, when

the expected frequencies were insufficient, Fisher's exact test. The p-values obtained (0.701; 1.000; 0.569; 0.981) indicate no statistically significant association between the different etiological groups and the therapeutic

approaches analyzed. These results suggest that the distribution of interventions was similar regardless of the cause of hemorrhage, indicating consistency in the clinical approach adopted.

Table 3. Association between the cause and resolution of bleeding

Cause/conduct adopted		Oxytocin	Methylergometrine	Bimanual massage	Tranexamic acid	Misoprostol	No information	Total
Atony	(n)	33	59	1	8	1	3	105
	%	31,4%	56,2%	1,0%	7,6%	1,0%	2,9%	100,0%
Retention	(n)	2	0	0	1	0	0	3
	%	66,7%	0,0%	0,0%	33,3%	0,0%	0,0%	100,0%
Laceration	(n)	0	1	0	0	0	0	1
	%	0,0%	100,0%	0,0%	0,0%	0,0%	0,0%	100,0%
Total	(n)	35	60	1	9	1	3	109
	%	32,1%	55,0%	0,9%	8,3%	0,9%	2,8%	100,0%
Chi-square tests								
	Value	df	Significance Sig. (2 sides)	Exact Sig. (2-tailed)				
Pearson's chi-square	6,105 ^a	10	0,806	0,309				
Likelihood ratio	7,007	10	0,725	0,258				
Fischer's Exact Test	19,196			0,250				
Number of Valid Cases	109							

a. 15 cells (83.3%) expected a count lower than 5. The minimum expected count is 0.01.
 Source: own work (2025)

Table 4 describes the comparative analysis between the cause of PPH and continuous maternal variables, specifically age and parity, using descriptive statistics (mean, median,

variance, standard deviation, 95% confidence interval, skewness, and kurtosis) associated with the Lilliefors normality test to verify the distributional adequacy of the data. In cases of uterine atony, the mean age was 26 years (SD = 6.23), with slight asymmetry and a range between 16 and 41

years, while the group with retained placental tissue had a lower mean and greater variability, a direct consequence of the small sample size.

Table 4. Age and parity of patients according to the cause of postpartum hemorrhage and normality tests

Cause	n	Age (years) mean ± SD	Median (min–max)	Parity mean ± SD	Median (min–max)	Misoprostol	Sem informação	Total
Atony	105	26.0 ± 6.2	25 (16–41)	1.0 ± 1.3	1 (0–8)	1	3	105
Retention	3	24.0 ± 3.6	25 (20–27)	2.7 ± 1.5	3 (1–4)	1,0%	2,9%	100,0%
Laceration*	1	—	—	—	—	0	0	3

SD: standard deviation

* No descriptive analysis was presented for laceration due to insufficient number of cases (n = 1).
 Source: own work (2025)

DISCUSSION

The maternal profile identified—predominantly young, with high adherence to prenatal care and broad compliance with admission criteria—

is compatible with the care model of Normal Birth Centers (NBCs) and reflects adequate selection of users, as well as efficient organization of care. Adequate prenatal care is recognized as a protective factor for adverse maternal outcomes²⁰, allowing early identification of clinical conditions that contraindicate delivery in non-hospital settings¹⁴⁻¹⁶. Even so,

postpartum hemorrhage (PPH) remains frequent and unpredictable, and may occur in the absence of previously identifiable risk factors.

Uterine atony was the main etiology of PPH in the study, in line with the international literature, which indicates its participation in 70% to 80% of cases². The high prevalence reinforces the importance of active sur-

veillance of uterine tone in the immediate postpartum period, especially in contexts such as CPNs, where care is focused on physiology but requires readiness to recognize and intervene quickly in complications. Failure of uterine contraction compromises the physiological mechanism of placental hemostasis, making timely management essential to prevent progression to severe conditions.

The low removal rate observed indicates that most episodes of PPH were resolved in the service itself, suggesting a high resolution capacity of the CPN, consistent with rates at other centers, which are generally less than 5%¹⁷. The need for transfer is often used as an indirect indicator of clinical severity and effectiveness of initial management¹⁸. Reduced removal rates, associated with strict admission criteria and well-established protocols, reflect care safety, team preparedness, and careful application of the eligibility protocol, which

minimizes the admission of pregnant women with higher risk factors for PPH.

The absence of a significant association between the etiologies of PPH and the interventions adopted suggests that clinical management followed standardized protocols, prioritizing universal measures to control bleeding before etiological confirmation¹. Similarly, age and parity had no significant influence on the etiological groups, corroborating evidence that PPH can occur unpredictably, even in young women without classic risk factors¹⁴. These findings reinforce the need for universal surveillance in the immediate postpartum period and continuous training of teams for rapid response to obstetric emergencies.

CONCLUSION

In summary, this study shows that Normal Birth Centers, when supported by strict eligibility criteria, well-de-

finied care protocols, and properly qualified teams, are a safe and effective model for caring for pregnant women at usual risk, including in the management of complications such as postpartum hemorrhage (PPH). The unpredictable nature of PPH reaffirms the need for continuous monitoring and early interventions in the immediate postpartum period, especially given the predominance of uterine atony as a central pathophysiological mechanism. The low transfer rate observed at the São Sebastião Birth Center demonstrates a high level of resolution, consistent with evidence-based guidelines, while the performance of obstetric nurses, guided by physiological practices and continuous care, reinforces the strategic role of CPNs in promoting maternal safety and improving the childbirth experience, consolidating them as fundamental elements of obstetric care networks.

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