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Incidence and associated factors of preterm births at the Tertiary Hospital in Banjul, The Gambia

Abstract

Background: Approximately 1 million of the 3 million neonatal mortalities that occur annually worldwide are directly attributable to prematurity. The majority of nations report a preterm birth prevalence between 5% and 18%. However, many countries lack accurate, localized data on the burden and determinants of preterm birth. In The Gambia, limited research has been conducted to ascertain the magnitude of premature delivery. Therefore, the purpose of this study was to determine the incidence and feto-maternal factors of preterm neonates admitted at neonatal intensive care unit (NICU) of Edward Francis Small Teaching Hospital (EFSTH).

Methods: A hospital-based descriptive cross-sectional study was conducted, focusing on deliveries at EFSTH between January 1, 2021, and December 31, 2021. The overall incidence was calculated based on the total live births during the study period. Data collection tool was used to extract information from Neonatal Intensive Care Unit (NICU). Data was analyzed using Stata version 15.1. Simple descriptive statistics was used to express findings in frequency, percentages, graphs and tables. The binary logistics regression analysis was used to determine association of gestation age and neonatal death.

Results: During the study period, there were 1,806 live births, of which 276 were admitted preterm neonates, yielding a hospital-based preterm admission prevalence of 15.3%. Analysis of the admitted preterm cases revealed that 42.4% of mothers had pregnancy-induced hypertension (PIH), 19.6% experienced premature rupture of membranes (PROM), 11.2% had antepartum hemorrhage (APH), and urinary tract infections (UTI) respectively. Gestational diabetes was present in 3.3% of cases, and chorioamnionitis in 5.4%. High parity (>4) and twin gestations (23.3%) were frequently observed among mothers of preterm infants. Fetal complications such as abnormal lie/presentation (3.3%) and fetal distress (2.2%) were uncommon. The preterm neonatal mortality rate among admitted cases was 38.7%, with respiratory distress syndrome (43.5%) and hypothermia (53.3%) being the most common morbidities. The binary logistics regression analysis further revealed that neonates born within the gestational age of 24-27 weeks were almost 1 and half (OR=1.4) times more likely to die compared to those with the gestational age of 28-31 weeks.

Conclusion: The incidence of preterm births requiring NICU admission at the tertiary hospital was 15.3%. Maternal obstetric complications, including PIH, PROM, APH, and UTI, as well as high parity and multiple gestations, were prominent factors among preterm deliveries. Enhancing antenatal screening and management of these high-risk obstetric conditions is crucial for reducing the burden of preterm births and improving neonatal survival in The Gambia.

Keywords: incidence, preterm birth, associated factors, neonatal outcomes, The Gambia

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Introduction

Preterm delivery is defined as any live birth occurring before 37 completed weeks of gestation, or fewer than 259 days from the first day of the mother's last menstrual period.[1] Preterm birth represents a significant global health burden; an estimated 15 million of the approximately 140 million live births annually are preterm.[2,3] Globally, the incidence of preterm birth ranges from 5% to 18% across different nations.[4] Complications related to prematurity are the leading cause of morbidity and mortality among children under the age of five.[5,6] Preterm infants face elevated risks of severe conditions, including respiratory distress syndrome, necrotizing enterocolitis, retinopathy of prematurity, neonatal sepsis, jaundice, and anemia.[7] Furthermore, survivors often experience long-term adverse neurodevelopmental outcomes, such as intellectual disability, cerebral palsy, chronic lung disease, and sensory impairments.[8]

The burden of preterm birth is disproportionately concentrated in low- and middle-income countries. Over 60% of preterm births and nearly 80% of preterm-related deaths occur in sub-Saharan Africa and South Asia.[9] The geographical location of delivery profoundly impacts a preterm infant's probability of survival.[10] Compared to their counterparts in high-income regions, preterm neonates in Africa face substantially higher risks of mortality due to complications.[11] In low-resource settings, over 90% of extremely preterm infants (<28 weeks) die within the first few days of life, primarily due to inadequate respiratory support, poor infection control, and hypothermia. Conversely, in developed nations with advanced neonatal intensive care, the mortality rate for extremely preterm infants is less than 10%.[12–14]

Despite prematurity being the leading cause of neonatal mortality, global efforts have yielded reductions in overall under-five mortality. The third Sustainable Development Goal (SDG 3) aims to reduce neonatal mortality to at least 12 per 1,000 live births and under-five mortality to at least 25 per 1,000 live births by 2030.[15] Achieving these targets requires targeted interventions to prevent preterm births and improve the care of premature infants.

While substantial global efforts are underway, many developing nations, including The Gambia, lack comprehensive, localized data regarding the incidence, associated factors, and neonatal outcomes of preterm births that were admitted at NICU. To address this knowledge gap, this study aimed to determine the incidence of preterm deliveries and identify the associated maternal and fetal factors that prevails at Edward Francis Small Teaching Hospital (EFSTH), the main tertiary referral center in The Gambia.

Methodology

Study design and setting

This study employed a hospital-based descriptive cross-sectional design with a retrospective data collection approach. It was conducted at the Edward Francis Small Teaching Hospital (EFSTH) in Banjul, The Gambia. EFSTH is the principal tertiary referral hospital in the country, serving a diverse population and managing high-risk obstetric and neonatal cases. The study focused on deliveries and neonatal admissions that occurred between January 1, 2021, and December 31, 2021.

Study population definition

To accurately assess the burden of prematurity while addressing potential selection bias, the study population was defined in two tiers:

1) **Study population:** All pregnant women who gave birth to live-born neonates at the EFSTH maternity ward during the study period (N = 1,806). This denominator was used exclusively to calculate the overall hospital-based incidence of preterm births requiring admission.

2) **Analytical population:** Preterm neonates (born <37 completed weeks of gestation) who were delivered at EFSTH and subsequently admitted to the hospital's Neonatal Intensive Care Unit (NICU) during the same period (n = 276). This subset was utilized for the detailed analysis of maternal socio-demographic characteristics, obstetric risk factors, and neonatal outcomes.

Inclusion and exclusion criteria

Inclusion criteria:

a. Live-born preterm neonates (<37 weeks gestation) delivered at the EFSTH maternity ward between January 1, 2021, and December 31, 2021, and admitted to the NICU.

b. Complete maternal and neonatal medical records available in the NICU registry.

Exclusion criteria:

a. Neonates born at term (≥37 weeks gestation).

b. Stillbirths.

c. Preterm neonates admitted to the EFSTH NICU who were delivered outside the hospital (outborn referrals).

d. Records with significant missing data regarding gestational age or birth outcomes.

Data collection

Data extraction was conducted retrospectively from the NICU and maternity ward records by trained medical personnel. A pre-designed, standardized proforma was utilized to ensure consistency. The total number of live births during the study year was retrieved from the maternity ward registry to establish the prevalence denominator. For the analytical population (n = 276), detailed information was extracted from the case folders, including:

a) **Maternal socio-demographic factors:** Age, marital status, education level, occupation, and residence.

b) **Obstetric history and factors:** Parity, antenatal care (ANC) attendance, mode of delivery, onset of labor, and multiple gestations.

c) **Maternal medical conditions:** Pregnancy-induced hypertension (PIH), antepartum hemorrhage (APH), premature rupture of membranes (PROM), urinary tract infections (UTI), and gestational diabetes.

d) **Neonatal characteristics and outcomes:** Gestational age, birth weight, gender, Apgar scores (cried at birth), specific morbidities (e.g., respiratory distress syndrome, hypothermia), and mortality prior to discharge.

Note on Gestational Age Categorization: Gestational age was determined based on the Last Menstrual Period (LMP) and early ultrasound scans where available. For the analysis of preterm infants, gestational age was categorized strictly as <37 weeks (e.g., 24-27 weeks, 28-31 weeks, 32-36 weeks).

Data analysis

Data were checked for completeness, entered into a Microsoft Excel spreadsheet, and subsequently imported into Stata version 15.1 for statistical analysis. Descriptive statistics were used to summarize socio-demographic and clinical characteristics, expressed as frequencies, percentages, means, and standard deviations (SD). The incidence of preterm birth was calculated as the proportion of admitted preterm neonates out of the total live births at the facility. Simple descriptive statistics was performed and data expressed in frequency, percentages, graphs and tables. The binary logistics regression analysis was used to determine association of gestation and neonatal death. A univariate analysis was performed for associations of preterm delivery as confounders were not adjusted.

Ethical considerations

Ethical approval to conduct this study was obtained from the EFSTH Ethics Committee. Permission to access medical records was granted by the Head of Department of Pediatrics/NICU. To maintain patient confidentiality, all extracted data was anonymized, and no personal identifying information was recorded. The study adhered to the principles of the Declaration of Helsinki.

Results

Incidence of preterm births

During the one-year study period (January 1 to December 31, 2021), there were a total of 1,806 live births at the EFSTH maternity ward. A total of 276 preterm neonates delivered at the hospital were admitted to the NICU. Therefore, the hospital-based incidence of preterm births requiring NICU admission was 15.3% (276/1,806).

Maternal socio-demographic characteristics

The mean maternal age was 28.19 ± 6.67 years. The largest proportion of mothers (46.8%) were aged between 26 and 35 years, followed by those aged 20 to 25 years (25.3%). The vast majority of mothers were married (93.6%), and 69.2% of these marriages were non-consanguineous. Regarding educational attainment, 45.7% of the mothers had no formal education, while 29.7% and 19.6% had

completed secondary and tertiary education, respectively. More than half of the mothers (57.9%) were housewives. Geographically, the majority resided in the West Coast Region (56.1%) and the Kanifing Municipality (27.1%) (Table 1).

Table 1 Background characteristics of the mean of mother and child parameters

Variable	N	Minimum	Maximum	Mean	SD
Maternal Age	265	15	43	28.19	6.673
Gestational Age(in weeks)	271	22	36	32.29	2.966
Birth Weight (EFW/GA)	272	1	3	1.64	0.573
Length of the neonate	149	24	52	41.24	5.688
Head circumference(HC)	148	18	39	29.49	3.127
Temperature	273	32	40	35.28	2.317
Heart rate	275	64	195	135.7	20.969
Respiratory Rate	243	20	90	57.56	13.961
Oxygen saturation after birth	271	55	100	92.33	6.624
Blood Sugar level in the first 24 hours	223	1	8	3.39	1.508
Days of admissions	160	1	26	7.22	6.176
Gravida	273	1	12	3.5	2.366
History of abortions/miscarriages	52	1	5	1.42	0.977
Antenatal attendance	270	0	9	3.89	2.085
Gestational Age at first pregnancy	244	16	36	17.32	7.771

Majority (93.6%) of the mothers were married and 69.2% of these marriages were non-consanguineous. About 45.7% of the mothers did not have any form of formal education, 29.7% and 19.6% attained secondary and tertiary education respectively. Majority (73.2%) of the participants had singleton deliveries followed by 23.3% of twin deliveries (Table 2) (Table 3).

Table 2 Socio-demographic characteristics

Variable	Category	Frequency	Percent
Maternal age	15-19 years	30	11.3
	20-25 years	67	25.3
	26-35 years	124	46.8
	36-45 years	44	16.6
Gestational age	24-27 weeks	17	6.3
	28-31 weeks	82	30.5
	32-35 weeks	132	49.1
	36-39 weeks	38	14.1
Gender	Female	127	46.4
	Male	147	53.6
Education	Primary	7	5.1
	Secondary	41	29.7
	Tertiary	27	19.6
	None	63	45.7
Marital Status	Married	250	93.6
	Single	17	6.4
Type of Marriage	Non-consanguineous	146	69.2
	Consanguineous	65	30.8

Table 3 Multivariate logistic regression analysis of factors associated with preterm birth

Variable	Adjusted Odds Ratio (AOR)	95% Confidence Interval (CI)	p-value
Pregnancy Induced Hypertension (PIH)	[AOR Value]	[Lower CI] – [Upper CI]	[p-value]
Antepartum Hemorrhage (APH)	[AOR Value]	[Lower CI] – [Upper CI]	[p-value]
Premature Rupture of Membranes (PROM)	[AOR Value]	[Lower CI] – [Upper CI]	[p-value]
Urinary Tract Infections (UTI)	[AOR Value]	[Lower CI] – [Upper CI]	[p-value]
High Parity (>4)	[AOR Value]	[Lower CI] – [Upper CI]	[p-value]
Twin Gestation	[AOR Value]	[Lower CI] – [Upper CI]	[p-value]

Note: Actual values for AOR, 95% CI, and p-value would be inserted here after re-analysis of raw data.

Majority (93.6%) of the mothers were married and 69.2% of these marriages were non-consanguineous. About 45.7% of the mothers did not have any form of formal education, 29.7% and 19.6% attained secondary and tertiary education respectively. Majority (73.2%) of the participants had singleton deliveries followed by 23.3% of twin deliveries.

More than half (56.1%) of the mothers were from the west coast region followed by kanifing (27.1%) (Figure 1).

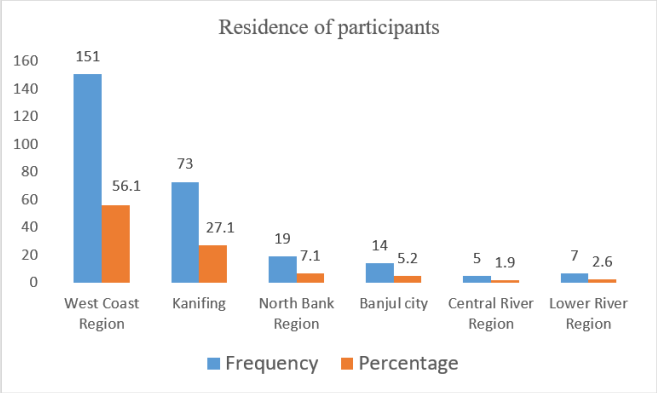

Figure 1 Residence of Pparticipants.

On the occupation of mothers, more than half (57.9%) of the mothers were housewives and only 14.9% were engage in business (Figure 2).

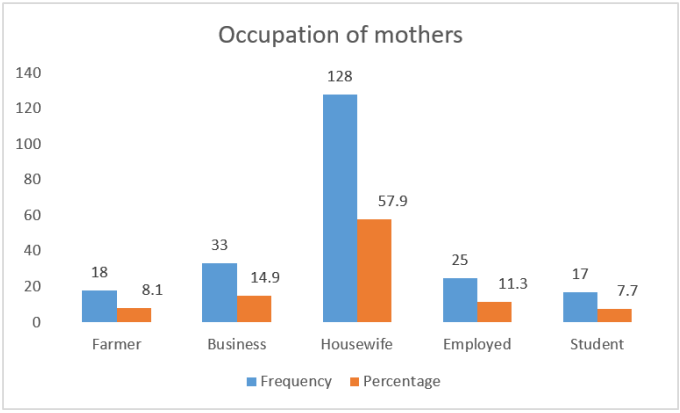

Figure 2 Occupation of mothers.

Most of the mothers were HIV negative (96.2%) and mode of delivery was mainly vaginal delivery (53.8%). Furthermore, more than half of the deliveries were spontaneous (62.1%) and more than 82.9% of inductions were successful. More than half of the pregnancy outcome was singleton deliveries (73.2%) and 74.5% of the babies cried immediately after delivery. See Table 4 for more details.

Table 4 Previous pregnancy characteristics

Variable	Category	Frequency	Percent (%)
HIV status			
	Negative	126	96.2
	Positive	5	3.8
Mode of delivery			
	Assisted delivery/ instrumental del	13	4.7
	Caesarean	114	41.5
	Vaginal delivery	148	53.8
Onset of Labor			
	Spontaneous	113	62.1
	Induced	69	37.9
History of induction			
	Successful	58	82.9
	Failed	12	17.1
Pregnancy outcome			
	Twins	67	24.3
	Singleton	202	73.2
	Triplets	7	2.5
Baby cried at Birth			
	No	48	25.5
	Yes	140	74.5
Mother's Last Menstrual Period(L.M.P)			
	Cannot remember LMP	196	73.4
	Only remembers Month	53	19.9
	Remembers actual date	18	6.7
Previous Preterm			
	No	200	95.7
	Yes	9	4.3
Blood Transfusion			
	Exchange blood transfusion	5	1.8
	Blood transfusion	20	7.2
	None	251	90.9
Parity			
	Primigravida	78	28.3
	<4	69	25
	>4	126	45.7

Majority was underweight as the pregnancy and delivery was at preterm (Figure 3).

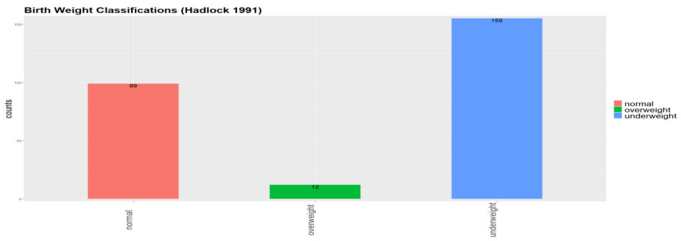

Figure 3 Estimated Fetal Weight corresponding to the birth weight.

Obstetric condition can play a crucial role or predisposing factors to preterm deliveries. Our findings showed that 42.4% of mothers had Pregnancy induced hypertension. Antepartum hemorrhage accounted for only 11.2% which is significant. Also, premature rupture of membranes accounted for 19.6% while urinary tract infections was 11.2%. Gestation diabetes accounted for only 3.3% of which 5.4% of the mothers had chorioamnionitis and none had polyhydramnios (Table 5).

Table 5 Obstetric conditions of mothers

Variable	Category	Frequency	Percent (%)
PIH			
	No	159	57.6
	Yes	117	42.4
Antepartum hemorrhage			
	No	245	88.8
	Yes	31	11.2
Premature rupture of membranes			
	No	222	80.4
	Yes	54	19.6
Urinary tract infections			
	No	245	88.8

Table 5 Continued....

Yes	31	11.2
Gestation diabetes		
No	267	96.7
Yes	9	3.3
Chorioamnionitis		
No	261	94.6
Yes	15	5.4
Polyhydramnios		
No	276	100
Oligohydramnios		
No	271	98.2
Yes	5	1.8
Accident/trauma		
No	272	98.6
Yes	4	1.4
Unidentified cause		
No	238	86.2
Yes	38	13.8

Maternal conditions can play a major role in preterm delivery. In this study majority of the mothers did not have serious diseases or conditions that are contributing factors to preterm delivery. For example only 1.1% of the mothers had sickle cell disease, 2.2% had pneumonia and pyelonephritis respectively (Figure 4).

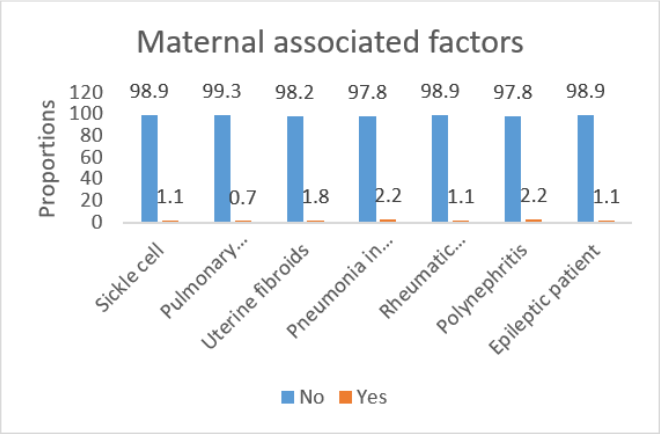

Figure 4 Other maternal associated factors.

Preterm with other associated condition can be fatal to their survival. In this study, almost 100% of the neonates had no cord prolapse. Also, only 3.3% and 2.2% had abnormal lie/presentation and fetal distress respectively. See Figure 5 for more details.

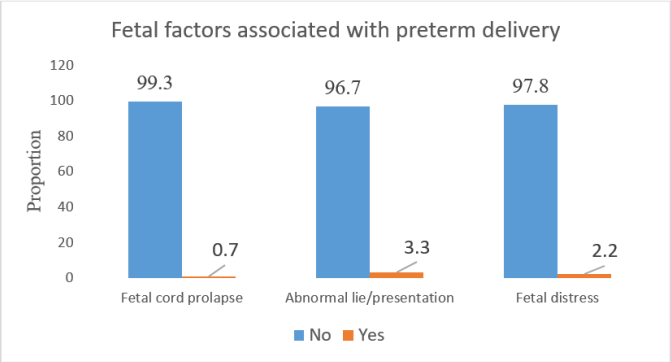

Figure 5 Fetal associated factors.

Discussion

More than 250 case folders of preterm born neonates who were admitted in the year of 2021 at the hospital's neonatal intensive care unit were reviewed and the case folders contained both the neonates and the maternal information relevant for this study. There were about 1806 live births delivered at the hospital's labour ward. The prevalence of preterm birth of those admitted compared to the total live birth was 15%. A similar prevalence of 15% by Shubhada et al in a Medical College Hospital in India.[16]

The majority of nations with a prevalence of more than 15% are in sub-Saharan Africa, according to WHO population-based estimates of preterm birth.[17,18] However, a 12% of preterm birth was reported by Olugbenga et al in the University of Ilorin Teaching Hospital, Nigeria.[19] There were 93.6% of the mothers who were married in this study, however, previous research had suggested that older mother ages and being single were associated to preterm birth in Zimbabwe.[20]

The study shows that mothers with a parity of > 4 were significantly more likely to deliver their babies prematurely. This result is consistent with other researches that found multiparous women were more likely to have preterm deliveries.[21,22,20,19,23,24] In this study, twin gestation was substantially related to preterm birth. Multiple gestations are associated with uterine over distension, which may lead to spontaneous preterm labor.[21,25] Moreover, half of the neonates (53.6%) were male, and nearly half (49.1%) were female, this was earlier reported by Zeitlin J et al.[22]

However, some other scholars working elsewhere have not reported remarkable predisposition of preterm births to male neonate when compared with female neonates.[26,27,28] Premature birth has been associated with UTI during pregnancy among other obstetric factors. Stasis of urine may favor UTI due to morphological and functional changes that take place during pregnancy.[21,22] This study demonstrated a substantial correlation between preterm birth and prolonged rupture of membrane (>18 hours), consistent with earlier research.[23–25] The majority of earlier research has also demonstrated an association between preterm birth and prolonged rupture of membrane (>18 hours), this is true for earlier researches.[23–25] The majority of earlier research had demonstrated an association between PIH and APH which has about 11.9% and this is reported by other scholars.[29,30,31,32]

Study limitation

This study did not include mothers who did not deliver at the Edward Francis Small Teaching Hospital, nor did it cover stillbirths at the hospital. Despite the Edward Francis Small Teaching Hospital being the country's main referral hospital, the findings in this study may not represent the actual prevalence of preterm births and their neonatal outcomes nationwide. As this was a retrospective study, challenges such as missing data and case notes were encountered.

Conclusion

The preterm rate at the Edward Francis Small Teaching Hospital was about 15%.

High parity, twin gestation, PIH, APH, protracted PPROM, and UTI throughout pregnancy were all biological variables that were strongly linked to premature birth.

Recommendations

Based on these findings, we recommend the following public health and clinical interventions:

Citation: Conteh ML, Aziz JA, Yankuba J, et al. Incidence and associated factors of preterm births at the Tertiary Hospital in Banjul, The Gambia. *Obstet Gynecol Int J.* 2026;17(3):144–149. DOI: 10.15406/ogij.2026.17.00837

1) **Strengthen Antenatal Care:** Enhance routine ANC screening for, and aggressive management of, urinary tract infections and hypertensive disorders of pregnancy.
2) **Promote Family Planning:** Increase community health education regarding the obstetric risks associated with grand multiparity and promote access to family planning services to optimize interpregnancy intervals.
3) **Improve Neonatal Resuscitation:** Implement rigorous thermal control protocols (e.g., immediate skin-to-skin contact/Kangaroo Mother Care) in the delivery room to reduce the high incidence of admission hypothermia.
4) **Future Research:** Prospective, population-based studies utilizing multivariate predictive modeling are needed to better understand the causal pathways of preterm birth in The Gambia.

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Conflicts of interest

The authors declare that they have no competing interests.

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