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The Prevalence Outcome and Associated Factors of Teenage Pregnancy in the Bamenda Health District

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Abstract

Teenage pregnancy is a common public health problem worldwide because teenagers in general are ill-prepared to deal with the burden of pregnancy. Sub-Saharan Africa has the highest burden of teenage pregnancy precisely in the west and central Africa; in Cameroon, about 12% of all births are to teenage mothers. Complications from pregnancy and childbirth are the leading cause of death among girls aged 15 to 19. Though the trend of teenage pregnancy tends to decrease in most parts of the world, this is not the case in our setting. The main aim of this study was to determine the prevalence, outcomes and the associated factors of teenage pregnancy in the Bamenda Health District (BHD). **Materials and Method:** This was a hospital-based cross-sectional descriptive and analytic study carried out at the maternity and postnatal units of the Bamenda Regional Hospital and the Nkwen Medicalised Health Center. A consecutive non-probabilistic sampling technique was used to recruit participants. A pretested questionnaire was used to collect information from the participant. Data was analysed using the software SPSS version 23. Bivariate logistic regression was used to test for associations. Statistical significance was set at p-value less than 0.05. **Result:** A total of 325 participants were recruited of which 44 were teenagers. The mean age of the participants was 25.02 ± 0.257 years. The mean age of teenagers was 17.49 ± 0.63 years, and mean adult age was 28.43 ± 5.64 years. The youngest participant was 15 years. Teenagers were significantly more likely to prematurity (OR = 0.14; 95% CI = 0.06 - 0.31; PV = 0.001), Low birth weight among teenagers (OR = 0.077; 95% CI = 0.03 - 0.21; PV = 0.001), Still birth; OR = 0.07; 95% CI = 0.01 - 0.86; PV = 0.03) Neonatal admission also high among tee-

nagers (OR = 0.172, 95% CI = 0.08 - 0.39, PV = 0.001) compared to the babies of their adult counterpart. The rate of caesarean section and episiotomy was high among adult deliveries (21.7%). **Conclusion:** There is a high prevalence of teenage pregnancy (13.54%) in the Bamenda Health District. prematurity was independently associated with teenage pregnancy. perineal tears were the most common maternal outcome of teenage pregnancy. Adolescents/teenagers in rural areas, having a low level of income, and low level of education were associated with high level of teenage pregnancy.

Keywords

Adolescent/Teenage Pregnancy, Prevalence, Outcomes, Associated Factors, Bamenda Health District

1. Introduction

1.1. Background

The World Health Organization (WHO) defines teenage pregnancy as pregnancy in a girl aged 10 to 19 years old [1]. The teenage period is a period of transition from childhood to adulthood, with important biological and social development [2]. Teenagers constitute a high risk group requiring high priority services. Teenage pregnancies are considered to be high risk pregnancies [3]. This is due to the potential increased risk of adverse outcomes to both the mother and the baby [3]. Teenage delivery is a global issue with its burden being experienced all over the world [4]. Most of this burden is in low and middle income countries [5]. Teenage pregnancy constitutes a public health problem worldwide with an estimation of about 16 million births in a 2008 report occurred to teenage mother with 95% of these deliveries being in low and resource limited countries [6]. For this sustainable development goals to be attained by 2030 issues pertaining to adolescent and adolescent pregnancy must be kept under check.

Teenage pregnancy is a global phenomenon. Worldwide, teenage pregnancy rates range from 143 per 1000 in some sub-Saharan African countries to 2.9 per 1000 in South Korea [7]. Save the Children found that annually, 13 million children are born to women aged under 20 worldwide, with more than 90% in developing countries [7].

In the industrialized Asian nations such as South Korea and Singapore, teenage birth rates are among the lowest in the world [7]. The pregnancy rate among teenagers in the USA was 67.8 pregnancies per 1000 women aged 15 - 19 in 2008 [7]. The teenage birth rate in the United States is highest in the developed world and the teenage abortion rate is also high [7]. In 2010 the birth rate in the USA was 34.3 births per 1000 women aged 15 - 19 [7]. This is twice as high as the rates found in England, France and Canada, three times as high as that in Sweden; and seven times as high as the Dutch rate, despite similar or higher rates of sexual activity in the other countries [2].

In sub-Saharan Africa, teenage pregnancy and deliveries also constitute a high public health burden. In Cameroon, a study carried out by *Tebeu et al.* from 2003 to 2005, found out that adolescent's contribution to deliveries ranges from 6.87% to 26.51%, with a national mean of 14.23% (1). Adolescents aged 16 or less contribute to 2.82% of deliveries while those aged from 17 to 19 contributed to 11.41% [1]. Another study done in the University teaching hospital Yaoundé (CHU) and Central Hospital Yaoundé shows that 12% and 9.3% of the deliveries respectively were by adolescents < 19 years old [8] [9] [10]. Its prevalence varies across regions in Cameroon with the Far North region having the highest rate of teenage deliveries (26.51%) [10].

Factors that predisposed adolescents to high rate of pregnancy included cultures, early marriages, poor access to modern contraception, low level of education, and low socio-economic status [11]. Studies carried out by Clifford *et al.* show that these factors varied across different regions in sub-Saharan Africa; Community levels of female unemployment ($P < 0.05$) and community poverty ($P < 0.05$) in Southern and East Africa. While only community poverty ($P < 0.05$) independently predicted the outcome in West Africa. In sub-Saharan African region in general, adolescent pregnancy was associated with all that is family disruption ($P < 0.05$), Community levels of female unemployment ($P < 0.05$) and community poverty ($P < 0.05$).

These differences in neonatal and maternal outcome between teenage deliveries and adult deliveries were most of the time attributed to the maternal age alone [12]. But it is now known that they are other underlying factors. Some of these factors are [13]; low number of prenatal visits, late initiation of prenatal care, and inappropriate prenatal care. Other factors are race, marital status, and low level of schooling, smoking, and poverty, low maternal weight, [13] [14]. Though other way around low socioeconomic level lead to women giving birth at teenage age.

1.2. Research Question

What is the prevalence, outcome and factors associated with teenage pregnancy in two hospitals in the Bamenda health district?

1.3. Research Hypothesis

The negative outcome of teenage pregnancy and their associated factors amongst women giving birth at the two hospitals in the Bamenda health district is statistically significance

1.4. Research Objectives

1.4.1. Main Objective

To determine the prevalence and associated health hazards of teenage pregnancy in two hospitals in the Bamenda health district.

1.4.2. Specific Objectives

1) To determine the prevalence of teenage pregnancy amongst all deliveries in

two Hospital in the BHD;

2) To assess the maternal and fetal outcomes of teenage pregnancy in the BHD;

3) To assess the factors associated to teenage pregnancy in the BHD.

2. Materials and Methods

2.1. Study Design

This study was a hospital-based cross-sectional comparative analytic study.

2.2. Study Duration

This study was conducted over a period of 4months (February 2019 to May 2019).

2.3. Study Area

The study was conducted at the maternity and post natal units of the Bamenda Regional Hospital and the Medicalised Health Center (CMA) Nkwen Bamenda, North-west region of Cameroon.

The northwest region is one of the 10 region of Cameroon, It has a population of about 1,804,695 inhabitants (25). It share boundary with Southwest region, West Region and the Federal Republic of Nigeria. It has Bamenda as the Regional headquarter, which also serves as headquarter of Mezam division. There are 17 health districts with 183 health areas. There is o one Regional drug supply structure known as the Northwest Regional special Fund for health, 4 private hospitals and 19 sub divisional medical Centers.

The Bamenda health district has a surface area of 560 km^2 and a population of about 236.336 inhabitants. It is bounded: To the North by the Bafut Health District, To the North east by the Tubah Health, District, to the Northwest by the Mbengwi Health District, to the South west by the Bali Health District, South by the Santa Health District, and to the Southeast by the Ndop Health District.

The Regional Hospital Bamenda (RHB) is a secondary health care center. It has a total bed capacity of about 600 beds and serves as main referral hospital in the region, as well as teaching hospital for the Faculty of Health Sciences, University of Bamenda. The maternity of this hospital conducts more deliveries than other health facilities in the region.

The BRH offers antenatal care (ANC), delivery care, and neonatal care family planning servces. The staffing situation in the maternity includes 2 obstetricians/gynaecologists, 2 general practitioners, 7 midwives, and 30 nurses.

The CMA Nkwen has 2 general practitioner, 2 midwives and 15 nurses. The labour and delivery room have 4 and 5 beds respectively. The postnatal unit of MHC Nkwen has two general wards each having 9 beds and 3 private wards (each containing 4 beds) giving a total of 30 beds.

All these amongst others turn to pull most pregnant women in the BHD to seek for care in these hospitals, hence a good representation of the population of the health district in particular and the Northwest Region in general.

2.4. Study Population

All the women aged 10 - 19 at the maternity unit of BRH and MHC Nkwen during their hospital stay at the postnatal ward were recruited into the study population throughout the study period.

2.4.1. Inclusion Criteria

- Women who put to birth at the maternity unit of the BRH and MHC Nkwen.
- All women gave their consent to participate.

2.4.2. Exclusion Criteria

- Women who were less than 10 years and above 20 years of age at delivery.
- Pregnancy that ended before 24th completed weeks of gestation.
- Twin deliveries.
- Women known to have a medical or surgical problem prior to their pregnancy.
- Women who refused to give their consent.

2.5. Sample Size Calculation and Sampling Technique

2.5.1. Sample Size

The Lorentz formula, was used to calculate our sample size. The prevalence of 13.3% from a recent study done at the Regional Hospital Buea by *Egbe et al.* in 2013 [3] was used to estimate the minimum sample size.

$$N = z^2 pq/d^2$$

where

N = minimum sample size required.

z = degree of precision corresponding to 95% CI (1.96 if type I error is limited to 5% that is if p-value is <0.05 for statistical significance).

p = The prevalence of 13.3% from a recent study done at the Regional Hospital Buea by Egbe *et al.* in 2013 (3) was used to estimate the minimum sample size.

q = (1 − p) d = degree of accuracy desired (5% margin of error) Substituting these values into the formula:

$$N = \frac{(1.96)^2 (13.3)(86.7)}{(5)^2} = 177 \text{ participants}$$

Hence using the above formula, the minimum sample size required was 177 study participants.

2.5.2. Sampling Technique

A consecutive non-probabilistic sampling technique was used with the selection of every accessible woman who put to birth in the two maternity units and has consented to participate in the study. Women of age 10 - 19 years were recruited as study group. Alongside those of age group 20 - 35 years at delivery that served as the control group. This age group was carefully chosen since its out of the

teenage pregnancy range.

2.6. Ethical Considerations

The protocol was submitted to the Institutional Ethical Review Board (IRB) of the faculty of health sciences (FHS) of University of Bamenda for ethical evaluation and for ethical clearance to be obtained from the Institutional review Board (IRB) of the Faculty of Health Sciences of the

University of Bamenda. Then an Administrative authorization from the Regional Delegate of Public Health for the North West Region (NWR) was also obtained for the study to be carryout in their area of administration. Lastly, an administrative authorization was obtained from the administration of the various health care institutions

2.7. Data Collection Procedure

During the study period, eligible participant for the study in conformity with the inclusion criteria were selected. A consecutive non-probabilistic sampling technique was used. A structured and pretested questionnaire was used to retrieve the necessary information from the participants to maintain consistency in the process. More data about maternal and fetal factors was collected from medical files of the patients concerned. Paper, pens, pencils, eraser, and a phone was used in the process. This information was stored in a computer, and a USB flash drive.

2.8. Study Variables

The information collected from the participant were:

- Socio demographic data age, occupation, resident, level of education, religion, marital status among others, level of income;
- Obstetric/clinical factors: Gravidity, parity, contraceptive knowledge and used, number of ANC, GA at first ANC;
- Fetal outcome: Prematurity, birth weight, Apgar score, admission to neonatology unit, neonatal death, still birth.

Maternal outcome: postpartum hemorrhage, mode of deliveries, maternal death, preeclampsia/eclampsia, placenta previa/placenta abruption, perineal tear, episiotomy.

2.9 Data Management

All data were retrieved by the investigator. The data were secured in a confidential and private location. Participants were referred to by identification numbers and the consent forms were kept separate from the questionnaires. Both could only be linked by a coding sheet available only to the investigators. Data was entered using Microsoft excel. Analysis was done using the Statistical Package for Social Sciences (SPSS) version 22. Descriptive statistics was depicted using absolute numbers and simple percentages as appropriate Means (standard deviations) were used to summarize continuous variables and proportions for cate-

gorical variables. The OR and their confidence intervals are at 95% (for qualitative variables such as gravidity, level of education, occupation, etc.), and mean or median (for quantitative variables such as age of participant, gestational age etc.). The level of association was determined by using Bivariate logistic regression. The level of significance was set at a p-value less than 0.05. ($P < 0.05$) Data is presented as numbers, percentage, means, and one standard deviation. Tables were used to present data.

3. Interpretation of Result

Out of the 500 pregnant women that were invited to participate in the study, 148 refused to consent. 352 women out of the total we met consented to participate in the study. 27 questionnaires were rejected because it was not properly filled as seen in Figure 1 below.

3.1. Comparison of Socio-Demographic and Clinical Variables of the Participant

3.1.1. General Characteristic of the Study Participants

Out of the 325 participant that were recruited, the mean age of the teenagers was 17.49 ± 0.63 years. The mean adult age was 28.43 ± 5.64 years.

From Table 1, the age 20 - 35 was mostly represented (18.5%). Majority of the respondents were married (86.8%), lived in urban areas (77.8%), were Christians (95.7%), attained secondary schools (49.2%) and majority were multigravida (77.8%). Most of the participants were primiparous (41.2%). Most of the participants were housewife (20.9%) and majority of them were note using any form of contraception (59.8%). Majority attended more than 3 ANC Visit.

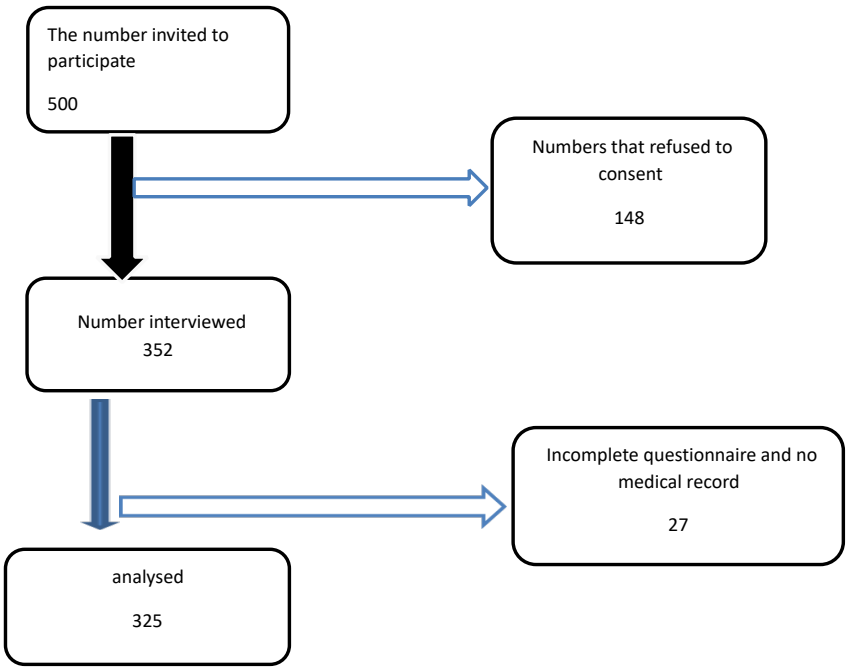

Figure 1. Consort flow diagram of the progress through the study.

Table 1. General characteristics of the study participants.

Characteristics	Category	Frequency	%
	(n = 325)		
Age	10 - 16	6	1.8
	17 - 19	38	11.7
	10 - 19	44	13.5
	20 - 35	281	18.5
Gravidity	Primigravida	44	13.5
	Multigravida	253	77.8
	Grand multigravida	28	8.6
Parity	Nulliparous	44	13.5
	Primiparous	134	41.2
	Multiparous	132	40.6
	Grand multiparous	15	4.6
Marital status	Single	43	13.2
	Married	282	86.8
Residence	Rural area	72	22.2
	Urban area	253	77.8
Religion	Christian	311	95.7
	Muslim	14	4.3
Educational level	None	25	7.7
	Primary	45	13.8
	Secondary	160	49.2
	Tertiary	95	29.2
Occupation	Student	39	12.0
	Housewife	68	20.9
	Farmer	36	11.1
	Trader	59	18.2
	Civil servant	56	17.2
	Others	67	20.0
Contraceptives used	Condoms	44	13.5
	COC pills	16	4.9
	Implant	29	8.9
	IUDs	9	2.8
HIV	None	227	69.8
	Negative	305	93.8
ANC	Positive	20	6.2
	3	70	21.5
	More than 3	225	78.5
Income level	Low	116	35.7
	High	209	64.3

3.1.2. Socio-Demograpic Charateristics of the Study Population

From Table 2, significant associations could be observe for maternal age with level of education, religion, area of residence at 5% probability level.

Table 2. Comparison of socio-demographic variable among teenagers (10 - 19) and control group (20 - 35).

Variable	Maternal age 10 - 19 yrs n (%) = 44	≥20 yrs n (%) = 281 (86.5)	p-value
Marital status Single	34 (77.3)	11 (3.9)	
Married	12 (27.2)	270 (96.1)	**≤0.001**
Residence Rural area	26 (59.1)	46 (16.4)	
Urban area	18 (40.9)	235 (83.6)	**≤0.001**
Live with Alone	2 (4.5)	21 (7.5)	**<0.001**
Parents	32 (72.7)	38 (13.5)	
Husband	7 (15.9)	215 (76.5)	
Others	3 (6.8)	7 (2.5)	
Religion Christian	41 (93.2)	270 (96.1)	
Muslim	3 (6.8)	11 (3.9)	**0.002**
HIV status Negative	41 (93.2)	264 (94.0)	
Positive	3 (6.8)	17 (6.0)	0.547
Educational level None	3 (6.8)	22 (7.8)	
Primary	5 (11.4)	40 (14.2)	
Secondary	36 (81.4)	124 (44.1)	**≤0.001**
Tertiary	0 (0.0)	95 (33.9)	
Occupation Student	15 (34.10	24 (8.6)	
Housewife	0 (0.0)	68 (24.2)	
Farmer	4 (9.1)	32 (11.4)	**≤0.001**
Trader	3 (6.8)	56 (19.9)	
Civil servant	0 (0.0)	56 (19.9)	
Others	22 (50.0)	45 (16.0)	
Monthly income < 54 USDFCFA	31 (70.5)	85 (30.2	**<0.001**
≥54 USDFCFA	13 (29.5)	196 (69.8)	
Consume alcohol during this pregnancy Yes	1 (2.3)	57 (20.3)	0.15
No	43 (97.7)	224 (97.7)	

With regard to the level of income, majority of the teenagers earned less than 54 USD a month (70.5%) compared to the adult where majority earn more than 54 USD (69.8%). With regard to level of education, 81.8% of teenagers were at secondary level of education and 44.1% of adults secondary. More adults were at tertiary level of education (33.9%) than the teenagers. Most teenagers live in rural Areas 59.1%, whereas most adult live in urban area 83.6%). Most of the teenagers were single 77.3% with and live with their parent 77.2% while most of the adults were married and lives with their husband. With respect to occupation, many more adult are employed 19.9% compared to the teenagers.

From Table 3, significant associations could be observed between gravidity, parity, number of ANC visit, GA at first ANC, heard of contraception and method used at 5% probability level.

Table 3. Comparison of clinical variable among teenagers (10 - 19) and control group (20 - 35).

Variable	Maternal age		P value
	n (%) = 44 (35.5)	n (%) = 281 (86.5)	
	10 - 19 yrs	≥20 yrs	
Gravidity			
Primigravida	38 (88.6)	5 (1.8)	≤0.001
Multigravida	5 (11.4)	248 (88.3)	
Grand multigravida	0 (0.0)	28 (10.0)	
Parity			
Nulliparous	38 (86.4)	6 (2.1)	≤0.001
Primiparous	6 (13.6)	128 (45.6)	
Multiparous	0 (0.0)	132 (47.0)	
Grand multiparous	0 (0.0)	15 (5.3)	
Number of ANC visits			
Less than 4	7 (15.9)	63 (22.4)	<0.001
4 and above	37 (84.1)	218 (77.6)	
GA at 1st ANC visit			
Before 17 weeks	24 (54.5)	83 (29.5)	0.001
17 weeks and above	20 (45.5)	198 (70.5)	
Ever Heard of contraception			
Yes	29 (65.9)	250 (89.0)	<0.001
No	15 (34.1)	31 (11.0)	
Contraceptives used			
Condoms	8 (18.2)	36 (12.8)	≤0.001
COC pills	1 (2.3)	15 (5.3)	
Implant	0 (0.0)	29 (10.4)	
IUDs	0 (0.0)	9 (3.2)	
None	35 (79.5)	192 (68.3)	

For gravity, 88.6% of teenagers are primigravida and 88.3% of adult are multigravida. Teen are mainly nulliparous 88.4%, whereas majority of adult 47.0% are multigravida.15% of the teenager did less than 4 ANC, 84.1% did 4 ANC and above. And 77.6% adult did 4 and above. 65.9% of adolescent as compared to 89.0% of adult has ever heard of it. 75.5% of adolescent do not used any method of contraception as compared to 68.3% of adult condom is used by 18.2% of adolescent and 12.5% in adult.

3.2. Prevalence of Teenage Pregnancy during the Study

From the Figure 2 below, the prevalence of teenage delivery was 13.5%.

3.2.1. Maternal Outcome of Teenage Pregnancy

From Table 4, the following maternal outcomes have statistical significant association with teenage pregnancy; mode of deliveries, perineal tears, and episiotomy at 5% probability level. Mode of delivery; teenagers were 0.22 time more likely to have assisted deliveries; (OR = 0.22; 95% CI = 0.03 - 0.48, PV = 0.003), Perineal tears, teenagers were 0.38 time more likely to have perineal tears (OR = 0.38; 95% CI = 0.19 - 0.76; P = 0.006), Episiotomy; OR = 0.332, 95% CI = 0.120.92; P = 0.033).

From Table 5 below, when adjusted to control for confounders, only perineal tears was significantly associated with teenage deliveries; aOR = 0.48; 95% CI = 0.24 - 0.99, aP = 0.049.

3.2.2. Fetal Outcome of Teenage Pregnancy

From Table 6 below the following fetal outcomes where significantly associated with teenage pregnancy (on bivariate analysis), we have Prematurity mainly among teenagers (OR = 0.14; 95% CI = 0.06 - 0.31; PV = 0.001), Low birth weight among teenager (OR = 0.077; 95% CI = 0.03 - 0.21; PV = 0.001), Still birth; OR = 0.07; 95% CI = 0.01 - 0.86; PV = 0.03) Neonatal admission also high among teenagers (OR = 0.172, 95% CI = 0.08 - 0.39, PV = 0.001).

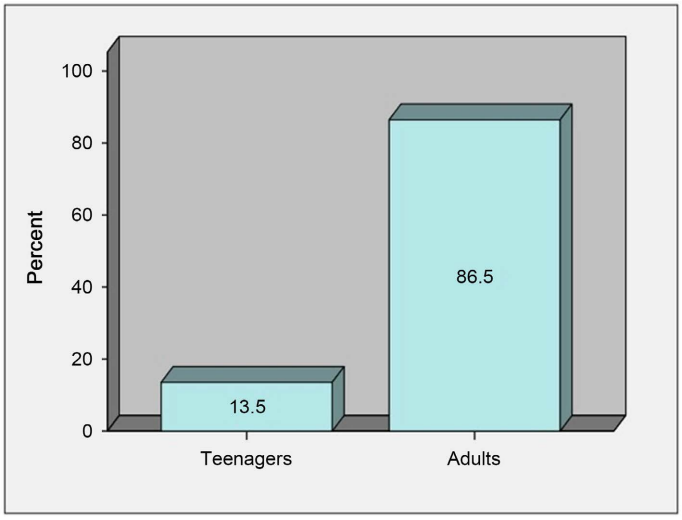

Figure 2. Distribution of the study participant by age.

Table 4. Comparison of Maternal outcome among teenagers (10 - 19) years and control group (2035) years.

Outcome	Maternal age		Unadjusted OR	P (95% CI)
	Teenager (n = 44)	Adult (n = 281)		
Onset of labour				
Induced	1 (2.27)	18 (6.4)	0.000	0.998
Spontaneous	43 (97.7)	223 (79.4)	0.000	0.997
None	0 (0.0)	40 (14.2)	1	
Mode of delivery				
Normal VD	33 (75.0)	207 (73.7)	0.411 (0.14 - 1.21)	0.106
Assisted VD	7 (15.9)	13 (4.6)	0.122 (0.03 - 0.48)	**0.003**
Caesarean delivery	4 (9.1)	61 (2.2)	1	
Hypertensive disorder in pregnancy				
Pre-eclampsia	0 (0.0)	5 (1.8)	0.000	0.999
None	44 (100)	276 (9.8)	1	
Premature rupture of membranes				
Yes	6 (13.6)	62 (2.2)	1.793 (0.73 - 4.44)	0.207
No	38 (86.4)	219 (77.9)	1	
Perineal tear				
Yes	17 (38.6)	55 (19.5)	0.387 (0.19 - 0.76)	**0.006**
No	27 (61.4)	226 (80.4)	1	
Episiotomy				
Yes	6 (13.6)	55 (19.5)	0.332 (0.12 - 0.92)	**0.033**
No	38 (86.4)	226 (80.4)		
Postpartum haemorrhage				
Yes	0 (0.0)	3 (1.1)	0.000	0.999
No	44 (100.0)	278 (98.9)	1	
Placenta Previa				
Yes	0 (0.0)	3 (1.1)	0.000	0.999
No	44 (13.7)	278 (86.7)	1	
Placenta abruption				
Yes	0 (0.0)	3 (1.1)	0.000	0.999
No	44 (100.0)	278 (98.9)		

Table 5. Comparison of Maternal outcome among teenagers (10 - 19) years to control group (2035) years on multivariate logistic regression.

Outcome	Maternal age		Adjusted OR (95% CI)	P
	Teenager n = 44 (%)	Adult (n = 281)		
Onset of labour				
Induced	1 (2.27)	18 (6.4)	0.000	0.998
Spontaneous	43 (97.7)	223 (79.4)	0.000	0.997
None	0 (0.0)	40 (14.4)	1	
Mode of delivery				
Normal VD	33 (75%)	207 (73.6)	1.884 (0.57 - 6.22)	0.299
Assisted VD	7 (15.9)	13 (4.6.)	0.202 (0.27 - 1.50)	0.118
Caesarean delivery	4 (9.0)	61 (21.7)	1	
Hypertensive disorder in pregnancy Pre-eclampsia	0 (0.0)	5 (1.8)	0.000	0.999
None	44 (100)	276 (98.2)	1	
Premature rupture of membranes				
Yes	6 (13.6)	62 (22.1)	2.614 (0.98 - 7.00)	0.056
No	38 (86.4)	219 (77.9)	1	
Perineal tear				
Yes	17 (38.6)	55 (19.5)	0.485 (0.24 - 0.99)	**0.049**
No	27 (10.7)	226 (89.3)	1	
Episiotomy				
Yes	6 (13.6)	55 (19.5)	1.066 (0.22 - 5.13)	0.937
No	38 (86.4)	226 (89.3)	1	
Postpartum haemorrhage				
Yes	0 (0.0)	3 (1.1)	0.000	0.999
No	44 (100)	278 (98.9)	1	
Placenta Previa				
Yes	0 (0.0)	3 (1.1)	0.000	0.999
No	44 (13.7)	278 (98.9)	1	
Placenta abruption				
Yes	0 (0.0)	3 (1.1)	0.000	0.999
No	44 (100)	278 (98.9)	1	

After adjusting for confounders on multiple logistic regression, only prematurity was significantly associated with teenage pregnancy; aOR = 0.26; 95% CI =

0.03 - 0.21, aPv = 0.03 (see Table 7).

3.3. Associated Factors of Teenage Pregnancy

From the Table 8 below, the following socio-demographics determinants was found statistically significant with teenage pregnancy, teenagers in Rural area; (OR = 5.076; 95% CI = 2.95 - 8.72, P = 0.001), low level of monthly income among teenagers < 27,000; (OR = 4.2; 95% CI = 2.34 - 7.88; P = 0.001), Educational level among teenagers (secondary school); (OR = 4.64; 95% CI = 2.34 - 9.67; PV = 0.000).

Table 6. Comparison of Fetal outcomes among teenagers (10 - 19) years and control group (20 - 35) years.

Outcomes	Maternal age		Unadjusted OR (95%CI)	P
	Teenager (n = 44)	Adult (n = 281)		
Prematurity				
Yes	15 (34.1)	19 (6.8)	0.140 (0.06 - 0.31)	**≤0.001**
No	29 (65.0)	262 (93.2)	1	
Sex of baby				
Male	25 (56.8)	143 (50.8)	0.788 (0.42 - 1.49)	0.460
Female	19 (43.2)	138 (49.1)	1	
Low birth weight				
Yes	11 (25.0)	7 (15.9)	0.077 (0.03 - 0.21)	**≤0.001**
No	33 (75.0)	274 (97.5)	1	
High birth weight				
Yes	2 (4.5)	22 (7.8)	1.784 (0.41 - 7.87)	0.445
No	42 (95.5)	259 (92.2)	1	
Apgar below 7				
Yes	3 (6.8)	13 (29.5)	0.665 (0.18 - 2.45)	0.536
No	41 (93.2)	267 (95.02)	1	
Still birth				
Yes	2 (4.5)	1 (0.04)	0.075 (0.01 - 0.86)	**0.036**
No	42 (95.5)	280 (99.6)	1	
Neonatal admission				
Yes	12 (27.2)	17 (6.0)	0.172 (0.08 - 0.39)	**≤0.001**
No	32 (72.73)	264 (93.9)	1	

Table 7. Comparison of fetal outcomes among teenagers (10 - 19) years and control group (20 - 35) year.

Outcomes	Maternal age		Adjusted OR (95% CI)	P
	Teenager (n = 44)	Adult (n = 281)		
Prematurity				
Yes	15 (34.1)	19 (6.8)	0.260 (0.11 - 0.64)	**0.003**
No	29 (65.9)	262 (90.2)	1	
Sex of baby				
Male	25 (56.4)	143 (50.8)	0.679 (0.33 - 1.39)	0.292
Female	19 (43.2)	138 (49.1)	1	
Low birth weight				
Yes	11 (25.0)	7 (2.5)	0.000	0.999
No	33 (75.0)	274 (9.7)	1	
High birth weight				
Yes	2 (4.5)	22 (7.8)	1.025 (0.23 - 4.67)	0.975
No	42 (9.5)	259 (92.1)		
Apgar below 7				
Yes	3 (6.8)	13 (4.6)	0.000	0.999
No	41 (94.1)	267 (95.0)	1	
Still birth				
Yes	2 (4.5)	1 (0.3)	0.000	0.999
No	42 (95.5)	280 (99.6)	1	
Neonatal admission				
Yes	12 (27.2)	17 (6.1)	0.000	0.999
No	32 (72.7)	264 (93.9)	1	

Table 8. Identification of socio-demographic determinants of teenage pregnancy.

		Maternal age		**OR**	**P-value**
Factors	Variable	Teenagers (10 - 19 yrs) N (%) = 44 (13.5)	Adults (≥20 yrs) N (%) = 281 (86.5)	(95% CI)	
Residence	Rural	26 (59.1)	46 (16.4)	5.076	**<0.001**
	Urban	18 (40.9)	235 (83.6)	(2.955 - 8.718)	
Religion	Christian	41 (93.2)	270 (96.1)	0.615	0.378
	Muslim	3 (6.8)	11 (3.9)	(0.217 - 1.745)	
Monthly income	<27000	31 (70.5)	85 (30.2)	4.296	**<0.001**
	>27000	13 (29.5)	196 (69.8)	(2.343 - 7.880)	
Use of contraception	Yes	9 (20.5)	89 (31.7)	0.596S	0.132
	No	35 (79.5)	192 (68.3)	(0.298 - 1.191)	
Educational level	None	3 (6.8)	22 (7.8)	0.878 (0.293 - 2.635)	0.815
	Primary	5 (11.4)	40 (14.2)	0.798 (0.332 - 1.916)	0.608
	Secondary	36 (81.8)	124 (44.2)	4.641 (2.226 - 9.674)	**<0.001**
	Tertiary	0 (0.0)	95 (33.8)	-	0.000

OR = odd ratio, P = p-value, CI = confident interval at 95%.

4. Discussion

This study is aim at comparing the maternal-fetal outcomes of deliveries in the different age group; we used the broader classification of teenage group 10 - 19 year and adult 20 - 35 year.

4.1. General Characteristics of the Study Population

The result from this study shows that out of the 325 participants, the age rang was from 15 - 35 years with a mean age of participants 25.02 ± 2.57 years. There was 44 of the participant that were teenagers (<20), with mean teenage age of 17.49 ± 0.63 years and the mean adult age was 28.43 ± 5.64 year [14]. This was similar to the result obtained by *Fouelifack et al. at* the Yaoundé Central Hospital, in the Centre Region of Cameroon 2010 were the adolescents participants had a mean age of 17.78 ± 1.31 years while the mean for the adult group was 28.32 ± 5 years [8]. This may be due to the fact that the two populations are similar in term of sexuality rate.

4.2. Socio-Demographic and Clinical Characteristics of Study Population

In literature, reports concerning developing countries indicate an inverse relationship between education level and frequency of adolescent pregnancy and/or childbearing *Sulaiman et al.* [12]. This was true for our study which confirm the fact that teenage mother mostly have low level of education, especially at tertiary level of education, we have 0.0% teenagers compare to 33.9% adult at that level of education.

Regarding marital status, teenage pregnancy in developed countries usually occurs outside marriage and in many communities and cultures carries a social stigma. In other countries and cultures, particularly in the developing world, teenage pregnancy is often within marriage and does not involve social stigma) [8], but our study proved the contrary. We discovered that more teenage pregnancies occurred outside marriage than in it and most were leaving with their parents. This finding is similar to that obtained by *Egbe et al.* at the Buea Health District [5]. Whatever contradiction there is between our study and those carried out in other low-income countries could be explained by the socio-cultural differences from one situation to the other and the present low rate of schooling in ours setting. Our study also shows that majority (88.6%) of adolescent pregnancies were in their first gestation while in the control group the percentage was 1.7% and majority of the teenagers were from rural areas. This finding is confirmed by other study [12].

In literature, the rates of use of contraception by adolescents are often low. Use of any contraceptive method in women aged 15 - 49 years who are married or in union has risen from 55% in 1990 to 63% in 2007. Among adolescents it is lower, but with large regional and country difference. A study of contraceptive use in married and unmarried adolescents in Latin America, European and

Asian countries showed rates ranging between 42% and 68% [11]. African countries have the lowest rates ranging from 3% to 49% (11). In our study a similar result was obtained with low rate of contraceptive used in adolescent than in adult (21.1% Vs 12.8%) for male condom.

While only 2.6% of teenagers used modern contraception while (5.3%, 10.4% 3.2%) of adults uses COC, implants, and IUCD respectively. These may be due to the low socio-economic and low employment status of the teenagers. Similar result was obtained with another study by *Sulaiman et al.* [12].

For employment status, our study shows that adult women were more employed as compared to teenagers this was similar to the one found by ahmed *et al.* in Egypt were most of the adult women were employed compare to the teenagers. This could be explained by the low level of schooling in the teenage population.

4.3. Prevalence of Teenage Pregnancy

The prevalence of teenage births in this study was 13.54% (44/325).

The 13.54% prevalence of teenage pregnancies found among the study population fell within the National prevalence range of 6.87% to 26.51% according to a study carried out by *Tebeu et al.* done at different regional hospitals of the ten regions of Cameroon with an overall national prevalence of 14.23% [1]. This was also similar to the study carried out by *Egbe et al.* to assess the prevalence of adolescent hospital births at the Buea health district, South West Region, Cameroon who also come out with a prevalence of 13.3%.

But this prevalence is higher than a similar study carried out by Kemfang *et al.* at Yaoundé General Hospital where adolescent deliveries represented 2.84% (331 deliveries) of all deliveries registered during that study period [9]. The prevalence of teenage pregnancy found in our setting have increased, this high prevalence can be due to differences in socioeconomic status, level of education and level of employment that was found mostly within our adolescent population. All these can be attributed to the ongoing crisis in our setting. Low levels of education, unemployment and pre-marital adventures were earlier discovered to be important contributory factors to teenage pregnancy. These findings corroborated those reported by other studies [10].

4.4. Outcomes of Teenage Pregnancy

4.4.1. Fetal Outcomes of Teenage Pregnancies

This study found more adverse fetal outcomes among adolescent mothers (10 - 19) than among adult women (20 - 35), a situation very much similar to that reported in literature on the subject [14]. It was observed in this study that children born of adolescent mothers had a significantly higher rate of prematurity ($P \leq 0.001$), LBW ($P \leq 0.001$), Still Birth ($P \leq 0.001$), and NICU ($P \leq 0.001$). These our findings are similar to those of *Egbe et al.* [5], in terms of LBW, Prematurity and differ from it in term of still birth and NICU. This difference can be explained by the fact that the various adolescent populations tend to be tributary to

different socio-economic conditions and institutional constraints. Besides, the sample sizes are often very uneven.

Many studies have reported that adolescents are exposed to such adverse fetal outcomes as still birth, low birth weight, low Apgar score, IUGR and prematurity. This study shows that pregnant adolescents had higher rates of LBW infants, premature babies, Still Birth, and neonatal admission than adult mothers. This tied in with other studies [12]. However, the rates of low Apgar score, high birth weight were similar between the two groups.

4.4.2. Maternal Outcomes of Teenage Pregnancies

The widely-held belief that the biological immaturity of the adolescent pelvis causes cephalopelvic disproportion (CPD) leading to increased cesarean sections was not confirmed by this study. Our study reveal lower rate of C/S in the teenagers compared to the adult population (9% Vs 21.7%). Similarly Egbe *et al.* also found a lower rate of cesarean sections among adolescents than in the adult control group (3). *Tyrberg et al.* [15], found an increase in caesarean sections among adolescents in Nigeria which was contrary to our findings. The controversy over this finding may be explained by the fact that adolescents generally give birth to small-size babies and so CPD is not necessarily a major problem in this age group. This may also probably be because of the small sample size of our study.

Most teenagers have mainly vaginal delivery with 75%, with high prevalent of assisted vaginal delivery of 15% compare to 4.6% in the adult. Abbas *et al.* in (2017) in Egypt also found that teenagers have high rate of normal vaginal deliveries compare to their adult counterpart [3]. There was a significantly higher rate of perineal tears in adolescents (38.5%, PV = 0.017) compared to 19.6% for adult group in this study. This is similar to result obtained by Egbe *et al.* where they also found that the adverse maternal outcomes caused by adolescent pregnancies were mainly perineal tear.

Anemia during pregnancy continues to take a heavy toll of maternal lives in Cameroon. Adolescence is normally a period of high nutritional needs due to rapid growth. In this study there is no much difference in the incidence of mild anemia at first ANC in the study group when compare to control group. This is similarly to that obtained by Chander *et al.* where teenage mother were as likely as adolescent to have anemia in pregnancy [12].

It has been reported that teenage mothers were more likely to die from pregnancy and delivery complications. However, we did not record any maternal deaths among teenage mothers in this study. This may be due the small size of our study population.

4.5. Factors Associated with Teenage Pregnancy

Factors associated with teen pregnancy cut across many aspects such as socio-economic, sociocultural and psychological factors that could be an important determinant of teenage pregnancy. Studies show that more women in rural area

are more likely to become teenage mother [3], our study shows similar results with teenage mother been more from rural area. According to a study done in Indonesia by *Andriyana et al.*, Teenage pregnancy in Indonesia is concentrated among women with less education, who are unemployed, unmarried and with inadequate antenatal care and obstetric risks for poor pregnancy outcome. Our study shows that girls in the rural area are more statistically significant at risk (PV < 0.001, OR = 5.07; 95% CI = 2.34 - 7.88) of becoming teenage mothers compared to those in urban area. This is in line with result obtained by *Egbe et al.* at the Buea Health District [5]. This study also tell us that having low level of education, low level income are associated with being a teen mother (PV = 0.001, or =4.29; 95% CI = 2.343 - 7.880) whereas nonuse of contraception is not associated with teenage pregnancy.

4.6. Limitation and Strength

Due to socio-political crisis in our setting, many participants fear to participate in the study due to the fear of the unknown.

This study was a hospital-based study and generalization of the prevalence to the overall prevalence will face some short coming.

This study is one among the few if any to have evaluated the prevalence, outcome and associated factors of teenage pregnancy in the Bamenda Health District.

The Regional hospital and the MHC Nkwen offer care to close to half of the population of the Bamenda Health district, with different socio-demographic socio-economic background including rural, and urban areas.

The information generated from this study provide important previously unstudied information, provide inside into system improvement opportunities in our setting.

From this study also we come to know the current trend of teenage pregnancy and hospital deliveries in the BRH and Nkwen medicalised health center this information will be used to compare with future trend.

5. Conclusions

The prevalence of teenage pregnancy in the BHD is high at 13.5%. Teenage pregnancies are responsible for both adverse maternal and fetal outcomes.

The adverse fetal outcomes found in our study are low birth weight (<2500 g), still births, prematurity (<37 weeks completed GA), and high rate of neonatal admission. A low 5 min Apgar score (<7) was not significantly different between teenagers and adult mothers.

The adverse maternal outcomes of teenage pregnancy were mainly perineal tears, Teenagers instead had significant low rate of episiotomy. Incidence of preeclampsia/eclampsia, placenta previa and PROM was not significantly different between adolescents and adult women. The factor associated with teenage pregnancies in the BHD were low level of education, residence in rural area, and

low level of income contribute greatly to the high level of teenage pregnancy.

6. Recommendations

1) To the individual hospitals

- Teenage pregnancies should be considered as a high risk pregnancies.
- Should increase and make available reproductive health services accessible by teenagers.
- Increase use of skilled antenatal childbirth and postnatal care among adolescents.

2) To the research community

Recommendation similar or further studies should be carried out with a larger sample size in and out of our setting in order to investigate more on the associated factor of teenage pregnancy and to provide more data for estimation of national prevalence.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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