An intervention to improve the quality of medication abortion knowledge among pharmacists in India

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Abstract

Objective: To test an infographic two-pager on medication abortions (MA) aimed to improve pharmacists counseling in India.

Methods: A quantitative baseline survey was conducted among 283 pharmacists in three districts around Lucknow, Uttar Pradesh in January 2018. The intervention (infographic) was given to 117 of these pharmacists a few weeks later and a follow-up survey was conducted 3 months later with 281 pharmacists. In addition, mystery clients were sent to 115 of the pharmacists.

Results: A statistically significant improvement in knowledge post-intervention was found, compared to pre-, for almost all quality items measured. Difference-in-difference estimators showed a difference in knowledge among indicators related to misoprostol in particular. However, mystery client reports showed few differences in pharmacist behaviors between intervention and control pharmacists.

Conclusion: This simple, paper-based intervention, which required no training, showed a significant improvement in pharmacists’ knowledge and was welcomed by the providers. Translating knowledge into behavior change, however, seems more difficult to impact. Adapting this simple intervention to motivate providers to change behaviors could improve the quality of care provided by pharmacists in India.

KEYWORDS
India; Intervention; Medication abortion; Out of facility; Pharmacists; Quality of care

1 | INTRODUCTION

Medication abortion (MA) use is increasing globally. Much of this increase is taking place in pharmacies.1 This is especially true in India, where an estimated 11.5 million of the 16 million abortions each year are MAs outside of clinics.2 Thus, pharmacists are critical in promoting quality MA care. However, as has been found in other countries, the quality of care in pharmacies for abortion in India is low, including knowledge and practices related to the provision of MA.3,4 We present results from a quasi-experimental study that tested a basic knowledge intervention among pharmacists in urban areas of Uttar Pradesh, India.

Evidence on interventions to improve the quality of clients’ experience with MA is limited, either targeting the users or providers. More interventions have focused on users, assuming that increases in user knowledge will improve both access to and experience with MA. For example, in India, an intervention focused on improving client knowledge of MA through community health workers and found increased utilization of safe abortion services, in particular MA, across all sites.5
In other settings, researchers have used other approaches, such as mobile SMS messaging, to improve user knowledge.6

Of the existing interventions for pharmacists regarding MA, all have been geared at intensive pharmacist-based trainings and most have followed a harm reduction strategy.7,8 Harm reduction, an evidence-based framework, prioritizes approaches to lessen harm and maintain health in contexts where practices and/or policies may forbid, stigmatize, or force common activities underground. For example, in Nepal, researchers conducted harm reduction orientation and refresher trainings with pharmacists on safe use and provision of misoprostol and mifepristone and compared their reported change in knowledge of MA from baseline to follow-up with those pharmacists in a comparison district. They found trained pharmacists reporting providing information on safe use of mifepristone and misoprostol for early first trimester MA more often compared to their counterparts in the comparison district.8 Evidence from a MA operations study in central Zambia that also used a harm reduction training approach with pharmacists found at end line more pharmacists reported referring to a healthcare facility while fewer reported selling ineffective and unsafe abortion medications as compared to their baseline reports.9

Other studies, while not focused on MA, have documented some effectiveness of materials and trainings to improve pharmacist quality of care provision of reproductive and other healthcare services. Most of these have included pharmacist training, in addition to written information or other resources such as referral systems.10–16 While these studies document that pharmacists are more willing to discuss and provide reproductive health services, such as emergency contraception and condoms, and refer their customers to appropriate care following the intervention, none are able to assess longer-term impact of their interventions on pharmacist behaviours or on client-related reproductive health outcomes.6 A recent intervention in Nepal found that pharmacists trained in MA provided safe and satisfactory care, which was sustained for about 5 years.17

Given the increasing evidence that pharmacies are the first and primary point of contact for 11.5 million MA users in India, coupled with the clear dearth in tested pharmacist-based interventions to improve the quality of MA care, our team developed a simple informational and graphic handout (infographic) with information on MA dosing, timing, expected symptoms, side effects, and when to seek care. In India, MA is most commonly purchased and taken through a combination pack ("combi-packs") of one mifepristone (200 mg) and four misoprostol tablets (200 mcg each), thus two types of medication to be taken with specified time spacing must be explained. To our knowledge, this study is the first to develop and test a simple knowledge-based tool for pharmacists to improve quality of care of MA in India. This paper will describe the intervention and evaluate the impact of the intervention on pharmacists’ knowledge about MA and its practices.

2 | MATERIALS AND METHODS

For the study intervention, we designed a two-page (one sheet of paper, back and front) information sheet with graphics (infographic), guided by a harm reduction framework. The goal of this infographic was to provide pharmacists with information about MA to improve the quality of their interactions with clients purchasing MA. The infographic was designed in Hindi (local language of study area) and informed by in-depth qualitative interviews that the research team conducted in 2016–2017 with pharmacists and clients from the same study area. Our team’s formative research in India demonstrates low-quality provision of MA despite the growing amount and variety of MA packs available in pharmacies.18 The infographic contains concise information and guidance supported with pictures of the contents inside MA combi-packs, directions for taking the medication, indications and contraindications, expected side-effects during the normal progression of abortion, signs of completed abortion, possible complications, and advice on family planning to prevent future unintended pregnancy (Fig. 1).

A quantitative baseline survey was conducted with 283 pharmacists in urban and peri-urban areas of three districts of Uttar Pradesh: Lucknow, Kanpur, and Unnao. A team of six public health researchers conducted the survey in February 2018, after 2 days of training. Pharmacists were approached, the study purpose was explained, and verbal consent was obtained after which the baseline survey data were digitally collected on tablets using Survey CTO software (Dobility, Cambridge, MA). The informed consent also included consent for mystery clients to visit the pharmacy at some point in the next 6 months before the end-line survey.

Of the 283 interviewed, 117 pharmacists were assigned randomly to the intervention group and 166 to the control group. Each district had both control and intervention pharmacies. Within 2 months of the baseline survey (April 2018), the infographics were distributed to the intervention group. A team of two trained social scientists visited and distributed multiple copies of the infographic on MA to the intervention pharmacists during non-rush hours. At least one pharmacist per pharmacy outlet was requested to go through the contents and questions, if any, were answered before moving on to the next outlet. The end-line survey was conducted in June 2018 with 281 pharmacists.

About 1 month after the distribution of the infographic, mystery clients visited a sub-sample of 115 randomly selected pharmacies, 52 in the intervention group and 63 in the control group. The mystery clients presented themselves unannounced as a woman (or her partner) who recently missed their period, had a positive pregnancy test, and did not want to continue the pregnancy. They specifically asked about MA if the pharmacist did not suggest it, and probed about how to take the pills, abortion progression, side effects, and possible complications. They noted the quality of information and counseling given.

Mystery clients included six researchers (three males and three females) with experience in the public health or social science fields. They were trained for 3 days to ensure that their interactions were as comparable as possible to real clients and were uniform across client types. They presented as one of four scenarios: a young unmarried woman, aged 18–20 years, not highly educated; a married woman, approximately 30 years old, not very well educated; a young unmarried man, approximately 20 years old and in college; and an older educated married man, about 30 years old.
Guidelines for Chemists to share with Medical Abortion users

Medical abortion kits should be sold with prescription only. This guide does not promote over-the-counter sale of such kits without prescription.

What is Medical Abortion (MA)?

✓ Medical abortion is a safe, effective and legal method for terminating an early unwanted pregnancy by using a combination of two medications: Mifepristone (1 pill of 200 mg) and Misoprostol (4 pills of 200 mcg each) available in a combi-pack.
✓ The medications, when taken orally, cause a process similar to a miscarriage.
✓ With the right information and guidance, you can have a safe abortion.

Before you start:

✓ Confirm that the pregnancy is within 9 weeks (63 days LMP).
✓ Check for certain conditions before having a medical abortion (see back for details).
✓ Identify a hospital to visit in case of emergency.
✓ Consider taking painkillers (other than Aspirin) like Ibuprofen/Flexon/Ibugeic and/or anti-nausea medicine 1 hour before using misoprostol.
✓ Have sanitary pads / cloth ready.
✓ You may eat as you desire throughout the entire process. Drink plenty of fluids/water to keep yourself hydrated.

How to take the pills? (For more details, see back)

Step 1: Swallow 1 pill of Mifepristone (one large pill at the top) with water.
Step 2: Wait 24 hours after taking Mifepristone.
Step 3: Take a painkiller like Brufen/Flexon/ Ibugeic 1 hour before taking Misoprostol.
Step 4: Place 4 pills of Misoprostol underneath your tongue for 30 mins.
Step 5: After 30 mins, you may drink water to wash down remains of the pills
Step 6: Within 4 hours after taking Misoprostol, cramping and bleeding will start. This is normal and shows that the medicines are working.
Step 7: Other side effects include fever, diarrhea, nausea/vomiting, headache and chills. Most women feel better in less than 24 hrs.

Step 1: Swallow 1 pill of Mifepristone (one large pill at the top) with water.

Step 4: Place 4 pills of Misoprostol underneath your tongue for 30 min

Even if bleeding starts after taking mifepristone, it is important to take the remaining pills

How do you know the abortion is complete?

- If within 5 -7 days of using the tablets the bleeding isn’t heavy or has stopped.
- There are no pregnancy symptoms and you feel in good health.

FIGURE 1 Snapshot of the front page of the English version of infographic.
Marital status for women was indicated through wearing socially recognized symbols of married women, and for men it was conveyed to the pharmacist verbally in the course of the mystery client's conversation. Unmarried women also conveyed this verbally to the pharmacist in their conversation. The user profiles and interaction script were informed by the initial qualitative results of this study, to ensure that the scenario generated was realistic and reflected the concerns of the user populations. Mystery clients did not purchase the medication from the pharmacists, but rather, after all the counseling had been completed, asked the price, and declined, saying that they did not have enough money to purchase it. Immediately after the interview, mystery clients completed a short quantitative survey describing the interaction that took place with the pharmacist.

### 2.1 Survey measures

Changes in seven outcomes that were measured in the survey both pre- and post-intervention were explored (Table 1).

### 2.2 Mystery client measures

A number of indicators related to the nature and quality of information provided to mystery clients were explored (Table 2).

| Quality indicator | OR (95% CI) |
|-------------------|------------|
| Did the provider ask you when you/your wife last had her menstrual period or how many weeks pregnant you were? | 2.397 (0.934–6.150) |
| Did the provider ask if you had taken a pregnancy test? | 1.839 (0.538–6.285) |
| Did the provider ask if you had taken MA before? | 0.715 (0.109–4.677) |
| Did the provider describe the normal progression of MA to expect? | 0.908 (0.383–2.151) |
| Did the provider tell you what to do if you have any problems with MA? | 0.877 (0.394–1.952) |
| Did the provider tell you where to go to seek more care if you have problems with MA? | 0.568 (0.247–1.308) |
| Did the provider describe the normal progression of MA to expect? | 9.230 (2.429–35.07) |
| Did the provider tell you what to do if you have any problems with MA? | 5.872 (0.676–1.746) |
| Did the provider write instructions on the MA box or other piece of paper for you? | 0.320 (0.0587–1.746) |
| Did the provider give you his/her contact information? | 2.464 (0.572–10.62) |
| Did the provider ask if you had a prescription? | 1.177 (0.226–6.130) |
| How did the provider tell you to take MIFE? – Did not tell anything | 0.372 (0.0375–3.691) |
| How did the provider tell you to take MISO? – Did not tell anything | 0.372 (0.0375–3.691) |
| Was the dosage explained by the provider? (correct answer one MIFE – four tablets MISO) | 0.479 (0.221–1.036) |
| Was the time gap between MIFE and Miso explained by the provider? (correct answer – four tablets MISO after a gap of 24–48 h from MIFE) | 1.099 (0.499–2.421) |
| What side effects/complication did the provider mention? – none | 1.383 (0.464–4.119) |

Abbreviations: OR, odds ratio; CI, confidence interval; MA, medical abortion; MIFE, mifepristone; MISO, misoprostol.

*P*<0.1.

*P*<0.05.
2.3 | Survey analysis

Pre- and post-intervention differences in primary outcome measures among the intervention group were first tested. Next, a series of difference-in-differences models on the outcomes that showed evidence of change were run. Finally, pharmacists’ perspectives on the infographic were described.

2.4 | Mystery client analysis

Differences were explored between the responses of mystery clients who visited a pharmacist who received the intervention and those who visited a pharmacist who did not receive the intervention, using logistic regression models and controlling for mystery client profile type.

Data were analyzed using STATA 15. The significance cut-off was set to the P<0.05 level. This study received Human Subjects Approval from the University of California, San Francisco and Public Health Foundation of India (PHFI) in India.

3 | RESULTS

Results from the pre-post survey with pharmacists followed by key findings from the mystery client debrief interviews are below.

3.1 | Pre/post survey

The majority of the pharmacists were male (99.3%). Pre-intervention, the majority of pharmacists said that they confirmed a woman was pregnant and asked her for her gestational age before selling her MA (n=270, 95.41% each) (Table 1). Significantly more pharmacists reported they did these two activities post-intervention (n=260, 98.86%). A significantly larger percent of pharmacists stated that the correct time between mifepristone and misoprostol was 24–48 hours post intervention (n=228, 77.03%) compared to pre-intervention (n=207, 69.93%). Additionally, significantly more respondents reported post-intervention (n=86, 29.05%) that all misoprostol doses should be taken together compared to pre-intervention (n=51, 17.23%). Significantly more pharmacists reported that mifepristone could be taken starting at any time, and should be taken orally, post-intervention (n=249, 99.60%), compared to pre-intervention (n=254, 97.32%). Significantly more pharmacists stated that the correct misoprostol dose was four tablets (200 mcg each), taken vaginally, sub-lingually, or buccally, after a gap of 24–48 hours after the mifepristone, with 20.69% (n=54) reporting this process pre-intervention versus 36.40% (n=91) post intervention. There was no significant change in the percentage of pharmacists reporting that they told respondents about symptoms.

We ran difference-in-differences models on three of the outcomes that were statistically significantly different between pre and post surveys (Table 3). Since so few pharmacists reported the incorrect answer, the numbers were too small to calculate a difference in the correct answer to the questions asking gestation age, confirming the woman was pregnant, and the appropriate mifepristone dose. The difference-in-differences estimator did not show evidence of a treatment effect of the intervention on pharmacists’ knowledge of the appropriate time gap between mifepristone and misoprostol. The intervention led to an increase in odds that a pharmacist knew there should be no time gap between the doses of misoprostol and the appropriate number of misoprostol tablets, route, and timing after mifepristone.

Most pharmacists showed the infographic to some respondents, with only 24.11% (n=21) reporting they showed it to no clients (Table 4). Similarly, most pharmacists gave the infographic to clients, with only 25.29% (n=22) giving it to no clients. Almost all (n=95, 91.35%) the pharmacists found the infographic handout useful, the majority thought it helped them provide better care (n=88, 84.62%), and 93.27% (n=97) would like something like it to give to clients.

3.2 | Mystery clients

Pharmacists in the intervention arm had higher odds (odds ratio [OR] 9.23, P<0.001) of showing MA instructions to the mystery clients (Table 2). They were also marginally significantly more likely to ask the mystery client for the gestational age and to provide the correct information about the appropriate mifepristone and misoprostol dose (P<0.1). There was no statistically significant difference (at the P<0.05 level). This study received Human Subjects Approval from the University of California, San Francisco and Public Health Foundation of India (PHFI) in India.

| TABLE 3 | Difference-in-difference of knowledge variables pre/post intervention, comparing intervention and control pharmacists. a |
|-----------------------------------------------|-----------------------------------|------------------|
| Stated that the time gap between mifepristone and misoprostol should be 24–48 h | 1.54 (0.89–2.68) | 0.40 (0.10–1.64) | 2.57 (0.94–7.07) b |
| Stated that there should be no time between misoprostol doses | 1.08 (0.62–1.88) | 0.20 (0.05–0.81) c | 4.17 (1.82–9.58) d |
| Stated that misoprostol was four tablets (200 mcg each), taken vaginally, sub-lingually, or buccally, after a gap of 24–48 h from mifepristone | 1.26 (0.74–2.15) | 0.28 (0.07–1.07) b | 3.20 (1.41–7.28) d |

aValues are given as odds ratio (95% confidence interval).
bP<0.1.
cP<0.05.
dP<0.01.
training that included role-plays could enable pharmacists to translate this increase in knowledge into the actual provision of higher-quality information on MA to their clients.

Regardless, pharmacists welcomed the infographic and wanted this type of tool both for themselves and to give to their clients. In addition, it led to greater knowledge and increased sharing of information with clients visually. This suggests that expanding the provision of this infographic to pharmacists would be acceptable and could improve knowledge, and that carefully thinking through adapting this infographic (most likely with simpler language) for clients is key. This very simple intervention made measurable improvements in pharmacists’ knowledge and could be quickly, easily, and economically scaled up, meeting pharmacists needs and, potentially, with additional time and edits, improving the quality of clients’ experiences and information.

### AUTHOR CONTRIBUTIONS

NDS designed the study, and led the data analysis and manuscript writing. BP aided in data analysis and manuscript writing. JP helped with manuscript writing and data coding, as well as training mystery clients. MS helped with research-related activities and manuscript preparation. PD ran the data collection, data entry process, and manuscript preparation. AS helped co-design the study, oversaw research and data collection, and participated in manuscript preparation.

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### CONFLICTS OF INTEREST

The authors have no conflicts of interest.

### REFERENCES

1. Fernandez MM, Coeytaux F, de León RGP, Harrison DL. Assessing the global availability of misoprostol. Int J Gynecol Obstet. 2009;105:180–186.
2. Singh S, Shekhar C, Acharya R, et al. The incidence of abortion and unintended pregnancy in India, 2015. Lancet Glob Health. 2018;6:e111–e120.
3. Ganatra B, Manning V, Pallipamulla S. Medical Abortion in Bihar and Jharkhand: A Study of Service Providers, Chemists, Women and men. New Delhi: Ipas; 2005.
4. Sneeringer RK, Billings DL, Ganatra B, Baird TL. Roles of pharmacists in expanding access to safe and effective medical abortion in developing countries: A review of the literature. J Public Health Policy. 2012;33:218–229.
5. Banerjee SK, Andersen KL, Baird TL, Ganatra B, Batra S, Warvadekar J. Evaluation of a multi-pronged intervention to improve access to
safe abortion care in two districts in Jharkhand. BMC Health Serv Res. 2014;14:227.

6. deTolly KM, Constant D. Integrating mobile phones into medical abortion provision: Intervention development, use, and lessons learned from a randomized controlled trial. JMIR Mhealth Uhealth. 2014;2:e5.

7. Hyman A, Blanchard K, Coeytaux F, Grossman D, Teixeira A. Misoprostol in women’s hands: A harm reduction strategy for unsafe abortion. Contraception. 2013;87:128–130.

8. Tamang A, Puri M, Lama K, Shrestha P. Pharmacy workers in Nepal can provide the correct information about using mifepristone and misoprostol to women seeking medication to induce abortion. Reprod Health Matters. 2014;22:104–115.

9. Fetters T, Raisanen K, Mupeta S, et al. Using a harm reduction lens to examine post-intervention results of medical abortion training among Zambian pharmacists. Reprod Health Matters. 2014;22:116–124.

10. Adu-Sarkodie Y, Steiner MJ, Attahuah J, Tweedy K. Syndromic management of urethral discharge in Ghanaian pharmacies. Sex Transm Infect. 2000;76:439–442.

11. Garcia P, Hughes J, Carcamo C, Holmes KK. Training pharmacy workers in recognition, management, and prevention of STDs: District-randomized controlled trial. Bull World Health Organ. 2003;81:806–814.

12. Liambila W, Obare F, Keesbury J. Can private pharmacy providers offer comprehensive reproductive health services to users of emergency contraceptives? Evidence from Nairobi, Kenya. Patient Educ Couns. 2010;81:368–373.

13. Mayhew S, Nzambi K, Pépin J, Adjei S. Pharmacists’ role in managing sexually transmitted infections: Policy issues and options for Ghana. Health Policy Plan. 2001;16:152–160.

14. Minh PD, Huong DTM, Byrkit R, Murray M. Strengthening pharmacy practice in Vietnam: Findings of a training intervention study. Trop Med Int Health. 2013;18:426–434.

15. Pick S, Reyes J, Alvarez M, Cohen S, Craige J, Troya A. AIDS prevention training for pharmacy workers in Mexico City. AIDS Care. 1996;8:55–70.

16. Ramos MC, da Silva RDC, Gobbato RO, et al. Pharmacy clerks’ prescribing practices for STD patients in Porto Alegre, Brazil: Missed opportunities for improving STD control. Int J STD AIDS. 2004;15:333–336.

17. Tamang A, Puri M, Masud S, et al. Medical abortion can be provided safely and effectively by pharmacy workers trained within a harm reduction framework: Nepal. Contraception. 2018;97:137–143.

18. Srivastava A, Saxena M, Percher J, Diamond-Smith N. Pathways to seeking medication abortion care: A qualitative research in Uttar Pradesh, India. PLoS ONE. 2019;14:e0216758.

19. StataCorp. Stata Statistical Software: Release 15. College Station, TX, 2017.

20. Footman K, Keenan K, Reiss K, Reichwein B, Biswas P, Church K. Medical abortion provision by pharmacies and drug sellers in low- and middle-income countries: A systematic review. Stud Fam Plann. 2018;49:57–70.