Original Research Article

Is there a relationship between repeat-induced abortion and current use of contraception among women in the reproductive age? A study in Ghana

ABSTRACT

Aims: Women in the developing world use abortion to regulate fertility and space childbearing. However, repeat-induced abortion has become common and it's linked to increased risk of adverse outcomes in future pregnancies. The aim of this study was to determine the relationship between repeat induced abortion and current use of contraception among women in Ghana.

Study design: A secondary analysis of cross-sectional survey data.

Place and Duration of Study: The study was conducted in Ghana between July 2019 and August 2019.

Methodology: Data on a weighted sample of 4595 women aged 15-49 years with a lifetime history of induced abortion from the 2017 Ghana Maternal Health Survey were analysed using Chi-square test and multivariable survey logistic regression in STATA/IC 15.0. Statistical significance was set at the 5% level. The adjusted odds ratio were estimated.

Results: Out of 4595 women, 1591 (34.6%) experienced repeat-induced abortion. Current use of contraception was 36.7% (CI: 34.7-38.7). The majority used modern contraceptives (78%). The commonly used methods were injectables (20.3%), implants (19.7%), pills (16.6%) and rhythm (16.2%). After adjusting for potential confounding, repeat induced abortion was not significantly associated with current use of contraception. However, age, marital status, place of residence and ecological zone of residence were associated with current use of contraception. For instance, rural women with a history of repeat induced abortion were 1.3 times (AOR=1.27, 95% CI: 1.02-1.59, p=0.036) more likely to be on contraception compared to urban women.

Conclusion: Repeat-induced abortion was not associated with current use of contraception. Other factors were significantly associated with women's use of contraception post-abortion. Further research is recommended to clearly understand this phenomenon among Ghanaian women.

Keywords: Associated; contraception; reproductive; women; induced abortion; Ghana

1. INTRODUCTION

Induced abortion is a common practice among women. Globally, an estimated 55.7 million induced abortions occurred annually between 2010-14 [1]. Abortion rates have declined significantly in developed countries but not in developing countries [2]. The women who induce abortion in low and middle-income countries are highly educated, wealthier and live in urban areas [3]. Furthermore, the reasons why women induce abortion are known [4]. However, abortion contributes significantly to

maternal mortality in many countries worldwide. In Ghana, 15-30% of maternal deaths result from abortion [5].

Women who induce abortion may not desire another unwanted pregnancy. Therefore, the use of contraception can be vital in preventing unwanted pregnancies and reducing maternal deaths in settings where abortion is common. In 2012, an estimated 33% of maternal deaths in sub-Saharan Africa (SSA) were averted due to contraception [6]. It is therefore not surprising that family planning (FP) is among the pillars of the Safe Motherhood Initiative to reduce maternal deaths in developing countries. Nevertheless, from the 2014 Ghana Demographic and Health Survey (GDHS), only 23% of Ghanaian women use any form of contraception and an additional 30% have an unmet need for contraception [7].

Furthermore, post-abortion care (PAC) is an integral part of the comprehensive abortion care (CAC) strategy in Ghana. It outlines how service providers should respond to the needs of women who miscarry or induce abortion [8]. The provision of sexual reproductive health services including FP counselling and access to contraceptives is a key component of PAC. Unfortunately, repeat-induced abortion is increasingly becoming a normal practice among Ghanaian women. From a recent national study, repeat induced abortion accounted for 33% of induced abortions in Ghana [9]. Women with a history of repeat-induced abortion have increased risk of ectopic pregnancy, foetal loss, low birth weight babies and preterm delivery in prospective pregnancies [10].

The determinants of contraceptive use by Ghanaian women in the reproductive age have been explored by previous studies and include, but not limited to maternal education, parity, marital status, desire for children and wealth [11–15]. However, none of these studies explored the association between repeat induced abortion and current use of contraception. In Angola, a positive association was reported between abortion history and current use of contraception [16]. Besides the differences in contraceptive prevalence and unmet need for family planning between Angola and Ghana [17], the said study combined women with a single history of abortion to women with multiple histories of abortion due to the rarity of the exposure in their sample. In addition, Marston & Cleland observed from their review of data from eleven countries that while the incidence of abortion declined with an increase in contraceptive use in some countries, the two indicators increased simultaneously in other countries. They concluded that induced abortion and contraceptive use are inversely related only when fertility itself is stabilized [18]. The relationship between repeat-induced abortion and current use of contraception in Ghana is therefore arguable.

The aim of this study was to determine the relationship between repeat-induced abortion and current use of contraception among women in the reproductive age (15-49 years) in Ghana. We expect more women with a history of induced abortion to use contraception to avoid future unwanted pregnancies that may also end in abortion.

2. MATERIAL AND METHODS

This study used data from the most recent Ghana Maternal Health Survey (GMHS). The 2017 GMHS was conducted by the Ghana Statistical Service (GSS) with support from the DHS program. The survey sample was designed to provide national, zonal and regional estimates of key reproductive health indicators. The survey included women aged 15-49 years who met the eligibility criteria. The sample was stratified and selected in two stages from an updated sampling frame used for the 2010 population and housing census in Ghana. In the first stage, clusters were selected using probability proportional to size. The second stage involved selecting households from each cluster. The stratification of regions into urban and rural areas was also taken into account. A total of 25,062 women out of 25,304 eligible women were interviewed. Additional information about the design of the 2017 GMHS including the questionnaires used can be found in the published report [19].

The exposure and outcome of interest in this study were repeat induced abortion and current use of contraception respectively. From the merged dataset, information on the current use of contraception was available for 3459 of the 3702 women with a lifetime history of induced abortion. Therefore, the analyses in this study involved 3459 (weighted n= 4595) women aged 15-49 years in Ghana.

2.1. Dependent variable

The dependent variable in this study was the current use of contraception. This was based on women's self-report of the current use of any form of contraceptives. The variable was dichotomized: women who identified as currently using any form of contraceptives were categorized as "Yes" for current use of contraception. Those who did not identify as currently using any method of contraceptives were categorized as "No" for current use of contraception. The outcome of interest—"Yes" for the current use of contraceptives was coded as "1" and "0" for "No".

2.2. Main independent variable

The main independent variable was repeat-induced abortion. The variable was constructed in binary form from the number of lifetime induced abortions reported by respondents. Women who reported a single episode of induced abortion in their lifetime were categorized as "No" for repeat induced abortion. Women who reported multiple episodes of induced abortions were categorized as "Yes" for repeat induced abortion.

2.3. Covariates

Respondent's age group, marital status, highest level of education attained, religion, place of residence (urban/rural), ecological zone of residence (northern, middle and coastal)[1], wealth quintile[2], media exposure (Yes or No)[3], knowledge about the fertile period (Yes or No)[4], knowledge about abortion legislation in Ghana[5] and knowledge about a source for family planning method were included as potential confounders.

2.4. Statistical analysis

Weighting and clustering were used to account for the disproportional sampling design used by the DHS program [20]. Pearson Chi-square (χ^2) test was used to compare differences in categorical variables in univariable analysis. Survey logistic regression model was used to estimate the association between the explanatory variables and the dependent variable at a 95% confidence level in multivariable analysis. All variables with a p-value ≤ 0.05 in the univariable analysis were fitted in an adjusted logistic regression model to control for potential confounding. Educational level was included in the adjusted model in spite of the non-significant relationship with the outcome in the univariable analysis. Its inclusion was based on its known association with the trend in current use of contraception in Ghana [15].

All analyses were carried out in STATA/IC 15.0 for Windows (StataCorp LLC, College Station, Texas USA). The adjusted odds ratio (AOR) with their corresponding confidence intervals (CIs) were estimated. Statistical significance was set at the 5% level. The goodness-of-fit of the adjusted regression model was tested using the Archer & Lemeshow goodness-of-fit test for survey data [21]. We failed to reject the null hypothesis (at the 5% level) underlying the model that it is a good fit.

[1] The northern zone comprised of Northern, Upper East and Upper West regions, the middle zone comprised of Eastern, Ashanti and Brong Ahafo regions, while the coastal zone included Western, Central, Volta and Greater Accra regions.

[2] The wealth quintiles in the GMHS were constructed from household asserts using principal component analysis (PCA).

[3] "Yes" for respondents who were involved in at least one of the following activities; read newspapers, listened to the radio, watched television or used the internet within the one week reference period in the GMHS, or "No" if otherwise.

[4] Women who responded that the fertile period was "halfway between two periods" were classified as 'Yes" for knowledge about the fertile period and "No" if otherwise.

[5] Women who responded that abortion is legal in Ghana were classified as "Yes" for knowledge about abortion legislation and "No" if contrary.

3. RESULTS AND DISCUSSION

3.1 RESULTS

3.1.1 Background characteristics of the women included in this study

As revealed in table 1, the mean age of the women was 33.3 ±8.4 years (range: 15-49), 67.1% were in a union (married/ cohabitating), 65.7% had basic level education, 90.7% were Christians and 66.5% resided in urban areas.

Table 1: Background characteristics of the women included in this study

Category/variable	Frequency	Percent
Demographic characteristics		
Age years (Mean:33.3, SD* :8.4)		
15-24	763	16.6
25-34	1766	38.4
35-49	2066	45.0
Marital status		
Single	1508	32.8
Married	1679	36.5
Cohabiting	1408	30.6
Highest level of education		
No formal education	490	10.7
Basic level	3021	65.7
Secondary or higher	1084	23.6
Religious affiliation		
Traditional	104	2.3
Christian	4166	90.7
Islam	325	7.1
Place of residence		
Urban	3056	66.5
Rural	1539	33.5
Ecological zone of residence		
Northern	99	2.2
Middle	2035	44.3
Coastal	2461	53.6
Wealth quintile		
Poorest	211	4.6
Poorer	726	15.8
Average	1028	22.4
Richer	1365	29.7
Richest	1265	27.5
Media Exposure		
Yes	2420	52.7
No	2175	47.3

*SD: standard deviation

3.1.2 Abortion and contraceptive-related characteristics of the women included in this study

Of the 4595 women, 34.6% had a history of repeat induced abortion, 36.7% (CI: 34.7-38.7) were currently using contraception, of which 78% were on modern contraceptives and 89.4% out of 3282

women knew a source for FP method (Table 2). The methods of contraception in order of frequency included injectables (342), implants (332), pills (280), rhythm (273) and so on (Figure 1).

Table 2: Abortion and contraceptive-related characteristics of the women included in this study

Category/variable	Frequency	Percent
Abortion History		
Number of lifetime abortions		
1	3004	65.4
2	1161	25.3
3	287	6.2
4 or more	143	3.1
Repeat induced abortion		
No	3004	65.4
Yes	1591	34.6
Knowledge about the fertile period (N=4190)		
Yes	2262	54.0
No	1928	46.0
Knowledge about abortion legislation		
Yes	507	11.0
No	4088	89.0
Contraceptives use/Knowledge		
Currently using contraceptives		
No	2909	63.3
Yes	1686	36.7
Modern contraceptives use (N=1686)		
No	371	22.0
Yes	1315	78.0
Knowledge about a source for family planning method (N=3282)		
Yes	2935	89.4
No	347	10.6

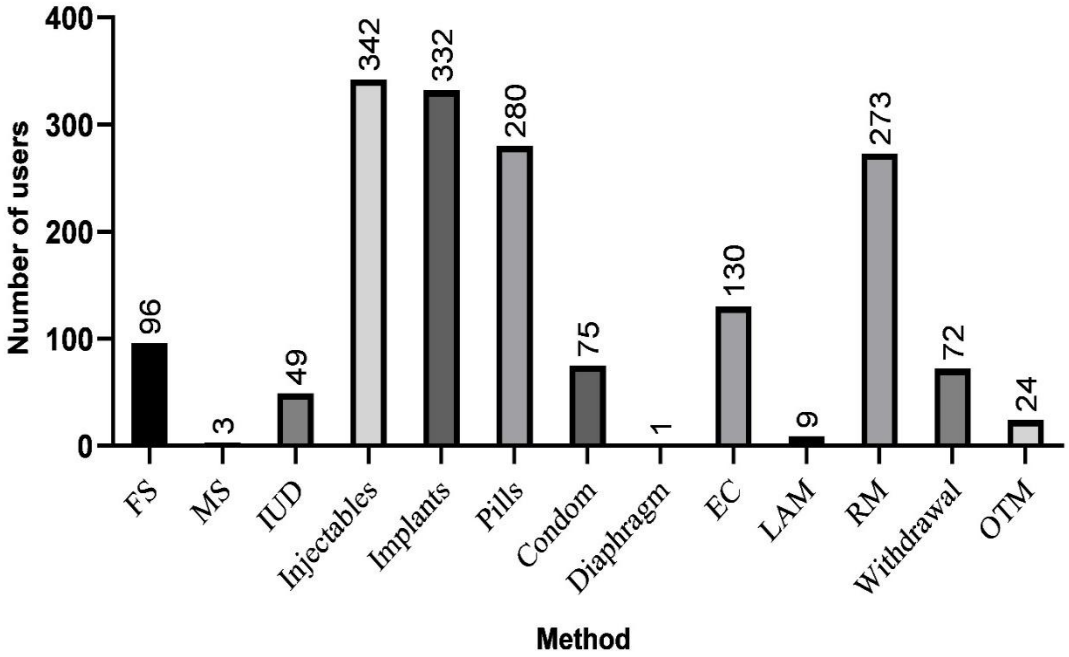

Figure 1: **Major contraceptives used by methods** (FS: female sterilization, MS: male sterilization, IUD: intrauterine device, EC: emergency contraception, LAM: lactational amenorrhea method, RM: rhythm method, OTM: other traditional methods)

3.1.3. Factors Associated with current use of contraception in univariable analysis

The univariable analysis showed significant disparities in the current use of contraception by repeat-induced abortion, age, marital status, place of residence, ecological zone, wealth quintile and knowledge about the fertile period. Comparatively, women with a previous history of abortion, older women (35-49 years), single women, urban women, women from the coastal zone, women in the richest wealth quintile, and women with knowledge about the fertile period were significantly less likely to be on contraception (Table 3).

Table 3: Factors Associated with current use of contraception in univariable analysis

Variable	n	Current use of contraception		*P-value*
		No	Yes	
Repeat induced abortion				.01
No	3004	1847(61.5)	1157(38.5)	
Yes	1591	1062(66.8)	529(33.2)	
Age				<.001
15-24	763	387(50.7)	376(49.3)	
25-34	1766	1049(59.4)	717(40.6)	
35-49	2066	1473(71.3)	593(28.7)	
Marital status				.002
Single	1508	1025(68.0)	483(32.0)	
Married	1679	1041(62.0)	638(38.0)	
Cohabiting	1408	843(59.9)	565(40.1)	
Highest level of education				.67

No formal education	490	310(63.3)	180(36.7)	
Basic level	3021	1894(62.7)	1127(37.3)	
Secondary or higher	1084	705(65.0)	379(35.0)	
Religious affiliation				.95
Traditional	104	67(64.4)	37(35.6)	
Christian	4166	2634(63.2)	1532(36.8)	
Islam	325	208(64.0)	117(36.0)	
Place of residence				<.001
Urban	3056	2033(66.5)	1023(33.5)	
Rural	1539	876(56.9)	663(43.1)	
Ecological zone of residence				<.001
Northern	99	59(59.6)	40(40.4)	
Middle	2035	1183(58.1)	852(41.9)	
Coastal	2461	1667(67.7)	794(32.3)	
Wealth quintile				.003
Poorest	211	126(59.7)	85(40.3)	
Poorer	726	426(58.7)	300(41.3)	
Average	1028	606(58.9)	422(41.1)	
Richer	1365	904(66.2)	461(33.8)	
Richest	1265	847(67.0)	418(33.0)	
Media Exposure				.29
Yes	2420	1542(63.7)	878(36.3)	
No	2175	1367(62.9)	808(37.1)	
Knowledge about the fertile period (N=4190)				.02
Yes	2262	1464(64.7)	798(35.3)	
No	1928	1146(59.4)	782(40.6)	
Knowledge about abortion legislation				.90
Yes	507	323(63.7)	184(36.3)	
No	4088	2586(63.3)	1502(36.7)	
Knowledge about a source for family planning method (N=3282)				.19
Yes	2935	2591(88.3)	344(11.7)	
No	347	318(91.6)	29(8.4)	

3.1.4. Factors associated with current use of contraception in multivariable analysis

After controlling for potential confounding, a history of repeat-induced abortion was not significantly associated with current use of contraception, although relatively, women with a history of repeat induced abortion were 12% (AOR=0.88, 95% CI: 0.73-1.06) less likely to be on contraception (Table 4). However, age, marital status, place of residence and ecological zone of residence were significantly associated with current use of contraception. Women in the age groups of 15-24 (AOR= 2.86, 95% CI: 2.18-3.77) and 25-34 (AOR=1.85, 95% CI: 1.54-2.23) were more likely than their counterparts in the age group of 35-49 to be on contraception albeit with a decreasing trend in use with increasing age. Also, women in a union: married (AOR=1.69, 95% CI: 1.36-2.10) or cohabiting (AOR=1.37, 95% CI: 1.10-1.71), had increased odds for current use of contraception relative to single women. Furthermore, rural women were about 1.3 times likely to be on contraception compared to urban women (AOR=1.27, 95% CI: 1.02-1.59). Finally, women residing in the middle zone were about 2 times favoured to be on contraception relative to women in the coastal zone (AOR=1.52, 95% CI: 1.27-1.82) (Table 4).

Table 4: Factors associated with current use of contraception in multivariable analysis

Variable	Current use of contraception AOR[95% CI]	*P-value*
Repeat induced abortion		
No	Reference	
Yes	0.88[0.73-1.06]	.17
Age		
15-24	2.86[2.18-3.77]	<.001
25-34	1.85[1.54-2.23]	<.001
35-49	Reference	
Marital status		
Single	Reference	
Married	1.69[1.36-2.10]	<.001
Cohabiting	1.37[1.10-1.71]	.004
Highest level of education		
No formal education	1.25[0.85-1.83]	.25
Basic level	1.16[0.90-1.49]	.24
Secondary or higher	Reference	
Place of residence		
Urban	Reference	
Rural	1.27[1.02-1.59]	.04
Ecological zone of residence		
Northern	1.04[0.72-1.49]	.82
Middle	1.52[1.27-1.82]	<.001
Coastal	Reference	
Wealth quintile		
Poorest	1.06[0.64-1.76]	.81
Poorer	1.23[0.89-1.71]	.22
Average	1.20[0.91-1.60]	.19
Richer	0.99[0.78-1.28]	.98
Richest	Reference	
Knowledge about the fertile period		
Yes	Reference	
No	1.15[0.95-1.39]	.14

Goodness of fit test: F-adjusted test statistic = F(9,710)= 0.827, Prob>F = 0.591

3.2 DISCUSSION

The aim of this study was to determine the association between women's history of repeat-induced abortion and their current use of contraception. The results showed that 36.7% of the women were currently on any form of contraception which is higher than what was reported in the 2014 GDHS [7]. After controlling for potential confounding, repeat-induced abortion was not significantly associated with current use of contraception, although awareness about a source for family planning method was high (89%). Post-abortion contraceptive counselling and access to contraceptives are part of the CAC package implemented in Ghana [8]. In addition, contraceptives have been subsidized across all public health facilities in the country and these facilities have remained the major sources for family planning commodities [19]. Moreover, post-abortion counselling and access to post-abortion contraceptives significantly increase contraceptive uptake by women [22,23]. The unanswered question is why do Ghanaian women with multiple episodes of abortion not use contraception to prevent prospective unwanted pregnancies that may lead to abortion? We, recommend further studies

to understand this phenomenon. Specifically, qualitative studies would prove vital to understanding this behaviour by women with multiple histories of abortion. Nevertheless, the following factors were significantly associated with current use of contraception; maternal age, marital status, place of residence and ecological zone of residence.

The positive association between younger maternal age and current use of contraception in this study is in contrast to the findings of a study in Angola [16]. In spite of that, a study by Achana et al. in northern Ghana found no significant association between age and use of contraception, although they observed a decline in use with increasing age [11]. Sexual intercourse outside marriage is a practice in Ghana [24]. Hence, younger women, especially those not married may use contraception to avoid unwanted pregnancies, out of wedlock children and stay in school. Conversely, older women may rely on their perceived insusceptibility to pregnancy due to a decrease in fecundity not to use contraception. In Ghana, 10% of women 30-49 years are menopausal [7]. Moreover, older women in this study were more involved in repeat induced abortion relative to younger women (data not shown) and may, therefore, be using induced abortion instead of contraception to control fertility [24].

Also, the study found that women in a union were more likely to use contraception. This is consistent with previously published studies from Ghana [11,13]. Logically, single women without sexual partners have no pregnancy risk. In contrast, women in a union may use contraception to avoid unwanted pregnancies, space births or limit childbearing [11,12]. Additionally, spousal support encourages the use of contraception among women in union [25].

The finding that rural women were more likely to be on contraception contrasts other published studies [26,27]. However, this finding has been reported by other scholars [15]. The scale-up of the Community-based Health Planning and Services (CHPS) initiative in Ghana might have contributed to closing the gap in access to contraceptives by rural women. As part of the initiative, FP services are provided free of charge and the commodities are highly subsidized such that rural women can afford [28]. In addition, non-profit organizations such as Maries Stopes International have supported in improving access to FP services in rural areas in all the ten administrative regions in Ghana. These and other factors explain the increasing trend in contraceptives use by rural women in Ghana [29]

Finally, the association between the ecological zone of residence and current use of contraception can be explained by differences in cultural and religious beliefs, variations in fertility rates, desire to limit childbearing and access to reproductive health services [7]. A study in Malawi supports this finding [27]. The non-significant association of the socioeconomic factors (education and wealth) in this study with the current use of contraception in the adjusted model is contrary to previous documentation [14,15,30]. The decline in socioeconomic-related inequalities in the use of contraception in many countries in SSA including Ghana and the positive association of wealth status with long-term contraceptives use may partly explain this finding [31].

The results of this study should be interpreted with caution in light of the following limitations and strengths. Firstly, the survey is cross-sectional in design and causal deductions cannot be made. Secondly, it involved a recall of events on the exposure and outcome so recall biases cannot be ruled out. Thirdly, the independent variable did not differentiate modern contraceptives use from traditional contraceptives use. It is, therefore, possible that the explanatory variables may exhibit different relationship based on the type of contraception. Nevertheless, the key strength of this study is that it used a nationally representative sample and applied robust statistical analysis that allows for reliable conclusions and generalization of results across Ghana. The findings of this study serve as a foundation for future studies to promote post-abortion contraceptive use among women, especially those with a history of induced abortion. The findings also add to the growing literature on abortion and contraception in developing countries with limited information such as Ghana.

4. CONCLUSION

The study aimed at determining the relationship between repeat induced abortion and current use of contraception. After controlling for potential confounding, repeat induced abortion was not associated with current use of contraception. The findings suggest that other factors such as age, marital status,

place of residence and ecological zone of residence were significantly associated with women's current use of contraception post-abortion. Our findings can inform future research and examine how to improve post-abortion contraception to prevent future unwanted pregnancies leading to induced abortion.

ETHICAL APPROVAL

This study used already published data and did not require a review by an Institutional Review Board (IRB). However, permission to use the datasets was obtained from ICF international. The ethical considerations in the DHS surveys are published online (www.dhsprogram.org)

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