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Published in:
Acta Obstetricia et Gynecologica Scandinavica

DOI:
10.1111/aogs.14134

Publication date:
2021

Document version:
Accepted manuscript

Citation for published version (APA):

Go to publication entry in University of Southern Denmark's Research Portal

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Medical management of induced and incomplete first-trimester abortion by non-physicians in low- and middle-income countries: A systematic review and meta-analysis of randomized controlled trials

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This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1111/AOGS.14134

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Conflicts of interest
None

Funding
No external funding was received. All authors, except MBK who is a medical student, were financed through their institutions. KSK is Distinguished Investigator funded by the Beatriz Galindo (senior modality) grant given to the University of Granada by Spanish Ministry of Education.

ABSTRACT

Introduction: Unsafe abortion is the cause of a substantial number of maternal mortalities and morbidities globally, but specifically in low- and middle-income countries. Medical abortion methods provided by non-physicians may be a way to reduce the burden of unsafe abortions. Currently, only one systematic review comparing non-physicians with physicians for medical abortion exists. However, the review does not have any setting restrictions and newer evidence has since been published. Therefore, this review aims to evaluate the effectiveness, acceptability, and safety of first-trimester abortion managed by non-physicians compared to physicians in low- and middle-income countries.

Material and methods: The databases PubMed, Cochrane Library, Global Health Library, and EMBASE were searched by use of a structured search strategy. Further, the trial registries clinicaltrials.gov and The International Clinical Trial Registry Platform were searched for published and unpublished trials. Randomized controlled trials comparing provision of medical abortion by non-physicians to physicians in low- or middle-income countries were included. Risk of bias was assessed using the Cochrane Risk of Bias tool. Trials that reported effect estimates on the effectiveness of medical methods on complete abortion were included in the meta-analysis. The protocol was prospectively registered in the PROSPERO database, ID: CRD42020176811.

Results: Six papers from four different randomized controlled trials with a total of 4021 participants were included. Two of the four included trials were assessed to have overall low risk of bias. Four papers had outcome data on complete abortion and were included in the meta-
analyses. Medical management of first-trimester abortion and medical treatment of incomplete abortion were found to be equally effective when provided by a non-physician as when provided by a physician (RR: 1.00; 95% CI: 0.99-1.01). Further, the treatment was equally safe, and women were equally satisfied when a non-physician provided the treatment compared to a physician.

**Conclusions:** Provision of medical abortion or medical treatment for incomplete abortion in the first trimester is equally effective, safe, and acceptable when provided by non-physicians compared to physicians in low- and middle-income countries. We recommend that the task of providing medical abortion and medical treatment for incomplete abortion in low- and middle-income countries is shared with non-physicians.

**Key message**

Medical induced and incomplete first-trimester abortion can be provided equally effectively, acceptably, and safely by non-physicians as by physicians. Task shifting from physicians to non-physicians may increase the access to safe abortions in low- and middle-income countries.

**Abbreviations**

CI confidence intervals  
LMICs low- and middle-income countries  
MA medical abortion  
RCT randomized controlled trials  
RR risk ratio  
WHO World Health Organization

**Keywords**

abortion, incomplete, postabortion care, midlevel providers, low-income countries, termination of pregnancy
INTRODUCTION

Every year 25 million unsafe abortions occur, and more than 95% of these occur in low- and middle-income countries (LMICs) [1]. Unsafe abortion causes between 5-13% of maternal deaths each year [2], but almost every death and morbidity related to abortion could be prevented [3]. One of the barriers to safe abortion is the insufficient availability of safe abortion services [3]. This is due to strict abortion laws, nonfunctioning health systems, lack of trained healthcare providers, and lack of services in rural areas [4]. Further, in LMIC settings where abortion is legal, there are still many unsafe abortions due to women's unawareness of their opportunities, healthcare providers' attitudes towards abortion, lack of health personnel to provide safe abortions, lack of privacy and confidentiality, and services that are inadequate to meet the demand [5].

Due to the workforce crisis, task sharing within reproductive healthcare is important. The World Health Organization (WHO) estimates a shortfall of 18 million health workers by 2030, mainly in LMICs [6]. These countries already have the greatest shortage of trained healthcare providers, and the highest maternal mortalities and morbidities [7]. An important element for reducing the rates of unsafe abortions in LMICs is to expand abortion care to involve a wider range of providers and facilities, e.g. primary health centers and secondary hospitals [8]. WHO recommends that first-trimester abortion (both medical and vacuum aspiration) and post-abortion care can be performed by properly trained and competent mid-level providers, such as nurses, midwives, auxiliary nurses, and auxiliary nurse midwives [9]. Hence, medical abortion (MA) has the potential for task sharing as it is a simple method that can easily be managed by lower-level providers. This may improve the access to safe abortion care, particularly in low-resource settings where facilities and human resources are limited [10].

MA is proven to be safe, effective, and acceptable [11-16]. The combination of misoprostol with mifepristone is proven to be highly effective and safe for early induced abortion with efficacy rates up to 98% [17, 18]. Furthermore, the use of misoprostol alone is an effective treatment for incomplete abortion [19, 20], with no significant difference reported between the effect of misoprostol and manual vacuum aspiration [21, 22]. In addition, MA does not require the same healthcare infrastructure as manual vacuum aspiration, though surgical backup is needed for a small percentage of women [23].
A number of systematic reviews have concluded that medical termination of first-trimester pregnancy is generally well-accepted and equally effective when conducted by physicians and non-physicians [24, 25]. An earlier review from 2013 by Renner et al. concluded that trained non-physicians may effectively and safely provide termination of first-trimester pregnancy, although with limited evidence [24]. A 2013 review by Ngo et al. concluded that there was no statistical difference for first-trimester medical and surgical abortion performed by non-physicians compared to physicians [25]. Further, a Cochrane review from 2015 concluded that there was no statistically significant difference in the risk of failure for MAs performed by non-physicians compared to physicians [26]. However, none of these reviews specifically focused on LMICs and most of the included studies were set in high-income countries. So far, only one systematic review from 2017 exists specifically focusing on MA by trained non-physicians [27]. It included few studies of different designs from a variety of settings and study populations. Further, more research from LMICs has been published since then [28, 29]. Hence, to properly understand the effect of MA conducted by non-physicians in a low-income context an updated review specifically focused on trials set in LMICs is needed. Therefore, this review aims to landscape randomized trials set in LMICs and analyze the safety, acceptability, and effectiveness of medical management of induced and incomplete first-trimester abortion conducted by non-physicians compared to physicians.

**MATERIAL AND METHODS**

**Search strategy**
A comprehensive search strategy was developed and adapted using various key terms and free text words. To limit our search only to LMICs we added Cochrane’s LMICs filter 2020 [30] to the search strategy (Appendix, S1). The strategy was modified to the following databases, which were searched for published trials without any time or language restrictions until August 2020: PubMed, Cochrane Library, Global Health Library, and EMBASE. Further, the trial registries Clinicaltrials.gov and the International Clinical Trial Registry Platform (ICTRP) were searched until October 2020 for additional ongoing or unpublished trials. The protocol for the review was prospectively registered in the PROSPERO database (ID: CRD42020176811, 28 April 2020) [31]. The review is reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Checklist (Appendix, S4) [32].
Selection

After removing duplicates, the remaining records were uploaded to Covidence (www.covidence.org). Firstly, for title-abstract screening, and secondly for full-text screening. The records were independently screened; MBK took on the task as first one reviewer whilst BCS and RP shared the task as the second reviewer. Any disagreements were solved through discussions. The inclusion criteria for the studies were defined according to the PICO principles (participants, intervention, comparison, outcome) as well as study design and setting. Randomized controlled trials (RCTs) set in LMICs (defined by the World Bank [33]) were included in the review if their participants were women in their first trimester seeking either an induced abortion or treatment for incomplete abortion. The intervention was defined as medical induced abortion or medical treatment of incomplete abortion performed by a non-physician. The comparator was medical induced abortion or medical treatment of incomplete abortion provided by a physician. The primary outcome “effectiveness” was defined as complete abortion without the need for surgical intervention. The secondary outcome “acceptability” was defined as women’s satisfaction based on their expectations, experience, and whether they would recommend the type of provider or treatment to others. The outcome “safety” was defined as serious adverse events.

Data extraction and quality assessment

Data from included studies were extracted into Covidence using a standardized template developed by one author (MBK). The outcomes were verified by another author (RP). The following data were extracted: title, first author, journal, publication year, country, study characteristics, participant characteristics, description of intervention and control, and the outcomes. The quality of each included study was independently assessed by MBK and BCS/RP using the Cochrane Risk of Bias tool [34]. The following domains were assessed: selection bias (randomization and allocation), detection bias, attrition bias, and reporting bias. As the providers were the intervention and the control in these studies, they were naturally not blinded, and neither were the participants. Therefore, performance bias was not judged. Detection bias was judged as low risk if the outcome was assessed by someone other than the provider, e.g. a research assistant, and as high risk if assessed by the assigned provider. Studies were judged as overall low risk of bias trials if they scored low risk in all five different biases. Otherwise, they were considered as overall high risk of bias trials.

Data analysis

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A meta-analysis was conducted on trials that reported our primary outcome, treatment effectiveness (complete abortion). The meta-analysis was done using Reviewer Manager 5.4 [35]. A random-effects model using the Mantel-Haenszel method for dichotomous data was used to calculate pooled risk ratios (RR) with corresponding 95% confidence intervals (CIs). The data used were numbers of events and numbers of participants in both groups. Due to the nature of the intervention, most trials had per-protocol as their primary analysis, and therefore this was used in the primary meta-analysis. However, a sensitivity analysis was performed using intention-to-treat analysis for the trials reporting data for it. Further, a sensitivity analysis was performed using a fixed-effect model. Acceptability and safety were analyzed descriptively by comparing the extracted results. Acceptability is a subjective measurement and was measured as experience, satisfaction, expectation, or recommendation in various questionnaire items across trials. Therefore, frequency data on these items were extracted when available and perceived as various measures for acceptability. When stated, the percentage was extracted, if not it was calculated. Data on safety were expressed as the number of reported serious adverse events and extracted and analyzed descriptively when available.

**RESULTS**

A total of 1411 records were identified through the database search of which 61 were removed as duplicates; 1350 records were screened by title and abstract, and 1333 excluded. After the full-text screening, 6 papers from 4 different trials with a total of 4021 participants were included in the review [28, 29, 36-39] (Fig. 1). The included papers were published between 2011 and 2017.

Among the included studies were two Nepalese papers based on one RCT and two papers from one RCT in Uganda. Two papers assessed the intervention's effect and safety [36, 37], and the other assessed satisfaction and acceptability [28, 38]. Further, one RCT was set in Kenya and assessed effectiveness [29], and one RCT set in Mexico assessed effectiveness, safety, and acceptability [39]. The settings ranged from low-income (Nepal, Uganda) [28, 36-38] and lower-middle-income (Kenya) [29] to upper-middle-income countries (Mexico) [39]. Three of the papers assessed the provision of induced first-trimester abortion [28, 36, 39], and three assessed the treatment of first-trimester incomplete abortion [29, 37, 38]. The different treatment regimens consisted of combined misoprostol and mifepristone for termination of pregnancy or misoprostol alone to treat incomplete abortion. The length of provider experience was either quite similar between the two provider groups or it was higher among the non-physicians (Table 1).
**Acceptability and safety**

In total, four of the included papers had acceptability as an outcome, two as the primary outcome [28, 38], and two as secondary outcomes [29, 39]. There was no significant difference in acceptability ratings between types of providers in any of the papers (Table 2) [28, 29, 38, 39], which indicates that women’s satisfaction with MA is independent of the type of provider. Three of the papers used willingness to recommend the treatment or provider to a friend as a measurement for acceptability [29, 38, 39]. It varied from 96% to 98,5% in the non-physician group, and it was not significantly different from the physician group. Two papers reported satisfaction with no significant difference between the two provider groups, and a total satisfaction level of 99,6 and 99,7 % [28, 39]. Further, one paper reported the overall acceptability to be 95% with no significant difference between the groups [38]. Similarly, no difference was detected between the two groups when the outcome measure ‘whether the treatment met the expectations or not’ was used as measurement for acceptability, and a total of 96% and 93% reported that the treatment was easier than or as expected (Table 2) [29, 38].

Across all trials, only one serious adverse event was recorded. This concerned a 26-year-old woman in the physician group who was hospitalized due to bleeding and needing a surgical abortion, but without further complications [39]. No serious adverse events were recorded in any of the other trials [28, 29, 36-38]. This indicates that the provision of MA by non-physicians is as safe as when provided by a physician, according to the definition of safety as no serious adverse events.

**Risk of bias assessment**

Two of the RCTs scored low in selection, detection, attrition, and reporting bias, and were assessed to have an overall low risk of bias [29, 37]. Two were assessed to have an overall high risk of bias as they scored high in detection bias and reporting bias [36, 39] (Appendix, S2). The judgment of high-risk bias was due to the trial being registered retrospectively, which leads to a risk of reporting bias, and having the same person to provide the treatment and assess the outcome, which may introduce detection bias [27, 36, 39]. In one trial, an obstetrician was available for consultation for the providers if needed, but it was not reported whether the cases needed consultation or not, or if they were excluded from the analysis [39]. This could introduce reporting bias as well as per protocol violation if they were included in the analysis.
Meta-analysis

Four papers had outcomes on complete abortion [29, 36, 37, 39] and were eligible for the meta-analysis on effectiveness. Effectiveness was defined as complete abortion without the need for surgical intervention [29, 36, 37, 39]. The primary method for determining complete abortion was a clinical examination, but one trial reported using ultrasound [39]. The determination was done either by the assigned provider [36, 39] or by a research assistant [29, 37]. The meta-analysis showed that type of provider did not affect the effectiveness, RR: 1.00; 95% CI: 0.99-1.01 (Fig. 2). There was no heterogeneity (I²=0%) and the result did not change significantly if using a fixed model instead or a random-effects model, RR_{fixed}: 1.00; 95% CI: 0.99-1.01, or when pooling intention-to-treat data, RR_{intention-to-treat}: 1.00; 95% CI: 0.98-1.02 (Appendix, S3).

DISCUSSION

A total of 4021 participants from six papers of four trials set in low- and middle-income countries were included in this review. Our meta-analysis showed that medical induced abortion and medical treatment of incomplete abortion in the first trimester provided by non-physicians are as effective as when provided by physicians. Further, our descriptive analysis showed that women found both types of providers to be equally acceptable, and that treatment was as safe when provided by non-physicians.

To our knowledge, this is the first systematic review that evaluates the effectiveness, acceptability, and safety of medical management of first-trimester induced and incomplete abortion, by non-physicians versus physicians in LMICs. Several systematic reviews have previously been performed evaluating non-physicians for abortion provision [24-27]. However, they have included various study designs and studies from settings with great variation in health care systems (eg India, Nepal, South Africa, Sweden, United States, and Vietnam). By including countries with such great diversity, important differences in service provision and training level may be masked. To account for this issue, the present review was restricted to LMICs which tend to face the same problems regarding the quality of health care and shortages of trained health care workers. Thus, our review is less heterogeneous than previous reviews and the findings are likely more robust. Further, the fact that we only included trials allowed us to pool data and perform different sensitivity analyses, which strengthened our meta-analysis. It is plausible that length of experience may influence the effectiveness, safety, and acceptability of the intervention. However, as the non-physician’s length of experience did not vary much between the trials, a sensitivity
analysis considering years of experience was not made. Another strength of this review is that we performed a thorough quality assessment of the included trials, where two out of four were scored as overall low risk of bias trials, and two as high risk. The two trials of induced abortion were the trials that were judged as high risk of bias trials, which lowers our trust in the results as they may be over- or underestimated. On the other hand, the results were overall homogenous across all trials and the higher-risk trials did not deviate from the low-risk trials. The fact that none of the trials were blinded – due to the providers being the intervention and control – is not likely to have an impact on the outcomes, and hence performance bias was not judged.

Despite the mentioned strengths, our review also has its limitations. There are few RCTs available from LMICs within this research area. Only four individual RCTs were eligible for inclusion and several of the papers originate from the same trial. Hence, available data for our meta-analyses were limited. However, the available evidence was precise with narrow confidence intervals indicating no difference in effect across groups. Further, while developing the search string we decided to include a block limiting our search to LMICs. Still, there may be a risk of missing countries due to e.g. spelling variations or countries missing in the list. An alternative way to avoid this risk could have been to exclude the non-LMICs during the title abstract screening.

The findings of this systematic review are in line with previous reviews [24-27]. However, our review adds more recent data and provides more evidence to support the conclusion that non-physicians may provide MA or treatment of incomplete abortion in the first trimester both as effectively, acceptably, and safely as physicians in LMICs. With the definition of safety as “no serious adverse events” and the fact that only one such event was described in our included papers, we argue that medical induced abortion or treatment of incomplete abortion is equally safe when provided by a non-physician. The one serious event described in a trial occurred in the physician group [39]. Therefore, we recommend task sharing of medical induced abortion or treatment of incomplete abortion to non-physicians in LMICs.

In our included studies, nurses, midwives, and auxiliary nurse midwives are represented. Thus, the non-physician group is heterogenous and this may cause some problems when interpreting the findings and viewing these health care providers as one group. These healthcare providers may have different educations with variations in length and content, as well as different working areas and skills. This means that even though one type of provider can perform a MA effectively and safely, it is not a given that another type of provider can. Due to this, relevant training and

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supervision is an important aspect to consider if more non-physicians are to provide MA and medical management of incomplete abortion in LMICs.

Our review supports the WHO recommendations that non-physician providers should be upgraded to medically manage first-trimester abortions [9]. However, despite the favorable evidence and the WHO recommendations, the implementation of task sharing is slow and rates of unsafe abortions are still high. This may be due to factors such as workload and the need for access to proper training and supervision, and this is already a challenge due to the workforce crisis in LMICs. Hence, there is a need for pushing the task sharing agenda forward, which has also been stressed in an analysis of ten countries' health system capacity to provide post-abortion care [40]. The study noted that only 3-53% of primary level facilities and fewer than half of referral level facilities could provide basic and comprehensive post-abortion care [40]. As primary level facilities are the closest available health facilities for many women, they may not be able to receive appropriate and timely care. Adopting medical management and amending policies so that trained non-physicians may provide medical treatment of abortion may improve access and quality of post-abortion care.

The scale-up of task sharing is dependent on both health workers factors and health system factors, which is reflected in a paper by Glenton et al. who performed a case study synthesis in Bangladesh, Ethiopia, Nepal, South Africa, and Uruguay [41]. The authors found that the success of role extension strategies is associated with health workers knowledge about which services are available to whom, and under what circumstances as well as by the ability of the health system to adapt to the organizational implications of task sharing. The latter includes health workers’ workloads and incentives, training and supervision, supply chains and referral systems as well as monitoring and evaluation systems. Finally, the success of scaling up task sharing is also influenced by how women perceive the abortion care providers [41-43]. However, our review found that women's attitudes and experiences towards service providers are not barriers to task sharing.

CONCLUSION

Although few trials exist in this area, our findings suggest that provision of MA or medical treatment for incomplete abortion in the first trimester may be provided equally effective and safe by non-physicians as by physicians in low- and middle-income countries. Further, women accept
the provision of these services by non-physicians. We therefore recommend that the task of providing MA and medical treatment for incomplete abortion in LMICs is shared with non-physicians.

References:


7. Preventing unsafe abortions through task shifting and sharing. Lancet. 2015;386:504. (no authors listed)


43. Prata NG A. Holston M. Moran M. Weinrib R. Comprehensive abortion care pilot project in Tigray, Ethiopia: Final report. Tigray Regional Health Bureau, Ethiopia; Venture Strategies Innovations, California, USA; Bixby Center for Population, Health and Sustainability, California, USA, 2011.

Legends

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Table 1. Characteristics and outcomes

Table 2. Acceptability.

Figure 1. PRISMA Flow Diagram of records identified, included and excluded.

Figure 2. Risk of Bias assessment.

Figure 3. Effect of non-physician vs physician on provision of medical abortion, per-protocol analysis.

Supporting Information legends

Appendix, S1: Search strategy.

Appendix, S2: Risk of bias assessment

Appendix, S3: Sensitivity analysis

Appendix, S4: PRISMA checklist
### Table 1. Characteristics and outcomes

<table>
<thead>
<tr>
<th>Trial ref</th>
<th>Country</th>
<th>Time period</th>
<th>Participants</th>
<th>Gestational age (GA)</th>
<th>Type of abortion</th>
<th>Treatment regimen</th>
<th>Primary outcome</th>
<th>Intervention (mean years of practice)</th>
<th>Control (mean years of practice)</th>
<th>Effect of intervention (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warriner, 2011 36</td>
<td>Nepal</td>
<td>April 2009-March 2010</td>
<td>1104</td>
<td>LMP=6.6 CE=6.8</td>
<td>Induced abortion</td>
<td>Mifepristone: 1x200 mg oral, day 1 Misoprostol: 4x200 μg vaginal, day 4. Follow-up: day 10-14</td>
<td>Complete abortion without manual vacuum aspiration within 30 days of treatment.</td>
<td>Nurses n=8, ANM=3 n=11 (21.8 years)</td>
<td>Doctors n=14 (14.1 years)</td>
<td>RD&lt;sub&gt;PP&lt;/sub&gt;: 0.89% (-1.11% to 2.88%) RD&lt;sub&gt;ITT&lt;/sub&gt;: 1.24% (-0.53% to 3.02%)</td>
</tr>
<tr>
<td>Tamang, 2017 28</td>
<td>Nepal</td>
<td>April 2009-March 2010</td>
<td>1104</td>
<td>LMP=6.6 CE=6.8</td>
<td>Induced abortion</td>
<td>Mifepristone: 1x200 mg oral, day 1 Misoprostol: 4x200 μg vaginal, day 4. Follow-up: day 10-14</td>
<td>Complete abortion without manual vacuum aspiration within 30 days of treatment.</td>
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</tr>
<tr>
<td>Klingberg-Allvin, 2015 37</td>
<td>Uganda</td>
<td>April 2013-July 2014</td>
<td>1010</td>
<td>CE=8.8</td>
<td>Incomplete abortion</td>
<td>Misoprostol: 1x600 μg oral. Analgesics and antibiotics offered. Follow-up: day 14-28</td>
<td>Complete abortion not needing surgical intervention within 14–28 days.</td>
<td>Midwives n=9 (15.4 years)</td>
<td>Physicians n=13 (14.8 years)</td>
<td>RD&lt;sub&gt;PP&lt;/sub&gt;: -0.8% (-2.9 to 1.4)</td>
</tr>
<tr>
<td>Cleeve, 2016 38</td>
<td>Uganda</td>
<td>April 2013-July 2014</td>
<td>1010</td>
<td>CE=8.8</td>
<td>Incomplete abortion</td>
<td>Misoprostol: 1x600 μg oral. Analgesics and antibiotics offered. Follow-up: day 14-28</td>
<td>Acceptability measured in expectations and satisfaction</td>
<td>Midwives n=9 (15.4 years)</td>
<td>Physicians n=13 (14.8 years)</td>
<td>RD&lt;sub&gt;PP&lt;/sub&gt;: -0.8% (-2.9 to 1.4)</td>
</tr>
</tbody>
</table>

LMP, last menstrual period; CE, clinical examination; MA, medical abortion; ANM, Auxiliary nurse midwife; RD<sub>PP</sub>, Risk Difference Per Protocol; RD<sub>ITT</sub>, Risk Difference Intention to Treat; RD, Risk Difference; UL, Ultrasound.

### Table 2. Acceptability

- **Warriner, 2011**
  - 36
  - Nepal
  - April 2009-March 2010
  - 1104 participants
  - LMP=6.6 CE=6.8
  - Induced abortion
  - Mifepristone: 1x200 mg oral, day 1
  - Misoprostol: 4x200 μg vaginal, day 4.
  - Follow-up: day 10-14
  - Complete abortion without manual vacuum aspiration within 30 days of treatment.
  - Nurses n=8, ANM=3 n=11 (21.8 years)
  - Doctors n=14 (14.1 years)
  - RD<sub>PP</sub>: 0.89% (-1.11% to 2.88%)
  - RD<sub>ITT</sub>: 1.24% (-0.53% to 3.02%)

- **Tamang, 2017**
  - 28
  - Nepal
  - April 2009-March 2010
  - 1104 participants
  - LMP=6.6 CE=6.8
  - Induced abortion
  - Mifepristone: 1x200 mg oral, day 1
  - Misoprostol: 4x200 μg vaginal, day 4.
  - Follow-up: day 10-14
  - Complete abortion without manual vacuum aspiration within 30 days of treatment.
  - Nurses n=8, ANM=3 n=11 (21.8 years)
  - Doctors n=14 (14.1 years)
  - RD<sub>PP</sub>: 0.89% (-1.11% to 2.88%)
  - RD<sub>ITT</sub>: 1.24% (-0.53% to 3.02%)

- **Klingberg-Allvin, 2015**
  - 37
  - Uganda
  - April 2013-July 2014
  - 1010 participants
  - CE=8.8
  - Incomplete abortion
  - Misoprostol: 1x600 μg oral. Analgesics and antibiotics offered.
  - Follow-up: day 14-28
  - Complete abortion not needing surgical intervention within 14–28 days.
  - Midwives n=9 (15.4 years)
  - Physicians n=13 (14.8 years)
  - RD<sub>PP</sub>: -0.8% (-2.9 to 1.4)

- **Cleeve, 2016**
  - 38
  - Uganda
  - April 2013-July 2014
  - 1010 participants
  - CE=8.8
  - Incomplete abortion
  - Misoprostol: 1x600 μg oral. Analgesics and antibiotics offered.
  - Follow-up: day 14-28
  - Acceptability measured in expectations and satisfaction
  - Midwives n=9 (15.4 years)
  - Physicians n=13 (14.8 years)
  - RD<sub>PP</sub>: -0.8% (-2.9 to 1.4)

Overall satisfaction:
- Nurses/ANMs: 100%
- Doctors: 99.2%
| Olavarria, 2015 | Mexico | November 2012-January 2013 | 1017 | LMP=52. 5 days UL=50 days | Induced abortion | Mifepristone: 200 mg oral. Misoprostol:4x200 μg buccal, self-administered 24 h later. Follow-up: day 7-15 | Complete termination of pregnancy without surgical intervention | Nurses n=7 | Physicians n=8 | RD_{PP}: 1.0% (-0.8 to -2.9) | RD_{ITT}: 0.5% (-1.2 to 2.3) | Overall satisfaction: Midwife= 99.7% Physician= 99.6% |
| Makenzius, 2017 | Kenya | June 2013-May 2016 | 890 | CE=9.2 | Incomplete abortion | Misoprostol:1x600 μg oral. Analgesics and antibiotics offered. Follow-up: day 7-10 | Complete abortion not needing surgical intervention | Midwives n=19 (22.4 years) | Physicians n=18 (8.8 years) | RD_{PP}: 1.0% (-4.1 to 2.0) |

<table>
<thead>
<tr>
<th>Trial</th>
<th>Measure</th>
<th>Method</th>
<th>Specifics</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tamang, 2017</td>
<td>Experience and satisfaction</td>
<td>Acceptability form</td>
<td>Questions regarding pain, bleeding, duration, side effects, privacy, counseling, and communication. Direct question on satisfaction.</td>
<td>Highly satisfied or satisfied: MLP: 515/515, P: 512/516, Total: 1027/1031; 99.6%</td>
</tr>
<tr>
<td>Cleeve, 2016</td>
<td>Satisfaction and expectations</td>
<td>Standardized questionnaires</td>
<td>1. Was treatment as expected? 2. Would you recommend treatment to a friend? Overall acceptability was measured by merging the two questions</td>
<td>1. Easier or as expected: MLP: 453/472, P: 461/482, Total: 914/954; 96% 2. MLP: 465/472, P: 477/482, Total: 942/954; 99% Overall acceptability: MLP: 449/472, P: 455/482, Total 904/454; 95%</td>
</tr>
<tr>
<td>Olavarrieta, 2015</td>
<td>Satisfaction and expectation</td>
<td>Satisfaction survey of 14 questions, binary and categorical</td>
<td>Questions regarding provider, treatment, counseling, satisfaction, and if she would recommend the type of provider to a friend</td>
<td>Very satisfied and satisfied: MLP: 433/434, P: 448/450, Total: 881/884; 99,7% Recommend to a friend: MLP: 427/434, P: 444/450, Total: 871/884; 98,5%</td>
</tr>
</tbody>
</table>
| Makenzius, 2017 | Expectations and experience | 3 questions | 1. How did you perceive the treatment procedure?  
2. Did you feel safe after the treatment?  
3. Will you recommend the treatment to a friend or a relative? | 1. As or easier than expected: MLP: 378/407, P: 371/398, Total: 748/801; 93%  
2. MLP: 383/400, P: 378/399, Total: 779/799; 97%  
3. MLP: 383/400, P: 378/399, Total: 761/799; 95% |

MLP, mid-level provider; P, physician.
Figure 1. PRISMA Flow Diagram of records identified, included and excluded

Records identified through database searching (n = 1411)

Duplicates excluded (n=61)

Records for title-abstract screened (n = 1350)

Records excluded (n = 1333)

Full-text articles assessed for eligibility (n = 17)

Full-text articles excluded due to: wrong study design (n = 5), wrong setting (n=2), wrong comparator (n=1), wrong population (n=1), already included (n=2)

Studies included in qualitative synthesis (n = 6)

Studies included in quantitative synthesis (meta-analysis) (n = 4)
Figure 2. Risk of Bias assessment

Figure 3. Effect of non-physician vs physician on provision of medical abortion, per-protocol analysis

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Non-physician Events</th>
<th>Total</th>
<th>Physician Events</th>
<th>Total</th>
<th>Weight</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.1.1 Termination of pregnancy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warriner 2011</td>
<td>490</td>
<td>504</td>
<td>455</td>
<td>472</td>
<td>26.0%</td>
<td>1.01 [0.99, 1.03]</td>
<td></td>
</tr>
<tr>
<td>Olavarria 2015</td>
<td>386</td>
<td>395</td>
<td>401</td>
<td>406</td>
<td>19.4%</td>
<td>0.99 [0.97, 1.01]</td>
<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>876</td>
<td>856</td>
<td>878</td>
<td>858</td>
<td>65.5%</td>
<td>1.00 [0.98, 1.02]</td>
<td></td>
</tr>
<tr>
<td>Total events</td>
<td>842</td>
<td>845</td>
<td>845</td>
<td>845</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: Tau² = 0.00; Chi² = 1.78, df = 1 (p = 0.19); I² = 44%</td>
<td>Test for overall effect: 2 = 0.22 (p = 0.63)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>1.1.2 Treatment of incomplete abortion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Makenzious 2017</td>
<td>452</td>
<td>409</td>
<td>378</td>
<td>401</td>
<td>13.1%</td>
<td>1.01 [0.98, 1.04]</td>
<td></td>
</tr>
<tr>
<td>Klingberg-Alvin 2015</td>
<td>452</td>
<td>472</td>
<td>467</td>
<td>483</td>
<td>21.5%</td>
<td>0.99 [0.97, 1.02]</td>
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<tr>
<td>Subtotal (95% CI)</td>
<td>881</td>
<td>884</td>
<td>884</td>
<td>884</td>
<td>34.5%</td>
<td>1.00 [0.96, 1.02]</td>
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</tr>
<tr>
<td>Total events</td>
<td>842</td>
<td>845</td>
<td>845</td>
<td>845</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: Tau² = 0.00; Chi² = 1.05, df = 1 (p = 0.31); I² = 5%</td>
<td>Test for overall effect: 2 = 0.15 (p = 0.68)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td>1762</td>
<td>1701</td>
<td>1762</td>
<td>1701</td>
<td>100.0%</td>
<td>1.00 [0.99, 1.01]</td>
<td></td>
</tr>
<tr>
<td>Total events</td>
<td>1718</td>
<td>1701</td>
<td>1718</td>
<td>1701</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Heterogeneity: Tau² = 0.00; Chi² = 2.33, df = 3 (p = 0.42); I² = 0%</td>
<td>Test for overall effect: 2 = 0.43 (p = 0.67)</td>
<td></td>
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<tr>
<td>Test for subgroup differences: Chi² = 0.00, df = 1 (p = 0.96); I² = 0%</td>
<td></td>
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</tbody>
</table>

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