



Original Article

PREVALENCE AND FACTORS ASSOCIATED WITH ADVERSE PREGNANCY OUTCOMES AT THE BUEA REGIONAL HOSPITAL: A RETROSPECTIVE STUDY

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ABSTRACT

Background: Adverse pregnancy outcomes is a broad term comprising health problems that occur to the mother, the newborn, or both during pregnancy, labor, delivery and the postpartum period. Despite ongoing efforts to improve maternal health, there is paucity of data from the study area on the specific factors contributing to adverse pregnancy outcomes. The main aim of this study was to determine the prevalence and factors associated with adverse pregnancy outcomes at the Buea Regional Hospital.

Methods: This retrospective study was carried out at Buea Regional Hospital. A total of 1069 Files of women admitted to the maternity wards from January 1st 2022 to December 31st 2024 were reviewed. Data analysis was performed using the Statistical Package for Social Sciences version 28. Statistical associations were set at p values <0.05.

Results: The overall prevalence of adverse pregnancy outcomes was found to be 24.3% with preterm delivery (27.5%) and preeclampsia (22.7%) being the most common. Maternal level of education, employment status, body mass index, smoking, alcohol consumption, multiple gestation, and cesarian delivery were found to be significant predictors of adverse pregnancy outcomes with p values of 0.020, 0.043, 0.013, 0.016, 0.002, 0.011 and 0.003 respectively.

Conclusion: Health institutions and community stakeholders should strengthen maternal health education programs focused on early antenatal booking, nutrition, lifestyle modification, and danger sign recognition to reduce the prevalence of adverse pregnancy outcomes.

Key Words: Prevalence, Risk, Factors, Adverse, Pregnancy, Outcomes, Buea Regional Hospital, Cameroon

INTRODUCTION

Adverse pregnancy outcome is a broad term comprising health problems that occur to the mother, the newborn, or both during pregnancy, labor and delivery, and the postpartum period [1]. Some of the common pregnancy complications include antepartum hemorrhage (APH), hyperemesis gravidarum, postpartum hemorrhage (PPH), stillbirth, low birth weight, premature rupture of membranes (PROM), and obstructed labor. According to the World Health Organization (WHO) reports, each day across the globe approximately 810 women die of preventable complications during pregnancy, childbirth, or postpartum period [2]. In 2020, over 295,000 women died during and following pregnancy and childbirth with Sub-Saharan Africa accounting for nearly 66% (196,000) of the global maternal deaths, while Southern Asia accounted for about 20% (58,000) [3].

In Cameroon, in 2020, according to the Demographic and Maternal Health Survey (DMHS), the maternal mortality ratio went from 782 deaths per 100,000 live births in 2011 to 467 deaths per 100,000 live births in 2018 [4]. This ratio is heterogeneous according to the health structures.

For instance, in 2015 at Central Hospital Yaoundé, the rate was estimated at 964 per 100,000 live births and 247 per 100,000 live births at the Regional Hospital in Bamenda [5]. Maternal death has been associated with haemorrhage, sepsis, obstructed labour and hypertensive disorders in developing countries [6].

Adverse pregnancy outcomes are the most important vital statistics used to assess maternal and child health programs. They are an indicator of the quality of maternal and child health care services such as antenatal care, intrapartum care, and medical services [7]. Since the year 2000, Cameroon has reduced maternal and neonatal mortality by half, but a maternal mortality rate of 412 per 100,000 live births and neonatal mortality rate of 29 per 1,000 remains concerning [8].

The causes of these outcomes are multifactorial, including poor healthcare infrastructure, cultural practices, low health literacy, malnutrition, and increasing non-communicable diseases like hypertension and diabetes among pregnant women. Despite ongoing efforts to improve maternal health, there is a lack of localized knowledge on the specific factors contributing to adverse pregnancy outcomes at the Buea Regional hospital.

METHODS

Study Area and Settings

This study was carried out at the, Buea Regional Hospital (BRH). The health facility is one of the most significant healthcare institutions within the Region offering both general and specialized services such as gynecological care.

Study Design and Duration

This study was a hospital-based retrospective study which involved the review of medical records of women admitted to the maternity wards from 1st January 2022 to 31st December 2024. This study lasted for a period of 8 months, from November 2024 to June 2025.

Study Population

The study included files of women admitted to the maternity ward of the Buea Regional hospital from 1st January 2022 to 31st December 2024. A total of 1,069 files were reviewed out of which 1,017 met the inclusion criteria. The exclusion criteria were based on incomplete files, or admissions admitted for reasons other than pregnancy, labor and multiple gestations.

Data Collection and analysis

A modified structured data extraction form was used to obtain data related to the prevalence and factors associated with adverse pregnancy outcomes.

The data was computed into MS Excel version 2016 and analyzed using the Statistical Package for Social Sciences (SPSS) version 28.0 for windows. Descriptive and bivariate analysis were performed. Statistical significance was based on a 95% confidence interval with a cut-off point set at $p < 0.05$.

Ethical considerations

This study was approved by the Ethics Committee for Human Health Research of the Regional Delegation of Public Health for the South West Region (Approval number: 34/CRERSH/SW/C/01/2025).

RESULTS

Socio-demographic characteristics of admitted cases

The mean age of the admitted cases was 25.4 ± 4.3 years. The majority 431 (42.4%) of the admitted pregnant women were aged between 25–29 years. Regarding the level of education completed, nearly half of the respondents (49.0%) had completed secondary education. In terms of employment, 448 (44.1%) of the cases of admission were self-employed. The majority resided in urban areas, comprising 770 (75.7%), while 247 (24.3%) lived in rural areas. Concerning marital status, married women accounted

for 593 (58.3%) of the admitted cases (Table 1).

Prevalence of adverse pregnancy outcomes

Out of the 1,017 maternal health records reviewed, 247 women (24.3%) experienced adverse pregnancy outcomes. The most common adverse outcome

identified was preterm delivery (27.5%). Other adverse pregnant outcomes identified include preeclampsia (22.7%), and small for gestational age infants (17.0%) (Figure 1). The highest (27.0%) yearly prevalence within the study period was observed from the year 2022 (Figure 2).

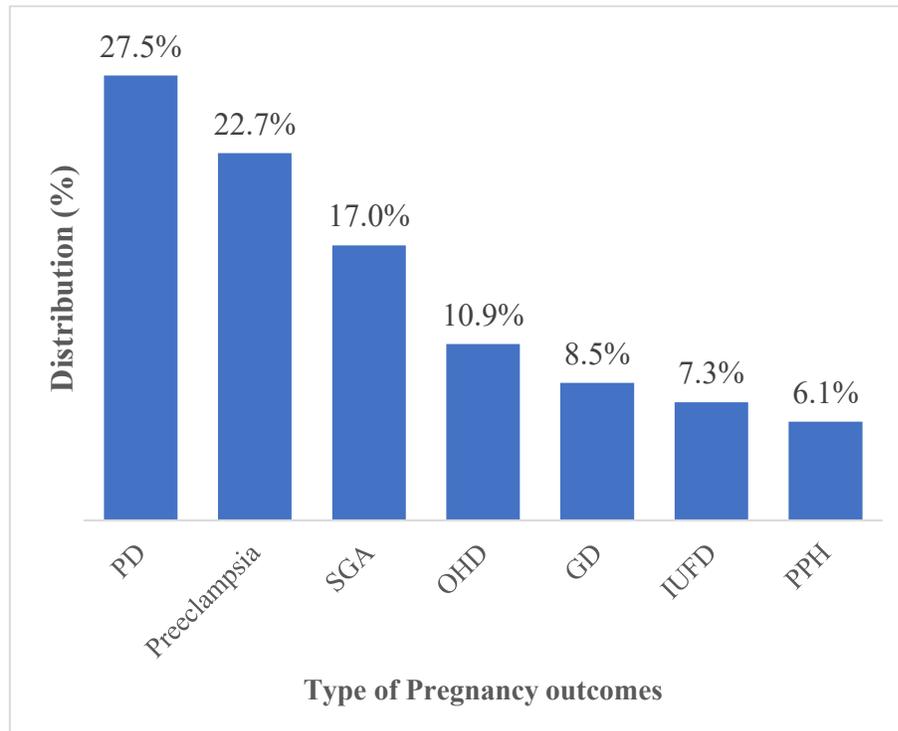


Figure 1: Prevalence and type of pregnancy outcome among admitted cases from January 1st 2022 to December 31st 2024 (n=247), PD: preterm delivery, SGA: small for gestational age infant, GD: gestational diabetes, OHD: other hypertensive disorders, IUFD: intrauterine fetal demise, PPH: post-partum hemorrhage

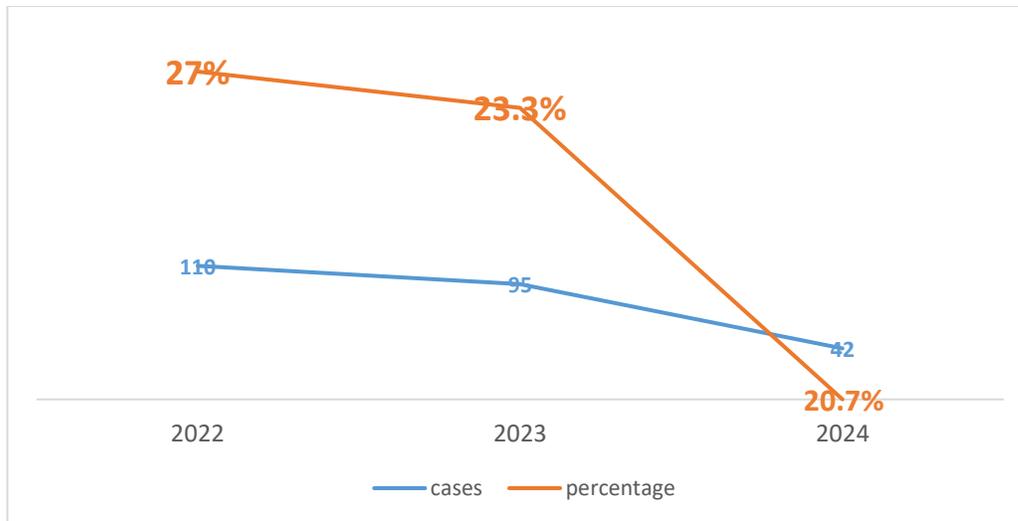


Figure 2: Prevalence trend of adverse pregnancy outcomes per year

Table 1: Socio-Demographic Characteristics of admitted cases (n = 1,017)

Variable	Category	Frequency (n=1017)	Percentage (%)
Age (years)	15–19	86	8.5
	20–24	321	31.6
	25–29	431	42.4
	≥30	179	17.6
Level of Education	No formal education	62	6.1
	Primary	144	14.2
	Secondary	499	49.0
	University	312	30.7
Employment Status	Civil Servant	107	10.5
	Self-employed	448	44.1
	Unemployed	388	38.1
	Student	62	6.1
	Others	12	1.2
Place of Residence	Urban	770	75.7
	Rural	247	24.3
Marital Status	Single	366	36.0
	Married	593	58.3
	Divorced	33	3.2
	Widowed	25	2.5

Antepartum Factors of admitted cases with adverse pregnancy outcomes

The antepartum data reveal that a significant proportion of women were overweight or obese (40.5%). Additionally, 21.1% of women had fewer than four antenatal visits (Table 2).

Table 2: Antepartum Factors of admitted cases with adverse pregnancy outcomes (n=247)

Variable	Category	Frequency (n=247)	Percentage (%)
BMI	Underweight (<18.5)	26	10.5
	Healthy (18.5–24.9)	121	49.0
	Overweight (25.0–29.9)	65	26.3
	Obese (\geq 30)	35	14.2
Smoking Status	Never	215	87.0
	Previous	24	9.7
	Current	8	3.3
Alcohol Consumption	Never	182	73.7
	Occasionally	51	20.6
	Heavy	14	5.7
Gravidity	Nulligravida	39	15.8
	Primigravida	78	31.6
	Multigravida	96	38.9
	Grand multigravida	34	13.8
Parity	Nulliparous	43	17.4
	Primiparous	80	32.4
	Multiparous	89	36.0
	Grand multiparous	35	14.2
ANC Visits	1–3 visits	52	21.1
	4–6 visits	109	44.1
	>7 visits	86	34.8
Number of Fetuses	Single	228	92.3
	Twin	15	6.1
	Triplet	3	1.2
	>3	1	0.4

Intrapartum Factors of admitted cases with adverse pregnancy outcomes

Most of the women (65.6%) had vaginal deliveries, with cesarean sections accounting for 28.3% and assisted vaginal deliveries 6.1%. Labor complications occurred in 35.2% of cases (Figure 3)

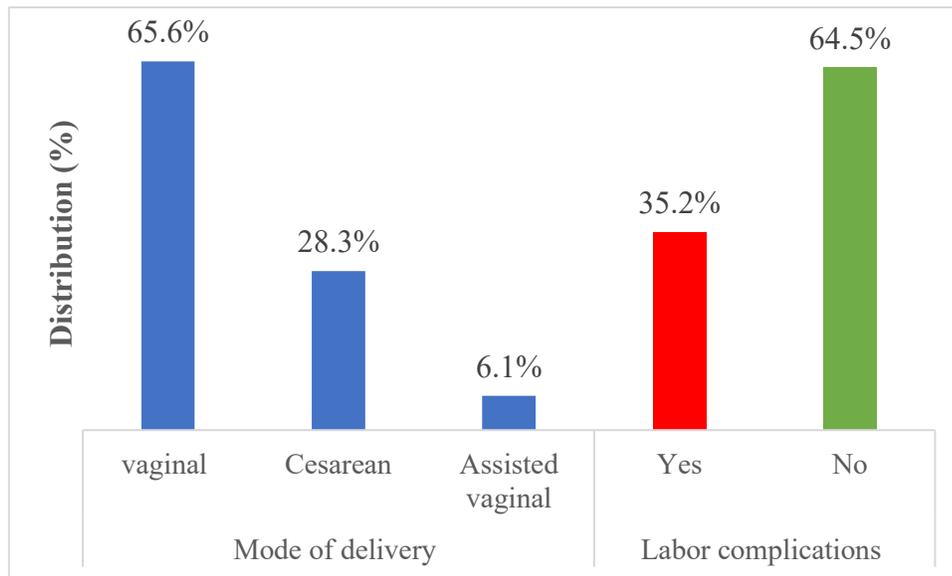


Figure 3: Intrapartum factors of admitted cases with adverse pregnancy outcomes (n=247)

Postpartum Factors of Respondents

Postpartum infections were present in 21.5% of women. Regarding recovery, most women (48.2%) recovered within 1–2 weeks, while 27.1% recovered in less than a week and 24.7% took longer than two weeks (Figure 4).

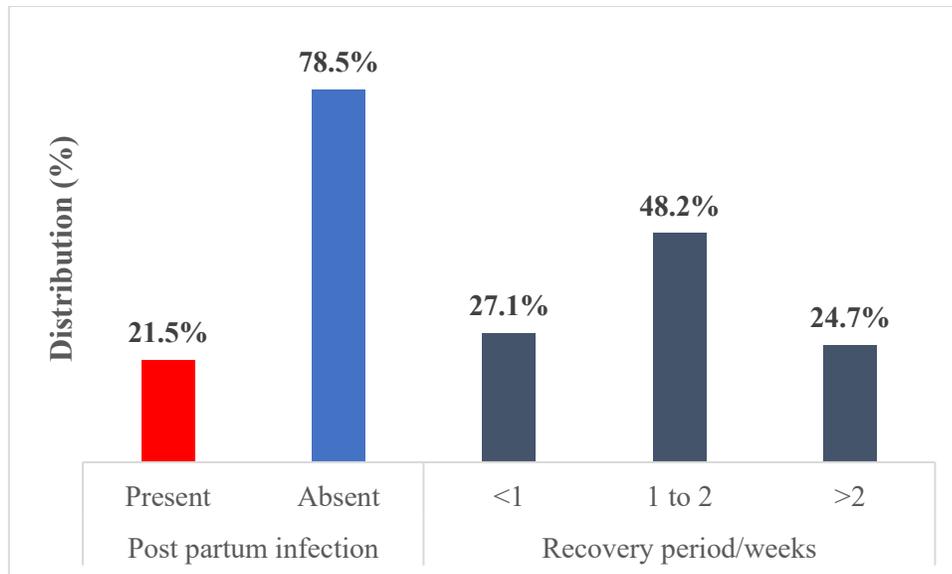


Figure 4: Postpartum Factors of admitted cases with adverse pregnancy outcomes (n=247)

Association between Socio-Demographic Variables and Adverse Pregnancy Outcomes

Data analysis showed statistically significant associations between education level ($p = 0.020$), employment status ($p = 0.043$) and the occurrence of adverse pregnancy outcomes. Women with no formal education experienced a disproportionately higher rate of adverse outcomes compared to those with secondary or university education (Table 3)

Association Between Antepartum Factors and prevalence of Adverse Pregnancy Outcomes

Several antepartum factors had significant associations with adverse pregnancy outcomes. Specifically, maternal Body Mass Index (BMI) ($p = 0.013$), smoking status ($p = 0.016$), alcohol consumption ($p = 0.002$), gravidity ($p = 0.011$), and number of fetuses ($p = 0.012$) were found to be predictors of adverse pregnancy outcomes (Table 4).

Table 3: Association between Socio-Demographic Characteristics and Adverse Pregnancy Outcomes

Variable	Category	Adverse Outcome n (%)	No Adverse Outcome n (%)	Total (n)	χ^2 Value	p-Value
Age (years)	15–19	21 (24.4)	65 (75.6)	86	0.23	0.974
	20–24	78 (24.3)	243 (75.7)	321		
	25–29	105 (24.4)	326 (75.6)	431		
	≥30	43 (24.0)	136 (76.0)	179		
	Total	247	770	1,017		
Level of Education	No formal education	29 (46.8)	33 (53.2)	62	9.86	0.020
	Primary	37 (25.7)	107 (74.3)	144		
	Secondary	126 (25.2)	373 (74.8)	499		
	University	55 (17.6)	257 (82.4)	312		
	Total	247	770	1,017		
Employment Status	Civil Servant	16 (15.0)	91 (85.0)	107	8.14	0.043
	Self-employed	111 (24.8)	337 (75.2)	448		
	Unemployed	95 (24.5)	293 (75.5)	388		
	Student	21 (33.9)	41 (66.1)	62		
	Others	4 (33.3)	8 (66.7)	12		
	Total	247	770	1,017		
Marital Status	Single	86 (23.5)	280 (76.5)	366	0.34	0.843
	Married	144 (24.3)	449 (75.7)	593		
	Divorced	8 (24.2)	25 (75.8)	33		
	Widowed	9 (36.0)	16 (64.0)	25		
	Total	247	770	1,017		

Table 4: Association Between Antepartum Factors and prevalence of Adverse Pregnancy Outcomes

Variable	Category	Adverse Outcome n (%)	No Adverse Outcome n (%)	Total (n)	χ^2 Value	p-Value
BMI	Underweight (<18.5)	26 (10.5)	81 (10.5)	107	10.85	0.013
	Healthy (18.5–24.9)	121 (49.0)	378 (49.0)	499		
	Overweight (25.0–29.9)	65 (26.3)	203 (26.3)	268		
	Obese (\geq 30)	35 (14.2)	108 (14.2)	143		
	Total	247	770	1,017		
Smoking Status	Never	215 (87.0)	655 (85.1)	870	8.21	0.016
	Previous	24 (9.7)	82 (10.6)	106		
	Current	8 (3.3)	33 (4.3)	41		
	Total	247	770	1,017		
Alcohol Consumption	Never	182 (73.7)	550 (71.4)	732	12.42	0.002
	Occasionally	51 (20.6)	180 (23.4)	231		
	Heavy	14 (5.7)	40 (5.2)	54		
	Total	247	770	1,017		
Gravidity	Nulligravida	39 (15.8)	115 (14.9)	154	6.04	0.011
	Primigravida	78 (31.6)	248 (32.2)	326		
	Multigravida	96 (38.9)	312 (40.5)	408		
	Grand multigravida	34 (13.8)	95 (12.3)	129		
	Total	247	770	1,017		
ANC Visits	1–3 visits	52 (21.1)	160 (20.8)	212	4.56	0.102
	4–6 visits	109 (44.1)	343 (44.5)	452		
	>7 visits	86 (34.8)	267 (34.7)	353		
	Total	247	770	1,017		

Association Between Intrapartum Factors of Respondents and prevalence of Adverse Pregnancy Outcomes

Data analysis revealed significant associations between Mode of Delivery ($p=0.003$) and Labor Complications ($p<0.001$) with adverse pregnancy outcomes. Labor complications were more frequent among women with adverse pregnancy outcomes compared to those without adverse outcomes (Table 5).

Table 5: Association Between Intrapartum Factors of Respondents and prevalence of Adverse Pregnancy Outcomes

Variable	Category	Adverse Outcome n (%)	No Adverse Outcome n (%)	Total (n)	χ^2 Value	p-Value
Mode of Delivery	Vaginal	162 (65.6)	400 (51.9)	562	11.73	0.003
	Cesarean Section	70 (28.3)	280 (36.4)	350		
	Assisted Vaginal	15 (6.1)	90 (11.7)	105		
	Total	247	770	1,017		
Labor Complications	Yes	87 (35.2)	150 (19.5)	237	19.72	<0.001
	No	160 (64.8)	620 (80.5)	780		
	Total	247	770	1,017		

Association between Postpartum Factors and Adverse Pregnancy Outcomes

Data analysis revealed statistically significant associations between Postpartum Infection ($p = 0.001$) with adverse pregnancy outcomes. Postpartum infections were more common among women with adverse outcomes (Table 6).

Table 6: Association between Postpartum Factors and Adverse Pregnancy Outcomes

Variable	Category	Adverse Outcome n (%)	No Adverse Outcome n (%)	Total (n)	χ^2 Value	p-Value
Postpartum Infection	Present	53 (21.5)	85 (11.0)	138	10.24	0.0014
	Absent	194 (78.5)	685 (89.0)	879		
	Total	247	770	1,017		
Recovery Period	< 1 week	67 (27.1)	130 (16.9)	197	8.47	0.061
	1–2 weeks	119 (48.2)	360 (46.8)	479		
	> 2 weeks	61 (24.7)	280 (36.3)	341		
	Total	247	770	1,017		

DISCUSSION

This study revealed an overall prevalence of adverse pregnancy outcomes (APOs) of 24.3% over the period from January 2022 to December 2024 at Buea Regional Hospital. A breakdown by year showed a steady decline in prevalence from 27.0% in 2022 through 23.3% in 2023 to 20.7% in 2024. This decline suggests potential improvements in antenatal care, public health education, or hospital-based maternal interventions aligning with observations by Benneh-Akwasi Kuma *et al.* [9]. The most common APO was preterm delivery (27.5%). These findings are consistent with those of Lawn *et al.* who reported high rates of preterm birth and hypertensive disorders as leading causes of perinatal morbidity in sub-Saharan Africa [10]. Similarly, Adeoye *et al.* found preterm births and preeclampsia to be predominant in Nigerian tertiary hospitals [11].

A range of socio-demographic, antepartum, intrapartum, and postpartum factors were found to be predictors of adverse pregnancy outcomes. The level of education ($p = 0.020$) was significantly associated with APOs with women who had no formal education having nearly double the rate of adverse outcomes

compared to those with university education. This aligns with the findings of Gage *et al* and Mekonnen & Mekonnen, who demonstrated that maternal education improves health literacy, timely ANC utilization, and ability to identify complications [12,13]. Similarly, employment status ($p = 0.043$) was equally a predictor of adverse pregnant outcome, with students and those in irregular jobs experiencing more APOs. This is likely due to economic vulnerability, inconsistent access to care, or stress echoing findings from Adeoye *et al.* [14]. Among the antepartum factors, BMI ($p = 0.013$), smoking ($p = 0.016$), alcohol use ($p = 0.002$), gravidity ($p = 0.011$), and number of fetuses ($p = 0.012$) were factors associated with adverse pregnancy outcomes. These findings align with those of Cnattingius *et al.*, who reported a U-shaped risk pattern, where both underweight and obese women are at elevated risk for complications such as preterm birth and fetal distress [77]. For intrapartum factors, both mode of delivery ($p = 0.003$) and labor complications ($p < 0.001$) were significantly associated with adverse outcomes. Women with adverse outcomes were more likely to have undergone

cesarean sections or experienced labor complications, aligning with findings by Souza *et al.* and Stanton & Ronsmans, who reported that cesarean deliveries often reflect underlying complications rather than elective procedures in LMICs [16, 17]. Labor complications such as obstructed labor or fetal distress were also found to increase maternal and neonatal morbidity.

Postpartum infection ($p = 0.0014$) was a significant predictor of APOs, with 21.5% of affected women experiencing infections compared to 11% of those without APOs. This supports Filippi *et al.* and WHO, who listed postpartum infections among the top contributors to maternal morbidity [18, 19]. Although recovery time was not statistically significant ($p = 0.061$), there was a trend toward delayed recovery in women with APOs, potentially reflecting the impact of surgical deliveries or infection-related complications.

Conclusion

The findings of this study reveal an overall prevalence of 24.3% for adverse pregnancy outcomes among women at Buea Regional Hospital between 2022 and 2024, with preterm delivery and preeclampsia being the most common. Several factors were significantly

associated with adverse outcomes, including low maternal education, unemployment, high or low BMI, smoking, alcohol use, gravidity, multiple gestation, labor complications, cesarean delivery, and postpartum infections. These associations underscore the multifactorial nature of pregnancy risks, influenced by biological, behavioral, and socio-economic factors.

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Conflict of interest

The authors declare no conflict of interest

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