

Using the RE-AIM Framework to Evaluate Implementation of Male Involvement Strategies to Optimize the PMTCT Program in Malawi: A Mixed-Methods Study

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Mphatso Kumwenda¹ , Emmanuel Singogo², and Alinane Linda Nyondo-Mipando¹ 

Abstract

Involvement of male partners has been shown to be key for the prevention of mother-to-child HIV transmission (PMTCT). Despite the recorded success, uptake and implementation of strategies to involve men in PMTCT continues to be low in Malawi. In this study, we used the Reach Effectiveness Adoption Implementation and Maintenance (RE-AIM) implementation science framework to explore the implementation of male involvement (MI) strategies in Lilongwe, Malawi. We used a cross-sectional mixed-methods complementary-concurrent design from September to October 2020 in two health facilities. Qualitatively, we used a phenomenological approach and conducted seven focus group discussions (FGDs), three with women and four with men. We further conducted four key informant interviews (KIIs) among health care workers. Quantitatively, we conducted a cross-sectional study comprising 138 men presenting at an antenatal clinic (ANC). We used univariate analysis in Stata for the quantitative data, whereas a manual thematic analysis was applied to the qualitative data. Implementation and adoption of the strategies was high among health providers and there were indications of maintenance of the strategies. Provider's attitude, coordinated service provision, integrated training and service provision, information provision, and baby's HIV outcomes were driving factors in implementing the MI strategies. These factors have contributed to the sustained implementation of the strategies over time. In contrast, financial and time constraints, inadequate human resources, and male-friendly spaces impede the implementation of MI strategies. Improving MI will require a systems approach considering health system and individual-level factors for both providers and consumers.

Keywords

men, male involvement, PMTCT, RE-AIM framework

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Background

Children aged 0 to 19 years were estimated to compose 2.7 million of the 38.4 million people living with HIV globally in 2021 (UNICEF, 2022). In Malawi in 2020, mother-to-child HIV transmission for children aged 0 to 4 years was estimated at 6.3% (UNICEF, 2022). Non-adherence to care greatly increases the chances of a woman transmitting the virus to her baby during pregnancy, childbirth, or through breastfeeding (Ngoma et al., 2015; Omonaiye & Agu, 2016; Phillips et al., 2014).

According to the Ministry of Health in Malawi (MoH, 2018), as of 2017, non-adherence had stabilized at 1.8%

¹Department of Health Systems and Policy, School of Global and Public Health, Kamuzu University of Health Sciences, Blantyre, Malawi
²University of North Carolina Project-Lilongwe, Lilongwe, Malawi

Corresponding Author:

Mphatso Kumwenda, Department of Health Systems and Policy, School of Global and Public Health, Kamuzu University of Health Sciences, Private Bag 360, Blantyre, Malawi.
Email: mphatsokumwendaec@gmail.com



quarterly overall in the country with variations among health facilities. Non-adherence to care and poor retention among women in programs aimed at prevention of mother-to-child HIV transmission (PMTCT) have been associated with a lack of male involvement (MI) (Sifunda et al., 2019). Research has reported that involvement of male partners in PMTCT services improves uptake, adherence, and retention of female partners in PMTCT services, thereby reducing MTCT (Ambia & Mandala, 2016; HIV Mohlala et al., 2011). In a largely patriarchal society, men as heads of families hold a lot of power regarding health-seeking behavior including that of their spouses and families in general (Organisation for Public Health Interventions and Development [OPHID] Trust, 2015). Therefore, strategies that encourage MI in PMTCT are a crucial part of the puzzle in ending vertical HIV transmission. Despite such evidence, uptake and implementation of MI strategies remain low in Malawi.

Among strategies to promote MI implemented in Malawi are shorter waiting time for clients presenting as couples at the antenatal clinic (ANC), inviting men via word of mouth or other means, MI messaging via the media such as radio, and engaging community gatekeepers to mobilize men. The strategies have been reported effective in promoting MI (Mphonda et al., 2014; Nyondo-Mipando et al., 2015). However, there is a paucity of data on the implementation of the strategies, particularly what has worked versus what has not worked in implementation and the associated factors. As such, it is important to understand how such strategies are operationalized and implemented in practice to uncover these factors.

In this study, we used the Reach Effectiveness Adoption Implementation and Maintenance (RE-AIM) framework to evaluate the implementation of word of mouth and male-friendly strategies. The RE-AIM framework focuses on evaluating dimensions that are most relevant for "on-the-ground" implementation. These dimensions are Reach, Effectiveness, Adoption, Implementation, and Maintenance (Glasgow et al., 1999). *Reach* refers to the number or proportion of the target audience that participates in an intervention, *Effectiveness* explores the impact of an intervention on intended outcomes, *Adoption* measures the extent to which providers are willing to take on and implement an intervention, and *Implementation* is concerned with consistency with which an intervention is delivered. Finally, *Maintenance* measures the extent to which the intervention is sustained beyond introduction. Overall, the framework is aimed at identifying facilitators/barriers to implementation and the impact of interventions. We defined male-friendly strategies as giving preferential treatment to males such as pushing them to the front of the service provision line. Word of mouth, on the other hand, is defined as using women as a medium to invite their partner to ANC. For

our study, we only focused on the adoption, implementation, and maintenance components of the framework. We defined implementation and adoption as any action taken by providers to include men in the provision of ANC services. Maintenance, on the other hand, is defined as sustained implementation after the introduction of the intervention.

Method

Study Design

We used a cross-sectional mixed-methods complementary-concurrent design and conducted the study from September to October 2020. We conducted seven focus group discussions (FGDs), three with women and four with men. In addition, we conducted four key informant interviews (KIIs) among health care workers (HCWs). The interviews were aimed at gaining insight into the provider's opinions, experiences, and motivations (Busetto et al., 2020). To add depth to the male interviews, we conducted FGDs which allowed for interaction between participants and for sharing of more detailed information (Sutton & Austin, 2015).

For the quantitative component, we conducted a cross-sectional study employing 138 exit interviews with men who had presented with their partners at the ANC.

Study Setting

The study was implemented at Bwaila and Kabudula hospitals in the Lilongwe district in Malawi which is also the capital city of the country. Both facilities are owned by the Ministry of Health. According to the 2018 census, the district had a population of 2,626,901, with 62% of the population being rural and 38% being urban (National Statistics Office [NSO], 2018). Bwaila hospital is in the city of Lilongwe and is a secondary-level facility. Kabudula hospital, on the other hand, is a community hospital located 35 km west of the city and lies in a relatively rural part of the district. District hospitals act as referral centers for primary care facilities and some, as is the case for Bwaila, have an intermediary level of community hospitals. Therefore, including an urban and rural facility ensured that the study gains perspectives from both settings, enabling a more comprehensive approach. At the time of the study, HIV prevalence was estimated to be 11.5% in Lilongwe city versus 6.1% in Central-West where Kabudula hospital is located (MPHIA 2015–2016). For both facilities, PMTCT initiatives include HIV testing and counseling intrapartum, antenatal care, and health education, anti-retroviral therapy for women and for babies postpartum. Both facilities provide ANC services throughout the working week. Similarly, HIV services including HIV testing and counseling are provided within

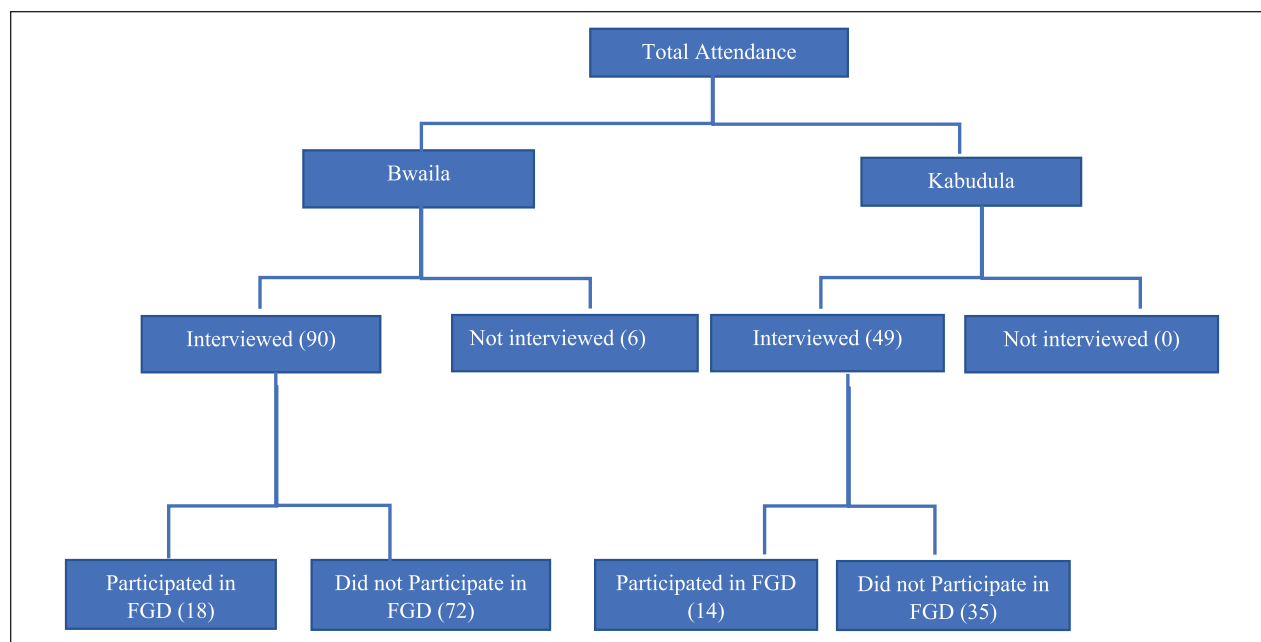


Figure 1. Sample Size of the Study

Note. FGD = focus group discussion.

the ANC throughout the weekdays. However, whereas for Bwaila hospital the HIV testing and counseling site is located within the same building as the ANC services site, at Kabudula hospital clients are served at the hospital's HIV clinic which provides HIV to all other clients and is located away from the ANC.

Study Participants and Sample Size

Figure 1 sets out the sample sizes for each category. We used Cochran's formula to calculate the desired sample size for the quantitative survey. Hypothesizing a proportion of MI in PMTCT of 10% based on previous studies (Kalembo et al., 2013; Kim et al., 2012), $\alpha = .05$, 95% confidence intervals, and a power of 80%, we came up with a sample of 138 participants to be interviewed.

For Bwaila hospital, out of the six participants who did not participate after being approached, four cited time as a constraint and two declined to provide consent.

For the qualitative component, the sample size to reach saturation was based on recommendations by Morse (1995) and Creswell (1998). In total, the FGDs were made up of 32 men and 17 women, respectively.

Data Collection and Recruitment Criteria of Study Participants

A guide was developed to allow for a semi-structured approach, thereby allowing enough room for the participants to express themselves while simultaneously ensuring

that discussions remained on the topic (Supplementary File 1). For the male and female participants, interviews and discussions were conducted in Chichewa, the local language, and audio recorded. Interviews for the HCWs were conducted in both Chichewa and English depending on the preference of the interviewee.

Health Workers. Health workers for key informant interviews were selected based on whether they were involved in provision of any PMTCT services, particularly at the ANC. We worked with the ANC in-charge nurse at both hospitals to identify such health workers. Our final sample comprised one community nurse, two registered nurses, and one PMTCT coordinator.

Men Interviews and FGDs. All men who had presented with a partner for antenatal services during the data collection period were approached for an exit interview. These were identified by the health providers during the couple's counseling session. With the help of health workers, we purposively selected participants for the FGDs from those who had participated in the interviews and held the interviews at the participants' convenient time. Out of those approached, three refused participation citing time constraints. We held two FGDs at each site. At Bwaila, the first FGD had 10 members, while the second had eight members. Similarly, at Kabudula, one FGD was composed of eight members, whereas the other was composed of six members. The FGDs were further disaggregated by age with each site having two groups of <25 and ≥ 25 .

Women FGDs. We identified women participants with assistance from health providers and included women of reproductive age (16–49 years), who were HIV positive and attending ANC regardless of whether they were accompanied by a male partner or not. For Bwaila, the women FGDs were conducted on the same day they presented for ANC services. For Kabudula, on the other hand, an appropriate time and day depending on the participants' availability was booked.

Data Analysis

The quantitative data was captured in Open Data Kit (ODK) and analyzed using Stata version 13. Univariate analysis was used to describe the demographic characteristics of our sample, describe MI in ANC services, describe motivating factors for MI, and describe the economic implications of MI in ANC. Frequencies and proportions were used to summarize the data.

For qualitative data, thematic analysis was used using the framework proposed by Graneheim and Lundman (2004). Audio recordings of the FGDs and KIIs were transcribed from Chichewa to English. One researcher listened to all the audio recordings and read all the transcripts to get familiar with the data. Another researcher also listened to a sample of the audio recordings and read a sample of the transcripts for familiarization with the data. Following this, the researchers held discussions on their understanding of the data and subsequently developed a coding framework to analyze the data. Next, we identified a meaning unit which was defined as a group of text expressing a common thought. In order not to lose meaning, we opted to use a whole statement rather than parts of a statement expressed by the participants as our meaning units. We proceeded to inductively attach codes to the meaning units describing what their content was across all the transcripts. We then grouped together all codes that had a common thread running through them and categorized them under overarching themes. The themes were reviewed to ensure that they correctly represented the codes and to eliminate any overlaps.

Ethical Considerations

Prior to data collection, the study was approved by the Malawi College of Medicine Research Ethics Committee and was further supported by heads of both health facilities and the Lilongwe District Health Office. Written consent was also obtained from all study participants who were able to read and write. For those that were unable to read and write, the consent form was read out to them and a thumbprint of the participant together with a signature of a witness was obtained to certify the provision of consent. To ensure anonymity of the participants, codes were

assigned to each participant and the interviews and discussions were conducted in private spaces.

Results

Characteristics of Study Participants

Of the four health workers that we recruited, one was a PMTCT coordinator, two were registered nurses, and one was a community health nurse. Out of these, three were female and one was male. The median age was 35.5 (interquartile range [IQR]: 34–40.75).

About 46% (64) of male participants were aged between 18 and 25 years, 45% (62) did not currently have children, while the rest had one or more children. In addition, 89% (122) were Christians, 43% (60) and 57% (78) had primary school level and secondary school and higher levels of education, respectively. Regarding employment status, 52% (72) were self-employed (Table 1).

Adoption of MI Strategies

To assess adoption and implementation, we conducted key informant interviews with HCWs and interviews with the male participants to highlight the services that are provided as part of MI strategies and how and where these are provided. The findings are presented below.

Provider Adoption of MI Strategies. HCWs stated that they implement what they were trained on in attracting and retaining males in accessing ANC services. This included ensuring privacy, male attendees' prioritization, and using culturally appropriate language:

So, the first thing is about community awareness, and the second thing is about the provision of privacy, like special rooms, special for couples and this has really helped because, a lot of couples have been coming, if they see that they have specially treated in a well secured room, and all the privacy is there, they are well respected, it has really improved. And also the other strategy that we use is that when they come as a couple and they want to be served first, they don't wait for a long time at the hospital. So, really this has made a lot of couples to be coming to the hospitals for services. (Nurse at Bwaila)

Male Involvement in ANC Services. Exit interviews were administered to 138 male participants presenting with their partners. Out of these, 58.7% (81) had never accompanied their spouse to ANC before the current visit, with the remaining 41% (57) having participated in ANC prior to the study (Table 2). Seventy-five percent (61) of the men who had never accompanied their partners prior to the current visit cited the current pregnancy being their first as the reason for not accompanying their spouses before.

Table 1. Demographic Characteristics of Male Participants by Site and Strategy of Reaching Them (N = 138)

Variables	Kabudula				Bwaila			
	Radio	Oral partner invitation	Community member	Other	Radio	Oral partner invitation	Community members	Other
Total participants	11	17	25	9	38	16	30	10
Age								
18–25	8	3	17	3	15	9	12	6
26–32	2	8	6	2	20	5	16	2
>33	1	6	2	4	3	2	2	2
Marital status								
Single	0	1	0	0	0	1	0	0
Married	11	16	25	9	38	15	30	10
Number of children								
0	2	0	9	2	25	9	20	4
1 or more	9	17	16	7	13	7	10	6
Religion								
Christian	11	17	21	7	35	13	24	7
Muslim	0	0	1	1	3	3	6	3
Other	0	0	3	1	0	0	0	0
Education								
Primary	6	15	18	7	3	7	7	3
Secondary and higher	5	2	7	2	35	9	23	7
Employment status								
Unemployed	1	1	2	1	0	0	0	0
Self-employed	6	8	13	6	16	9	18	6
Employed	4	8	10	2	22	7	12	4

Implementation of MI Strategies

Services Provided During ANC. Participants highlighted receipt of different health services upon presenting with their partners at ANC. These included health education on HIV prevention, PMTCT, and HIV testing and counseling services. Sixty-seven percent (93) respondents indicated that they had received health education on PMTCT, whereas 58% (80) stated that they had received couple HIV counseling and 94% (130) received HIV testing services (Table 2).

To add depth to responses on services received during the ANC, FGD participants were asked about their experiences upon presenting at the ANC. Similar to the survey, in the FGDs, it was highlighted that those who presented as couples at ANC were offered couple HIV testing and counseling on HIV/AIDS and information on antenatal care safe practices. Participants further stated that they received counseling and information on PMTCT as part of the couple counseling:

When we entered as a couple, they explained that if a person one of us is found with HIV, we are given ways of ensuring the safety of the unborn baby. So, they give you a way in which you're supposed to go to the hospital regularly to receive counseling if you've been found with HIV. And even if you've not been found with HIV, you're still required to

receive counseling at the hospital. (Bwaila FGD Male Participant)

In the urban hospital, HCWs indicated that if couples tested HIV positive, Antiretroviral therapy (ART) initiation services were provided within the ANC to prevent such clients from having to go through several service points during their visit and, therefore, save some time:

So, when the couples come, we start with HIV motivation talk, then they are tested, then, after testing them, those who are tested positive, we manage them, counsel them and initiate them on ART in this ward and if it is the discordant couple, let's say it's the wife who is positive, we initiate her, or it is the husband who is positive and since they came for antenatal, we also initiate the ART. If it the concordant couple, we initiate them together, they continue here. (Nurse at Bwaila)

On whether the above-outlined services were provided to clients together as couples or individually despite presenting as a couple, 94% (123) reported that they had been provided with the services together as a couple and the remaining 6% (15) reported the contrary (Table 2).

This was similar to discussions arising from the FGDs where there was no consensus on the extent to which men are involved in the full cycle of ANC service provision as

Table 2. Male Involvement in ANC Services

Level of involvement of male partners in PMTCT	Total	Kabudula	Bwaila
	n (%)	n (%)	n (%)
Accompanied spouse to ANC before current visit	57 (100)	38 (67)	19 (33)
Accompanied spouse to ANC during first pregnancy	52 (91)	36 (63)	16 (27)
Accompanied spouse to ANC during subsequent pregnancies	52 (91)	32 (56)	20 (35)
Comfortable accompanying spouse to ANC	134 (97)	53 (38)	81 (59)
Information and services provided during ANC visit			
Prevention of mother to child HIV transmission	93 (67)	36 (26)	57 (41)
HIV prevention	97 (70)	41 (30)	56 (40)
HIV testing	131 (95)	52 (38)	79 (57)
Couple HIV counseling	90 (65)	34 (25)	56 (40)
HIV prevention information provided to clients together as a couple	123 (89)	49 (36)	74 (53)
Recommending friends to accompany partners to the ANC	137 (99)	55 (40)	82 (59)

Note. ANC = antenatal clinic.

well as on the extent to which men should be involved. Despite both the men and women agreeing that the extent to which men are involved in procedures at ANC is limited, that is, men are only included in the process up to a certain point beyond which only the women take part, there were differing perspectives among the men on the status quo. Whereas some male participants expressed that there is no need for them to be part of the whole process if they have been informed of what happens in their absence, other participants expressed that they felt left out and that their presence at the ANC was a waste of time if they were not fully incorporated in the service provision:

The main reason why men are bored to come here at the hospital, because of the issue of letting the woman go alone in the last room, so to them they think that it is also better to let her go for ANC (alone), because he will not see what will happen there. (Bwaila Male FGD)

In contrast, other participants expressed that they agreed with the status quo especially if it related to the need for privacy of the female patients. It was stated that men's participation should be limited to some aspects of ANC and that the rest was for the women such that full involvement of men in the ANC cycle was unnecessary:

There are some things that a man cannot and/or shouldn't see during the pregnancy of the woman . . . When we escorted them there, we as men already had our own starting and finishing line at the hospital, so if we reach that finishing line then that's it because we've done what we were supposed to do, and the rest is for the women. (Bwaila Male FGD)

Duration of Service Provision. The majority of the men surveyed (88%) reported spending more than 2 h to accompany their partners to ANC. These findings were similar to what was pointed out in a key informant interview that due to the number of services provided to couples being more than those provided to lone presenters, sometimes couples take longer at the clinic relative to the former group:

So that was the strategy [assisting women who present with their partners first] that was being used at that facility, but we do not do that here we only tell them they should go through the HTS, and then the tetanus vaccine, and then the ACR, So sometimes they can take some time at HTS, you'll find that maybe we have already assisted some who did not come with their husband so we still can't assist them first. (Kabudula KII)

In contrast, in the women FGD, it was pointed out that those who present with their partners receive faster services:

Yes, for those women who were escorted by their husbands were put in front, on number 1, so that the men should go fast, so that was the difference. (Bwaila Women FGD)

Gender Preferences of Service Providers. There was negligible gender preference from the survey respondents indicated by the proportion (2%) of respondents that indicated the service provider being male too as the reason for their comfortability at ANC. This was corroborated by older men FGD findings where participants stated that they did not have a gender preference regarding providers

so long as the providers were competent in carrying out their duties. Participants highlighted that their provider gender preferences were not based on whether the content delivered by the health workers was male-facing or female-facing since providers have been trained to provide both:

In my opinion, I cannot say that the work should be done by a man or a woman because this is a job, and they were both employed to do it. This means that if they were given those positions, then it means that they are reliable and qualified to do the health issues. So the issue here is that it doesn't matter if the pregnant women are assisted by a male or a female, but the main issue here is that did he assist her in a right way or not? (Bwaila Men FGD Participant)

In contrast, the younger men FGD participants highlighted that gender preference was based on whether the content was male-facing or female-facing. Particularly, that male-facing content should be provided by male providers and female-facing content to be provided by female providers:

What you are saying is that if the issue is concerning a woman, then it means that they will explain it in a feminine way, so maybe by doing this, they will no longer be shy, and this means that when the man(provider) is back, he will explain the issue in a clear manner more especially on issues where the person who was explaining the issue was shy to explain it clearly, so this means that they will be able to explain it and we will be better able to understand everything. (Bwaila Men FGD Participant)

Maintenance

Maintenance was assessed by asking participants about their motivations for participating in the MI strategies and learning from the providers on the factors that have facilitated the implementation of the strategies, on one hand, and those that impede implementation, on the other hand.

Male Motivation for Participating in ANC. Majority of the men (67%) cited wanting to participate in PMTCT as the reason for accompanying their partners to ANC during the first pregnancy. For subsequent pregnancies, on the contrary, HIV outcomes of the previous child following couple participation in ANC was cited by majority (77%) of the men as the reason for their participation. Table 3 outlines other motivating factors for men's participation in ANC.

Facilitators of Implementation

Individual-level facilitators from the client perspective were ascertained by asking the male participants whether

they were comfortable in their ANC experience and what factors led to this comfortability. The majority (97%) (138) of the men expressed comfortability with accompanying their spouses to ANC. Out of these, 28% (38) reported that their comfortability stemmed from their presence at ANC being associated with fulfilling their responsibility and from being treated as equally important and being provided with relevant health information, respectively. Other reasons included being able to access services they had come for (18%) (25) and good provider attitude (13%) (18) (Table 4).

There were, however, other facilitators that only emerged in the qualitative and not quantitative arm of the study. These are outlined below.

Baby's HIV Outcomes. In the women's FGD, participants narrated that some men are motivated to participate in ANC when HIV-positive mothers have previously been able to have HIV-negative babies:

I have observed that men take part when the women deliver for the first time and the child has not contracted the virus and for subsequent pregnancies, the children also have not contracted the virus, then they start thinking that our children will be being born without HIV. In that way he will escort you, even when you get pregnant again and this is good. (Bwaila Female FDG participant)

This was echoed from the provider's perspective who stated that observed positive results, in terms of reduced MTCT, as a result of MI was a motivating factor for the continued implementation of MI strategies:

We saw that there is need, we were comparing when the woman have come alone and she is tested, and counselling is done, and there is a couple, it was different because, this one who is alone, sometimes when coming, you will see that the uptake of drugs, was ending up to become a defaulter because there was no one to encourage and maybe because of disclosure issues, the husband is not aware, so, it is difficult for her to be taking the drugs, while those who were coming as a couple, everything is okay because they have been tested together and they have been counselled together because it is like they encourage one another, they remind one another to take the drugs. (Bwaila KII)

Provider's Attitude. Similar to the health seekers' view, positive provider attitude toward MI strategies was also pointed out as being beneficial for the successful implementation of the strategies in the KIIs. This was associated with how receptive providers would be and their willingness to implement what the strategies contain or propose:

As I have said that maybe the issues of attitudes of the health providers, because if the health providers receive something

Table 3. Reason for Accompanying Spouses to ANC for First and Subsequent Pregnancies

	Total	Kabudula	Bwaila
	n (%)	n (%)	n (%)
Motivating factors of male partners presence at ANC			
Reasons for accompanying partner to ANC first pregnancy	52 (100)	36 (69)	16 (31)
Faster ANC service access	6 (12)	1	5
Partner accompaniment requirement for accessing ANC services	4 (8)	4	
Participate in PMTCT as a couple	35 (67)	24	11
Other	19 (37)	14	5
Reasons for accompanying partner to ANC for subsequent pregnancies	52 (100)	32	20
Partner accompaniment requirement for accessing ANC services	6 (12)	1	5
Participate in PMTCT as a couple	4 (8)	4	
HIV outcomes of previous baby following couple participation in ANC	40 (77)	28	12
Other	10 (19)	6	4

Note. ANC = antenatal clinic; PMTCT = prevention of mother-to-child HIV transmission.

Table 4. Reasons for Comfortability in Participating in ANC Services

Variables	Total N(%)	Kabudula n (%)	Bwaila n (%)
	134 (100)		
Faster services	12 (9)	4 (33)	8 (67)
Treated as equally important party and provided with relevant health information	38 (28)	10 (26)	28 (74)
Sense of fulfilling responsibility	39 (28)	13 (33)	26 (67)
Accessing services, they sought	25 (18)	16 (64)	11 (36)
Good provider attitude	18 (13)	11 (61)	7 (39)
Other	18 (13)	4 (22)	14 (78)

Note. ANC = antenatal clinic.

with good attitude, receive something with like in good terms, you will be able to implement it. So, a lot of health workers receive this male involvement with good attitude, and this has made a lot of health facilities, some of them to establish some strategies on how to attract a lot of couples to be coming. So, the attitude of the health providers has really helped. (Nurse Bwaila)

Integration of Training and Services. Providers further mentioned that integration of MI content across different capacity-building trainings for providers is beneficial for the implementation of the strategies. They stated that integration would ensure that providers get informed and empowered to implement the strategies:

Also, the government initiative because in each training, there is male involvement, if you go for a training in ART, you will hear about male involvement, if you go for a training on PMCTC, you will hear about male involvement, if you go for maternal and neonatal health, you will hear about male involvement. So, initiatives from the government in all sectors about male involvement has also made it to be really sustained. (Community Nurse Bwaila)

Coordination among the service providers was said to be helpful in ensuring that MI was being implemented as strategized. For example, in the rural facility where ANC services are withheld from women who have not presented with a male partner without a valid reason, other health providers providing related services such as prenatal health education and monitoring were asked to also ask for the presence of a male partner. This was pointed out to encourage men's presence:

Ok. I think it's about teamwork, because sometimes the nurse in the antenatal clinic may say "You have come here for the first time, then go to HTS first before you come here" now the woman maybe does not have a husband, when she goes there, she'll meet the counselor where he'll say "Aren't you pregnant? Don't worry, you'll start antenatal. But where is your husband?" and she replies, "I did not come with my husband" and they tell her to go back. So, you talk about even the HTS guys, maybe the woman came without her husband and she is just starting her antenatal care, then they can say "don't allow her if she did not come with her husband. Unless, otherwise, you're told about her situation and those exceptions that are allowed", so everywhere she

goes she'll have to show the evidence that she has a husband or else she'll go back. (Nurse Kabudula)

In addition, incorporating MI across other clinics other than ANC was highlighted to ease the implementation of the MI strategies. It was argued that such integration would ensure more contact with MI messaging and, therefore, push for the normalization of MI:

I think that role should be given to experts to educate them [men] that it is important to come with their wives, to come as a couple, so that they start antenatal while both of them have been tested. That is, we can reduce the number of HIV positive babies. And I think health education should be done here, not every day . . . it should be given to our patients, even in the OPD it can still be done because some who come at the OPD are pregnant, maybe 2 months or so, but they come to the OPD for other reasons. So, that information should go everywhere. (Nurse Kabudula)

Information Provision. Another facilitator highlighted was the provision of information to ensure the target audience understands why MI is important, which would in turn encourage male participation:

We need to continue mobilizing people in the community and give them adequate knowledge so that they should understand why we request for them to come with their husbands, why they are involved in the care of that woman. And, at the facility level, we need more trainings so that each staff should be aware of what is involved in male involvement. (Nurse Kabudula)

Barriers to Implementation of MI Strategies

Different barriers at both the individual and institutional levels were identified in both the survey and the qualitative data collection. Twenty-six percent (36) of the men reported that the conflict between using their time for work and income-generating activities relative to accompanying their partners has historically stopped them from participating in ANC. Sixteen percent (22) cited lack of money for transportation and other related costs as ever being a barrier to their participation.

Other factors that act as barriers to implementation were only highlighted in the FGDs and KIIs and not the survey. These are outlined below.

Inadequate Health Personnel. Participants pointed out that due to inadequate staff, the content of ANC services is dependent on the time that one presents at ANC such that those that present later in the day miss out on key counselling. This was said to be a deterrent for male participation, especially among those presenting for the first time:

There is only one room offering such counselling service, so what happens is that they deliver the counselling only once to those people available at that time, this means that all those who came in late, will not be able to hear such a counselling. So, this means that the hospital has a problem in this case. Had it been that they had two rooms providing the same service where those who came on time should be assisted in one room and the rest to be assisted in another room, so that both groups of people should be assisted accordingly, things would have been better. However, the health worker started sending the clients back home, like those who came in at 11am because he said that he was supposed to go and attend women at the maternity wing. Again, the same health worker was supposed to go to another department as well, so it's like assisting patients in three departments but with only one person delivering different services at the hospital, all these for one day. (Bwaila Male FGD)

In addition, inadequate staff was said to negatively affect prioritization of couples which stops them from accessing the services faster:

I think the availability of resources and also man power, because if there is adequate staff, it is easy to manage, because as we say that we prioritize them, so if I am alone or two, we can prioritize but still they will delay, unlike when we are a good number of us because others will be doing this and others that, so if we win the whole area, it will indeed be the whole area. If they come by 7.30am, at least by 8.45 they are done, but if there are no adequate staff, yes, we will prioritize them, but you will see them going by 10 or 11, so they have already wasted a lot of their time. (Nurse Bwaila)

Inadequate Training. Another barrier pointed out was the amount of training on MI strategies that staff have had. It was highlighted that staff who have not been trained may not fully appreciate the relevance of MI and therefore not implement it to its fullest extent. It was argued that staff that have not been trained may be unable to be male-sensitive in delivery of services. Both these factors were said to deter successful implementation of the strategies:

Of course, we can say that we should incorporate with the consideration that there is a presence of males, but there is a deficiency of knowledge as we said before. Maybe I can understand that I should be more sensitive since there males around and I should acknowledge their presence, but my understanding and other's understanding of the presence of the males is/may be different and they do not care about that, all they know is that they are dealing with women and their understanding of ANC is that it is for women and even with the presence of males they do not care. So, the way I can handle things and the way another person would handle things is different. That's why I said there is a deficiency of knowledge somewhat. (Nurse Bwaila)

Lack of Male-Friendly Spaces. It was pointed out that inadequate space sometimes entailed that couples would not receive all services as couples but as individuals at some points of the ANC service cycle, thereby impeding implementation of the strategies. Second, the nature of the spaces was said to be unfriendly to men which also impeded implementation of the strategies:

Maybe I can give an example, because of inadequate space or if we had more rooms then the implementation would be like having to assess that couple in separate rooms but because of limited space, that plan isn't followed. When the woman comes the man usually left behind in the other room. So sometimes it is not working well. (Nurse Kabudula)

Discussion

This study evaluated the implementation of “male-friendly” and word-of-mouth MI strategies in PMTCT using the RE-AIM framework. The main findings show that implementation and adoption of the strategies were high among health providers. Services provided to men presenting at ANC included health education on HIV prevention, PMTCT, and HIV testing and counseling services. However, respondents highlighted that due to inadequate infrastructural and human resources, and inadequate provider training, in some instances, these services are only provided to some and not all men which impedes the implementation of the MI strategies. On the individual health-seeker level, time and financial constraints were discussed as limiting MI. The factors that facilitate MI include men's perception of their responsibility, willingness to participate in ANC, provider's attitude, coordinated service provision, integrated training and service provision, and a baby's HIV outcomes. In sum, the study found adoption, implementation, and maintenance of the MI strategies to be high in the facilities under study despite the highlighted implementation challenges.

Adoption and Implementation of MI Strategies

Health provider adoption of the strategies is key to their implementation and success. Earlier work has indicated that there was common adoption of MI strategies across four countries in Africa: Malawi, DRC, Uganda, and Cote d'Ivoire (Besada et al., 2016). Our study corroborates this finding. We found that there was adoption of the strategies signified by routinization at both facilities and health providers implementing what they had been trained on in attracting and retaining MI in PMTCT. Despite adoption of the strategies, there was a lack of consistency in implementation particularly regarding what services were provided to couples. This is consistent with what has been

reported by other studies where inadequate space and human resources led to the exclusion of men at some points of service provision in ANC despite presenting as couples (Clark et al., 2020; Masaba & Mmusi-Phetoe, 2020). The inconsistency in services provided in our study was attributed to inadequate staff such that some information is only provided to those who present early whereas those clients who come later in the day miss out as staff have sometimes moved on to other service points by this time. This barrier has been widely documented by other researchers in the region (UNICEF, 2016; World Health Organization [WHO], 2012). The information gap this creates clearly undermines the purpose of the MI strategies and is a missed opportunity for the program. Inadequate health human resource is a general health system challenge for most African countries. For example, it is estimated that there is a regional density of 1.5 physicians, nurses, and midwives per 1,000 population which falls far below the minimum WHO recommended density of 2.3 per 1,000 population (Ahmat et al., 2022). Therefore, an increase and improvement in the health workforce can benefit the MI program. It is however important to acknowledge that this can only be achieved in the long term. Quick fixes such as more flexible work schedules or extended hours that allow for more providers during peak times can be employed as a solution to improve implementation fidelity in the short term (Yourkavitch et al., 2017). In addition, re-designing ANC services to allow a one-stop-shop approach can help close the highlighted leakages while simultaneously easing the extended time barrier faced by clients presenting as couples (van den Berg et al., 2015; Morfaw et al., 2013).

Constant engagement of men has been reported to have positive effects on men's participation and their involvement particularly being related to improved knowledge of PMTCT and higher engagement in HIV and pregnancy-safe practices (Melis & Fikadu, 2022; OPHID, 2015). However, contrasting with other studies (Ayalew et al., 2020), less than 50% of the men in our study were returning clients with the rest presenting for the first time. Our findings indicate that there is a gap between attracting men to the ANC program and keeping them engaged in the program. Therefore, beyond attracting MI, implementation further needs to employ mechanisms to sustain men's engagement. Continued adaptation of ANC spaces to the needs of men is important for the implementation of the MI strategies. In addition, our findings underscore the importance of continued civic education on the benefits of MI. This supports what has been identified by other studies. For example, Clark et al. (2020) show that MI in ANC works best where efforts are taken to make clinic places “more male-friendly” and where there are high levels of education programs around MTCT.

Facilitators of Implementation

Several factors were discussed as important in the implementation of MI strategies in our study, one of which was provider attitude. Health workers offer a key point of contact for health seekers with the MI program; their positive relationship with health seekers is important for the successful implementation of the program (Makoni et al., 2016). Previous studies have cited interpersonal relationships between patients and health care providers as crucial to MI (Kalembo et al., 2012; Peltzer et al., 2011). This is similar to our findings which identify provider's attitude to be key in the implementation of MI strategies. This suggests that improving provider interpersonal skills and incorporating components on cultural sensitivity in providers' training can be beneficial for the implementation of MI strategies.

Coordinated service provision has similarly been emphasized by WHO (2012), particularly where men are seen as more than facilitators but also as partners in PMTC. Thus, ensuring a coordinated and integrated approach at the facility level, where all health providers and service points are engaged is key for facilitating the implementation of the strategies (M'baya Kasinjiro & Nyondo-Mipando, 2021).

Furthermore, we found that mainstreaming men's participation in various health provider capacity-building programs is critical to implementing MI strategies. This resonates with findings from Uganda where training health providers in "customer care skills" improved implementation of MI strategies (Clark et al., 2020). Provider capacity was associated with increased confidence in the program by men in the study. We suggest continued training of providers for improved implementation of MI strategies.

Similarly, men's knowledge of PMTC, maternal health, and their attitude toward ANC have been identified as being positively correlated with their participation (Amano & Musa, 2016; Elias et al., 2017; OPHID, 2015). Similar to past studies, our findings established that men held positive attitude toward their participation in PMTCT (M'baya Kasinjiro & Nyondo-Mipando, 2021). Providing men with relevant health information and treating them as equally important can enhance the positive perception. Ensuring that ANC services also cater to the health needs of men, such that they are not only taken as a means to an end, can help boost their involvement. Drawing on men's motivations around fulfilling their responsibility, framing MI messaging and civic education in this way can facilitate men's engagement.

The negative HIV test results of children born to HIV-positive mothers motivated men's involvement in our

study, facilitating MI strategy implementation. Literature reports similar findings. Nkhonjera et al. (2021), for example, reported that low MI was a barrier in retaining HIV-exposed infants in care, increasing the possibility of MTCT. As such increasing men's awareness of the benefits of ANC and MI in PMTCT is crucial for the successful implementation of MI strategies.

Barriers of Implementation

Different challenges to implementation from both health seekers and health providers were highlighted in the study. First, the time conflicts that men encounter between income-generating activities and participating in ANC are similar to findings from a systematic review covering sub-Saharan Africa, Europe, and Asia (Morfaw et al., 2013). Innovative programming such as time preference for men and outreach services can facilitate implementation by making it easier for men to participate. For example, some studies have identified weekend clinics as a successful tool for improving male uptake of PMTCT services (Becker et al., 2010; Ditekemena et al., 2011).

Lack of male-friendly spaces raising concerns for privacy and compounding the perception of ANC as a feminine issue was another challenge to the implementation of MI strategies identified in the study. Nyondo et al. (2014), for example, report that a facility setup that is not conducive to privacy and feminized service provision deter men from participating in MI, hindering the implementation of MI strategies. Similarly, other previous studies have established male-unfriendly physical infrastructure and inconvenient timing of services as a barrier to MI (Morfaw et al., 2013; OPHID, 2015). Putting in place infrastructure that allows for privacy and ensuring ANC service provision incorporates male health service package, instead of being women-health centric can encourage male participation. M'baya Kasinjiro and Mipando (2021) concluded that men are more motivated to accompany their spouses if it is medically beneficial for them, further strengthening the need for ANC to also cater to the health needs of men.

As in other studies (Adane et al., 2020; OPHID, 2015), in this study, men's lack of comprehensive knowledge about PMTCT has been shown to hinder their participation. This could be indicative of a gap in the PMTCT health care delivery cycle. Improving knowledge on maternal health and PMTCT through such channels as educational campaigns in places where men gather, radio and TV announcements, and using women as agents of these messages, is key for improving men's engagement in PMTCT programs and resultantly implementation of MI programs (Elias et al., 2017; Makoni et al., 2016).

Strengths and Limitations

By including facilities from both urban and rural areas, our study ensures that we gain perspectives on implementation from both setting allowing for more insight into how implementation is facilitated or hindered by geographic location of a facility. Similarly, inclusion of health providers and consumers allows us to get insights from both the supplier and consumer angle of MI strategies.

In addition, using a mixed-methods approach allowed the study to undertake a comprehensive overview of the subject, by complementing and validating the quantitative data with the qualitative data.

However, the study suffers from the inability to assess all pillars of the RE-AIM framework due to data unavailability. For example, effectiveness dimension required access to data on HIV outcomes of exposed infants born to parents who took part in the MI strategies. However, linking male participation to HIV outcomes proved impossible due to the unavailability of the data in some periods under study. Therefore, the study focused on the last three dimensions: Adoption, Implementation, and Maintenance of the strategies.

Conclusion

MI has been discovered to be critical for preventing vertical HIV transmission; however, little is known about the implementation of MI strategies. Our study shows that improvement in implementation of MI strategies will require a systems approach considering both the providers and consumers of health care in the MI context. Improving provider capacity, making ANC services more male-friendly, increasing awareness of men in MI and PMTCT, and building on men's willingness to participate in ANC is key to facilitating the implementation of MI strategies. In addition, removing barriers to men's participation by bringing ANC services closer to them can facilitate implementation of MI strategies.

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Ethics Approval and Consent to Participate

We obtained ethical approval from an Ethics Committee in Malawi before commencement of any study-related activities. The heads of the facilities in which the study was undertaken provided support for us to proceed with the study. All participation in the study was voluntary and participants had to provide written consent. In cases where participants were unable to read and write, the consent was read to them in the presence of a witness and a thumbprint was provided as consenting to participate. Participants were informed that their participation was voluntary and that refusal to participate in the study would not affect their right to access services. To ensure confidentiality, we conducted all interviews in private spaces and ensured that only those working on the study had access to the data. For FGDs, we discouraged disclosure of HIV status and use of names among the participants; instead, codes were given to each participant. We scheduled interviews with health workers after they were done with their work to limit disruptions to service provision.

ORCID iDs

Mphatso Kumwenda  <https://orcid.org/0000-0002-4758-0271>

Alinane Linda Nyondo-Mipando  <https://orcid.org/0000-0002-3572-3810>

Supplemental Material

Supplemental material for this article is available online.

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