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AVERTING MATERNAL DEATH AND DISABILITY

An assessment of postabortion care in three regions in Ethiopia, 2000 to 2004

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KEYWORDS

Ethiopia;
Postabortion care;
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Abstract

Objective: To assess postabortion care services in 3 regions in Ethiopia following provider training and service improvements between 2000 and 2004. *Methods:* Data on availability and quality of services were collected at 119 facilities in 3 regions of Ethiopia before and after postabortion care (PAC) provider training in 42 of the sites; supervision, supplies, and equipment were also provided. Changes over time, changes attributable to the training intervention, and overall self-reported improvements in PAC were assessed for outcomes of interest, including availability of uterine evacuation services, postabortion contraceptive methods and supply availability (including manual vacuum aspiration [MVA]), and minimum-skilled providers. *Results:* Between 2000 and 2004, the capacity for offering uterine evacuation increased from 57% to 79% among intervention facilities, while remaining relatively constant among the comparison facilities. The training intervention was significantly associated with improvements in the availability and use of MVA, the availability of a minimum number of skilled providers and availability of postabortion contraceptive services. The proportion of uterine evacuation procedures performed with MVA increased among comparison facilities, but increased even more among intervention facilities, from 14% to 50% of procedures. *Conclusions:* Training and supporting providers in comprehensive PAC effectively improve women's access to PAC services in Ethiopia, but more attention must be paid to training midlevel providers, extending services into health centers, pain management, and provision of postabortion contraceptives.

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1. Introduction

1.1. Extent of the problem

Complications of unsafe abortion account for 13% of pregnancy-related deaths worldwide, with 95% of the deaths occurring in low-income countries [1]. An Ethiopian woman's lifetime risk of dying of maternal causes is 1 in 14, compared with 1 in 2566 among women living in North America [2]. A major cause of maternal death in Ethiopia is complications of unsafe abortion because treatment requires accessible and high-quality medical services. Left untreated, complications of unsafe abortion can progress to life-threatening infection or hemorrhage. According to Ministry of Health statistics, abortion complications are the fifth leading cause of hospital admissions among Ethiopian women [3]. Although there are no reliable data on national incidence of unsafe abortion in Ethiopia, some older household and hospital-based studies found that unsafe abortion accounts for as much as 25%–50% of maternal deaths in some regions and that poor postabortion management was among the main avoidable factors contributing to these deaths [4–7].

A 1996 National Safe Motherhood Needs Assessment found serious deficiencies in the availability and quality of postabortion care (PAC) in Ethiopia, particularly in health centers [8]. Only 46% of surveyed health centers could perform an emergency uterine evacuation (UE) to treat the complications of unsafe abortion [8]. Furthermore, the most common treatment was sharp curettage even though the WHO recommends that properly equipped health facilities phase out curettage and adopt simpler, safer, and equally effective manual vacuum aspiration (MVA) and medical abortion, both of which can be done by trained midwives or nurses [1,8–12].

1.2. Preferred approach

For Ethiopian women, most of whom live in rural areas, the health center is the locus of their medical care. Expanding PAC services from hospitals to health centers requires enabling providers to meet postabortion needs. Use of MVA by midwives has been an effective means of expanding PAC services to primary and lower-level health facilities in other African countries [12]. Thus, the Ethiopian Federal Ministry of Health chose promotion of MVA by midlevel providers (including midwives) as a way to provide PAC to women in the most distant regions of Ethiopia. In 1999, Ethiopia acknowledged this need in the Health Sector Development Program [13] and continued the priority in the Health Sector Strategic Plan for 2005–2010 [14].

Managing complications of unsafe abortion requires providers skilled in UE, clean environs, and the proper equipment and supplies to perform the procedure [1]. Often only physicians are trained to manage abortion complications, and this training often focuses on sharp curettage. The PAC training described here focused on midwives, health officers, and physicians who had received little preservice information, education or practice in the use of MVA and the provision of PAC.

1.3. Purpose

The purpose of this evaluation was to assess an intervention of provider training and service improvements through the following research questions:

1. How did PAC services at surveyed facilities compare between 2000 and 2004?
2. How did the intervention affect availability and quality of PAC services between 2000 and 2004?
3. How did the quality and availability of PAC change between 2000 and 2004 among the facilities whose staff participated in the intervention?

2. Methods

2.1. Data collection

A semi-structured questionnaire was developed and pretested to measure the type and quality of postabortion clinical services, availability of UE equipment and supplies, and adequacy and privacy of areas where PAC is provided. Other collected data pertained to technical skill and training level of staff involved in PAC, contraceptive services and types of available contraceptives, quality of infection prevention, and quality of record keeping. Questionnaires differed for facilities that provided treatment for abortion complications and those that referred such women.

From July to September 2000, data collectors administered the questionnaire to heads of maternity/PAC services in 119 health-care facilities, and available supplies and equipment were inventoried. These facilities were selected based on 3 inclusion criteria: location in the regions of Addis Ababa, Amhara and Oromia; accessibility by car; and approval by the appropriate Regional Health Bureau, the regional Ministry of Health administrative office. The results of the baseline survey were used to determine PAC-related needs, describe the availability and quality of PAC, and to develop an intervention for providers to increase access to and quality of comprehensive PAC services [15].

Follow-up data were collected from April to June 2004 using the 2000 questionnaire with an additional section on perceived improvements to PAC. At this time, facilities were classified as either intervention facilities if at least one provider who had participated in the training course was currently or had been previously employed by the facility; or comparison facilities if no providers who participated in the training course had ever been employed by the facility. Overall, there were 42 intervention facilities (11 hospitals and 31 health centers) and 77 comparison facilities (17 hospitals and 60 health centers).

2.2. The intervention

The intervention was a collaboration of the federal Ministry of Health, Regional Health Bureaus, and Ipas—an international nongovernmental organization that works to improve sexual and reproductive rights and to reduce deaths and injuries from unsafe abortion.

The intervention training was designed to improve healthcare workers' skills, attitudes, and ability to offer high-quality PAC services. It was offered to almost 400 invited providers from across Ethiopia between 2001 and 2002 via a residential intensive course lasting 10.5 days. Teaching techniques included structured lecture presentations, videos, practice on anatomical models, clinical skills practice in a hospital setting, and quizzes and pre- and post-test exams to ensure that an acceptable level of learning had been achieved.

Each course trained 10–12 participants and all spent 2–4 days in a classroom acquiring the clinical skills to manage patients with abortion complications. The clinical sessions included practice assembling and disassembling the MVA aspirator, supervised use of MVA on models and patients, processing of MVA instruments, and

managing and counseling hypothetical and actual cases. Clinical practice, patient care, role modeling, and observation sessions were held in affiliated training hospitals, but the amount of time each trainee spent providing patient care varied depending on the caseload and the individual trainees' pre-existing skills.

The intervention package also supplied the health care facilities with MVA instruments; general supplies, equipment and planning for continued supply of these products; forecasting commodities for infection prevention; a checklist for supervisory visits; use of logbooks for service statistics; development of service delivery protocols; and follow-up technical visits by Ipas staff and Ministry of Health colleagues.

The Ipas program in Ethiopia combines training and service delivery support in Ministry of Health and private sector facilities with research, technology distribution, policy and advocacy work at a national level. These interventions were essential to create demand and to give priority to postabortion services in a resource-poor country. Activities were targeted not only to the intervention sites, but were designed to supplement training received by individual providers by creating an enabling environment where their work could thrive.

2.3. Analysis

Data were entered in Epi Info version 6.0 (Centers for Disease Control and Prevention, Atlanta, GA, USA) and further analyses used SAS version 9.1 (SAS Institute Inc. Cary, NC, USA). Categorical data are presented as frequencies and percentages, continuous data are presented as means and standard deviations. Comparisons between 2000 and 2004 data among all 119 facilities were calculated using McNemar's test [16]. Associations between receiving the intervention and changes from 2000 to 2004 in

each dichotomous response of interest (namely, capacity for UE services, minimum-skilled providers, provision of postabortion contraceptives, MVA availability, and use of MVA) were reported using χ^2 statistics and associated *P* values from adjusted logistic regression models. For example, capacity for UE services in 2004 was modeled as a function of intervention status (having a provider who participated in training) after adjusting for capacity for UE services in 2000. For the continuous variable percentage of UE procedures using MVA, a paired *t* test and the corresponding *P* value is presented. Finally, differences between 2000 and 2004 among the 42 intervention facilities were computed using McNemar's tests for categorical variables and using paired *t* tests for continuous variables. Note that for outcomes specific to UE providing facilities, the analysis was limited to the 33 facilities providing PAC in either 2000 or 2004.

3. Results

No statistically significant bivariate differences were found at baseline between the intervention and comparison groups with respect to facility type, rural/urban location, at least one obstetrician/gynecologist on staff, at least one general practitioner on staff, at least one midwife on staff, providing UE services, and having an MVA instrument available.

3.1. Availability and quality of postabortion care services

Overall, availability of UE services did not increase significantly during the 4-year period. Fig. 1 compares capacity to provide UE services between 2000 and 2004.

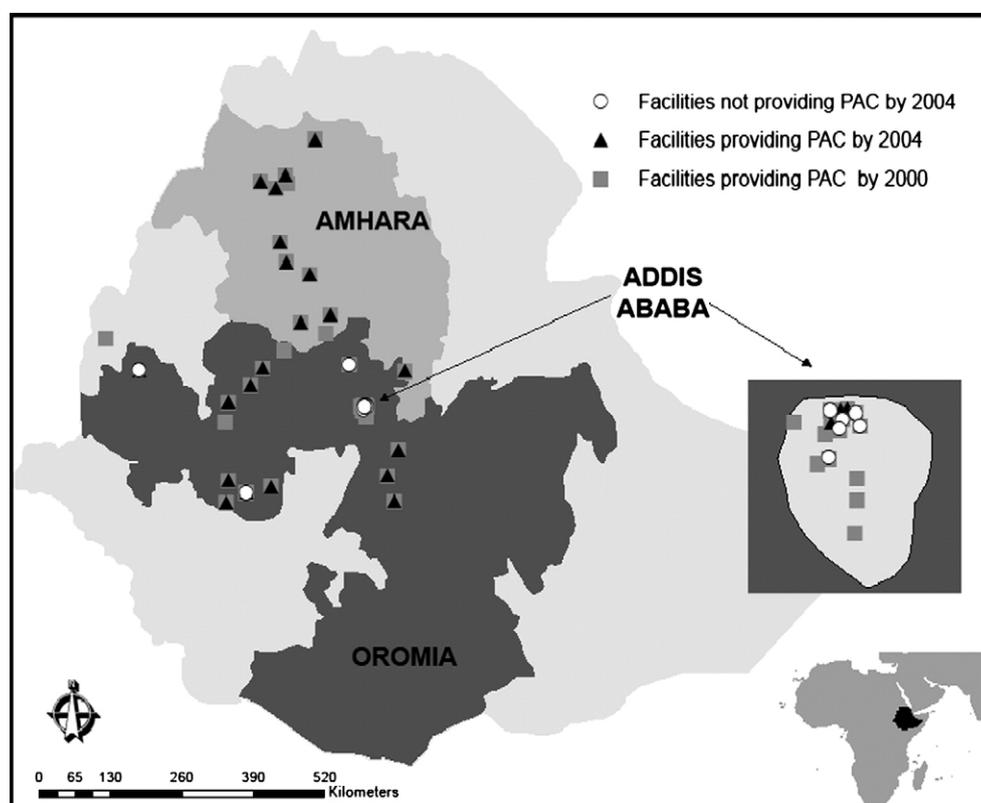


Figure 1 Capacity to provide uterine evacuations in 2000 and 2004, by region.

Table 1 Availability and quality of postabortion care services over time among all 119 facilities surveyed

Service	2000		2004		McNemar's test	
	No.	(%)	No.	(%)	χ^2	P value
UE services available	64	(54)	74	(62)	3.13	0.077
Contraceptive methods available						
At least one method	117	(98)	119	(100)	2.00	0.157
Oral contraceptives	117	(98)	89	(74)	28.00	<0.001 ^a
Injectables	97	(82)	100	(84)	0.29	0.590
IUD	31	(26)	44	(37)	3.93	0.047 ^a
Male condoms	91	(76)	103	(87)	3.79	0.052
Essential supplies available						
Pain control medications	50	(42)	61	(51)	2.28	0.131
Antibiotics	67	(56)	47	(40)	7.69	0.006 ^a
Infection-prevention materials	78	(66)	94	(79)	5.12	0.024 ^a
Gloves	93	(78)	85	(71)	1.33	0.248
Specula	94	(79)	96	(81)	0.18	0.732
Tenacula	92	(77)	102	(86)	2.78	0.096
Manual vacuum aspiration	18	(15)	58	(49)	36.36	<0.001 ^a
Emergency transport available	27	(23)	30	(25)	0.31	0.578
Minimum-skilled providers available ^b	20	(17)	59	(50)	31.04	<0.001 ^a

^a Findings statistically significant at the $\alpha < 0.05$ level.

^b Minimum-skilled providers is defined as follows: Among health centers, 1 or more providers trained to perform MVA; among hospitals, 3 or more providers trained to perform MVA.

As shown in Table 1, while having at least one contraceptive method available remained fairly constant, oral contraceptive availability decreased from 98% in 2000 to 74% in 2004 ($P < 0.001$), while IUD availability increased from 26% in 2000 to 37% in 2004 ($P = 0.047$). Availability of antibiotics decreased from 56% in 2000 to 40% in 2004 ($P = 0.006$), while essential supplies that increased in availability from 2000 to 2004 included infection-prevention materials ($P = 0.024$) and MVA ($P < 0.001$). The minimum-skilled providers available (defined as ≥ 1 provider trained to provide MVA at health centers or ≥ 3 providers trained to perform MVA at hospitals) increased from 17% in 2000 to 50% in 2004 ($P < 0.001$).

3.2. Comparison of services by intervention status

Table 2 explores the associations between 2004 status of services and the training intervention, controlling for 2000 status of services. In general, receiving the intervention was associated with increases in positive outcomes. Between 2000 and 2004, the capacity for offering UE services increased from 57% to 79% among intervention facilities, while remaining relatively constant among comparison facilities (52% vs 53%; $P = 0.005$). In addition, participating in the intervention was significantly associated with positive change between 2000 and 2004 in the availability of MVA ($P < 0.001$), use of MVA ($P < 0.001$), and availability of minimum-skilled providers of MVA ($P < 0.001$). While compar-

ison facilities providing contraception as part of PAC dropped from 58% in 2000 to 17% in 2004, intervention facilities providing contraception as part of PAC rose from 50% in 2000 to 57% in 2004 ($P < 0.001$). Furthermore, among facilities offering PAC services, the intervention was associated with an increase in the proportion of UE procedures conducted using MVA. While the proportion of UE procedures using MVA rose from 6% to 18% among comparison facilities, it increased even more among intervention facilities, from 14% to 50% of procedures ($P = 0.003$).

3.3. Overall improvements in PAC

The intervention was also associated with reported improvements by healthcare personnel in the surveyed facilities for the provision and quality of PAC during the 2 years before the 2004 assessment (Table 3). In particular, 83% of intervention facilities reported overall improvements in PAC services compared with only 39% of comparison facilities ($P < 0.001$). Specific improvements associated with the intervention included increased community awareness (29% of intervention facilities compared with 8% of comparison facilities, $P = 0.003$); more attention paid to PAC (24% of intervention facilities vs 9% of comparison facilities, $P = 0.029$); and more motivation and enthusiasm from the Ministry of Health (14% of intervention facilities vs 3% of comparison facilities $P = 0.022$). There was no difference between intervention and comparison facilities for changes in organization of PAC service delivery.

3.4. Quality of services among intervention facilities

In 2000, 57% of the 42 PAC intervention facilities reported some capacity to provide UE services; by 2004 this had increased to 79% of facilities ($P = 0.007$). Because all intervention hospitals were already providing UE in 2000, increases in access to care occurred exclusively in health centers. Among the intervention facilities reporting capacity to provide UE services, improvements were seen in most measures of PAC quality. In particular, the availability of MVA instruments increased from 21% to 83% ($P < 0.001$), use of MVA instruments increased from 17% to 67% ($P < 0.001$), availability of minimum-skilled providers increased from 19% to 88% ($P < 0.001$), and the percentage of UE procedures performed with MVA increased from 14% to 50% ($P = 0.003$). However, offering contraception as part of PAC and providing pain medication for UE procedures did not differ significantly among intervention facilities between 2000 and 2004.

4. Discussion

This study was the largest facility-based assessment of PAC in Ethiopia to date providing longitudinal data over a 4-year span. We found associations between the intervention and improvements in the accessibility, availability, and quality of PAC in the 3 large geographic regions. The results offer a "real world" measure of increases in PAC provision in a challenging, changing environment.

In the total study group, the availability of UE services remained relatively stable during the period but availability significantly increased among the subset of intervention facilities. All of the observed increase in the intervention group was found among health centers, with no change

Table 2 Effect of intervention over time on availability and quality of postabortion care services by intervention ($n=42$) and comparison ($n=77$) groups

Service	2000				2004				Test statistic	P value ^b
	Intervention ($n=42$)		Comparison ($n=77$)		Intervention ($n=42$)		Comparison ($n=77$)			
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	Adj. χ^2 ^a	
UE services available	24	(57)	40	(52)	33	(79)	41	(53)	1.35	0.005
MVA available	9	(21)	9	(12)	35	(83)	23	(30)	31.09	<0.001
Use of MVA (among UE providing facilities)	7	(17)	6	(8)	28	(67)	21	(27)	1.68	0.001
Minimum-skilled providers (among UE providing facilities)	8	(19)	12	(16)	37	(88)	22	(29)	3.04	<0.001
Provision of postabortion contraceptives (among UE providing facilities)	21	(50)	45	(58)	24	(57)	13	(17)	17.87	<0.001
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Paired t	P value ^b
Percent of UE procedures using MVA	14%	(39)	6%	(19)	50%	(38)	18%	(23)	-3.10	0.003

^a For categorical variables, adjusted statistics were computed by fitting logistic regression models predicted 2004 status with intervention/comparison status, adjusting for 2000 status. See the Methods section for a complete description.

^b Findings statistically significant at <0.05.

Table 3 Self-reported improvements in postabortion care during past 2 years of services, 2004

Improvement	2004				Test statistic*	
	Intervention (n=42)		Comparison (n=77)		χ^2	P value
	No.	(%)	No.	(%)		
Overall reported improvements	35	(83)	30	(39)	21.59	<0.001 ^a
Increased community awareness	12	(29)	6	(8)	9.14	0.003 ^a
More attention is paid to PAC	10	(24)	7	(9)	4.77	0.029 ^a
More motivation and enthusiasm from Ministry of Health	6	(14)	2	(3)	– ^b	0.022 ^a
Changed organization of services	8	(19)	6	(8)	– ^b	0.081

^a Findings statistically significant at <0.05.

^b A missing test statistic (denoted by –) indicates that the Fisher's exact *P* value associated with the relationship of interest is not reported because expected cell counts <5.

reported in hospitals that were already providing some PAC services. Initiation of PAC services in 9 intervention and 1 comparison facility (an increase from 64 to 74 facilities) has a potentially dramatic impact on the hundreds of Ethiopian women who require PAC services each year. In fact, healthcare providers at the 74 assessment facilities that provided PAC treated more than 6500 women in 2004 compared with 5200 women cared for in PAC-providing facilities the year prior to the baseline study [15]. Decreasing direct travel and hospitalization costs for PAC services by increasing access at health centers eases the financial burden on households while ensuring that women may quickly reach a trained healthcare provider able to stabilize their condition and alleviate the risk of morbidity or mortality.

The type of practitioner present in facilities continues to be a central factor in determining access to UE services in these study areas. In 2000, the primary providers of UE were gynecologists or general practitioners at the hospital level. In 2004, most UE procedures using MVA were performed by general practitioners and midwives. The training emphasis on midlevel providers offered an important opportunity to reach women seeking care at the health center level where specialized physicians remain in short supply.

Contraceptive counseling is a critical element in PAC and decreases the likelihood of unintended pregnancy or unsafe abortion. While this study found some progress in this area among intervention facilities (the proportion of such facilities that regularly provide postabortion contraceptives rose from 50% to 57%), there remains room for improvement. In particular, postabortion contraceptive provision fell among comparison facilities from 58% to 17% and availability of oral contraceptives within all facilities dropped from 98% to 74% during the study period. Efforts to introduce and strengthen postabortion contraception should encourage facilities to provide counseling and a wider range of contraceptive commodities in the gynecology ward where PAC treatment takes place; this mode of delivery has been proven more effective than referral to other sources [17]. During the study period, Ethiopia faced contraceptive shortages due to changing donor commitments and negotiations to encourage the Government to purchase a greater share of its own commodities. Funding gaps and commodity and equipment logistics must be addressed at a national level to sustain improvements in this area.

A consistent supply of MVA continues to be a challenging goal for the Ministry of Health. Although MVA was supplied to training participants either during the training or by delivery afterwards, 17% of facilities in the intervention group and 70% of those in the comparison group had no functioning MVA equipment in 2004. More attention is needed to ensuring a timely resupply of equipment, effective procurement channels, and a rapid response mechanism for notification of out-of-stock equipment.

Although MVA is generally considered to be a less painful procedure than sharp curettage, every woman should be offered some type of pain medication for existing cramping and procedural pain. While the percentage of all UE patients who received no pain medication decreased from 75% to 48% among the intervention facilities, there remains significant room for improvement in providing high-quality postabortion care. Of course, a critical component of the provision of pain medication is availability: by 2004 only 51% of all facilities (64% of UE providing intervention facilities) reported availability of pain control medications. It is possible that these shortages precipitated rationing pain medications for other types of procedures or ailments. Both supply and practice will need to be improved to fully address this issue.

4.1. Study limitations

The findings of this study must be viewed in light of limitations in design and scope. Inclusion in the PAC intervention was by invitation and largely based on the expertise and opinions of the local governments whose primary interest was to promote PAC services where crucial and sustainable. Factors such as distance to the nearest referral facility, availability of staff to cover training absenteeism, and the perceived likelihood of success all influenced discussions on selection and may have influenced outcome measures. In addition, master trainers were given standardized materials and curricula to follow; however, some individual variation may have influenced their participants and ultimately the evaluation outcomes. Finally, the roll-out of training proceeded over a 2-year period and the variation in time elapsed was not controlled for in the analyses.

4.2. Political will

The political climate for women's health in Ethiopia has changed over the past 3 years. In 2004, the Ethiopian

Parliament revised the country's Penal Code to restrict early marriage, abduction, rape, harmful traditional practices, child trafficking, sexual violence, and to expand legal indications for induced abortion. Despite this strong commitment to women's sexual and reproductive health and rights, it is unlikely that Ethiopia will meet its Millennium Development Goal of decreasing the maternal mortality ratio by three-quarters by 2015 unless dramatic improvements occur in contraceptive availability and uptake, more healthcare providers are skilled and willing to provide safe abortion and PAC, and women themselves become more aware of the nearby availability of safe abortion services and the need for early treatment of complications. PAC, while important, is a stop-gap measure. Efforts now underway in Ethiopia to implement broad access to safe abortion are the most effective strategy to prevent the tragic loss of women's health and lives due to unsafe abortion.

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