



Trajectories of contraception before pregnancy and after medication abortion among women accessing clinic vs pharmacy services in Ghana

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ABSTRACT

Objectives: This study examined contraceptive use before pregnancy and after medication abortion (MA) among clinic and pharmacy clients in Ghana, and factors linked to modern contraceptive uptake post-MA.

Methods: Data were drawn from a non-inferiority, prospective study of 1,974 women who obtained MA with misoprostol and mifepristone from pharmacies (n = 929) and clinics (n = 1,045) in Ghana. Descriptive statistics were generated to assess contraceptive use before pregnancy and after MA, whereas binary logistic regressions were fitted to examine the factors associated with modern contraceptive uptake post-MA.

Results: Overall, non-use of contraception increased from 57 % before pregnancy (n = 1123) to 66 % post-MA (n = 1293), a trend driven by pharmacy clients. While 55 % (n = 344) of the clinic clients who were not using any contraceptive method before pregnancy remained non-method users post-MA, 86 % (n = 434) was the case for the pharmacy group. Additionally, of the non-method users who switched to any contraceptive method after MA, a higher share of the clinic group (n = 274, 44 %) used modern contraceptive methods compared to the pharmacy group (n = 58, 12 %). The regression results revealed that receiving information on contraception and accessing MA from clinics significantly increased the odds of adopting modern contraception after MA.

Conclusions: A relatively greater share of women who accessed MA in pharmacies did not use any contraceptive method following the abortion. Additionally, receiving contraception information enhanced modern contraception adoption after MA. Findings highlight the need to develop programmes and strategies to expand the provision of contraception information to women seeking MA, including those using the pharmacy route.

Background

Unsafe abortion is among the leading causes of maternal deaths in many developing countries [1]. Approximately 97 % of unsafe abortions worldwide occur in the developing world [1,2]. A combination of factors, including legal restrictions, stigma and the high cost of abortion services, impede access to safe abortion in the developing world [3]. Studies show that medication abortion (MA) is an effective approach to enhancing access to safe abortion [4,5], especially in settings where there are legal restrictions and socio-cultural impediments. The use of misoprostol with or without mifepristone for ending pregnancies is generally safe and effective [6–8].

In Ghana, the abortion law allows women to end pregnancies in hospitals and clinics (hereafter referred to as clinics) in cases of rape,

incest, fetal impairment, or risks to their health [9–11]. However, Ghana Health Service's standard protocols do not require women to show any evidence to obtain abortion services [12], making abortion access relatively liberal in practice in the country. Although pharmacies are not legally sanctioned to provide abortion services, in practice, some pharmacies offer MA services without prescriptions. Women who access MA from pharmacies are less likely to receive information on postabortion contraception since the pharmacies are operating outside their mandate [13].

The current WHO guidelines on abortion care recommend self-management of abortion (in whole or in part) at <12 weeks gestation with MA pills from a broad cadre of trained health providers, including pharmacy workers, pharmacists and community health workers [6]. In addition, the guidelines recommend the provision of comprehensive

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abortion care (CAC) by these workers, including counselling on contraception and provision of a broad array of methods for women to choose [6]. This is crucial for averting subsequent unintended pregnancies and reducing deaths associated with unsafe abortions [14,15]. Women who receive quality CAC and do not intend to become pregnant again shortly are more likely to adopt contraception following abortion immediately [16,17]. Providing counselling sessions tailored to the specific contraception needs of abortion clients may require understanding the history of their contraceptive use before pregnancy.

Previous studies in sub-Saharan Africa (SSA) have documented the characteristics of women more likely to utilise contraceptives after abortion [18–21]. For example, Wake et al. [19] showed that Ethiopian women who received counselling on contraception and those with a history of family planning adoption have higher odds of using contraceptives after abortion. A similar study in Bahir Dar, Ethiopia found that unmarried women, those who previously had an abortion and women who have a history of using contraceptives are more likely to use contraceptives after terminating a pregnancy [18]. In Nigeria, women who obtained abortion care from clinics are more likely to adopt a contraceptive method [21].

However, the contraceptive use behaviour of women before pregnancy and after MA is under-researched, especially in SSA. Although Agula et al. [22] studied before and after abortion contraceptive use, the scope was limited to poor urban settlements in Accra, Ghana. Moreover,

the contraceptive use behaviour of women who accessed MA from pharmacy versus clinic providers has not been studied. This study contributes to the body of abortion literature by examining women’s contraceptive use immediately preceding pregnancy and after MA, as well as the factors associated with modern contraceptive use following MA from pharmacies and clinics in Ghana. We hypothesised that receiving contraception information before MA would increase the likelihood of adopting modern methods after abortion.

Data and methods

Study area

This study utilised secondary data from an earlier study, which was implemented in the Greater Accra, Western (now Western and Western North), Eastern and Ashanti regions of Ghana by the Regional Institute for Population Studies (RIPS) and Ipas International [23]. These regions were selected for their high prevalence of abortion and ethnic diversity [24]. See Fig. 1 for the map of Ghana with the study regions and the analytic sample.

Design

The study employed a prospective non-inferiority design to recruit

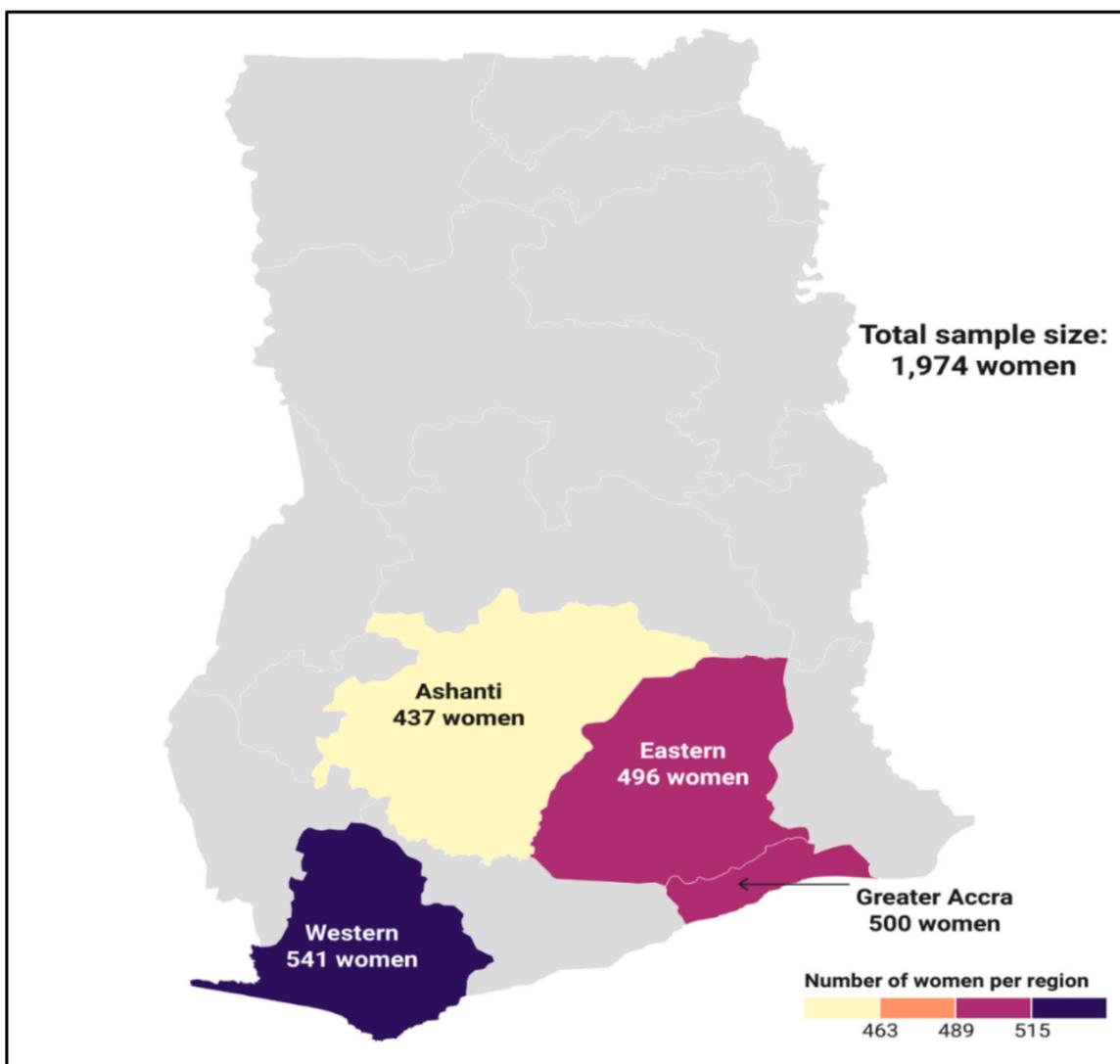


Fig. 1. A map of Ghana with study regions and the analytic sample.

women who accessed MA from selected pharmacies and clinics in the four regions. Three follow-up surveys were conducted at 3, 10 and 30 days post-recruitment. The 3-day survey confirmed whether women had initiated the termination process by taking the pills, while the subsequent surveys assessed their experiences with the medication. Full details of the design and methodology have been published elsewhere [23,25,26].

Sample size

The sample size was determined using a binary non-inferiority design, with adjustments for cluster effects and potential attrition. This resulted in a required sample of 1981 women, of whom 1974 (1045 from clinics and 929 from pharmacies) with complete follow-up data were included in the analysis. Full details of the sample size determination are reported elsewhere [23,25,26].

Sampling procedure

The study recruited only clinics and pharmacies that offered MA with Miprist and MM Combi Kit. Facilities were recruited through exploratory visits by the research team with support from the Ghana Health Service, Marie Stopes (MS) Ghana Reproductive Choices and the Pharmacy Council. Eligibility required the provision of MA (without a doctor's prescription in the case of pharmacies) and adequate service demand. Exit interviews were conducted with consenting women (<9 weeks of pregnancy gestation) who independently accessed MA at these facilities. Trained research assistants recruited participants at the point of exit, collected baseline information, and created secure identifiers for follow-up phone interviews. Full details of recruitment procedures and eligibility criteria are reported elsewhere [23,25,26].

Data collection

Data for the study were collected electronically using tablets programmed with a questionnaire on CommCare software, previously used in a similar study in Cambodia [27] and piloted in Ghana for contextual appropriateness. Data collection occurred in two periods (December 2019-March 2020 and July 2020-April 2021), with a pause due to the COVID-19 pandemic. The interviews covered various domains, including women's socio-demographics, geographic location, MA access costs, pregnancy information, experiences after MA, provider choice, and contraceptive use immediately before pregnancy and after MA. The questionnaire was pre-tested to ensure reliability and validity. While initial recruitment was conducted face-to-face, all follow-up interviews were conducted via phone. Full details of data collection are reported elsewhere [23,25,26].

Measures

The outcome variable for this study is modern contraceptive utilisation following MA. In the final follow-up interview, women were asked "Are you currently using a contraceptive method?". At that point, the women already had their pregnancies terminated. Those who responded "yes" and indicated using either an oral contraceptive pill (OCP), condom, intrauterine device (IUD), injectable, implant, lactational amenorrhea method (LAM), emergency contraceptive (EC) or diaphragm were considered utilizing a modern method. Women who responded "no", as well as those who indicated using withdrawal or herbs were considered not utilizing a modern method.

The independent variables included in the regression models are age (<20, 20–24, >24 years), education (no education, primary, middle/junior high school, senior high school, tertiary/higher), marital status (currently in union, formerly in union, never in union), number of live births (0, 1, ≥2), occupation (professional/managerial, service, skilled manual, unskilled manual, student, unemployed), previous abortion

history using medication method (yes, no), previous abortion history using procedure method (yes, no), use of modern contraceptive before recent pregnancy (yes, no), receipt of contraception information before MA (yes, no) and the type of MA provider (clinic, pharmacy). These variables were selected based on existing literature regarding post-abortion contraceptive use in SSA [18–22].

Analysis

Descriptive statistics were generated to examine contraceptive use immediately before pregnancy and following MA. The analysis was conducted from two perspectives: 1) a cross-sectional view of the specific contraceptive methods women used before pregnancy and after MA, and 2) an individual-level view tracking each woman's method-use behaviour to understand patterns of method switching. Additionally, three binary logistic regression models were estimated to examine the factors associated with modern contraceptive use following MA. The first model was estimated using the entire sample. To further understand the factors associated with post-MA modern contraceptive use in clinics and pharmacies, separate regressions were run.

Results

Socio-demographic characteristics of women

Table 1 presents women's background characteristics for the entire sample and segregated by provider type. Results indicate that approximately 10 % (n = 198) of the women were aged 20 and younger, with about 55 % (n = 109) accessing MA in clinics. Most women (n = 1361, 69 %) were not in a union with a partner. Almost all the women reported having some form of formal education. A little over a third (n = 703, 36 %) of them indicated having a tertiary or university level of education. Of those with at least a tertiary education, 69 % (n = 483) were clinic clients. Results further indicate that 58 % (n = 1145) of the women were nulliparous while the rest had at least one live birth. Most of the women (n = 1343, 68 %) also reported having a job and the remaining were students (n = 379, 19 %) and unemployed (n = 252, 13 %).

Women's abortion history and contraception information before recent pregnancy

Results further indicate that 21 % (n = 421) of the women previously ended pregnancy using any medication method, with 59 % (n = 248) of them accessing the service in pharmacies (see Table 1). Notably, before the recent pregnancy, seven in ten (n = 1373) of the women were not using any modern contraceptive method. Although a little over half (n = 1021, 52 %) of the sample received information on contraception before their recent abortion, the majority (n = 961, 94 %) of them were clinic clients, while 6 % (n = 60) were pharmacy clients.

Contraceptives women used before pregnancy and after MA

Figs. 2 and 3 provide cross-sectional information on the specific contraceptive methods women used before becoming pregnant and after MA for the entire sample and by provider type, respectively. Before pregnancy, 57 % (n = 1123) of the women did not use any contraceptive method, which increased to 66 % (n = 1293) after MA (see Fig. 2). A breakdown analysis shows that this rise in non-use was largely driven by pharmacy clients (see Fig. 3). While approximately 59 % (n = 614) of clinic clients were not using any method after MA, the proportion was higher among pharmacy clients (n = 679, 73 %). Notably, the share of non-method users in the clinic group decreased slightly by 0.67 percentage points after MA whereas a 19-percentage-points increase was observed among the pharmacy group. The methods women mainly used immediately before pregnancy were EC (n = 415, 21 %), followed by withdrawal (n = 154, 8 %). However, after MA, injectables (n = 252, 13

Table 1
Socio-demographic attributes, abortion history and contraception information of women, and by type of provider.

| Variable | Total sample (n; %) | By type of MA provider | |
|---|---------------------|------------------------|-----------------|
| | | Clinic (n; %) | Pharmacy (n; %) |
| Age category** | | | |
| <20 | 198 (10.0) | 109 (55.1) | 89 (44.9) |
| 20–24 | 716 (36.3) | 402 (56.2) | 314 (43.8) |
| >24 | 1060 (53.7) | 534 (50.4) | 526 (49.6) |
| Educational level*** | | | |
| No formal education | 33 (1.7) | 14 (42.4) | 19 (57.6) |
| Primary | 78 (4.0) | 33 (42.3) | 45 (57.7) |
| JHS/middle school | 423 (21.4) | 170 (40.2) | 253 (59.8) |
| SHS/secondary | 737 (37.3) | 345 (46.8) | 392 (53.2) |
| Tertiary/university | 703 (35.6) | 483 (68.7) | 220 (31.3) |
| Marital status*** | | | |
| Currently in union | 563 (28.5) | 286 (50.8) | 277 (49.2) |
| Formerly in union | 50 (2.5) | 13 (26.0) | 37 (74.0) |
| Never in union | 1361 (69.0) | 746 (54.8) | 615 (45.2) |
| Number of live births*** | | | |
| No live birth | 1145 (58.0) | 679 (59.3) | 466 (40.7) |
| One live birth | 356 (18.0) | 152 (42.7) | 204 (57.3) |
| Two or more live births | 473 (24.0) | 214 (45.2) | 259 (54.8) |
| Occupation*** | | | |
| Professional/managerial | 359 (18.2) | 224 (62.4) | 135 (37.6) |
| Sales/service | 560 (28.4) | 248 (44.3) | 312 (55.7) |
| Skilled manual | 221 (11.2) | 121 (54.8) | 100 (45.2) |
| Unskilled manual | 203 (10.3) | 88 (43.4) | 115 (56.6) |
| Student | 379 (19.2) | 223 (58.8) | 156 (41.2) |
| Unemployed | 252 (12.7) | 141 (55.9) | 111 (44.1) |
| Previously had abortion(s) using MA pills*** | | | |
| Yes | 421 (21.3) | 173 (41.1) | 248 (58.9) |
| No | 1,553 (78.7) | 872 (56.2) | 681 (43.8) |
| Previously had abortion(s) using surgical procedure | | | |
| Yes | 198 (10.0) | 98 (49.5) | 100 (50.5) |
| No | 1,776 (90.0) | 947 (53.3) | 829 (46.7) |
| Used modern contraceptive method before recent pregnancy*** | | | |
| Yes | 601 (30.5) | 308 (51.3) | 293 (48.7) |
| No | 1373 (69.5) | 737 (53.7) | 636 (46.3) |
| Received information on contraception before MA*** | | | |
| Yes | 1021 (51.7) | 961 (94.1) | 60 (5.9) |
| No | 953 (48.3) | 84 (8.8) | 869 (91.2) |
| Observations | 1974 | 1045 | 929 |

Chi-square test: *** $p < 0.01$, ** $p < 0.05$
MA-Medication abortion, JHS-Junior High School, SHS-Senior High School, n-Number of women

%) and OCPs (n = 124, 6 %) were mainly used (see Fig. 2). Further analysis shows that the observed shift to injectables and OCP after MA was predominantly driven by clinic clients (see Fig. 3).

To gain deeper insights, an analysis of the switching patterns in methods used before pregnancy and after MA was conducted (see Table 2). This analysis followed each woman over one month to track the method used after MA. The results indicate that 86 % (434/502) of women who obtained MA from pharmacies and were not using any method before pregnancy continued not to use any method after the MA. Among the remaining non-users, some switched to adopting injectables (n = 18, 3.6 %) and EC pills (n = 18, 3.6 %), followed by OCPs (n = 12,

2.4 %), condoms (n = 8, 1.6 %), withdrawal (n = 7, 1.4 %), rhythm (n = 2, 0.4 %), implants (n = 2, 0.4 %) and herbs (n = 1, 0.2 %).

In contrast, 55 % (344/621) of clinic clients who were not using any method before pregnancy continued not to use any method after the abortion. However, a relatively larger proportion (n = 274, 44 %) of the remaining women switched to modern methods – injectables (n = 149, 24.0 %), OCPs (n = 57, 9.2 %), implants (n = 52, 8.4 %), IUDs (n = 8, 1.3 %), condoms (n = 4, 0.6 %) and EC (n = 4, 0.6 %).

Furthermore, results reveal that a substantial share of pharmacy clients who reported using modern hormonal methods, such as OCPs, injectables and implants, before pregnancy switched to no method after MA. Specifically, 74.4 % (n = 32), 84.0 % (n = 21) and 60.0 % (n = 3) of OCP, injectable and implant users before pregnancy, respectively, switched to no method after MA.

In addition, women who were using traditional methods, such as rhythm, withdrawal or herbal concoctions, before pregnancy often switched to either no method, EC or another traditional method after MA, regardless of where the service was obtained.

Factors associated with modern contraceptive use after MA

Table 3 presents multivariate logistic regression results for the factors associated with modern contraceptive use following MA. Three separate regression models were performed: Model 1 used the total sample while Models 2 and 3 focused on the clinic and pharmacy groups.

Results indicate that receiving contraception information before MA significantly increased the likelihood of using modern contraceptive methods after MA. Women who received such information were 2.3 times as likely to adopt a modern contraceptive method after MA compared to those who did not (AOR = 2.3, $p < 0.01$) (see Model 1 of Table 3). Similarly, compared to non-users, women who used modern methods before pregnancy were more likely to adopt a modern method following the termination (AOR = 1.5, $p < 0.01$). Clinic clients also had a 50 % higher chance of using a modern method after MA than pharmacy clients (AOR = 1.5, $p < 0.05$).

Additionally, certain socio-demographic characteristics such as education, number of live births and occupation are significantly associated with post-MA modern contraception (see Model 1). Women with tertiary or university education were more likely to utilise modern contraception after MA compared to those with no education (AOR = 2.6, $p < 0.01$). The odds of using modern methods after MA were also higher for women with one (AOR = 1.6, $p < 0.01$) or two and more live births (AOR = 2.0, $p < 0.01$), compared to those with no live births. In addition, women engaged in skilled manual jobs were twice as likely to use modern contraception after MA compared to unemployed women (AOR = 2.0, $p < 0.01$).

The breakdown analysis by provider type reveals that the clinic group largely drove the results regarding contraception information and occupation. For example, among the clinic clients, those who received contraception information were 6.1 times as likely to use modern methods after MA (see Models 2). However, this was not the case among the pharmacy group, as receiving such information is not significantly associated with post-MA modern contraceptive utilisation (see Model 3).

On the other hand, the pharmacy group largely influenced the results on the use of modern contraceptive methods before pregnancy. Those in that group who used modern contraception before pregnancy were 2.3 times as likely to utilise modern contraception after MA (AOR = 2.3, $p < 0.01$) (see Model 3). In addition, results for the pharmacy group indicate that women who previously ended pregnancy using a surgical procedure before the recent MA were more likely to adopt modern contraception after MA (AOR = 2.7, $p < 0.01$) (see Model 3).

Women's age and marital status were not significantly associated with post-MA contraceptive utilisation.

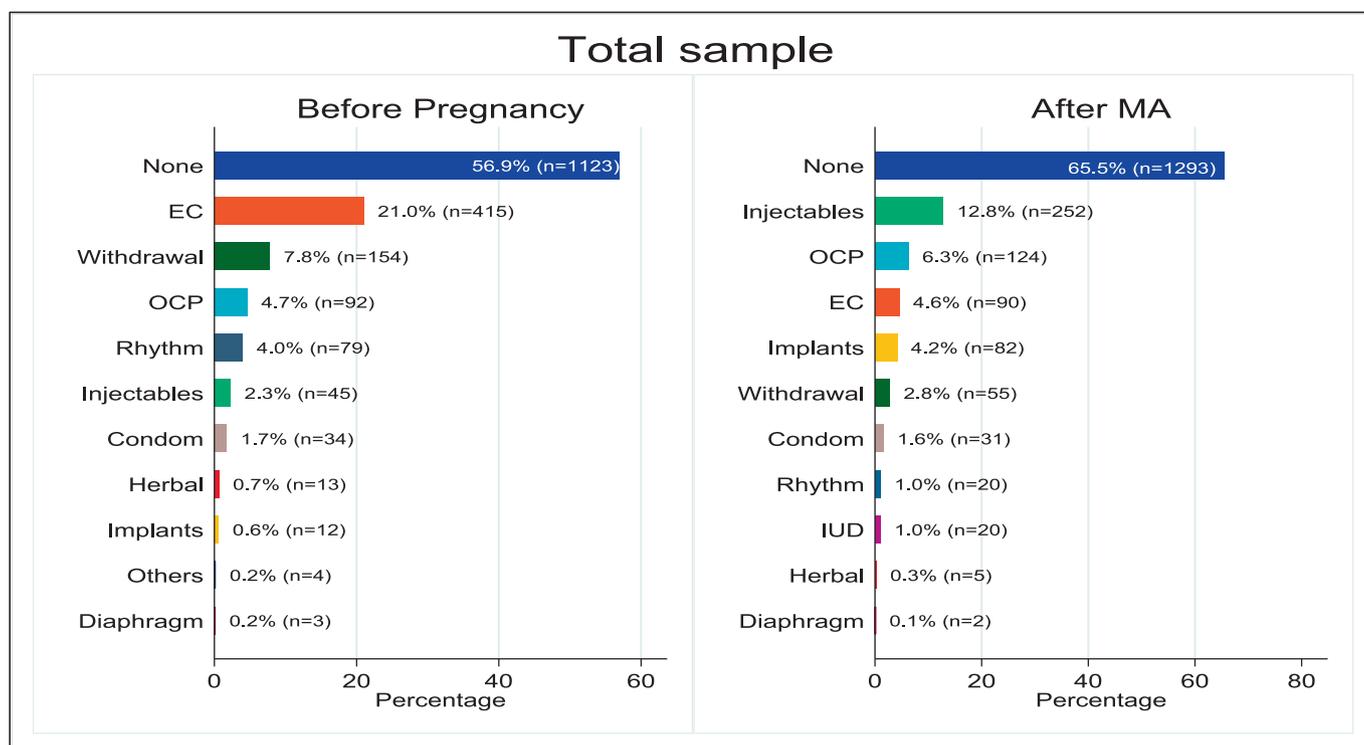


Fig. 2. Contraceptive methods used before pregnancy and after MA-total sample.

Discussion

This study found that 57 % of women who had undergone MA were not using any contraceptive method before becoming pregnant. Moreover, the method users primarily relied on EC pills and withdrawal. Though these methods may reflect what they prefer, such methods are associated with high failure rates, often stemming from either ineffective or poor timing of use [28,29].

In addition, 55 % of clinic clients and 86 % of pharmacy clients who were not using any contraceptive method before pregnancy continued not to use any method afterward MA. Although the fertility intentions of these women are unknown, the risk of having another unintended pregnancy and abortion is high. The literature indicates that half of women who terminate pregnancy become sexually active within 2 weeks after termination [30]. Moreover, their fertility resumes very early, typically between 8 and 36 days after MA [31], posing a significant risk of another unintended pregnancy for women who continue not to use any method. A notable proportion of women in the pharmacy group who were using modern hormonal methods before pregnancy switched to no method after the termination and are similarly at risk of another pregnancy.

On the factors associated with the use of modern contraceptive methods after MA, the regression analyses revealed that receiving contraception information is significantly linked to adoption of modern contraception following MA. Women who received this information before MA were more likely to adopt modern contraceptive methods after the termination, and the clinic group significantly drove this. The descriptive analysis corroborates this outcome: approximately 44 % of women in the clinic group who initially were not using any method switched to modern contraception after the MA, compared to 12 % for the pharmacy group. Moreover, 94 % of the women who received contraception information were from the clinic group, which may have influenced the adoption of modern contraception after the abortion.

Women who obtained MA in clinics were also more likely to use modern contraception after MA. In Ghana, clinics licensed to provide abortion services are expected to offer comprehensive abortion care,

including counselling on contraception [12], explaining this outcome. However, it is imperative to indicate that the content and quality of the counselling in some clinics may be inadequate. As such, some women may not fully benefit from the counselling. Another reason for the finding could be that most of the women who opted for MA in clinics had already decided to use modern contraception after the procedure. Literature from Brazil indicates that nearly all women who request contraception in clinics already know the methods they want to use before any counselling [32].

Furthermore, women who used modern contraceptive methods before the pregnancy were more likely to use modern methods after the abortion. This observation aligns with existing research, which indicates that most women tend to maintain the contraceptive methods they employed before the abortion [18]. An earlier study in Ghana further supports this finding, as women in low-income urban settings who used modern contraception before abortion were more likely to adopt a modern method after the abortion [22]. Other findings indicate that many of these women were using EC pills and OCPs, whose effectiveness largely depends on correct use and timing.

Also, pharmacy clients with a history of abortion, particularly those who underwent surgical procedures, were more likely to adopt modern contraception after MA. This finding is consistent with other studies in SSA and the United States, which have also shown a similar association between abortion history and the uptake of modern contraception [33,34]. Additional exploratory cross-tabulation analysis (not presented here) revealed that a relatively higher proportion of women in the pharmacy group with a history of surgical abortion had two or more children compared to those in the clinic group. This factor may have influenced the observed outcome, as other regression results suggest that having two or more children is associated with higher odds of adopting modern contraception after MA.

Additionally, other socio-demographic factors, such as having tertiary or university education and working in a skilled manual job, are significantly associated with modern contraception utilisation after MA. Generally, higher education tends to influence health behaviors [35], including decisions to prevent unintended pregnancy. Regarding

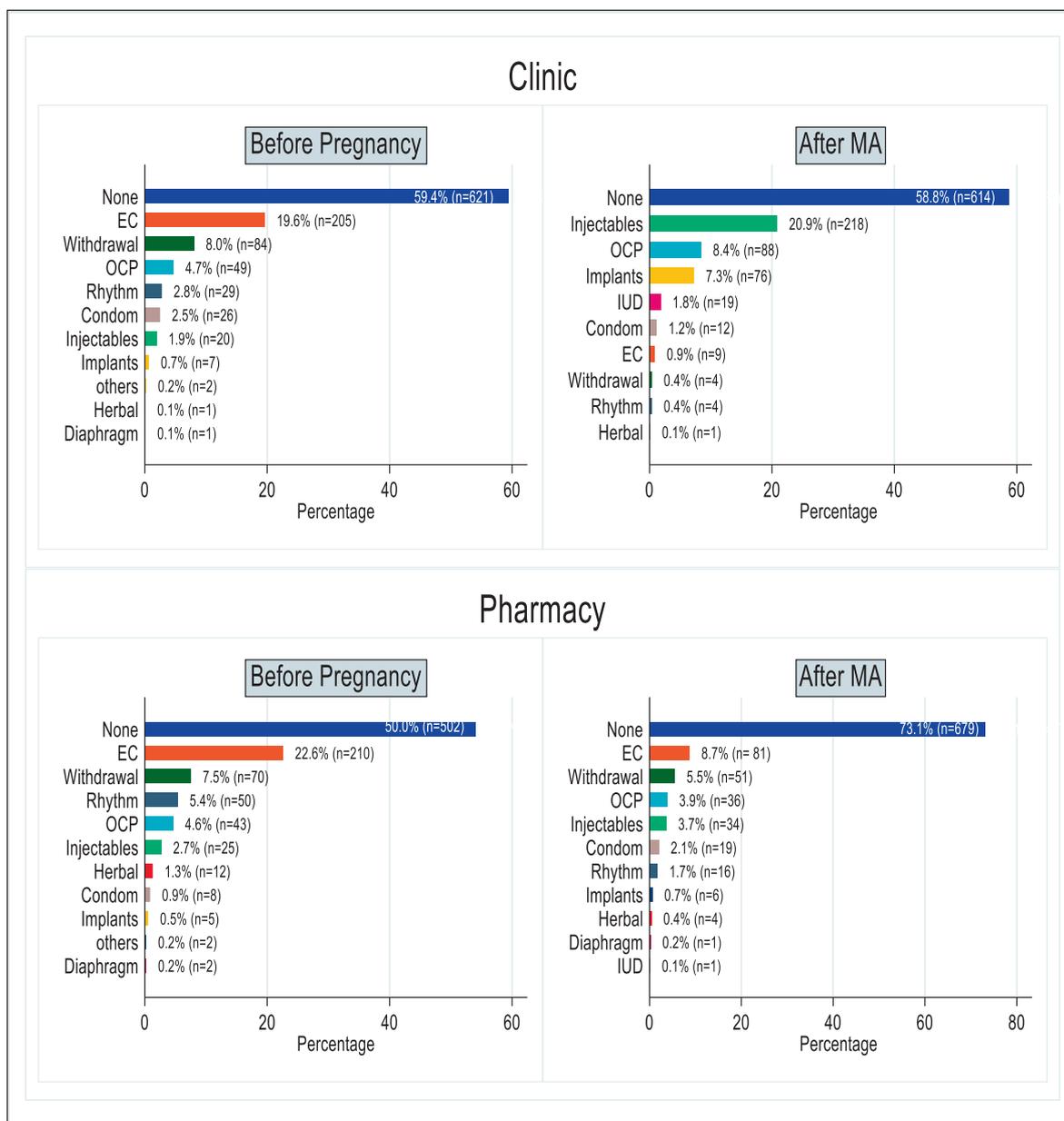


Fig. 3. Contraceptive methods used before pregnancy and after MA- by provider type.

women with skilled manual jobs, pregnancy may jeopardise their jobs, which justifies the need for them to avoid it. Nonetheless, this outcome highlights the need for further qualitative inquiry to explore the contextual nuances that may explain this relationship.

Limitation of the study

This study has a few limitations worth noting. The sample comprises only women who ended pregnancy using mifepristone and misoprostol combination pills. Those who could not afford the combination pills or preferred misoprostol alone would have been excluded from this study. This exclusion potentially reduces the representativeness of MA clients, depending on the number excluded. However, it is important to note that the combination pills were subsidized for all recruited facilities to enhance affordability. Moreover, information obtained from the providers suggests very minimal occurrences of women not participating due to the cost of the pills or based on preference for misoprostol alone.

In addition, there is a potential for differential bias in women’s responses regarding contraceptive methods used before pregnancy and

after obtaining MA. This may stem from recall bias, particularly for methods used prior to conception. However, recall bias is likely minimal in this study because participants were less than nine weeks pregnant at recruitment, and the question specifically focused on the method used immediately before becoming pregnant.

Social desirability bias is another possible limitation, as clinic and pharmacy clients may report contraceptive use in line with perceived expectations. To mitigate this, Research Assistants (RAs) were trained to ensure confidentiality and conduct interviews at times convenient for respondents, reducing pressure to provide socially desirable answers. Furthermore, except during recruitment, all interviews were conducted via phone, and questions (adapted from national surveys) were neutrally framed, which minimizes these socially desirable responses.

Conclusion

In conclusion, findings show that approximately 57 % and 66 % of the women were not using any contraception before pregnancy and after MA, respectively. In addition, 55 % of clinic clients and 86 % of

Table 2
Patterns of contraceptive method switching before pregnancy and after MA.

| Methods used before pregnancy | Methods used following MA | | | | | | | | | | Total | | | |
|-------------------------------|---------------------------|------------|---------------|------------|--------------------|-----------------|----------------|-----------|---------------|----------------|---------------|---------------|-----|-----|
| | No method (n; %) | OCP (n; %) | Condom (n; %) | IUD (n; %) | Injectables (n; %) | Implants (n; %) | Diaphr. (n; %) | EC (n; %) | Rhythm (n; %) | Withdr. (n; %) | Herbal (n; %) | Others (n; %) | n | % |
| No method | C 344 (55.4) | 57 (9.2) | 4 (0.6) | 8 (1.3) | 149 (24.0) | 52 (8.4) | 0 (0.0) | 4 (0.6) | 1 (0.2) | 2 (0.3) | 0 (0.0) | 0 (0.0) | 621 | 100 |
| P | 434 (86.4) | 12 (2.4) | 8 (1.6) | 0 (0.0) | 18 (3.6) | 2 (0.4) | 0 (0.0) | 18 (3.6) | 2 (0.4) | 7 (1.4) | 1 (0.2) | 0 (0.0) | 502 | 100 |
| OCP | C 23 (46.9) | 10 (20.4) | 0 (0.0) | 3 (6.1) | 10 (20.4) | 2 (4.1) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 1 (2.0) | 0 (0.0) | 49 | 100 |
| P | 32 (74.4) | 6 (14.0) | 1 (2.3) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 1 (2.3) | 0 (0.0) | 3 (7.0) | 0 (0.0) | 0 (0.0) | 43 | 100 |
| Condom | C 18 (69.2) | 3 (11.5) | 3 (11.5) | 0 (0.0) | 0 (0.0) | 2 (7.7) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 26 | 100 |
| P | 1 (12.5) | 4 (50.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 1 (12.5) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 8 | 100 |
| Injectable | C 13 (65.0) | 0 (0.0) | 0 (0.0) | 1 (5.0) | 5 (25.0) | 1 (5.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 20 | 100 |
| P | 21 (84.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 1 (4.0) | 1 (4.0) | 1 (4.0) | 0 (0.0) | 1 (4.0) | 0 (0.0) | 0 (0.0) | 25 | 100 |
| Implant | C 2 (28.6) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 3 (42.9) | 1 (20.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 7 | 100 |
| P | 3 (60.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 1 (20.0) | 1 (20.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 5 | 100 |
| EC | C 123 (60.0) | 15 (7.3) | 5 (2.4) | 5 (2.4) | 40 (19.5) | 11 (5.4) | 0 (0.0) | 4 (2.0) | 2 (1.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 205 | 100 |
| P | 124 (59.1) | 7 (3.3) | 3 (1.0) | 1 (0.5) | 10 (4.8) | 1 (0.5) | 0 (0.0) | 44 (21.0) | 7 (2.9) | 12 (5.7) | 1 (0.5) | 0 (0.0) | 210 | 100 |
| Diaphragm | C 1 (100.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 1 | 100 |
| P | 1 (50.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 1 (50.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 2 | 100 |
| Rhythm | C 22 (75.9) | 1 (3.5) | 0 (0.0) | 0 (0.0) | 4 (13.8) | 1 (3.5) | 0 (0.0) | 0 (0.0) | 1 (3.5) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 29 | 100 |
| P | 33 (66.0) | 2 (4.0) | 1 (2.0) | 1 (2.0) | 4 (8.0) | 1 (2.0) | 0 (0.0) | 2 (4.0) | 6 (12.0) | 1 (2.0) | 0 (0.0) | 0 (0.0) | 50 | 100 |
| Withdrawal | C 67 (79.8) | 2 (2.4) | 0 (0.0) | 2 (2.4) | 5 (6.0) | 5 (6.0) | 0 (0.0) | 1 (1.2) | 0 (0.0) | 2 (2.4) | 0 (0.0) | 0 (0.0) | 84 | 100 |
| P | 27 (38.6) | 5 (7.1) | 3 (4.3) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 1 (1.4) | 9 (12.9) | 25 (35.7) | 0 (0.0) | 0 (0.0) | 70 | 100 |
| Herbal | C 1 (100.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 1 | 100 |
| P | 2 (16.7) | 0 (0.0) | 1 (8.3) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 5 (41.7) | 0 (0.0) | 2 (16.7) | 2 (16.7) | 0 (0.0) | 12 | 100 |
| Others | C 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 2 (100.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 2 | 100 |
| P | 1 (50.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 1 (50.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 2 | 100 |

C-Clinic, P-Pharmacy, Diaphr-Diaphragm, EC-Emergency contraceptive, IUD-Intrauterine device, MA-Medication abortion, OCP-Oral contraceptive pill, Withdr-Withdrawal, n-Number of women.

Table 3

Factors associated with modern contraceptive use after MA, by type of provider.

| Variables | Model 1 Total sample | | Model 2 Clinic | | Model 3 Pharmacy | |
|--|-------------------------|------------|-------------------|-------------|---------------------|-------------|
| | AOR | 95 % CI | AOR | 95 % CI | AOR | 95 % CI |
| Age category (ref: <20 years) | | | | | | |
| 20–24 years | 1.2 | (0.8, 1.8) | 1.2 | (0.7, 1.9) | 1.4 | (0.7, 3.1) |
| >24 years | 1.0 | (0.6, 1.6) | 0.9 | (0.5, 1.7) | 1.2 | (0.5, 2.8) |
| Educational level (ref: No formal education) | | | | | | |
| Primary | 1.7 | (0.6, 4.6) | 0.7 | (0.2, 2.8) | 5.2 | (0.6, 44.7) |
| JHS/middle school | 1.7 | (0.7, 4.2) | 0.8 | (0.3, 2.7) | 4.3 | (0.5, 34.2) |
| SHS/secondary | 2.2* | (0.9, 5.5) | 1.1 | (0.4, 3.6) | 4.9 | (0.6, 39.0) |
| Tertiary/university | 2.6** | (1.0, 6.5) | 1.1 | (0.3, 3.7) | 6.4* | (0.8, 52.9) |
| Marital status (ref: Currently in union) | | | | | | |
| Formerly in union | 1.1 | (0.5, 2.1) | 0.7 | (0.2, 2.4) | 1.1 | (0.5, 2.7) |
| Never in union | 0.9 | (0.7, 1.2) | 0.9 | (0.7, 1.4) | 0.9 | (0.6, 1.4) |
| Number of live births (ref: no live birth) | | | | | | |
| One live birth | 1.6*** | (1.1, 2.1) | 1.9*** | (1.3, 2.9) | 1.3 | (0.8, 2.1) |
| Two and more live births | 2.0*** | (1.4, 2.9) | 2.3*** | (1.4, 3.7) | 1.8** | (1.0, 3.1) |
| Occupation (ref: Unemployed) | | | | | | |
| Professional/managerial/clerical | 0.8 | (0.5, 1.2) | 0.9 | (0.6, 1.5) | 0.6 | (0.3, 1.3) |
| Service | 1.2 | (0.8, 1.7) | 1.1 | (0.7, 1.8) | 1.2 | (0.6, 2.2) |
| Skilled manual | 2.0*** | (1.3, 3.0) | 2.2*** | (1.3, 3.8) | 1.6 | (0.8, 3.2) |
| Unskilled manual | 1.1 | (0.7, 1.7) | 1.2 | (0.6, 2.1) | 0.8 | (0.4, 1.8) |
| Student | 1.3 | (0.9, 1.9) | 1.3 | (0.8, 2.1) | 1.3 | (0.6, 2.6) |
| Previously had abortion(s) using MA (ref: No) | | | | | | |
| Yes | 0.9 | (0.7, 1.2) | 0.8 | (0.5, 1.1) | 1.0 | (0.7, 1.5) |
| Previously had abortion(s) using surgical procedure (ref: No) | | | | | | |
| Yes | 1.6 | (1.2, 2.3) | 0.9 | (0.6, 1.5) | 2.7*** | (1.6, 4.3) |
| Used modern contraceptive method before recent pregnancy (ref: No) | | | | | | |
| Yes | 1.5*** | (1.2, 1.8) | 1.1 | (0.8, 1.5) | 2.3*** | (1.6, 3.2) |
| Received information on contraception before MA (ref: No) | | | | | | |
| Yes | 2.3*** | (1.6, 3.4) | 6.1*** | (3.1, 12.3) | 0.8 | (0.4, 1.7) |
| Type of service provider (ref: Pharmacy) | | | | | | |
| Clinic | 1.5** | (1.0, 2.2) | | | | |
| Constant | 0.1*** | (0.0, 0.2) | 0.1*** | (0.0, 0.3) | 0.0*** | (0.0, 0.2) |
| Observations | 1974 | | 1045 | | 929 | |

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

MA-Medication abortion, AOR-Adjusted odds ratio, CI-Confidence Intervals, MA-Medication abortion, JHS-Junior High School, SHS-Senior High School, Ref-Reference category

pharmacy clients who were not using any contraceptive method before MA continued not to adopt any method after MA. Of the non-method users who switched to using a contraceptive method following MA, a higher share of the clinic group (44 %) used modern contraceptive methods compared to the pharmacy group (12 %). Additionally, receiving contraception information before MA and accessing the service from clinics increase the chances of women to adopt modern contraception following MA. These findings highlight the need for the Ghana Health Service to strengthen contraception counselling for abortion clients and/or facilitate those who desire a method to get one. Programmes such as telehealth could also be explored to extend counselling on contraception to women who prefer MA outside clinical settings.

CRedit authorship contribution statement

Caesar Agula: Writing – original draft, Visualization, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Ayaga A. Bawah:** Writing – review & editing, Supervision, Resources, Project administration, Investigation. **Nathalie Kapp:** Writing – review & editing, Supervision, Resources, Investigation, Funding acquisition. **Jamie L. Menzel:** Writing – review & editing, Investigation, Data curation. **Samuel K. Antobam:** Writing – review & editing, Investigation. **Elisabeth Eckersberger:** Writing – review & editing, Project administration, Investigation, Funding acquisition. **Erin E. Pearson:** Writing – review & editing, Supervision, Investigation, Funding acquisition.

Ethics approval and consent to participate

This study was conducted in accordance with the Declaration of Helsinki and ethical approvals for the study were obtained from the Ghana Health Service Ethics Review Committee (GHS-ERC012/07/19), the University of Ghana Ethics Committee for the Humanities (ECH 034/19-20) and the Marie Stopes International Ethics Review Committee (025-19). Before women were recruited to participate in the MOC-Ghana study, written consent was obtained from them.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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