
'It's a very complicated issue here': understanding the limited and declining use of manual vacuum aspiration for postabortion care in Malawi: a qualitative study

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Abstract

Malawi has one of the highest maternal mortality ratios in the world. Unsafe abortions are an important contributor to Malawi's maternal mortality and morbidity, where abortion is illegal except to save the woman's life. Postabortion care (PAC) aims to reduce adverse consequences of unsafe abortions, in part by treating incomplete abortions. Although global and national PAC policies recommend manual vacuum aspiration (MVA) for treatment of incomplete abortion, usage in Malawi is low and appears to be decreasing, with sharp curettage being used in preference. There is limited evidence regarding what influences rejection of recommended PAC innovations. Hence, drawing on Greenhalgh *et al.*'s (2004. Diffusion of innovations in service organizations: systematic review and recommendations. *Milbank Quarterly* 82: 581–629.) diffusion of healthcare innovation framework, this qualitative study aimed to investigate factors contributing to the limited and declining use of MVA in Malawi. Semi-structured interviews with 17 PAC providers in a central hospital and a district hospital indicate that a range of factors coalesce and influence PAC and MVA use in Malawi. Factors pertain to four main domains: the system (shortages of material and human resources; lack of training, supervision and feedback), relationships (power dynamics; expected job roles), the health workers (attitudes towards abortion and PAC; prioritization of PAC) and the innovation (perceived risks and benefits of MVA use). Effective and sustainable PAC policy must adopt a broader people-centred health systems approach which considers all these factors, their interactions and the wider socio-cultural, legal and political context of abortion and PAC. The study showed the value of using Greenhalgh *et al.*'s (2004. Diffusion of innovations in service organizations: systematic review and recommendations. *Milbank Quarterly* 82: 581–629.) framework to consider the complex interaction of factors surrounding innovation use (or lack of), but provided more insights into rejections of innovations and, particularly, a low- and middle-income country perspective.

Key words: Diffusion of innovations, low- and middle-income countries, Malawi, manual vacuum aspiration (MVA), people-centred health systems, postabortion care

Key Messages

- Numerous interconnecting factors influence the limited and declining use of MVA for postabortion care in Malawi.
- Effective and sustainable postabortion care policy must adopt a broader, people-centred health systems approach which considers all these factors, their interactions and the wider socio-cultural, legal and political context of abortion and postabortion care.
- Human factors and perspectives are key to understanding diffusion of innovations.
- This study extends Greenhalgh *et al.*'s (2004) diffusion of innovation framework to the rejection of innovations and, particularly, low- and middle-income settings.

Introduction

Malawi has one of the highest maternal mortality ratios in the world (WHO *et al.* 2014). Unsafe abortion may contribute to around 18% of Malawi's maternal mortality (Bowie and Geubbels 2013), where abortion is illegal except to save the woman's life. Levandowski *et al.* (2013) estimated 67 300 abortions were performed in Malawi in 2009; over one-third required treatment for complications. Many organizations, including WHO (2014) and Ipas (2011) emphasize that for countries like Malawi to meet global maternal mortality reduction targets, unsafe abortion deaths must be reduced. The Malawian Ministry of Health's (2009) key strategies for tackling unsafe abortion-associated mortality and morbidity are family planning to reduce unintended pregnancies and provision of postabortion care (PAC). PAC aims to reduce mortality and long-term morbidity attributable to unsafe abortion through provision of emergency care, treatment of incomplete abortion by uterine evacuation, counselling and contraception (Corbett and Turner 2003). Some authors (Descher and Cohen 2003; Grimes 2006) argue that increasing contraception usage and reducing legal restrictions to safe abortion should be priorities as PAC only mitigates the consequences of unsafe abortions. However, in Malawi significant abortion law reform is not anticipated soon (Chikuse 2015) and increasing contraception use will not eliminate unwanted pregnancies (Ahman and Shah 2011). Thus, unsafe abortions will continue to occur and quality PAC remains essential to reduce morbidity and mortality (Pattinson *et al.* 2006).

WHO (2012) recommends vacuum aspiration (electronic or manual) or misoprostol for first-trimester uterine evacuation as part of PAC. Manual vacuum aspiration (MVA) is recommended over dilatation and sharp curettage (D&C) as it is associated with fewer complications, shorter hospital stays (Tunçalp *et al.* 2010) and can be performed by midwives or nurses as an outpatient procedure (Grimes *et al.* 2006). MVA was introduced as a pilot to Malawi in 1994 (Leme *et al.* 1997) and rolled out with investments in facilities, training and equipment in 2001 (Schenck-Ygleslae 2004). It is the recommended treatment for first-trimester incomplete abortion and is on the country's standard equipment list; misoprostol is not currently recommended in national PAC policy (Ministry of Health 2009). However, in their strategic assessment of unsafe abortion in Malawi (involving observations of facilities and key informant interviews), Jackson *et al.* (2011) found MVA is used infrequently, with D&C being used in preference. Reasons suggested for this included: a lack of MVA equipment, equipment being locked up to prevent its use in inducing abortions and a lack of trained staff. Moreover, a recent study found declining MVA use in three Malawian hospitals during 2009–12 from 31.0 to 4.9%, with a corresponding increase in D&C (Odland *et al.* 2014). Studies have shown MVA to be more

cost-effective than D&C in Malawi (Benson *et al.* 2015) and other low- and middle-income countries (LMIC) (Johnston *et al.* 2007; Maonei *et al.* 2014). Thus, increasing MVA use may improve the quality of PAC without significantly increasing spending, crucial in Malawi given its high poverty levels and minimal health budget (World Bank 2014).

It is therefore important to investigate what contributes to the limited and declining use of MVA in Malawi, and why Malawi's policy, which recommends MVA, does not translate into practice. Scholars have used various theoretical approaches to attempt to understand how clinical policies translate into practice. Some studies from high-income countries have used behavioural theories which analyse how individual factors affect transfer of clinical policies into practice (Godin *et al.* 2008). The widely used 'diffusion of innovations' theory (Rogers 2003) goes beyond this individualistic approach, by focusing on individual decision-making processes but also recognizing the importance of communication and social networks for how and why organizations or groups adopt innovations (new ideas or technologies) or not. The theory proposes individuals' use of innovations is the outcome of a staged process: obtaining knowledge and understanding of the innovation; persuasion; decision to use the innovation or not; implementation of the decision; reinforcement of the decision through observed outcomes. This process diffuses throughout the organization (Rogers 2003). Rejection of the innovation, as happened with MVA in Malawi, may occur at any point and be passive (individuals or organizations do not consider the innovation) or active (consideration followed by a decision to not use or discontinue using the innovation).

Greenhalgh *et al.* (2004) contend that diffusion of innovations theory still treats behaviours as the outcome of conscious, rational and individual decision-making processes, rather than as the combined result of individual, communal, organizational, economic and social factors. Moreover, they argue that diffusion of innovations theory treats diffusion as an overly simple and linear imitation process. In reality, diffusion is more complicated due to the impact of a myriad of contextual factors, including management structures, local priorities and power dynamics and result in formal dissemination processes (e.g. staff training) co-existing with unplanned diffusion processes. Greenhalgh *et al.* (2004) capture the complexity of the diffusion process and the interplay of a range of contextual factors in their diffusion of healthcare innovation framework.

We build on Greenhalgh *et al.*'s (2004) framework since contextual issues will be particularly important for MVA use in Malawi, given the general importance of social, cultural and political contexts for sexual and reproductive health programmes (WHO 2007). As Greenslade *et al.* (1994) and Kulczycki (2009) argue, controversies surrounding abortion and women's reproductive rights

complicate the introduction of PAC innovations. Studies from a number of LMIC examining implementation of MVA and PAC programmes found that various health system elements and social and political issues, in particular abortion-related stigma, create challenges for the sustained implementation of MVA and PAC programmes (Tagoe-Darko 2013; Paul *et al.* 2014; Storeng and Ouattara 2014). Therefore, the framework developed by Greenhalgh *et al.* (2004) is particularly appropriate for the study of the diffusion (or not) of MVA in Malawi. The framework highlights that features of the wider context and health system interact with the innovation adopters (health workers) and their relationships and interactions with one another, and that all these factors together influence diffusion, dissemination and implementation of innovations.

Furthermore, Greenhalgh *et al.*'s (2004) framework chimes with the growing body of literature on people-centred health systems, which emphasize that 'software' (ideas, interests, values, norms and relationships) is at least as important as 'hardware' (technical, financial and material resources) for health system functioning (Sheikh *et al.* 2014). Thus, this study will explore how hard- and software related contextual factors affect PAC and the use of MVA. Moreover, we explore these issues through the perceptions of healthcare providers. After all, providers' perceptions and understandings are key for policy implementation (Greenhalgh *et al.* 2004; Blaauw *et al.* 2006; Aniteye and Mayhew 2013).

Methods

This small-scale qualitative study primarily involved interviews with health workers conducted by the first author in Chiradzulu District Hospital and Queen Elizabeth Central Hospital (QECH). We selected these two government hospitals because public hospitals provide the majority of PAC in Malawi (Kalilani-Phiri *et al.* 2015) and the selection of a rural and urban site enabled exploration of potential differences between rural and urban facilities. Furthermore, QECH is the largest referral hospital in Malawi and sees the majority of women with abortion complications. Odland *et al.* (2014) found Chiradzulu had the lowest use of MVA (7.4%) compared with two other Malawian hospitals. Interviews were supplemented by unstructured observations of care practices (but no direct interactions with patients) made during the 4-week study period, to

provide contextual insights concerning organizational set up, resources and staff dynamics. Observations were triangulated with interview findings.

Through purposeful sampling, we included PAC providing health workers of different cadres (doctors, nurses and clinical officers), genders and levels of experience and seniority, to capture a wide range of views and understandings. We excluded practitioners who were not currently involved in providing PAC, were not predominantly based in either hospital or were working in their current position for <1 month. A total of 11 participants were interviewed in QECH and 6 in Chiradzulu (Table 1).

We used semi-structured interviews rather than focus groups because PAC is a potentially sensitive topic and may involve criticizing colleagues' practices; individual interviews allowed participants to speak more freely (Bowling and Ebrahim 2005). Interview topics included experiences of, and perceptions towards, PAC and MVA. During the study, small adaptations were made to interview questions mainly to reflect locally used terms (e.g. 'evacuation' rather than 'D&C'). Acknowledging the importance of reflexivity in qualitative research, we reflected throughout the study on how participants' perceptions of the interviewer as female, foreign, white and a doctor and our own preconceptions and values, might influence the findings. For instance, our western liberal values according to which abortion is a human and reproductive right could lead to overly negative interpretations of less liberal attitudes amongst providers. Furthermore, the interviewer had previous experience of both providing PAC in Malawi and abortion care within the UK, which may allow personal, as opposed to participants' thoughts and experiences, to influence the findings. Reflection on our own views and experiences led to a more balanced interpretation of attitudes and preferences.

Informed written consent was obtained from all participants following a written and verbal explanation of the study and the interviewer's inability to directly improve PAC. They were advised that their personal responses would remain confidential and anonymous, that they were not obligated to participate, and could refuse to answer a question or withdraw at any time. Nobody refused to participate. Permission was requested to digitally record the interviews; one participant refused, so handwritten notes were taken. The recordings were transcribed and thematic analysis performed (Braun and Clarke 2006). The first author coded and arranged the data into descriptive and analytical themes and sub themes; data and analysis

Table 1. Participants' characteristics

	Nurse	Clinical officer	Doctor
Number of participants	6	5	6
Hospital	QECH: <i>n</i> = 3 Chiradzulu: <i>n</i> = 3	QECH: <i>n</i> = 2 Chiradzulu: <i>n</i> = 3	QECH: <i>n</i> = 6 Chiradzulu: <i>n</i> = 0 (No doctors from Chiradzulu were interviewed, as they are rarely involved in PAC)
Gender	Female: <i>n</i> = 4 Male: <i>n</i> = 2	Female: <i>n</i> = 2 Male: <i>n</i> = 3	Female: <i>n</i> = 2 Male: <i>n</i> = 4
Seniority	Nurse-midwife technician: <i>n</i> = 3 Senior nurse: <i>n</i> = 3	Clinical officer (independent practitioner with ≥ 3 years training): <i>n</i> = 3 Senior clinical officer: <i>n</i> = 2	Junior intern (doctor in first year following medical school): <i>n</i> = 1 Senior intern (second year doctor): <i>n</i> = 2 Registrar (doctor post-internship specializing in obstetrics and gynaecology): <i>n</i> = 2 Consultant: <i>n</i> = 1
Length of time in current position	1 month–15 years (< 1 year: <i>n</i> = 3, 2–5 years: <i>n</i> = 2, 15 years: <i>n</i> = 1)	2 months–15 years (<1 year: <i>n</i> = 2, 1–7 years: <i>n</i> = 2, 15 years: <i>n</i> = 1)	2 months–5 years (<1 year: <i>n</i> = 3, 1–5 years: <i>n</i> = 3)

were discussed with the second author and compared with other similar studies to enhance credibility and trustworthiness (Yin 2015). The analysis used a mixed deductive and inductive approach; some codes (e.g. 'monitoring and feedback') were derived from Greenhalgh *et al.*'s (2004) framework, whereas others emerged from the data.

Ethical approval was granted from both Queen Margaret University, Edinburgh and the College of Medicine Research and Ethics Committee, Malawi.

Results

The emergent themes are discussed later and displayed in the resultant conceptual framework (Figure 1), which builds on Greenhalgh *et al.*'s (2004) framework. We categorized findings into four themes: the system, relationships, health workers' values and attitudes and the innovation. The outer context impacts on all these areas; all these factors together influence the provision of PAC and MVA usage. One participant described this interaction of interdependent factors, all influenced by the outer context: 'it's a very complicated issue here' (P.10, clinical officer, Chiradzulu).

The system

Greenhalgh *et al.* (2004) emphasize that numerous system features, including hardware and organizational aspects, are key to the adoption, diffusion and sustained use of innovations. Participants highlighted a number of such features as key barriers to MVA use. They described the challenges of working with limited resources generally but emphasized MVA instruments are a particular and increasing

problem. After initial donations, there has not been a reliable supply to replace old and broken equipment.

So the problem we have is these things start as projects, somebody develops an idea, after possibly looking at how successful it was somewhere, but then comes incorporated, part of the system, but how to continue without that capacity, it becomes a challenge. So that project goes away, there's no supply of equipment, so it goes naturally to extinction. (P.4, intern, QECH)

Participants explained that in the absence of MVA equipment, they would perform D&C rather than delay the procedure. This appeared to sometimes result in health workers automatically resorting to D&C; they became used to there being no equipment.

In addition to shortage of physical resources, participants emphasized the problem of staff shortages, particularly staff trained in PAC. Patients requiring PAC are admitted to the gynaecology ward in QECH and the female ward in Chiradzulu. Nurse shortages were observed in both these wards, with often only one or two nurses covering up to 70 patients. Participants explained how staff shortages lead to staff feeling overworked and demotivated, thus potentially affecting quality of care. Participants noted that unsafe abortions contribute to a large proportion of gynaecology admissions and some thought the number of women presenting for PAC may be increasing, which may be compounding feelings of being overworked.

Staff shortages may also affect MVA use. Nurse shortages were felt to contribute to nurses trained in MVA not performing it as they were engaged with other tasks.

We nurses we are in a shortage. So most of time we are concentrated in the ward, doing rounds, doing other things. While these

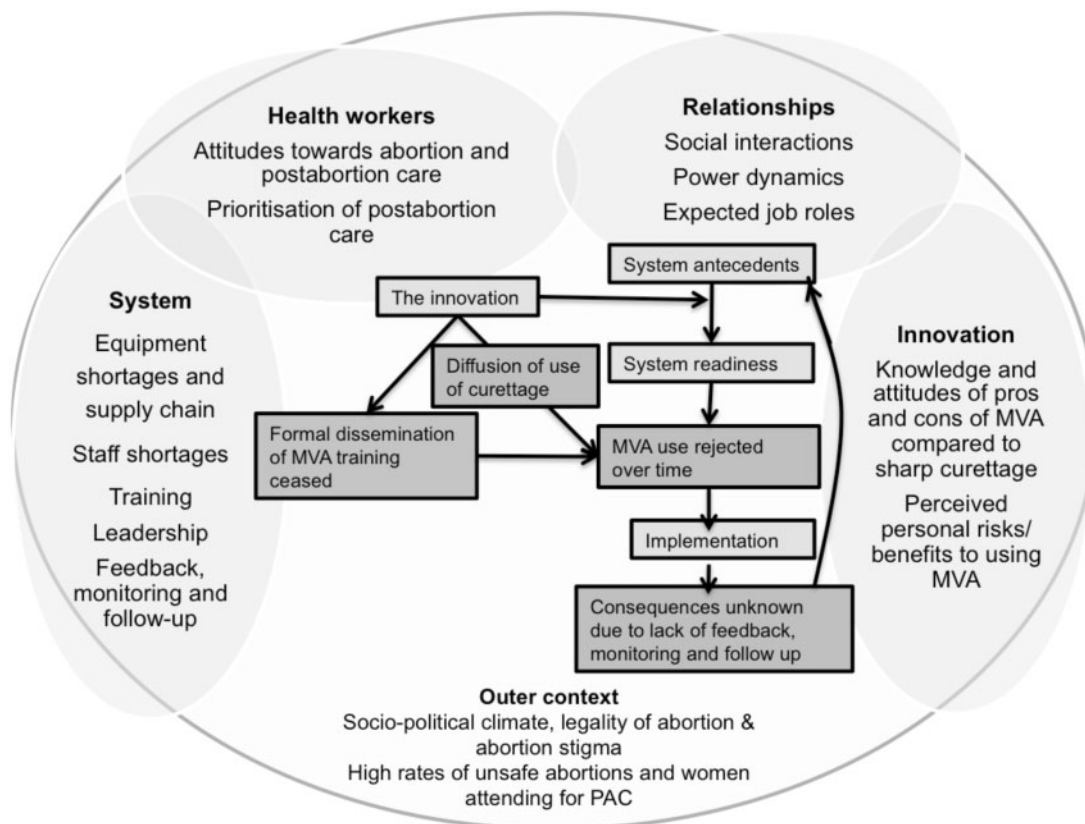


Figure 1. Conceptual framework developed from Greenhalgh *et al.*'s (2004) framework and the study's findings

interns are assigned to do the assessment of the abortion patients. So we just leave them to do. (P.1, nurse, QECH)

The junior interns, however, receive little of the practical on-the-job training they require, again due to staff shortages.

So you find as an intern, it is put on the schedule that you are going to do an evacuation, but there is nobody to guide... So the junior, all he has in mind is theoretically this is how we do, in terms MVA. (P.4, intern, QECH)

Doctors expressed concerns about the quality of on-the-job training; interns might pass weaknesses down to juniors. Furthermore, senior interns usually train juniors only in D&C, as they tend to be more confident in D&C than MVA. Participants said this is leading to MVA becoming a 'forgotten skill', as the next cohort feel even less confident and are less likely to train others. However, in Chiradzulu, clinical officers described good on-the-job training and support. Some nurses had received MVA training, although often some years ago, during a national programme. Participants from both hospitals felt it important to have ongoing practical supervision or regular refresher courses both to train more people and maintain skills of those already trained.

A lack of follow-up and feedback were highlighted as additional organizational issues. At QECH, women are not followed-up after PAC, whereas at Chiradzulu they are advised to return after 2 weeks. Participants at QECH were concerned that without routine follow-up, they would not know whether women experienced problems after treatment, and whether 'what we have done is OK'. (P.4, intern, QECH). Absence of feedback may limit the use of relatively new procedures like MVA, about which staff may feel less secure.

Furthermore, a lack of monitoring of health workers' performance was felt to contribute to poor care and low MVA use. One nurse described how performance and MVA use was better when an non-governmental organization was monitoring their performance but when this ceased MVA use declined.

In the first maybe because we were being sponsored by JHIEPEGO and what and they were supervising us... and they were check listing, so people were doing it. (P.1, nurse, QECH)

Participants also felt that monitoring MVA rates is beneficial and suggested that MVA usage increased in Chiradzulu following the dissemination of results demonstrating it had the lowest usage between 2008 and 2012 (Odland *et al.* 2014). They attributed this to appointing a PAC coordinator who organizes a MVA staff rota and monitors supplies. Thus, leadership may be another organizational factor affecting MVA rates.

Relationships

According to Greenhalgh *et al.* (2004), social networks, that is networks of communication and influence between colleagues and friends, influence the diffusion of innovations. Thus, staff relationships and dynamics need to be examined. At both hospitals, staff have distinct and set roles and responsibilities. Junior interns provide PAC in QECH; senior interns described being 'off the hook' after completion of their junior internship. Nurses provide initial and post-procedural care in QECH. Nurses perform the same role at Chiradzulu but clinical officers and occasionally senior nurses conduct procedures. However, nurses perform MVA rarely and may consider it as the clinicians' duty, as one nurse indicated.

If we are given a chance to do it [MVA], we can do it, but according to scope of practice in Malawi, it is the duty of the clinician. (P.14, nurse, Chiradzulu)

On the other hand, one doctor described that following widespread MVA training for nurses, doctors started perceiving MVA as a nurse's responsibility and D&C as a doctor's responsibility. Clear demarcations between nurses and doctors in terms of role and status may have contributed to doctors discontinuing MVA, which became seen as a simple innovation of lower standing, designed for nurses.

Strictly delineated roles and responsibilities may also negatively impact on patient care and teamwork if health workers do not consider a particular task or patient as their responsibility, as one intern explained:

we don't really work as a team... It's like when you work, you do say 'it's OK, as long as I do this then it's fine. If something happens [to the patient], it won't be on my side now, I have cleared on my side, and then they are on that other side'.

The intern points to a distinction between 'my side', for which one is responsible and 'the other side', for which one is not. The same intern explained if a doctor is unable to find the correct senior doctor to help them, others may refuse, as they do not consider it their responsibility.

So I asked them to assist, they said 'no I am not on-call, you need to inform the ones on-call'. I said 'the patient is not well, can you just assist?' They said 'no I can't assist'. (P.6, intern, QECH)

Whilst poor teamwork will affect the quality of care in general, we can again see how it may particularly affect use of MVA, a relatively unknown procedure about which the staff feel less confident. Collaboration will be further impeded by strong hierarchical power structures between cadres which were apparent in both hospitals but particularly QECH. Nurses are perceived to have less power than doctors.

The powers are mainly with the College of Medicine as compared with the College of Nursing. So there's an issue with superiority with that one. And the ones who are in charge of the wards, they are the doctors, the consultants, so they have authority. (P.4, intern, QECH)

This power differential also comes through in the description later; a senior nurse described how she tries to help and train junior interns in MVA when they are having difficulties.

If there is a problem then I come in and maybe just suggestion, you can do this one, so then they do MVA. (P.1, nurse, QECH)

The use of the phrase 'maybe just suggestion' points to a lack of assertiveness and power differentials, despite the nurse having more experience than junior doctors and displays how MVA use might be particularly hampered by these power differentials between cadres if nurses feel unable to speak up. Power differentials between cadres also appeared to influence participants' views on who should ideally perform MVA. Almost all participants agreed nurses, clinical officers and doctors should perform MVA, but they described uterine evacuation as being primarily a clinical officer or doctor's responsibility, with nurses only providing services when doctors or clinical officers are unavailable to reduce delays.

Participants also described a strong hierarchy amongst doctors. This appears to contribute to juniors' fears to ask for help, as they do not want to admit a lack of knowledge or are scared of being shouted at.

Yeah so instead of teaching, they just shout at you as if, they just put all the blame on you as if you have completed nothing, so,

anyway we are used [to it], because even when we are at [medical] school it's just the same things. (P.4, intern, QECH)

If MVA is expected to be carried out by relatively inexperienced staff, hierarchical relationships and fears about being scolded rather than supported may make staff less inclined to carry out MVA.

Health workers' values and attitudes

Greenhalgh *et al.* (2004) note that the adopters' needs, values and goals matter for diffusion of innovations. They will be especially important for PAC related innovations given that abortion is a particularly value-laden issue. Participants displayed a range of attitudes towards providing PAC. They all agreed it should be an emergency service and patients should be prioritized as they require urgent treatment. However, participants held differing opinions on whether PAC is actually prioritized in their hospitals. Some felt it is, as reducing maternal mortality is a national priority. However, others said often PAC is not treated as a priority emergency service, resulting in treatment delays.

They are kind of looked at on the lower side of care. ... emergency obstetrics is taken like more of a priority than postabortal care. That's why even if, that's why a lady who has signs of miscarriage or signs of abortion would come at night but then they wouldn't be attended to, but somebody in labour would be attended to there and then. (P.10, clinical officer, QECH)

This suggests that outside the interview context, providers may attribute less importance to PAC. Some health workers described PAC as a 'normal duty', no different from other healthcare services, others were very positive and passionate about providing PAC. One nurse explained PAC was her main motivation to work in gynaecology. Nurses appeared more enthusiastic about providing PAC than clinical officers and doctors, reflected in using words such as 'passion', 'great' and 'satisfaction'. Many health workers found PAC satisfying as they considered it necessary and life-saving care, and it seemed to provide them with heroic feelings.

So I was just like: we saved her life. (P.3, nurse, QECH)

Furthermore, some participants described positive feelings about helping and providing advice to women who they considered vulnerable, such as teenagers. Some health workers also described feelings of sadness or sympathy, towards both women who had spontaneous and induced abortions, who may have a lack of support and long-term complications, particularly infertility.

However, many health workers described finding PAC challenging due to their personal belief that induced abortion is immoral. These feelings were influenced by religious beliefs and prevailing community beliefs and norms. Participants explained that PAC is often only associated with induced abortions by the public and there tends to be negative attitudes towards these women, with people considering them 'sinners' or 'criminals'; these words and views were often reflected by health workers. Many participants described other health workers exhibiting discriminatory or judgemental attitudes towards patients whom they suspected had induced abortions, particularly in mission hospitals and amongst health workers who don't work directly in PAC.

Participants stated that this stigma surrounding abortion often leads to women delaying presenting for care or not disclosing induced abortions (or even pregnancies or miscarriages), resulting in health workers feeling frustrated with these women. Staff shortages and perceived increasing rates of women presenting for PAC

may increase negative feelings towards these patients, who they feel are increasing already heavy workloads by 'opting' to induce abortions.

They [staff working in Outpatient Department] can shout at them 'why did you do this? You are creating a lot of job here, you want us to be helping you this month and then next month you are coming a lot of you! You come here with a lot of induced abortion!' (P.12, clinical officer, Chiradzulu)

A nurse also noted other staff feel PAC is facilitating abortions. Although she did not agree, an intern did and therefore felt very negatively towards PAC.

People are not afraid of getting pregnant, knowing that if they do the abortion, someone at the hospital is ready to treat them. (P.5, intern, QECH)

It is important to note, however, that negative views of abortion could go together with a perceived obligation to provide care for all women.

I believe that doing a abortion is a sin myself, but just because I believe that it is a sin, it's not like I say 'because you did an abortion I'm not going to help you', I'm supposed to help everybody. (P.5, intern, QECH)

One participant described this as creating an internal conflict of values, between their moral or religious views and the care they provide. Most participants felt their beliefs did not affect their care but one thought it might.

The innovation

Knowledge and attitudes towards the innovation (MVA) are considered highly important for adoption and diffusion (Rogers 2003). Although the literature has identified various advantages of MVA over D&C, Greenhalgh *et al.* (2004) point out that *perceived* advantages are most important for the uptake of innovations, which are not fixed and open to negotiation and adjustment.

All participants noted MVA is the first-line treatment for first-trimester incomplete abortions and curettage should be used for higher gestations. Some staff members felt for this reason, curettage will continue to be used more often than MVA, as they perceived second-trimester abortions to be more common. However, a clinical officer suggested that some practitioners struggle to determine pregnancy gestations and when in doubt, opt for curettage.

Numerous advantages of MVA over curettage were expressed; most commonly that it is associated with fewer complications.

We can do MVA patient with minimal complications, minimal. And MVA we cannot perforate unless you are careless. (P.1, nurse, QECH)

Other advantages cited were that it is cheaper, simpler and quicker to perform, requires less staff and allows for rapid discharge of patients resulting in fewer in-patients. Staff noting these advantages were those mainly responsible for patient care post-procedure: nurses in QECH and clinical officers in Chiradzulu; these cadres will feel this benefit more directly to their personal workload.

Yet, many health workers noted that curettage is used more commonly in their hospital than MVA. Participants often referred to other staff preferring curettage; only one participant stated he personally preferred curettage, as from his experience MVA seems to have a higher risk of incomplete procedures; a concern that some other participants shared. Participants suggested junior staff might prefer curettage as they are more familiar with it and are worried

about making mistakes or performing incomplete procedures and disappointing their seniors.

so people are trying to impress and as a result they tend to do something that they are comfortable with rather than the thing that they are supposed to do. (P.6, intern, QECH)

Paradoxically, MVA's perceived simplicity entails a risk; if complications do occur, they may be attributed more easily to a lack of competence or being 'careless'.

It appears, then, that health workers' attitudes towards using MVA are affected by perceived personal benefits or risks of MVA, whether reducing inpatients and workload, becoming personally responsible for an incomplete procedure or complication or incurring colleagues' negative views of one's professional capacity.

Discussion

Our findings demonstrate how multiple 'hardware' and 'software' issues interact and reinforce each other to influence MVA use. Greenhalgh *et al.* (2004) stress that few studies consider this interconnectedness. The wider context of PAC and abortion influences many factors contributing to low MVA usage. PAC has been promoted as the least contentious service for reducing unsafe abortions' adverse consequences (Barot 2014), but it cannot be separated from the socio-cultural, religious and legal status of abortion. Negative attitudes surrounding abortion may lead to delays; women who delay seeking care are at increased risk of more severe complications such as sepsis, resulting in being more likely to require further procedures in theatre rather than MVA as an outpatient. Negative attitudes may also result in providers' negative attitudes towards providing PAC, low prioritization of services and low motivation to improve services. The idea that large numbers of women choosing to induce abortions are increasing already heavy workloads may further reduce prioritization and motivation to improve PAC. Practical difficulties, such as unreliable equipment supplies, make MVA a more difficult option than curettage; when motivation and prioritization are low, staff will likely opt for the easier option, which may not be what is best for the patient.

Staff shortages, relationships, expected job roles and power dynamics appear very important in this context and impact on many elements. Although social interactions are being increasingly recognized as important for innovation use (Cain and Mittman 2002), Greenhalgh *et al.* (2004) note there is a dearth of research investigating this. The findings of this study support McPake and Koblinsky's (2009) and Gilson's (2012) assertion that health systems are social in nature; people and their views, behaviours and interactions shape how policies recommending innovations are implemented. Staff relationships impact on training and supervision and power dynamics may affect staff attitudes towards MVA and their willingness to use it. Despite widespread acknowledgement of MVA policies and its benefits, the personal risks and benefits of using MVA appeared more important. Greenhalgh *et al.* (2004) emphasize that it is important that those with more power, such as purchasers, senior clinicians and managers, see the benefits of creating an enabling environment for staff to use it. Graff and Amoyaw (2009) found that a lack of prioritization of PAC in Ghana led to purchasing equipment for other services rather than MVA when funds were limited. Moreover, purchasers may not appreciate MVA's advantages as equipment is more expensive and does not last as long as curettage equipment (Zaidi *et al.* 2014), although it is still more cost-effective as it can be performed as an outpatient procedure.

Our findings highlight the value of using Greenhalgh *et al.*'s (2004) framework as opposed to more individualistic behavioural theories; rejection of MVA is clearly not only a choice based merely on individual knowledge and attitudes but also influenced by staff relationships and broader contextual and organizational issues. Furthermore, this study adds to the existing literature on diffusion of innovations. First, this study examines issues from health workers' viewpoints, which are key as providers' perceptions inform and shape practice (Blaauw *et al.* 2006; Aniteye and Mayhew 2013). Furthermore, Greenhalgh *et al.*'s (2004) framework is based largely on studies conducted in high-income settings. We demonstrate its applicability to LMIC but here certain factors such as limited material and human resources will carry more weight. This study highlighted the strong importance that power dynamics can play in diffusion of innovations. The importance of staff roles and power dynamics between staff cadres appeared to come through in another study of MVA usage in another LMIC, with some doctors feeling midwives always require supervision when performing MVA, despite policies and training to allow for tasking-shifting of MVA to midwives (Paul *et al.* 2014). It is therefore possible that whilst power differentials will affect the provision of care everywhere (Greenhalgh *et al.* 2004), they may affect diffusion of innovations more in LMIC settings but this requires more research. Furthermore, the study emphasizes the difficulty and complexities of sustaining the adoption of an innovation, which Greenhalgh *et al.* (2004) highlight has been a neglected research area. Rogers (2003) theorizes that once adoption of an innovation reaches almost 100%, it will be self-sustaining, as it becomes 'a normal and taken-for-granted way of working' (McEvoy *et al.* 2014, p. 3). This process is termed routinization (Greenhalgh *et al.* 2004), institutionalization (Billings *et al.* 2007) or embedding (May *et al.* 2007). However, MVA use became briefly widespread in Malawi but then decreased as facilities struggled to maintain skills and supplies. Routinization may be less applicable to LMIC health systems, which may be susceptible to externally driven changes such as finance or supply chain difficulties. Hence, it is equally, if not more important, particularly in LMIC, to consider both how to achieve widespread adoption of innovations but also how to sustain use.

Limitations and future research

This study adds to a limited research base about what influences rejection of recommended PAC innovations. However, there are limitations. Some findings may partially be a by-product of the interview context; e.g. participants may have over-emphasized the importance of resource issues in the hope the interviewer could help the situation. Furthermore, as this is a small-scale study involving only two hospitals, transferability to other situations may be limited. Greenhalgh *et al.* (2004), however, note that generally insights regarding diffusion of innovations cannot be readily transferred to other contexts due to the importance of the 'fit' between the innovation and the local system or context. Whilst the study provides some general insights into factors that contribute to rejection of recommended innovations, it is recognized that MVA and PAC may be a special case and involves moral sensitivities that other innovations and policies would not. Thus, we need to be careful with assuming insights could apply to other health innovations.

A particular limitation in the context of PAC in Malawi is that no urban or rural health centres were included. As they are often the first contact for women seeking PAC, yet generally suffer from even worse resource shortages, further research involving health centres would be beneficial. Longitudinal ethnographic research could also

provide further insights and may be particularly useful for understanding how best to sustain innovation use in different situations, as how innovations work out in different contexts is never predictable (McPake and Koblinsky 2009).

Implications and recommendations

In spite of the aforementioned limitations, we can make some tentative recommendations. Recognizing the danger of claims to context-free knowledge and one-size-fit-all solutions (Sheikh *et al.* 2014), these may only be relevant to Malawi and similar LMIC. Participants emphasized reliable, sustainable equipment supplies and practical, regular training are necessary to increase MVA use. Simpson (2005) argues that local ownership of programmes with a bottom-up approach, i.e. health workers creating strategies themselves, improves sustainability. It is also important that practitioners are involved in equipment purchasing decisions, as they understand the cost-effectiveness and importance of MVA. On-the-job training promotes adoption of innovations (Cain and Mittman 2002), but the current system for doctors in Malawi appears inadequate, and nurses may not receive on-the-job training at all. Training designated staff members in teaching others to provide on-the-job training and supervision may help (RamaRao *et al.* 2011). However, since trained nurses currently rarely perform MVA, it is possible training more nurses may not improve matters.

There is a growing recognition that for successful, sustainable health programmes whole health systems need to be strengthened, including all six WHO building blocks (service delivery, human resources, information, medicines and technologies, financing, governance) (Simpson 2005; Billings *et al.* 2007; Gilson 2012). This research has indicated that effective and sustainable PAC policy likely requires a broader people-centred health systems approach. Evidence from Honduras shows that providing MVA equipment and training alone is unlikely to increase use; Chincilla *et al.* (2014) suggest other system factors and human resource issues needed to be addressed. These include shortages of health workers; a significant problem in Malawi, particularly in rural areas (WHO 2014), which have worse and higher rates of abortion complications (Kalilani-Phiri *et al.* 2015). However, training and staff shortages are not the only human resource issues, addressing staff relationships and power dynamics that negatively impact on PAC and MVA usage is equally important. Regular team meetings can improve communication between cadres, team-working and performance (Firth-Colins 2001; Borril and West 2003). A doctor remarked that in QECH daily team meetings used to occur but stopped due to staff shortages. Recommending these may be beneficial but only if different cadres feel respected and safe to participate (Firth-Colins 2001). Team meetings may also encourage support and recognition of junior staff members, which might improve motivation and job satisfaction (McAuliffe *et al.* 2009) but only if managers have sufficient training and awareness about supporting junior staff. Finally, it is important to consider negative attitudes towards, and low prioritization of, PAC. Strengthening regular training for all staff may improve staff attitudes towards women requiring PAC (Shah *et al.* 2014). Building on the satisfaction that some staff described from helping vulnerable women and saving lives, and their recognition of the complexity of the lives of many women with induced abortions may decrease judgements, improve care and increase MVA use through increasing motivation to adopt the innovation that is considered best practice, even if it is not always the easiest option. However, attempting to alter attitudes and behaviours, and indeed to improve MVA use and PAC provision more generally, in a context where abortion is illegal,

highly stigmatized and compounded by multiple gender and power dynamics will remain 'complicated'.

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