

Full title: Uptake of Intrauterine Contraception after Medical Management of First Trimester Incomplete Abortion: A Cross-sectional study in central Uganda

Short title: Uptake of Post Abortion Intrauterine Contraception in Uganda

Herbert Kayiga^{1*}, Emelie Looft-Trägårdh², Amanda Cleeve^{2,3}, Othman Kakaire¹, Nazarius Mbona Tumwesigye⁴, Musa Sekikubo¹, Joseph Rujumba⁵, Kristina Gemzell-Danielsson², Josaphat Byamugisha¹

¹Department of Obstetrics and Gynecology,
Makerere University, College of Health Sciences, Kampala, Uganda

²Department of Women's and Children's Health,
Karolinska Institutet, and WHO collaborating centre, Karolinska University
Hospital, Stockholm, Sweden

³Department of Global Public Health,
Karolinska Institutet, Sweden

⁴Makerere University, School of Public Health,
Makerere University, College of Health Sciences, Kampala, Uganda

⁵Department of Paediatrics and Child Health,
Makerere University, College of Health Sciences, Kampala, Uganda

*Corresponding Author

Email: hkayiga@gmail.com (HK)

Abstract:

Background: Although intrauterine devices (IUDs) are readily available in Uganda, their utilization remains low, including within post abortion care. The level and factors associated with uptake of post abortion IUDs are not well documented. We set out to determine the uptake

NOTE: This preprint reports new research that has not been certified by peer review and should not be used to guide clinical practice.

and factors associated with uptake of post abortion IUDs after medical management of first trimester incomplete abortions in central Uganda.

Methods: Between February 2023 and September 2023, we conducted a cross-sectional study among women aged 15 to 49 years, who expressed interest in initiating post abortion intrauterine contraception and were managed with Misoprostol for first trimester incomplete abortions at five health facilities in central Uganda. Healthcare providers received extensive training in post abortion contraceptive counselling and service provision. Data from 650 participants were collected using interviewer administered questionnaires. The primary outcome was uptake of post abortion IUDs, defined as the actual insertion of the post abortion IUDs. Data were collected during a post abortion follow up visit. The determinants of post abortion IUD uptake were assessed using the modified poisson regression.

Results: The proportion of women who took up IUDs after medical management of first trimester abortion, was 370/650 (56.9%). Among the other available contraceptive choices, 121(18.6%) women opted for injectable Depo-Provera (DMPA), 116(17.9%) women opted for implants, 35(5.4%) women opted for oral contraceptive pills, five (0.8%) of the women opted for condoms, and three (0.5%) women for periodic abstinence. The mean age of the participants was (27.3 $\pm$ SD 1.8) years. A high proportion of the women in the study were; Catholics (32.3%), unemployed (52.6%), cohabiting with their partners (84.0%) and had given birth to 2-3 children (38.5%). A high proportion (56%) of IUD users, opted for the copper IUDs. The post abortion IUD uptake was independently associated with religion- being a Pentecostal (Adjusted PR=2.49, CI= (1.19-5.23), p-value=0.016), monthly earning > one million Ugx (270 USD) (Adjusted PR=1.88, CI= (1.44-2.46), p-value<0.001), and staying <5 kilometres from the health facility (Adjusted PR=1.34, CI= (1.04-1.72), p-value=0.023). Women who were not cohabiting with their partners, were less likely to choose IUDs (Adjusted PR=0.59, CI= (0.44-0.79), p-value=0.001).

Conclusion: The uptake of IUDs among post abortion women was nearly 60% emphasizing the potential impacts of integrated contraceptive services in Post abortion care. The impact of comprehensive and updated training on post abortion contraceptive counselling is vital on the uptake of IUDs. Regardless of sociodemographic status, women seeking post abortion care in Uganda should be provided with high-quality integrated services by trained providers offering a range of contraceptive methods. Such efforts may not only prevent unintended pregnancies but also improve health equity across the country.

64 **Key words:** Uptake, Intrauterine contraception, First-trimester, Incomplete abortions,
65 Misoprostol, and central Uganda.

Introduction:

Unwanted pregnancies lead to induced abortions [1] that may result into unsafe abortions and subsequent abortion-related complications [2] such as sepsis, hemorrhage, infertility and adverse pregnancy outcomes in the subsequent pregnancies [3, 4]. Unsafe abortions [5] in sub-Saharan Africa, have been implicated in 9.9% of the maternal deaths [6]. On the African continent, 460 deaths per 100,000 as compared to 30 deaths per 100,000 in high income countries follow unsafe abortions [7]. A high unmet need for effective contraception in Africa, has been identified as the main driver for the unwanted pregnancies [8].

Uganda has a high total fertility rate of 5.2 births per women [9], and a largely young population where nearly 80% of the population is below 30 years. Nearly 50% of the total population are adolescent girls. The unmet need for modern contraception in Uganda of 27.7%, [10] is higher than the proportion reported for the East African region (24.6%) [11]. As a result, 56% (1.2 million) of all pregnancies in this region are unintended, with 25% of the pregnancies (39 per 1000) ending in abortion [12-14]. With the abortion laws being restrictive, many Ugandan women experience induced abortions, some of whom end up as unsafe abortions or as maternal deaths [15, 16].

First trimester incomplete abortions are managed either surgically using manual vacuum aspiration or medically using Misoprostol [17, 18]. Research shows that Misoprostol is highly acceptable, effective and safe to use in the management of first trimester incomplete abortion [17]. After surgical management, most of the contraceptive methods including IUDs can be initiated immediately thereafter [19]. Women do not need to return after the intervention as commonly seen after medical management of incomplete abortions [20-26]. In many settings, a high proportion of women never return for in-person follow up visits [20-26]. With fertility returning as early as two weeks of the uterine evacuation [27], there is a need for women to have access to effective contraception to prevent future unwanted and mistimed pregnancies [28].

Although, intrauterine devices (IUDs) are readily available in Uganda, their user rate has stalled at two percent among the currently married and 15% among the sexually active unmarried women [9]. In other parts of Africa, similar trends have been reported [29, 30] with IUD user rates of less than five percent. Prior studies in sub-Saharan Africa have associated low user

rates with low educational status [10, 31], desire for more children [32], myths and misconceptions [33], unsupportive spouses [34], low socio-economic status [35], religion [10, 34, 36], poor prior pregnancy outcomes [36], inadequate skills among healthcare providers [37] and knowledge gaps about IUDs [28].

Information on rates of IUD uptake within post abortion care, and the factors that are associated with uptake, are lacking in Uganda. Such information may be useful in order to improve post abortion IUD uptake and prevent unintended pregnancies in Uganda. To this end, this study set out to determine the level and factors associated with uptake of post abortion intrauterine contraception following medical management of first trimester incomplete abortions in central Uganda.

Materials and Methods:

Study design:

We used a cross-sectional study to determine the level and factors associated with uptake of post abortion IUDs following medical management of first trimester incomplete abortions at five public facilities between 1st February 2023 and 30th September 2023.

Study setting:

Five public health facilities including Kawempe National Referral Hospital, Kayunga Regional Referral Hospital, Mityana General Hospital, Kiganda Health centre IV, and Bukuya Health centre III were selected from central Uganda. The central region was selected due to the high abortion rate compared to the national average (62 vs. 39 per 1,000 live births) and the large case load of women treated for abortion complications in this setting [12, 16, 38]. All five health facilities offered free medical and contraception services seven-days a week (24/7) and were at the time of the study, the biggest family planning service providers in central Uganda. These facilities were run by healthcare providers of different cadres, with a senior midwife overseeing the family planning administrative duties. The selected facilities had sufficient staff to establish a group of 250 midwives and 80 physicians and a caseload of 50-150 post abortion care patients a month. The infrastructures for family planning research were already in existence at these sites. Healthcare providers received extensive training in post abortion contraceptive counselling and service provision.

All study sites were located within 1-2 hours from Kampala, the capital city of Uganda. The selected public study sites were equipped to provide comprehensive emergency gynaecological services in rural, peri-urban and urban areas. Routinely at the health facilities, women presenting with symptoms and signs of incomplete abortion are triaged at the emergency wards or the outpatient department. History taking and physical examination are conducted by the attending healthcare providers including an abdominal-pelvic assessment to ascertain the presence of cervical dilation. Pregnancy dating is done by calculating the weeks of gestation from the first day of the last menstrual period or by ultrasound. Laboratory examinations are usually undertaken if the patient is found to be anemic or has other co-morbidities like febrile illnesses. Other investigations are performed based on the symptoms and clinical examination findings. Patients with first trimester incomplete abortion based on their clinical status, are managed either medically using Misoprostol or surgically using manual vacuum aspiration. The management of the incomplete abortions is usually on an out-patient basis unless patients present with complications necessitating blood transfusion in severe anemia, exploratory laparotomy with perforated uteri or administration of parenteral antibiotics as seen in septic abortions. (See Appendix 1) for the descriptive characteristics of the five study sites.

Appendix 1: Descriptive characteristics of five selected health facilities in central Uganda

Health Unit	Location	Bed capacity	No. of healthcare providers	Duration of work	Cumulative 1st trimester Abortion load in the past 3 months	Setting	Service delivered
Kawempe National Referral Hospital	Kampala	900	500	24 hours a day, 7 days a week.	484	Urban	Teaching hospital. Offers free emergency gynaecological and obstetric services.
Mityana General Hospital	Mityana	100	116	24 hours a day, 7 days a week.	100	Peri-urban	Offers comprehensive maternal health services including PAC.

Kiganda Health Centre IV	Kassanda	15	50	24 hours a day, 7 days a week	38	Rural	Offers both in and outpatient services including family planning.
Kayunga Regional Referral Hospital	Kayunga	200	179	24 hours a day, 7 days a week	212	Peri-urban	Offers specialist maternal services including PAC.
Bukuya Health centre III	Kassanda	20	30	24 hours a day, 7 days a week	60	Rural	Offers maternal services including PAC, family planning services.

147 Participant recruitment:

148 The criteria for identifying study participants with incomplete abortion was based on
149 experience of any of the following conditions: a confirmation of pregnancy by any of the
150 following methods; a positive urine HCG, ascertaining the gestation age on ultrasound scan or
151 calculation from the first day of the last menstrual period. Furthermore, history of lower
152 abdominal pain, or cramps, and vaginal bleeding, before 12 weeks of gestation was needed to
153 confirm occurrence of first trimester incomplete abortion. Clinical evaluation that included
154 ascertaining the symphysio-fundal height, cervical dilatation, feeling or visualization of
155 products of conception on vaginal or speculum examination by the clinical team, was
156 conducted to confirm the diagnosis of first trimester incomplete abortion. The research
157 assistants being part of the care teams at the different health facilities, identified and
158 approached potential participants willing to undertake medical management for first trimester
159 incomplete abortion from the emergency gynaecology units. Individuals interested in using
160 post abortion intrauterine contraception were given all the required information on all available
161 contraceptive methods to enable them make an informed voluntary choice of a family planning
162 method. They were then assessed for eligibility, provided written and oral information about
163 the study. Participants who consented to participate, were enrolled into the study. An
164 interviewer administered, semi-structured questionnaire was used to collect data at the
165 participants' convenience at the five public facilities before discharge from the facility.

Inclusion criteria:

Women 15 years or older having undergone medical management for first trimester incomplete abortion and expressed interest in initiating post abortion intrauterine contraceptive method, within the past four weeks and who were willing to participate in the study, were recruited.

Exclusion criteria:

Participants who were too sick to participate in the study or with confirmed uterine anomalies like bicornuate uterus, coagulopathies, severe anemia, allergy to copper or Levonorgestrel IUDs, or sepsis, were excluded.

Data collection procedure:

All eligible women with first trimester incomplete abortion who opted for medical management of abortion, meeting the inclusion criteria for post abortion intrauterine contraception, were invited to participate in the study. At the post abortion follow-up visit within four weeks following medical management of abortion, potential participants were given comprehensive contraceptive counselling and information about the study. Participants who were interested were enrolled consecutively into the study and given their preferred contraceptive choices. A pretested standard questionnaire was administered by the trained staff on participants' sociodemographic characteristics, contraceptive choices and predictors of the post abortion intrauterine contraceptive uptake.

Sample size calculation:

We used a study that assessed *Post abortion contraceptive uptake among young women in ten countries in South Asia and Africa*, to calculate the sample size for the primary outcome. In this study, the overall uptake of IUDs was 11%[39]. After computation into OpenEpi info sample size calculator, we required 190 participants to answer the objective on uptake of the post abortion IUDs.

Sample size calculation for factors associated with Post Abortion Intrauterine

Contraception after first Trimester Medical PAC (secondary outcomes):

In a study by Makenzius[5], the Age group of 21–25 (OR: 2.35; $p < 0.029$) was independently associated with contraceptive uptake in PAC. Using OpenEpi info sample size calculator, with OR of 2.35, power of 80%, two-sided confidence level of 95% and level of significance of < 0.05 , a sample size for associated factors of 642 participants was required. To compensate for any non-response, a total sample of 650 participants was used to determine both primary and

secondary objectives for the study. The primary outcome and secondary outcomes (choice of other contraceptive methods) were measured during the post abortion follow-up visit.

Primary outcome: Uptake of post abortion intrauterine contraception, was defined as the actual placement of the post abortion IUDs within four weeks of medical management of first trimester incomplete abortion.

Predictor variables: Sociodemographic characteristics like Age, parity, socio-economic status, education background, health facility factors like availability of the contraceptive mix, were assessed in relation to the uptake of the post abortion IUDs.

Quality Control:

Staff training and recruitment:

Nurse-midwives familiar with the local hospital settings were selected and trained for three days. The training included how to identify potential participants, study procedures and participant recruitment while observing the research ethics in accordance to the Declaration of Helsinki[40]. Thirty research assistants were then selected to collect the data at five study sites over the study period. The nurse-midwives were also trained on how to identify emergencies like severe hemorrhage following the abortion, need for blood transfusion, genital infections like septic abortion and the procedures to undertake so as to inform the obstetric team on duty so that the affected participants could obtain timely emergency care to save their lives.

A pilot study was carried out to pretest and modify the data collection tools. Completed data collection tools were checked daily for completeness and thereafter edited, coded and entered by two data clerks on same day of collection for the five health facilities into KoboToolbox, an online platform for data collection. Data was backed up on external hard drives, encrypted and kept on a secure cloud storage. The database used was password protected and the participants' records were kept under restricted access in a lockable cabin. The research materials were only accessed by the research team in order to protect patient confidentiality and privacy.

Data management:

Electronic questionnaires were designed in KoboToolbox (<https://www.kobotoolbox.org/>) with programmed logic checks and validation rules. The KoboToolbox software was installed on two tablets for the two data clerks to ensure double data entry. Preset validation checks in KoboToolbox enabled us to ensure that the questionnaires were fully and correctly filled before the data was sunk into the local database. We performed double data entry to ensure consistency

between the two entered data. Data was then downloaded into the PAIC database and cleaned using STATA version 15.0. Queries were generated and addressed by the principal investigator and research team before final data freeze and analysis.

Ethical consideration:

Ethical approvals were obtained from The Makerere University School of Medicine Research and Ethics Committee, (Mak-SOMREC-2021-131), and Uganda National Council for Science and Technology (HS2111ES). Administrative clearances were obtained from the administrators of the five health facilities. Written informed consent was obtained from all study participants prior to data collection. Participants were reassured that participating in the study was voluntary and that they could opt out of the study without any interference with the relationship with the research team and service delivery. Participants were compensated for their time. Confidentiality and participants' rights were observed throughout the study.

Analysis:

Univariate analysis was done using frequencies and percentages for categorical variables and mean and standard deviation for continuous variables. We then compared the background characteristics of the participants who had insertion of the post abortion IUDs to those who opted for other contraceptive methods. Categorical variables were analysed using a Chi-square while continuous variables were analysed using student's t test for normally distributed data and fisher's exact t test for skewed data.

Bivariate analysis was done using modified poisson regression due to the prevalence being greater than 15%. Crude Prevalent Ratios were obtained and variables with a p-value of less than 0.2 were included into the final multivariate model. To determine factors independently associated with uptake of intrauterine contraception, adjusted Prevalent Ratio were obtained using the modified poisson regression model. Variables with p-values of less than 0.05 were considered statistically significant. The level of uptake of the IUDs was determined by the computing the proportion of women who had post abortion IUDs inserted as their contraceptive method out of the women who receive family planning counselling following medical management for first trimester incomplete abortion, expressed as a percentage.

We assessed for confounding by considering a ten percent change in the Prevalence Ratio of a model with the dependent variable and one without. Interaction between the study variables

was assessed by forming two-way interaction terms and comparing the models using the likelihood ratio test. Using the Modified Hosmer-Lemeshow test as the ideal test for goodness of model fit for the modified poisson regression, we obtained 0.57 which is greater than 0.05. This shows that the model's predicted probabilities were well-aligned with the observed outcomes, indicating good model calibration.

Results:

Baseline characteristics of study participants:

Between 1st February 2023 and 30th September 2023, we screened 1,911 potential participants who received medical management of first trimester incomplete abortions and were willing to take up post abortion intrauterine contraception at the five health facilities. Out of these potential participants, we enrolled 650 participants. The proportion of women who took up IUDs after medical management of first trimester abortion, was 370/650 (56.9%). The majority of participants who opted for intrauterine contraception chose the copper IUDs 213(57.6%) while 157(42.4%) opted for Levonorgestrel IUDs. Of the other available contraceptive methods, 121(18.6%) women opted for injectable Depo-Provera (DMPA), 116(17.9%) women for implants, 35(5.4%) women opted for oral contraceptive pills, five (0.8%) of the women opted for condoms, and three (0.5%) women opted for periodic abstinence.

A high proportion of the participants (56.6 %) were aged between (25-29) years, were Catholics (32.3%), and housewives or unemployed (52.6%). The mean age was (27.3 $\pm$ SD 1.8) years. Over 50% of the participants who had abortions, had had a livebirth before. The majority of the women who had had abortions were living with a partner (84.0%) and had 2-3 children (38.5%). Only one percent of the participants had a monthly income greater than Ugx shillings 1,000,000/= (USD 270). (*Table 1*)

Table 1: Sociodemographic characteristics of 650 participants:

Variables	Freq(n) (%)
Age-group	
Below 20 years	61(9.38)
20-24	166(25.54)
25-29	202(31.08)
30-35	156(24.00)
Greater than 35years	65(10.00)
Religion	
Adventist	18(2.77)
Anglican/Protestant	170(26.15)

Catholic	210(32.31)
Moslem	113(17.38)
Pentecostal	139(21.38)
Prior pregnancy outcome	
Early Neonatal Death (ENND)	7(1.08)
Intrauterine fetal death (IUFD)	9(1.38)
Induced abortion	42(6.46)
Live birth	387(59.94)
No prior pregnancy	95(14.62)
Spontaneous abortion	110(16.92)
Number of living children	
0	103(15.85)
1	137(21.08)
2-3	250(38.46)
4-5	115(17.69)
>5	33(5.08)
No response	12(1.85)
Mean (SD)	2.81(1.16)
Level of education	
No formal education	17(2.62)
Primary	197(30.31)
O level education	311(47.85)
A level education	61(9.38)
Tertiary	64(9.85)
Occupation	
Employed	310(47.69)
Housewife or unemployed	340(52.61)
Monthly income (Ugx Shillings)	
(1 USD/3700 Ugx)	
<50,000/=	307(47.23)
50,000-499,999/=	278(42.88)
500,000-999,999/=	48(7.38)
>1,000,000/=	7(1.08)
No response	10(1.54)
Distance from Health facility	
<5km	270(45.54)
5-10 km	167(25.69)
11-15km	82(12.69)
16-20km	55(8.46)
>20km	76(11.69)
Mean (SD)	3.31(1.17)
Smoking status	
No	631(97.08)
Yes	19(2.92)
Relationship Status	
Living with a partner	546(84.00)
Not living with a partner	104(16.00)
Number of sexual partners	
1	520(80.00)
2-3	130(20.00)

Accompanied by Partner to the clinic

No 469(72.15)
Yes 181(27.85)

HIV Status

Negative 621(95.54)
Positive 29(4.46)

Current uptake of Post abortion contraceptive method(N=650)

Condoms 5(0.77)
Copper IUDs 213(32.77)
Levonorgestrel IUD 157(24.15)
Injectable 121(18.62)
Implants 116(17.85)
Periodic abstinence 3(0.46)
Pills 35(5.38)

Partner's approval of post-abortion contraception

No 301(46.67)
Yes 344(53.33)

N stands for absolute frequency and % stands for Row percentage

Factors associated with the use of IUDs after the first trimester of incomplete abortion in Uganda.

At bivariate analysis; age, religion, current number of children, occupation, monthly income, distance from health facility, spousal approval of the contraception, and co-habiting status, were statistically associated with the use post abortion IUDs after the first trimester of incomplete abortion with a p-value less than 0.2.(Table 2)

At multivariate analysis; Women who were Pentecostal or Catholic, earning more than one million Ug shillings (USD 270), staying within five kilometres from the health facilities and living with their partners were more likely to choose post abortion IUDs.

Religion: Pentecostal women were 2.49 (Adjusted PR=2.49, CI= (1.19-5.23) p-value=0.016) times more likely to use IUDs compared to those who were Adventists. Women who were Catholics were 2.15 (Adjusted PR=2.13, CI= (1.01-4.47), p-value=0.045) times more likely to use IUDs compared to those who were Adventists.

Socioeconomic status: Women who earned greater than 1,000,000/= (USD 270) were 88% (Adjusted PR=1.88, CI= (1.44-2.46), p-value<0.001) more likely to use IUDs compared to those who earned less than 50,000/=.

307 Cohabiting Status: Women who were not living with their partners were 41% (Adjusted
308 PR=0.59, CI= (0.44-0.79), p-value=0.001) less likely to use IUDs compared to those who were
309 living with their partners.

310 Proximity to the health facilities: Women who lived less than five kilometres from the health
311 facility were 34% (Adjusted PR=1.34, CI= (1.04-1.72), p-value=0.023) more likely to use
312 IUDs compared to those who lived more than 20 kilometres from the health facility. (See Table
313 2)

314 **Table 2: Regression analysis of the factors associated with the Uptake of IUDs after**
315 **First Trimester Incomplete Abortion managed with Misoprostol (n= 650).**

Variables	Use of IUDs No(n=280)	Unadjusted PR (CI 95%) Yes(n=370)		Adjusted PR (CI 95%)
Age-group				
Less than 20 years	31(11.07)	30(8.11)	1	1
20-24	84(30.00)	82(22.16)	1.00(0.74-1.35)	0.81(0.59-1.11)
25-29	80(28.57)	122(32.97)	1.23(0.93-1.62)	0.80(0.58-1.12)
30-35	60(22.14)	94(25.14)	1.22(0.92-1.63)	0.78(0.55-1.10)
Greater than 35	23(8.21)	42(11.35)	1.31(0.96-1.80)	0.87(0.60-1.27)
Religion				
Adventist	13(4.66)	5(1.36)	1	1
Anglican/Protestant	76(27.24)	94(25.61)	1.99(0.93-4.25)	2.09(0.99-4.41)
Catholic	90(32.26)	120(32.70)	2.06(0.97-4.38)	2.13(1.01-4.47) *
Moslem	53(19.00)	60(16.35)	1.91(0.89-4.11)	1.99(0.94-4.22)
Pentecostal	47(16.85)	88(23.98)	2.35(1.10-5.00)	2.49(1.19-5.23) *
Current number of children				
0	58(20.71)	45(12.16)	1	1
1	68(24.29)	69(18.65)	1.15(0.88-1.52)	1.02(0.77-1.36)
2-3	97(34.64)	153(41.35)	1.40(1.10-1.78)	1.19(0.91-1.57)
4-5	39(13.93)	76(20.54)	1.51(1.17-1.95)	1.28(0.95-1.72)
>5	12(4.29)	21(5.68)	1.46(1.04-2.04)	1.22(0.84-1.80)
No response	6(2.14)	6(1.62)	1.14(0.62-2.10)	1.02(0.57-1.82)
Occupation				
Employed	125(44.64)	185(50.00)	1	1
Housewife or unemployed	155(55.36)	185(50.00)	0.91(0.80-1.04)	1.03(0.85-1.25)
Monthly income (1 USD/3700 Ugx)				
<50,000/=	143(51.07)	164(44.32)	1	1
50,000-499,999/=	111(39.64)	167(45.14)	1.12(0.98-1.30)	1.15(0.95-1.40)
500,000-999,999/=	17(6.07)	31(6.38)	1.21(0.96-1.53)	1.25(0.93-1.68)
>1,000,000/=	1(0.36)	6(1.62)	1.60(1.16-2.21)	1.88(1.44-2.46) ***
No response	8(2.86)	2(0.54)	0.37(0.11-1.30)	0.37(0.11-1.28)
Distance from Health facility				
>20km	39(13.93)	37(10.00)	1	1
16-20km	29(10.36)	26(7.03)	0.97(0.68-1.40)	0.91(0.63-1.32)
11-15km	42(15.00)	40(10.81)	1.00(0.73-1.38)	0.96(0.70-1.32)

5-10 km	81(28.93)	86(23.24)	1.06(0.80-1.39)	0.99(0.75-1.32)
<5km	89(31.79)	181(48.92)	1.34(1.08-1.76)	1.34(1.04-1.72) *
Cohabiting status				
Living with a partner	212(75.71)	334(90.27)	1	1
Not living with a partner	68(24.29)	36(9.73)	0.57(0.43-0.74)	0.59(0.44-0.79) **
316	<i>p-value <0.05 were significant, NB * = p<0.05, ** = p<0.01, *** = p<0.001</i>			

Discussion:

The uptake of post abortion IUDs following medical management of first trimester incomplete abortion at five public facilities in central Uganda, was 57%. The factors associated with post abortion IUDs were; religion, woman's income, cohabiting status and participants' distance from their homes to the health facilities.

The uptake of post abortion IUDs in our study is similar to the 60% reported in the Marie Stopes International clinics across Australia[41] but it is significantly higher than the one percent reported at two public hospitals in Kisumu, Kenya. In this Kenyan study, a high proportion of women opted for injectable Depo-Provera (39%) followed by pills (27%) and condoms (25%) [5]. Our study's post abortion IUD uptake is also comparable to the 48% reported in Kalafong Provincial Tertiary Hospital in Atteridgeville, Pretoria, South Africa following uterine evacuation[42]. Although, uptake of post abortion intrauterine contraception has been reported to be higher after surgical as compared to medical evacuation [41, 43], the uptake in our study after medical evacuation was higher than the 18.4% reported in the Massachusetts, United States after surgical evacuation[44]. Comparisons of our high uptake rate and rates shown in previous studies must however, be done with some caution, keeping in mind that we included only women who had expressed an interest in initiating an IUD and who attended a follow-up visit in facilities with healthcare providers who had recently received comprehensive training in post abortion family planning counselling and provision. The importance and positive impact of healthcare providers' training on the uptake of post abortion IUDs has previously been shown by Benson et al. who analyzed client log book data from 921,918 abortion care cases in 4,881 health facilities from July 2011 through June 2015 across ten countries in Asia and sub-Saharan Africa[39]. Trained healthcare providers were more likely to adequately counsel and offer post abortion contraception compared to healthcare providers who were not trained. Hence, acquisition of the appropriate knowledge and skillsets in post abortion intrauterine contraception by healthcare providers in our study could explain

the high uptake of the IUDs. Other studies in similar settings have reported that the uptake of contraception was even higher when the available healthcare providers were more skilled in intrauterine contraception, and in the facilities that had procedure rooms for evacuation[45-47].

About 42.4 % of study participants who took up post abortion IUDs chose the hormonal IUDs. Although Levonorgestrel IUDs have been reported to have advantages [48, 49] such as reduced menstrual loss, and dysmenorrhea, compared to the copper IUDs, nearly 60% of the participants in the study preferred copper IUDs over Levonorgestrel IUDs. Despite the said advantages, a number of African women desire to have periods as an assurance of their fertility that might not be the case with Levonorgestrel IUDs[50].

Findings in our study show that religion has an impact on the uptake of post abortion IUDs. The influence of religion on contraceptive use has been highlighted in other studies. For instance, Addai, [51] identified religion as a strong determinant to the uptake of contraception in Ghana. In the United States, Catholics were reported to have low contraceptive user rates[52]. These results are contrasted by Bakibinga 2016, who found that religion didn't have any influence on the uptake of contraception [53]. The observation of more Pentecostal Christians and Catholics taking on post abortion IUDs as reported in our study could suggest a mindset adjustment among the individuals and a collective effort from the religious leaders to advocate for effective contraception like IUDs. In Western Kenya, when religious leaders were offered with the appropriate family planning knowledge and involvement at six faith-based organizations, the uptake of modern contraception increased by tenfold. This underscores the impact of religious leaders' involvement and advocacy in the uptake modern contraception [54].

Our study results underscore the importance of how socio-economic status on contraceptive uptake. Although contraceptives were free of charge in our study, we found that women who earned more than one million Ugandan shillings (USD 270) were more likely to opt for IUDs as compared to house wives or those who were unemployed. Wealthier women have been reported to utilize the IUDs more than unemployed women [10]. The wealth status is believed to follow women's education status that gives the women more power to decide their contraceptive choices. As women get more years of education, their wealth status improves. This empowerment enables wealthier women to make more informed decision in regard to their contraceptive needs as compared to women of less education and low social economic

status[55]. Women of low socioeconomic status in Marie Stopes International clinics across Australia were noted to leave without their intrauterine contraception of preference [41] as compared to those in the higher economic quintiles thereby being predisposed to subsequent unintended pregnancies. These findings highlight opportunities to counteract reproductive health inequities. Policy makers in Uganda should consider subsidizing contraceptives to ensure access to IUDs for women in lower economic quintiles as well as strengthening efforts towards female education for informed contraceptive decision making.

In our study, women who were co-habiting with their partners were more likely to use post abortion intrauterine contraception than single women. This finding has been reported in other studies[5, 56, 57]. The higher uptake of post abortion IUDs among women in union could be resulting from influence by their partners [58]. The emotional and physical support from their partners during the management of the abortions could have influenced the higher uptake of post abortion IUDs among the marrieds in our study as reported by Kayi et.al in Ghana[56]. The uptake could also result from healthcare provider bias with providers being less likely to push LARCs on young single women in sub-Saharan Africa [59, 60]. Young and unmarried women are commonly encouraged to abstain for fears of becoming infertile following IUD use [61-63]. In Uganda, 44.5% of the pregnancies are unintended[64]. It's likely that married women have an immediate danger of becoming pregnant shortly after an abortion, hence the increased urgency to adopt a family planning method.

Our study findings suggest that proximity to health facilities influences the uptake of post abortion intrauterine contraception. The fact that after medical management women were expected to return for insertion could be the explanation that women who lived closer to the health facilities were more likely to have their IUDs inserted than those who stayed far. Time that would have been wasted in transit as women travel long distances to seek family planning consultations, is reduced by women staying closer to the health facilities. In similar settings as noted by Achana in Upper East Region of Ghana, women staying within two kilometres were 36% more likely to use contraception than those who lived further[65]. Staying within five kilometres to the health facilities among the rural married women was associated with increased utilization of modern contraceptive methods in Rural Ethiopia [66]. Policy makers ought to facilitate services that ensure that quick start of family planning methods can integrate in contraceptive counselling and provision on the first contact after abortion treatment. Such

approaches can ensure that women who live far don't have to return for follow up visits. Follow up visits for women staying far could be prioritized to be over phone for a majority of women. Prior studies have shown higher continuation rates and patient satisfaction with early intrauterine contraception within a week of medical management of abortions than with the standard insertion between 2-4 weeks later[26]. There's also no need for back up contraception with early insertion as implemented for standard care of inserting IUDs 2-4 weeks later[67, 68].

The strength of this study lies in the fact that our sample size of 650 participants was large and included both rural and urban women giving us the ability to generalize our study findings. Participants were comprehensively counseled on a wide range of contraceptive methods and voluntarily adopted a method of their choice thereby minimizing social desirability bias. The healthcare providers had extensive trainings in post abortion family planning counselling and provision prior to the study. The acquired knowledge and skillsets in post abortion contraception was a backbone that could have motivated women to fully participate from start to end of the study.

We were however unable to determine the continuation rates among the study participants as the study design was cross-sectional. Healthcare providers' and couples' perceived barriers and motivators as factors for the uptake of post abortion contraception, couldn't be determined in the current study but should be explored further. Only public facilities offering free family planning services were used in the current study. In our study, only women who expressed interest in initiating intrauterine contraceptive method, and attended the post abortion follow up visit, were included in the study. Our results may not be comparable to other similar studies that look at post abortion uptake in general after medical management of first trimester incomplete abortions.

Conclusion:

The uptake of IUDs among post abortion women was nearly 60% emphasizing the need to integrate IUD services in the post abortion care package. Our study findings accentuate the impact of comprehensive and updated training on post abortion contraceptive counselling on the uptake of IUDs. Efforts are now needed to ensure that all women seeking post abortion care in Uganda, regardless of sociodemographic status, are provided high-quality integrated services by trained providers, that offer a range of contraceptive methods, including IUDs.

Such efforts may not only prevent unintended pregnancies but also improve health equity across the country.

Abbreviations:

DMPA	Injectable Depo-Medroxyprogesterone
IUD	Intrauterine Device
LARCs	Long-Acting Reversible Contraceptives
PAC	Post Abortion Care
PAIC	Post Abortion Intrauterine contraception
SOMREC	The School of Medicine Research and Ethics Committee
UNCST	Uganda National Council for Science and Technology
WHO	World Health Organization

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Availability of data and Materials:

All the necessary data and materials underlying the findings described have been provided as part of this manuscript. In case any more data or materials are needed, they are readily accessible from the Secretary in the Department of Obstetrics and Gynecology library, Makerere University, College of Health Sciences, Kampala, Uganda.

Author Contributions:

Conceptualization: HK, EL, AC, KG
 Formal analysis: HK, JB, KO
 Data collection: DAG, DN,
 Funding acquisition: HK, EL
 Methodology: HK, EM, KS, AC, JR, MS
 Project administration: DAG, HK, DN
 Resources: KG, HK, NT, DAG
 Supervision: KO, AC, JB, NT, KG, JR, MS
 Writing original draft: HK,
 Writing review & editing: AC, KO, DK, EL, JR, MS

References:

1. Sedgh G, Singh S, Shah IH, Ahman E, Henshaw SK, Bankole A., *Induced abortion: incidence and trends worldwide from 1995 to 2008*. Obstetric Anesthesia Digest, 2013. **33**(1): p. 15-16.h
2. Conde-Agudelo A, Belizan JM, Breman R, Brockman SC, Rosas-Bermudez A. et al., *Effect of the interpregnancy interval after an abortion on maternal and perinatal health in Latin America*. International Journal of Gynecology & Obstetrics, 2005. **89**: p. S34-S40.

3. Ziraba AK, Izugbara C, Levandowski BA, Gebreselassie H, Mutua M, Mohamed SF, et al., *Unsafe abortion in Kenya: a cross-sectional study of abortion complication severity and associated factors*. BMC pregnancy and childbirth, 2015. **15**: p. 1-11.
4. Pike, G.K., *Abortion and Infertility*. Issues L. & Med., 2020. **35**: p. 173.
5. Makenzius M, Faxelid E, Gemzell-Danielsson K, Odero TM, Klingberg-Allvin M, Oguttu M., *Contraceptive uptake in post abortion care—Secondary outcomes from a randomised controlled trial, Kisumu, Kenya*. PloS one, 2018. **13**(8): p. e0201214.
6. Say L, Chou D, Gemmill A, Tunçalp Ö, Moller AB, Daniels J, et al., *Global causes of maternal death: a WHO systematic analysis*. The Lancet global health, 2014. **2**(6): p. e323-e333.
7. Ahmed S, Li Q, Liu L, Tsui AO., *Maternal deaths averted by contraceptive use: an analysis of 172 countries*. The Lancet, 2012. **380**(9837): p. 111-125.
8. Singh, S., J.E. Darroch, and L.S. Ashford., *Adding it up: the costs and benefits of investing in sexual and reproductive health 2014*. 2014.
9. Uganda Bureau of Statistics (UBOS) and ICF, International Inc, 2022., *Uganda Demographic And Health Survey (UDHS) 2022*. Kampala, Uganda and Rockville, Maryland, USA: UBOS and ICF
10. Belay, A.S., H. Sarma, and G. Yilak, *Spatial distribution and determinants of unmet need for family planning among all reproductive-age women in Uganda: a multi-level logistic regression modeling approach and spatial analysis*. Contraception and Reproductive Medicine, 2024. **9**(1): p. 4.
11. Alie, M.S., G.F. Abebe, and Y., Negesse, *Magnitude and determinants of unmet need for family planning among reproductive age women in East Africa: multilevel analysis of recent demographic and health survey data*. Contraception and Reproductive Medicine, 2022. **7**(1): p. 2.
12. Hussain, R., *Unintended pregnancy and abortion in Uganda*. 2013.
13. Carney, H., *Category: Health & Wellness*.
14. Sedgh G, Filippi V, Owolabi OO, Singh SD, Askew I, Bankole A, et al., *Insights from an expert group meeting on the definition and measurement of unsafe abortion*. International Journal of Gynecology & Obstetrics, 2016. **134**(1): p. 104-106.
15. Government of Uganda, Ministry of Health., *The National Annual Maternal and Perinatal Death Surveillance and Response (MPDSR) Report for FY 2022/2023*. September 2023.

16. Singh S, Prada E, Mirembe F, Kiggundu C., *The incidence of induced abortion in Uganda*. International family planning perspectives, 2005: p. 183-191.
17. Weeks A, Alia G, Blum J, Winikoff B, Ekwaru P, Durocher J, et al., *A randomized trial of misoprostol compared with manual vacuum aspiration for incomplete abortion*. Obstetrics & Gynecology, 2005. **106**(3): p. 540-547.
18. Klingberg-Allvin M, Cleeve A, Atuhairwe S, Tumwesigye NM, Faxelid E, Byamugisha J, et al., *Comparison of treatment of incomplete abortion with misoprostol by physicians and midwives at district level in Uganda: a randomised controlled equivalence trial*. The Lancet, 2015. **385**(9985): p. 2392-2398.
19. Roe, A.H. and D. Bartz., *Society of Family Planning clinical recommendations: contraception after surgical abortion*. Contraception, 2019. **99**(1): p. 2-9.
20. Gillett PG, Lee NH, Yuzpe AA, Cerskus I., *A comparison of the efficacy and acceptability of the Copper-7 intrauterine device following immediate or delayed insertion after first-trimester therapeutic abortion*. Fertility and sterility, 1980. **34**(2): p. 121-124.
21. Stanek AM, Bednarek PH, Nichols MD, Jensen JT, Edelman AB., *Barriers associated with the failure to return for intrauterine device insertion following first-trimester abortion*. Contraception, 2009. **79**(3): p. 216-220.
22. Davis A, Ramos ME, Rosario L, Westhoff C., *Timing of copper intrauterine device insertion after medical abortion: a randomized controlled trial*. Obstetrics & Gynecology, 2011. **118**(3): p. 623-628.
23. Paul M, Iyengar SD, Essén B, Gemzell-Danielsson K, Iyengar K, Bring J, et al., *Does mode of follow-up influence contraceptive use after medical abortion in a low-resource setting? Secondary outcome analysis of a non-inferiority randomized controlled trial*. BMC public health, 2016. **16**(1): p. 1-13.
24. Chong E, Frye LJ, Castle J, Dean G, Kuehl L, Winikoff B., *A prospective, non-randomized study of home use of mifepristone for medical abortion in the US*. Contraception, 2015. **92**(3): p. 215-219.
25. Grossman D, Ellertson C, Grimes DA, Walker D., *Routine follow-up visits after first-trimester induced abortion*. Obstetrics & Gynecology, 2004. **103**(4): p. 738-745.
26. Sääv, I., O. Stephansson, and K. Gemzell-Danielsson., *Early versus delayed insertion of intrauterine contraception after medical abortion—a randomized controlled trial*. PloS one, 2012. **7**(11): p. e48948.

27. Cameron, I. and D. Baird., *The return to ovulation following early abortion: a comparison between vacuum aspiration and prostaglandin*. European Journal of Endocrinology, 1988. **118**(2): p. 161-167.
28. Kakaire O, Nakiggude J, Lule JC, Byamugisha JK., *Post abortion women's perceptions of utilizing long acting reversible contraceptive methods in Uganda. A qualitative study*. Open journal of obstetrics and gynecology, 2014. **4**(16): p. 1087-1097.
29. Tsui, A.O., W. Brown, and Q. Li., *Contraceptive practice in sub-Saharan Africa*. Population and development review, 2017. **43**(Suppl Suppl 1): p. 166.
30. Alkema L, Kantorova V, Menozzi C, Biddlecom A., *National, regional, and global rates and trends in contraceptive prevalence and unmet need for family planning between 1990 and 2015: a systematic and comprehensive analysis*. The Lancet, 2013. **381**(9878): p. 1642-1652.
31. Nzokirishaka, A. and I. Itua., *Determinants of unmet need for family planning among married women of reproductive age in Burundi: a cross-sectional study*. Contraception and reproductive medicine, 2018. **3**: p. 1-13.
32. Khalil, S.N., M.M. Alzahrani, and A.F. Siddiqui., *Unmet need and demand for family planning among married women of Abha, Aseer Region in Saudi Arabia*. Middle East Fertility Society Journal, 2018. **23**(1): p. 31-36.
33. Blackstone, S.R., U. Nwaozuru, and J. Iwelunmor., *Factors influencing contraceptive use in sub-Saharan Africa: a systematic review*. International quarterly of community health education, 2017. **37**(2): p. 79-91.
34. Letamo, G. and K. Navaneetham., *Levels, trends and reasons for unmet need for family planning among married women in Botswana: a cross-sectional study*. BMJ open, 2015. **5**(3): p. e006603.
35. Yibrah, H. and T. Gabriel., *Explaining unmet need for family planning in rural Tigray, Ethiopia*. J Contracept Stud, 2018. **3**(2): p. 14.
36. Kumar, A. and A. Singh., *Trends and determinants of unmet need for family planning in Bihar (India): evidence from National Family Health Surveys*. Advances in Applied Sociology, 2013. **3**(2): p. 157-163.
37. Blumenthal, P.D., A. Voedisch, and K. Gemzell-Danielsson., *Strategies to prevent unintended pregnancy: increasing use of long-acting reversible contraception*. Human reproduction update, 2011. **17**(1): p. 121-137.

38. Prada E, Atuyambe LM, Blades NM, Bukenya JN, Orach CG, Bankole A., *Incidence of Induced Abortion in Uganda, 2013: New Estimates Since 2003*. PLoS ONE, 2016. **11**(11): p. e0165812.
39. Benson J, Andersen K, Healy J, Brahmi D., *What factors contribute to postabortion contraceptive uptake by young women? A program evaluation in 10 countries in Asia and sub-Saharan Africa*. Global Health: Science and Practice, 2017. **5**(4): p. 644-657.
40. *World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects.*, The Journal of the American College of Dentists, 2014. **81**(3): p. 14.
41. Goldstone P, Mehta YH, McGeechan K, Francis K, Black KI., *Factors predicting uptake of long-acting reversible methods of contraception among women presenting for abortion*. Medical Journal of Australia, 2014. **201**(7): p. 412-416.
42. Moagi, M., L.C. Snyman, and J.D. Makin., *Feasibility and uptake of intrauterine contraceptive device at the time of uterine evacuation in women presenting with incomplete miscarriage at Kalafong Provincial Tertiary Hospital*. in *Obstetrics and Gynaecology Forum*. 2019. In House Publications.
43. Rocca CH, Goodman S, Grossman D, Cadwallader K, Thompson KM, Talmont E, et al., *Contraception after medication abortion in the United States: results from a cluster randomized trial*. American journal of obstetrics and gynecology, 2018. **218**(1): p. 107. e1-107. e8.
44. Roe AH, Fortin J, Janiak E, Maurer R, Goldberg AB., *Prevalence and predictors of initiation of intrauterine devices and subdermal implants immediately after surgical abortion*. Contraception, 2019. **100**(2): p. 89-95.
45. Mutua MM, Achia TN, Manderson L, Musenge E., *Spatial and socio-economic correlates of effective contraception among women seeking post-abortion care in healthcare facilities in Kenya*. PloS one, 2019. **14**(3): p. e0214049.
46. Solo, J., *Creating linkages between incomplete abortion treatment and family planning services in Kenya*. Studies in family planning, 1999. **30**(1): p. 17-27.
47. Sundaram A, Juarez F, Ahiadeke C, Bankole A, Blades N., *The impact of Ghana's R3M programme on the provision of safe abortions and postabortion care*. Health Policy and Planning, 2015. **30**(8): p. 1017-1031.
48. Kadir, R.A. and C. Chi., *Levonorgestrel intrauterine system: bleeding disorders and anticoagulant therapy*. Contraception, 2007. **75**(6): p. S123-S129.

49. Pakarinen, P. and T. Luukkainen., *Treatment of menorrhagia with an LNG-IUS*. Contraception, 2007. **75**(6): p. S118-S122.
50. Laher F, Todd CS, Stibich MA, Phofa R, Behane X, Mohapi L., *Role of menstruation in contraceptive choice among HIV-infected women in Soweto, South Africa*. Contraception, 2010. **81**(6): p. 547-551.
51. Addai, I., *Does religion matter in contraceptive use among Ghanaian women?* Review of Religious Research, 1999: p. 259-277.
52. Fehring, R. and J. Ohlendorf., *The influence of religiosity on contraceptive use and abortion in the United States*. Life and Learning XVII, 2007.
53. Bakibinga P, Mutombo N, Mukiira C, Kamande E, Ezech A, Muga R., *The influence of religion and ethnicity on family planning approval: a case for women in rural Western Kenya*. Journal of religion and health, 2016. **55**: p. 192-205.
54. Ruark A, Kishoyian J, Bormet M, Huber D. ., *Increasing family planning access in Kenya through engagement of faith-based health facilities, religious leaders, and community health volunteers*. Global Health: Science and Practice, 2019. **7**(3): p. 478-490.
55. Tetui M, Baroudi M, Ssekamatte T, Birabwa C, Kibira SP, Atuyambe L., *Total demand, use and unmet need for modern contraceptives among women living in informal settlements in Kira Municipality, Wakiso District, Uganda. Implications for urban health*. Frontiers in Global Women's Health, 2021. **2**: p. 655413.
56. Kayi EA, Biney AA, Dodoo ND, Ofori CA, Dodoo FN., *Women's post-abortion contraceptive use: Are predictors the same for immediate and future uptake of contraception? Evidence from Ghana*. Plos one, 2021. **16**(12): p. e0261005.
57. Delvaux T, Sœur S, Rathavy T, Crabbé F, Buvé A., *Integration of comprehensive abortion-care services in a Maternal and Child Health clinic in Cambodia*. Tropical Medicine & International Health, 2008. **13**(8): p. 962-969.
58. Abdel-Tawab N, Huntington D, Hassan EO, Youssef H, Nawar L., *Effects of husband involvement on postabortion patients' recovery and use of contraception in Egypt*. Postabortion Care: Lessons from Operations Research. Nueva York: Population Council, 1999: p. 16-37.
59. Nalwadda G, Mirembe F, Byamugisha J, Tumwesigye NM, Faxelid E., *Young peoples' interface with providers of contraceptive care: a simulated client study in two Ugandan districts*. Contraception and Reproductive Medicine, 2016. **1**: p. 1-10.

60. Cooke, A., *A Systematic Review of Physician-Patient Interactions and the Effect of Health Care Provider Bias and Knowledge on Adolescent Contraception Counseling in Developing Countries and Comprehensive Review: Contraceptive Use and Impact of Physician Counseling for Adolescent Patients of Method Choices and Side Effects in Developing Countries*. 2019.
61. Sedlander E, Bingenheimer JB, Thiongo M, Gichangi P, Rimal RN, Edberg M, et al., “They destroy the reproductive system”: exploring the belief that modern contraceptive use causes infertility. *Studies in family planning*, 2018. **49**(4): p. 345-365.
62. Gomez, A.M. and B. Freihart., *Motivations for interest, disinterest and uncertainty in intrauterine device use among young women*. *Maternal and Child Health Journal*, 2017. **21**: p. 1753-1762.
63. Osei IF, Mayhew SH, Biekro L, Collumbien M, ECAF Team., *Fertility decisions and contraceptive use at different stages of relationships: windows of risk among men and women in Accra*. *International perspectives on sexual and reproductive health*, 2014. **40**(3): p. 135-143.
64. Asrat, D., A. Copas, and A. Olubukola., *Exploring the association between unintended pregnancies and unmet contraceptive needs among Ugandan women of reproductive age: an analysis of the 2016 Uganda demographic and health survey*. *BMC Pregnancy and Childbirth*, 2024. **24**(1): p. 117.
65. Achana FS, Bawah AA, Jackson EF, Welaga P, Awine T, Asuo-Mante E, et al., *Spatial and socio-demographic determinants of contraceptive use in the Upper East region of Ghana*. *Reproductive health*, 2015. **12**: p. 1-10.
66. Shiferaw S, Spigt M, Seme A, Amogne A, Skrøvseth S, Desta S, et al., *Does proximity of women to facilities with better choice of contraceptives affect their contraceptive utilization in rural Ethiopia?* *PloS one*, 2017. **12**(11): p. e0187311.
67. Royal College of Obstetricians and Gynaecologists., *The care of women requesting induced abortion*. 2011: RCOG press.
68. Okusanya, B.O., O. Oduwole, and E.E. Effa., *Immediate postabortal insertion of intrauterine devices*. *Cochrane Database of Systematic Reviews*, 2014(7).

Supporting Information:

We have availed the approved study protocol, ethical approval forms from the School of Medicine, Makerere University Ethic Review, and the Uganda National Committee of Science and Technology, informed consent and the data collection tool. The authors agree to the data sharing plan. In case any more data or materials are needed, they are readily accessible in the Department of Obstetrics and Gynecology library, Makerere University College of Health Sciences, Kampala, Uganda.