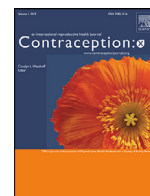




Contents lists available at ScienceDirect

## Contraception: X

journal homepage: <https://www.elsevier.com/locate/conx>

# Medical abortion at 13 or more weeks gestation provided through telemedicine: A retrospective review of services <sup>☆,☆☆</sup>

Nathalie Kapp<sup>a,\*</sup>, Kathryn Andersen<sup>a</sup>, Risa Griffin<sup>a</sup>, Amalia Puri Handayani<sup>b</sup>,  
Marlies Schellekens<sup>b</sup>, Rebecca Gomperts<sup>b</sup>

<sup>a</sup> Ipas, Chapel Hill, NC, USA

<sup>b</sup> Women on Web, Toronto, Canada

## ARTICLE INFO

### Article history:

Received 2 July 2020

Revised 15 January 2021

Accepted 20 January 2021

### Keywords:

Abortion

Telemedicine

Second trimester abortion

Self-management of medical abortion

## ABSTRACT

**Objectives:** To evaluate medical abortion effectiveness and safety in women at 13 or more weeks gestation provided care through Women on Web's telemedicine service.

**Study Design:** We conducted a retrospective case study of abortions at 13 or more weeks gestation provided by Women on Web between 2016 and 2019. Women received mifepristone and misoprostol or misoprostol alone for abortion. We extracted demographic characteristics and outcome data for cases with pregnancy continuation outcomes.

**Results:** We identified 144 women who used medical abortion at 13 or more weeks; 131 (91%) provided abortion outcome data. Almost all, 118 (90%) received mifepristone and misoprostol. The population had an average age of  $26 \pm 5.8$  years, 102 (78%) reported a gestational age of 13 to 15 weeks, 114 (87%) had experienced prior pregnancy, and represented all world regions. Overall, 13 (10%) women reported a continuing pregnancy, with 5 (5%) among women 13 to 15 weeks and 8 (28%) among those  $\geq 16$  weeks ( $p = 0.001$ ); 38 (29%) reported adverse events (heavy bleeding, fever), 53 (43%) sought additional care from a health provider, and 18% of all cases received treatment with D&C/aspiration.

**Conclusions:** Efficacy of self-administered medical abortion decreases as gestational age increases, risking continuation of pregnancy. Provision through telemedicine at 13 to 15 weeks appears safe and effective.

**Implications:** Limited data suggest that medical abortion through telemedicine services may be a safe option through 15 weeks gestation in settings where there is ready access to the formal health system. More research with adequate sample sizes and high rates of follow-up is needed to inform on the safety of telemedicine for pregnancies 13 weeks and greater.

© 2021 The Author(s). Published by Elsevier Inc.  
This is an open access article under the CC BY-NC-ND license  
(<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

## 1. Introduction

Medical abortion, or the use of pharmacological drugs to terminate a pregnancy, is a safe and effective way to induce an abortion [1–3]. Because medical abortion does not rely on the surgical skills of a trained provider, women may self-administer their abortion at home rather than in a health facility, thereby providing opportunities for women to receive abortion care despite legal, geographic, or other restrictions. The World Health Organization (WHO) has

listed investigating alternative options for providing abortion care as a research priority as part of an effort to expand global access to safe abortion [4,5]. Several studies in diverse settings have reported medical abortion through telemedicine services up to 9 weeks gestation to be safe and generally well tolerated [4,6–10]. Such services offer medical abortion in early pregnancy; investigation to date has not yet focused on outcomes in pregnancies greater than 12 weeks gestation [4]. Clinical trials in hospital settings have demonstrated that medical abortion remains effective at higher gestational age ranges, with 84% to 91% expelling the fetus within 24 hours provided repeat doses of misoprostol are administered over time [11–18].

Women on Web is a nonprofit telemedicine abortion service attempting to increase abortion access to women living in countries where abortion is legally restricted [7,9,10]. Women request ser-

<sup>☆</sup> Declaration of Competing Interest: Rebecca Gomperts is the Director of Women on Web. Amalia Puri Handayani and Marlies Schellekens are both employees of Women on Web.

<sup>☆☆</sup> Funding: Ipas.

\* Corresponding author.

E-mail address: [kappn@ipas.org](mailto:kappn@ipas.org) (N. Kapp).

vices and may communicate in multiple languages with staff and providers through an online system for shipments of medical abortion pills, prescriptions for local drugs, if available, advice, and information on medical abortion. The service offers medical abortion to those with a pregnancy less than 10 weeks gestation; however, there are instances where delays may mean women obtain or take the medicines at later gestational ages. Delays in the shipment, deliberation by the woman, and incorrect reporting of gestational age when requesting an abortion are all reasons that pills provided by Women on Web might be used in a pregnancy of 13 weeks or greater. The service always sends multiple doses of misoprostol (4–6 doses) with information explaining how to properly use repeated, lower doses of misoprostol, what to expect during the process, and a warning that women with higher gestational ages have a higher risk of complication when the expected date of the delivery of medicines is after 12 weeks. Any woman who reports being more than 20 weeks pregnant is strongly discouraged by the service from attempting a self-abortion due to the risk of giving birth to a live fetus, and medications and information on how to take them are not sent.

There are many reasons why women need abortion care in later gestations. Women at 13 weeks of pregnancy or later presenting for abortion are more likely than those seeking care earlier to be young or a victim of violence, to have detected their pregnancy later or have financial and logistical barriers to care, and to feel ambivalent about the pregnancy and abortion decision [19–23]. Additionally, medical or fetal indications for an abortion may not be apparent until later in pregnancy [24]. Reasons for seeking abortion care at 13 or more weeks gestation appear similar across countries and cultures and may disproportionately affect the most underserved women [25–27].

The objective of this retrospective case study was to assess the effectiveness and safety of self-administered medical abortion at 13 or more weeks as provided by the telemedicine service Women on Web.

## 2. Materials and Methods

We conducted a retrospective review of women who took medical abortion pills at 13 or more weeks gestation after receiving services from Women on Web from January 2016 to February 2019. Regimens consisted of 200 mg mifepristone and repeated (4–6) doses of 400 micrograms sublingual misoprostol administered 1–2 days after mifepristone, or repeated doses (4–6) of 400 micrograms misoprostol only. Among the 30,422 clients served during this time period, 199 reported being 13 weeks or more gestation. We required confirmation that the medical abortion drugs were received and administered to be considered as our study population; therefore, 144 who confirmed receipt and took the pills were included in our analyses.

Women on Web collected information from those seeking their services through standard forms and follow-up surveys. On initial request for services, women provided the following information: demographic and relevant medical history including of previous pregnancies, contraceptive use, last menstrual period or gestational age by ultrasonography, and reasons for seeking abortion. After shipment of medical abortion drugs, Women on Web asked the clients to confirm their receipt. Five weeks later, the service sent the women an evaluation of 30 questions about their abortion experience, including the eventual outcome of the pregnancy. Women may also have communicated with staff and providers through the online system, if needed. The investigators compiled these data for our analysis from the Women on Web database using data extraction sheets designed for this study.

The primary outcome of the analysis was pregnancy status after medical abortion drug administration, as measured via self-report, either in the post-medical abortion evaluation or online communication with Women on Web. Secondary outcomes were incidence of adverse events and seeking additional treatment from a health facility, including surgical uterine evacuation, to align with the Medical Abortion Reporting Efficacy (MARE-S) guidelines [28]. The MARE-S guidelines recommend defining a successful medical abortion as one in which the intrauterine pregnancy is expelled without need for surgical intervention [28]. Evaluation forms contain close-ended questions for each of these outcomes. Any data entered as free text in the evaluation form or through communication with staff was collected if relevant to the above outcomes. Additionally, acceptability of the abortion process was assessed in the post-medical abortion evaluation with a close-ended question “Was medical abortion an appropriate method for you” to which women could answer positively or negatively.

We performed an analysis consisting of descriptive statistics, including frequencies/percentages and mean/standard deviation for characteristics of the study population and the outcomes of interest. Due to small sample sizes, bivariate associations were assessed using Fisher’s exact statistics. All analyses were conducted using Stata.

## 3. Results

Of the 144 women eligible for inclusion in our analysis who reported taking the medical abortion pills at a gestational age of 13 weeks or more, 131 (91%) had information on the abortion outcome (continued pregnancy or successful abortion), yielding a 9% ( $n = 13$ ) loss-to-follow-up. The sociodemographic characteristics between the 131 women included in our study sample and the 13 women lost to follow-up were similar, suggesting no association of characteristics with eventual loss to follow-up. Table 1 presents the characteristics of our study population.

Table 2 presents the characteristics of the abortion process. Overall, 118 (90%) women reported aborting after taking the medical abortion drugs; 23 (18%) of whom received treatment with D&C/aspiration. Thirteen (10%) women reported a continuing pregnancy, with 5 (5%) among women 13 to 15 weeks and eight (28%) among those  $\geq 16$  weeks ( $p = 0.001$ ).

Completion of the abortion was confirmed by ultrasonography ( $n = 30$ ), observing the expelled fetus ( $n = 21$ ), resolution of pregnancy symptoms ( $n = 18$ ), negative pregnancy test ( $n = 8$ ), and resumption of normal menses ( $n=4$ ), among those who provided this information. Women received different amounts of medications, depending on reported gestational age to the service and their location; most women (87%) received between 4 and 6 doses of misoprostol and there was no association between regimen and abortion failure (data not shown).

Of those who failed to have an abortion with prescribed treatment ( $n = 13$ ), 5 were diagnosed as having an ongoing pregnancy by ultrasound and 2 by pregnancy test or symptoms and 6 did not respond to this question. After failing to have an abortion, 4 women reported that they chose to continue their pregnancies. Two women gave birth within 1 day of using the abortion pills to premature infants and 1 woman gave birth 7 weeks after using the pills to a premature infant: 2 infants survived, while 1 lived for 6 days.

There was an association between gestational age and pregnancy outcome: 5 (5%) women between 13 and 15 weeks had a continued pregnancy rate compared with 8 (28%) among those  $\geq 16$  weeks ( $p = 0.005$ ). There was an association between previous pregnancy and pregnancy outcome: 4 women (31%) with no previous pregnancy had medical abortion failure, compared

**Table 1**

Bivariate comparison of characteristics of women seeking telemedicine abortion services at 13 or more weeks gestation with and without follow-up information

Characteristics	Participants with abortion outcome information (N = 131)		Participants lost to follow-up (no abortion outcome information) (N = 13)		p Value
Region					0.19
Africa	6	(5)	0	(0)	
Arab States	7	(3)	1	(8)	
Asia & Pacific	44	(34)	5	(38)	
Europe	52	(40)	2	(15)	
South/Latin America	25	(19)	5	(38)	
Age					0.68
15–19	17	(13)	3	(23)	
20–24	44	(36)	3	(23)	
25–29	35	(27)	3	(23)	
30+	35	(27)	4	(31)	
Mean (SD)	26	±5.8	26	±6.2	
Previous pregnancy					0.63
Yes	114	(90)	11	(85)	
No	13	(10)	2	(15)	
Missing	4		-		
Previous abortion					0.31
Yes	29	(24)	5	(38)	
No	94	(76)	8	(62)	
Missing	8		0		
Using contraception during cycle of conception					0.76
Yes	61	(61)	6	(55)	
No	63	(29)	5	(45)	
Missing	7		2		
Gestational age (weeks)					0.30
13–15	102	(78)	12	(92)	
16+	29	(22)	1	(8)	
Mean (SD)	14.8	±2.74	13.8	±0.93	

SD, standard deviation.

Presented as n (%) or mean ± standard deviation.

**Table 2**

Abortion process reported by women who received telemedicine medical abortion services at 13 or more weeks gestation, by gestational age category

	Study population (N = 131)		13–15 weeks (n = 102)		16+ Weeks (n = 29)		p Value
	n	(%)	n	(%)	n	(%)	
Continued pregnancy							<0.01
No	118	(90)	97	(95)	21	(5)	
Yes	13	(10)	5	(5)	8	(28)	
Type of medical abortion pills							0.73
Misoprostol only	13	(10)	11	(11)	2	(7)	
Misoprostol + mifepristone	118	(90)	91	(88)	27	(93)	
Adverse event reported (very heavy bleeding/fever)							0.07
Yes	38	(29)	34	(33)	4	(14)	
No	32	(24)	23	(22)	9	(31)	
Missing	61	(47)	46	(45)	16	(55)	
Sought additional care							1.00
Yes	53	(40)	41	(40)	12	(41)	
No	22	(17)	17	(17)	5	(17)	
Missing	56	(43)	45	(44)	12	(41)	
Received D&C, among all							
Yes	23	(18)	18	(17)	5	(17)	
No/Missing	108	(82)	85	(83)	24	(83)	
Received D&C, among care seekers (n = 53)							1.00
Yes	23	(43)	18	(44)	5	(42)	
No/Missing	30	(57)	23	(56)	7	(58)	
Medical abortion acceptable							0.07
Yes	61	(47)	51	(50)	10	(34)	
No	5	(4)	2	(2)	3	(10)	
Missing	66	(49)	49	(48)	16	(55)	

D&amp;C, dilation and curettage.

to just 7 (6%) of those with a previous pregnancy ( $p = 0.015$ ). We found no other associations, including between medical abortion type (mifepristone and misoprostol or misoprostol-only) and abortion success (Fisher's exact  $p$  value = 1.00), or need for additional treatment and world region or pregnancy history.

#### 4. Discussion

With appropriate information, medicines and support, women generally can manage their abortion process outside of health facility settings, up to 13 to 15 weeks gestation. These data are concordant with limited evidence from medical abortion provi-

sion through hotlines or accompaniment models [29,30]. Consistent with data from clinical studies, efficacy decreases with increasing gestational age as the length of time for the process increases and need for diligent misoprostol redosing becomes more important [15,16].

We found rates of surgical uterine evacuation after medical abortion in this study, 18% overall, to be comparable to other published studies of telemedicine in which rates appear setting-dependent [4,8,29,30]. Rates of intervention for completion of the abortion and/or retained placenta vary greatly between studies and are likely related more to providers' practices than reflecting a medical need for evacuation. Care-seeking among a population that is self-managing abortion may not only reflect a complication or adverse event, but may reflect what a woman needs, wants, or may have been instructed to do [30]. As seen following medical abortion below 13 weeks gestation, women seek care when they perceive they need it, which may be as much for reassurance of a normal process as it is for symptoms of a serious event or complication [4,8,10]. Telemedicine and reports of self-use generally demonstrate intervention rates higher than those reported in clinical trials. The association between nulliparity and abortion failure may be related more to behavior than biology; women lacking experience with miscarriage and childbirth may seek additional care earlier in the process, have less confidence in self-assessment or administration of drugs, and have more advanced pregnancies—all of which influence the failure rate.

Adverse outcomes were not common overall and did not differ by gestational age group. Data from self-reporting can be difficult to interpret, as among those who reported an adverse event (heavy bleeding much more than menses or persistent fever), less than half sought additional care from a health facility. Telemedicine or provision for home use of medical abortion at 13 weeks or more gestation appear to be generally safe and acceptable up to 16 weeks gestation; however, risks of abortion failure and provoking a premature delivery occurred among those with gestational ages greater than 20 weeks, as was decreased acceptability of the method. To avoid the most serious adverse outcomes, women should be informed that earlier use is safer than later use in pregnancy; barriers to services and treatment should be decreased to facilitate earlier treatment; treatment for anyone approaching a 13 week gestation should have time-to-treatment accelerated; and those seeking care at 13 weeks or more should be informed about serious risks of a preterm birth if dating is unsure, or if the pregnancy is beyond 20 weeks. As complications resulting from abortion in areas where ready access to quality abortion services is limited result in a substantial percentage of potentially life-threatening complications, self-care or telemedicine services for women with quality medical abortion drugs should result in rarer abortion-related mortality at the population level [31]. Decreases in associated mortality and morbidity with such care are likely to be greater at higher gestational ages. Although women would ideally receive services as early as possible in a pregnancy, delays and barriers to care for many in restricted settings limit their ability to get care at all. Quality drugs, adequate information and support from their community or services such as Women on Web can greatly reduce the risks of self-managed care [4,30,31].

A strength of this study is the wide geographic representation of participants which increases generalizability. These data, however, are limited by the small sample size, which reflects the relatively few women who seek services from Women on Web at later gestational ages, and the study design, which is a retrospective analysis of service data. One significant limitation is the number of women, almost 30%, who did not respond to the service with confirmation of having received or taken the medical abortion pills after initially contacting Women on Web, which may bias our findings. However, we note that this difference between

seeking abortion and further contact with the service staff is commonly reported in evaluations of telemedicine abortion and may represent some characteristics of people who are likely to choose a telemedicine service [4]. Our findings may be further impacted by the loss-to-follow-up of 13 women who were not included in our analysis due to missing abortion outcome data; an ongoing pregnancy amongst all these women would have resulted in an unsuccessful abortion rate of 18% (compared with 10%). Given all data was by self-report, we are unable to assess health care interventions as a medical need from patient request or provider initiative. As stated in a prior-published report highlighting a research agenda for self-use, research in medical abortion outside formal health settings would benefit from standardized measures to assess need for further management among providers [32]. Additionally, we may have overestimated failure rates, as some women who failed to abort may have been successful had they used additional doses of misoprostol beyond the 4 to 6 doses generally provided. As data was not solicited about the number of doses taken before seeking an intervention or determining that the abortion was a failure, we are unable to determine the degree of overestimation in our data, and clinical studies demonstrate a range of needed misoprostol doses [17,33–38].

The results of this study provide initial evidence for telemedicine provision of medical abortion at 13 weeks or more gestational age. Findings suggest safe and effective use through 15 weeks, with increasing need for treatment from formal health systems, including uterine evacuation, as gestational age increased. More research with adequate sample sizes and high rates of follow-up is needed to confirm the safety of telemedicine for pregnancies 13 weeks and greater.

## Acknowledgments

Megan Perkins for her assistance with data extraction

## Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.conx.2021.100057](https://doi.org/10.1016/j.conx.2021.100057).

## References

- [1] World Health Organization Safe Abortion: Technical and Policy Guidance for Health Systems. Geneva: World Health Organization; 2012.
- [2] Kulier R, Kapp N, Gulmezoglu AM, Hofmeyr GJ, Cheng L, Campana A. Medical methods for first trimester abortion. *Cochrane Database Syst Rev* 2011(11):Cd002855.
- [3] World Health Organization Medical Management of Abortion. Geneva: World Health Organization; 2018.
- [4] Endler M, Lavelanet A, Cleeve A, Ganatra B, Gomperts R, Gemzell-Danielsson K. Telemedicine for medical abortion: a systematic review. *BJOG* 2019;126(9):1094–102.
- [5] World Health Organization Health worker roles in providing safe abortion care and post-abortion contraception. Geneva; 2015.
- [6] Gill R, Norman WV. Telemedicine and medical abortion: dispelling safety myths, with facts. *Mhealth* 2018;4:3.
- [7] Gomperts RJ, Jelinska K, Davies S, Gemzell-Danielsson K, Kleiverda G. Using telemedicine for termination of pregnancy with mifepristone and misoprostol in settings where there is no access to safe services. *BJOG* 2008;115(9):1171–5.
- [8] Gomperts R, Petow SA, Jelinska K, Steen L, Gemzell-Danielsson K, Kleiverda G. Regional differences in surgical intervention following medical termination of pregnancy provided by telemedicine. *Acta Obstet Gynecol Scand* 2012;91(2):226–31.
- [9] Gomperts R, van der Vleuten K, Jelinska K, da Costa CV, Gemzell-Danielsson K, Kleiverda G. Provision of medical abortion using telemedicine in Brazil. *Contraception* 2014;89(2):129–33.
- [10] Aiken ARA, Digol I, Trussell J, Gomperts R. Self reported outcomes and adverse events after medical abortion through online telemedicine: population based study in the Republic of Ireland and Northern Ireland. *BMJ* 2017;357(j2011). doi:10.1136/bmj.j2011.
- [11] Kapp N, Whyte P, Tang J, Jackson E, Brahm D. A review of evidence for safe abortion care. *Contraception* 2013;88(3):350–63.

- [12] Kapp N, Borgatta L, Stubblefield P, Vragovic O, Moreno N. Mifepristone in second-trimester medical abortion: a randomized controlled trial. *Obstet Gynecol* 2007;110(6):1304–10.
- [13] Wildschut H, Both MI, Medema S, Thomee E, Wildhagen MF, Kapp N. Medical methods for mid-trimester termination of pregnancy. *Cochrane Database Syst Rev* 2011(1):Cd005216.
- [14] Blum J, Karki C, Tamang A, Shochet T, Shrestha A, Tuladhar H, et al. Feasibility of a hospital outpatient day procedure for medication abortion at 13–18 weeks gestation: findings from Nepal. *Contraception* 2019;100(6):451–6.
- [15] Platais I, Tsereteli T, Maystruk G, Kurbanbekova D, Winikoff B. A prospective study of mifepristone and unlimited dosing of sublingual misoprostol for termination of second-trimester pregnancy in Uzbekistan and Ukraine. *BMJ Sex Reprod Health* 2019.
- [16] Borgatta L, Kapp N. Clinical guidelines. Labor induction abortion in the second trimester. *Contraception* 2011;84(1):4–18.
- [17] Ngoc NT, Shochet T, Raghavan S, Blum J, Nga NT, Minh NT, et al. Mifepristone and misoprostol compared with misoprostol alone for second-trimester abortion: a randomized controlled trial. *Obstet Gynecol* 2011;118(3):601–8.
- [18] von Hertzen H, Piaggio G, Wojdyla D, Nguyen TM, Marions L, Okoiev G, et al. Comparison of vaginal and sublingual misoprostol for second trimester abortion: randomized controlled equivalence trial. *Hum Reprod* 2009;24(1):106–12.
- [19] Bonnen KI, Tuijje DN, Rasch V. Determinants of first and second trimester induced abortion - results from a cross-sectional study taken place 7 years after abortion law revisions in Ethiopia. *BMC Pregnancy Childbirth* 2014;14:416.
- [20] Foster DG, Kimport K. Who seeks abortions at or after 20 weeks? *Perspect Sex Reprod Health* 2013;45(4):210–18.
- [21] Lim L, Wong H, Yong E, Singh K. Profiles of women presenting for abortions in Singapore: focus on teenage abortions and late abortions. *Eur J Obstet Gynecol Reprod Biol* 2012;160(2):219–22.
- [22] Sowmini CV. Delay in termination of pregnancy among unmarried adolescents and young women attending a tertiary hospital abortion clinic in Trivandrum, Kerala, India. *Reprod Health Matters* 2013;21(41):243–50.
- [23] Jatlaoui TC, Shah J, Mandel MG, Krashin JW, Suchdev DB, Jamieson DJ, et al. Abortion surveillance - United States, 2014. *MMWR Surveill Summ* 2018;66(25):1–44.
- [24] Lyus R, Robson S, Parsons J, Fisher J, Cameron M. Second trimester abortion for fetal abnormality. *BMJ* 2013;347:f4165.
- [25] Swanson M, Karasek D, Drey E, Foster DG. Delayed pregnancy testing and second-trimester abortion: can public health interventions assist with earlier detection of unintended pregnancy? *Contraception* 2014;89(5):400–6.
- [26] Baum S, DePiñeres T, Grossman D. Delays and barriers to care in Colombia among women obtaining legal first- and second-trimester abortion. *Int J Gynaecol Obstet* 2015;131(3):285–8.
- [27] Constant D, Kluge J, Harries J, Grossman D. An analysis of delays among women accessing second-trimester abortion in the public sector in South Africa. *Contraception* 2019;100(3):209–13.
- [28] Creinin MD, Chen MJ. Medical abortion reporting of efficacy: the MARE guidelines. *Contraception* 2016;94(2):97–103.
- [29] Gerdtts C, Jayaweera RT, Baum SE, Hudaya I. Second-trimester medication abortion outside the clinic setting: an analysis of electronic client records from a safe abortion hotline in Indonesia. *BMJ Sex Reprod Health* 2018;44(4):286–91.
- [30] Moseson H, Bullard KA, Cisternas C, Grosso B, Vera V, Gerdtts C. Effectiveness of self-managed medication abortion between 13 and 24 weeks gestation: a retrospective review of case records from accompaniment groups in Argentina, Chile, and Ecuador. *Contraception*; 2020.
- [31] Calvert C, Owolabi OO, Yeung F, Pittrof R, Ganatra B, Tunçalp Ö, et al. The magnitude and severity of abortion-related morbidity in settings with limited access to abortion services: a systematic review and meta-regression. *BMJ Global Health* 2018;3(3):e000692.
- [32] Kapp N, Blanchard K, Coast E, Ganatra B, Harries J, Footman K, et al. Developing a forward-looking agenda and methodologies for research of self-use of medical abortion. *Contraception* 2018;97(2):184–8.
- [33] Abbas DF, Blum J, Ngoc NT, Nga NT, Chi HT, Martin R, et al. Simultaneous administration compared with a 24-hour mifepristone-misoprostol interval in second-trimester abortion: a randomized controlled trial. *Obstet Gynecol* 2016;128(5):1077–83.
- [34] Ashok PW, Templeton A, Wagaarachchi PT, Flett GM. Midtrimester medical termination of pregnancy: a review of 1002 consecutive cases. *Contraception* 2004;69(1):51–8.
- [35] Dabash R, Chelli H, Hajri S, Shochet T, Raghavan S, Winikoff B. A double-blind randomized controlled trial of mifepristone or placebo before buccal misoprostol for abortion at 14–21 weeks of pregnancy. *Int J Gynaecol Obstet* 2015;130(1):40–4.
- [36] Louie KS, Chong E, Tsereteli T, Avagyan G, Abrahamyan R, Winikoff B. Second trimester medical abortion with mifepristone followed by unlimited dosing of buccal misoprostol in Armenia. *Eur J Contracept Reprod Health Care* 2017;22(1):76–80.
- [37] Prodan N, Breisch J, Hoopmann M, Abele H, Wagner P, Kagan KO. Dosing interval between mifepristone and misoprostol in second and third trimester termination. *Arch Gynecol Obstet* 2019;299(3):675–9.
- [38] Shaw KA, Topp NJ, Shaw JG, Blumenthal PD. Mifepristone-misoprostol dosing interval and effect on induction abortion times: a systematic review. *Obstet Gynecol* 2013;121(6):1335–47.