Factors Associated with Reporting a History of Induced Abortion among Adolescent Girls in Ghana during 2012-2017

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Authors' contributions

This work was carried out in collaboration between both authors. Authors DA and MB designed the study, performed the statistical analysis. Author DA wrote the first draft of the manuscript. Author MB reviewed the first draft of the manuscript. Both authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Aims: Adolescent girls are misinformed about safe sex, contraception, and lack access to modern contraceptive methods to prevent unwanted pregnancies and unsafe abortions. This study sought to explore the factors associated with reporting a history of abortion among sexually active adolescent girls in Ghana during 2012-2017.
Study design: A cross-sectional study
Place and duration of study: This study was conducted in Ghana in April, 2020
Methodology: We analyzed a nationally representative sample of 1,902 sexually active adolescent girls aged 15-19 years. The study relied on secondary data from the 2017 Ghana Maternal Health Survey. The Chi-square (χ^2) test and survey multivariable logistic regression were performed to determine the association between selected demographic and reproductive characteristics of the adolescents and reporting a history of abortion during 2012-2017.

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Results: Of the 1,902 adolescent girls, 146 (7.68%; 95% CI: 6.19-9.53) reported a history of abortion over the study period. The findings also showed that 70.5% of the abortions were unsafely performed. The current use of contraception among the sample was low (26.6%). In multivariable analysis, the odds of reporting a history of abortion significantly decreased with an increase in the age at first sexual intercourse (AOR=0.79; 95% CI: 0.68-0.91), but significantly increased with being a Christian (AOR=4.57; 95% CI: 1.76-11.90) and knowing the ovulation period (AOR=2.24; 95% CI: 1.09-4.63).

Conclusion: Reporting a history of abortion among adolescent girls in Ghana was relatively low. However, more than two-thirds of these abortions were unsafely performed. The early provision of information on sexuality, provision of adolescent-friendly reproductive health services, as well as access to safe abortion services, may reduce unwanted pregnancies and unsafe abortions among adolescent girls in Ghana.

Keywords: Teenage; sexuality; pregnancy; reproduction; contraceptive.

ABBREVIATIONS

AOR	:	*Adjusted odds ratio,*
CI	:	*Confidence interval,*
DHS	:	*Demographic and Health Survey,*
GMHS	:	*Ghana Maternal Health Survey,*
GSS	:	*Ghana Statistical Service,*
IRB	:	*Institutional Review Board,*
OR	:	*Odds ratio,*
PHC	:	*Population and Housing Census,*
SD	:	*Standard deviation,*
SDGs	:	*Sustainable Development Goals,*
WHO	:	*World Health Organization*

1. INTRODUCTION

Globally, an estimated 55.7 million abortions occur annually [1]. Women induce abortion for obvious reasons, although the frequently mentioned reasons for abortion are poor socioeconomic conditions and birth control [2]. Unplanned or mistimed pregnancies have also been associated with abortion among reproductive women [3–5]. Abortion may not be a public health problem per se, but when it is unsafely carried out, complications may develop, which sometimes result in mortality. The World Health Organization (WHO) defines unsafe abortion as an unwanted pregnancy which is terminated by a person without the prerequisite skills or a procedure being undertaken in an environment that does not satisfy the minimum medical standards or both [6]. Nearly half of abortions occurring worldwide are unsafe. The percentage of unsafe abortions is significantly higher in low-income and middle-income countries compared to high-income countries [1]. In Ghana, it has been estimated that about 26.0% of the 141,316 illegally induced abortions in 2017 resulted in complications requiring post-abortion care in health facilities [7].

The period of adolescence (10-19 years) is marked by rapid physical, social, cognitive, emotional, as well as sexual development [8,9]. Unwanted pregnancies are common among adolescent girls because, firstly, they are unable to negotiate safe sex and are most often than not victims of sexual coercion [10,11]. Secondly, adolescent girls are misinformed about safe sex, family planning, and lack access to modern contraceptive methods [12–14]. Notwithstanding, abortions among adolescent girls may result from the undesirable implications unwanted pregnancy brings along with it, such as the risk of being expelled from school, the potential health hazards, and the circumstances that led to the pregnancy [8,15,16].

In Ghana, the law on abortion is fairly liberal. The criminal code on abortion was amended in 1985 legalizing abortion if it was "caused by a medical practitioner specializing in gynaecology or other registered practitioner in a government hospital or registered private hospital or clinic when the pregnancy is the result of rape, defilement of a female idiot or incest; when continuation of the pregnancy would involve risk to the life of the pregnant woman or injury to her physical or mental health; or where there is substantial risk that if the pregnancy were carried to term the child would suffer from or later develop a serious physical abnormality or disease" [17,18]. Unfortunately, awareness about abortion legislation in Ghana is low. Data from a recent nationwide study hinted that only 11.0% of Ghanaian women are aware that abortion in Ghana is legal under certain circumstances [19]. We recognize that data on abortion behaviour are underreported due to the stigma associated with abortion in Ghana and other places [20]. However, a small study among adolescent girls in Ghana found that 87.0% of the abortions

among those with abortion experiences, were unsafely performed [21]. Unsafe abortions among adolescent girls in Ghana are influenced by the social stigma on premarital sex and abortion, having a child out of wedlock, and the negative attitude of some healthcare providers [11,18,22,23]. More generally, safe abortion services in Ghana are limited owing to the limited number of legal facilities and providers of safe abortion services [7,24]. Consequently, complications from unsafe abortions account for a large number of hospital admissions in hospitals in Ghana, and a large contributor to maternal mortality [25,26].

The characteristics of adolescents reporting a history of abortion in Ghana are not well known. Previous studies have explored the socio-demographic and obstetric profiles of women aged 15-49 years in Ghana who reported a history of abortion [17,27–31]. However, these studies are limited in the sense that their scope is affected by the use of specific regions and women of the reproductive age group in general. It is undeniable that adolescents share many characteristics with older women. Nevertheless, their health needs, challenges, and health-seeking behaviour differ in some significant respects [32,33]. Moreover, it has been widely recognized that inequalities exist in access to reproductive health services by age and adolescents are the least favoured [34].

This study addresses the gaps in the literature by using nationally representative data from the recent 2017 Ghana Maternal Health Survey (GMHS) to examine the factors associated with reporting a history of abortion among adolescent girls in Ghana. The 2017 GMHS collected information that allowed for assessment at the national and regional levels, as well as for rural and urban areas.

2. MATERIALS AND METHODS

This cross-sectional study analyzed secondary data from the 2017 GMHS. Detailed information on the procedures, as well as the questionnaires used for the 2017 GMHS can be found in the final report [19]. However, briefly, the Ghana Statistical Service (GSS) implemented the survey with assistance from ICF international through the Demographic and Health Survey (DHS) program. The survey was conducted among women aged 15-49 years using a sampling frame from the 2010 Population and Housing Census (PHC) conducted in Ghana. A stratified cluster sampling methodology was used in the selection of enumeration areas and households. The survey selected 27,001 households of which 26,500 were occupied at the time of the data collection. Furthermore, 25,304 women were identified in households for individual interviews. However, 25,062 completed the interviews giving a response rate of 99.0%.

The primary aim of this study was to explore the factors associated with reporting a history of abortion among adolescent girls in Ghana. Therefore, the sample for analysis was restricted to the subgroup of women aged 15-19 years. In the 2017 GMHS, adolescents aged 15-19 years formed about 20.0% (4,909) of the total sample. Our interest was on the most recent history of abortion among lifetime abortions, which is abortions that occurred during 2012-2017. The Individual recode, household recode, and births recode datasets were merged to provide more information on the participants, including their abortion behaviour during 2012-2017. Of the 4,909 adolescents in the GMHS dataset, 3,046 (62.0%) reported that they had never had sexual intercourse. Therefore, a total of 1,863 (38.0%) adolescent girls who were sexually experienced at the time of the survey were included in this analysis (weighted n=1,902). We used data on only sexually experienced adolescents because it is through sexual intercourse that pregnancies occur, which may result in abortion if unwanted.

2.1 Variables and Their Definitions

The dependent variable in this study was a history of abortion. All the respondents who reported a history of abortion during 2012-2017 were coded as "1" for a history of abortion; otherwise, "0". The safety of abortions was determined using the WHO definition [6]. Thus, in the present study, we defined the safety of an abortion by the method, provider, and location. A safe abortion method was limited to the use of vacuum aspiration, misoprostol, a combination of misoprostol and mifepristone, dilation and curettage, or dilatation and evacuation. A safe medical provider included a doctor or a nurse/midwife. Lastly, a medically safe location included a public government hospital, public government health centre/clinic, private hospital/clinic, private family planning/Planned Parenthood Association of Ghana (PPAG) clinic and private maternity.

Some demographic and reproductive profiles of the participants were selected as explanatory

factors for this analysis. It is worth mentioning, however, that not all the variables with a known association with abortion experience could be explored, the main reason being lack of, or inadequate data, for the adolescents in general or those with a history of abortion. Besides, the GMHS was not specifically designed for the present study. As a result, not all the relevant information on abortion among adolescents, suited for this analysis could be obtained. We acknowledge these as inherent notable limitations associated with using secondary datasets for analyses [35,36]. We also recategorized variables to have enough sample size for analysis where necessary by collapsing the existing categories in the datasets.

We included the self-reported age (in years) at first sexual intercourse, the highest level of education attained, marital status, ecological zone of residence, including northern, middle and coastal zones, place of residence (rural or urban), household wealth group, religious affiliation, exposure to media, delivery experience, knowledge about abortion legislation in Ghana, knowledge about the ovulation period, current use of contraceptive, and knowledge about a contraceptive source. The household wealth group was constructed from data on household assets and resource variables according to principal component analysis [37]. The ecological zone of residence was categorized from the 10 administrative regions in Ghana into the northern zone, including Northern, Upper East, and Upper West Regions; middle zone, including Eastern, Ashanti, and Brong Ahafo Regions; and coastal zone, including Western, Central, Volta, and Greater Accra Regions. Religion in Ghana reportedly influences perceptions of abortion care and behaviour [38]. In addition, we noted that only 2 adolescents among the African traditional religious group had a history of abortion. Therefore, since Christianity is the dominant religion in Ghana, we grouped the study participants into Christians and others on religious affiliation; where others comprised the Moslem and African traditional religious groups.

2.2 Statistical Analysis

All the statistical analyses were conducted in STATA/SE 13.0 for Windows (StataCorp LP, College Station, Texas 77845 USA). The survey design used by the DHS program is complex and should be accounted for in statistical analyses involving the use of the datasets, to produce representative estimates [39]. Therefore, our analyses were conducted using sampling weights to account for the sampling procedures used by the DHS program in the GMHS. The "svy:" command prefix was used before each command to estimate the means, proportions, and odds ratio.

The Chi-square (χ^2) test was used for the bivariate analysis of the association between the demographic and reproductive profiles of the adolescents, and the history of abortion. The t-test was used to assess differences in continuous variables. All the explanatory variables were fitted simultaneously in a multivariable logistic regression model to examine their independent association with reporting a history of abortion. A $p < 0.05$ was considered statistically significant in two-tailed analyses. The odds ratio (OR) and the corresponding 95% confidence intervals were estimated. The model fitness was assessed using the "svylogitgof" command developed for survey data by Archer and his colleague [40].

3. RESULTS

3.1 Socio-demographic Characteristics of the Adolescent Girls in this Study

The mean age of the adolescents was 17.5 (±1.2) years. The mean age at first sexual intercourse was 15.4 (±1.7) years. Of the 1,902 adolescent girls, the majority attained basic level education (72.0%), resided in rural settings (55.4%), were Christians (83.8%), had media exposure (54.7%), and had no delivery experience (70.1%). We found that 91.1% of adolescents did not know about the legalization of abortion in Ghana. Also, of the 1,560 adolescents who reported that they knew the ovulation period, only 35.3% were able to tell the period in the menstrual cycle when ovulation occurred. Lastly, the results showed that 26.2% (460/1,294) of the adolescents reported currently using any form of contraception, although knowledge of contraceptive source was high (73.4%) (Table 1).

3.2 Abortion-related Characteristics of the Adolescent Girls in this Study

Of the 1902 adolescents, 146 (7.7%; 95% CI: 6.2-9.5) reported a history of abortion during 2012-2017. We noted that the reasons for abortion were varied, including wanted to continue schooling (27.4%), too young to have a

child (19.9%), not ready to be a mother (13.7%), afraid of parents (8.9%), and parents insisted (7.5%). Overall, using the WHO definition of unsafe abortion, 70.5% (n=103) of the 146 abortions were unsafely performed, 30.1% by an unsafe method, 62.3% by an unsafe provider, and 63.7% in an unsafe location. Finally, 11.6% of the sample were on contraception at the time of the recent pregnancy which resulted in abortion (Table 2).

Table 1. Socio-demographic characteristics of adolescent girls in this study (N=1902 unless indicated)

Variable	Frequency	Percentage
Mean age of the adolescents; mean (SD)	17.5(1.2)	
Mean age at first sexual intercourse; mean (SD)	15.4(1.7)	
Education		
No education	92	4.8
Basic education	1369	72.0
Secondary or higher	441	23.2
Marital status		
In a union	405	21.3
Not in a union	1497	78.7
Ecological zone of residence		
Northern	247	13.0
Middle	824	43.3
Coastal	831	43.7
Place of residence		
Urban	848	44.6
Rural	1054	55.4
Household wealth group		
Poor	878	46.2
Middle	474	24.9
Rich	550	28.9
Religious affiliation		
Others*	309	16.2
Christian	1593	83.8
Exposure to media		
No	1040	54.7
Yes	862	45.3
Delivery experience		
No	1334	70.1
Yes	568	29.9
Knowledge of abortion legislation (N=1811)		
No	1649	91.1
Yes	162	8.9
Knowledge of ovulation period (Self-reported knowledge)		
No	150	7.9
Yes	1560	82.0
Don't know	192	10.1
Knowledge of ovulation period (actual knowledge[1]) (N=1560)		
No	1009	64.7
Yes	551	35.3
Current use of contraceptive (N=1754)		
No	1294	73.8
Yes	460	26.2
Knowledge of contraceptive source (N=1569)		
No	418	26.6
Yes	1151	73.4

Others; Moslem and African traditional; SD: standard deviation

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[1] Respondent was able to tell the ovulation period

3.3 Factors Associated with Reporting a History of Abortion among Adolescent Girls in Ghana during 2012-2017 in univariate analyses

In the bivariate analyses, the average age at which first sexual intercourse occurred was found to be lower among adolescent girls who reported a history of abortion compared to adolescents without abortion experience (*P*<0.001). Also, 8.3% (133) of Christian adolescents were more likely to report a history of abortion compared to 4.2% (13) of non-Christians (*P*=.001). Finally, compared to adolescents who were not on contraception at the time of the survey, adolescents who reported being on contraception were more likely to have reported a history of abortion (*P*<0.001) (Table 3).

3.4 Factors Associated with Reporting a History of Abortion among Adolescent Girls in Ghana during 2012-2017 in Adjusted Analysis

The results of the multivariable survey logistic regression analysis showed that comparatively, the odds of reporting a history of abortion was decreased with increasing age at first sexual intercourse (AOR=0.79; 95% CI: 0.68-0.91). By contrast, the odds were increased with being a Christian (AOR=4.57; 95% CI: 1.76-11.90), and knowing the ovulation period (AOR=2.24; 95% CI: 1.09-4.63).

4. DISCUSSION

This study sought to examine the factors associated with a history of abortion among Ghanaian adolescent girls during 2012-2017. Estimates on abortion incidence are usually conservative because abortion-related information is often limited by underreporting. Nevertheless, our findings showed that about 8.0% of adolescent girls in Ghana had a history of abortion during the study period, which was higher than the 5.0% previously reported from an analysis of data from 4 administrative regions in Ghana [17]. The incidence of abortion among adolescents in Ghana is lower than the incidence reported from hospital-based studies from Tanzania (55.0-60.0%) [14,41] and Uganda (15.0%) [42]. Comparatively, population-based surveys are better suited for determining abortion incidence than hospital-based studies, which are usually less representative of the general population. Therefore, we attribute the

differences in findings to differences in the study participants and study designs. Besides, sexual activity among adolescent girls in Ghana was low [43]. So we also believe that Ghanaian adolescents had fewer unplanned pregnancies, which require resolution by abortion.

We also found that although the proportion of adolescent girls with a history of abortion in our sample was relatively low, more than two-thirds (70.5%) of the abortions were unsafely performed. The study by Bain et al. among 30 adolescent girls in Jamestown, Accra identified that 13 (87.0%) of the 15 abortions in their sample were unsafely performed [21]. Adolescent girls were more likely than adult women to delay seeking an abortion, use unskilled providers and more dangerous abortion methods, and more likely to experience complications from abortion due to the challenges they face in seeking reproductive health services [44–46]. In fact, studies have shown that complications from unsafe abortion were greater for adolescent girls than for older women [47,48]. Widespread access to safe abortion services by adolescents in Ghana may contribute to reducing unsafe abortion and its associated complications. One finding worth mentioning is the distribution of unsafe abortions. The results showed that adolescents were more likely to use unsafe providers and locations, but less likely to use unsafe methods, which we attribute to the use of self-administered medical abortifacients [49].

The study found that the age at first sexual intercourse was independently associated with reporting a history of abortion; the odds of reporting a history of abortion was reduced with an increase in the age at which first sexual debut occurred, which is broadly in congruence with the findings from other studies [50,51]. The early age at first sexual intercourse was associated with a risky sexual life, including engaging in unprotected sex, keeping multiple sexual partners, more frequent sexual intercourse, and early pregnancies [43,52]. Data from the 2014 Ghana demographic and health survey show that, although 14 % of adolescents have begun childbearing, about 2% are married by age 15 [53]. The reasons leading to first sexual intercourse among adolescents in Ghana are varied and include pressure from peers, personal satisfaction, financial benefits, and sexual coercion [54]. However, the period of adolescence is marked with a lack of knowledge on the prevention of unwanted pregnancies and

misperceptions regarding the risk of pregnancy, which increases their risks of unwanted pregnancies at first sexual intercourse [12,55]. Consequently, adolescents use abortion to meet their reproductive and life goals, avoid early motherhood, and continue their education. However, the poor access to safe abortion services, negative attitude of some health care providers towards young girls seeking safe abortion services, and high cost of safe abortion services may have compelled most of them into seeking unsafe abortion services [20,56].

Our findings on the association between the Christian religion and reporting a history of abortion are broadly aligned with findings from previous studies [17,57]. In Ghana, Christians were less likely to justify abortion compared with Moslems [38]. A study among Ghanaian health care providers showed that society frowned on abortions, and stigmatized those who sought abortion services as well as the providers of these services [56]. In the same study, some providers were reluctant to provide abortion (Table 4).

services due to religious beliefs, but they were more willing to refer women to other health facilities for comprehensive abortion care services. At the same time, religion played a major role in promoting unsafe abortion practices among adolescents in Ghana. The Catholic doctrine, for instance, prohibits premarital sex. Sex before marriage is perceived by religious leaders as being against biblical teachings. Christian girls in our sample who got pregnant before marriage may have decided to abort the pregnancy to avoid shame to their family if the pregnancy became known to the public. The abortion may even be carried out secretly using unsafe methods or providers to avoid disclosure. The use of dangerous methods to terminate pregnancies, such as administering un-prescribed drugs, use of herbal mixtures to drink or as an enema, ground-up bottles mixed with Guinness beer, or the insertion of cassava sticks or herbs in the vagina are common among adolescent girls in Ghana who want to secretly perform abortion [58].

Table 2. Abortion-related characteristics of adolescent girls in this study (N=146 unless indicated)

Variable	Frequency	Percentage
Lifetime history of abortion (N=1902)		
No	1745	91.7
Yes	157	8.3
Abortion during 2012-2017 (N=1902)		
No	1756	92.3
Yes	146	7.7
The main reason for recent abortion **		
Wanted to continue schooling	40	27.4
Too young to have a child	29	19.9
Not ready to be a mother	20	13.7
Afraid of parents	13	8.9
Parents insisted	11	7.5
Safety of recent abortion (according to the WHO definition)		
Safe	43	29.5
Unsafe	103	70.5
Safety of provider used for recent abortion		
Safe	55	37.7
Unsafe	91	62.3
Safety of method used for recent abortion		
Safe	102	69.9
Unsafe	44	30.1
Safety of location used for recent abortion		
Safe	53	36.3
Unsafe	93	63.7
Contraceptive use at the time of pregnancy		
Yes	17	11.6
No	129	88.4

**Only the top 5 reasons out of 16 reasons mentioned have been listed; therefore, the column total (%) will not be equal to 100%

Table 3. Chi-square test of factors associated with a history of abortion among adolescent girls in Ghana during 2012-2017 (N=1902 unless indicated)

Variable	N	History of abortion		*P*-value
		No (N=1756) n (%)	Yes (N=146) n (%)	
Age at first sex, mean (SD)	1902	15.5(1.7)	14.6(1.4)	<0.001
Educational attainment				.107
No education	92	88(95.7)	4(4.3)	
Basic education	1369	1252(91.5)	117(8.5)	
Secondary or higher	441	416(94.3)	25(5.7)	
Marital status				.267
In a union	405	367(90.6)	38(9.4)	
Not in a union	1497	1389(92.8)	108(7.2)	
Ecological zone of residence				.055
Northern	247	237(96.0)	10(4.0)	
Middle	824	747(90.7)	77(9.3)	
Coastal	831	772(92.9)	59(7.1)	
Place of residence				.326
Urban	848	775(91.4)	73(8.6)	
Rural	1054	981(93.1)	73(6.9)	
Household wealth group				.420
Poor	878	821(93.5)	57(6.5)	
Middle	474	431(90.9)	43(9.1)	
Rich	550	504(91.6)	46(8.4)	
Religious affiliation				.001
Others*	309	296(95.8)	13(4.2)	
Christian	1593	1460(91.7)	133(8.3)	
Exposure to media				.257
No	1040	968(93.1)	72(6.9)	
Yes	862	787(91.3)	75(8.7)	
Delivery experience				.506
No	1334	1237(92.7)	97(7.3)	
Yes	568	519(91.4)	49(8.6)	
Knowledge of abortion legislation (N=1811)				.681
No	1649	1518(92.1)	131(7.9)	
Yes	162	147(90.7)	15(9.3)	
Knowledge of the ovulation period (N=1560)				.118
No	1009	937(92.9)	72(7.1)	
Yes	551	495(89.8)	56(10.2)	
Current use of contraceptive (N=1754)				<0.001
No	1294	1220(94.3)	74(5.7)	
Yes	460	394(85.7)	66(14.3)	
Knowledge of contraceptive source (N=1569)				.545
No	418	398(95.2)	20(4.8)	
Yes	1151	1081(93.9)	70(6.1)	

Others; Moslem and African traditional; SD: standard deviation

An interesting finding was that adolescents who knew the stage in the menstrual cycle when ovulation occurred were more likely than those who did not know to report a history of abortion. Although the exact reasons for this relationship are not clearly understood, we postulate that the lack of autonomy to negotiate safe sex, misperceptions regarding the risk of pregnancy, and concerns about the side effects of using modern contraceptive may, in part, offer plausible explanations to the observed relationship [14,54,59,60]. For instance, there is

evidence that adolescent girls are coerced, threatened or sometimes forced not to use a contraceptive, especially when sex is exchanged for money or material gains, thereby exposing them to unplanned pregnancies [14,59]. Typically, the use of a condom, which is widely accessible, during sex was limited by association with decreased sexual pleasure, together with greater partner control when sexual intercourse is with older men [14,54,59]. Although, the present study could not ascertain when the knowledge about the ovulation period was acquired, the low knowledge of the ovulation period in our sample may suggest that limited information on mensuration and sexuality was given to adolescent girls, which may not have included information on the fertile period.

Table 4. Factors associated with reporting a history of abortion among adolescent girls in Ghana during 2012-2017 in adjusted analysis (N=1102)

Variable	AOR(95% CI)	*P*-value
Age at first sexual intercourse	0.79(0.68-0.91)	.001
Education		
No formal education	Reference	
Basic education	1.89(0.52-6.86)	.335
Secondary or higher	1.65(0.36-7.46)	.518
Marital status		
In a union	Reference	
Not in a union	0.54(0.21-1.38)	.198
Ecological zone of residence		
Northern	Reference	
Middle	1.43(0.63-3.21)	.391
Coastal	1.09(0.44-2.71)	.850
Place of residence		
Urban	***	
Rural	***	
Household wealth group		
Poor	Reference	
Middle	1.26(0.53-3.03)	.597
Rich	0.81(0.32-2.04)	.650
Religious affiliation		
Others*	Reference	
Christian	4.57(1.76-11.90)	.002
Exposure to media		
No	Reference	
Yes	1.39(0.77-2.52)	.275
Delivery experience		
No	Reference	
Yes	0.43(0.15-1.18)	.100
Knowledge of abortion legislation		
No	Reference	
Yes	1.11(0.41-3.03)	.835
Knowledge of the ovulation period		
No	Reference	
Yes	2.24(1.09-4.63)	.029
Current use of contraceptive		
No	Reference	
Yes	0.98(0.35-2.77)	.972
Knowledge of contraceptive source		
No	Reference	
Yes	1.65(0.67-4.06)	.277

*F-adjusted test statistic= F (9,548) =0.657; Prob>F=0.748; *Others; Moslem and African traditional; *** No data from the multivariable analysis; CI: confidence interval*

Our findings are limited in terms of drawing causal linkages due to the cross-sectional nature of the design. In addition, information was collected retrospectively over five years and may, therefore, be affected by recall bias. However, we limited the recall to the most recent abortion experience to minimize recall bias. More broadly, abortion information is underreported due to the clandestine way abortions are performed and the stigma associated with abortion seeking in Ghana. As a result, we believe that our estimate on the incidence of abortion among adolescent girls may be conservative.

5. CONCLUSION

This study explored the factors associated with reporting a history of abortion among adolescent girls in Ghana during 2012-2017. We found that approximately 8.0% of adolescent girls reported an abortion experience during the entire study period of which more than two-thirds were unsafely performed. In addition, we noted low use of contraception among adolescent girls. Independently, the odds of reporting a history of abortion was decreased with an increase in the age at first sexual intercourse but increased with being a Christian and having knowledge about the ovulation period. The prevention of unwanted pregnancies among adolescent girls by providing reliable information on sexuality, ensuring adolescent-friendly reproductive health services, and access to safe abortion services by adolescents may help to reduce unwanted pregnancies and unsafe abortions in this susceptible group.

CONSENT

Not applicable

ETHICAL APPROVAL

Ethical approval was not needed for this study because it involved a secondary analysis of data without personal identifiers to respondents or their households. However, the protocol for the 2017 GMHS was approved by the ICF Institutional Review Board (IRB). Details about the ethics of the DHS program can be obtained online (www.dhsprogram.com). Notwithstanding, permission was obtained from ICF International to use the datasets for the present study. The terms of use of the datasets were observed accordingly. The study did not also require informed consent.

AVAILABILITY OF DATA AND MATERIALS

The datasets used for the analysis in this study are publicly available online at the DHS program website (www.dhsprogram.com). The authors do not have the right to share the datasets without approval from the DHS program.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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