



Factors affecting the persistent use of sharp curettage for abortion in public hospitals in Mexico

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Abstract

Objectives: Dilation and curettage is an outdated abortion procedure no longer recommended by the World Health Organization. However, use of dilation and curettage remains high in some countries, including Mexico. We aim to understand the factors that contribute to persistent use of dilation and curettage in Mexico.

Methods: We conducted a mixed-methods study in two phases: (1) secondary quantitative data analysis from 40 Ipas-supported public hospitals in Mexico and (2) 28 in-depth interviews in 9 Ipas-affiliated hospitals with doctors, nurses, and hospital administrators.

Results: Among our sample, 41% of abortions less than 13 weeks performed in 2019 were treated with dilation and curettage, while this increased to 67% of abortions at or above 13 weeks. Only 18% of induced abortions were performed with dilation and curettage compared to 44% of post-abortion care procedures. The main factor identified as determining use of dilation and curettage in in-depth interviews was availability of abortion supplies, both in terms of cleaning, storage, and maintenance of supplies and in the budgeting and procurement of supplies. Other factors included confidence in the efficacy of other methods, attitudes toward different methods, skill and training, and perceived benefits to patients.

Conclusion: Ensuring supplies for recommended abortion methods are available is a key lever for any intervention aimed at reducing dilation and curettage use. However, as the doctor performing the abortion decides which method to use, individual factors such as lack of skill and mistrust in other procedures can become a particularly obstinate barrier to recommended method use. Localizing decision-making power in the hands of doctors is problematic in that it places the doctor's preference above that of the person receiving the abortion. It is important to look deeply at the power structures that contribute to doctor-oriented models of abortion care.

Keywords

abortion, D&C, gynecology and obstetrics, Latin America and the Caribbean, reproductive health, sharp curettage

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Introduction

An estimated 55.9 million abortions occur each year around the globe.¹ When performed using recommended methods such as vacuum aspiration (VA) or medical abortion (MA), abortion is an extremely safe procedure.^{2,3} However, use of outdated procedures such as dilation and curettage (D&C), also known as sharp curettage, have been shown to increase the risk of adverse events as many as two to three times when compared to VA.⁴

A substantial body of research enumerates potential adverse events with D&C, including uterine perforations, subsequent preterm birth, and intrauterine adhesions.^{4–8} Along with higher risk of adverse events, D&C has been

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shown to involve greater financial burdens for patients and more intensive requirements of health facilities and practitioners due to the need for anesthesia and overnight hospital stays, vastly reducing accessibility and affordability.⁹ Furthermore, non-use of general anesthesia and shorter hospital stays allow patients to return more quickly to their normal routines, factors that have also been identified from the patient preference perspective.¹⁰ D&C is the only abortion procedure that must be provided by a doctor; VA and MA can be provided by a range of specialist and non-specialist doctors, nurses, and midwives, and, in the case of MA, by the abortion client themselves, thus diminishing cost and improving access.¹¹ Given this, the World Health Organization (WHO) discourages D&C and strongly recommends use of manual vacuum aspiration (MVA) or MA as safer, less costly, and more accessible methods of abortion care.²

Despite this evidence, use of D&C for abortion remains high in many low and middle resource settings, including Mexico. Abortion in Mexico is legal under certain indications in the majority of Mexican states; these indications range from rape (legal in all states), to risk to health or life, incest, and congenital malformations, among others. In Mexico City and Oaxaca, abortion is legal at the patient's request up to 12 weeks of pregnancy.¹² A 2008 survey of 135 providers at private clinics in Mexico found that 70% of clinics used D&C for first trimester abortions, with VA and MA making up less than one third of procedures.¹³ However, literature focused specifically on the reasons for continued high D&C rates in Mexican hospitals despite the availability of both MA and MVA in country is lacking. Research from other parts of the world suggests that potential barriers to use of MVA include insufficient availability of equipment,^{14,15} lack of training or rotation of doctors trained in recommended methods for abortion,^{16,17} and gestational age.¹⁸ In the case of MA, barriers include drug supply and provider knowledge of and comfort with using this non-invasive method.¹⁹ These studies originate from low-income economies with health systems, abortion law, and economies very different from those of Mexico. The one study that looked at reasons for D&C use in Mexico found that providers largely lacked knowledge of effective MA regimens, lacked MVA equipment, and were less convinced of the efficacy of MVA.²⁰ However, assessing reasons for different abortion method use was not the main focus of this research; our study aims to deepen our understandings of the different factors affecting persistent D&C use in Mexico.

Phasing out the use of D&C is imperative, with serious implications on accessibility, safety, acceptability, and affordability of abortion care. Our study attempts to fill the gap in research on reasons for continued use of D&C in Mexico and identify possible solutions to increase use of recommended methods in the country.

Methods

Between February and June 2020, we conducted a mixed-methods study in two phases to better understand use of D&C in Ipas-supported public hospitals in Mexico when compared to recommended methods. Ipas is an international non-governmental organization that allies with public hospitals around the world to prevent unsafe abortion. Recommended methods for abortion is an umbrella term for abortion methods recommended by the WHO, including MVA and MA. We focused on MVA and not electric vacuum aspiration (EVA) given that EVA is largely unavailable in public hospitals in Mexico.

The first phase consisted of secondary quantitative data analysis using data from 40 Ipas-supported public hospitals in Mexico. We excluded legal abortion clinics in Mexico City that Ipas continues to work with as nearly all of those procedures are performed using recommended methods²¹ and are not representative of continued high D&C use in public hospitals. The data analyzed are summary data and include variables such as number of abortions provided, abortion method by trimester, age data of clients accessing abortion, and contraceptive method received. These data are official abortion data and available to the public.²² Ipas also regularly conducts site visits and collects additional data on site functioning, including supply stock-outs and adverse event (AE) and serious adverse event (SAE) reporting. AEs for Ipas reporting standards are defined by taxonomy and include events resulting from clinical care (such as a perforation occurring during the abortion procedure) that are not a result of the person's presenting condition. SAEs are defined by outcome, including death, life threatening injury, hospitalization, permanent impairment, or an event necessitating medical or surgical interventions to preclude permanent impairment. All data are stored in a password-protected database maintained by Ipas.

We ran simple frequencies looking at use of D&C over time by year and in the past year by 3-month periods. We then compared data on D&C use with other internally collected data that we hypothesized could be related to D&C use. These variables included stock out of MVA equipment or MA drugs in the past 3 months, number of visits by Ipas in one year, the number of trainings on data registration systems, increases in abortions at or after 13 weeks, reporting of AEs and SAEs, number of residents in the hospital, and length or type of Ipas support with each hospital. We created a matrix to permit us to cross variables and assess relationships. We used findings to identify hospitals for the second phase of the research, as well as to identify important patterns to probe further in in-depth interviews (IDIs).

The second phase of the study consisted of IDIs using both open-ended questions and quantitative factor ranking with doctors, nurses, and hospital administrators. We conducted a total of 28 IDIs in 9 Ipas-affiliated hospitals, all of

which were part of the secondary data analysis in the first phase. All nine hospitals were located outside of Mexico City in states where abortion is legal only under certain indications. Hospitals were chosen based on their interest in participating and their D&C use, with three sites having consistently low use of D&C and the remaining six having either decreasing or increasing rates of D&C since the start of Ipas support. Eleven of the 28 IDIs (39%) were with obstetrician and gynecologists (Ob/Gyns), 10 (36%) with nurses, and 7 (25%) with administrators. The research team chose these three profiles due to the fact that doctors, nurses, and administrators hold direct or indirect influence in decisions regarding which surgical or medical method to use. In Mexico, Ob/Gyns directly perform the abortion, nurses assist in supporting the procedure and disinfecting equipment used for abortion, and administrators are responsible for ensuring abortion equipment and medications are stocked.

We recruited participants via convenience sampling. Members of the research team who work closely with health personnel in the hospitals identified possible participants, with the objective of oversampling doctors who use D&C, as this is ultimately the behavior we seek to change. Possible participants were then contacted via text message to assess interest in participating in the study. Phone interviews were scheduled with participants who expressed interest and lasted approximately 45 minutes. We obtained verbal informed consent from all participants to streamline the consent process during phone interviews. Interviewers reviewed the consent with participants on the phone and documented on a spreadsheet their verbal informed consent to participation and audio recording.

Two members of the research team with experience in qualitative research and familiarity with the subject matter developed Spanish-language semi-structured interview guides. Given the different roles doctors, nurses, and administrators play in abortion service delivery, we developed different guides for the three interviewee profiles. Similarly, different interview guides were developed for doctors who reported using D&C and those who only use recommended methods for abortion. All other members of the research team reviewed and edited the guides and guides were pilot tested. Guides focused on reasons for using D&C, barriers and facilitators to stock, maintain, and use different methods for abortion, and suggestions for ways to reduce use of D&C. Doctors who use D&C were asked to reflect on their reasons for use, while those who do not use D&C were asked to reflect on the D&C use of their colleagues.

To enable us to focus on the main reasons that impact use of D&C, guides for doctors and nurses also contained scales for ordering identified reasons from least to most important. These included reasons that we hypothesized to be important in determining the use of recommended methods according to existing literature and expertise

among the research team, including lack of skills/knowledge, confidence, or interest in other abortion methods, perceptions of patient safety, stockout of MVA/MA equipment, lack of clean and available commodities at time of procedure, length of time for cleaning of supplies, preference for general anesthesia because of provider or patient comfort, influence of the anesthesiologist, facility revenue and cost of D&C, and hospital culture. Factors presented were different for nurses and doctors to reflect their different roles in abortion service delivery. Administrator guides did not include factor ranking as their sphere of influence is restricted to supply stock. For each factor, respondents were asked whether or not it was important to determining the type of method used and if so, to scale its importance on a three-item scale ranging from a little important to very important. Of all reasons identified as important, respondents were then asked to rank these from most to least important. This allows us to build a more targeted response by pinpointing the main factors that must be addressed to reduce D&C use.

Trained interviewers fluent in Spanish conducted, recorded, and transcribed all interviews verbatim. Interviews were stored on password-protected devices and unique IDs were created to protect identifying information. Members of the research team listened to recordings periodically throughout data collection and reviewed transcriptions for quality.

A subset of the research team fluent in Spanish analyzed transcriptions using a thematic analysis approach. We created a conceptual framework based on the socio-ecological model to map how different structural and individual-level factors may lead to D&C acceptance and use. We discussed biases we have related to the research and came up with a plan for mitigating bias in our analysis. We then read transcripts and developed an initial codebook using themes that emerged from the data. We held numerous meetings to review coding to ensure consistency and to make edits to the codebook. After finalizing the codebook, two researchers double-coded transcripts to check for inter-coder reliability and made final edits and clarifications to the codebook as needed. Coding and analysis were done using Dedoose version 8.3.17. Bilingual members of the research team translated all quotes for this article from Spanish into English applying meaningful translation rather than literal translation to more appropriately convey the interviewee's message or meaning. This study received institutional review board (IRB) approval from the Allendale Investigational Review Board (approval #AIRB021320).

Results

Our review of internal public hospital records found that there is substantial variability within and across hospitals in their use of D&C for abortion. Among the 40 public

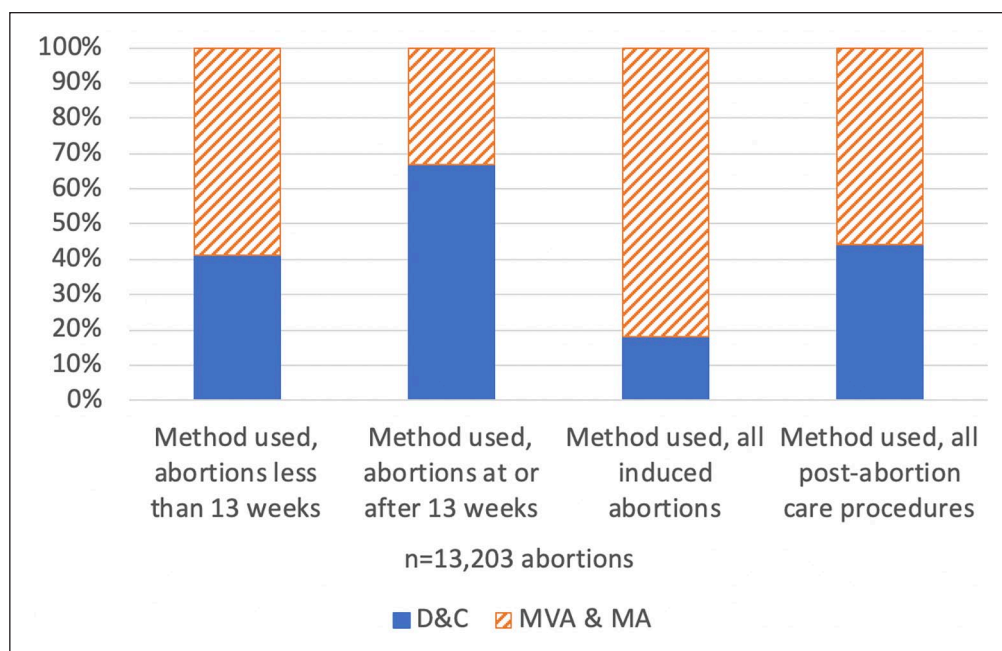


Figure 1. Method use by trimester and procedure type among 40 Ipas-supported public hospitals in Mexico, 2019 (n = 13,203).

hospitals actively working with Ipas at the time of this writing, 41% of abortions less than 13 weeks performed in 2019 were treated with D&C, while this increased to 67% of abortions at or above 13 weeks (Figure 1). Use of D&C in our sample also varied between type of abortion procedure, with only 18% of all induced abortions performed with D&C compared to 44% of all post-abortion care (PAC) procedures. Use of D&C also differs across hospitals with use as high as 91% in the first trimester in one hospital to as low as 0% in another. Looking historically at the data also allowed us to identify patterns of D&C use in different hospitals across time. Among the 37 hospitals with historical data (not new to Ipas intervention in 2019), nearly one-third (11; 30%) experienced decreases in D&C use over time, 2 (5%) experienced an increase in D&C use, 5 (14%) had consistently low use of D&C, while the remainder (19; 51%) had no identifiable trend over time. No consistent patterns were identified when we examined the relationship of D&C rate trends and potential influencing variables of interest (stock out of MVA equipment or MA medications in the past 3 months, number of visits by Ipas in one year, the number of trainings on data registration systems, increases in abortions at or after 13 weeks, reporting of AEs and SAEs, number of residents in the hospital, and length or type of Ipas support with each hospital).

Availability of abortion supplies: budgeting and procurement

The main factor identified in determining use of recommended methods for abortion in IDIs was availability of

abortion supplies, especially with regard to budgeting and procurement of supplies. Quite simply, respondents explained that if they do not have access to MVA equipment or the medications needed for MA (misoprostol and for increased efficacy mifepristone), they resort to D&C. These supplies are generally either donated or budgeted and obtained at the federal or state level. Respondents explained that MVA equipment in particular is often donated, meaning MVA is sometimes not budgeted by the Health Secretary, leading hospitals to be more reliant on donations. As one nurse said,

The [MVA equipment] we have is not registered with the Health Secretary, they are donations. The ones we have now and in the past have always been donations. So no, the institution doesn't buy them nor are they requested from the central warehouse. (Nurse, Hidalgo)

Even when MVA equipment is budgeted, hospital administrators expressed that budget cuts often result in cuts to the purchase of abortion supplies. As one administrator said,

As soon as there is a budget cut in the federal or state health budgets, then if I request 10 MVAs, perhaps because of the budget cuts they tell me, I'm going to buy you 4, because we only have money for 4. (Administrator, Quintana Roo)

With regard to MA, the supply and frequent stockout of necessary medications was identified as the main barrier to its use. According to respondents, mifepristone and misoprostol are often not included in the “*cuadro básico*,” meaning the drugs are not considered essential medicines

that should be available at all times in all health facilities. This is true for mifepristone, which, unlike misoprostol, can only be used for abortion. However, mifepristone can sometimes be included in an individual hospital's "*cuadro básico*" or acquired on an emergency basis. Misoprostol is included in the federal list of essential medicines in Mexico:

I actually have misoprostol this month that I was able to request directly from the company . . . but in other months I would ask for it and ask for it and well no, we didn't have it before . . . and mifepristone is not included in the bidding process so it has not been possible to buy it. We have been requesting it from a supplier and we can't get it. Truth be told, we've gone a long time without mifepristone. (Administrator, Jalisco)

Availability of abortion supplies: site-specific access to supplies

Lack of immediate access to MA and MVA was also identified by respondents as limiting its consistent use. In some hospitals, equipment and medication are not available during all shifts, meaning there are certain hours of the day when the necessary supplies are not accessible to providers. As one doctor described,

At least in my hospital, the times that I have asked for mife [mifepristone] . . . there is not much of a problem when it's the morning shift. But when it's the night shift, which I also work, it's a little more difficult for me to get mife because it's stored away . . . so if the patient needs more than miso [misoprostol], I would have to wait for the next shift. (Doctor, Quintana Roo)

Availability of disinfected MVA equipment at the required moment was also identified by some respondents as posing a barrier to MVA use. When comparing MVA with D&C, some respondents felt the cleaning process for MVA equipment takes longer. Thus, if a hospital does not have enough MVA instruments to keep up with demand, doctors resort to D&C. However, this view was not shared by all respondents; on the contrary some expressed that MVA disinfection is easier and less time consuming compared to D&C, and that in their hospitals, MVA equipment is often available, disinfected, and ready to use.

Many quotes illustrate how the budgeting, storing, and maintenance of equipment are interrelated, and the coordination necessary to avoid use of D&C due to supply issues. In particular, MVA equipment having multiple pieces that can break or be lost, time needed to sterilize MVA equipment, and the multiple personnel required to forecast and procure MA and MVA, were all issues highlighted by respondents as often rendering supplies absent or unusable. Issues related to time required for sterilization, or the loss or breaking of parts of MVA equipment were even more acute for hospitals with scarce MVA supplies in the first place:

The bad thing about the MVA is that if you lose a piece the MVA is basically useless . . . and if you lose a piece it is very difficult to replace it. (Doctor, Tlaxcala)

Before I had 4 MVAs . . . right now I only have 3 and sometimes I use one while the other is sterilizing, but sometimes I run out of equipment, so then, I just use D&C. (Doctor, Quintana Roo)

The continuous supply depends on the coordination between nursing, nursing supervisors, and us; us to supply nurses and nurses to give the supplies to the doctors when they need them. (Administrator, Jalisco)

Doctor preference, confidence, and attitudes

Nearly all respondents also spoke about a doctor's individual confidence and attitudes around methods for abortion as either hindering or enabling use of MVA and MA. It is important to note that, according to the interviews, the decision regarding the type of method to be used always rests with the doctor providing the abortion, such that nurses and anesthesiologists act as support staff and have no influence on method selection, which in the case of MVA and MA could also theoretically be provided directly by a range of specialist and non-specialist providers. It is therefore possible that, despite having clean and available supplies, doctors may decide to use D&C because of personal preferences. No one in our sample responded that they always use D&C. However, preference for D&C was especially common for abortions at or after 13 weeks; even doctors who prefer to use MVA or MA mentioned using D&C for later trimester abortions. This is despite the fact that D&C is not recommended for later trimester abortions and MA can be safely and effectively used in abortions at or after 13 weeks.³ As one doctor said,

For the first trimester I basically use MVA, but with more advanced pregnancies the pressure we get from the MVA cannulas—I feel it is not enough to ensure a good evacuation. (Doctor, Mexico State)

Many doctors also expressed knowing someone or themselves feeling more confident in D&C in certain circumstances, especially when regarding the successful termination of the pregnancy, despite overwhelming evidence of the efficacy of MVA and MA. Inherent in this line of thought is a distrust of MVA and MA as reliable abortion methods. In some cases, this distrust was alleviated through the use of an ultrasound to confirm successful termination of the pregnancy, as shown in the following quote:

Because when compared with a curettage [D&C], I do not need to repeat an ultrasound because I had that confidence at the end of the procedure. But with the MVA there's a mistrust that, well obviously if you don't have experience with the

technique, there's greater insecurity, and you want to confirm successful termination with an ultrasound. (Doctor, Jalisco)

This distrust was amplified when discussing MA. Many respondents voiced concern that MA leads to future abortion-related incidents for patients or legal issues for the doctors themselves; this insecurity increased when serving patients who live in rural settings and would have difficulty accessing a health center in the case of an AE or morbidity diagnosis (including hemorrhage, infection, failed abortion, or other abortion-related incidents):

I think the question of the medication [MA] is largely due to fear . . . when you do a medical abortion there is a lot of fear that there is some remaining tissue or some other issue that puts you at legal risk. (Doctor, Tlaxcala)

In addition, there are those doctors who interviewees mentioned as being entirely disinterested or even resistant to being trained on and using new methods for abortion. These doctors were mostly characterized as older doctors who were not trained in MVA or MA during medical school and who have decades of training and experience in D&C:

Well for many they think, it [D&C] is something that I already know how to do, it is something that works for me . . . why am I going to try to use a new technique that at the moment I am not so skilled at and something can happen? . . . so then maybe you no longer have the desire to want to continue to learn or go beyond what you already know . . . and for people who are older, you know, an old dog doesn't learn new tricks. (Doctor, Quintana Roo)

That the decision about what method to use rests solely with the doctors who are tasked to perform the abortion was seen as a barrier to nurses who expressed feeling limited in their ability to encourage the use of recommended methods. Among doctors interviewed, autonomy over the abortion decision was only seen as a barrier in the case of residents working with doctors who are resistant to MVA or MA use. Doctor autonomy was otherwise seen as a positive, with only a few doctors acknowledging how being the sole decision makers may be a barrier in the absence of hospital policies that encourage use of recommended methods. As one doctor said,

. . . if the institution does not make MVA the first choice above D&C well logically they [doctors] will be more likely to perform the procedure as they've always done it. (Doctor, Jalisco)

Some respondents commented that hospital culture, namely, the position of the head of the gynecology department, can also either foster or suppress the use of recommended methods. In this case, one person in particular—the head doctor—has considerable control over the type of abortion method used. Importantly, while some interviewees

viewed the use of recommended methods as being in the best interest of the patient, it was *never* mentioned that the person actually receiving the abortion procedure does or should make the decision regarding the procedure method or that non-specialist healthcare providers should or could be the direct providers of MVA or MA.

Individual skills and perceived benefits to the patient

Among doctors who use recommended methods, all identified training in MVA and MA as key to encouraging its use, as well as the ability to use these methods promptly after training and witness firsthand the benefits and ease of MVA and MA when compared to D&C. As expressed in the following quote,

Yes, knowing how to use it [recommended methods], being trained, and having the experience guarantees that there will be no complications and over time you realize that MVA is a very very very fast procedure, less aggressive, less costly to the hospital, with a shorter stay for the patient. (Doctor, Mexico State)

One of the main factors in an individual's adoption of MVA in particular was the benefits they perceive this method to have for the patient. Interviewees who cited using MVA spoke about it in terms of its safety and comfort for patients. MVA was perceived as less aggressive, less invasive, and more effective than D&C. Among the advantages of MVA reported by the informants were the speed and comfort of its use, the lower risk of bleeding, perforation, and SAEs for patients, as well as a quick recovery and a shorter hospital stay. Furthermore, it was recognized as a low-cost instrument from the health system perspective:

In my case I prefer to use the smaller cannulas because they are much safer. They have fewer side effects, fewer risks to the patient, and it is less traumatic. Recovery is a little faster, it is simpler. And the hospital stay is much shorter. (Doctor, Quintana Roo)

Nurses in our sample also voiced a preference for MVA over D&C from a gendered perspective, stressing their interest, as a field largely staffed by women, in doing all they can to make the experience less painful. Importantly, this seemed to factor more in cases where the pregnant person lost the pregnancy or suffered a miscarriage, and not in the case of legal abortion. As one nurse described,

Well . . . the majority of the nursing staff are women . . . and if a woman lost her baby for some reason, then there's empathy for her . . . and so it's as if to give her this benefit since we already know that if you do 5 curettages [D&Cs] then maybe that patient will no longer be able to have a pregnancy or it will end again in abortion. (Nurse, Hidalgo)

Ranking of factors

By and large, doctors and nurses both identified the lack of MVA and MA supplies as the main factors determining D&C use (Figure 2); 82% of doctors and 70% of nurses (Figure 2) identified supply shortages as a determining factor. Among the doctors, supply issues were followed by the lack of skill, confidence, or interest related to recommended methods; respectively 73%, 73%, and 55% of doctors identified these as determining factors. Among the nurses, supply issues were followed by hospital culture and hierarchy (60%). Existing literature has shown that D&C is much costlier for patients when compared to MVA or MA, in part due to the use of general anesthesia,^{23,24} which could encourage an economic preference for D&C among anesthesiologists and hospitals. Application of general anesthesia may also be beneficial to providers who prefer to perform abortion on a patient who is under anesthesia. However, only 27% of doctors considered the benefits of anesthesia to the doctor as a determining factor, only 9% said that the anesthesiologist exerts influence over the decision regarding abortion methods, and no respondents identified hospital revenues from different abortion methods as influencing their decision. The benefit of anesthesia for nursing staff was also the factor least commonly cited by nurses as influencing the decision around method use (20%); however 50% identified as important the preference for general anesthesia considering patient comfort.

When asked to order the factors from most to least important, shortage of supplies and lack of skill,

knowledge, and confidence in other methods were most frequently ranked as most important (first) by doctors, while those ranked last were the influence of the anesthesiologist and the costs of the different methods to hospitals. Among nurses, availability of supplies was most frequently ranked first, with cleaning of MVA supplies taking more time and the benefits of anesthesia to nursing staff ranking last (Figure 2).

Suggestions

Interviewees were also asked for their suggestions for improving recommended method use in their hospitals. Overwhelmingly, respondents discussed the need for further training and sensitization on recommended methods for abortion at all levels, as described in the following quotes:

Well first off training, more training . . . that supplies are always available and, well, willingness, more knowledge in general among all staff because later the doctors leave, or we have new interns, new residents. (Nurse, Mexico State)

That everyone from administrators to managers are made aware, that is essential . . . I honestly do not think there is any other way this situation will improve. (Administrator, Quintana Roo)

This request for training is in line with interviewees' own stories of change, citing training and sensitization as a

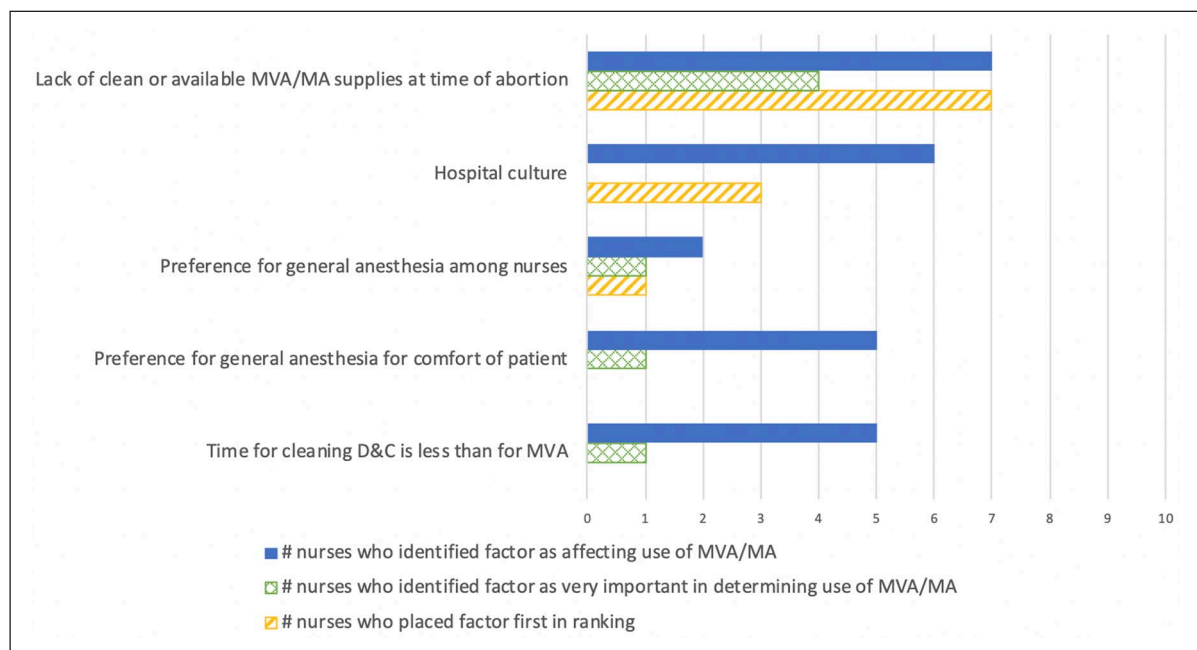


Figure 2. Factor ranking among nurses (n = 10).

Note: # placed first does not sum to 10, as one nurse ranked multiple factors identified as important as #1.

key component to their transitions from using D&C to using MVA and MA:

Personally, it [the transition] was a little difficult, because I thought it was a waste of time, to put it bluntly. But as we kept doing it [MVA], we became convinced of the appropriateness of the technique. (Doctor, Jalisco)

As the lack of available supplies was identified as the main barrier to recommended method use, respondents also identified ensuring continuous stock of MVA and MA as a key intervention. While some suggestions identified hospital-level changes that would improve availability of supplies, most of these suggestions focused on upper-level shifts in budgeting and acquisition:

With the MVA, the nurse has to request it from the supplies and sterilization office (CEYE), and if that equipment were available in the operating room, like equipment that is delivered and received in the operating room, it would probably be much less common for there to be a stock-out. (Doctor, Jalisco)

Well I imagine that the authorities would need to be a little more aware that these medications lower the cost of the procedure so why not provide these supplies to the hospitals that need them, no? Like in our case with mifepristone it has been complicated to get it, but I imagine that if we had the medication we would do the procedure as it should be done. (Administrator, Jalisco)

Respondents also voiced other suggestions related to internal hospital processes and policies that they believe could decrease the use of D&C in their hospitals, as expressed in the following quotes:

Here I have seen that on shifts where there is a doctor who does not do [MVA or MA], they assign someone with them who does . . . so if when they evaluate the patient, the other doctor who is there can say, well we can perform an MVA and it's within his right to say: I do it, or I'll let you do it, and then there's not so much of a problem. (Doctor, Quintana Roo)

The hospital should get rid of the curettes, the chief of the hospital should remove the curettes so that, to a certain extent, it's obligatory that the procedure be done with MVA. (Doctor, Jalisco)

It occurs to me that for example when they do an MVA there should be, I don't know, a sheet that describes what it is we're using with every patient . . . so that at the end of the month we can say, how many MVAs did we have? How many needles did we use? And how many cannulas?

Interviewer: Like a supply sheet per procedure?

Yeah, like in private clinics. (Nurse, Mexico State)

Discussion

Our analysis uncovers reasons for the persistent use of D&C for abortion in Mexican hospitals and illuminates a

path toward increased use of recommended methods and improving people's access to and experience of abortion. While secondary quantitative analysis did not yield any conclusive findings, results from the qualitative phase demonstrate that overwhelmingly, availability of abortion supplies for MVA and MA within hospitals is the lead factor affecting the use of recommended methods among our sample. This is in line with previous research from other areas of the world.¹³⁻¹⁷ Availability of abortion supplies goes beyond whether or not hospitals have supplies for recommended methods stocked, but also includes how they are budgeted, stored, and cleaned such that recommended methods are available for every person needing or requesting an abortion. It is possible no patterns were identified between stockouts and D&C use in quantitative analysis due to delays in reporting stockouts and persistent issues in abortion data registration.

The inclusion of factor ranking is unique to our study and demonstrates that ensuring supplies are available is a key lever for any intervention aimed at reducing D&C use. Indeed, research has shown drastic adoption of recommended methods when supplies are available;^{13,15} however, it is important that hospitals have the resources and knowledge to stock these supplies and not become reliant on donations. Respondents affirmed the various levels at which supply availability must be ensured: correct budgeting in federal, state, and hospital budgets, supply management and cleaning, restock in the event of broken or missing equipment or expired medications, and storage and accessibility of supplies during all shifts. Extensive research on the cost benefits of MA and MVA to health systems should also be emphasized to those responsible for budgeting and procuring abortion supplies.^{9,25,26}

On an individual level, respondents also identified the lack of skills or confidence in MVA and MA as a key factor affecting their use, a finding that has also been recorded in previous literature.²⁷ Respondents cited a general disinterest among some in being trained on a new method, especially older doctors, as driving the lack of interest and skill. Training and sensitization played a key role in the respondent's own stories of transition from D&C to recommended methods, and was similarly identified by nearly all respondents as being necessary to encourage MVA and MA use. Respondents who use MVA in particular emphasized the efficacy of the procedure as well as the comfort for patients who benefit from a less-invasive procedure and a shorter recovery time. Highlighting these benefits and including a practice component in trainings emerged as particularly important for successful adoption of recommended methods. However, there was also a clear distrust in recommended methods in certain situations even among doctors who report using MVA and MA, including more advanced pregnancies, heavy bleeding, and patients who travel far to access the procedure. Further provider training and patient education tools would likely

be helpful in alleviating distrust in certain methods for fear that patients, especially those living in remote settings, may experience an AE or morbidity diagnosis. Respondents expressed particular discomfort in the confirmation of pregnancy termination with MVA and MA. This is a novel finding that deepens our understanding of previous literature that has reported provider preference for D&C based on perceptions of method efficacy.^{19,28} Persistent mistrust in successful termination when using MVA or MA and preference for D&C in some situations evinces a clear need for further training on confirming successful termination, abortion at advanced gestations, and MA as an effective standalone abortion method.

All interviewees agreed that the decision over which method to use rests solely with the doctor performing the abortion. As such, individual factors such as lack of skill and mistrust in other procedures becomes a particularly obstinate barrier to recommended method use in the case of doctors who prefer to use D&C. While many doctors saw this decision-making power as a positive thing, encouraging mutual respect and autonomy in the hospital, this can be particularly problematic in the absence of hospital policies and clinical standards that encourage the use of MVA and MA over D&C. If left in the hands of doctors themselves, a culture of recommended method use is much more difficult to foster, thus evincing the need for clear and comprehensive standards of practice for both clinicians and facilities.

Localizing decision-making power in the hands of doctors is also particularly problematic in that it places their preference above that of the person receiving the abortion service; instead, we should maximize the use of all qualified health personnel and people themselves (in the case of self-managed abortion) to provide abortion. There is a wealth of research that shows that MA is a preferred method among people accessing abortion, and that the benefits of MVA over D&C in terms of recovery time, invasiveness, and use of anesthesia make MVA and MA more desirable abortion methods from the patient perspective.^{29,30} Similarly, evidence shows that promoting task sharing and involvement of midwives, nurses, and primary care providers would go a long way in making abortion more widely accessible and would promote less medicalized models of care that prioritize MVA and MA.³¹ While availability of abortion supplies was the most commonly cited reason for continued use of D&C among these respondents, it is important to look deeply at the power structures that remain in place in hospitals in Mexico and that also contribute to doctor-oriented models of abortion care. Given the benefits of MA and MVA over D&C, empowering the abortion client to choose the procedure method and embracing task shifting for abortion care would likely drastically reduce use of D&C. In fact, considering methods presented to abortion patients should *only* be recommended methods, transferring

decision-making power to the patients would effectively remove D&C entirely from the method roster.

Interestingly, although MA was specifically articulated in the interview questions, most interviewees contrasted their experiences with MVA and D&C and rarely mentioned MA unless prompted by the interviewer. Issues with supply of mifepristone and its absence from essential medicine lists may reinforce the exclusion of MA from the recommended method framing. Use of misoprostol was often discussed in combination with MVA, and less so as an appropriate abortion method on its own despite the fact that evidence shows it is safe and effective as a freestanding abortion method, with potential to greatly de-medicalize care and expand access to safe abortion. In Mexico, a large majority of induced (legal) abortions are performed using MA,³² but this method is much less frequently used for PAC as seen in our secondary data analysis. As abortion is only legal under certain indications in all the states in which we conducted our study, this highlights an important interpretation of our study results: confirmation of successful termination is especially important in more restrictive settings where MA use (and specifically standalone use of misoprostol) could be associated with self-induced abortion. Therefore, in order to better facilitate MA use, health personnel must be convinced of the efficacy and safety of the procedure, as well as emphasizing the validity and value of MA's use in any context if that is the patient's preference.

This study has a number of limitations. Findings are limited to Ipas-supported public hospitals in Mexico, and may differ from hospitals in countries with different health systems, supply chains, and abortion law and from other hospitals within Mexico that do not have the access to training and supplies that Ipas-supported hospitals do. Quantitative analysis was complicated by the fact that official hospital registration systems in Mexico often suffer from misreporting, whether not reporting legal abortions or wrongly coding the procedure method used for reported abortions. However, supplementing our analysis with IDIs enabled us to dig deeper into variables captured in our quantitative analysis as well as factors not captured quantitatively, such as provider attitudes, use of anesthesia and pain management, hospital culture, how abortion supplies are forecasted and stocked, and institutional changes at the hospital. Although we intentionally attempted to recruit doctors who use D&C, those who use recommended methods may have been more willing to participate, leading to an oversampling of those doctors, or a reluctance to admit to D&C use during the interview. We believe questions about use of D&C in certain circumstances and reasons for D&C use among them *or* their colleagues reliably tapped into reasons for use of D&C even among doctors not using or not willing to admit to using D&C. Interviewing doctors, nurses, and administrators who all operate at the hospital level may explain why costs to health systems or

national-level supply chain issues did not come out strongly in our analysis. However, the aim of this analysis was to focus on the reasons for use of D&C from the perspective of the individuals who make and inform these decisions on a daily basis. Recruitment for the qualitative component coincided with the onset of the COVID-19 pandemic in Mexico, causing us to shift to phone as opposed to in-person interviews and increase the number of hospitals for recruitment given lower response rates. Interviewers were trained in conducting IDIs over the phone and recordings were monitored throughout data collection to ensure quality. Ipas anticipates significant disruptions to recommended method supplies given the global pandemic,³³ likely exacerbating supply barriers to use of recommended methods.

Our results show an overwhelming interest among hospital personnel in shifting to methods for abortion that are safer, simpler and more acceptable to abortion patients. However, for this to happen, the views and needs of abortion patients must outweigh doctor preferences. In addition, mistrust and lack of confidence in recommended methods is persistent, especially for advanced gestations and MA in general. This likely requires a complex approach focused on incentives for doctors, decreased medicalization of abortion, training and sensitization, and building a culture of patient-centered care at hospitals and in the medical field as a whole. Such approaches would also benefit from comprehensive patient education protocols about management of symptoms after an abortion as distinguished from SAEs, thereby improving post-abortion self-care and self-efficacy. In addition, the lack of supplies poses a substantial barrier to doctors wishing to use recommended methods for abortion and provide patient-centered care. Interventions to increase the use of recommended methods must focus on increasing supply and availability of MA and MVA in a way that does not encourage dependency on donations, and further training and dissemination of evidence around the efficacy of recommended methods for abortion both at a provider-level and in institutional policies. Our findings are extremely important to shaping a path toward increasing access to and use of simpler, safer, and more appropriate methods in countries with persistently high D&C rates.

Conclusion

Dilation and curettage is an obsolete abortion procedure. However, use of D&C remains high in many settings, including Mexico, despite the availability of recommended methods for abortion. The main factor identified in our study as determining use of D&C was availability of abortion supplies, especially cleaning, storage, maintenance, budgeting, and procurement of supplies. Other factors included confidence in the efficacy of other methods, attitudes toward different methods, skill and training, and

perceived benefits to patients. In Mexico, doctors are the sole decision makers with regard to method use, which effectively places the doctor's preference above that of the person receiving the abortion. Phasing out the use of D&C is imperative, with serious implications on accessibility, safety, acceptability, and affordability of abortion care. Our study shows that ensuring supplies for recommended methods are available is a key lever for any intervention aimed at reducing D&C use; however, we must also look critically at and reconsider the power structures that elevate doctor-oriented models of abortion care in Mexico and beyond.

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Author contributions

K.P.Z. conceived of the idea for this research. S.A.K., B.O., G.A.O.A., M.Z., and K.P.Z. developed the research methodology. S.A.K., B.O., C.M.L., and M.Z. managed and coordinated research activities. S.A.K. and B.O. provided research supervision, and analyzed and validated the data. S.A.K. wrote the first draft of the manuscript. B.O., M.Z., C.M.L., G.A.O.A., and K.P.Z. all provided critical review of the analyses and manuscript.

Availability of data and materials

The datasets analyzed for the quantitative portion of this study are available publicly through the Mexico Health Secretary at http://www.dgis.salud.gob.mx/contenidos/basesdedatos/BD_Cubos_gobmx.html. The qualitative interviews analyzed for this study are not publicly available due to the sensitive nature of the research and risks to breach of confidentiality, especially in hospitals where few doctors provide abortion services. These data are available from the corresponding author on reasonable request.

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