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Pathways to care: Factors predicting women's access to clinic versus pharmacy-based medication abortion in Ghana

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Abstract

Background: Women's decision to access medication abortion (MA) in clinics or pharmacies may be shaped by several factors, but is an area that has not been adequately researched. Little is also known about the primary predictors of choice of MA provider.

Objectives: Our study examined the factors associated with choice of MA provider and identified the primary predictors.

Design: A non-inferiority and prospective design.

Methods: We utilized data from a non-inferiority and prospective study that recruited women who had MA from selected clinics and pharmacies in Ghana. Our sample comprises 1045 and 929 women from clinics and pharmacies, respectively. We used a multivariate binary logistic model to examine the factors associated with MA providers. Following this, a decision tree model was utilized to shed light on the main predictors.

Results: Our results show that women were more likely to spend more on accessing MA in clinics than in pharmacies (adjusted odds ratio (AOR) = 1.0, $p < 0.01$). Notably, results from the decision tree model indicate that MA cost has the strongest effect on provider selection ($\chi^2 = 937$, $p < 0.01$). Additionally, women over 24 years old (AOR = 0.7, $p < 0.05$), those with secondary education (AOR = 0.5, $p < 0.01$), those who learned about MA from friends or close relatives (AOR = 0.5, $p < 0.01$), and those who previously had MA before their recent MA (AOR = 0.6, $p < 0.01$) were less likely to access MA in clinics.

Conclusion: We found that cost has the strongest effect on women's choice of MA provider in Ghana. In addition, sociodemographic and abortion-related factors play a role. These factors should be considered in developing strategies to enhance equal opportunity in accessing high-quality and safe MA. For instance, developing strategies to reduce MA costs in clinical settings could reduce the burden on vulnerable women, including those younger who may prefer clinic providers.

Keywords

medication abortion, choice of healthcare provider, cost of abortion, pharmacy, clinic, Ghana, Sub-Saharan Africa

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Introduction

Unsafe abortion is a leading contributor to maternal fatalities in the developing world, where 97% of unsafe abortions worldwide occur.[1,2] The World Health Organization further classifies unsafe abortions as less safe or least safe, depending on the method used for the pregnancy' gestation, adequacy of information regarding the correct use of the method and skills of the provider.[2] Abortions conducted by trained providers using non-recommended methods for certain pregnancy gestations or those conducted using recommended methods but without sufficient information on the correct use of the method or adequate support from a trained provider are considered less safe.[2] In contrast, least safe abortions are those performed by untrained providers using non-recommended methods.[2]

Like many developing countries, unsafe abortions, especially those that are least safe, constitute the leading cause of maternal deaths in Ghana.[3,4] Around 15%–30% of maternal deaths in various parts of the country are attributed to unsafe abortions.[3,4] Legal restrictions on abortion, stigma, and financial barriers associated with abortion access are cited as some of the main factors contributing to unsafe terminations and maternal deaths in the country and other developing settings.[5–8]

Medication abortion (MA), especially mifepristone and misoprostol combination regimen, is an effective and safe method for ending early pregnancies and could potentially reduce fatalities associated with unsafe abortions.[9–12] The mifepristone tablet, which blocks the hormone required for pregnancy growth, is taken first while the misoprostol tablet, which causes contraction, is taken aftermath to empty the uterus.[13,14] Research indicates that ending pregnancies using MA pills could facilitate women to achieve their reproductive rights even in contexts where abortion is legally restricted and highly stigmatized.[9,15]

Ghana has a less restrictive legal framework for abortion.[5,16] A woman is allowed to end a pregnancy in a licensed hospital and clinic (hereafter referred to as clinic) under the conditions of rape, incest, risk of fetal impairment, and if the pregnancy poses a potential threat to her physical or mental health.[16–18] Pharmacies are not permitted to offer abortion services in the country per the current legal provisions.[5,17,19] However, in reality, the situation is different as women covertly access MA services from pharmacy providers without a physician's prescription.[5,19,20] Women may secretly access MA from pharmacies for several rational reasons, including shorter access time, being the only known place, and provider's discreetness.[21,22]

Women's preference for MA from a specific type of provider, whether a pharmacy or a clinic, may be shaped by various factors, including their sociodemographic backgrounds, geographic location, previous abortion experience, and exposure to MA information. For example, adjacent literature in Turkey shows that younger women aged 16–24 years, compared to those aged 40 years and above, were more likely to opt for private health providers for abortions compared to public health providers.[23] Despite the legalization of abortion in Turkey in 1983, which allows free access in any public health facility, the younger women, being largely single, preferred private providers to avoid public censure due to cultural, moral, and religious factors.[23] In addition, a study in Brazil suggests that higher-educated women preferred abortion from medical doctors and health professionals rather than self-managing the process or using other non-clinic providers where safety is not guaranteed.[24] Furthermore, women in Nigeria opt for non-clinic over clinic providers due to the higher cost of service associated with clinics.[25] A study in Kenya also found that women who obtained information from their social networks, such as friends, were more likely to access abortion from unsafe providers secretly.[26]

Notably, the focus of previous studies was not on MA clients. The factors associated with choice of provider for MA, particularly mifepristone and misoprostol combination, are yet to be explored. Moreover, the primary factors shaping women's choice of provider for MA are unknown. Therefore, our study contributes to the body of literature on abortion by first examining the factors associated with women's choice of provider for MA in Ghana. It is important to indicate that our sample comprises women who had the option to select their preferred provider, underscoring its uniqueness for a realistic comparison. In addition, we identify and examine the principal factors among the significant factors predicting provider choice. This is particularly important for tailoring programs and strategies. Our work aims to provide valuable evidence for formulating strategies to expand quality abortion care. Specifically, our findings may play a crucial role in policy programming to meet the unique needs of women who access abortion services in pharmacies and are likely not to benefit from contraception counseling.

Methods and materials

We utilized secondary data from an earlier study implemented in Ghana (referred to as MOC-Ghana), which was spearheaded by the Regional Institute for Population Studies, University of Ghana and Ipas International (Ipas).[11] The primary objective of the study was to compare the clinical outcomes of the use of mifepristone and misoprostol combination pills (Mariprist or MM combi kit) among clients who accessed services from pharmacies versus clinics. Details of the study are found in Kapp et al.[11]

The reporting of this study conforms to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement.[27] The completed STROBE checklist is submitted as Supplemental Material 1.

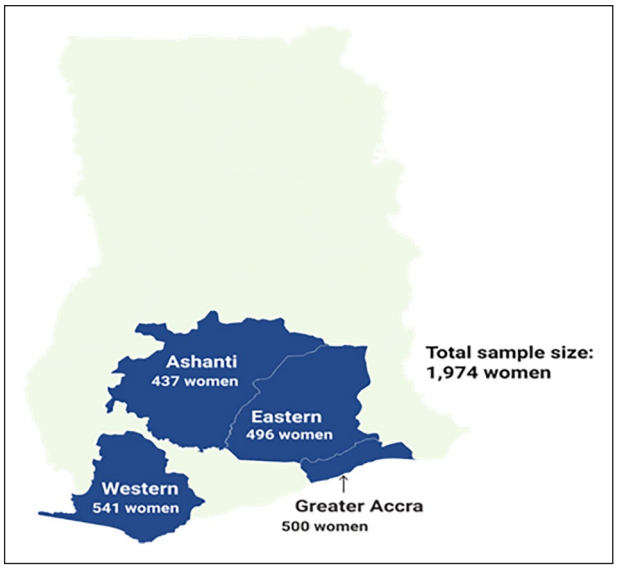

Figure 1. A map of Ghana with study regions and the analytic sample.
Source: Authors' construction.

Study setting

The Medication Abortion Out of Clinic (MOC)-Ghana study was implemented in four regions in Ghana: the Greater Accra, Ashanti, Eastern, and Western (now Western and Western North) regions. These regions are densely populated and contain 54.4% (Greater Accra—17.7%, Ashanti—17.6%, Eastern—9.5%, Western—6.7%, and Western North—2.9%) of Ghana's 30.8 million population.[28] The selection of these regions was informed by factors such as the prevalence of abortion and the relative ethnic diversity of the regions.[29] See Figure 1 for the map of Ghana with the study regions, as well as the analytic sample.

Design

The MOC-Ghana study employed a non-inferiority and prospective design to recruit and interview women who accessed MA services in pharmacies and clinics. Women were recruited after obtaining mifepristone and misoprostol combination pills and exiting the health facilities. These women's contact information was collected as part of the recruitment process (baseline survey) and used to conduct phone interviews after the recruitment.

Three sequential prospective quantitative surveys were conducted at 3–7, 10–29, and 30–35 days after the recruitment. The first survey, 3–7 days post-recruitment, primarily aimed to confirm whether the woman had initiated the termination process by taking the MA pills and to gather information on the amount paid for the pills. The subsequent surveys at 10–29 and 30–35 days delved into understanding the experiences of women after taking the medication.

Sample size

The MOC-Ghana study used a three-level procedure to determine the sample size.[11] First, a power calculator for a binary outcome non-inferiority design was used, yielding a sample size of 1108 women.[30] The calculation was based on 80% power ($\beta = 0.2$), a one-sided confidence level of 97.5% ($\alpha = 0.025$), and a primary outcome (need for a repeat abortion after using MA pills) of 6%, based on a previous study.[31] Next, to account for potential cluster effects within facilities, the sample size was adjusted. Using an intra-cluster correlation coefficient (ρ) of 0.01 and a cluster size (m) of 50, the design effect was calculated at 1.49. Lastly, the design effect, along with 20% attrition rate, was applied to the initial estimate ($1108 \times 1.49 \times 1.2$), resulting in a total sample size of 1981 women. However, 1974 women (1045 from clinics and 929 from pharmacies) with complete follow-up data were used in the analysis.

Sampling procedure

The MOC-Ghana study is facility-based and focused on facilities that offer MA with mifepristone and misoprostol combination pills, specifically Mariprist and MM combi kit brands.[11] These two brands are approved by Ghana's Food and Drugs Authority.[32] To recruit facilities, an initial exploratory visit to the study areas was carried out by the research team with support from Ghana Health Service, Marie Stopes (MS) Ghana Reproductive Choices, and the Pharmacy Council of Ghana to assess facilities that met certain criteria.[11] These criteria include: (1) providing MA with Mariprist/MM combi kit, (2) having a sufficient number of patients/clients, (3) not requiring a physician's prescription (especially for pharmacies), and (4) being located near another facility that allows women to choose from.[11] For example, a clinic should have at least one nearby pharmacy that provides a similar service to give clients more options.[11]

To obtain data, exit interviews were conducted with women who consented, had a pregnancy gestation of less than 9 weeks, and had independently accessed MA from pharmacies and clinics in the study regions. Experienced female Research Assistants (RAs) with a minimum of a bachelor's degree were trained by the research team and assigned to the recruited pharmacies and clinics in the study areas to recruit women at the point of exit who had obtained MA or purchased MA pills. The women seeking MA were briefly informed about the study and referred to the RAs for recruitment by the service providers immediately after obtaining MA service. In-depth information about the study was then provided by the RAs to the women, and their background information such as phone number, sociodemographic characteristics, and gestation of pregnancy was collected for follow-up phone interviews. An easy-to-remember security code was also established between the RAs and respondents to ensure that

follow-up phone interviews were conducted for the actual recruited women.

For a pregnant woman to be eligible for follow-up interviews after recruitment at the facility, the following inclusion criteria were met: (1) the gestational age of pregnancy is less than 9 weeks, (2) the woman purchased Mariprist or MM combi kit brand pills, (3) do not have medical contraindications, and (4) agreed to sign the consent form to participate in the study.[11]

Data collection

Data for the MOC-Ghana study were collected from December 2019 to March 2020 and July 2020 to April 2021. Due to the COVID-19 pandemic, there was an interruption in data collection to ensure the safety of both RAs and respondents. The RAs collected all data with electronic devices (tablets) programmed with a questionnaire using CommCare software.

Most parts of the questionnaire comprised questions from the Demographic and Health Survey, Multiple Indicator Cluster Survey and a similar MOC study implemented in Cambodia. The questionnaire covered women's socioeconomic attributes, demographic characteristics, geographic location, cost of accessing MA (in Ghanaian cedi), pregnancy information, experiences after taking MA, choice and reasons for opting for an MA service provider, and pre- and post-contraception behavior. Before actual data collection, the questionnaire was pre-tested and finalized to ensure that data collected were reliable and valid. Except for recruiting women face-to-face, all follow-up interviews were via phone calls. To compensate for respondents' loss of productive time, five Ghana cedis worth of call credit was given to each respondent.

The interviews were conducted in English and three Ghanaian languages (Twi, Ewe, and Ga), enabling the participation of women without formal education. These three Ghanaian languages are widely spoken in the study areas and across the country. Notably, the RAs were fluent in these languages and received training to conduct interviews effectively in them.

Measures

Outcome variable. The choice of MA provider serves as the outcome variable for our study's regression model. Choice of MA provider has a binary outcome: (1) obtained MA from a clinic and (2) obtained MA from a pharmacy. Data on the type of facility where women obtained their MA were collected during recruitment.

Independent variables. The independent variables used for the regression cover women's sociodemographic backgrounds, geographic location, exposure to MA information, and other MA-related attributes. Specifically, women's age group ($\leqslant$24 and $>$24 years), marital status (never in union and currently/formerly in union), number of live births, level of education (no formal education, basic-primary/junior high school, secondary, and tertiary/higher), occupation (professional/managerial, service, skilled manual, unskilled manual, student, and unemployed), place of residence (city, town, and village/rural area), study region (Ashanti, Eastern, Greater Accra, and Western), learning about MA from a friend (yes and no), learning about MA from a family member (yes and no), learning about MA from the internet (yes and no), previously had abortion(s) using medication method (yes and no), previously had abortion(s) using surgical procedure (yes and no), and cost of accessing MA were used as the independent variables.

During the MOC-Ghana study's recruitment phase, women were asked questions about their geographic location (e.g., where they live) and sociodemographic background (e.g., age, level of education, marital status, and economic activity they mainly do). Their responses were used to construct the sociodemographic and geographic location variables.

Additionally, in the third follow-up survey, women were asked how they learned about MA pills. Specifically, they were asked, "How did you learn that taking medication abortion pills could end a pregnancy?" This question allowed for multiple selections. Women's responses included friends, family members, and the internet, which were used to construct MA exposure variables. Furthermore, women were asked about their previous pregnancies. They were first asked whether they had been pregnant before (excluding the current pregnancy). Those who indicated yes were further asked how many pregnancies were terminated or resulted in live births. Women who indicated that they previously had abortion(s) were asked about the types of methods used. This question allowed for multiple selections for women who had more than one previous abortion. Their responses included surgical procedures and medication methods, which formed the basis for abortion history variables.

Regarding the cost of MA, women were asked how much they paid (in Ghanaian cedis) for the MA pills in the first post-recruitment survey. The total cost, estimated from the client's perspective, comprises the direct amount paid for MA pills and the estimated opportunity cost of time spent at the facility. The waiting time contributed less than 1% of the total cost; however, it was accounted for. To estimate the waiting time cost, we used Ghana's 2020 per-capita income, as over 95% of the interviews were conducted during that year. The per-minute income was derived from the per-capita income to estimate each client's waiting time cost, following standard economic evaluation methods.[33]

The independent variables we selected were based on abortion literature in sub-Saharan Africa.[5,11,25,34]

Statistical analysis

A multivariable binary logistic regression was estimated to examine the predictors of choosing a provider for MA. The binary logistic model was employed because the response variable has two outcomes. The theoretical underpinning of the binary logistic model and our empirical model are presented in Supplemental Material 2.

Furthermore, to identify among the significant variables those that have a greater effect on choice of MA provider and to deepen understanding of the interaction among the variables, a chi-square automatic interaction detector (CHAID) analysis was employed. A CHAID is a type of decision tree model that gives visual relationship between the outcome variable and explanatory variables.[35]

The covariates that were considered statistically significant and discussed are those with *p*-values less than 5%.

Results

Sociodemographic and geographic location attributes of women

Table 1 shows descriptive statistics on women's sociodemographic and geographic location characteristics for the entire sample and segregated by type of MA provider. Approximately 46% ($n=914$) of the women were aged 24 years and younger. A greater proportion ($n=511$, 56%) of this age group were clinic clients. The majority of the women ($n=1361$, 69%) had never been in a union. Of these women, 55% ($n=746$) accessed MA in clinics. On average, each woman had one live birth (mean = 0.9, standard deviation = 2.6). Almost all the women had some form of formal education. Approximately 2% ($n=33$) reported having no formal education while about 36% ($n=703$) had tertiary or higher education. Of the tertiary-educated women, 69% ($n=483$) accessed MA in clinics, while the remaining accessed the service in pharmacies. In addition, 68% ($n=1343$) of the women indicated being employed, with services ($n=560$, 28%) accounting for the highest share in employment. About 19% ($n=379$) of the sample reported being students.

Regarding the distribution of the sample, results suggest an evenly distributed sample across the four regions: Ashanti ($n=437$, 22%), Eastern ($n=496$, 25%), Greater Accra ($n=500$, 25%), and Western ($n=541$, 28%). A bigger proportion of the women ($n=1349$, 68%) reported staying in towns. Only 4% ($n=76$) indicated staying in villages, while the rest reported living in cities ($n=549$, 28%).

Abortion-related attributes of women

Additionally, the abortion-related attributes of women are presented in Table 1. Approximately 21% ($n=421$) of the entire sample had previously ended pregnancy using medication methods. About 10% ($n=198$) of the sample also indicated that they had previously terminated pregnancy using surgical procedures. The breakdown by type of provider further suggests that a bigger share ($n=248$, 59%) of those who previously ended pregnancy with MA pills accessed their recent MA from pharmacy providers. A little over half ($n=1054$, 53%) of the women reported learning about MA from a friend. Approximately 14% ($n=269$) and 19% ($n=366$) of them also indicated learning about MA from family members and the internet, respectively.

Cost of accessing MA

Table 2 shows the average cost of accessing MA. Results indicate that the price of MA pills is the major cost component women incurred in obtaining MA, accounting for over 99% of the average cost for the entire sample. On average, women incurred about GH₵ 205.00 (equivalent to US$ 35.80 in June 2020; https://www.google.com/finance/quote/USD-GHS?sa=X&ved=2ahUKEwj21_O0roz_AhWZhVwKHUHMDaUQmY0JegQIBhAc&window=MAX) for MA. Segregating the sample by type of provider further indicates that clinic clients incurred an additional cost to obtain MA compared to their counterparts who obtained similar services in pharmacies. The clinic clients, on average, incurred about GH₵ 264.00 (US$ 46.00), while the pharmacy clients spent about GH₵ 139.00 (US$ 24.00) to have MA.

Factors associated with choice of MA provider

Table 3 shows results for the factors associated with MA access in either a clinic or pharmacy. We conducted a multicollinearity test to ensure the independent variables were not correlated. The results of this post-estimation test are presented in Supplemental Material 3.

Table 3 shows that certain sociodemographic background attributes of women are associated with choice of MA provider. Specifically, women over 24 years old were less likely to obtain MA in clinics compared to those aged 24 years and younger (adjusted odds ratio (AOR) = 0.7, $p<0.05$). Compared to higher-educated women, those who obtained secondary education were less likely to opt for a clinic provider (AOR = 0.5, $p<0.01$).

In addition to sociodemographics, geographic location factors predict choice of service provider significantly. Women from the Eastern region, compared to those in Greater Accra, were 4.5 times as likely to procure MA from a clinic provider (AOR = 4.5, $p<0.01$). Conversely, women in the Ashanti region, compared to those in Accra, had lower odds of accessing MA from a clinic provider (AOR = 0.1, $p<0.01$).

Furthermore, results suggest that women who learned about MA from friends (AOR = 0.5, $p<0.01$) and family members (AOR = 0.5, $p<0.01$) had lower odds of opting

Table 1. Women's sociodemographic, geographic location, and abortion-related attributes-total sample and by type of MA provider.

Variable	Total sample, *n* (%)	By type of MA provider	
		Pharmacy, *n* (%)	Clinic, *n* (%)
Age category**			
⩽24 years	914 (46.3)	403 (44.1)	511 (55.9)
>24 years	1060 (53.7)	526 (49.6)	534 (50.4)
Marital status**			
Currently/formerly in union	613 (31.1)	314 (51.2)	299 (48.8)
Never in union	1361 (68.9)	615 (45.2)	746 (54.8)
Number of live births, mean (SD)***	0.9 (2.6)	1.1 (3.5)	0.7 (1.2)
Level of education***			
No education	33 (1.7)	19 (57.6)	14 (42.4)
Basic: Primary/JHS	501 (25.4)	298 (59.5)	203 (40.5)
Secondary	737 (37.3)	392 (53.2)	345 (46.8)
Tertiary/higher	703 (35.6)	220 (31.3)	483 (68.7)
Occupation***			
Professional/managerial	359 (18.2)	135 (37.6)	224 (62.4)
Service	560 (28.3)	312 (55.7)	248 (44.3)
Skilled manual	221 (11.2)	100 (45.3)	121 (54.7)
Unskilled manual	203 (10.3)	115 (56.7)	88 (43.3)
Student	379 (19.2)	156 (41.2)	223 (58.8)
Unemployed	252 (12.8)	111 (44.1)	141 (55.9)
Place of residence***			
City	549 (27.8)	321 (58.5)	228 (41.5)
Town	1349 (68.3)	566 (42.0)	783 (58.0)
Village/countryside/rural	76 (3.9)	42 (55.3)	34 (44.7)
Study site/region***			
Ashanti	437 (22.2)	201 (46.0)	236 (54.0)
Eastern	496 (25.1)	309 (62.3)	187 (37.7)
Greater Accra	500 (25.3)	191 (38.2)	309 (61.8)
Western	541 (27.4)	228 (42.1)	313 (57.9)
Previously had abortion(s) using MA pills			
Yes	421 (21.3)	248 (58.9)	173 (41.1)
No	1553 (78.7)	681 (43.8)	872 (56.2)
Previously had abortion(s) using surgical procedure			
Yes	198 (10.0)	100 (50.5)	98 (49.5)
No	1776 (90.0)	829 (46.7)	947 (53.3)
Learned about MA from friend			
Yes	1054 (53.4)	529 (50.2)	525 (49.8)
No	920 (46.6)	400 (43.5)	520 (56.5)
Learned about MA from family member			
Yes	269 (13.6)	177 (65.8)	92 (34.2)
No	1705 (86.4)	752 (44.1)	953 (55.9)
Learned about MA from internet			
Yes	366 (18.5)	117 (32.0)	249 (68.0)
No	1608 (81.5)	812 (50.5)	796 (49.5)
Observations	1974	929	1045

Mean comparison *t*-test was performed for the number of live births. JHS: junior high school; SD: standard deviation; MA: medication abortion. Chi-square test: **$p < 0.05$. ***$p < 0.01$.

for MA in clinical settings. The likelihood of women who previously had abortion(s) using medication, compared to those who did not, to access MA in a clinical setting was lower (AOR = 0.5, $p < 0.01$). The cost of MA was also statistically associated with choice of provider (AOR = 1.0, $p < 0.01$). The results suggest higher odds of spending more to access MA in clinical settings than in pharmacies.

Table 2. Components of MA cost-total sample and by type of MA provider.

Variable	Total sample, *n* (%)	By type of MA provider	
		Pharmacy, *n* (%)	Clinic, *n* (%)
Total cost, mean (SD)***	205.2 (103.8)	138.9 (44.8)	264.2 (105.8)
Cost of pills***	203.5 (103.3)	138.3 (44.8)	261.5 (106.0)
Cost of time spent at facility***	1.7 (1.2)	0.5 (0.1)	2.7 (0.8)
Observations	1974	929	1045

MA: medication abortion; SD: standard deviation.
Mean comparison t-test: ***$p < 0.01$.

Table 3. Multivariate logistic regression results of the predictors of choosing a clinic provider.

Variable (reference category)	Adjusted odds ratio	95% CI	
Age (⩽24 years)			
>24 years	0.7**	0.5	0.9
Marital status (currently/formerly in union)			
Never in union	0.9	0.6	1.2
Number of live births	1.0*	1.0	1.1
Educational level (tertiary/higher)			
No education	0.7	0.2	2.1
Basic: Primary/junior high school	0.7	0.5	1.2
Secondary	0.5***	0.3	0.7
Occupation (professional/managerial)			
Service	1.2	0.8	2.0
Skilled manual	1.2	0.7	2.2
Unskilled manual	1.1	0.6	2.0
Student	1.0	0.6	1.7
Unemployed	1.2	0.7	2.1
Woman's place of residence (city)			
Town	1.2	0.9	1.7
Village/rural area	0.9	0.4	1.7
Study site/region (Greater Accra)			
Ashanti	0.1***	0.1	0.2
Eastern	4.5***	2.8	7.2
Western	0.9	0.6	1.3
Learned about MA from a friend (no)			
Yes	0.5***	0.3	0.6
Learned about MA from a family member (no)			
Yes	0.5***	0.4	0.8
Learned about MA from the internet (no)			
Yes	0.8	0.5	1.2
Previously had abortion(s) using MA pills (no)			
Yes	0.6***	0.4	0.8
Previously had abortion(s) using surgical procedure (no)			
Yes	0.7*	0.4	1.0
Cost of MA	1.0***	1.0	1.0
Constant	0.0***	0.0	0.0
Observations	1,974		

CI: confidence interval; MA: medication abortion.
*$p < 0.1$. **$p < 0.05$. ***$p < 0.01$.

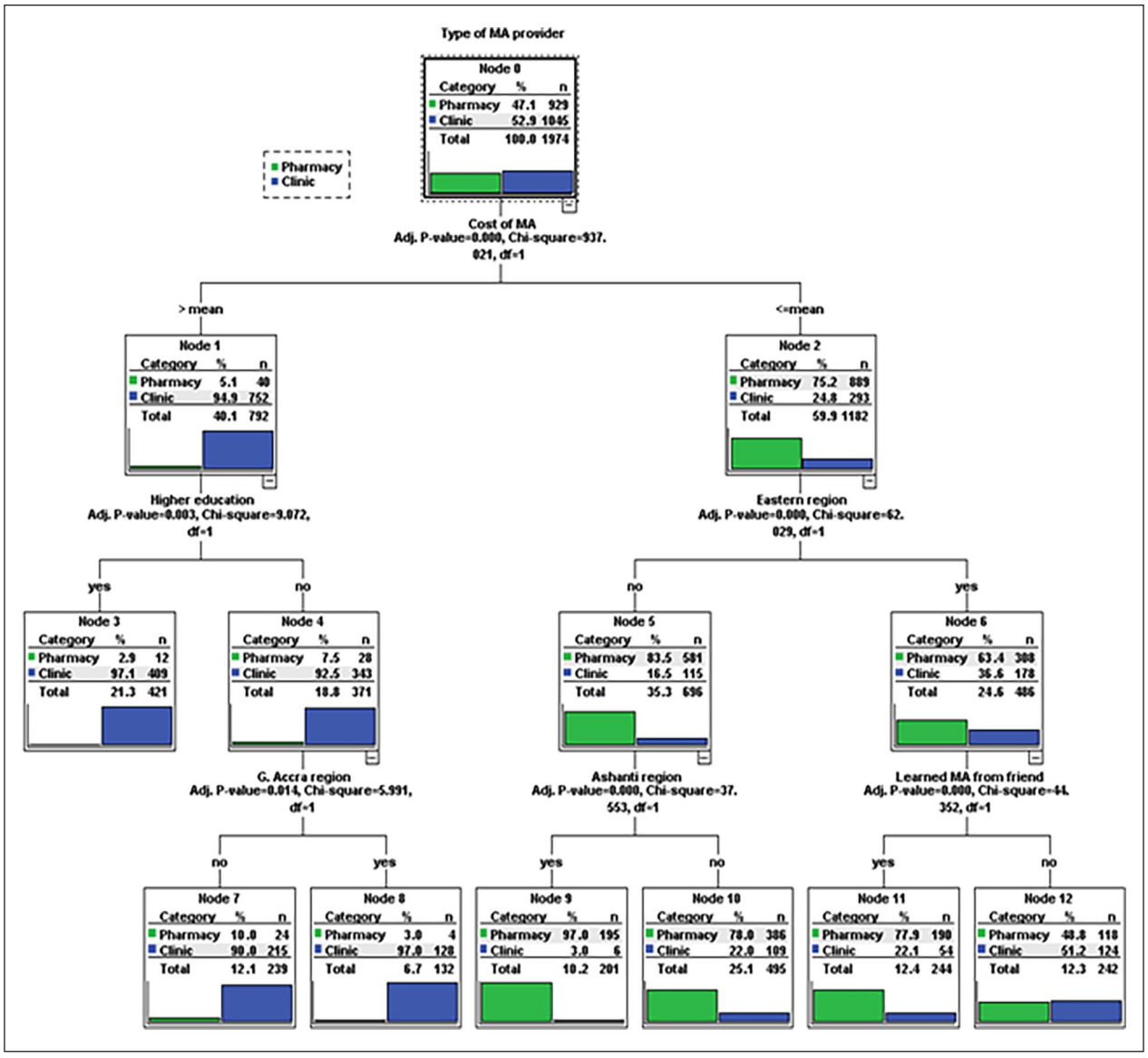

Figure 2. CHAID analysis of choice of MA provider.
CHAID: chi-square automatic interaction detector; MA: medication abortion.

Decision analysis of choice of MA provider

We employed CHAID analysis to identify among the significant predictors those with a stronger effect on choice of provider and how these predictors interact (see Figure 2).

Figure 2 shows that MA cost has the strongest effect on provider choice ($\chi^2 = 937.0$, $p < 0.01$). Notably, 95% of the women (752 out of 792) who spent above the average cost (GH¢ 205.00/US$ 35.80) obtained services from clinic providers (see Node 1). Furthermore, results indicate that tertiary/higher education significantly modifies the relationship between accessing MA at above-average cost and provider choice ($\chi^2 = 9.1$, $p < 0.01$). The breakdown of the data shows that 53% ($n = 421$) of the 792 women who accessed MA above the average cost had tertiary education. Among them, 97% ($n = 409$) accessed MA in clinics (see Node 3). Similarly, 93% ($n = 343$) of the remaining women without tertiary education ($n = 372$) who accessed MA above the average cost also obtained the service in clinics.

On the other hand, Node 2 shows that 75% of the women (889 out of 1182) who spent less than or equal to the average cost obtained MA from pharmacy providers. Additionally, results indicate that procuring MA in the Eastern region significantly modifies the relationship between accessing MA at or below the average cost and provider choice ($\chi^2 = 62.0$, $p < 0.01$). A detailed breakdown analysis reveals that 59% ($n = 696$) of the 1182

women who accessed MA at or below the average cost were from regions other than Eastern. Among them, 84% obtained MA from pharmacy providers (see Node 5).

Discussion

Our study found that the cost of accessing MA has the strongest effect on women's choice of provider for MA. Women were more likely to access MA at higher costs in clinics than in pharmacies. These findings align with previous studies in Ghana, which highlight the important role of cost in shaping abortion decisions and choices.[36–38] For example, Appiah-Agyekum revealed that some university students in Accra opt for MA from pharmacy providers to avoid the high cost of accessing abortion in clinical settings.[37] An article by our research team, which explored cost disparities in MA access using data from MOC-Ghana and context information, shows that the higher cost of MA in clinics stems from price discrimination.[39] Like other developing countries, some public clinics in Ghana have shortages in pharmaceutical products, including MA pills. In managing this health system challenge, some clinic providers independently procured MA pills from MS Ghana Reproductive Choices using their private resources and discriminated in pricing depending on women's vulnerability.[39] This was possible because abortion-related stigma fosters information asymmetry, enabling providers to have adequate information about MA over their clients.

In addition, results show a notable trend regarding women's age. Women aged 24 years and younger were more likely to procure MA in clinics than those older (>24 years). It is worth indicating that this finding diverges from expectations, based on previous abortion studies in Ghana.[34,36] For example, Klu et al. found that younger women were more inclined to utilize pharmacies for abortion.[34] However, it is imperative to emphasize the unique nature of this study's sample and why its findings differ from Klu et al.[34] This study exclusively sourced data from women who used the same abortion treatment method, mifepristone and misoprostol combination pills, allowing for a realistic choice analysis. Moreover, the design of our study ensured that each recruited pharmacy had a nearby clinic, enabling women to exercise their preferences.[11]

Furthermore, our study found that higher-educated women were more likely to access MA in clinics. Education has a far-reaching influence on health behavior, including making decisions and choices.[40,41] In selecting MA service provider, women may take into consideration several factors such as cost and safety. The finding on education suggests that safety, rather than cost-effectiveness, was prioritized by higher-educated women.

Women's preference for MA providers also varies depending on the region where they access the service. Compared to Ashanti, women in Accra were more likely to choose a clinic provider for MA. Conversely, those in the Eastern region, compared to Greater Accra, were more likely to use clinical settings. The reasons for these regional differences in provider selection may stem from a combination of factors, including providers' discreetness, ease of access, and the trust women place in them.[21] Nonetheless, an in-depth analysis of women's motivations for choosing a particular provider is necessary to understand these regional differences better. Furthermore, a qualitative study focusing on MA service delivery system in clinics across different regions is needed to identify the health system factors that affect clinical access.

Women who learned about MA from friends and close relatives were more likely to utilize pharmacy providers when seeking abortion. Generally, social networks play an essential role in abortion decision-making, particularly regarding where and how to terminate the pregnancy.[38,42,43] A previous study that aimed to understand the context of informal abortions in Ghana revealed that friends were the most trusted in keeping abortion secrets.[38] According to Hill et al., when friends are contacted for assistance, they often recommend informal providers such as pharmacies, rather than clinics, for reduced cost.[38] Hill et al. further revealed that family members, especially mothers, are usually contacted for financial assistance to terminate the pregnancy.[38] Parents with adequate resources would send their daughters to clinic providers, and those not having enough resources would opt for pharmacies and other informal providers.[38] However, it is important to highlight that parents' decision-making in selecting a particular provider for their daughters is a function of a combination of reasons, which may include those related to stigma.

Findings from this study also show that women who previously had abortion(s) using medication were more likely to opt for a pharmacy provider. Most of these women may have previously employed the services of pharmacy providers. With background knowledge of those providers, the likelihood of obtaining a similar service from them is high, especially when the experiences of the previous abortion are positive.

Strengths and limitations

This study has a few shortcomings worth highlighting. First, the sample used for this study's analysis only comprises women who used a combination of mifepristone and misoprostol pills. This means that women who desired the combination but could not afford it were not included in the study. However, it is important to indicate that affordability was not an issue during the survey, as available data from the RAs and providers suggest only one occasion where a woman indicated that her resources were not sufficient. All the same, she was still offered the MA pills.

Second, data collection was at the facility level and findings drawn from the study may not necessarily reflect the entire population. However, the design of the study included pharmacies, which enabled the participation of

women who ordinarily would have missed out because they prefer to self-manage their abortions.

Conclusion

In conclusion, our study found that cost has the strongest effect on women's choice of MA providers. Women are more likely to access MA at higher costs in clinical settings than in pharmacies. Furthermore, women's sociodemographic attributes, such as age and educational level, were associated with choice of provider. Specifically, women aged 24 years and younger, compared to those older (>24 years), were more likely to access MA in clinical settings, where the cost is higher. Furthermore, higher-educated women were more likely to access MA from clinics than pharmacies.

To ensure women seeking MA have equal opportunity to access high-quality and safe MA, these findings presented may be valuable in developing effective strategies. Specifically, developing strategies to reduce MA costs in clinical settings by the Ghana Health Service could reduce the burden on vulnerable women, including those younger who may prefer clinic providers. Also, less educated women and those likely to access MA in pharmacies could benefit if pharmacy providers are trained on safe and quality MA provision.

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Ethical considerations

This study was conducted in accordance with the Declaration of Helsinki and ethical approvals for the MOC-Ghana 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).

Consent to participate

Before women were recruited to participate in the MOC-Ghana study, written consent was obtained from them. The Participant Information Sheet (translated into various Ghanaian languages), which contained detailed information about the study, including the potential risks and benefits of participating in the study, was given to each woman to read before providing consent to be interviewed. For those who could not read, the information sheet was read to them in their preferred language.

Consent for publication

Not applicable.

Author contributions

Caesar Agula: Conceptualization; Methodology; Investigation; Validation; Visualization; Writing – original draft; Writing – review & editing; Formal analysis; Project administration; Data curation; Software.
Adriana Biney: Supervision; Writing – review & editing.
Pearl Kyei: Supervision; Writing – review & editing.
Ayaga A. Bawah: Supervision; Funding acquisition.

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Data availability statement

The datasets generated and/or analyzed during the current study are not publicly available due to restrictions [Ipas International and Regional Institute for Population Studies do not permit data publicity before publication] but are available from the corresponding author on reasonable request.

Supplemental material

Supplemental material for this article is available online.

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