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Implementation fidelity of a peer-led self-help group intervention for female sex workers in Zimbabwe: A qualitative process evaluation

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Abstract

Background

Various factors exacerbate female sex workers' (FSWs) HIV vulnerability. FSWs are also underserved by health services. Self-help groups (SHGs) can build FSW agency and support health-services linkage. We explored implementation fidelity of the Adapted Microplanning to Eliminate Transmission of HIV in Sex Transactions (AMETHIST) trial SHG component to better understand trial outcomes.

Methods

December 2020 to August 2021, we conducted 64 semi-structured interviews (SSIs) and 24 natural group discussions (NGDs) across three trial sites in two rounds of research activities. Participants (FSWs, microplanners (peer empowerment workers) and staff) were purposively sampled, with new individuals per round. Each round included 30 SSIs (n = 5 FSWs; n = 5 microplanners per site). We also conducted SSIs (n = 4) with staff, resulting in N = 64 SSIs altogether. We also conducted 24 NGDs over two rounds (n = 12 per round). Trained female social scientists led data collection and analysis, guided by a fidelity framework assessing peer-led governance, structured meetings, internal savings/lending (*mukando*), safe spaces and health linkages.

Results

Fidelity was dynamic and negotiated rather than rigid blueprint adherence. Sixty-five (31.3%) of the planned 208 SHGs were formed across 11 intervention sites. Thirty (46.2%) remained active after 28 months of establishment. High-fidelity components; ISAL/*mukando* and safe spaces directly addressed FSWs' economic and psychosocial needs. Safe spaces enabled discussions of HIV status, antiretroviral therapy/pre-exposure prophylaxis adherence. In contrast, components requiring ongoing external facilitation (structured curriculum meetings and transition to peer-led governance) had low fidelity. A fifth of microplanners (20/104, 19.2%) were not fully trained on establishing and supporting SHGs. Some SHGs struggled to relinquish microplanner leadership after the required six months. COVID-19 undermined fidelity, with members prioritising survival needs over SHG participation.

Conclusions

The AMETHIST trial SHG model was partially implemented, particularly regarding coverage, structured meetings and transition to independent peer governance. This limits interpreting the trial as a definitive test of the full model. Future delivery should ensure full facilitator training, adequate supervision and communication resources, readiness-based transition to member leadership, and contingency plans

preserving core functions during disruptions, while allowing flexible meeting formats and locally-selected activities.

Trial registration

The trial was registered in the Pan African Clinical Trials Registry on 2 July 2020 (PACTR202007818077777), after randomisation but before data collection.

Introduction

Female sex workers (FSWs) often experience exclusion from health and social services through intersecting vulnerabilities such as stigma, discrimination, violence, social isolation, economic insecurity and criminalisation. These factors can reduce individual and collective agency; limit access to HIV prevention, treatment and care, and increase vulnerability to poor health outcomes (1, 2). Self-help groups (SHGs) represent a promising community-based approach to empowerment of women, including FSWs (3, 4). An SHG can be defined broadly as a group of individuals who share similar experiences that come together for mutual support (5).

Within HIV programmes, SHGs may strengthen both social cohesion and social capital by building trust, solidarity, shared problem-solving and reciprocal support (6, 7). In a recent scoping review, SHGs were associated with improved health outcomes among FSWs, specifically HIV knowledge, condom use, HIV testing, access to services and engagement with treatment, although the effects varied across settings and intervention designs (4, 8).

SHGs enable marginalised FSWs to build collective agency and tackle shared challenges. Large community mobilisation programmes, including Avahan and the Sonagachi Project in India, have used peer-led groups to address HIV risk, violence, service access and collective rights among FSWs (9, 10). In Zimbabwe, peer mobilisers and microplanners (i.e., FSWs trained as peer empowerment workers) are key players in the national sex work programme. The AMETHIST (Adapted Microplanning to Eliminate Transmission of HIV in Sex Transactions) trial built on this approach by testing combined risk-differentiated peer support with SHGs to strengthen cohesion, psychological resilience, financial resilience and linkage to HIV services (11).

The AMETHIST trial has been described in detail elsewhere (11). Briefly, it randomised 22 clinics serving FSWs to either the AMETHIST intervention or usual care. The intervention package delivered by FSWs integrated intensified, systematic community-based support for FSWs tailored to level of risk, combined with establishing SHGs that aimed to build cohesion between members and the wider sex-work community, and strengthen psychological and financial resilience (11).

The combined trial primary outcome of HIV transmission and acquisition risk was 55.3% in the intervention arm compared to 52.7% in the usual care arm (age-adjusted risk difference – 0.9%, 95% CI

-5.7% to 3.9%; p = 0.70) (11). Risk of transmission among women living with HIV was lower in the intervention arm (5.8% vs. 10.4%; age-adjusted risk difference − 5.5%, 95% CI -8.2% to -2.9%; p = 0.0003), while HIV acquisition risk among HIV-negative women was similar between arms (11).

AMETHIST trial theory of change's hypothesised pathway posited that microplanners would form SHGs among FSWs in their hotspot diaries, deliver a structured start-up curriculum, and support a transition to member-led governance. It was expected that regular meetings, internal savings/lending (ISAL)/*mukando*, confidentiality, and support for linkage to health services. would increase trust, collective agency, practical support, and financial/psychological resilience. These intermediate changes were then expected to improve both uptake and continuity of HIV prevention and treatment services, and ultimately, reduce both HIV acquisition and transmission risk.

The success of complex interventions such as those implemented in the AMETHIST trial depends not only on the robustness of their design but also on the fidelity with which they are implemented. Implementation fidelity refers to the extent to which an intervention is delivered as intended, including its reach, content, quality of delivery and factors that support or impede delivery (12). This qualitative exploration was nested within the AMETHIST trial process evaluation, and focused specifically on fidelity of the SHG component. It explored what was delivered as planned, what was adapted or not delivered, why variation occurred, and how this could inform trial results interpretation. This paper, therefore, examines implementation fidelity of the SHG component to better understand trial outcomes.

Methods

AMETHIST trial intervention and programme theory

Microplanners (i.e., trained peer empowerment workers) were each responsible for a caseload of 50–80 FSWs and received a monthly stipend (US$50). They provided individualised community-based support to their caseloads, with intensity of support guided by a six-item vulnerability risk scale (13). Each microplanner was also expected to establish at least two SHGs of 10–15 members over a two-year period, to facilitate FSWs' social support, collective problem-solving, and linkage to health services. Start-up SHG activities followed an intervention manual. Outreach workers (i.e., programme implementers) supervised and supported microplanners, including troubleshooting group formation and reinforcing messages, while programme coordinators oversaw implementation.

The programme theory posited that peer-led governance and structured meetings would create a stable platform for mutual support; ISAL/*mukando* would improve financial resilience and collective responsibility; confidential spaces would enable trust and discussion of sensitive concerns; and clinic linkage would reduce practical and social barriers to care. Together, these mechanisms were expected to improve engagement with HIV prevention and treatment services.

We developed a programme-specific fidelity framework from the programme implementation manuals and training materials. The framework assessed adherence to five core components:

1. 1. Peer-led, participatory governance
2. 2. Structured, curriculum-based meetings
3. 3. Internal Savings and Lending Schemes (“*mukando*”)
4. 4. A safe and confidential space
5. 5. Linkage to health services

We assessed programme coverage and group formation (as delivery indicators) separately because the five components could only operate if groups were formed and FSWs participated.

This exploration was nested within the wider AMETHIST trial process evaluation and used qualitative methods to examine adherence, quality of delivery, participant responsiveness, and contextual influences. Fidelity to these components was rated not as 'rigid compliance' but as upholding the 'integrity of the model's causal pathways'. This exploration adopts the term 'adaptive fidelity' to describe how components that resonated with member priorities such as ISAL/*mukando* and safe spaces thrived, while externally-driven elements experienced drift. Given contextual shocks, especially during the COVID-19 pandemic when interpersonal contact and travel restrictions necessitated adaptive delivery strategies, additional analysis considers this negotiation of fidelity.

The research questions were: *“To what extent were AMETHIST trial SHGs implemented with fidelity (to core components)? What factors facilitated or impeded delivery, and how were components adapted during the COVID-19 disruption?”*

Table 1
implementation fidelity model

Core Component	Planned Implementation and Description
Peer-led, participatory governance	The microplanner's role was to facilitate group formation. The microplanner was to disengage from the group after 6 months, at which point the SHG was designed to become self-sustaining. The group was to be led by democratically-elected members who would guide decision-making, plan activities, and ensure the group's continuity independently.
Structured, curriculum-based meetings	SHGs were to be established using a manualised curriculum. This manual defined an SHG, its benefits, and examples of group activities. Groups were supposed to meet at least twice a month to conduct these structured activities, which were designed to help them decide their priorities and plan their actions.
Internal lending and savings (mukando)	The manual detailed the establishment of a collective savings fund and the rules for internal lending as a core group activity. This economic empowerment component was intended to be a central, regular function of the group, building financial resilience and reinforcing trust, and collective responsibility among members.
Safe and confidential space	The microplanner was tasked with facilitating a supportive environment. The manual outlined the importance of confidentiality and mutual respect, and the microplanner was responsible for encouraging these norms to create a trusted space where members felt secure to share experiences and support one another.
Linkage to health services	The microplanner was responsible for encouraging and facilitating clinic attendance for all group members. This was a core function of the facilitator role, designed to bridge the gap between the community-level SHG and formal health services.
Coverage and group formation	Each of the 104 microplanners was expected to facilitate the formation of at least two SHGs from their caseload over 28 months, leading to a total target of 208 SHGs. With 10–15 members per group, this aimed to involve between 2,080 and 3,120 FSWs in SHGs across the intervention sites.

Exploration setting

This exploration took place in three of the eleven AMETHIST trial intervention sites: Chinhoyi, Ngundu and Rusape. Chinhoyi, a municipal capital (population ~ 112,000) has an economy anchored around mining, agriculture and education (14). Sex work in Chinhoyi concentrates around a university and nearby farming areas, while the town also lies on a major highway linking Harare and Zambia. Ngundu (population ~ 48,600) is a strategic growth point on a major highway serving surrounding rural communities (15). Sex work in Ngundu is strongly linked to highway traffic and to general informal livelihood strategies in the context of economic hardship. Rusape (population ~ 38,000) lies between Harare and an eastern border town, Mutare, with an economy tied to tobacco farming. Sex work concentrates along the highway, brothels, bars and the streets. Together, these sites represent a mix of urban, peri-urban and transport corridor settings.

Data collection

Data collection for this initiative occurred from 16 December 2020 to 18 August 2021 in two phases. Phase one occurred within six months of the intervention's start; phase two followed nine months of implementation. Data were collected through semi-structured interviews (SSIs) — one-on-one interviews guided by predetermined open-ended questions, with flexibility for the interviewer to probe participants' responses and explore emerging issues in greater detail, and natural group discussions (NGDs). Participants were self-identified FSWs aged ≥ 18 years. Purposive recruitment used programme staff to ensure inclusion of both SHG and non-SHG members as well as successful SHGs and disbanded SHGs so that fidelity could be clearly understood from varying perspectives. The sampling design repeated the same participant categories at both rounds. At each site and time point, the study sought interviews with microplanners (n = 5) and FSWs (n = 5), alongside NGDs with members of four SHGs. In addition, a total of 4 SSIs were conducted with outreach workers.

Twelve group discussions were conducted at six months (n = 4 per site) and twelve at nine months (N = 24 groups). Categories included high performing SHGs, poorly performing SHGs, SHGs with < 5 members, and SHGs with > 5 members. SHGs with < 5 members provided insights on why some members dropped out, and those with > 5 members on what helped them maintain a reasonable group membership. A poorly performing SHG was one that was unable to meet at least twice a month, and their activities were not yielding much value to the members as per their definition.

All discussions were conducted in private spaces participants chose themselves and in observation of COVID-19 regulations, and in Shona, the participants' language. Discussion topic guides covered group formation and reach; leadership and decision-making; delivery of the structured curriculum and meeting frequency; establishment and management of ISAL/*mukando*; confidentiality, trust and cohesion; clinic referral, accompaniment and health education; participant expectations and engagement and; COVID-19-related challenges and/or adaptations.

Data analysis

We transcribed and translated audio-recordings from interviews and group discussions verbatim into English. An independent researcher randomly reviewed 20% of transcripts to ensure consistency. We managed data using NVivo 12 (QSR International, Melbourne, Australia). We conducted thematic analysis following the six-step approach described by Braun and Clarke (16, 17). The process was primarily inductive, with codes generated from the data, although the analysis was subsequently mapped onto a bespoke implementation fidelity framework (see Table 1). Two researchers (GM, TK) independently coded transcripts, meeting regularly to compare and refine the coding framework until consensus was achieved. Discrepancies were resolved through discussion with a more senior researcher (JB). We used inter-researcher triangulation to enhance the credibility and validity of the findings (18). We iteratively reviewed, refined, and defined the themes. We maintained an audit trail of all analytical decisions to ensure transparency. We used quotes to illustrate themes.

Results

Across the three sites, a total 206 FSWs participated in the group discussions and semi-structured interviews (SSIs) (Chinhoyi n = 64 FSWs, Ngundu n = 73 FSWs and Rusape n = 69 FSWs). Of these, 60 took part in SSIs and 146 participated in group discussions. Most FSW participants had completed primary education and had also been in sex work for > 3 years. Table 2 summarises participants characteristics. Illustrative quotations supporting each fidelity finding are presented in Table 3.

Table 2
demographic characteristics of participants

	Chinhoyi	Ngundu	Rusape	Total N
	Distribution of characteristics & behaviours (n, column %)	Distribution of characteristics & behaviours (n, column %)	Distribution of characteristics & behaviours (n, column %)	N
Overall	64	73	69	206
Age at Interview / NGD				
Below 25 years	4 (6.25%)	3 (4.1%)	32 (46.4%)	39 (18.9%)
25–34 years	23 (35.9%)	29 (39.7%)	24 (34.8%)	76 (36.9%)
≥ 35 years	34 (53.1%)	38 (52%)	12 (17.4%)	84 (40.8%)
Marital status				
Single/never married	32 (50%)	22 (30.1%)	44 (63.8%)	98 (47.6%)
Married/cohabiting	1 (1.6%)	4 (5.5%)	2 (2.1%)	7 (3.4%)
Divorced	23 (35.9%)	35 (47.9%)	17 (24.6%)	75 (36.4%)
Widowed	5 (7.8%)	9 (12.3%)	5 (7.2%)	19 (9.2%)
Highest level of education attained				
No education/incomplete primary	11 (17.1%)	26 (35.6%)	0	37 (18%)
Complete primary education	50 (78.1%)	44 (60.3%)	69 (100%)	162 (78.6%)
Complete secondary education	39 (60.9%)	42 (57.5%)	56 (81.1%)	137 (66.5%)
Duration selling sex				
< 2 years	1 (1.6%)	1 (1.4%)	5 (7.2%)	7 (3.4%)
2–3 years	0	5 (6.8%)	11 (15.9%)	16 (7.8%)

	Chinhoyi	Ngundu	Rusape	Total N
	Distribution of characteristics & behaviours (n, column %)	Distribution of characteristics & behaviours (n, column %)	Distribution of characteristics & behaviours (n, column %)	N
3 + years	60 (93.7%)	64 (87.7%)	52 (75.4%)	176 (85.4%)

[a] Percentages are column percentages. Totals may not sum to the site sample sizes as some responses were missing.

Table 3
Illustrative quotes on fidelity

Component	Theme	Illustrative quote
Peer-led governance	Self-initiated group formation	*"What motivated the establishment… one of us fell sick… we decided to form a group… contributing money in case one of us falls sick".* **(Group discussion, Chinhoyi)**
	Member-driven approach	*"I don't usually tell them what to do… when we meet, we do a prayer, and we begin".* **(Microplanner, Rusape)**
	Difficulty transitioning leadership	*"I was told to step back… but the group was not ready… they would fall apart".* **(Microplanner, Chinhoyi)**
	Resource constraints	*"You would end up spending US$1.50 to call others… no coordination resources… this demotivated [us]".* **(Group discussion, Rusape)**
	Outreach worker follow-up and supportive supervision	*"We would see her [the ORW] twice a month so that she could see what we are doing, whether we are paying the round [ISAL] money … helping us where necessary. We would meet her twice a month".* **(Group discussion, Ngundu)**
	Inconsistent facilitation	*"Some microplanners are very good at organising the groups, but others … they just do the minimum. They register the women, they do the risk assessment, but the SHG meetings … sometimes they happen, sometimes they don't. It depends on the microplanner's motivation".* **(Outreach worker, Ngundu)**
	Importance of facilitator training	*"The training helped me understand what is expected of me. I learned how to do the risk assessment, how to talk to the girls, and how to start a self-help group. Those who came later did not get that same training, and you can see the difference".* **(Microplanner, Rusape)**
Mukando (ISAL)	Economic empowerment	*"We won't be relying on sex work alone… the proceeds from sex work are not enough".* **(FSW, 29yrs, Chinhoyi)**
	Income-generating projects	*"We have our chicken project… 12 chickens… we want this to grow to 35".* **(Group discussion, Rusape)**
		"…this group has actually built something where we bake buns to sell, what we need is flour". **(Group discussion, Rusape)**
Safe space	Peer teaching and support	*"We also teach each other about cleanliness… we talk about taking medication… if a fellow sister is sick… we just talk to and constantly teach each other".* **(Group discussion, Ngundu)**

Component	Theme	Illustrative quote
	Socialising and friendship	*"I enjoy SHGs. When we attend these, people will be socialising".* **(ORW, Rusape)**
	Social cohesion	*"If one of us faces a challenge, we help her".* **(Group discussion, Ngundu)**
Health linkages	Peer accountability for HIV treatment	*"We encourage those who are HIV positive to take medication and adhere… and those on PrEP to do the same".* **(FSW, 26yrs, Ngundu)**
	Accompaniment to clinic	*"When one of us is very sick, we accompany her to the clinic. One of us once fell sick and we carried her in a wheelbarrow to the clinic".* **(FSW, 35yrs, Chinhoyi)**
	Health education	*"We talk about safety issues… to always put on condoms, get tested regularly"* **(FSW, 31yrs, Ngundu)**
Coverage	COVID-19 disruption	*"Initially the SHG had 12 members… we have since stopped due to COVID-19… some people have relocated".* **(Microplanner, Ngundu)**
	COVID-19 impact on activities	*"Last year was a difficult year… it was difficult to meet… even those that wanted to do mukando [ISAL] found it difficult".* **(Group discussion, Ngundu)**
	Microplanner attrition	*"We experienced problems whereby some microplanners would go to South Africa and never come back".* **(ORW, Rusape)**
	Competing priorities	*"They viewed meetings as time-consuming… taking time away from other lucrative activities".* **(Microplanner, Chinhoyi)**
	Time constraints	*"We don't want to exceed 30 minutes because sometimes we would have left some pots cooking on the fire".* **(Group discussion, Ngundu)**
	Need for outreach worker (ORW) endorsement	*"I would like the ORW to help endorse my message about SHG to fellow sex workers".* **(Group discussion, Ngundu)**
Factors influencing participation and uptake (participant responsiveness)	Perceived financial benefit	*"If you do mukando [ISAL], you will realise that as sex workers, you will be in a better place financially".* **(FSW, 28yrs, Chinhoyi)**
	Tangible benefit (groceries)	*"I was so happy about the groceries… my children were able to enjoy Christmas".* **(Group discussion, Ngundu)**
	Individual business from ISAL/*mukando*	*"Now each has their own business".* **(Group discussion, Rusape)**

Component	Theme	Illustrative quote
	Peer influence on HIV treatment	*"I got mobilised at the SHGs… you hear one saying 'look here is my book, I am on medication'… I saw my peers taking ART, and I am the only one who is not".* **(FSW, 33yrs, Rusape)**
	Health emergency support	*"This group provided a platform… we each contribute money to assist members in case of a health emergency".* **(Group discussion, Chinhoyi)**
	Unmet material expectations	*"I was expecting to get something to sell, like tomatoes, bales of second-hand clothes".* **(Group discussion, Chinhoyi)**
	Mistrust	*"When there is no money for incentives and drinks, they [FSW members] should understand that I was also not given those things. But they think I am hiding something. It makes me not want to work with them".* **(Microplanner, Ngundu)**

Coverage and group formation

Fewer than expected SHGs were established. Across the 11 intervention sites, 65/208 (31.3%) SHGs were formed. After 28 months of establishment, under half (30/65, 46.2%) remained active. The three sites for this exploration had 29/65 (44.6%) trial SHGs: n = 17 in Rusape, n = 7 in Chinhoyi and n = 5 in Ngundu; 16/29 (55.17) remained active at 28 months.

Reasons for inactivity included COVID-19 restrictions and participant mobility. Additional challenges included microplanner attrition, competing livelihood and household demands, difficulty contacting members, and limited endorsement or support from outreach workers in some settings. However, when outreach workers were more involved, they appeared to play a crucial facilitating role. For example, some microplanners mentioned that they were initially not accepted by fellow FSWs but this changed when an outreach worker backed them up. Others mentioned that outreach workers made follow-ups on SHG activities, and helped resolve challenges. Despite SHGs being led by microplanners, these accounts suggest that some microplanners and SHGs relied on outreach-worker support.

Peer-led, participatory governance and structured meetings

Qualitative findings reflected some divergence from the initially conceived model of peer-led governance and structured meetings. Whilst the intervention strategy specified that microplanners would facilitate group formation and support the group for an initial six-month period, this was not always the case. In some instances, groups were formed by FSWs themselves, typically as a response to shared need, to which the microplanner then added themselves.

However, the quality of delivery of the core components was significantly influenced by facilitator-level factors. About a fifth (20/104, 19.2%) of microplanners did not receive the critical initial training, others only got on-the-job training. Microplanners struggled with the prescribed six-month transition to member-

led governance, fearing that the groups would collapse or disengage too early. Motivation was also challenging given the relatively meagre US$50 monthly stipend. Lack of resources for communication adversely affected meeting frequency and quality of delivery, alongside pre-existing mistrust between FSWs and microplanners.

Internal savings and lending *(mukando)*

ISAL/mukando was among the most successfully implemented and member-oriented components, facilitating lending and borrowing. Groups autonomously decided to establish ISAL/*mukando* and determined fund use, mostly for small-scale businesses, demonstrating high fidelity to participatory governance. The capital from ISAL/*mukando* funded a diverse range of income-generating projects, which were a cause of great pride and a visible measure of shared success. These projects included production and selling of food as well as farming and livestock.

Safe and confidential space

SHGs created secure and confidential spaces that facilitated trust building which was necessary for members to talk about highly sensitive and stigmatised topics. Findings suggested that, over time, these groups became safe spaces of trust within which they felt comfortable sharing personal experiences and supporting each other without judgment. Confidentiality of the group was also critical for supporting care of health conditions, particularly HIV. The members felt able to disclose their status and discuss difficulties with adherence, with the confidence that the information would not go beyond the group. This was a culture of trust and care that fostered a robust sense of social cohesion and solidarity.

Linkage to health services

Linking SHGs with formal health care was critical for the AMETHIST trial outcomes. Participants described microplanners and group members providing HIV prevention information, encouraging clinic attendance, discussing antiretroviral therapy (ART) and pre-exposure prophylaxis (PrEP) use, and accompanying sick members to facilities. These reports suggest that referral, health education and accompaniment activities were delivered in some groups. They, however, do not demonstrate verified adherence to ART or PrEP, and should not be interpreted as clinical outcome data.

Factors influencing fidelity

Participant responsiveness affected whether planned activities could be delivered. FSWs were more willing to attend when groups offered an immediate and visible benefit, particularly savings, lending, practical support and social connection. Participation declined when meetings competed with income-generating or household activities, and some FSWs disengaged because they had initially anticipated material benefits from the programme. We treat these findings as influences on attendance and delivery, rather than as fidelity outcomes.

COVID-19 adaptations and disruptions

Covid-19 did not result in uniform adaptations. Some members attempted to continue savings or peer support, but most groups reduced meetings, stopped ISAL/*mukando*, or disbanded because both gatherings and movement were restricted and household survival needs took priority. Our findings therefore support selective continuity in some groups, alongside substantial loss of coverage and activity.

Discussion

This exploration found partial and uneven implementation of the AMETHIST trial SHG intervention. The clearest fidelity gap was reach: fewer than one-third of the planned groups were formed, and fewer than half of those formed remained active after 28 months. Among participating groups, ISAL/*mukando* and the creation of confidential peer-support spaces were delivered most consistently. Structured curriculum meetings, complete microplanner training and the planned transition to independent member governance were less consistently implemented. Linkage activities such as health education, encouragement, referral and accompaniment were reported, but the qualitative data did not establish treatment or prevention adherence.

Findings reveal inconsistent fidelity across all six core components. Greatest fidelity was observed in running ISAL/*mukando* and establishing a safe and confidential space. These features were enthusiastically taken up by participants, leading to member-driven economic projects and trust that facilitated open discussion of very private health- and work-related matters. This robust adherence to the intervention's socio-economic and psychosocial "active ingredients" is one of the key successes, and is supported by literature that cites member ownership and trust as being the key to SHG success (19).

We also examined fidelity of the AMETHIST trial SHG intervention implementation through the critical lens of "whose agenda" these groups ended up serving. Participant responsiveness was a facilitator when members perceived practical benefits, but it also constrained delivery when expectations were not met or meetings competed with work and household responsibilities. Outreach worker endorsement and follow-up helped some groups, suggesting that peer-led delivery still required a functioning supervision system. Future fidelity assessments should therefore measure not only whether a group exists, but also facilitator training, meeting frequency, curriculum coverage, leadership transition, member attendance and delivery of referral and accompaniment activities.

Understanding fidelity in community-based interventions requires an understanding of the interaction between elements of the intervention that are developed externally and initiatives that are grown organically by members. This evaluation highlighted that programme goals that matched members' immediate economic and psychosocial interests had the highest fidelity. ISAL/*mukando*'s remarkable success and safe and confidential spaces' organic growth are a testament to the fact that these characteristics gained traction with what Swain and Wallentin (2009) (20) refer to as SHGs' underlying intention: member-controlled economic empowerment and mutual support (21). The strong participant responsiveness to these elements tells us what development researchers term "appropriation" - where

external inputs are utilised in the service of locally-defined priorities rather than simply programme deliverables (22, 23). By way of contrast, those elements that required frequent external facilitation were characterised by more variable fidelity. Taking-up structured, curriculum-based meetings and the partial transition to peer-led, participatory governance reveal the limitations of what Agarwal (2015) (24) terms the "instrumentalisation" of SHGs for programme delivery (25).

The COVID-19 pandemic presented a natural experiment in agenda negotiation, demonstrating the hierarchy of member priorities. Restrictions limited movement and face-to-face meetings, while economic pressure shifted attention towards immediate household needs. Some groups maintained selected activities, but others suspended savings, lost members or disbanded. Jakimow's (2014) (26) observes that SHGs assert their agency by selectively adopting, adapting, or resisting different components of external programmes based on how highly relevant members feel them to be to their lives (27). This also revealed a clear 'hierarchy of member priorities': survival needs took precedence over programmatic requirements, explaining why fidelity was high for economic and psychosocial elements but low for curriculum-based meetings.

The variable fidelity among components emphasises the worth of what Cornwall (2008) (28) calls "spaces for negotiation" in development programming. The intervention's strongest point was its flexibility to include member priorities as well as programme objectives. However, the resource constraints that eroded coverage and group formation also limited these spaces for negotiation, particularly for those groups under economic vulnerability.

These findings affect interpretation of the AMETHIST trial outcomes. The trial did not show an effect on the combined primary outcome, although risk of transmission among women living with HIV was reduced (11), and broader AMETHIST trial analyses reported increased clinic attendance among SHG members. Because coverage and delivery were incomplete, the trial cannot be interpreted as a definitive test of the fully implemented SHG model. Limited reach and inconsistent delivery may have reduced the intervention's capacity to affect population-level outcomes, especially HIV acquisition risk. At the same time, this fidelity study cannot determine how much each implementation gap contributed to the trial results.

For future implementation, all microplanners should receive the full training before beginning work, with refresher training in group facilitation, conflict management and clinic linkage. Programmes should budget for communication and supervision, monitor group formation against targets, and use readiness criteria rather than a fixed six-month deadline for transition to member leadership. The core functions of confidentiality, participatory decision-making, savings and lending, and linkage to care should be protected, while meeting format and member-selected economic activities can remain flexible.

The main lesson is that fidelity in a peer-led SHG intervention depends on both clear specification of core functions and the practical capacity to deliver them. Flexibility should not obscure low coverage or omitted activities, but rigid delivery rules should not prevent groups from choosing locally relevant ways

to achieve the intended function. Reporting both adherence and adaptation makes it easier to distinguish implementation failure from limitations in the intervention model.

Strengths and limitations

There are several strengths to this evaluation. Firstly, a bespoke fidelity framework that distinguished five core components from coverage, included perspectives from FSWs, microplanners and outreach workers, and sampled active, lower-performing and disbanded groups. Data from two rounds allowed examination of changing delivery during the COVID-19 period, and triangulation across interviews and group discussions strengthened interpretation. The use of qualitative data also identified how training, supervision, resources and participant expectations shaped fidelity.

However, some limitations can be noted. Data were collected during the first year of a 28-month intervention and, therefore, did not capture the full development of every group. The two rounds were not designed as a participant-level longitudinal cohort, limiting analysis of individual change. Findings came from three of 11 intervention sites and 45% of SHGs, and may not represent other settings or types of sex work. The study relied on self-reported implementation experiences and did not independently verify meeting records, curriculum completion, savings transactions or clinical adherence. The broader AMETHIST trial measured health-service and trial outcomes, including an association between SHG membership and clinic attendance, but this qualitative fidelity analysis cannot attribute those outcomes to specific SHG components.

Conclusion

The AMETHIST trial SHG intervention was not delivered at its planned scale or intensity. Coverage was low, facilitator training was incomplete, structured meetings were inconsistent and transition to member-led governance was often delayed or premature. ISAL/*mukando*, confidential peer support and some clinic-linkage activities were implemented more consistently among groups that remained active.

These findings suggest that future SHG programmes should protect clearly defined core functions while allowing practical flexibility in how groups meet and select activities. Full facilitator preparation, ongoing supervision, communication resources, monitoring of reach and delivery, and a readiness-based transition to peer leadership are needed before the effects of the complete SHG model can be fairly assessed.

Abbreviations

AMETHIST - Adapted Microplanning: Eliminating Transmissible HIV In Sex Transactions

ART - Antiretroviral therapy

CI – Confidence interval

COVID-19 - Coronavirus disease 2019

FSW – Female sex worker

HIV - Human immunodeficiency virus.

ISAL - Internal savings and lending

NGD - Natural group discussion

ORW – Outreach worker

PrEP - Pre-exposure prophylaxis

SHG - Self-help group

SSI - Semi structured interview

Declarations

Ethics approval and consent to participate

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Ethical approval was obtained from the Medical Research Council of Zimbabwe (MRCZ; A/2559), Liverpool School of Tropical Medicine (LSTM; 19-115RS), and London School of Hygiene & Tropical Medicine (LSHTM; 19123). Written informed consent to participate was obtained from all participants before data collection.

Consent for publication

Not applicable.

Availability of data and materials

Data can be made available upon request.

Competing interests

The authors affirm that they do not possess any competing interests.

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Authors' contributions

GM led the conceptualisation of this manuscript, as part of her PhD, with WM, FM, FC and JB as supervisors. FC conceptualised the intervention, contributed to its design and supervision, and secured funding from the Gates Foundation and the Wellcome Trust. GM, WM, FM and JB contributed to the study design, development of the analysis plan and interpretation of the data. FM supervised the research team in data collection. FM and JB provided technical support and oversight during the process evaluation. GM led manuscript drafting, while WM, FM, JB and FC led the critical revision of the manuscript. GM coordinated collaboration among all authors. GM, MM, TK, JM and AK contributed to data collection and provided input on manuscript drafts. All authors read and approved the final manuscript.

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Disclaimer

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References

1. Footer KHA, White RH, Park JN, Decker MR, Lutnick A, Sherman SG. Entry to Sex Trade and Long-Term Vulnerabilities of Female Sex Workers Who Enter the Sex Trade Before the Age of Eighteen. J Urban Health. 2020;97(3):406-17.
2. Nestadt DF, Tomko C, Schneider KE, Kerrigan D, Decker MR, Sherman SG. Co-occurring Threats to Agency Among Female Sex Workers in Baltimore, Maryland. J Interpers Violence. 2022;37(11-12):Np8818-np43.
3. Nichols C. Self-help groups as platforms for development: The role of social capital. World Development. 2021;146:105575.
4. Madimutsa G, Machingura F, Nyamwanza O, Cowan FM, Mavhu W. Exploring the contribution of self-help groups to sexual and reproductive health and HIV outcomes for female sex workers in sub-Saharan Africa: A scoping review protocol. Wellcome Open Res. 2024;9:535.
5. Gurnani V, Beattie TS, Bhattacharjee P, Mohan HL, Maddur S, Washington R, et al. An integrated structural intervention to reduce vulnerability to HIV and sexually transmitted infections among female sex workers in Karnataka state, south India. BMC Public Health. 2011;11(1):755.
6. Langford CP, Bowsher J, Maloney JP, Lillis PP. Social support: a conceptual analysis. J Adv Nurs. 1997;25(1):95-100.

7. Qiao S, Li X, Stanton B. Social Support and HIV-related Risk Behaviors: A Systematic Review of the Global Literature. AIDS and behavior. 2014;18(2):419-41.
8. Madimutsa G, Machingura F, Nyamwanza O, Cowan FM, Mavhu W. Exploring the contribution of self-help groups to sexual and reproductive health and HIV outcomes for female sex workers in sub-Saharan Africa: A scoping review. PLOS Glob Public Health. 2025;5(4):e0003883.
9. Chandrasekaran P, Dallabetta G, Loo V, Mills S, Saidel T, Adhikary R, et al. Evaluation design for large-scale HIV prevention programmes: the case of Avahan, the India AIDS initiative. Aids. 2008;22:S1-S15.
10. Jana S, Basu I, Rotheram-Borus M, Newman P. The Sonagachi Project: A Sustainable Community Intervention Program. AIDS education and prevention : official publication of the International Society for AIDS Education. 2004;16:405-14.
11. Cowan FM, Machingura F, Ali MS, Chabata ST, Takaruza A, Dirawo J, et al. A risk-differentiated, community-led intervention to strengthen uptake and engagement with HIV prevention and care cascades among female sex workers in Zimbabwe (AMETHIST): a cluster randomised trial. The Lancet Global Health. 2024;12(9):e1424-e35.
12. Carroll C, Patterson M, Wood S, Booth A, Rick J, Balain S. A conceptual framework for implementation fidelity. Implementation Science. 2007;2(1):40.
13. Matambanadzo P, Jones HS, Takaruza A, Chabata S, Busza J, Sibanda EL, et al. HIV risk segmentation in microplanning with female sex workers in Zimbabwe: an observational study. 2026.
14. contributors CC. Chinhoyi Rural Training Centre (Chinhoyi, Zimbabwe): Catholic Commons.; 2025 [updated 20 August 2025 19:24 UTC; cited 2025 30 October 2025]. Available from: https://en.catholiccommons.com/w/index.php?title=Chinhoyi_Rural_Training_Centre_(Chinhoyi,_Zimbabwe)&oldid=77676.
15. Agency) ZZNS. 2022 Population and Housing Census: Preliminary Report. Government of Zimbabwe. Zimbabwe: ZIMSTAT (Zimbabwe National Statistics Agency); 2022.
16. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative research in psychology. 2006;3(2):77-101.
17. Braun V, Clarke V. Reflecting on reflexive thematic analysis. Qualitative research in sport, exercise and health. 2019;11(4):589-97.
18. Meydan CH, Akkaş H. The role of triangulation in qualitative research: Converging perspectives. Principles of Conducting Qualitative Research in Multicultural Settings: IGI Global; 2024. p. 98-129.
19. Saha S, Kermode M, Annear PL. Effect of combining a health program with a microfinance-based self-help group on health behaviors and outcomes. Public Health. 2015;129(11):1510-8.
20. Bali Swain R, Wallentin F. Does microfinance empower women? Evidence from self-help groups in India. International Review of Applied Economics. 2009;23:541-56.
21. from COP26 EE. Safe Spaces in Unsafe Environments—Experiences from COP26 About Hosting Inclusive Spaces for Deep Encounters and Reflection. for Transformation. 2024:193.

22. Ingram G. Locally Driven Development. Washington, DC: Brookings Institute; 2022.
23. Bragstad LK, Bronken BA, Sveen U, Hjelle EG, Kitzmüller G, Martinsen R, et al. Implementation fidelity in a complex intervention promoting psychosocial well-being following stroke: an explanatory sequential mixed methods study. BMC Med Res Methodol. 2019;19(1):59.
24. Agarwal B. The power of numbers in gender dynamics: illustrations from community forestry groups. Journal of Peasant Studies. 2015;42(1):1-20.
25. Dulhunty A. Disciplinary mobility and women's empowerment: a complicated connection. Mobilities. 2023;18(2):282-96.
26. Jakimow T. Sightings of the state, reflections of self as citizen: Self-becoming in development encounters. The European Journal of Development Research. 2014;26(5):905-21.
27. Kumar N, Raghunathan K, Arrieta A, Jilani A, Pandey S. The power of the collective empowers women: Evidence from self-help groups in India. World Dev. 2021;146:105579.
28. Cornwall A. Unpacking 'Participation': models, meanings and practices. Community development journal. 2008;43(3):269-83.

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