Fertility Awareness and Contraceptive Use: A Study of Reproductive Age Women in Ghana

Abstract

The purpose of this analysis is to examine the association between fertility awareness knowledge, and contraceptive use among Ghanaian women of reproductive age.

This study used data from the 2017 Ghana Maternal Health Survey. We extracted and analyzed relevant data (i.e., socio-demographic characteristics, sexual behavior, fertility-related characteristics, and contraceptive use) using a logistic regression. Odds Ratios (OR) and marginal effects were estimated, and statistical significance was set at $P \leq 0.05$.

In logistic regression, the factors significantly associated with knowing a woman's fertile period were: age, education, wealth, previous pregnancy, previous abortion, rural residence, and using periodic abstinence.

Almost two-thirds of the women in our study did not know when a woman's fertile period was, although significantly more women who rely of periodic abstinence answered this question correctly.

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Despite Ghana's relatively strong family planning program, most Ghanaian women do not use contraception. In the most recent Demographic and Health Survey, modern use of contraception was 22%[1]. While there has been an increase in use of modern contraceptive methods over the past 30 years, in 2018 still over half of pregnancies were unintended[2] . Unmet need for contraception is documented as high in Ghana, standing at about 30%. However, use of natural or "traditional" methods is likely undercounted[3]. This under-reporting could explain some of the variation seen in contraceptive prevalence rates among countries with similar total fertility rates. For example, between 2012 and 2014, Ghana and Kenya recorded similar TFRs (4.2 and 3.9, respectively), but very different levels of contraceptive prevalence among married women (27% and 58%).

A small but growing literature exists documenting unusual findings about contraceptive use in Ghana. For example, in the 2014 Ghana DHS[4], women in the highest wealth quintile were less likely than those in lower wealth tiers to report contraceptive use (20% vs. 21–25%), and urban women had a lower rate than rural women (20% vs. 25%). Modern contraceptive use was also more common in less-educated women than those with higher levels of education (24 vs. 27%). Qualitative work in Accra[5] has shown that many women use "periodic contraception", where they rely on periodic abstinence and use emergency contraception to avoid pregnancy if they have intercourse on days deemed unsafe, and then rely on abortion if those methods fail. Ghanaian women's hesitancy to use hormonal contraception. Ghanaian women report fear of side effects as a determining factor is contraceptive non-use[6, 7].

Previous research has demonstrated fertility awareness[8], the ability of a woman to identify the days during her menstrual cycle when unprotected sexual intercourse is most likely to result in pregnancy, could help women avoid unwanted pregnancies[9]. Fertility awareness is usually achieved through monitoring various signs and symptoms of fertility. Knowledge of the fertile period can enable the woman to modify her sexual behavior, deciding whether to either prevent unintended pregnancy or achieve pregnancy. Therefore, women can avoid unprotected sex during their fertile period or use a barrier method or emergency contraception to prevent an unwanted pregnancy[10]. Despite the benefits of fertility awareness, most young women in SSA do not understand their menstrual cycle and fertility awareness knowledge is low[11]. The lack of fertility awareness knowledge while not using contraceptive methods can impact its effectiveness[9].

Given Ghanaian women's documented reluctance to use hormonal contraception, and heavy reliance on natural family planning, we conducted these analyses to determine factors associated with knowing when in a cycle a woman is most fertile.

Methods

This study used data from the 2017 Maternal Health Survey conducted by the Ghana Health Service and the Ghana Statistical Service. GMHS is a nationally representative cross-sectional household survey with a two-stage stratified random sample. Households were randomly sampled within each enumeration area that was selected as a primary sampling unit with probability proportionate to size. Within each selected household, all women of reproductive age (15-49 years) were eligible to participate. Data collection was implemented by the Ghana Statistical Service and the Ghana Health Service from June 15-

October 12, 2017, and analysis was carried out from November 2023-January 2024. All data were anonymized by the Ghana Health Service and Ghana Statistical Service. The authors did not have access to information that could identify participants before or after data collection.

Descriptive statistics are reported with GMHS-defined survey weights. Via logistic regression with standard errors clustered by enumeration area, we analyzed factors associated with knowing when during a woman's menstrual cycle she is most fertile. To determine this knowledge, a two-stage question was posed. First, women were asked, "Do you know when a woman's fertile period is?" Those who answered yes were then asked to choose between these six answer options, "just before her period begins", "during her period", "right after her period", "halfway between the two periods", "other", and "I don't know". Those who answered they did not know, and all who answered anything other than, "halfway between two periods" were coded as not knowing when a woman's fertile period is.

We created a dichotomous "periodic abstinence" variable using the original contraceptive method used question. Those who reported using periodic abstinence were coded as 1, all others were coded as 0.

Age was originally collected as continuous. We created six categories; 15-17, 18-24, 25-29, 30-34, 35-39, and 40+. Level of education was originally collected as two separate variables; the first asked if the respondent had ever attended school. If the answer was yes, they were asked their highest level of education. We combined those two questions to end up with four categories: those who reported they had never attended school coded as "none", we combined primary and middle as "primary", kept the JSS/JHS category, and combined the three categories above that as "higher". We created a "relationship" variable, with those answering they were married or in-union as 1, and those answered they were not currently in-union as 0. We created an "ever sex" variable from the age at first intercourse variable. Those who reported they had not had sex were coded as 0 and those who answered any age for first sex were coded as 1. Finally, we created an "ever pregnant" variable from the total pregnancy outcomes variable. Those who reported no pregnancy outcomes were coded as 0, and those with any pregnancy outcomes were coded as 1.

We conducted bivariate analysis using cross tabs with chi square analysis to determine which variables to include in our logistic regression model with correct knowledge of the fertile period as the outcome variable. Variables associated at the .05 level, as well as variables we thought important to control for, were included in the analysis. All analyses were conducted using Stata v.16.

Results

Table X shows the distribution of contraceptive method currently used and fertility awareness knowledge among this sample:

	Know Fertile Period	
	No	Yes
Overall	16,615 (66.3)	8,447 (33.7)
Method		
None	12,922 (67.8%)	6,151 (32.2%)
Sterilization	137 (60.4%)	90 (39.6%)
IUD	51 (50.0%)	51 (50.0%)
Injection	1,260 (70.6%)	525 (29.4%)

Implant	922 (70.0%)	395 (30.0%)
Pill	509 (63.3%)	295 (36.7%)
Condom	197 (51.3%)	187 (48.7%)
Emergency Contraception	121 (47.1%)	136 (52.9%)
Periodic Abstinence	302 (38.6%)	481 (61.4%)
Withdrawal	128 (57.9%)	93 (42.1%)
Other	66 (60.6%)	43 (39.4%)

Overall, just about 1 in 3 women correctly identified when during the menstrual cycle a woman's fertile period is (33.7%). However, this is not evenly distributed; while a majority of those who do not use contraception, or who use long-acting, permanent, and hormonal methods do not know when a woman's fertile period is, almost half of those using condoms, and majorities of those using emergency contraception, periodic abstinence, and withdrawal know the fertile period.

In our logistic regression with knowledge of the fertile period as the outcome variable, women who use periodic abstinence as their method of contraception are 17% more likely to know when a woman's fertile period is (marginal effect: .170). Compared to the most educated women, women with no education were 19.2% less likely to answer correctly when a woman's fertile period is, while those with a primary education and junior secondary education were 15.9% and 10.7% less likely, respectively, than women with more education to answer that question correctly. Women who have had sexual intercourse and those who reported having had an abortion were more likely to answer the question about a woman's fertile period correctly (9.2% and 6.2%, respectively).

Compared to women aged 25-29 years, those younger were significantly less likely, and women over the age of 40 were significantly more likely to know when during her cycle a woman is most fertile. Compared to women in the middle wealth quintile, the poorest women were 9.1% less likely to know when a woman's most fertile time was, while those in the fourth and fifth wealth quintiles were significantly more likely to answer that question correctly. Interestingly, women in rural areas were significantly more likely to know when during her a cycle a woman is most fertile (marginal effect .048).

Variable	Level	OR (95% CI)	p-value	Marginal Effect
Periodic Abstinence		.836 (.663-.1.01)	<.001	.172
Education	None	-.869 (-1.01- -.779)	<.001	-.192
	Primary	-.728 (-.829- -.627)	<.001	-.159
	JSS/JHS	-.475 (-.561- -.390)	<.001	-.107
	SSS/SHS/higher	Ref		
Relationship		.003 (-.075-.081)	.939	.001
Ever Sex		.445 (.319- .570)	<.001	.092
Ever Abortion		.299 (.217- .381)	<.001	.062
Age Categories	15-17	-.612 (-.749- -.476)	<.001	-.120
	18-24	-.216 (-.306- -.126)	<.001	-.045
	25-29	Ref		
	30-34	.043 (-.053- .139)	.382	.009
	35-40	.039 (-.061- .138)	.414	.009
	40+	.110 (.011- .209)	.029	.024
Wealth quintile	1	-.442 (-.586- -.318)	<.001	-.091

	2	-.143 (-.247-.040)	.070	-.030
	3	Ref		
	4	.151 (.050-.251)	.003	.033
	5	.266 (.147-.386)	<.001	.059
Live in a rural area		.233 (.110-.356)	<.001	.048
Ever Pregnant		-.047 (-.157- .063)	.402	-.010
Knowledge about fertility returning before menstruation		-.507 (-.688- -.327)	<.001	-.006

Discussion

To our knowledge, this is the first study in Ghana that has examined the association between fertility awareness knowledge and specific types of contraceptives used. Overall, 33.7% of women in the Ghana Maternal Health Survey answered correctly when a woman's fertile period is. While women who use episodic or natural family planning methods were more likely to answer that question correctly, still only 61.4% who rely on periodic abstinence knew when during a woman's menstrual cycle she is at the highest risk of pregnancy. Given that these women rely on this information to reach their fertility goals, increased education for women who want to use these methods is needed.

Other factors associated with knowing when during her a cycle a woman is most fertile were: education, having had sexual intercourse, having had an abortion, wealth status, age, and living in a rural area.

The proportion using natural family planning methods is likely an undercount[12, 9], and so it is possible that more women using periodic abstinence do not correctly know when a woman's fertile period is. Regardless, the relatively few women who know when their fertile period is a substantial knowledge gap, putting both those who do not use contraception and those who use fertility-based methods at risk for unwanted pregnancy[9].

Across 29 African countries[13], an average of 15.5% (95% CI 14.2–17.0%), varying from 11.5% in Liberia to 57.1% in the Democratic Republic of Congo had correct knowledge of the ovulatory cycle. Our overall rate of 33.7% is higher than the average found in that study. Similarly, compared to women in Ethiopia[14], the women in this sample had a higher rate of correct knowledge of when a woman's fertile period is. Similarly to Zegeye and colleagues (2022), we found that older women and those with more education were more likely to know when a woman's fertile period was, although they did not look at method of contraception use.

Given Ghanaian women's increasing reliance on fertility-awareness based methods (FABM) of contraception, these findings underscore the importance of educating women on when during their cycle they are most susceptible to pregnancy.

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