ORIGINAL RESEARCH ARTICLE

Family Planning in a Sub-district near Kumasi, Ghana: Side Effect Fears, Unintended Pregnancies and Misuse of a Medication as Emergency Contraception

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Abstract

The Barekuma Collaborative Community Development Project (BCCDP) performed a study regarding family planning in communities in the Barekese sub-district near Kumasi, Ghana in July 2010. Eighty-five women, ages 15-49 years, in three communities were interviewed with a modified version of the 2008 Ghana Demographic and Health Survey. While virtually all women recognized at least one family planning method, half of all recent or current pregnancies were unintended and 20 percent of women had a previous abortion. Unexpectedly, 27 percent of women had misused norethisterone tablets (Primolut N or "N-tablets"), a synthetic progesterone, as emergency contraception. Women had a variety of concerns about family planning methods, including one-third having a fear of side effects for hormonal methods (particularly heart palpitations), as well as unfamiliarity with and particular aspects they did not like for most methods. However, women were interested in learning more about side effects as well as modern fertility awareness-based methods. There is an urgent need for interventions aimed at regulating and implementing the correct use of Primolut N tablets, addressing real and perceived side effects of family planning practices through properly trained community health nurses and introducing modern methods of fertility awareness such as Standard Days Method® and the Two-day Method® in the Barekese sub-district (*Afr J Reprod Health 2011; 15[3]:121-132).*

Résumé

Planification familiale dans un sous-district près de Kumasi, Ghana : Effets secondaires, grossesses non voulues et l'abus d'un médicament comme contraception d'urgence : Le Barekuma Collaborative Community Development Project(BCCDP) a mené une étude concernant la planification dans des communauté dans les sous districts de Barakese , près de Kumasi, Ghana au mois de juillet 2010. Quatre-vingt-cinq femmes âgées de 15-49 ans dans trois communautés ont été enquêtées à l'aide d'une version modifiée de l'Enquête Démographique et de Santé réalisée au Ghana. Tandis que presque toutes les femmes ont reconnu au moins une méthode de la planification familiale, la moitié de toutes les grossesses récentes ou actuelles étaient non voulues et 20% des femmes ont déjà eu un avortement. Alors qu'on ne s'y attendait pas, 27% des femmes ont abusé des comprimés de norethistérone (Primolut N ou « Comprimés-N ») une progestérone synthétique, comme une contraception d'urgence. Les femmes avaient pas mal de soucis concernant les méthodes de la planification familiale, y compris un tiers qui avaient peur des effets secondaires à l'égard des méthodes hormonales (surtout les palpitations cardiaques, aussi bien que la non familiarité avec des aspects particuliers qu'elles n'aimaient pas à l'égard des plupart des méthodes. Néanmoins, les femmes s'intéressaient à mieux se renseigner sur les effets secondaires aussi bien que sur les méthodes de la fertilité qui sont basées sur la sensibilisation. Il y a un besoin urgent d'interventions qui visent le contrôle et la mise en œuvre d'une utilisation des comprimés de Primolut N, de s'occuper des effets secondaires réels ou percus des pratiques de la planification familiale à travers des infirmières de la santé publique et d'introduire des méthodes modernes de la sensibilisation de la fertilité telle la Standard Days Method et la Two-Day Method dans le sous district de Barakese (*Afr J Reprod Health 2011; 15[3]:121-132).*

Keywords: Family Planning, Unwanted pregnancies, Misuse of drugs, Emergency contraception

Introduction

Family Planning in Ghana

In 2008, a Demographic and Health Survey (DHS) was performed nationwide in Ghana, which provided a useful update regarding multiple aspects of family planning in the nation.[1] According to the Ghana 2008 DHS, Ghana experienced a dramatic decline in fertility over the past 20 years, which was accompanied by the doubling of contraceptive use in the same time period. However, the uptake of contraceptives has slowed in recent years; from 1998 to 2003, the contraceptive prevalence rate among married women increased slightly, but the rate remained steady at approximately 25 percent from 2003 to 2008.

In the Ashanti region, where the Barekese sub-district is located, ninety-nine percent of married women had heard of at least one method to avoid pregnancy, but only 27.0 percent were currently using any method, of which injectables and the rhythm method were the most popular (5.9 and 5.4 percent, respectively). More than a third of married women (36.5 percent) in Ghana had an unmet need for family planning.

When married women who were not currently using contraception were asked about the reason for not using contraception in the future, 26.0 percent cited a fear of side effects, 8.1 percent cited health concerns, and 3.7 percent cited that contraception interferes with the body's normal process. Only 2.6 percent of women reported that their husband/partner was opposed to contraception and only 1.0 percent reported that they lacked access to contraception or that it was too costly. While this information is valuable, women were only able to give their general response to family planning or contraception as a whole, not to particular methods separately. In addition, the respondent's open-ended response to why they would not use a family planning in the future was immediately categorized by the interviewer and recorded in the survey as a code. Method-specific information regarding family planning beliefs, practices and preferences among women is necessary to further inform family planning programs, research and policy.

Barekuma Collaborative Community Development Project

The Barekuma Collaborative Community Development Project (BCCDP) is a collaborative effort between Komfo Anokye Teaching Hospital (KATH), Kwame Nkrumah University of Science and Technology (KNUST), and the University of Utah to improve the quality of life in communities through the use of community-based participatory research in the Barekese sub-district of the Atwima Nwabiagya district, near Kumasi, Ghana.[2] Multiple studies and projects have been conducted since 2003 on various topics including, but not limited to, malaria3, schistosomiasis and other parasitic infections4, undernutrition3, and causes of death in children under the age of 5.5 However, family planning had not been assessed by the BCCDP nor has the BCCDP conducted a project/intervention on family planning.

In 2010, the BCCDP identified family planning as a priority area to investigate the growing concern that side effect fears (as broadly defined) was the number one reason why Ghanaian women would not want to use contraception in the future. A research team was formed to design and conduct a preliminary study regarding family planning in 2010 in order to generate an evidence base for potential interventions in the Barekese sub-district.

More specifically, we sought to (1) explore specific reasons why women did not want to use family planning methods, by type of method, (2) identify which family planning methods women recognized, had ever used and currently use, (3) understand pregnancy intentions and family planning perceptions, and (4) explore interest in potential family planning interventions.

Methods

The assessment was conducted as a cross-sectional study. Convenience sampling was used to select women between the ages of 15 and 49 years of age in the Barekuma Collaborative Community Development Project (BCCDP) catchment area during July 21-30, 2010. Eligibility was not restricted in any other way. Three communities (small peri-urban community, medium peri-urban community, and rural community) were chosen as target communities in the area. The medium peri-urban community has a

family planning and maternal health clinic, but the other two communities do not.

Respondents were found in their households or at their workplaces. The study was briefly introduced to each potential respondent and eligibility was ascertained. Respondents were then invited to participate in the study. Upon acceptance, the research team obtained informed consent. Each respondent was given a Respondent Information Leaflet and Consent Form with a local phone number to call if they had ever had any questions or concerns about their participation in the study. In addition, the form was explained to them verbally through an interpreter before signing or giving their thumbprint. For respondents under the age of 18, consent was also obtained from one parent or guardian.

Respondents were interviewed with a truncated and modified version of the Demographic and Health Survey (DHS) tool that was used in Ghana in 2008. The 2008 Ghana DHS was chosen because of its validity and applicability. Questions regarding reproductive history, family planning usage and recognition, maternal health, and fertility preferences were included, among others. A particular focus was directed toward perceived risks for specific types of family planning methods, because these details were excluded in the DHS. Questions regarding possible future interventions were also added. The interview took approximately one hour to complete for each respondent.

The Internal Review Boards at the Komfo Anokye Teaching Hospital, Kwame Nkrumah University of Science and Technology and University of Utah reviewed and approved this study prior to initiation. Microsoft Excel 2007 was used for data entry and storage. The data were double-entered and cleaned in Microsoft Excel 2007 and then imported into STATA Version 10 (StataCorp. 2007. *Stata Statistical Software: Release 10*. College Station, TX: StataCorp LP) for analysis. For open-ended responses, textual data was coded and categorized..

Results

Respondent Characteristics

Eighty-five women aged 16-48 years in the Barekuma Collaborative Community Development Project (BCCDP) area were interviewed, 25 of which were residents of a small peri-urban community, 26 a medium peri-urban community, and 33 a rural community. Table 1 describes the characteristics of women in our study. The mean age of respondents was 28.7 years. The majority of women (52.9 percent) had attended middle school or junior secondary school (JSS) as part of their education. Of our sample, 77.4 percent currently had a partner. The majority of the women were Christian (87.1 percent) and the remaining 12.9 percent were Moslem. The characteristics of our respondents were similar to women interviewed in the 2008 Ghana Demographic and Health Survey (Table 1).

Table 1: Characteristics of 15-49 year old Ghanaian women in the Barekese sub-district included in the study (n=85)

Characteristic	No	%	Ghana DHS[a] %
Community			
Small periurban	25	29.4	
Medium periurban	27	31.8	
Rural	33	38.8	
Age (mean=28.7, median=28, range=16-48)			
15-24	34	40.0	38.7
25-34	25	29.4	30.0
35-49	26	30.6	31.3
Highest level of education attended			
None	9	10.6	21.2
Primary school	22	24.8	20.1
Middle/Junior secondary school	45	52.9	41.5
Senior secondary school or higher	9	10.6	17.2
Has a partner[b] (n=84)			
Yes	65	77.4	58.5
No	19	22.6	41.5
Religion			
Christian	74	87.1	77.6
Moslem	11	12.9	15.0
Other	0	0.0	7.4

[a] *Background characteristics of female respondents of the Ghana Demographic and Health Survey 2008 (nationwide).*
[b] *Defined in the study as "Is currently married, living with a man or has a sexual partner"; defined in Ghana Demographic and Health Survey 2008 as "Is currently married or living* with a man."

Abortion, Pregnancy Intentions and Family Planning Perceptions

Twenty percent of women had had at least one abortion (see Table 2). When asked about their latest or current pregnancy, 44.9 percent were trying to get pregnant at that time, 36.2 percent wanted to wait until later, and 13.0 percent of women did not want any more children. The mean number of live births was 2.6. The average desired number of total children was 3.9.

When asked about knowledge of family planning methods, 65.5 percent of women stated they know where to obtain a family planning method, but only 17.7 percent have been visited by a fieldworker in the last 12 months. Sixty percent of women agreed with the statement that "women who use contraception may become promiscuous" and 40.0 percent of women agreed that "contraception is a woman's business, not a man's". However, nearly all women agreed that "having too many children may be dangerous for a woman", that "it is better not to have more children than they can afford", and that "children in smaller families are more likely to succeed" (Table 2).

Family Planning Recognition, Use and Preferences

Table 3 describes recognition of, ever use, current use and future preference by family planning method among women in our study. Virtually all women recognized at least one family planning method, and three-quarters of them had ever used a method. The majority of women recognized male condoms (95.3 percent), female sterilization (88.2 percent), and injectables (89.4 percent). Daily oral contraceptives (29.4 percent), emergency contraception (27.1 percent), and the rhythm/calendar method (21.2 percent) were the most widely ever used methods. Barrier methods (other than the male condom), intrauterine devices (IUDs), implants and male sterilization had the lowest rates of recognition, as well as ever and current use.

Although 65 women had a partner, 5 of them were not currently sexually active. In total, 25 women (29.4 percent) were at reproductive potential but currently not sexually active, 7 women (8.2 percent) were pregnant at the time of the study, and 2 women (2.4 percent) reported they were in menopause. Therefore, 51 women (60 percent of women) were susceptible to pregnancy at the time of the interview. Of these women, fifty-five percent were currently using a method to delay or avoid pregnancy. The most popular current method among women at risk for pregnancy was oral contraceptives (25.5 percent). The second most popular method was emergency contraception (7.8 percent). The use of emergency contraception was higher than expected, and after further investigation we found that women were misusing Primolut N tablets ("N-tablets") as an emergency contraceptive (see discussion section).

Table 2: Prevalence of abortion, last or current pregnancy intention and family planning perceptions among 15-49 year old Ghanaian women in the Barekese sub-district.

Variables	No	%
Women who have had an abortion (n=85)	17	20.0
Last or current pregnancy intention (n=69)[a]		
Wanted to become pregnant then	31	44.9
Wanted to wait until later	25	36.2
Did not want any more children	9	13.0
Missing data	4	6.0
Family planning perceptions		
Contraception is a woman's business and a man shouldn't have to worry about it (n=85)	34	40.0
Women who use contraception may become promiscuous (n=85)	51	60.0
Having too many children may be dangerous for a woman (n=84)[b]	77	91.7
It is better not to have any more children than we can afford (n=84)[b]	81	96.4
Children in smaller families are more likely to succeed (n=84)[2]	82	97.6

[a]Sixty-nine women had a previous pregnancy or were currently pregnant and sixteen of them had not been pregnant before; [b]Missing data for one respondent.

When asked about potential future usage, 85.9 percent of respondents stated they intend to use

Table 3: Recognition, ever use, current use and future preferences of family planning methods among 15-49 year old Ghanaian women in the Barekese sub-district (n=85)

	Recognizes		Ever use		Current use[a]		Future preferences	
Family planning method	#	%	#	%	#	%	#	%
Female sterilization	75	88.2	0	0.0	0	0.0	14	16.5
Male sterilization	17	20.0	1	1.2	0	0.0	1	1.2
Pill	71	83.5	25	29.4	13	25.5	30	35.3
Intrauterine device[b]	48	56.4	0	0.0	0	0.0	0.0	0.0
Injectable	76	89.4	13	15.3	2	3.9	17	20.0
Implant	64	75.3	3	3.5	1	2.0	4	4.7
Condom	81	95.3	15	17.6	2	3.9	11	12.9
Female condom	59	69.4	0	0.0	0	0.0	0	0.0
Diaphragm	14	16.5	0	0.0	0	0.0	1	1.2
Foam or jelly	20	23.5	2	2.4	0	0.0	3	4.7
Rhythm/calendar	61	71.8	18	21.2	2	3.9	15	17.6
Withdrawal	56	65.9	17	20.0	3	5.9	7	8.2
Lactational amenorrhea method (LAM)	35	41.2	9	10.6	3	5.9	4	4.7
Emergency contraception[c]	63	74.1	23	27.1	4	7.8	10	11.8
Total	84	98.8[d]	63	74.1[e]	28[f]	54.9	73[g]	85.9

[a] Percent reported is out of 51 women who were susceptible to pregnancy at the time of the interview. Twenty-five women in our sample were not currently sexually active, 7 women were pregnant, and 2 were in menopause.
[b] Missing one value for IUD recognition. Percent reported is out of 84.
[c] Primolut N or "N-tablets"
[d] Percent of respondents who recognized at least one family planning method.
[e] Percent of respondents who had used at least one family planning method in their lifetime.
[f] Two respondents reported using 2 methods together. Therefore, the total number for currently using is 28, not 30.
[g] Many respondents reported 2 or more preferred methods. Seventy-three respondents stated that they think they will use a contraceptive method to delay or avoid pregnancy at any time in the future.

some form of family planning, with oral contraceptives (35.3 percent), injectables (20.0 percent) and rhythm/calendar methods (17.6 percent) being the most popular preferred future methods.

Family Planning and Health Services Availability and Accessibility

When asked if they knew of a place to obtain a family planning method, 66.3 percent of women said they knew where to obtain a method. For health services in general, only 14.3 percent of women cited it was a "big problem" to get permission to go the health clinic and only 15.5 percent said that distance was a "big problem" in seeking healthcare. Money seemed to be a larger barrier than permission or distance as 33.3 percent of women said money was a "big problem" in obtaining care. Women's major concern was that there "would not be a provider available" (60.7 percent) and that "drugs may not be available" (61.4 percent).

Reasons for Not Wanting to Use Family Planning Methods

We also asked women open-ended questions about why they would choose to not use specific family planning methods in the future. Table 4 summarizes the common reasons why women would not use a particular method. The top reason stated for women not wanting to use hormonal methods was a fear of side effects; nearly a third of women cited side effects as a reason they wouldn't use oral contraceptives, intrauterine devices (IUDs), injectables, or implants. Women were particularly afraid of heart palpitations.

Other side effects cited were that hormonal methods would affect menstrual cycles, cause

Table 4: Common reasons why 15-49 year old Ghanaian women in the Barekese sub-district would not use family planning methods in the future (n=85)

Family planning method	Top reason	No	%	2nd reason	No	%	3rd reason	No	%
Female sterilization	Wants more children	44	51.8	But would consider when family complete	22	25.9	May fall sick with operation	9	10.6
Male sterilization	Man's decision or man against	32	37.6	Wants more children	30	35.3	But would consider when family complete	8	9.4
Pill	Fear of side effects	27	31.8	Have to take everyday	14	16.5	Unfamiliar	6	7.1
Intrauterine device	Fear of side effects	26	30.6	Unfamiliar	24	28.2	Afraid of insertion and/or doesn't want it inside her	11	12.9
Injectable	Fear of side effects	24	28.2	Afraid of needles	16	18.8	Unfamiliar	10	11.8
Implant	Fear of side effects	24	28.2	Unfamiliar	15	17.6	Lost in body and/or doesn't want under skin	14	16.5
Condom	Can tear/burst	28	32.9	Man's decision or man against	15	17.6	Intercourse not as enjoyable	11	12.9
Female Condom	Unfamiliar	30	35.3	Can tear	17	20.0	Intercourse not as enjoyable or condom is too big	14	16.5
Diaphragm	Unfamiliar	42	49.4	Difficult to place exactly	9	10.6	Can get lost inside	4	4.7
Foam or Jelly	Unfamiliar	35	41.2	Slippery and/or men don't like it	14	16.5	Doesn't want it inside her and/or may affect vagina	8	9.4
Rhythm/Calendar	Not confident in ability to count	34	40.0	Unfamiliar	15	17.6	Not effective	5	5.9
Withdrawal	Man's decision or man against	15	17.6	Unfamiliar	11	12.9	Not effective	10	11.8
Lactational Amenorrhea	Unfamiliar	40	47.1	Doesn't experience amenorrhea or exclusively breastfeed postpartum	13	15.3	Not effective	10	11.8
Emergency Contraception[a]	Not effective	15	17.6	Unfamiliar	13	15.3	Fear of side effects	8	9.4

[a] *Primolut N or "N-tablets"*

dizziness, weight gain or loss, and that IUDs and implants were painful. Most women described the specific side effects they feared, but some women simply commented that they would fall sick. Other side effects mentioned were that IUDs, implants and diaphragms would be lost inside the body. Only 5.9% of women mentioned that hormonal methods may cause permanent sterility.

Women also mentioned particular aspects they did not like for most methods that were not their preference. For female sterilization, 51.8 percent stated they would like more children (but 25.9 percent would consider this method when their family is complete). With pills, 16.5 percent of women doubted their ability to remember to take a pill every day. For injectables, 18.8 percent of women were afraid of needles. With condoms, 12.9 percent of women cited that intercourse would not be as enjoyable. With IUDs, implants, diaphragms, and spermicides, some women were uncomfortable with the idea of having something inside of their body.

Non-literate women were concerned about their ability to use the rhythm/calendar method; 40.0 percent of women stated that they would not be able to count the days correctly with a calendar. Nearly half of women would not use lactational amenorrhea method because they were unfamiliar with it. For all traditional methods, 6-12 percent of women cited that they were not effective in preventing pregnancy.

Women mentioned that it would be the man's decision or that the man was opposed to three methods: male sterilization (37.6 percent), condoms (17.6 percent) and withdrawal (17.6 percent). A third of women were afraid of condoms tearing or bursting.

Lastly, the most common reason for which women would not use emergency contraception was because they believed it was not effective. Several of the women who cited this had experienced Primolut N's ineffectiveness themselves, which resulted in an abortion or unwanted pregnancy. Fifteen percent stated they would not use it because they were unfamiliar with the method and only a few women were afraid of possible side effects.

It is also important to consider that unfamiliarity was one of the top three reasons for which women would not use 11 of the 14 methods. Unfamiliarity did not necessarily mean that women did not recognize a method. Although women may have had heard about a specific method, they often stated that they did not know enough about the method and therefore would not choose it.

Interest in Possible Family Planning Interventions

Women were also asked questions about their interest in possible family planning interventions. One respondent could not finish the interview, which means a total of 84 women were asked questions regarding this topic. Nearly all women (92.8 percent) were interested in learning more about contraceptives, including their side effects, and would be interested in a toll-free number they could call to seek advice on contraceptives (92.8 percent). Three-quarters of women were also interested in learning more about new methods of natural family planning including using beads on a string to count days of fertility and infertility (Standard Days Method® using CycleBeads®) and recognizing their body's signs for fertility and infertility (Two-day Method®). Only 35.7 percent of women were interested in an injectable contraceptive they could administer themselves.

Discussion

Effective family planning programs are associated with decreases in maternal mortality and morbidity, especially among adolescent women, infant mortality and abortions.[6] The goal of conducting this study was to preliminarily explore family planning knowledge, attitudes and practices from the perspective of reproductive age women in the Barekese sub-district in order to inform potential future family planning activities. Through the study, we were able to (1) explore specific reasons why women did not want to use family planning methods, by type of method, (2) identify which family planning methods women recognized, had ever used and currently use, (3) understand pregnancy intentions and family planning perceptions, and (4) explore interest in potential family planning interventions. However,

our main research finding was unexpected. We determined that women were misusing Primolut N or "N-tablets" as emergency contraception. We will address the other findings following a discussion of Primolut N.

Misuse of Primolut N or "N-tablets"

Twenty-seven percent of women reported using "N-tablets", the common name for Primolut N tablets (a pill containing 5 mg of synthetic progesterone called norethisterone or norethindrone), as emergency contraception even though it is not a WHO-recommended regimen.[7] A literature review identified one report of the use of ethinyl estradiol *and* norethisterone together as an emergency contraceptive method and was comparably effective to the combined use of ethinyl estradiol and levonorgestrel (called the Yuzpe regimen).[8] In the 2011 update to *Family Planning: A Global Handbook for Providers*, the use of ethinyl estradiol *and* norethisterone together have been included as an emergency contraceptive method.[9] However, to our knowledge, no study has been conducted to determine the effectiveness of using a norethisterone-*only* pill for emergency contraception and, to our knowledge, no health organization or agency has recommended its use.

Furthermore, women reported using "N-tablets" as a primary method of family planning, as opposed to being used for cases of emergency, such as failure of the primary method or sexual assault. Even if women were using true emergency contraception, the WHO does not recommend emergency contraception for regular use given that it is not as effective as primary methods of family planning.[7] Regular use of emergency contraception has been found in Accra, Ghana, as women cited they preferred emergency contraception over other family planning methods due to a fear of side effects and dislike of other methods.[10] However, family planning providers in Kumasi, Ghana, were found to be in need of further training to improve knowledge about emergency contraceptives.[11]

Primolut N tablets, as noted on the manufacturer leaflets found online, are meant to be used to regulate menstrual cycles, dysmenorrhea and endometriosis.[12-14] The progesterone in Primolut N tablets, norethisterone, is also used in the mini-pill (i.e., Micronor) at a 0.35 mg daily dose.[15] Norethisterone tablets (5 mg) are included on the Ghana Essential Medicines List as a progestogen and should be only available at regional or teaching hospitals.[16] However, we found these tablets are being dispensed without a prescription at unregulated chemical shops, drug stores or pharmacies with inconsistent instructions on how to take them. A recently published study confirms this finding; only 3 percent of respondents who asked for Primolut N at pharmacies in Kumasi had a prescription for the drug.[17] Furthermore, 94 percent of respondents in this study who asked for Primolut N at pharmacies did so for contraceptive purposes and requested the drug differently in terms of dosage and timing of intercourse (before and/or immediately after).[17]

Another study reported that 4 percent of 'at-risk' women (aged 18-35 who had at least 3 coital acts per week and two sexual partners in the last three months) in Kumasi in 2009 were using Primolut N as an emergency contraceptive.[18] Our study found a higher rate of current use (7.8 percent) and a high ever use rate (27.1 percent), which may mean that the rate of use has increased from 2009 to 2010 and/or that the prevalence is higher than previously reported. Furthermore, our study took place in peri-urban and rural areas of Kumasi, suggesting that Primolut N misuse has spread out further from the Kumasi metropolitan area.

The misuse of Primolut N tablets had real consequences for the women who take them. In our study, we found that several women noted "N-tablets" were ineffective for them, resulting in unwanted pregnancies and in some cases abortion. Twenty percent of women had at least one abortion in their lifetime, which is comparable to the 20.8 percent reported by women in the Ashanti Region in the 2007 Ghana Maternal Health Survey.[19] The misuse of medication as an emergency contraception and abortion are indicators that family planning programs need improvement in the area.

Fear of Side Effects

The unwillingness of some women to use family planning can be attributed to fear of side effects as well as particular aspects that women did not like about methods (i.e., needle injection, something under their skin or uterus, intercourse not being as enjoyable, fear of forgetting to take a pill every day, fear of insertion of IUD or implants, etc.). Many of the side effects women mentioned, such as heart palpitations, dizziness, and weight gain, are possible with family planning methods.[9] The reason why heart palpitations was commonly cited is not known, but it could be that women are not being appropriately screened for high blood pressure before receiving a hormonal contraceptive and therefore actually experiencing higher rates of this side effect. It also could be that a few women may have experienced heart palpitations and the story has been magnified as it has been passed along; women often cited that she heard that someone had taken a method and had experienced a side effect and therefore did not want to take it herself. Other side effects mentioned were misconceptions or rumors, but these were less common than expected.

Side effect fears of family planning methods were also a challenge for Ghana's national promotional campaign of family planning, *Life Choices*, during 2000-2005.[20] Although the campaign recognized the need to address side effect fears and incorporated this into activities, an evaluation of this objective found that the campaign had only a small, and somewhat ambiguous, effect on attitudes. The evaluation did not, however, do a thorough investigation into side effect fears, but rather asked women and men if they agreed with one side effect statement: "A girl who uses family planning before her first child can become infertile," which was not a common concern in our study. The evaluation concluded that continued effort is needed to tackle side effect concerns, as well as the lack of spousal/partner communication regarding family planning and the belief that social norms do not support the use of family planning. Data from the Ghana Demographic and Health Survey from the last 10-15 years also has found that side effect fears are the main reason that women who want to prevent pregnancy are not using modern contraceptive methods.[1, 21]

Male Contraceptives

We found low rates of condom use, although this concurs with other data; only 4 percent of married women or women in union reported currently using condoms in Ghana in 2008 and married women in sub-Sahara Africa have reported lower rates of condom usage than men have.[22, 23] The primary reason for not wanting to use condoms was condom failure (breaking), which may suggest better education as how to correctly use condoms. The second most cited reason was that condom usage was the decision of the male partner. The fear of condom failure may be particular to Ghana; in a report regarding the reasons for non-use of condoms in eight countries in sub-Saharan Africa, trust of their partner or dislike of condoms was frequently reported by women in Luanda (Angola), urban Cameroon and urban Zambia, with the next common response being partner objection.[24]

While most women at least recognized condoms, the same was not true for male sterilization. Only 20.0 percent of women recognized male sterilization as a family planning method even though 88.2 percent of women recognized female sterilization. After describing male sterilization to women, male decision-making was the number one reason why women cited they would not consider male sterilization.

While our study did not include men due to resource constraints, we recognize that more men need to be included in family planning research as well as education and outreach programs.

Fertility Awareness-Based Methods

Recognizing that fears of side effects was likely a barrier for women to use family planning in the Barekese sub-district, our study explored fertility awareness-based methods. For the calendar method, most women were not confident in their ability to calculate the days of fertility and infertility. However, many stated that they would consider a natural method in the future because of the lack of side effects. A possible intervention could include modern fertility awareness-based

methods, including the Standard Days Method® (CycleBeads®), which can be used by women with regular menstrual cycles to track her days of fertility and infertility by moving a ring down a string of color-coded beads. This method is 95 percent effective if used correctly[25] and has been successfully implemented as part of the method mix in other African nations such as Rwanda[26] and Uganda.[27] In our study, when women were asked if they would be interested in such a method, 76.2 percent expressed an interest.

Desire for Better Information

An overwhelming majority of women expressed an interest in gaining better information about contraceptives, including their side effects. In particular, women were interested in being able to call a toll-free phone number to seek advice on family planning. There is evidence that this intervention could be successful; in the Democratic Republic of Congo a toll-free hotline for contraceptives was launched in 2005 and received 80,000 calls in a three year period.[28]

Strengths and Limitations

The limitations to our study include convenience sampling and a relatively small sample size that may not be entirely representative of the communities. Additionally, we were not able to isolate women for private interviews; a number of interviews were conducted with other people nearby, listening in and occasionally commenting on questions. We were unable to interview men, which limit our study to only a female perspective.

However, our study had several strengths. The majority of our questions came from the validated Demographic and Health Survey that was used in Ghana in 2008. The survey also included in-depth and open-ended questions and thus had a strong qualitative component. We also encountered very high participation rates.

Conclusion

Our study found several family planning issues in the Barekese sub-district that, if addressed effectively, could improve maternal health. Interventions should consider regulating and implementing the correct use of Primolut N tablets, better training of community health nurses regarding the management of family planning side effects as well as how to dispel rumors of perceived side effects, proper education of family planning among reproductive age women, an increase in family planning outreach activities, including men in family planning, introduction of modern methods of fertility awareness such as Standard Days Method® and the Two-day Method®, and an implementation of a toll-free phone number that women could use to seek advice on family planning. In the future, we hope that our efforts through the Barekuma Collaborative Community Development Project will increase family planning use and knowledge among women in the Barekese sub-district.

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Authors Guarantee Form

All authors named have contributed sufficiently to the work submitted. DKR participated in study design and questionnaire development, collected and entered data, performed the analysis, and drafted the manuscript. DA participated in study design and questionnaire development, helped develop the BCCDP, assisted in data collection, and revision of the manuscript. EO participated in study design and questionnaire development, and revision of the manuscript. ST participated in study design and questionnaire development, collected and entered data, and revision of the manuscript. DK participated in study design and questionnaire development, collected and entered data, and revision of the manuscript. IB participated in study design and questionnaire

development, assisted in data collection, and revision of the manuscript. TD participated in study design and questionnaire development, assisted in data collection and revision of the manuscript. BC participated in study design and questionnaire development, assisted in data collection, served as mentor for DKR and the study team, assisted in the analysis of data, and revision of the manuscript.

The content of the manuscript has neither been previously published nor being considered for publication elsewhere.

Competing Interests

The authors declare that they have no competing interests.

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