Postpartum and post-abortion contraception and sexual inactivity young women in Ghana

ABSTRACT

Pregnancy outcomes impact subsequent pregnancy preventive behaviours. The purpose of this study is to assess the relationship between previous pregnancy outcomes and pregnancy-preventive sexual behaviours among unmarried young women intending to delay childbearing. Using data from the 2014 Ghana Demographic and Health Survey, among 1,118 sexually experienced, fecund and non-pregnant single females aged 15–24 years, the study assessed how childbirth and abortion are related with sexual inactivity and use of modern contraception. While about 70% of single young women were nulligravid, approximately 11% had had an abortion and 18.2% were postpartum. Majority of respondents were sexually inactive while some 21% and 27% had met need and unmet need respectively. Postpartum women were thrice as likely as nulligravid women and twice as likely as post-abortion women to use contraceptives. Post-abortion women were least likely to be sexually inactive. Duration of sexual experience was positively associated with the likelihood of a met need, particularly among the postpartum, and negatively associated with sexual inactivity among the ever-aborted. Prior pregnancy outcomes have significant implications for secondary abstinence and contraceptive use among unmarried young women. Post-abortion women are more likely than postpartum women to be sexually active but more likely to have unmet need for contraceptives. Efforts must be strengthened towards increasing access to modern contraceptives for young women who present for abortions in Ghana.

Keywords: postpartum; post-abortion; contraception; sexual inactivity; adolescents; young adults; Ghana

INTRODUCTION

Adolescence and young adulthood can be considered the healthiest periods in a person's lifetime but they constitute transitional phases of development with critical implications for later adult health, morbidity and longevity (Bearinger et al., 2007; Hanson et al., 2015; Patton et al., 2016). For female adolescents and young adults especially, poor reproductive health behaviours and outcomes are rife as they, in addition to risks shared with their male peers, are exposed to complications related to unintended pregnancy, unsafe abortion and pregnancy-related morbidity (Chandra-Mouli et al., 2014). Young women in low-resource countries across the globe, including Ghana, due to social and economic inequalities associated with pregnancy and child care, are more vulnerable to risks of unsafe abortions (Mirembe et al., 2010; Shah & Ahman, 2010; Sundaram et al., 2012; Biney & Atiglo, 2017). In most Ghanaian societies, childbirth is only acceptable within marriage (Ghana Statistical Service (GSS) et al., 2015) and non-marital pregnancy is stigmatised (Agyei et al., 2000; Cockrill et al., 2013; Payne et al., 2013; Biney & Atiglo, 2017). Nonetheless, the disparity between early sexual debut and delayed marriage indicates prevalence of premarital sexual activity, and with it, the attendant risks of unintended pregnancies among unmarried but sexually active young women (GSS et al., 2015). In spite of this, only few studies acknowledge and measure the need for contraception among single adolescent and young adult females in Ghana, for whom obtaining and appropriately using contraception is not without challenges (Chandra-Mouli et al., 2014). In addition, secondary abstinence is a strategy used by sexually experienced young women to delay pregnancy (Loewenson et al., 2004; Atiglo & Biney, 2018); however, few studies have looked into its role as a pregnancy prevention tactic among young women.

A key theme correlated with women's contraceptive and pregnancy-preventive behaviour is their previous pregnancy outcomes (Padmadas et al., 2014). Their pregnancy outcomes constitute transitional life events or experiences which may potentially alter young women's cognition and behaviour related to sex and pregnancy. This study is based on the proposition that experiences of consequences of risky sexual behaviour will have a relational effect, and upon self-evaluation, motivate adolescent and young adult women to engage in subsequent safe and preventive sexual behaviour. While prior studies have focused on the health impacts of sexual behaviour (Vasilenko et al., 2014), the behavioural outcomes of the consequences of previous sexual behaviour has not been much researched. Studies on post-abortion and postpartum sexual inactivity and contraception uptake are scant, much less among unmarried young women. Available studies compare timing of postpartum and post-abortion uptake and discontinuation of contraception among married women (Wilson et al., 2013; Padmadas et al., 2014).

Again, fertility levels have declined but rapid postpartum conception and repeat abortions continue to plague low and middle income countries (Hindin et al., 2014). Repeat pregnancies and/or abortions are detrimental to the health of women and in the case of the former, the well-being of the child (Shah et al., 2015; Maravilla et al., 2016). Also, among all women, those aged 15-24 are least likely to initiate contraceptive use after an abortion or birth and even if they do they are most likely to discontinue use soonest (Padmadas et al., 2014). Post-abortion and postpartum contraception is important to prevent unintended pregnancy and repeat abortion (Tripney et al., 2013; Padmadas et al., 2014). However, it is rare to find a single study employing population-based data to compare the effects of abortions (spontaneous or induced), childbirth and duration of sexual experience on met need and sexual inactivity among single young women. The aim of this present study is to assess

71 the relationship between pregnancy outcomes and pregnancy-preventive behaviour among
72 unmarried 15- to 24-year old women in Ghana.
73
74 **METHODOLOGY**
75 **Data**
76 This cross-sectional study employed the women's dataset from the nationally representative
77 2014 Ghana Demographic and Health Survey (GDHS) which collected data on reproductive
78 health behaviours, socioeconomic and demographic characteristics and child healthcare
79 practices among women aged 15-49 (GSS et al., 2015). The survey data collection protocol
80 was approved for ethical considerations including, confidentiality and informed consent
81 procedures, by the Ghana Health Service Ethical Review Committee, Accra, Ghana and the
82 ICF International Institutional Review Board, Maryland, USA (GSS et al., 2015).
83 Sampling procedures of eligible women for the survey involved a multilevel sampling design,
84 details of which are available from the 2014 GDHS report (GSS et al., 2015). This study
85 used data from 1,118 sexually experienced, fecund and non-pregnant unmarried women aged
86 15-24 who wanted to postpone pregnancy for at least two years. Women in the age bracket
87 who were excluded from the study included those not exposed to the risk of pregnancy
88 because they had never had sex (1,211) or were infecund (33) or amenorrhoeic (254) or
89 already pregnant (196). The sample also excluded all women who desired a child within two
90 years of the survey (189) and those currently married (326).
91
92 **Variables**
93 **Dependent variable.** The dependent variable was pregnancy preventive sexual behaviour
94 employed at the time of the survey. There were three categories of preventive sexual
95 behaviour based on sexual activity and contraceptive use. Sexual activity was measured by

intercourse within four weeks preceding the survey and contraceptive use was limited to modern methods only (see Hubacher & Trussell (2015) for choice of categorization of modern methods). Sexually active women who wanted to delay childbirth (for two or more years) or were unsure about their fertility intentions but not using a modern contraceptive method were deemed as having an unmet need. Sexually inactive women for four or more weeks prior to the survey were deemed as practising abstinence while women who were using modern contraceptives were described as having a met need. The duration of four or more weeks was selected to represent secondary abstinence as it is the typical definition of period of sexual inactivity (GSS et al. 2015) and also because studies use this to determine abstinence (Wilson et al., 2013; Machiyama & Cleland, 2014). Also, the minimum of four weeks allows for a better comparison with women's current contraceptive use.

Independent variables. Pregnancy outcomes in this study was indicated by two main factors including parity and abortion. Thus, there are three categories of women by pregnancy outcome i.e. nulligravid (never pregnant), post-abortion (whether induced or spontaneous) and postpartum. Postpartum women who had ever had an abortion were classified based on their most recent experience. Explicit data on induced abortions are rare (Shah et al., 2015) but following the examples of other studies using the DHS (Padmadas et al., 2014; Banerjee et al., 2015) and knowledge of underreporting of abortion in Ghana and other contexts (Rossier, 2003; Awusabo-Asare et al., 2004; Biney & Atiglo, 2017) all pregnancy terminations (spontaneous or induced) constitute abortions in this study.

Control variables. In this study, the covariates included variables available from the dataset and observed in the literature to be significantly associated with contraceptive use (Nyarko, 2015; Wulifan et al., 2016). These included age, educational attainment, household wealth,

employment status, urban-rural residence, region of residence, religion and ethnicity. The duration of women's sexual experience (the difference between one's current age and age at sexual debut) was also controlled for. In addition, knowledge of ovulatory cycle was derived from respondents' response to which time of the cycle ovulation occurs. Their responses were deemed accurate (for middle of the cycle) and inaccurate/no knowledge (for all other responses including "don't know").

Data Analyses

Descriptive statistics were used to assess the patterns of preventive sexual behaviour and pregnancy outcomes and the socioeconomic and demographic characteristics of adolescents and young women in Ghana. Cross-tabulations show the bivariate relationships between pregnancy outcomes and preventive sexual behaviour of women with chi-square tests of significance of the associations therein. Finally, three multinomial logistic regression models were run to determine the risk ratios of abstinence and met need for contraception relative to having an unmet need. In the second model, the reference for pregnancy outcome was changed from the nulligravid in the first model to postpartum women. This enabled comparison of the relative odds of abstinence and met need between the postpartum and ever-aborted women. The third model involved interaction terms between previous pregnancy outcome and duration of sexual experience. Chi-square tests and logistic regression models were conducted at an alpha level of .05.

Study Limitations

The first limitation of the study is the classification of traditional method users as having an unmet need. Traditional methods could also be effective in preventing unintended pregnancies (Hubacher & Trussell, 2015; Festin et al., 2016;); however, for this study having

a met need is limited to the use of more assessable modern contraceptive methods. Secondly, sexual inactivity within the four or more weeks prior to the survey does not imply volition to abstain but could also be due to other reasons including lack of opportunity and suffering negative or coerced sexual debuts. Third, duration of sexual experience does not take into account the frequency of sexual activity and number or types of partnerships during the period, for which information is not available in the dataset. Finally, women's responses are subject to recall biases as self-reported retrospective information is sought from the respondents. In particular, due to the sensitivity of information regarding sexual activity and pregnancy termination from unmarried young women in Ghana, misreporting may occur.

RESULTS

Descriptive Statistics

As shown in Table 1, the about half (51.6%) of respondents were not using any modern contraceptive method at the time of the survey because they had been sexually inactive at least four weeks prior. Among the sexually active, majority were not using any modern contraceptive though sexually active. Not unexpected among single young women in Ghana, about 71% of respondents had never conceived, while about a tenth had had an abortion and a little under a fifth had given birth. Women who had ever aborted were 127 in all, however, those who had had at least one live birth since their abortion (9 of them) were included among the postpartum women.

A third of the young women had accurate knowledge of the timing of ovulation. The mean duration of sexual activity among respondents was about three years with a standard deviation of 2.3. Twenty-eight outliers had higher durations of about nine or more years of sexual experience (result not shown in table). Just about 4% of the respondents had no

education and about 80% had at least junior high education. While a quarter of respondents were still in school, approximately 56% were employed, though not all were being paid. About half were aged 20 and above (54%) or resided in urban areas (51.1%). Of the ten administrative regions, six represented between 10% and 15% and the others each represented 5% - 9% of the sample. Akans constituted the highest composition (46%) while minority groups comprised about 4.6% of the sample. The Christian groups constitute a huge majority with muslims and other religions making up about 17% of the respondents.

Bivariate associations between pregnancy outcomes, duration of sexual experience, age group, educational attainment, region of residence, and religion and the dependent variable, unmet need, showed statistically significant correlations. Cross tabulation results from Table 1 suggest that while the post-abortion women had the lowest proportion not sexually active (31.5%) they had the highest proportion of single young women with an unmet need (37.8%). The nulligravid women tended to be more sexually inactive (55.3%) but also used modern contraception the least (17.8). More postpartum women (49.5%) were sexually inactive than experiencing an unmet need (20.6%). Current contraceptive users have the highest mean duration of sexual experience (3.82 years) while those sexually inactive have the lowest mean (2.94 years). Postpartum women have the highest mean duration of sexual experience (4.85 years) while the nulligravid have the lowest mean of 2.52 years (not shown).

Multivariate analyses

Results from multinomial logistic regression analyses shown in Table 2 indicate a strong association between pregnancy outcomes and both sexual inactivity and use of modern methods of contraception. Compared with the nulligravid, post-abortion women were less likely (.393) to be sexually inactive whereas postpartum women were more than twice as

likely (2.226) to have a met need (Model 1). A unit increase in the duration of sexual experience was associated with a .110 increase in the odds of having a met need.

For pregnancy outcomes, it was initially important to compare those who experienced pregnancies to the nulligravid as they represented those who have never experienced a pregnancy. However, as an additional check, the nature of the relationships between post-abortion women and their postpartum counterparts were explored. Running the same model using postpartum women as the reference category (Model 2) showed that post-abortion women were also less likely than their postpartum counterparts to be abstinent and have a met need for modern contraceptives. Nulligravid young women were less likely to have a met need than those with children compared to those with an unmet need.

With the interaction between duration of sexual experience and the three categories of pregnancy outcome (Model 3), only the interaction with post- abortion was statistically significant. Among post-abortion women, there was a negative correlation (exp β= .837) between duration of experience and odds of sexual inactivity. Although there was a positive correlation (exp β=1.183) between duration of sexual experience and having a met need, among those who had both an abortion and a live birth the statistically significant correlation was negative (result not shown in table). Models 2 and 3 (Table 2) include all other control variables in Model 1. Not much difference is observed in their associations with the dependent variables, hence the odds ratios and standard errors are not shown to ensure readability of table. In another model (not shown) which includes both the pregnancy outcome variables and the interaction terms none was significantly associated with either category of the dependent variable.

Inaccurate or no knowledge of the timing of ovulation was associated with higher odds (1.559) of having a met need but not with sexual inactivity. Having a minimum of junior secondary education was associated with higher odds of abstinence, and secondary or higher

education was associated having a met need when compared with having no formal education. Residents of the Brong-Ahafo Region were more likely than those of the Northern Region to have a met need (3.580). Also, Muslim women were less than half (.444) as likely as Catholic women to be sexually inactive than have an unmet need. Neither sexual inactivity nor met need is differentiated by urban-rural residence, age, employment status, wealth and ethnicity.

DISCUSSION

This cross-sectional study reveals a relationship between pregnancy outcomes and later preventive sexual behaviour among single young adults and adolescents in Ghana, corroborating findings that gynaecologic experiences evoke later contraceptive behaviour among US adolescents (Chernick et al., 2015). In Ghana, however, young adult and post-abortion adolescent females are less likely to be using contraceptives than their postpartum counterparts and are not significantly different from their nulligravid cohorts in this regard. This could connote that childbirth (perhaps the consequences young women face before, during and/or after) predisposes them to postpartum contraceptive use. The study's findings show higher met need among postpartum than post-abortion single young women. Post-abortion contraception acceptance has been shown to be lowest among women aged under 25 years in India (Banerjee et al., 2015). In Ghana, women aged under 25 may be least likely to access safe abortion services (Biney & Atiglo, 2017) and hence lack the opportunity for post-abortion counselling. Perhaps due to stigma and lack of established structures, compared with women who have facility-based delivery, post-abortion women may be less likely to revisit the facilities where they received abortion care i.e. if facilities were utilized (Sundaram et al., 2012). Thus, they may have inadequate and less regular interaction with health workers and

contraception counselling services. On the other hand, where they have access to post-abortion contraception counselling and method introduction, the service providers may be disinclined to offer long acting or hormonal methods (Banerjee et al., 2015) due to the young age of the respondents and the health worker's own biases or misperceptions (Hindin et al., 2014). This may explain the lower contraceptive uptake among this group. It is also likely that post-abortion women may continue to resort to abortion as an antidote to non-marital pregnancy. Perhaps also, they may want to test and be sure of their fecundity after an abortion and thereby continue to engage in sexual activity without contraception.

The likelihood of having a met need is lower among nulligravid and ever-aborted women relative to postpartum women. Postpartum young women may have been provided with contraception or contraception counselling at the place of delivery which in Ghana is most likely a health facility (GSS et al., 2015). Pregnancy-prevention interventions that occur at health service sites are effective at removing barriers to contraception (Hindin et al., 2016). There are some other possible explanations for higher contraception uptake among postpartum unmarried young women. First, it is possible that they have proven their fertility to stabilise their relationships where their relationship is unstable because future fertility is in doubt (Osei et al., 2014). Another possible explanation is the prohibition and stigmatisation of non-marital fertility in certain societies. A common anecdote is that an unmarried young woman with at least a child is derogatorily labelled as *born-one* in some circles. Postpartum women may thus be motivated to use more effective modern methods to space or delay repeat childbirths until they are in stable unions or their current relationships become more formalized.

Again, infertility-related misconceptions about use of hormonal modern methods especially may predispose nulliparous women to reject modern methods for traditional methods or more "natural" methods (Hindin et al., 2014). The fear of permanent fertility-

damaging side effects from modern contraceptives, though misconceived and mainly received from non-clinical sources, may often override the fear of the side effects of abortion (Biney, 2011) at the point of sexual intercourse where the choice is theirs. The nulligravid seem to particularly have shorter durations of sexual experience and so have a reduced risk of conception. However, with prolonged coital experience these young women stand the risk of future unintended pregnancies.

Having accurate knowledge of the timing of ovulation was associated with less likelihood of using modern contraception among women but not associated with sexual activity. This could suggest that they are making use of this natural method that has seemingly proved effective so far. It is also to be expected that where fear and misperception of contraceptives is rife, young women may tend to trust their knowledge of timing of ovulation and rely on the rhythm or other traditional methods.

The results also indicate that about a third of female adolescents and young adults are at risk of unintended pregnancy. While contraceptive use is not particularly high among the sexually active there is a high prevalence of abstinence among young women who have initiated sexual activity. Findings have shown that the unmarried young women who had initiated sex may have had their sexual debut about 3 years earlier and about half of them were sexually active at least four weeks prior to the 2014 GDHS.

This study found other significant factors associated with non-marital sexual activity and met need for contraceptives. Women with a minimum of junior high education are likely to be more sexually inactive as they seek to postpone childbirth and those with secondary education are more likely to have met need for contraception. Formal education is associated with more responsible pregnancy-prevention behaviour among young women. In addition, young unmarried Muslim women in Ghana are less likely to be sexually inactive compared with their Catholic counterparts than have an unmet need.

CONCLUSIONS

Single young women are at risk of unintended pregnancies, not wanting a child and not using modern contraception though sexually active. Nonetheless, sexual inactivity is a common strategy among sexually experienced single young women in Ghana to avoid getting pregnant. Their gynaecologic history has differing implications for sexual abstinence for unmarried young adult and adolescent females. Post-abortion women are most sexually active but they are not significantly different from never-pregnant women in their contraceptive use while postpartum women are most likely to use contraception. The findings of this study indicate higher odds of contraceptive use among postpartum than post-abortion and nulligravid women. Thus, could childbirth be the threshold at which contraceptive uptake is motivated into the conscious calculation among young unmarried women?

This study concludes that abortion tends to reinforce the risk of unintended pregnancies and repeat abortions while childbirth minimises later risk by means of contraception. Thus, while the optimum objective is to prevent unintended pregnancy via increased contraception the recommendation is that pregnant young women should be assisted to carry pregnancy to term towards birth as this engenders later positive pregnancy-prevention behaviours. To this effect, efforts at reducing stigmatisation and reintegrating young mothers into school and economic systems must be strengthened to reduce their social exclusion. Otherwise, particular attention must be paid to young abortion seekers to progressively make safe abortion services more accessible to them while strengthening the capacity of health workers and facilities to offer post-abortion contraceptive counselling. Targeted efforts to increase modern contraceptive uptake should improve reproductive biology education and service availability at health centres and also in schools. Other studies have demonstrated the effectiveness of mass media campaigns to augment uptake of modern contraception. It is acknowledged that a small percentage of the abortions may be deemed as

spontaneous, hence it is possible that the adolescents/young women may have wanted to carry that particular pregnancy to term. However, at the time of the survey these women reported wanting to delay childbearing and hence were at risk of an unintended pregnancy.

Finally, abstinence is not considered in most studies but can help us understand young women's contraceptive and preventive reproductive health habits. Teenage pregnancy-prevention programmes should consider sexual abstinence (both primary and secondary) which is within the conscious calculation and choice of single young women in Ghana.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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441 **TABLES**

Table 1. Frequency and percent distribution of unmarried adolescent and young adult women by their pregnancy outcomes, pregnancy-preventive behaviour and background characteristics

Characteristic	Frequency (n=1,118)	Proportion of total (%)	Proportion abstaining (%)	Proportion with met need / using contraceptives (%)	Proportion with unmet need (%)
Unmet need for modern method					
Unmet need	302	27.0			
Abstinent	577	51.6			
Met need	239	21.4			
Pregnancy outcome				***** (.000)**	
Nulligravid	797	71.3	55.3	17.8	26.9
Post-abortion	118	10.5	31.5	30.6	37.8
Postpartum	203	18.2	49.5	30.7	20.6
Knowledge of ovulatory cycle				**(.502)**	
Inaccurate	746	66.7	51.1	22.4	26.5
Accurate	372	33.3	52.7	19.4	28.0
Age				**** (.007)**	
15-19	515	46.1	53.6	17.3	29.1
20-24	603	46.9	49.9	24.9	25.2
Educational attainment				***** (.000)**	
No education	41	3.7	31.7	26.8	41.5
Primary	179	16.0	46.4	16.8	36.9
JHS/JSS	470	42.0	50.2	21.9	27.9
Secondary/Higher	428	38.3	57.2	22.2	20.6
Wealth quintile				**(.198)**	
Poorest	213	19.1	54.0	23.5	22.5
Poor	230	20.6	51.7	21.3	27.0
Middle	281	25.1	47.7	21.0	31.3

Rich	172	19.9	50.0	18.9	31.1
Richest	213	15.4	57.0	22.7	20.3
Type of place of residence				**(.556)**	
Urban	571	51.1	52.0	20.1	27.8
Rural	547	48.9	51.2	22.7	26.1
Region of residence				***** (.000)**	
Western	165	14.8	48.5	17.6	33.9
Central	116	10.4	45.7	23.3	31.0
Greater Accra	117	10.5	53.8	24.8	21.4
Volta	100	8.9	40.0	29.0	31.0
Eastern	122	10.9	57.4	9.8	32.8
Ashanti	124	11.1	58.9	18.5	22.6
Brong Ahafo	159	14.2	47.2	32.7	20.1
Northern	65	5.8	55.4	12.3	32.3
Upper West	60	5.4	50.0	21.7	28.3
Upper East	90	8.0	63.3	18.9	17.8
Religion				*** (.020)**	
Catholic	149	13.3	60.4	22.1	17.4
Protestant / Other Christian	36	32.8	48.8	21.0	30.2
Pentecostal / Charismatic	411	36.8	53.0	23.1	23.9
Muslim	162	14.5	46.9	17.9	35.2
Other	29	2.6	48.3	17.2	34.5
Ethnicity				*** (.063)**	
Akan	514	46.0	50.2	23.1	26.7
Ewe / Ga Dangme	222	19.9	48.7	23.4	27.9
Mole-Dagbani	234	20.9	60.2	15.0	24.8
Gursi / Gurma / Mande	97	8.7	44.3	26.8	28.9
Other	51	4.5	52.9	13.7	33.3
Employment status				**(.171)**	
Not working	319	28.5	52.0	20.7	27.3

In school	287	25.7	55.1	17.4	27.5
Unpaid employment	208	18.6	44.2	25.5	30.3
Paid employment	304	27.2	53.0	23.0	24.0
Mean duration of sexual experience (years)		**3.172**	2.948	3.820	3.086
Total	**1,118**	**100.0**	**51.6**	**21.4**	**27.0**

Computed from the 2014 Ghana Demographic and Health Survey

^ p < .1; * p < .05; ** p < .01; *** p < .001

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Table 2. Predicted odds from multinomial logistic regression analyses of abstinence and met need for modern contraceptives among single adolescent and young adult females, by pregnancy outcomes and selected background characteristics,

Characteristic	**Model 1** Nagelkerke R^2 =.172		**Model 2** Nagelkerke R^2 =.172		**Model 3** Nagelkerke R^2 =.164	
	Abstinence OR (S.E)	**Met need OR (S.E)**	**Abstinence OR (S.E)**	**Met need OR (S.E)**	**Abstinence OR (S.E)**	**Met need OR (S.E)**
Pregnancy outcome						
Nulligravid	(r)		.705 (.242)	.458 (.280)**		
Post-abortion	.393 (.263)***	.931 (.288)	.280 (.304)***	.450 (.327)*		
Postpartum	1.394 (.241)	2.226 (.277)**	(r)			
Duration of sexual experience	1.000 (.041)	1.116 (.046)*				
Duration of sexual experience*Pregnancy outcome						

Nulligravid*Years of experience			1.031 (.045)	1.063 (.053)
Post-abortion*years of experience			.826 (.053)***	.974 (.050)
Postpartum*Years of experience			1.041 (.043)	1.183 (.046)***
Knowledge of ovulatory cycle				
Inaccurate/none	1.241 (.164)	1.559 (.205)*		
Accurate (r)	1.000	1.000		
Age				
15-19	1.024 (.195)	.881 (.242)		
20-24 (r)	1.000	1.000		
Educational attainment				
No education (r)	1.000	1.000		
Primary	1.675 (.427)	.850 (.493)		
JHS/JSS	2.811 (.414)*	2.012 (.468)		
Secondary/Higher	4.959 (.425)***	3.599 (.486)**		
Wealth quintile				
Poorest (r)		1.000		
Poor	.910 (.261)	.748 (.314)		
Middle	.651 (.277)	.607 (.333)		
Rich	.560 (.324)^	.497 (.395)^		
Richest	.859 (.374)	.998 (.452)		
Type of place of residence				
Urban	.885 (.199)	.757 (.248)		
Rural (r)				
Region of residence				
Western	.860 (.398)	1.090 (.565)		
Central	.844 (.434)	1.508 (.590)		
Greater Accra	1.336 (.453)	2.130 (.605)		
Volta	.775 (.467)	2.282 (.615)		
Eastern	.978 (.417)	.589 (.618)		
Ashanti	1.755 (.421)	1.790 (.587)		

Brong Ahafo	1.413 (.393)	3.580 (.535)*
Northern (r)		
Upper East	1.542 (.421)	2.525 (.598)
Upper West	1.053 (.443)	2.684 (.573)^
Religion		
Catholic (r)	1.000	1.000
Protestant / Other Christian	.585 (.281)^	.543 (.335)^
Pentecostal / Charismatic	.814 (.273)	.862 (.326)
Muslim	.444 (.309)**	.579 (.382)
Other	.511 (.505)	.359 (.653)
Ethnicity		
Akan (r)	1.000	1.000
Ewe / Ga Dangme	1.030 (.266)	.845 (.335)
Mole-Dagbani	1.294 (.290)	.623 (.367)
Gursi / Gurma / Mande	.828 (.326)	.965 (.383)
Other	1.090 (.371)	.519 (.525)
Employment status		
Not working (r)	1.000	1.000
In school	.948 (.212)	.931 (.271)^
Unpaid employment	.867 (.229)	1.315 (.272)
Paid employment	1.397 (.212)	1.299 (.258)

Computed from the 2014 Ghana Demographic and Health Survey
OR – Odds ratio; SE – Standard Error
^p < .1; *p < .05; **p < .01; ***p < .001

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