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Socio-Demographic and Other Determinants of Teen Pregnancies in the Tamale Metropolis: A Community-Based Unmatched Case-Control Study

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Abstract

Purpose: This study aimed to assess the socio-demographic determinants and to ascertain other factors leading to teen pregnancies in the Tamale Metropolis.

Methodology: This study adopted a descriptive cross-sectional study design, using an unmatched case-control technique with a quantitative approach. The case and control groups for this study were adolescents who were between 13 years and 19 years. The study was conducted in the Tamale Metropolis from April 2021 to June 2021. The metropolis is divided into four sub-districts. Almost 36.4% of the population is below 15 years. The exclusion criteria were girls below 13 years, and who have been pregnant before, and those same age group who have aborted before term; and male adolescents from 13 years to 19 years of age.

A multi-stage sampling design was used for the study. STATCALC formula for Epi Info was used to calculate the sample size of 291 for unmatched case-control groups of pregnant and non-pregnant study participants. A well-structured self-administered questionnaire in English language was used to interview participants. Descriptive statistics were used to describe the data by summarizing them into percentages and frequencies. Data was analyzed using SPSS version 25 and Microsoft Excel. Chi-square test was used to measure the association between the outcome and predictor variables. A p-value < 0.05 was indicated an association between the variables.

Results: When participants socio-demographic risk factors in case group (85, 44.3%) and control group (107, 55.7%) by adolescent pregnancy were determined, data proved statistically significant difference ($\chi^2=21.29$; $p<0.001$). However, there was no statistically significant difference between case and control groups ($\chi^2=0.56$; $p=0.55$) on social media usage influencing adolescent pregnancy. Bivariate and multivariate analyses on marital status respectfully showed a statistically significant difference in terms of co-habiting (Crude odds: 0.04-0.36, $p<0.001$; AOR: 0.01-0.59, $p=0.02$) and married (Crude odds: 0.24-0.20), $p<0.001$; AOR: 0.01-0.22, $p<0.001$).

Conclusion: Despite strong religious affiliation, there exists teenage pregnancy in the Tamale Metropolis as a result of consensual sex.

Recommendation: There is the need to publicly intensify sex education among the youth as well as the various religious sects by the health authorities within the metropolis.

Keywords: Socio-demographics; Tamale; Metropolis; Teenage; Pregnancy

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Introduction

Teenage pregnancy is a worldwide phenomenon affecting both developed and developing countries (Indongo, 2020) due to the fact that teenagers are sexually active. It has not only

become a public health issue, but also a major media focal point, irrespective of the teenager's marital status (World Health Organization [WHO], 2020). The phenomenon has become one of the main issues in every health care system, since early pregnancy

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can have harmful implications on girls' physical, psychological, economic and social status [1]. However, pregnancy in the very young is generally considered to be a high-risk event because of the additional burden imposed by reproduction on a still growing body.

Teenage pregnancy is a social menace with a public health importance globally and Ghana is no exception. The 2010 Population and Housing Census emphasized the contribution of adolescents toward the Total Fertility Rate (TFR) of Ghana. Out of the total TFR in 2008, 8.2 percent were from adolescents [2].

Teenagers are neither children nor adults, but are in transition to adulthood. They constitute a high-risk group often highlighted in public debates [1]. By definition, teenage pregnancy is any pregnancy occurring among adolescent girls aged 19 years or younger. In recent decades, the number of teens who have become pregnant worldwide has increased and become a major health issue for nations. In Ghana, for instance, adolescent or teenage is defined as a person between the ages of 10 and 19 years [3]. In view of this getting pregnant within this age brackets is considered teenage pregnancy. The margin, however, varies across the world in view of the fact that teenage pregnancy is associated with the desire to meet basic needs, sexual violence and the need for self-respect [4]. Notwithstanding this fact, the term teenage pregnancy applies to all women who become pregnant before reaching the age of legal adulthood. As a consequence of this phenomenon, teenage girls who get pregnant are stigmatized in the society, especially when the pregnancy occurs before marriage in Ghana and by extension some parts of Africa. It is commonly to see that most girls have a child or children before marriage in many countries.

Prevalence of teenage pregnancy has become common in most societies. The rate of pregnancy before marriage is high in Latin America and the Caribbean, and some parts of sub-Saharan Africa as compared to that of Asia [5]. In Ghana, 9.2% of adolescents between the ages 15 and 19 years were married and 3.2% were living with their partners (co-habiting) [6]. This was buttressed by Domfe and Oduro (2018) who claimed that 5.2% of adolescents between the ages of 12 and 14 years were married when they presented an article on the prevalence and trends in child marriage in Ghana.

During the 2009 Basic Education Certificate Examination (BECE) there were two teenage mothers who were among the candidates writing their exams in the Ho Municipality in the Volta Region of Ghana. These adolescents were 13 and 15 years [2]. In the Manya-Krobo District in the Eastern Region of Ghana, more than 33 female students were not able to sit for their BECE due to pregnancy [6]. There was a record of 572 teenage pregnancies in the Shame District of the Western Region and a reported mass failure of candidates who sat for the BECE in that area (Bedzo & Manortey, 2019). In the Sunyani West District of the Brong Ahafo Region, 259 teenage pregnancies were recorded between January and June 2014 (Vibe, Ghana, 2014). Again, in the Brong Ahafo Region, 7.8% of adolescent females between the ages of 15 and 19 were found to be married. Almost four percent (3.8%) who were between the ages of 12 and 14 years were pregnant [6].

The Northern Region has the lowest level of school attendance of pupils of primary school age at just 59.4%. The region also has the lowest female literacy rate in Ghana at 44.3% of young women aged 15-24 years (national average 61.4%) (UNICEF, 2020). A baseline survey conducted by the Planned Parenthood Association of Ghana ([PPAG], 2014) in the Northern and Upper East Regions of Ghana revealed that 52.4% of all antenatal care registrants in all the Districts, Metropolis and Municipalities in these two regions were within the age group of 13-19 years. The report further showed that 89% of these teenagers' pregnancies were unplanned or unintended. This was attributed to the low level of knowledge and use of available contraceptives which was found to be 8.2%. In situations of unplanned pregnancy, most of the adolescent girls result to termination of pregnancy by methods which put their lives at risk. In some cases these adolescents lose their lives and where they are fortunate enough to survive, it leaves serious repercussions on their reproductive health. People who are between the ages of 15 and 24 years account for 40% of HIV infection incidence in adults in 2009 (UN, 2011).

By virtue of age, most adolescents who become pregnant may not physiologically be able to cope with the health, social and economic burdens that result from the early pregnancy. Notwithstanding, teenage pregnancy is high in most high income countries including the United States of America. It comes with its social stigma in these societies and cultures [7].

A study conducted in the United States of America indicated that about 73% of adolescents used at least one form of social networking sites such as Facebook, Whatsapp, MySpace and Twitter [8]. More so, it has been reported that 9.5% of adolescent girls between 15 and 19 years in Ghana have access to at least three mass media platforms (including newspaper, radio and television) once a week, and 12.5% of adolescent boys were between 15 and 19 years (GSS, 2019). This means that adolescents are privy to programs with adult or sexual content and this may influence their sexual behaviour which may lead to adolescent pregnancy.

Comparing the outcomes of exposure to the mass media in Whites and Blacks in America, the report showed that White adolescents' sexual activity were greatly influenced by sexual content in music, magazines and television which also prone them to engaging in early sexual activities. Black adolescents, on the other hand, were influenced by the perception of their parents' expectations and sexual behaviours of their peers rather than what they see and hear through the mass media (Ashcraft & Murray, 2017). Watching sex on television has also been found to hasten or increase the likelihood for adolescents to initiate sexual activities which also result in adolescent pregnancy [9]. However, most adolescents would have preferred getting information or talking to health professionals in person for sexual education; seeking information on reproductive or sexual health on the internet is their only option in obtaining such information [8].

A study by revealed that most sexual intercourse that takes place during early ages is often associated with non-use of contraceptives. This is normally due to inaccessibility to contraceptives, lack of skills and self-efficacy to negotiate contraception. Another factor

mostly associated with the level of adolescent pregnancy is low or no use of contraceptives or unmet need for contraceptives. A report in the 2010 Population and Housing Census indicated that there is low usage of contraceptives by adolescents who are sexually active in sub-Saharan Africa which has led to increase rate of unplanned pregnancies and sexually transmitted infections including HIV/AIDS [10]. The percentage use of modern contraceptives by women between 15 and 19 years is 5.2% and 7.6% for all female adolescents, and adolescents who are currently married respectively. Ghana therefore reported the lowest contraceptive use between women aging from 15 to 19 (Ghana Statistical Service [GSS], 2012). From Boamah et al. (2014), among adolescents between the ages of 12 and 19 years in Ghana, Burkina Faso, Malawi and Uganda, 43-65% of female adolescents and 50-65% male adolescents were found to have used contraceptives before.

Peer pressure has also been found to be a causal factor for premarital sexual activity in sub-Saharan Africa. A study in Ghana documented that adolescents were influenced by their peers to indulge in unsafe sexual behaviours, though they might not be ready for that [11]. In view of this sex education is an important component in the development of the adolescent. It provides the adolescent with all the necessary information they need to know about their bodies, gender, reproductive health, puberty, knowledge on contraceptives which enhance their usage and the consequences of coitus, which include sexually transmitted infections and unwanted pregnancies. It also helps the adolescent to make informed decisions concerning their sexuality. However, most parents find it difficult to talk about sex with their adolescents. Just as the parents, adolescents also find it uncomfortable and difficult to discuss matters concerning sex with their parents [12]. In homes where parents are able to discuss issues of sex with their adolescents, the content is limited, infrequent and mostly between certain family members such as the mother and the daughter. This communication often times happen after the adolescent had already initiated sex (Baku et al., 2018). A study by Adu Ahorlu C K (2014) in the Upper Denkyira West District in Ghana indicated that about 83% of the respondents agreed to the assertion that lack of sex education results in adolescent pregnancy.

A qualitative study at Chorkor, a suburb of Accra, Ghana, by Gyan indicated that 94% agreed that poverty influences adolescent pregnancy since most female adolescents engaged in transactional sex. Female adolescents from poor families have 2.7 times the odds of being engaged in premarital sex which mostly lead to adolescent pregnancy compared to those from rich families [13]. As a result of father's death, leaving their families due to divorce, family conflicts and/or poverty.

Socialization and social theories of intergenerational transmission of early childbearing contend that children born to teenage mothers are at risk of early pregnancy because of their mother's marital instability and reduced parenting ability, as well as poorer socioeconomic environment in which young mothers raise their offspring's [14]. Most girls after realizing that they are pregnant resort to any means possible to terminate the pregnancy. Some go to the extent of undergoing unsafe abortions; even if they

survive the ordeal it leaves permanent mark or adverse effect on their reproductive life.

On the challenges posed by early pregnancy, it is estimated that 21 million adolescents aged 15–19 years in developing regions get pregnant every year, and approximately 12 million of them give birth which brings great cost to the adolescent mother, the baby and the society [15]. In view of this early child bearing has been found to be associated with many health glitches such as pregnancy-induced hypertension [16]. Anaemia, mental illness (puerperal psychosis), malaria, unsafe abortion, and obstetric fistulae. Data estimates 5.6 million abortions occur each year among adolescent girls aged 15-19 [15], and the practice of unsafe abortion occurs every year in developing countries, and this has contributed immensely to maternal mortality, perinatal mortality and infant mortality. Nonetheless, adolescent pregnancy is found to contribute to deep-seated cycle of ill-health and poverty [17]. Besides, pregnancy related deaths have also been established to be the leading cause of mortality among adolescent girls who are between the ages of 15 and 19 years worldwide [18].

In support of the data as stated, 86% of respondents of a study were out of school due to adolescent pregnancy. As much as 82.8% of respondents indicated that the pregnancy has affected their academic performance whilst 94% of the respondents had no intentions of going back to school after delivery [19]. Due to lack of social support systems coupled with low socioeconomic status of the adolescent pregnant mother [20]. In sharp contrast to this assertion, recent studies have shown a decline in the rate of deaths in all regions globally, especially in South-East Asia where mortality rates have reduced from 21 to 9 deaths per 100,000 girls since the year 2000.

Many women find it challenging to meet the demands of early motherhood [21]. And for adolescent mothers with repeat pregnancies; it may be more difficult to garner support. This makes their experience of motherhood more challenging. Social support, therefore, is an important component of the emotional and physical well-being of mothers, especially, just after childbirth [21]. This assertion was confirmed by a study that found that paternal presence and financial support led to the reduction of stress for the teenage mother. More so, paternal support for the baby is affected by the level of involvement of the father in the decision-making process during the pregnancy [22]. Mollborn, et al. revealed that many teenage mothers depend on their mothers for support, and that there are higher levels of teenage life satisfaction and positive parenting skills when teenage mothers have a close relationship with their mothers. This was supported by a case-control study that insisted on family resilience during pregnancy among inner-city women and emphasized the importance of family support in building the resilience of teenage mothers [23]. However, lack of social and economic support for the teenage mother may pose a greater risk than even the pregnancy itself [5]. And those women with low interpersonal support were six times more likely to have low resilience [23].

Contrary to the assertion made, personal resources for teenage mothers in terms of support and motivation decrease the risk of having another pregnancy and that support from members of the

family is a positive factor in furthering the career development of adolescents [24].

Notwithstanding all the efforts put into the reduction and prevention of teenage pregnancy by the Ministry of Health, the Ghana Health Service, the Metropolitan Health Directorate through education in the mass media, the Ghana Education Service, and the contributions of Non-Governmental Organizations (NGOs) in the metropolis, teenage pregnancy is still an issue confronting the people in Tamale. The question that arises is: 'Why do two adolescents with similar characteristics and living under similar conditions in a community, one become pregnant and the other does not?' As little is known about the exposure that leads to one adolescent becoming pregnant and the other not becoming pregnant under similar conditions, this study seeks to examine the factors that influence the level of teenage pregnancy in the Tamale Metropolis.

Methodology and Procedure

This study adopted a descriptive cross-sectional study design, using an unmatched case-control technique with a quantitative approach to assess the socio-demographic determinants and ascertain other factors leading to teen pregnancies in the Tamale Metropolis. The case group for this study were adolescents who were 13 years and above but have not celebrated their 19th birthday and were either pregnant or have given birth to at least one child. The control group, on the other hand, were adolescent girls who were 13 years and above but have not yet celebrated their 19th birthday, who were not pregnant or have not given birth before and live within the same community as the case group. The study took place from April 2021 to June 2021.

The study was conducted in the Tamale Metropolis, which is one of the six Metropolitan Assemblies in the country and the only Metropolis in the four northern regions of Ghana. The metropolis is divided into four sub-districts namely: Tamale Municipality which include Areas 1 to 3; Tamale South; Tamale Central; and Tamale North. The population of Tamale Metropolis, according to the 2010 Population and Housing Census, is 233,252 representing 9.4 percent of the region's population. Males constitute 49.7 percent and females represent 50.3 percent. The metropolis has a sex ratio of 99.1. Almost 36.4% of the population is below 15 years. The occupation with the highest population in the Metropolis is service and sales workers (33.0%). This is followed by those in the craft and related trade works (21.5%). The proportion of the employed persons engaged in skilled agricultural forestry and fishery is 17.6 percent, which is the third largest occupation in the metropolis. There are more males compared to females in almost all the occupations with the exception of service and sales where only 16.5 percent of males are engaged, compared to a large proportion of 50.3 percent for females. Also, there are more females (11.3%) than males (6.1%) in the elementary occupation category (GSS, 2010).

The study involved adolescent females between the ages of 13 and 19 years who were residents of Tamale Metropolis, and currently pregnant or have given birth to at least one child and have not yet celebrated their 19th birthday, as well as adolescent girls who were between 13 years and 19 years, but have not yet

celebrated their 19th birthday, and who were not pregnant or have not given birth before and live within the same community at time of the study. The exclusion criteria, however, were girls below 13 years, have been pregnant before but aborted before term, and male adolescents from 13 years to 19 years of age.

A multi-stage sampling design was used for the study. Stratified random sampling was used to select the cases and the controls. Purposive sampling was employed to select pregnant adolescent girls as cases. Pregnant adolescents and adolescent mothers who visited the public health facilities within the municipality for ante-natal and post-natal services were selected for the study as the cases. The metropolis was stratified to comprise both urban and peri-urban settings to facilitate good representation. The choice of the four sub-districts was based on factors such as socioeconomic status, background characteristics and homogeneity. At the community level, based on the population density, a sampling interval was developed for the houses to be randomly selected for the study. For example, in Kakpayili where the population is not dense and most of the villages were sparsely situated, a sampling interval of every 5th house was used to select houses where controls were systematically selected. Adolescent girls who were between the ages of 13 and 19 years in the selected houses were interviewed; not more than one per house. In houses where there was more than one adolescent girl and they have consented to the study, one of them was randomly selected through simple random technique by using papers with yes and no written on them and shuffled, and the girl who picked yes was interviewed. In houses where there were no adolescent girls, a different house which was not part of the already chosen households was used.

STATCALC formula for Epi Info was used to calculate the sample size for unmatched pregnant and non-pregnant study participants (groups) as follows:

$$n = [2(Z_{\alpha/2} + Z_{\beta})^2 \times P(1 - P)] \div (P_1 - P_2)^2, \text{ where}$$

n = Sample size

$Z_{\alpha/2}$ = 1.96 (from Z table) at type 1 error of 5%

Z_{β} = 0.84 (from Z table) at 80% power

P_1 = Case group

P_2 = Control group

$P_1 - P_2$ = Difference in proportion of events in the two groups

P = Pooled prevalence $\{[(\text{Prevalence in Case group } [P_1] + \text{Prevalence in Control group } [P_2])] \div 2, \text{ that is, Pooled prevalence } \div 2$

$P = (0.2 + 0.3) \div 2 = 0.25$

$P = 0.25$

We assumed that 20% of the Case group already had children, and 30% of the Control groups were yet to get pregnant, then the Effect size was the difference between the proportions of the participants or the groups. That is: $P_1 - P_2 = 0.2 - 0.3 = -0.1$.

At 5% significance level and 80 powers, and by inserting figures into the equation, the sample size was then calculated as follows:

$$n = [2(Z_{\alpha/2} + Z_{\beta})^2 \times P(1 - P)] \div (P_1 - P_2)^2$$

$$n = [2(1.96 + 0.84)^2 \times 0.25(1 - 0.25)] \div (0.2 - 0.3)^2$$

$$n = [15.68 \times 0.25(1 - 0.25)] \div (-0.1)^2$$

$$n = [15.68 \times 0.25(0.75)] \div (-0.1)^2$$

$$n = (15.68 \times 0.1875) \div (-0.1)^2$$

$$n = (2.94) \div (0.01)$$

$$n = 294$$

Due to attrition by three respondents, the final sample size was 291.

Well-structured self-administered questionnaire was used to interview adolescents to gather data. The questionnaire was read and filled for respondents who could not read and write the English language after explanations have been given in the local language. For participants who can read and write in the English language, the questionnaire was given to them to answer by themselves. The questionnaire used for the case group was the same as administered to the control group, but there were some questions that the control group were exempted from answering. Respondents who form the case group were selected from the ante-natal and child welfare clinics within the municipality. The control group was also selected from the individual households within the community.

The consent of the participants was sought before questionnaire was administered. Participants were asked to sign or thumbprint on a well written consent form after the study has been explained to them to agree to participate voluntarily. In situations where guardians were present for respondents who were below 18 years, the guardians signed, and the adolescents assented to it before questionnaire was administered.

Descriptive statistics was used to describe the socio-demographic data that influence adolescent pregnancy by summarizing them into percentages, proportions and frequencies. Mean and standard deviation was calculated for age. Figures were presented in tables. Data was analysed using SPSS version 25 and Microsoft Excel. Chi-square test was used to measure association between the outcome and predictor variables. A p-value of less than 0.05 was indicated an association between the variables. Regression analysis (logistic regression) using both bivariate and multivariate analysis was carried out to assess the odds of the factors influencing adolescent pregnancy and the outcome variable which is adolescent pregnancy. This was carried out to establish the strength of association between the predictor and outcome variables. Data entry was carried using Microsoft excel.

Ethical clearance was obtained from the Ghana Health Service, the Municipal Assembly, the Municipal Health Directorate and the Regional Health Directorate before the research was started.

Results

Socio-demographic characteristics

In this study, 157 (54.0%) participants were put under case group whilst 134 (46.0%) participants were placed under control group giving a total of 291 (100.0%) respondents. The socio-demographic

characteristics showed that more than half of the respondents 192 (66.0%) were between the ages of 13 and 15 years. It was noted that 217 (74.6%) were single whilst 28 (9.6%) were co-habiting. Majority of the adolescents 111 (38.1%) were attending Junior High School whilst four (1.4%) of the participants were college/tertiary students. Muslims being 198 (68.0%) dominated this study with the largest ethnic background of respondents 143 (49.1%) being Dagombas. 147 (50.5%) of the study participants were unemployed whilst 85 (29.2%) were students in terms of occupation. Table 1 depicts the socio-demographic data of the respondents (Table 1).

Table 1. Socio-demographic characteristics.

Variable	Frequency (n=291)	Percentage (100%)
Participant		
Case	157	54
Control	134	46
Age		
13-15 years	192	66
16-19 years	99	34
Marital status		
Single	217	74.6
Co-habiting	28	9.6
Married	46	15.8
Highest level education attained		
No formal education	59	20.3
Primary	52	17.9
Junior High School	111	38.1
Senior High School	65	22.3
College/Tertiary	4	1.4
Religious affiliation		
Christian	90	31
Muslim	198	68
Traditionalist	3	1
Source: Field data, 2021		
Table 1: Socio-demographic characteristics – cont'd		
Variable	Frequency (n=291)	Percentage (100%)
Place of birth		
Within Tamale Metropolis	119	40.9
Outside Tamale Metropolis	172	59.1
Ethnic background		
Dagomba	143	49.1
Mamprusi	57	19.6
Gonja	34	11.7
Akan	18	6.2
Others	39	13.4
Current Occupation		
Student	85	29.2
Trader	25	8.6
Farmer	5	1.7
Apprenticeship	29	10
Unemployed	147	50.5
Number of children you have		
	Control group (%)	Case group (%)
0	259 (89.0)	-
1	-	23 (7.9)
2	-	9 (3.1)

Socio-demographic risk factors in case group and control group by adolescent pregnancy

Bivariate analysis shows that 85 (44.3%) of the case group were 13-15 years whilst 107 (55.7%) control participants were in the same age range. Majority of the case group 42 (91.3%) were married whilst most of the control group 126 (58.1%) were single. Most of the case group 108 (78.8%) were not currently in school whilst most of the control group (105, 68.2%) were found to be in school. Majority of the case group (47, 79.7%) had no formal education; meanwhile 30 (57.7%) being majority of the control group had attained primary education. While most of the case group (107, 54.0%) were Muslims, most of the control group 42 (46.7%) were Christians. There is statistically significant difference between case participants and control participants in terms of their age, marital status, current schooling status, the highest education attained. However, this study shows no difference in case and control groups in terms of religion, ethnicity and place of birth (Table 2).

Social media influence on adolescent pregnancy

The table below shows that 79 (53.4%) of the case group use one or more of the social media handles whilst 69 (46.6%) of the control group use any social media handle, though there is no statistically significant difference between case and control participants ($\chi^2=0.04$; $p=0.91$). Majority of the case participants 63 (54.3%) use Facebook whilst 53 (45.7%) of control group also use Facebook. However, there was no statistically significant difference between case and control groups ($\chi^2=0.56$; $p=0.55$). The number of the control group who use Instagram were more than that of the case participants who use it; thus 17 (77.3%) and 5 (22.7%) respectively. As 11.1% of the case group use Twitter, 88.9% of the control group uses the same social media handle, 56.5% of the case group uses Whatsapp, and 43.5% of the control participants uses the same social media handle. There is statistically significant difference between the case and control groups in terms of the usage of Instagram, Twitter and Whatsapp. It was noted that majority of the case group (35, 68.6%) use social

Table 2. Socio-demographic risk factors in case group and control group by adolescent pregnancy.

Characteristics	Frequency (%)		Total	Statistical test
	Case	Control		
Age				$\chi^2=21.29$; $p<0.001$
13-15 years	85 (44.3)	107 (55.7)	192	-
16-19 years	72 (72.7)	27 (27.3)	99	-
Marital status				$\chi^2=49.82$; $p<0.001$
Single	91 (41.9)	126 (58.1)	217	-
Co-habiting	24 (85.7)	4 (14.3)	28	-
Married	42 (91.3)	4 (8.7)	46	-
Currently in school				$\chi^2=64.50$; $p<0.001$
Yes	49 (31.8)	105 (68.2)	154	-
No	108 (78.8)	29 (21.2)	137	-
Highest level education attained				$\chi^2=22.18$; $p<0.001$
No formal education	47 (79.7)	12 (20.3)	59	-
Primary	22 (42.3)	30 (57.7)	52	-
Junior High School	51 (45.9)	60 (54.1)	111	-
Senior High School	34 (52.3)	31 (47.7)	65	-
College/Tertiary	3 (75.0)	1 (25.0)	4	-
Religious affiliation				$\chi^2=0.21$; $p=0.90$
Christianity	48 (53.3)	42 (46.7)	90	-
Muslim	107 (54.0)	91 (46.0)	198	-
Traditionalist	2 (66.7)	1 (33.3)	3	-
Ethnic background				$\chi^2=8.84$; $p=0.07$
Dagomba	77 (53.8)	66 (46.2)	143	-
Mamprusi	34 (59.6)	23 (40.4)	57	-
Gonja	17 (50.0)	17 (50.0)	34	-
Akan	14 (77.8)	4 (22.2)	18	-
Others	15 (38.5)	24 (61.5)	39	-
Place of birth				$\chi^2=0.04$; $p=0.91$
Within Tamale Metropolis	65 (54.6)	54 (45.4)	119	-
Outside Tamale Metropolis	92 (53.5)	80 (46.5)	172	-
Number of children you have				$\chi^2=18.48$; $p<0.001$
0	129 (49.8)	130 (50.2)	259	-
1	22 (95.7)	1 (4.3)	23	-
2	6 (66.7)	3 (33.3)	9	-

media for socialization whilst most of the control respondents use it for business purposes. There is statistically significant difference in the use of the social media among the case respondents and control group ($\chi^2=12.12$; $p=0.01$). The result of this study shows that 14 (31.8%) of case respondents watch educative videos as against 30 (68.2%) of control participants, having a statistically significant difference ($\chi^2=11.52$; $p=0.001$). Adolescents under the case group use the social media for socialization more than the control group, though there exists statistically significant difference for these groups. Watching of videos on social media as an entertainment purpose revealed 70 (57.4%) and 52 (42.6%) among the case and control groups respectively with a statistically significant difference ($\chi^2=8.47$; $p=0.006$). According to 41 (70.7%) of teenage mothers, social media has had influence on their sexual behaviour ($\chi^2=13.02$; $p<0.001$) (Table 3).

Knowledge and use of contraceptives as a risk factors of adolescents

The table below shows that 110 (54.2%) of the case respondents had heard of any method that can be used to prevent pregnancy as compared to 93 (45.8%) of the control group who had heard, though there is no statistically significant difference between the case and the control respondents ($\chi^2=0.02$; $p=1.00$). For both the case and the control groups who had heard about the method that can be used to prevent pregnancy, 59 (56.7%) of the case respondents had heard about injectable as against 45 (43.3%) of the control group, 95 (60.9%) of the case group has heard about pills compared to 61 (39.1%); 42 (53.2%) of the case participants knew about implants compared to 37 (46.8%) of the control group, 99 (55.3%) of the cases knew about condoms against

Table 3. Reproductive risk factors for Adolescent pregnancy in case and control groups.

Variable	Frequency (%)			Statistical test
	Case	Control	Total	
Have you signed in to any social media platform?	$\chi^2=0.04$; $p=0.91$			
Yes	79 (53.4)	69 (46.6)	148	-
No	78 (54.5)	65 (45.5)	143	-
Facebook	$\chi^2=0.56$; $p=0.55$			
Yes	63 (54.3)	53 (45.7)	116	-
No	15 (46.9)	17 (53.1)	32	-
Instagram	$\chi^2=9.12$; $p=0.01$			
Yes	5 (22.7)	17 (77.3)	22	-
No	72 (57.6)	53 (42.4)	125	-
Twitter	$\chi^2=6.44$; $p=0.01$			
Yes	1 (11.1)	8 (88.9)	9	-
No	75 (54.7)	62 (45.3)	137	-
Whatsapp	$\chi^2=5.27$; $p=0.03$			
Yes	70 (56.5)	54 (43.5)	124	-
No	7 (30.4)	16 (69.6)	23	-
Purpose for using the social media platform	$\chi^2=12.12$; $p=0.01$			
Education	27 (43.5)	35 (56.6)	62	-
Business	0 (0.0)	4 (100.0)	4	-
Socialization	35 (68.6)	16 (31.4)	51	-
Entertainment	16 (59.3%)	11 (40.7)	27	-
What do you normally watch on these social media platforms?	-	-	-	-
Educational videos	$\chi^2=11.52$; $p=0.001$			
Yes	14 (31.8)	30 (68.2)	44	-
No	59 (62.8%)	35 (37.2)	94	-
Socialization videos	$\chi^2=0.62$; $p=0.51$			
Yes	15 (60.0)	10 (40.0)	25	-
No	58 (51.3%)	55 (48.7%)	113	-
Entertainment videos	$\chi^2=8.47$; $p=0.006$			
Yes	70 (57.4)	52 (42.6)	122	-
No	3 (18.8)	13 (81.3)	16	-
How often do you use these social media platforms?	$\chi^2=7.97$; $p=0.09$			
Almost every day	52 (61.9)	32 (38.1)	84	-
At least once a week	16 (39.0)	25 (61.0)	41	-
Less than once a month	5 (71.4)	2 (28.6)	7	-
Once a month	1 (33.3)	2 (66.7)	3	-
Other	4 (40.0)	6 (60.0)	10	-
Do they have any influence on your sexual behaviour?	$\chi^2=13.02$; $p<0.001$			
Yes	41 (70.7)	17 (29.3)	-	-
No	34 (40.0)	51 (60.0)	-	-

80 (44.7%) of the controls, 59 (48.0%) of the cases knew about periodic abstinence/rhythm as against 64 (52.0%) of the controls who knew this method. Apart from pills, there is no statistically significant difference between the cases and the controls in knowledge about other methods used to prevent pregnancy. In this study, the cases use injectable method of contraceptive (15, 71.4%) more than the controls (6, 28.6%). This was the same among other methods of contraceptives such that 34 (85.0%) of the cases use pills compared to six (15.0%) of the controls; seven (100.0%) of the cases use implants against none (0.0%) of the controls; 53 (71.6%) of the cases use condoms as against 21 (28.4%) of the controls who use the same method; 41 (64.1%) of the cases use periodic abstinence/rhythm as compared to 23 (35.9%) of the controls. With the exception of injectable, there is statistically significant difference between the cases and the

controls in the use of other methods of contraceptives to prevent pregnancy. The frequent use of these methods depicts that most of the cases 9 (60.0%) use injectable every time whilst majority of the controls 19 (70.4%) use it once a while; most of the cases (66.7%) use pills every time while most the controls (48.8%) never use it. For implants, majority of the cases (55.8%) had never used it whilst most of the controls (55.9%) used it once a while; 70.4% of the cases use condoms every time whilst 60.0% had never used this method; 65.2% of the cases use periodic abstinence/rhythm once a while as compared to 61.1% of the controls who use it every time. The findings of this study shows statistically significant difference in the frequent use of injectable, condoms and periodic abstinence/rhythm among the case and the control groups as seen from **Table 4**.

Table 4. Knowledge and use of contraceptives.

Variable	Frequency (%)		Total	Statistical test
	Case	Control		
Have you heard of any method that can be used to prevent pregnancy?				
Yes	110 (54.2)	93 (45.8)	203	$\chi^2=0.02; p=1.00$
No	47 (53.4)	41 (46.6)	88	
If yes, which of the following method (s) have you heard of?				
Injectables				
$\chi^2=1.07; p=0.34$				
Yes	59 (56.7)	45 (43.3)	104	-
No	50 (49.5)	51 (50.5)	101	-
Pills				
$\chi^2=14.85; p<0.001$				
Yes	95 (60.9)	61 (39.1)	156	-
No	14 (29.2)	34 (70.8)	48	-
Implants				
$\chi^2=0.00; p=1.00$				
Yes	42 (53.2)	37 (46.8)	79	-
No	66 (52.8)	59 (47.2)	125	-
Condoms				
$\chi^2=2.07; p=0.20$				
Yes	99 (55.3)	80 (44.7)	179	-
No	10 (40.0)	15 (60.0)	25	-
Periodic abstinence/ Rhythm				
$\chi^2=1.29; p=0.29$				
Yes	59 (48.0)	64 (52.0)	123	-
No	39 (56.5)	30 (43.5)	69	-
Which of the method(s) do you use?				
Injectable				
$\chi^2=3.20; p=0.11$				
Yes	15 (71.4)	6 (28.6)	21	-
No	91 (50.8)	88 (49.2)	179	-
Pills				
$\chi^2=20.58; p<0.001$				
Yes	34 (85.0)	6 (15.0)	40	-
No	70 (44.9)	86 (55.1)	156	-
Implants				
$\chi^2=6.55; p=0.02$				
Yes	7 (100.0)	0 (0.0)	7	-
No	96 (50.8)	93 (79.2)	189	-
Condoms				
$\chi^2=15.95; p<0.001$				
Yes	53 (71.6)	21 (28.4)	74	-
No	53 (42.4)	72 (57.6)	125	-

Periodic abstinence/ Rhythm				$\chi^2=4.83$; $p=0.03$
Yes	41 (64.1)	23 (35.9)	64	-
No	63 (47.4)	70 (52.6)	133	-
How often do you use any of the methods?				-
Injectables				$\chi^2=7.30$; $p=0.03$
Every time	9 (60.0)	6 (40.0)	15	-
Once a while	8 (29.6)	19 (70.4)	27	-
Never used	92 (57.1)	69 (42.9)	161	-
Pills				$\chi^2=1.58$; $p=0.45$
Every time	10 (66.7)	5 (33.3)	15	-
Once a while	33 (56.9)	25 (43.1)	58	-
Never used	66 (51.2)	63 (48.8)	129	-
Implants				$\chi^2=1.56$; $p=0.46$
Every time	2 (50.0)	2 (50.0)	4	-
Once a while	15 (44.1)	19 (55.9)	34	-
Never used	92 (55.8)	73 (44.2)	165	-
Condoms				$\chi^2=13.12$; $p=0.001$
Every time	19 (70.4)	8 (29.6)	27	-
Once a while	54 (63.5)	31 (36.5)	85	-
Never used	36 (40.0)	54 (60.0)	90	-
Periodic abstinence/ Rhythm				$\chi^2=5.88$; $p=0.05$
Every time	7 (38.9)	11 (61.1)	18	-
Once a while	43 (65.2)	23 (34.8)	66	-
Never used	59 (49.6)	60 (50.4)	119	-

Peer influence and sexual behaviour on adolescent pregnancy

The sexual behaviour on adolescent pregnancy illustrates that most of the cases 61 (82.4%) had sex less than a week prior to the study whilst majority of the controls (67, 94.4%) never had sex ($\chi^2=97.66$; $p<0.001$). Majority of the cases (78.9%) had sex at the age 10-15 years whilst most of the control adolescents had sex at the age of 16-19 years ($\chi^2=97.66$; $p<0.001$). Among the case group 97 (72.9%) of the adolescents were initiated into sex by their friends whilst 36 (27.1%) in the control group were also initiated by their friends ($\chi^2=9.16$; $p=0.03$). However, most of the cases (108, 78.8%) initiated sex consensually whilst majority of the control respondents initiated sex for financial gains. The percentage of respondents who did not use any protection during the sexual intercourse were 75.0% among the cases and 25.0% among control group, though data depicts that there is no statistically significant difference among these groups. It was noted that 33 (66.0%) of the cases use condom as compared to 17 (34.0%) control group who use same. According to 35.6% of the cases, they were not currently in relationship as compared to 64.4% of the control participants ($\chi^2=49.66$; $p<0.001$). For five (71.4%) of the case respondents they have two sexual partners, whilst two (28.6%) of the control group have the same number of sexual partners as shown in the **Table 5**.

Influence of sex education on adolescent pregnancy

According to 108 (75.0%) of adolescent case group, their source of information on sexual and reproductive health is their peers as against 36 (25.0%) of the controls who received sexual information

form their peers ($\chi^2=81.66$; $p<0.001$). According to 30 (33.0%) of the cases, school syllabus does not include sex education ($\chi^2=10.84$; $p=0.001$). From 114 (57.9%) of the adolescent mothers it would not be easy and comfortable for them to discuss issues on sex with their family and friends (**Table 6**).

Family related factors on adolescent pregnancy

The cross tabulation below illustrates that 32 (58.2%) of the case participants had both parents not alive whilst 23 (41.8%) of the control group also had parents not alive, though there is no statistically significant difference between the case group and the control groups ($\chi^2=0.49$; $p=0.55$). For those whose both parents are alive, 109 (50.5%) of the case group parents are still married as compared to 107 (49.5%) of the control group ($\chi^2=4.59$; $p=0.05$). According to 40 (69.0%) of the case group, they have had a sister who gave birth at an early age ($\chi^2=6.57$; $p=0.01$) (**Table 7**).

Challenges facing pregnant adolescents

The table below depicts challenges facing adolescent mothers (cases). It was revealed that more than half of the percentage 83 (52.9%) of these adolescents were living with their parents when they got pregnant, 89 (56.7%) of these teenage mothers were afraid upon hearing the news of their pregnancy with 92 (58.6%) of parents/guardians of these adolescent mothers disappointed upon noticing their wards were carrying pregnancy. Findings from this study, however, shows that 64 (40.8%) of the teenage mothers' partners denied responsibility (**Table 8**).

Support systems available for adolescent mothers

In this study, 42 (26.8%) of the teenage mothers did not have

Table 5. Peer influence and sexual behaviour.

Variable	Frequency (%)		Total	Statistical test
	Case	Control		
Last time you had sex	$\chi^2=97.66; p<0.001$			
Never had sex	4 (5.6)	67 (94.4)	71	-
Less than a week	61 (82.4)	13 (17.6)	74	-
Less than a month ago	41 (69.5)	18 (30.5)	59	-
More than a month ago	51 (59.3)	35 (40.7)	86	-
What age did you had first sex?	$\chi^2=97.66; p<0.001$			
10-15 years	112 (78.9)	30 (21.1)	142	-
16-19 years	43 (58.9)	30 (41.1)	73	-
Who initiated you into having sex?	$\chi^2=9.16; p=0.03$			
Friend	97 (72.9)	36 (27.1)	133	-
Sibling	13 (48.1)	14 (51.9)	27	-
Relative	34 (77.3)	10 (22.7)	44	-
Others	11 (84.6)	2 (15.4)	13	-
How were you initiated into having sex?	$\chi^2=13.82; p=0.008$			
Consensual sex	108 (78.8)	29 (21.2)	137	-
Rape	6 (66.7)	3 (33.3)	9	-
For financial gains	26 (52.0)	24 (48.0)	50	-
Was under the influence of alcohol/drugs	7 (58.3)	5 (41.7)	12	-
Others	3 (75.0)	1 (25.0)	4	-
Did you use any form of protection?	$\chi^2=0.69; p=0.42$			
Yes	53 (69.7)	23 (30.3)	76	-
No	102 (75.0)	34 (25.0)	136	-
Table 5: Peer influence and sexual behaviour – cont'd				
	Frequency (%)			-
Variable	Case	Control	Total	Statistical test
Which form of protection did you use?	$\chi^2=1.15; p=0.77$			
Condom	33 (66.0)	17 (34.0)	50	-
Pills	1 (100.0)	0 (0.0)	1	-
Emergency contraceptives	15 (71.4)	6 (28.6)	21	-
Others	1 (100.0)	0 (0.0)	1	-
What was your relationship with the person you had sex with for the first time?	$\chi^2=4.49; p=0.34$			
Husband	31 (79.5)	8 (20.5)	39	-
Boyfriend	90 (73.8)	32 (26.2)	122	-
Ex-boyfriend	15 (57.7)	11 (42.3)	26	-
Casual acquaintance	16 (80.0)	4 (20.0)	20	-
Others	3 (75.0)	1 (25.0)	4	-
Are you currently in a relationship?	$\chi^2=49.66; p<0.001$			
Yes	98 (77.2)	29 (22.8)	127	-
No	58 (35.6)	105 (64.4)	163	-
How many sexual partners do you currently have?	$\chi^2=6.52; p=0.04$			
1	91 (79.1)	24 (20.9)	115	-
2	5 (71.4)	2 (28.6)	7	-
3	1 (25.0)	3 (75.0)	4	-
Do you use protection with your current partner(s)?	$\chi^2=16.56; p<0.001$			
Yes	33 (60.0)	22 (40.0)	55	-
No	66 (90.4)	7 (9.6)	73	-
Which form of protection do you use?	$\chi^2=5.94; p=0.12$			
Condom	16 (47.1)	18 (52.9)	34	-
Pills	8 (66.7)	4 (33.3)	12	-
Emergency contraceptive	4 (80.0)	1 (20.0)	5	-
Others	4 (100.0)	0 (0.0)	4	-

Table 6. Influence of sex education on adolescent pregnant.

Variable	Frequency (%)			Statistical test
	Case	Control	Total	
Where/who is your source of information on sexual and reproductive health? $\chi^2=81.66; p<0.001$				
Peers	108 (75.0)	36 (25.0)	144	-
Parents/Guardians	14 (18.9)	60 (81.1)	74	-
Media/internet	9 (81.8)	2 (18.2)	11	-
Health professional	19 (65.5)	10 (34.5)	29	-
Teachers	7 (21.9)	25 (78.1)	32	-
Does your school syllabus have sex education $\chi^2=10.84; p=0.001$				
Yes	71 (55.5)	57 (44.5)	128	-
No	30 (33.0)	61 (67.0)	91	-
Will it be easy and comfortable for you to discuss issues on sex with your family and friends $\chi^2=3.77; p=0.06$				
Yes	43 (45.7)	51 (54.3)	94	-
No	114 (57.9)	83 (42.1)	197	-

Table 7. Family related factors that influence adolescent pregnant.

Variable	Frequency (%)			Statistical test
	Case	Control	Total	
Do you have both of your parents alive? $\chi^2=0.49; p=0.55$				
Yes	125 (53.0)	111 (47.0)	236	
No	32 (58.2)	23 (41.8)	55	
Are your parents still married to one another? $\chi^2=4.59; p=0.05$				
Yes	109 (50.5)	107 (49.5)	216	
No	17 (73.9)	6 (26.1)	23	
Do you have a sister who gave birth at an early age? $\chi^2=6.57; p=0.01$				
Yes	40 (69.0)	18 (31.0)	58	
No	117 (50.2)	116 (49.8)	233	
Does your sister early birth have any influence on your current state? $\chi^2=3.22; p=0.11$				
Yes	4 (44.4)	5 (55.6)	9	
No	40 (74.1)	14 (25.9)	54	
Does your parents/guardian have regular income? $\chi^2=1.49; p=0.23$				
Yes	112 (51.9)	104 (48.1)	216	
No	45 (60.0)	30 (40.0)	75	

any support systems. For those who had support system, more than half of the percentage (53.4%) received financial support. According to 80 (51.0%) of the teenage mothers, they have been receiving financial support from their partners. However, 129 (82.2%) did not receive any support from their community, group or friends, and for those who had support most of them (78.6%) had it socially. According to 87 (55.4%) of these teenage mothers, they sometimes felt rejected by their loved ones after getting them pregnant (Table 9).

Bivariate and Multivariate Analyses

The bivariate analysis depicts statistically significance difference between age of respondent and teenage pregnancy ($p<0.001$) where 16-19 years was a protective factor of teenage pregnancy (OR: 0.3; 95% CI=0.18-0.50). However, when this was adjusted, the age was found not to have any influence on teenage pregnancy. There is statistically significant association between marital status and teenage pregnancy. Both bivariate and multivariate analyses showed marital status as a protective factor to teenage pregnancy, if the reference point is single.

Education was seen to have a statistically significant association with teenage pregnancy during the bivariate analysis. The more the adolescent is educated the less likely she would become pregnant. Multivariate analysis confirmed that tertiary education is a protective factor to teenage pregnancy (p -value=0.05; AOR=0.04; CI=0.01-0.95). For primary level of students, they are five times more likely to become pregnant ($p<0.001$; AOR: 4.96; CI=0.78-31.44).

The result revealed that adolescents who seek sexual information from their peers are 51 times more likely to become pregnant than those who seek sexual information from their parents/guardians ($p<0.001$; AOR: 51.1; CI=12.60-206.95). If adolescent's school attended does not have sex education in the syllabus, the girl child is 5.32 more likely to get pregnant than the adolescent who is taught sex education in her school ($p<0.001$; AOR: 5.32; CI: 2.20-12.87) (Table 10).

Discussion

Majority of the participants 157 (54.0%) were under case study

Table 8. Challenges facing pregnant adolescents.

Variable	Frequency	Percentage
Whom were you living with when you got pregnant?		
Both parents	83	52.9
Mother only	21	13.4
Father only	6	3.8
Husband	44	28
Others	3	1.9
How did you react to the news of your pregnancy?		
Happy	23	14.6
Afraid	89	56.7
Disappointed	30	19.1
Felt matured	14	8.9
Others	1	0.6
How did your parents/guardian react to the news of your pregnancy?		
Happy	29	18.5
Afraid	28	17.8
Disappointed	92	58.6
Indifferent	6	3.8
Others	2	1.3
How did your partner react upon hearing about your pregnancy?		
Happy	30	19.1
Angry	16	10.2
Accepted responsibility	46	29.3
Denied responsibility	64	40.8
Others	1	0.6
Total	157	100

whilst 134 (46.0%) were placed under control. The bivariate analysis on the socio-demographic risk factors in cases and controls shows there is statistically significant different between case participants and control participants in terms of their age ($\chi^2=21.29$; $p<0.001$), marital status ($\chi^2=49.82$; $p<0.001$), current schooling status ($\chi^2=64.50$; $p<0.001$), the highest education attained ($\chi^2=22.18$; $p<0.001$), and the number of children one has ($\chi^2=18.48$; $p<0.001$).

This assertion was affirmed by a report that stated that in Ghana 9.2% of adolescents between the ages 15 and 19 years were married, and further buttressed by the fact that 5.2% of adolescents between the ages of 12 and 14 years were married as seen in an article on the prevalence and trends in child marriage in Ghana. Corroborations from other studies also confirmed these study findings that most teenagers were pregnant and/or married during their BECEs [2, 6, 25, 26]. However, this study shows no statistically significant difference in case and control in terms of religion, ethnicity and place of birth as far as the bivariate analysis was concerned.

The social media influence on adolescent pregnancy shows that 79 (53.4%) of cases use one or more of the social media handles whilst 69 (46.6%) of the control group use any social media handle, even though there is no statistically significant difference between case and control ($\chi^2=0.04$; $p=0.91$). There was no statistically significant difference between case and control groups given that $\chi^2=0.56$ and $p=0.55$ when it comes to Facebook usage. However, there is statistically significant difference between cases and controls in terms of the use of Instagram ($\chi^2=9.12$; $p=0.01$),

Table 9. Types of support systems available for adolescent mothers.

Variable	Frequency	Percentage
Did you receive any support from your parents/guardian after your pregnancy?		
Yes	115	73.2
No	42	26.8
Total	157	100
If yes, What form of support did you receive?		
Emotional support	25	21.74
Financial support	61	53.04
Social support	29	25.22
Total	115	100
Have you been receiving support from your partner?		
Yes	80	51
No	77	49
Total	157	100
If yes, In what way does your partner support you?		
Emotional support	1	1.25
Financial support	61	76.25
Social support	18	22.5
Total	80	100
Do you receive any support from your community, group or friends?		
Yes	28	17.8
No	129	82.2
Total	157	100
If Yes, In what way do they support you?		
Emotional support	4	14.3
Financial support	2	7.1
Social support	22	78.6
Total	28	100
Do you sometimes feel rejected by your loved ones after your pregnancy?		
Yes	87	55.4
No	70	44.6
Total	157	100

Twitter ($\chi^2=6.44$; $p=0.01$), and Whatsapp ($\chi^2=5.27$; $p=0.03$). Whilst majority of the cases (35; 68.6%) and controls (35; 56.6%) use social media for socialization and education respectively, there is statistically significant difference when it comes to the purpose for which the social media is being used ($\chi^2=12.12$; $p=0.01$). Besides, there is statistically significant difference when it comes to watching education videos ($\chi^2=11.52$; $p=0.001$), entertainment videos ($\chi^2=8.47$; $p=0.006$), and how social media usage influences sexual behaviour ($\chi^2=13.02$; $p<0.001$).

The influence of social media usage on adolescent pregnancy was confirmed by a study in the United States of America that indicated that about 73% of adolescents used at least one form of social networking sites such as Facebook, Whatsapp, Myspace and Twitter (Selkie et al., 2011). This is supported by the claim that 9.5% of adolescent girls between 15 and 19 years in Ghana have access to at least three mass media platforms (such as newspaper, radio and television) once a week, and 12.5% of adolescent boys were between 15 and 19 years (GSS, 2019). This means that adolescents are privy to programs with adult or sexual content and this may influence their sexual behavior

Table 10. Bivariate and Multivariate Analyses.

Characteristics	Frequency (%)		Crude odds (CI 95%)	p-value	AOR (CI 95%)	p-value
	Case	Control				
Age						
13-15 years	85 (44.3)	107 (55.7)	1	-	1	-
16-19 years	72 (72.7)	27 (27.3)	0.3 (0.18-0.50)*	<0.001	0.5 (0.20-1.27)	0.15
Marital status						
Single	91 (41.9)	126 (58.1)	1	-	1	-
Co-habiting	24 (85.7)	4 (14.3)	0.12 (0.04-0.36)*	<0.001	0.07 (0.01-0.59)**	0.02
Married	42 (91.3)	4 (8.7)	0.07 (0.24-0.20)*	<0.001	0.037 (0.01-0.22)**	<0.001
Highest level education attained						
No formal education	47 (79.7)	12 (20.3)	1	-	1	-
Primary	22 (42.3)	30 (57.7)	5.34 (2.31-12.36)*	<0.001	4.96 (0.78-31.44)	0.09
Junior High School	51 (45.9)	60 (54.1)	4.61 (2.21-9.62)*	<0.001	1.09 (0.23-5.20)	0.91
Senior High School	34 (52.3)	31 (47.7)	3.57 (1.61-7.94)*	0.02	1.23 (0.24-6.36)	0.8
College/Tertiary	3 (75.0)	1 (25.0)	1.31 (0.12-13.70)	0.82	0.04 (0.01-0.95)**	0.05
Sources of information on sexual and reproductive health						
Peers	108 (75.0)	36 (25.0)	12.86 (6.43-25.72)*	<0.001	51.1 (12.60-206.95)**	<0.001
Parents/Guardians	14 (18.9)	60 (81.1)	0.67 (0.14-3.23)	0.62	0.37 (0.03-3.92)	0.41
Media/internet	9 (81.8)	2 (18.2)	1.58 (0.67-3.71)	0.29	3.45 (1.04-11.46)**	0.04
Health professional	19 (65.5)	10 (34.5)	10.71 (4.27-26.86)*	<0.001	11.01 (3.27-37.10)**	<0.001
Teachers	7 (21.9)	25 (78.1)	1	-	1	-
Table 10: Bivariate and Multivariate Analyses – cont'd						
Characteristics	Frequency (%)		Crude odds (CI 95%)	p-value	AOR (CI 95%)	p-value
	Case	Control				
School syllabus on sex education						
Yes	71 (55.5)	57 (44.5)	1	-	1	-
No	30 (33.0)	61 (67.0)	2.53 (1.45-4.43)*	0.001	5.32 (2.20-12.87)**	<0.001
Easy and comfortable for discussing issues on sex with your family and friends						
Yes	43(45.7)	51 (54.3)	1	-	1	-
No	114 (57.9)	83 (42.1)	0.61 (0.37-1.01)*	0.05	0.38 (0.16-0.89)**	0.03

which may lead to adolescent pregnancy. To support this view further, a study affirmed that White adolescents' sexual activity were greatly influenced by sexual content in music, magazines and television which also prone them to engaging in early sexual activities. Black adolescents, on the other hand, were influenced by the perception of their parents' expectations and sexual behaviors of their peers rather than what they see and hear through the mass media [27]. Watching sex on television has also been found to hasten or increase the likelihood for adolescents to initiate sexual activities which also result in adolescent pregnancy [9].

Data on knowledge and use of contraceptives as a risk factor of adolescent pregnancy shows that 110 (54.2%) of cases had heard of any method that can be used to prevent pregnancy as compared to 93 (45.8%) of controls who had heard even though there is no statistically significant difference between the cases and the controls ($\chi^2=0.02$; $p=1.00$). However, most adolescents would have preferred getting information or talking to health professionals in person for sexual education, searching for information on reproductive health or sexual health on the internet is their only option in obtaining such information [8].

Similarly, data on pill indicates that there is statistically significant difference when it comes to hearing and usage of it respectively ($\chi^2=14.85$; $p=0.001$) ($\chi^2=20.58$; $p<0.001$); implants use ($\chi^2=6.55$;

$p=0.02$), condom use ($\chi^2=15.95$; $p<0.001$), and periodic abstinence/rhythm ($\chi^2=4.83$; $p=0.03$). In affirming these facts, between the ages of 12 and 19 years in Ghana, Burkina Faso, Malawi and Uganda, 43-65% of female adolescents and 50-65% male adolescents were found to have used contraceptives before [13].

When it comes to peer influence and sexual behaviour on adolescent pregnancy, among the case group 97 (72.9%) of the adolescents were initiated into sex by their friends whilst 36 (27.1%) in the control group were initiated by their friends ($\chi^2=9.16$; $p=0.03$). Since peer pressure has also been found to be a causal factor for premarital sexual activity in sub-Saharan Africa, this is confirmed by a study in Ghana that documented that adolescents were influenced by their peers to indulge in unsafe sexual behaviours, though they might not be ready for that [28]. In view of this sex education is an important component in the development of the adolescent.

Data from this study shows that 108 (75.0%) of adolescent case group had their source of information on sexual and reproductive health from their peers as against 36 (25.0%) of the control group who also received sexual information from their peers ($\chi^2=81.66$; $p<0.001$). However, 30 (33.0%) of the case group claimed that school syllabus does not include sex education ($\chi^2=10.84$; $p=0.001$). This is reinforced by a study in the

Upper Denkyira West District in Ghana that pointed that about 83% of the respondents agreed to the assertion that lack of sex education results in adolescent pregnancy [4]. Nonetheless, 114 (57.9%) of the adolescent mothers of this study said it would not be easy and comfortable for them to discuss issues on sex with their family and friends. This is in confirmation to a report that indicated that most parents find it difficult to talk about sex with their adolescents. Likewise the parents, adolescents find it uncomfortable and difficult to discuss matters concerning sex with their parents (Baku et al., 2018). Even in homes where parents are able to discuss issues of sex with their adolescents, mostly the content is limited, infrequent and mostly between the mother and the daughter after the adolescent has already initiated sex [12].

On the issue of family related factors on adolescent pregnancy, cross tabulation from this study depicts that 32 (58.2%) of the case group and 23 (41.8%) of the control group had both parents not alive, though there is no statistically significant difference between the case and the control groups ($\chi^2=0.49$; $p=0.55$). This point was sustained by female adolescents from poor families had 2.7 times the odds of being engaged in premarital sex which mostly lead to adolescent pregnancy compared to those from rich families (Boamah et al., 2014) as a result of father's death, divorce, family conflicts and/or poverty. One could conclude that dysfunctional family relations could have a negative impact on the development of the adolescent.

When it comes to challenges facing pregnant adolescents, data for this study suggests that 92 (58.6%) of parents/guardians of these adolescent mothers were disappointed upon noticing their ward's pregnancy, and 64 (40.8%) of the teenage mothers' partners denied responsibility. To reiterate these facts, as found in a study, 82.8% of those respondents cited pregnancy as affecting their academic performances, whilst 94% of that study's respondents had no intentions of going back to school after delivery [19]. Due to lack of social support systems coupled with low socioeconomic status of the adolescent pregnant

mother [20]. This means that teenagers who get pregnant face a lot of social challenges.

For support systems available for adolescent mothers, this study reported that 42 (26.8%) of the teenage mothers did not have any support systems. For those who had support system, more than half of the percentage (53.4%) received financial support. Since social support is an important component of the emotional and physical well-being of mothers after childbirth (Negron et al., 2013), paternal presence and financial support has been found to reduce stress for the teenage mother (Huang et al., 2014), leading to higher levels of teenage life satisfaction and positive parenting skills when teenage mothers have a close relationships, especially with their mothers [29].

Nonetheless, lack of social and economic support for the teenage mother may pose a greater risk than even the pregnancy itself [5]. And those women with low interpersonal support were six times more likely to have low resilience [23]. In sharp contrast to this assertion, personal resources for teenage mothers in terms of support and motivation decrease the risk of having another pregnancy and that support from members of the family is a positive factor in furthering the career development of adolescents [24].

Limitations

Considering the personal and sensitive nature of teen pregnancies and experiences in a Muslim dominated environment, the study acknowledges that there may be some underreporting and misinformation by the respondents, especially the case group.

Conclusion

Despite strong religious affiliation, there exists teenage pregnancy in the Tamale Metropolis as a result of consensual sex. Most adolescents have knowledge on and are using, at least, one form contraceptives. However, majority do not receive any support from their parents/guardians and/or are even rejected by their supposedly loved ones who got them pregnant.

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