Published in final edited form as:

Drug Alcohol Depend. 2020 October 01; 215: 108206. doi:10.1016/j.drugalcdep.2020.108206.

Implementation science outcomes of a gender-focused HIV and alcohol risk-reduction intervention in usual-care settings in South Africa

Margaret W. Gichane¹, Wendee M. Wechsberg^{*,1,2,3,4}, Jacqueline Ndirangu¹, Felicia A. Browne^{1,2}, Courtney Peasant Bonner¹, Ashraf Grimwood⁵, Najma Shaikh⁵, Brittini Howard¹, William A. Zule¹

¹RTI International, 3040 E. Cornwallis Road, Research Triangle Park, NC 27709, USA

²Gillings School of Global Public Health, University of North Carolina at Chapel Hill, CB #7445, Chapel Hill, NC 27599, USA

³Department of Psychology, North Carolina State University, 2310 Katharine Stinson Drive Raleigh, Raleigh, NC 27607 USA

⁴Psychiatry and Behavioral Sciences, Duke University School of Medicine, 40 Duke Medicine Circle, Durham, NC 27710 USA

⁵Kheth'Impilo AIDS Free Living, 11th floor, Metlife Centre, 7 Walter Sisulu Avenue, Cape Town 8000, South Africa

Abstract

Background—South Africa has the highest HIV prevalence globally, which disproportionately affects women. Hazardous alcohol use reduces antiretroviral adherence which can lead to adverse health. Few evidence-based interventions addressing hazardous alcohol use and HIV have been implemented in real-world settings. This study aimed to evaluate implementation outcomes from the Women's Health CoOp (WHC)—an evidence-based gender-focused HIV intervention—which was implemented in Cape Town.

Methods—We conducted this implementation science trial using a modified stepped-wedge design. Four health clinics were paired with four substance use rehabilitation programs and

* **Corresponding Author:** Wendee Wechsberg, PhD, Substance Use, Gender, and Applied Research Program, RTI International, 3040 E. Cornwallis Road, Research Triangle Park, NC 27709, USA, wmw@rti.org, Phone: +1-919-541-6422.

Contributors

WMW conceived and designed the study and reviewed and finalized the manuscript. MWG analyzed and interpreted the data and drafted the manuscript. JN and FB contributed to the methods, interpretation of results, and critically reviewed and revised the manuscript. CPB conducted costing analyses and critically reviewed and revised the manuscript. AG, NS, and WZ critically reviewed and revised the manuscript. BH coded and analyzed qualitative data and critically reviewed and revised the manuscript. All authors made substantial contributions to the development of the manuscript and agreed to be accountable for all aspects of the work in ensuring accuracy and integrity. All authors have read and approved the final manuscript.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Conflict of interest

No conflicts declared

randomized into four cycles. Women living with HIV and who use alcohol or other drugs were recruited into each cycle (n=120 each cycle). We assessed adoption, acceptability, appropriateness, cost, and fidelity using a mixed methods approach.

Results—*Adoption:* 100% of staff trained in the WHC and designated as interventionists delivered one or more workshops. *Acceptability:* Interventionists found the WHC content beneficial to their patients and the WHC improved connections between clinical units in facilities. *Appropriateness:* The WHC aligned with facility goals to improve antiretroviral adherence and reduce alcohol use; however, there were implementation challenges, including staff shortages, stigma, and few places to refer women for supportive services. *Cost:* The cost of implementing the WHC was 20.59 ZAR (1.40 USD) per attendee. *Fidelity:* Interventionists implemented the WHC with high fidelity and quality.

Conclusions—The findings suggest it is feasible to integrate the WHC into usual-care settings. Future efforts to scale up the intervention will need to address social and structural implementation challenges.

Trial Registration: [NCT02733003](#) approved 1/21/2016

Keywords

Implementation science; Evidence-based HIV intervention; HIV; Alcohol and other drug use; Women

1. Introduction

South Africa has made great strides toward their targets to have 90% of people living with HIV diagnosed, 90% of those diagnosed on treatment, and 90% of those on treatment virally suppressed. However, the country has not achieved all targets; though 90% of people living with HIV know their status, only 62% are on treatment, and 54% are virally suppressed (UNAIDS, 2018). Hazardous alcohol contributes to the epidemic with South Africa reporting one of the highest levels of hazardous drinking globally (World Health Organization, 2018). Alcohol use is associated with reduced antiretroviral (ARV) adherence and higher viral load, which contribute to adverse health outcomes (Schneider et al., 2014). Women of childbearing age carry the burden of HIV in South Africa and they also report high rates of alcohol use (Wechsberg et al., 2018a; Wechsberg et al., 2018b). Given the significant burden of HIV in South Africa and the intersecting risk of hazardous drinking, evidence-based interventions are needed to meet the 90-90-90 targets.

Several evidence-based interventions (EBIs) address hazardous drinking and HIV in Southern Africa (Carrasco et al., 2016). However, most of these interventions have not been implemented in real-world clinical settings highlighting the wide gap between research and practice. Barriers to adoption of EBIs in public health settings in South Africa include lack of awareness of EBIs, staff resistance to change, high workloads, staff shortages, and suboptimal communication from the health system (Brooke-Sumner et al., 2019; Myers et al., 2020). A study conducted in Cape Town, the setting for this study, assessing barriers to implementing interventions integrating substance use and HIV treatment found challenges

such as: separation between AOD and HIV services, limited knowledge of AOD treatment or services, and substance use stigma (Magidson et al., 2019).

Additionally, there is a dearth of implementation research studying strategies to implement alcohol interventions in low- and middle-income countries (LMICs). Evidence from implementation research conducted in high-income countries suggest that strategies such as marketing, training, and supporting health care providers in implementation, increases the effectiveness of brief alcohol interventions (Nilsen et al., 2006). Implementation science studies are a critical next step in assessing the scalability of interventions to address these intersecting epidemics in South Africa.

The Women's Health CoOp (WHC) is a gender focused, risk-reduction EBI originally developed for women who use alcohol and other drugs (AOD) (Lyles et al., 2007). Several randomized trials showed the WHC to be efficacious in reducing AOD use and sexual risk behavior among key populations of women in South Africa (Wechsberg et al., 2013; Wechsberg et al., 2008; Wechsberg et al., 2010b; Wechsberg et al., 2011). The WHC includes two interactive group workshops that combine risk-reduction information about AODs, HIV prevention and treatment initiation, the importance of treatment adherence, other sexually transmitted infections, and gender-based violence prevention with behavioral skills training, sexual empowerment (such as practicing male and female condom use), and negotiation and communication skills. The intervention also includes a personalized action plan for behavior change and active referrals to health and social protection services. Given the efficacy of the WHC, an implementation science trial was the logical next step.

The overarching aim of this mixed methods study was to assess implementation outcomes of the WHC in usual-care settings in Cape Town. We employed several implementation strategies, including obtaining formal commitments; assessing facilities for readiness, barriers, and facilitators; conducting educational meetings; training clinic staff on the WHC; and using a community collaborative board (Powell et al., 2015). These strategies have been used successfully in trials of the WHC in South Africa and North Carolina by the Principal Investigator and research team (Wechsberg et al., 2010a; Wechsberg et al., 2015) and they are based on the ADAPT framework (McKleroy et al., 2006).

2. Materials and Methods

2.1 Study design and setting

The WHC was implemented in four public health clinics and four substance use treatment programs (hereafter known as Matrix programs) from 2015–2018 using a modified stepped-wedge design (Wechsberg et al., 2017). Sites were recruited and randomized into one of four cycles (i.e., steps), with one clinic and one Matrix program per cycle. Each implementation cycle lasted at least six months. After each cycle, we engaged in a brief “lessons learned” activity that analyzed feedback from clinics and Matrix programs to inform the next cycle (Howard et al., 2017).

A total of 480 patients (120 per cycle) were enrolled in this study. Eligibility criteria included (1) being between the ages of 18 and 45, (2) self-reporting weekly AOD use during

the previous 3 months, (3) reporting unprotected sex with a male partner in the past 6 months, (4) having a positive verifiable HIV test result, (5) intending to remain in the area for at least the next 6 months, (6) providing contact information, and (7) being willing to participate in AOD screening.

2.2 Implementation strategies

We used five strategies to support the implementation of the WHC (Powell et al., 2015): obtaining formal commitments, conducting educational meetings, assessment of readiness, identification of barriers and facilitators, training, and utilizing a community collaborative board as the study advisory board. The specifics of the implementation strategies (Proctor et al., 2013) are summarized in Table 1. Given the stepped-wedge design, refinements were made to some of the strategies at each step. Specifically, training evolved as different topics were added to the WHC curriculum based on feedback from interventionists in previous cycles. Additionally, in FGDs assessing readiness, barriers, and facilitators, responses from interventionists from previous cycles led to the refinement of interview guides for subsequent FGDs.

2.3 Evaluation

Proctor's taxonomy of implementation outcomes is an evaluation framework (Nilsen, 2015) which outlines eight outcomes—acceptability, adoption, appropriateness, feasibility, fidelity, cost, penetration, and sustainability—that serve as indicators of implementation success, processes, and intermediate outcomes of patient-level outcomes (Proctor et al., 2011). We assessed the following five implementation outcomes: acceptability—defined as the extent to which an intervention is viewed as satisfactory, agreeable, or palatable by stakeholders including patients, clinic staff, and management; adoption—defined as the action to use an evidence-based practice or innovation; appropriateness—defined as the degree to which an evidence-based practice or intervention is viewed by stakeholders as compatible to a setting, provider, or consumer; cost—defined as the total cost of an implementation effort; and fidelity—defined as the extent to which an intervention is implemented as prescribed by the intervention's developers.

2.4 Adoption

We assessed adoption of the WHC at the clinic staff level. We used facility-based tracking forms to collect information on the ratio of staff members trained as interventionists who delivered at least one WHC workshop as compared with the total number trained.

2.5 Acceptability and Appropriateness

We assessed acceptability and appropriateness using qualitative methods, including focus group discussions (FGDs), joint interviews, and individual in-depth interviews (IDIs) with clinic and Matrix program staff implementing the WHC. Interviews and FGDs were conducted three months into implementation (mid-implementation) and post-implementation in private locations. Clinic staff provided written informed consent before each interview or FGD. The interviews and FGDs were conducted in English by female study personnel—including the principal investigator, project director, and two South African consultants—

and were audio-recorded. The principal investigator and South African consultants have doctorates in psychology, and the project director has a masters in global health. All have training in qualitative methods and extensive experience conducting qualitative research in South Africa. Interviewers had no relationship to participants prior to the study. Interview and FGD guides focused on staff's experience implementing the WHC and implementation barriers and facilitators. Notes were also taken during interviews.

Staff implementing the WHC were recruited via telephone agreed to participate. At mid-implementation, we conducted three FGDs, three joint interviews, and one IDI with 18 staff. At post-implementation, we conducted two FGDs, one joint interview, and one IDI with 11 staff. Interviews and FGDs were conducted in private rooms at the health facilities and lasted 30-60 minutes.

Interviews and FGDs were transcribed verbatim. An applied thematic analysis approach was used to guide analysis (Guest et al., 2012). Data were managed using Dedoose, mixed-methods research software. Analysis began with a deep reading of the transcripts to gain familiarity. A hierarchical codebook was developed using deductive codes from the interview guide and emergent concepts from reading transcripts. Three analysts coded the same transcript and compared coding. Inter-coder reliability was assessed using Cohen's Kappa (Dewey, 1983). Upon reaching high agreement (Kappa = .87), remaining transcripts were independently coded by each analyst. Coded data were summarized in matrices to identify themes across FGDs/interviews. Participants were not provided final transcripts for comment and feedback. We utilized the COREQ checklist for reporting qualitative research (Tong et al., 2007).

2.6 Cost

2.6.1 Cost measures—We collected data on the cost of implementing the WHC in health clinics and Matrix programs from a variety of sources. All costs are in South African Rand (ZAR); exchange rate = \$1 USD = 14.71 ZAR (December 9, 2019). We calculated the labor costs for implementation by multiplying the average hourly labor rate of interventionists (58.95 ZAR; USD 4.01) by the average number of hours to complete one workshop (46.26 minutes), yielding a labor rate per workshop of 45.45 ZAR (USD 3.09) and a labor cost to complete both workshops of 90.90 ZAR (USD 6.18). We also included the labor costs of providing periodic booster trainings for interventionists or other clinic staff who are interested in implementing the intervention. Trainings would be facilitated by those who have already been trained on the intervention and have implemented to intervention (i.e., existing interventionists). Training would occur every six months. The cost of the additional training was calculated by multiplying the hourly labor rate of the interventionist (58.95 ZAR; USD 4.01) by three hours per training. We garnered the cost of printing the intervention from study invoices. We obtained the costs of penis and vagina models used in condom demonstrations and pencils for taking notes from online retailers.

2.6.2 Cost Analyses—We summed all intervention-related costs to estimate the total cost of implementing the WHC. Given that all settings implemented the WHC more than once, we calculated one-time costs (i.e., penis models, vagina models, printing) and

recurring costs (i.e., clinic staff labor, pencils) separately. We also calculated the average costs per workshop by aggregating the costs across the number of intervention workshops conducted during the study (173 workshops). We calculated the average intervention costs per attendee by aggregating the intervention costs across the 802 women (Mean = 4.64, SD = 3.02) who attended at least one WHC workshop. Notably, attendees may have participated in two workshops. However, because women used resources each time they attended a workshop (e.g., pencils), each incidence of attendance was counted separately.

2.7 Fidelity

We assessed fidelity by using fidelity observer forms, which covered workshop length, content, and the quality of intervention delivery. These fidelity observer forms were used in previous WHC randomized trials (Wechsberg et al., 2013; Wechsberg et al., 2008; Wechsberg et al., 2010b; Wechsberg et al., 2011) and modified based on adaptations to the curriculum. Among the WHC workshops delivered, 90 were selected and audio-recorded (with consent) for feedback. Fidelity was rated by the master trainer who was also the project manager. We calculated a fidelity score for each workshop by summing the total number of components the interventionist completed and dividing the sum by the total number of intervention components. We calculated a quality score by summing the total number of criteria given a rating of good or adequate and dividing by the total number of criteria. Additionally, we calculated average fidelity and quality percentages for all observed workshops.

2.8 Ethics

This study is approved by the South African Medical Association Research Ethics Committee (SAMAREC); City of Cape Town: City Health Research Committee; and the RTI International Committee for the Protection of Human Subjects.

3. Results

3.1 Adoption

Managers within each facility selected staff to be trained as designated interventionists for the WHC. A total of 17 staff were trained on the WHC, nine from clinics and eight from Matrix programs. All interventionists adopted the intervention and delivered at least one WHC workshop.

3.2 Acceptability

3.2.1 WHC content—The key factor that helped interventionists adopt the WHC was recognizing the benefit of the program for their female patients. One of the main benefits of implementing the WHC is that it creates a safe and supportive space for women to share their experiences on sensitive topics, such as their HIV status and gender-based violence:

“...they share and become emotional and to see women support one another in that way is very nice.... We had a lady, who once said... ‘you know I think she’s being abused or whatever,’ and afterwards she opens up..., ‘you know that’s actually me....’ And they all got up and they hugged her.”

- Post-implementation, Cycle 4 Matrix program and Cycle 4 clinic

Interventionists felt their patients really benefited from having a forum where they could share with one another. They noted this was not typical among their patients.

Additionally, interventionists reported that the WHC provided patients with new information about HIV and substance use:

“Like when we speak about pregnancy, I think that there is this understanding that the baby is safe in the womb. But I try to really explain that it’s really not. What you [are] consuming affects the baby. So, a lot of shocked faces”

- Mid-implementation, Cycle 4 Matrix program

Interventionists were able to use the intervention to dispel myths about these topics.

However, sometimes intervention length was an issue. For some interventionists, workshops ran longer than expected, mainly because of the necessity to translate the intervention into local languages and having to provide breaks to help keep patients engaged. This meant that some sessions were rushed.

3.2.2 WHC facilitated connections within the clinic—Interventionists reported that holding the WHC in their facilities improved relationships between clinical units. Embedding the intervention in clinics and Matrix programs that offered other HIV-related services, allowed for successful internal referrals:

“Our TB section they really like [the WHC]... we’ve developed a bit of a working relationship...they are, they really interested in it.”

- Mid-implementation, Cycle 1 Matrix program

Solidifying these relationships ensured that women would be able to move seamlessly between clinical units when they needed different services.

3.3 Appropriateness

3.3.1 Alignment with clinic mission and goals—Interventionists expressed that the WHC was compatible with the mission and goals of the facilities, particularly for the Matrix programs. Matrix staff shared that they previously experienced challenges recruiting women for their programs, but the WHC brought them in:

“Something that was positive was seeing the women coming to...us for screening for substance abuse...and also another something that is positive...the community knowing that there is a place that offers services in terms of substance abuse.”

- Mid-implementation, Cycle 3 Matrix program

For Matrix programs, the WHC aligned with their focus of getting women to reduce substance use, despite their program focus and emphasis on total abstinence. Programs viewed the WHC as a primer to help women transition into the treatment curriculum:

“we have on occasion had those females do the Women’s CoOp, and had to give them brief intervention of, kind of what to expect in that ‘cause...our program is

about recovery. And so you start to bring in this idea of how recovery filters out into other areas of your life. How to be assertive, how to communicate. I mean that's all the topics that's covered in the Women's CoOp."

– Post-Implementation, Cycle 1 Matrix program

3.3.2 Staffing—The most reported barrier by interventionists was staff shortages. Interventionists reported they were invested in implementing the program but their facilities did not have enough staff to ensure their duties were covered while they implemented the WHC.

"That's the difficult part because you want to be there, but because of the shortage of staff you can't be there."

– Mid-Implementation, Cycle 4 clinic

Additionally, some interventionists expressed that they did not feel they were being supported by their colleagues to implement the WHC. They reported that sometimes colleagues would take extended breaks and supervisors would not intervene to stop this behavior. Staffing challenges resulted in workshops starting late, having to move workshop start times, and cancelling workshops on some occasions.

3.3.3 Limited services within communities—Interventionists described challenges in providing referrals for patients because of the limited availability of services within local communities. Although the study provided transportation to facilities for the two intervention workshops, patients faced barriers returning to facilities on their own for outpatient treatment or following up with referrals for services outside the clinic, such as domestic violence shelters:

"Because it is always a money issue with patients that are in [community name]. 'Why are there places not here in [community name], ' Because it would have been better if they could walk away and then you can go and find help. But now you have to go far."

– Mid-implementation, Cycle 4 clinic

For some patients, reaching services would require taking multiple modes of transportation, which would be costly and time consuming. Transportation was especially challenging for women who wished to enter the outpatient substance use treatment which requires regular attendance.

3.3.4 Stigma—Stigma was another factor that kept patients out of care. Interventionists reported that patients did not attend clinics or treatment programs because of stigma from the community and from clinic staff. Community-level stigma was described as mistreatment from the community based on their gender, substance use, and positive HIV status:

"...[T]here's a lot of stigma as a woman if you are drinking, you are using drugs, [or] you are on ARVs, so there is still a lot of stigma in our own communities."

– Mid-implementation, Cycle 3 clinic and Cycle 3 Matrix program

Stigma from the community often resulted in patients seeking care in clinics outside of their community.

For some patients who were ready to re-engage in care, an additional deterrent was stigma from clinic staff. Patients who had been out of care for a long period anticipated mistreatment from nurses:

“Like they normally say they stay away because the nurses always say, ‘Where were you?’ and stuff like that. And the nurses will always tell them. It’s almost like... they say the nurses [are] discriminating.”

– Post-implementation, Cycle 2 Matrix program

3.5 Cost

The total recurring cost of conducting one complete WHC intervention (both workshops) was ZAR 123.30 (USD 8.38) per intervention. The total one-time cost—the upfront costs to implement the intervention—for the WHC was ZAR 5,677.85 (USD 386.09) per clinic. Consequently, the total cost to implement the complete WHC intervention once was ZAR 5,801.05 (USD 394.47) per clinic.

The total cost to implement the WHC during the study was ZAR 16,511.86 (USD 1,122.81). The average cost per workshop was ZAR 95.44 (USD 6.49). The average cost per attendee was ZAR 20.59 (USD 1.40).

3.6 Fidelity

We observed high levels of intervention fidelity for both WHC workshops (n=90). On average, interventionists delivered Workshop 1 with 97% fidelity (range: 61%–100%) and Workshop 2 with 95% fidelity (range: 88%–100%). Quality of intervention delivery was also high (n=85), on average, interventionists received quality scores of 100% for Workshop 1 (range: 85%–100%) and 98% for Workshop 2 (range: 85%–100%).

4. Discussion

Implementation science studies are essential to take evidence-based interventions into real-world settings, with the need to determine the impact among women of childbearing age living with HIV in South Africa being paramount to the 90-90-90 goals. We found that all staff trained in the WHC adopted the intervention. The WHC was viewed as acceptable and appropriate by interventionists, although some structural factors challenged implementation. The intervention was delivered with high fidelity and quality, and implementation costs were low. Based on these findings, the strategies employed in this study can lead to feasible implementation of the WHC in clinics and substance use rehabilitation programs in South Africa.

All interventionists trained in the WHC delivered one or more sessions, indicating a high level of adoption. However, implementation challenges resulted from staff shortages and turnover, and at times there was a lack of support from supervisors and other colleagues.

Staff shortages and staff turnover in the healthcare sector are common in South Africa (Breier et al., 2009 (Chabikuli et al., 2005). A recent study found that efforts to implement innovations in district health facilities were challenged by job vacancies, poor infrastructure, and limited staff to implement innovations. However, senior managers reported that when they were well informed about innovations and their benefits, they were more able to motivate staff to integrate innovations (Orgill et al., 2019). To address this challenge in our study, we conducted trainings whenever new staff were hired to ensure that at least one staff at each facility was trained on the WHC, and held educational meetings with the entire clinic staff and administrators to obtain buy-in. Long-term sustainability of the intervention will require an investment from the health system.

Overall, interventionists expressed high acceptability for the WHC. They provided overwhelming evidence of how the program format and content provided a sense of social support among patients and helped fill key gaps in their knowledge about HIV and substance use. The benefits of the WHC to patients and to the facilities encouraged staff to continue implementing the WHC despite staff shortages. This supports theories of organizational readiness that posit that the more organization members value an innovation the more persistent they will be in implementing it (Weiner, 2009).

Some concerns emerged about the appropriateness of the WHC for this setting. Although interventionists reported that having the WHC in their facilities aligned with their mission and goals to increase the number of female patients and prepare women for substance use treatment, several structural-level factors influenced implementation. The absence of services in communities made it difficult for interventionists to make external referrals for follow-up services or for substance use treatment. Interventionists described patient's frustration when they made referrals outside of their community. Interventionists also reported that patients experienced stigma from their community and clinic staff. Our findings support research showing that stigma is a barrier to treatment and adherence for people living with HIV (Bogart et al., 2013; Katz et al., 2013) and that women who use alcohol and other drugs are reluctant to engage in care because they anticipate stigma from providers (Myers et al., 2016). Stigma-reduction training is a necessary complement to the WHC and has been included in a subsequent randomized trial of the intervention in South Africa (Wechsberg et al., 2019).

Implementation costs of the WHC were low, adding to a body of literature examining cost and cost-effectiveness of alcohol interventions (Anderson et al., 2009; Bray et al., 2012). In high-income countries, the median cost of behavioral interventions conducted in medical settings is approximately \$48 (Bray et al., 2012), far above WHC costs. Conversely, a modeling study conducted in Kenya found that implementing an alcohol reduction EBI intervention for people living with HIV at approximately \$1 per patient, similar to the \$1.40 per patient cost of the WHC, is cost-effective and could avert up to 13% of alcohol related HIV transmissions in the nation (Braithwaite et al., 2014). Considering that harmful alcohol use costs 10-12% of the South African GDP (Matzopoulos et al., 2014), investing in a low-cost EBI like the WHC would be beneficial to address hazardous alcohol use among women living with HIV.

However, several important lessons learned came to light in this implementation trial. First, because of staff shortages, adjustments needed to be made to the intervention to make the WHC more suitable for these real-world settings as opposed to a more controlled field trial. For example, the personalized action plan completed by each participant at the end of the second workshop became optional because of time constraints. Second, successful implementation requires support from staff and, more importantly, from upper management. Prior to implementation, we conducted educational meetings with leadership at the city level, health system level, and facility before any contacts were made with clinic staff. Having support from all these levels led to the optimal adoption observed in this study.

4.1 Limitations

This study has several limitations. First, although the original study protocol called for FGDs with staff implementing the WHC (Wechsberg et al., 2017), by mid- and post-implementation only a few staff were still implementing the WHC. Consequently, some FGDs had a small number of participants, so individual and joint interviews were conducted. Individual interviews provide more unique information than FGDs, however FGDs can uncover more sensitive information (Guest et al., 2017). It is possible that we missed some information that would have been generated within a group format. Second, the findings may be biased because the staff we interviewed were those still implementing the intervention, which suggests they were able to overcome challenges, such as staffing shortages. Finally, this study was conducted in a geographically limited area and findings may not be generalizable to other settings. However, we believe the lessons learned from this implementation science study provide important insights for future scale-up.

5. Conclusions

South Africa's goal of meeting the 90-90-90 targets will not be achieved without strategies to improve ARV adherence and address hazardous alcohol use. Women living with HIV who engage in hazardous alcohol use are a key population that may benefit from targeted prevention interventions such as the WHC. We found that using multifaceted implementation strategies led to successful implementation of the WHC in clinics and substance use rehabilitation facilities in Cape Town. The WHC was adopted, deemed acceptable, and delivered at a low-cost with high fidelity. Social and structural factors challenged implementation and the provision of referrals which are important for sustained HIV and substance use treatment engagement. These findings may inform future scale-up of evidence-based interventions in usual-care settings.

Acknowledgements

This research was conducted with support from the National Institute on Alcohol Abuse and Alcoholism (NIAAA) under grant R01AA022882 (PI: Wechsberg). The findings and conclusions presented in this article are those of the authors and do not necessarily represent the views of the NIAAA. We thank Jeffrey Novey for his editorial assistance.

Role of funding source

Nothing declared

References

- Anderson P, Chisholm D, Fuhr DC, 2009 Effectiveness and cost-effectiveness of policies and programmes to reduce the harm caused by alcohol. *Lancet* 373, 2234–2246. [PubMed: 19560605]
- Braithwaite RS, Nucifora KA, Kessler J, Toohey C, Li L, Mentor SM, Uhler LM, Roberts MS, Galvani A, Bryant K, 2014 How inexpensive does an alcohol intervention in Kenya need to be in order to deliver favorable value by reducing HIV-related morbidity and mortality? *J. Acquir. Immune Defic. Syndr.* 66, e54–e58. [PubMed: 24828269]
- Bray JW, Zarkin GA, Hinde JM, Mills MJ, 2012 Costs of alcohol screening and brief intervention in medical settings: a review of the literature. *J. Stud. Alcohol Drugs* 73, 911–919. [PubMed: 23036208]
- Bogart LM, Chetty S, Giddy J, Sypek A, Sticklor L, Walensky RP, Losina E, Katz JN, Bassett IV, 2013 Barriers to care among people living with HIV in South Africa: contrasts between patient and healthcare provider perspectives. *AIDS Care* 25, 843–853. [PubMed: 23061894]
- Breier M, Wildschut A, Mgqolozana T, 2009 *Nursing in a new era*. HSRC Press, Cape Town, South Africa.
- Brooke-Sumner C, Petersen-Williams P, Kruger J, Mahomed H, Myers B, 2019 ‘Doing more with less’: a qualitative investigation of perceptions of South African health service managers on implementation of health innovations. *Health Policy Plan.* 34, 132–140. [PubMed: 30863845]
- Chabikuli N, Blaauw D, Gilson L, Schneider H, 2005 Human resource policies: health sector reform and the management of PHC services in SA: human resources. *South African Health Review* 2005, 104–114.
- Carrasco MA, Esser MB, Sparks A, Kaufman MR, 2016 HIV-Alcohol Risk Reduction Interventions in Sub-Saharan Africa: A Systematic Review of the Literature and Recommendations for a Way Forward. *AIDS Behav.* 20, 484–503. [PubMed: 26511865]
- Cunningham SD, Card JJ, 2014 Realities of replication: implementation of evidence-based interventions for HIV prevention in real-world settings. *Implement. Sci.* 9, 5. [PubMed: 24387142]
- Dewey ME, 1983 Coefficients of agreement. *Br. J. Psychiatry* 143, 487–489. [PubMed: 6640218]
- Guest G, Namey E, Taylor J, Eley N, McKenna K, 2017 Comparing focus groups and individual interviews: findings from a randomized study. *Int. J. Soc. Res. Methodol.* 20, 693–708.
- Guest G, MacQueen KM, Namey EE, 2012 *Applied Thematic Analysis*. Sage, Thousand Oaks, CA.
- Howard BN, Van Dorn R, Myers BJ, Zule WA, Browne FA, Carney T, Wechsberg WM, 2017 Barriers and facilitators to implementing an evidence-based woman-focused intervention in South African health services. *BMC Health Serv. Res.* 17, 746. [PubMed: 29157230]
- Katz IT, Ryu AE, Onuegbu AG, Psaros C, Weiser SD, Bangsberg DR, Tsai AC, 2013 Impact of HIV-related stigma on treatment adherence: systematic review and meta- synthesis. *J. Int. AIDS Soc.* 16, 18640. [PubMed: 24242258]
- Kegeles SM, Rebchook G, Tebbetts S, Arnold E, Team TT, 2015 Facilitators and barriers to effective scale-up of an evidence-based multilevel HIV prevention intervention. *Implement Sci.* 10, 50. [PubMed: 25889582]
- Lyles CM, Kay LS, Crepaz N, Herbst JH, Passin WF, Kim AS, Rama SM, Thadiparthi S, DeLuca JB, Mullins MM, 2007 Best-evidence interventions: findings from a systematic review of HIV behavioral interventions for US populations at high risk, 2000–2004. *Am. J. Public Health* 97, 133–143. [PubMed: 17138920]
- McKleroy VS, Galbraith JS, Cummings B, Jones P, Harshbarger C, Collins C, Gelaude D, Carey JW, Team A, 2006 Adapting evidence-based behavioral interventions for new settings and target populations. *AIDS Educ. Prev.* 18, 59–73. [PubMed: 16987089]
- Magidson JF, Joska JA, Regenauer KS, Satinsky E, Andersen LS, Seitz-Brown C, Borba CP, Safren SA, Myers B, 2019 “Someone who is in this thing that I am suffering from”: The role of peers and other facilitators for task sharing substance use treatment in South African HIV care. *Int. J. Drug Policy* 70, 61–69. [PubMed: 31082664]
- Matzopoulos RG, Truen S, Bowman B, Corrigan J, 2014 The cost of harmful alcohol use in South Africa. *S. Afr. Med. J.* 104, 127–132. [PubMed: 24893544]

- Myers B, Carney T, Johnson K, Browne FA, Wechsberg WM, 2020 Service providers' perceptions of barriers to the implementation of trauma-focused substance use services for women in Cape Town, South Africa. *Int. J. Drug Policy* 75, 102628. [PubMed: 31830616]
- Myers B, Carney T, Wechsberg WM, 2016 "Not on the agenda": A qualitative study of influences on health services use among poor young women who use drugs in Cape Town, South Africa. *Int. J. Drug Policy* 30, 52–58. [PubMed: 26797188]
- Nilsen P, 2015 Making sense of implementation theories, models and frameworks. *Implement. Sci.* 10, 53. [PubMed: 25895742]
- Nilsen P, Aalto M, Bendtsen P, Seppa K, 2006 Effectiveness of strategies to implement brief alcohol intervention in primary healthcare. *Scand. J. Prim. Health Care* 24, 5–15. [PubMed: 16464809]
- Orgill M, Gilson L, Chitha W, Michel J, Erasmus E, Marchal B, Harris B, 2019 A qualitative study of the dissemination and diffusion of innovations: bottom up experiences of senior managers in three health districts in South Africa. *Int. J. Equity Health* 18, 53. [PubMed: 30925878]
- Powell BJ, Waltz TJ, Chinman MJ, Damschroder LJ, Smith JL, Matthieu MM, Proctor EK, Kirchner JE, 2015 A refined compilation of implementation strategies: results from the Expert Recommendations for Implementing Change (ERIC) project. *Implement. Sci.* 10, 21. [PubMed: 25889199]
- Proctor E, Silmere H, Raghavan R, Hovmand P, Aarons G, Bunger A, Griffey R, Hensley M, 2011 Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda. *Adm. Policy Ment. Health* 38, 65–76. [PubMed: 20957426]
- Proctor EK, Powell BJ, McMillen JC, 2013 Implementation strategies: recommendations for specifying and reporting. *Implement. Sci.* 8, 139. [PubMed: 24289295]
- Schneider M, Chersich M, Temmerman M, Degomme O, Parry CD, 2014 The impact of alcohol on HIV prevention and treatment for South Africans in primary healthcare. *Curationis* 37, 1–8.
- Tong A, Sainsbury P, Craig J, 2007 Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int. J. Qual. Health Care* 19, 349–357. [PubMed: 17872937]
- UNAIDS, 2018 Country factsheets: South Africa. Accessed on March 01, 2020 <https://www.unaids.org/en/regionscountries/countries/southafrica>.
- Wechsberg W, Zule W, van der Horst C, Bonner C, Ndirangu J, Browne FA, Kline T, Howard B, Rodman N, 2018a Combination prevention for women who use alcohol in South Africa: outcomes from the Women's Health CoOp Plus Study in Pretoria, South Africa. *J. Int. AIDS Soc.* 129.
- Wechsberg WM, Ahmed K, Ndirangu J, Browne FA, Bonner C, Speizer I, Minnis A, Nyblade L, Howard B, 2019 Can We End HIV Among Adolescent Girls and Young Women in South Africa? Key Challenges with PrEP, American Public Health Association Conference Philadelphia, PA.
- Wechsberg WM, Browne FA, Ellerson RM, Zule WA, 2010a Adapting the evidence-based Women's CoOp intervention to prevent human immunodeficiency virus infection in North Carolina and international settings. *N. C. Med. J.* 71(5), 477. [PubMed: 21473554]
- Wechsberg WM, Browne FA, Ndirangu J, Peasant C, Howard B, Zule W, 2018b Alcohol is a factor: The evidence and challenges of woman-focused research in South Africa, *Alcohol Clin Exp Res.* 314A.
- Wechsberg WM, El-Bassel N, Carney T, Browne FA, Myers B, Zule WA, 2015 Adapting an evidence-based HIV behavioral intervention for South African couples. *Subst. Abuse Treat. Prev. Policy* 10, 6. [PubMed: 25888856]
- Wechsberg WM, Jewkes R, Novak SP, Kline T, Myers B, Browne FA, Carney T, Lopez AAM, Parry C, 2013 A brief intervention for drug use, sexual risk behaviours and violence prevention with vulnerable women in South Africa: a randomised trial of the Women's Health CoOp. *BMJ Open* 3, e002622.
- Wechsberg WM, Luseno WK, Karg RS, Young S, Rodman N, Myers B, Parry CD, 2008 Alcohol, cannabis, and methamphetamine use and other risk behaviours among Black and Coloured South African women: a small randomized trial in the Western Cape. *Int. J. Drug Policy* 19, 130–139. [PubMed: 18207723]
- Wechsberg WM, Luseno WK, Kline TL, Browne FA, Zule WA, 2010b Preliminary findings of an adapted evidence-based woman-focused HIV intervention on condom use and negotiation among

at-risk women in Pretoria, South Africa. J. of Prev. Interv. Community 38, 132–146. [PubMed: 20391060]

Wechsberg WM, Ndirangu JW, Speizer IS, Zule WA, Gumula W, Peasant C, Browne FA, Dunlap L, 2017 An implementation science protocol of the Women's Health CoOp in healthcare settings in Cape Town, South Africa: A stepped-wedge design. BMC Womens Health 17, 85. [PubMed: 28923034]

Wechsberg WM, Zule WA, Luseno WK, Kline TL, Browne FA, Novak SP, Ellerson RM, 2011 Effectiveness of an adapted evidence-based woman-focused intervention for sex workers and non-sex workers: the Women's Health CoOp in South Africa. J. Drug Issues 41, 233–252.

Weiner BJ, 2009 A theory of organizational readiness for change. Implement. Sci. 4, 67. [PubMed: 19840381]

World Health Organization, 2018 Global status report on alcohol and health, 2018. World Health Organization, Geneva, Switzerland.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Highlights

- Hazardous alcohol use reduces antiretroviral adherence
- Few HIV and alcohol risk interventions have been implemented in real-world settings
- We found high acceptability, adoption, and fidelity of the Women's Health CoOp
- Implementation costs were low at \$1.39 per attendee
- Staff shortages, stigma, and limited social services challenged implementation

Table 1

Specification of the Women's Health CoOp (WHC) implementation strategies

Domain	Obtain formal commitments	Conduct educational meetings	Assess for readiness and identify barriers and facilitators	Training	Use a community collaborative board as study advisory board
Actors	Principal Investigator (PI), collaborators, consultants	PI, Project Director, Coinvestigators	PI, Project Director, Coinvestigators, Consultants	PI (WHC developer and trained clinician), WHC Master Trainer	PI, Project Director, WHC Master Trainer
Actions	Held a series of introductory meetings to provide an overview of the WHC; its history; intervention outcomes, requirements, and goals of the intervention; and related study materials.	Marketed the WHC to the entire clinic staff and administrators. Described the benefits of the intervention and how it would help achieve UNAIDS 90-90-90 targets.	Completed a survey assessing organizational readiness, barriers to change, acceptability, feasibility, and appropriateness of the WHC. Conducted focus group discussions to assess the need for interventions addressing HIV and substance use, capacity to implement the WHC, and implementation barriers and facilitators.	Provided an initial training to selected staff on the WHC and additional booster training. Training consisted of skill and knowledge building exercises (such as practicing how to use male and female condoms), role-playing, and observation and practice delivering the intervention.	Engaged and invited key stakeholders (such as government officials and clinic staff) to join an ongoing WHC Cape Town Community Collaborative Board (CCB).
Action targets	Government officials, Department of Health staff; clinic management and other key clinic staff	Clinic staff and management	Clinic staff and management	Clinic staff and management	Stakeholders, including service providers, governmental officials, and community members
Temporality	Initial governmental commitment obtained pre-implementation. Prior to the start of a new cycle, meetings were held with clinic managerial staff.	Before and during implementation	The survey was administered at baseline and 6-month follow-up, focus group discussions were conducted pre-, mid-, and post-implementation.	Training was held pre-implementation, and booster trainings occurred mid- and post-implementation. Additional trainings were held with new staff and after the modifications to the WHC in Cycle 3.	Pre-, mid-, and post-implementation
Dose	Several meetings were held at each level.	About 2 to 3 meetings with each facility	Surveys took 20 minutes to complete and focus group discussions lasted 1 to 1.5 hours.	Each interventionist received at least 16 hours of training.	Meetings were held twice a year during the study
Implementation outcomes affected	Adoption, Acceptability	Acceptability, Adoption	Appropriateness, Acceptability	Adoption, Fidelity	Acceptability, Adoption
Justification	The purpose was to ensure the support of the WHC at multiple levels, and gain approval to implement the WHC in clinics and Matrix programs.	The purpose of these meetings was to obtain buy-in from high level administrators and the clinic staff who would be implementing the WHC.	Clinics and Matrix programs recruited for this study are public facilities with limited resources. It was vital to understand capacity and address potential barriers prior to implementation.	Training was conducted to build interventionists skills to deliver the WHC. Booster trainings were conducted to incorporate insights from prior cycles and to ensure fidelity.	The purpose of the CCB was to ensure buy-in and obtain feedback on WHC marketing, recruitment, implementation, and the intervention.