Adaptation and delivery of a motivational interviewing-based counseling program for persons acutely infected with HIV in Malawi: Implementation and lessons learned

Catherine A. Grodensky[a,b,c], Carol E. Golin[b,c,d,*], Allison P. Pack[c,d], Audrey Pettifor[f], Michele Demers[g], Cecelia Massa[e], Gift Kamanga[e], Kevin McKenna[h,i], Amy Corneli[h,i]

[a] Department of Medicine, Institute of Global Health and Infectious Disease, University of North Carolina at Chapel Hill, Chapel Hill, NC, United States
[b] Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill, Chapel Hill, NC, United States
[c] Center for AIDS Research, University of North Carolina at Chapel Hill, Chapel Hill, NC, United States
[d] Department of Health Behavior, Gillings School of Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC, United States
[e] UNC Project Lilongwe, Lilongwe, Malawi
[f] Department of Epidemiology, Gillings School of Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC, United States
[g] Center for Sexuality and Health Disparities, University of Michigan, Ann Arbor, MI, United States
[h] Department of Social, Behavioral, and Health Sciences, FHI 360, Durham, NC, United States[1]
[i] Department of Population Health Sciences, Duke University School of Medicine, Durham, NC, United States

ARTICLE INFO

Article history:
Received 15 September 2017
Received in revised form 30 January 2018
Accepted 5 February 2018

Keywords:
HIV
Acute infection
Motivational interviewing
Sub-Saharan Africa
Counseling
Adaptation

ABSTRACT

Objective: Individuals diagnosed with acute HIV infection (AHI) are highly infectious and require immediate HIV prevention efforts to minimize their likelihood of transmitting HIV to others. We sought to explore the relevance of Motivational Interviewing (MI), an evidence-based counseling method, for Malawians with AHI.
Methods: We designed a MI-based intervention called "Uphungu Wanga" to support risk reduction efforts immediately after AHI diagnosis. It was adapted from Options and SafeTalk interventions, and refined through formative research and input from Malawian team members and training participants. We conducted qualitative interviews with counselors and participants to explore the relevance of MI in this context.
Results: Intervention adaptation required careful consideration of Malawian cultural context and the needs of people with AHI. Uphungu Wanga's content was relevant and key MI techniques of topic selection and goal setting were viewed positively by counselors and participants. However, rating levels of importance and confidence did not appear to help participants to explore behavior change as intended.
Conclusion: Uphungu Wanga may have provided some added benefits beyond "brief education" standard of care counseling for Malawians with AHI.
Practice implications: MI techniques of topic selection and goal setting may enhance prevention education and counseling for Malawians with AHI.

1. Introduction

Worldwide, approximately 2.5 million individuals become newly infected with the HIV-1 virus each year, with the largest burden of disease occurring in sub-Saharan Africa [1]. Newly infected individuals experience a period of acute HIV infection (AHI), a highly contagious phase that occurs before their body has mounted HIV antibodies. This period generally lasts approximately two months post-viral acquisition [2–5]. Symptoms during this acute phase are non-specific and time-limited, and although the concentration of HIV in blood and genital secretions is extremely high, standard HIV antibody tests show negative or indeterminate results due to the lack of an antibody response. Individuals with AHI are usually unaware they have been infected and often continue the risk behaviors by which they acquired HIV; therefore, they are likely to pass it on to others [6]. Indeed, the probability of transmission among those with AHI is estimated to be as much as 26 times that of chronically infected persons [7].

Previous studies have shown that when individuals are informed of their HIV-positive status, they are likely to reduce

* Corresponding author at: 310 Rosenau Hall CB #7440 Chapel Hill, NC 27599 USA.
E-mail address: carol_golin@med.unc.edu (C.E. Golin).
[1] At time of study.

https://doi.org/10.1016/j.pec.2018.02.004

sexual risk behaviors [8–11], and although data are limited, similar trends appear to exist for individuals with AHI [5,12–14]. In a mixed methods study of acutely infected individuals in Malawi (n = 37), participants also described several significant barriers to abstinence and condom use, and some reported continuing to have experiences with unprotected sex [14]. The high transmission risk that AHI poses, combined with the development of new methods for identifying individuals with AHI [3,15], presents a critical opportunity for HIV prevention, particularly in sub-Saharan Africa where HIV prevalence and incidence remain high.

Motivational Interviewing (MI) is an evidence-based approach to behavior change that holds promise for use in behavioral interventions addressing risk behavior among individuals with AHI. MI is a participant-centered, directive counseling style designed to elicit and enhance a participant's sense of importance and confidence for behavior change [16,17]. It employs active techniques, such as open-ended questions, reflective listening, and "elicit-provide-elicit" to encourage participants to explore personalized strategies for behavior change; in so doing, the MI counselor seeks to avoid counseling in which participants become passive recipients of knowledge without contributing their own ideas [18]. MI-based interventions have effectively reduced HIV risk behavior and improved medication adherence among individuals living with HIV in the US and in Europe [19–23], and been used for those same behaviors among individuals living with HIV in several sub-Saharan African settings [24–30]. Many studies testing MI-based interventions in African settings, however, reported significant implementation challenges, including lack of fidelity [26], poor session attendance [29], inadequate counselor MI proficiency [30], and a lack of change in measures of counselors' empathy and 'MI spirit' [27]. Moreover, none of these studies specifically targeted individuals with AHI.

In 2008, as part of the HIV Prevention Trials Network (HPTN) 062 pilot randomized controlled trial (RCT) [31,32], we integrated and adapted two existing evidence-based interventions that utilized MI, Options [33–35] and SafeTalk [21], to create Uphungu Wanga (or "My Counseling") to address secondary HIV prevention among individuals with AHI in Malawi. Principles from the Information-Motivation-Behavior Model (IMB) were used to guide its adaptation and implementation. Formative research from CHAVI 001, a clinical trial that examined host immune response to AHI, was also used to inform Uphungu Wanga [14]. From February 2010 to December 2011, we implemented Uphungu Wanga and tested its feasibility and acceptability in a two-arm randomized controlled trial among individuals with AHI enrolled in CHAVI 001 at a clinical site in Lilongwe. Results from the primary and secondary analyses have been reported elsewhere [31,32]. In brief, although the overall MI intervention was feasible and acceptable, most participants in both arms reported a sustained reduction in risky sexual behaviors after diagnosis [31,32].

HPTN 062 represents the first time MI has been modified for individuals with AHI and implemented in Malawi. In this manuscript, we describe 1) how Options and SafeTalk interventions were adapted for Uphungu Wanga's population and setting, and 2) the relevance and feasibility of the three key aspects of MI when modified in Uphungu Wanga—topic selection and flexibility, rating importance and confidence, and goal setting.

2. Methods

2.1. HPTN 062

A detailed description of the purpose and data collection activities for HPTN 062 can be found elsewhere [31,32]. Briefly, HPTN 062 was conducted in partnership with the Lilongwe, Malawi site of the Center for HIV/AIDS Vaccine Immunology 001 study [14]. Participants diagnosed with AHI at a sexually transmitted infection (STI) clinic located in the Kamuzu Central Hospital were enrolled in CHAVI 001 and then invited to participate in the HPTN 062 study.

The final HPTN 062 sample included 27 participants who were randomized 1:1 to receive either "brief education" counseling or the "brief education" counseling and the Uphungu Wanga intervention. Participants who were randomized to the Uphungu Wanga intervention arm received the brief educational counseling (weekly at weeks 1–4, then again at 8, 12, 16, and 24 weeks), as well as the MI counseling on the day of AHI diagnosis, three days after diagnosis, and at weeks 1, 2 and 8 after diagnosis. All participants were followed for 24 weeks of data collection. The Protection of Human Subjects Committee (PHSC) at FHI 360 and the National Health Science Research Committee in Malawi approved the study.

2.2. Development of Uphungu Wanga

We adapted Uphungu Wanga from two MI interventions, Options and SafeTalk. Options is an MI-based intervention originally developed for physician delivery during regularly scheduled HIV care appointments in U.S. clinical settings, and later tested and delivered in HIV clinical sites in Kwazulu Natal, South Africa [33]. SafeTalk is a multi-component MI-based intervention provided in four monthly sessions by Master's-level counselors in U.S. clinical settings for individuals with chronic HIV infection [21]. Session guides for SafeTalk provide sample language illustrating key points to discuss with participants, but, to preserve counselor responsiveness to clients, were not meant to be used verbatim. Both interventions were designed to reduce risky sexual behaviors among HIV-positive individuals.

Together with two MI experts from the University of North Carolina at Chapel Hill Center for AIDS Research, the U.S. study team initially adapted counseling session guides from Options and SafeTalk to create standardized guides for the Uphungu Wanga program. The draft intervention guides were then revised in collaboration with Malawian members of the HPTN 062 study team to: 1) address specific needs of participants acutely infected with HIV and 2) improve cultural competence and ensure feasibility for the Malawian setting. Key components of each source intervention and a description of how they were adapted for use in Uphungu Wanga are listed in Table 1.

Several key changes were made to account for the AHI and Malawian context. First, facilitator expertise was different. Compared to Options and SafeTalk, which respectively relied on physicians [33] and Master's-level counselors [21] to deliver MI, Uphungu Wanga was adapted to be delivered by experienced Malawian counselors. The counselors had certificates of education training in HIV voluntary counseling and testing, supplemental HIV training from the Ministry of Health, and intensive training and practice on MI specifically, but they did not have advanced degrees as in Options and SafeTalk.

Second, the short duration and high infectiousness of the AHI period influenced the timing and duration of Uphungu Wanga counseling sessions, the information covered in each session, and the degree of flexibility participants had in choosing their session topics and behavior change goals. Compared to a longer duration in Options and SafeTalk, Uphungu Wanga was designed to occur in a more condensed time frame to coincide with the AHI period, including five sessions spanning the first eight weeks after AHI diagnosis. Options and SafeTalk interventions include some flexibility in topic selection, based on the client-centered nature of MI. However, for the first three sessions of Uphungu Wanga, topics were pre-specified. We choose this approach so we could focus on topics critical to AHI given the period to intervene is very short. Yet, to follow the client-centered nature of MI, Uphungu

Table 1
Intervention Development and Adaptation Overview.

Intervention Component	Options [33]	SafeTalk [21]	Adaptation for Uphungu Wanga
Counselor/ Clinician training duration	4 h	5 days	5 days
SESSION STRUCTURE AND TIMING			
Duration	18 months	4 months	2 months
Intensity	At each regularly scheduled medical visit	Monthly	Day of diagnosis, 3 days, week 1, week 2, and week 8
Session Numbers	Variable	4 sessions	5 sessions
Session Time	10–15 min	45 min	<60 min
Interventionist	HIV care clinicians	Master's-level counselors	Trained HIV counselors (details provided below)
SESSION COMPONENTS			
Discussion Topics	Each session: • Participants are told they will be discussing drug use and sexual behaviors; they choose one behavior to focus on for the session. Follow up: • Goals set in the previous session	Each session: • Participants choose from a menu of options related to safer sex	Sessions 1–2: • Building rapport • Basic information about AHI • Behavior change for reducing HIV risk Session 3: Disclosure to sexual partners Session 4: Participants choose from a menu of topics related to AHI and HIV prevention Session 5: • Transition from acute to chronic infection • Goal setting for long-term HIV prevention
Importance and confidence	• Participants select a specific behavior to rate on "importance" and "confidence". • Clinicians/counselors ask the participants to rate the importance and confidence of changing that behavior on a scale from 0 to 10. • Clinicians/counselors use the ratings to explore barriers and facilitators to change.		• Participants select a specific behavior to rate on "importance" and "confidence". • Counselors ask the participant to rate the importance and confidence of changing that behavior on a 3-point scale: Not at all, Somewhat, and Extremely. • Counselors use the ratings to explore barriers and facilitators to change.
Goal-setting	Each session: • Clinicians/counselors elicit strategies from participants to move toward safer behavior • Clinicians/counselors negotiate an individualized behavior change goal with the participants for the next session • (Options only) Clinicians write goal on a prescription pad		• Sessions 1–2: Participants select goals related to practicing safer sex or abstinence until the next session • Session 3: Participants set goals focused on HIV status disclosure to sexual partners • Session 4: Participants set goals of their own choosing • Session 5: Participants set goals for long-term HIV prevention
Supplemental materials	• Prescription pad for writing patients' goals	• CDs, booklets, and booster letters	• None (formative research revealed participants would not want to take materials referencing HIV)
Safer Sex Information	• Not specifically included	"Did You Know?" booklet addressed the following topics: • Safer anal, vaginal, and oral sex • Using male condoms • Condom Do's and Don'ts • Using female condoms • Using dental dams • What other ways can I be intimate besides intercourse? • Positive partners • Is safer sex worth it? • How do I tell someone I'm positive? • How can I bring up safer sex?	Appendices addressed the following topics: • AHI Messages • AHI to Established HIV • Communication Skills • Condoms/Condom Demo • Risk Reduction Menu of Options • Planning for Disclosure • Triggers • Abstinence • Avoiding Fear of Partner • Negotiating Condom Use • Pregnancy and HIV • Sex with HIV+ Partner • Social Support • Ways to Be Intimate
Prevention messages	Not specifically included	Not specifically included	The following messages were communicated to participants in both arms to reinforce information about AHI: • Your HIV-test result shows that you have just contracted HIV, most likely within the past 3 months. This means you have acute HIV infection. Acute HIV infection lasts for about 3 months. (Message provided during enrollment only). • You have a lot of HIV virus in your body at this time. This makes it very easy to give HIV to another person through sex.

Table 1 (*Continued*)

Intervention Component	Options [33]	SafeTalk [21]	Adaptation for Uphungu Wanga
			• If you have unprotected sex with your partner (s), there is a very high chance that you will give him/her/them HIV. • It is very important that you either abstain or use a condom every time you have sex for at least 3–4 months.

Wanga participants could select an AHI-related topic important to them during session 4, which occurred two weeks post-diagnosis (Table 2). Session 5 used pre-specified topics to ensure discussion of participants' long-term prevention and care options and strategies.

Similarly, participants were asked to set goals in specific areas at each session. During the first two Uphungu Wanga sessions, participants set behavioral goals related to abstinence or safer sex due to the importance of risk reduction during the highly infectious AHI period. During the third session, participants set goals related to disclosure to sex partners, as our previous research demonstrated that disclosure can be an important determinant of abstinence and safer sex [14]. Participants were not given flexibility in discussion or goal topics until session 4 when they were asked to select a topic or goal of their choosing, and session 5 when they were asked to develop an individualized plan, including personalized goals, for long-term HIV care and treatment.

Third, Malawian study staff recommended several adaptations to Options and SafeTalk interventions to improve cultural competence for the Malawian setting. Specifically, they suggested modifying the 10-point numbered scale used to assess and explore participants' levels of importance and confidence in behavior change. They were concerned that participants would find the 10-point scale challenging and unfamiliar. Therefore, the scale was limited to a 3-point ordinal scale, similar to the response options used in the quantitative study assessments ("not at all", "somewhat", and "very"). We also incorporated material relevant to sexual norms in Malawi, particularly risks involved with "dry sex", "knee sex" and "sex between the buttocks." Information about contraception options was also added, and information about assertive communication skills for women was deemed necessary due to prevalent norms limiting women's ability to negotiate risk reduction.

2.3. Data collection and study population

To explore the relevance and feasibility of an MI intervention for AHI in Malawi, we examined data that were gathered from or documented by the two primary counselors who delivered Uphungu Wanga and from the 14 intervention participants participating in Uphungu Wanga. Both counselors were female and Malawian. The AHI participants included 8 men and 6 women, with a mean age of 24 (SD 4.0). Four participants were never married, six were currently married at the time of the study, and 4 were divorced. Additional characteristics for the HPTN 062 participant study sample are reported elsewhere [31,32].

Table 2
Session 4 menu of topics.

Session 4 Menu of Topics
Having children when HIV positive
Avoiding fear of one's partner
Telling others (including one's children) that "I am positive"
Finding social support and social networks
Maintaining abstinence
Using condoms and how to be safer during sex
How to be intimate when HIV-positive
Having sex with someone who is HIV-positive

For the counselor dataset, we used 1) responses to quantitative assessments that counselors completed after each Uphungu Wanga counseling session to document the topics discussed and participant goals and 2) findings from qualitative, semi-structured interviews (SSIs) that were conducted with the two intervention counselors—one interview was conducted with each counselor midway through the study and the other at the end. The SSIs explored a number of topics including perceptions of: counselor training, effectiveness, strengths and weaknesses of the intervention, participants' experiences, areas for improvement, and challenges of delivering the intervention, including the discussion guides.

The participant dataset included findings from qualitative SSIs conducted with participants as part of HPTN 062 at weeks 2, 8, 12, and 24. These SSIs explored participants' perceived acceptability of the counseling sessions. The main findings of those interviews are reported elsewhere [31].

All interviews were audio-recorded with participant permission. Detailed notes were taken for participants who did not wish to be recorded. All counselors and participants gave their written informed consent before data collection.

2.4. Data analysis

All SSIs were simultaneously transcribed and translated from Chichewa into English by the interviewer. Participant SSIs were analyzed using applied thematic analysis as described elsewhere [31]. For the counselor SSIs, two analysts developed deductive content codes based on concepts fundamental to MI and applied them to the transcripts using NVivo qualitative software. Both analysts applied codes to all four transcripts and resolved discrepancies in coding through discussion and reapplication of resolved coding. We then created data display matrices to enhance understanding of the emerging themes and sub-themes.

3. Results

3.1. Topic selection and flexibility

Both counselors said in the SSIs that they believed all topics offered in Uphungu Wanga were helpful and that none should be dropped. They perceived that study participants especially liked the opportunity to select their own topic during session 4. One counselor noted: "These people liked this part where you gave them a chance so that they are able to choose for themselves what they would want us to discuss."

Many study participants said the session on "having children when HIV positive" was particularly helpful. One study participant explained: "Because I was worrying a lot that I have HIV and I will not be able to have children, but the counseling I received has

helped me tremendously . . . It has helped me, well . . . I have learned how my future will be." Study participants also mentioned other useful topics, including: maintaining abstinence; disclosure; using condoms and having safer sex.

Although not designed to be read verbatim, the counselors indicated that they felt it was important to adhere closely to the counselor guide's sample wording and topics given the amount of material to cover in a short, specified time period. As one counselor reported, "We should stick to what we planned to discuss on that day, because there is a day [session 4] which is set for topics of choice for the clients and I feel it is good to stick to the planned session and give them the chance on that day set for topics of choice."

3.2. Rating importance and confidence

In the SSIs, one counselor discussed participant rating of importance and confidence and said that it was easy for participants to rate how important they felt it was to practice safer sex, and how confident they were in their ability to do so. However, she also noted and explained why there was little variation in the ratings, which were uniformly high across participants and sessions:

> "In this case, most of the clients that I have met and have asked this question, their answers were always, 'very important, very important!' This was because in the session, we had already informed them that, 'Since you have acute HIV it is important to reduce transmission,' so when the rating questions are asked, it is just answering what we had already told him. So I don't know whether these questions would come the other way round. This is because when asking these questions, you will have told him already about the importance . . . . I feel [the questions] are truly leading, the way they are."

Similarly, the same counselor reported that participants rated their levels of confidence in practicing safe sex consistently high; nevertheless, she found the exercise helpful because it helped clarify specifics about the participants' goals and the suitability of each goal for the participant:

> "I feel [rating confidence] is helpful because it helps us know whether the client has confidence to [achieve their goal]. It helps us know whether the client is courageous enough to do it according to his own rating of confidence. For us we are able to know the thoughts of the person about whether what we are discussing will work or not."

3.3. Perceptions of goal-setting activities and short- and long-terms goals selected

Both counselors reported that participants played an active role in goal setting, which was critical to participants' abilities to reduce risk behavior. The counselors felt that the goal-setting process helped them assess participants' understanding of AHI and dedication to practicing safer sex. The counselors noted that participants generally set "appropriate" goals reflecting an adequate understanding of AHI. Moreover, counselors perceived that participants were usually able to achieve their goals. The counselors attributed this ability to participants' option to modify their goal(s) based on individual experiences and their ownership over their goal-setting process. One counselor explained, "They were able to accomplish . . . their goals because they were forming the goals from themselves . . . . I saw that as important because a choice that they made for themselves, and they were able to accomplish."

Some participants reported that setting goals helped them feel committed to change. One participant noted, "When you accept your goal and set it, then you go ahead and do it." Another stressed how important it was to go through the process of setting a personalized goal: "Had I set another goal by just being passive, my choice could have hurt me or could have hurt others."

In many situations participants selected a set of goals enabling them to have "backup" strategies if their first goal failed. As one participant described, "I told the counselor that I will reduce my sexual behavior and the counselor encouraged me that if I fail to achieve that goal I will have to use condoms."

One counselor and several participants indicated that the specific long-term goals set during session five were usually goals that participants had already tried successfully during previous sessions as short-term goals. As one counselor described,

> "And so the aim is that the [new] goal will be long-term. So you should look at the goals that have been manageable earlier on and check whether . . . the client was able to choose a goal and would try it. It was possible that he encountered circumstances which made him not to accomplish his set goals or maybe he was able to accomplish it, yeah? . . . So we used to give them a chance to choose a goal which they had already tried and that he should be able to pick the goal which he was able to accomplish, which he also felt that he could manage for a long time."

Although goal-setting generally was seen as helpful, counselors felt that doing so at the very first counseling session, on the day of HIV diagnosis, was sometimes premature and difficult to implement by the second session just three days later. One counselor explained,

> "I feel from first day, day of enrolment, the client comes again after three days, and I feel that from the day of enrollment to come on day three, we do not give our clients enough time to meet their goal . . . . Maybe we should give them a week long after enrollment not at day three, I feel the time is not enough for them to accomplish their goal."

4. Discussion

The MI-based Uphungu Wanga intervention was shown to be acceptable (intervention format, content, and perceived effectiveness, and counselor interaction) and feasible (high overall retention) among study participants [31,32]. Adaptation of Options and SafeTalk interventions for Uphungu Wanga was enhanced by the involvement of Malawian team members, who contributed substantially to modifying HIV information topics and intervention content for the local population. Of the three key components that we adapted from Options and SafeTalk for Uphungu Wanga—topic selection and flexibility, rating importance and confidence, and goal setting—we believe two were acceptable and useful in this setting. Counselors and participants were engaged in the preselected topics in sessions 1–3 and they responded very positively to the participant topic selection during session 4, suggesting that the MI premise of offering participants a menu of counseling topics may be useful and acceptable. Participants and counselors also reacted positively to goal-setting which seemed to help participants develop concrete strategies to reduce HIV transmission risk, feel ownership over their goals, and discuss those strategies at subsequent visits.

One intervention component—having participants rate the importance they placed on changing their behavior and their confidence to make that change—may not have worked as intended. Used in Options and SafeTalk as a 10-point scale, the technique was shortened for Uphungu Wanga to a 3-point scale. Although we were only able to assess one counselor's perceptions of this scale, we suspect, based on participants' answers, that the technique did not trigger the intended detailed discussions about

barriers to behavior change. This deficiency may be due to the use of the truncated scale, participants' tendencies to choose the highest rating, the timing of the question during the session, or insufficient distinction made between importance and confidence. Future interventions may benefit from including a simpler method of exploring barriers to importance and confidence, or asking directly about specific barriers to safer sex most salient in this population, such as disclosure, the desire for sex, and (for women) male partners' refusal to abstain from sex [14].

Although we examined several aspects of MI, we did not directly assess the MI session quality utilizing one of the multiple validated coding systems available to assess MI counselor and participant behaviors. Previous research suggests that MI quality is often a significant predictor of behavior change; in the SafeTalk intervention, participants whose counselors received higher MI quality ratings were less likely to report unprotected sex at 8-month follow-up [36]. In the sub-Saharan African setting, Evangeli et al. found that counselors trained for 12 h in MI for a range of HIV-related health behaviors reported high levels of confidence in providing MI, but had not achieved beginning proficiency by the end of the training [27] or one year later [28]. The importance of MI quality and the number of counselors failing to achieve proficiency in Evangeli's studies suggest that further research is needed on the ability of counselors to achieve MI proficiency in sub-Saharan African settings. Future studies implementing MI in this setting should incorporate a coding component.

This study is not without limitations. First, we acknowledge our small sample size of both participants and counselors, as HPTN 062 was a small pilot study. Moreover, without formally applying MI coding, it is difficult to compare our results to other MI studies. Despite these limitations, we believe that the MI adaptation process we implemented, as well as the perspectives we gathered, contribute substantially to the development and adaptation of future MI interventions in sub-Saharan Africa. Future research with a larger sample size should explore more formal methods of assessing fidelity to key MI components. This research also provides insight into considerations specific for using MI with individuals with AHI in sub-Saharan Africa; however, it must be noted that the utility of an intervention tailored for this population may be limited outside of the research setting, as currently significant barriers exist to making AHI diagnostic tools widely available in this part of the world. The ultimate application of interventions such as Uphungu Wanga will depend on the extent to which AHI testing is able to be implemented.

5. Conclusions

In conclusion, adapting Options and SafeTalk for the Uphungu Wanga intervention required careful consideration of the needs of people with AHI, as well as the Malawian cultural context. Our diverse study team of MI and HIV experts as well as local collaborators facilitated that process. Findings indicate that counselors appreciated having a detailed counseling guide, yet allowing participants the chance to select a topic of personal interest during one of the sessions was highly valued by both counselors and participants. The MI component of rating importance and confidence raised implementation challenges. The goal setting process was reportedly beneficial to both counselors and participants. Given these findings, Uphungu Wanga may have provided some added benefits beyond the "brief education" standard of care counseling.

6. Practice implications

Specific MI techniques of topic selection and goal setting appear to be relevant to Malawian culture and the experiences of those diagnosed with AHI. These MI techniques may have a role in enhancing HIV prevention education and counseling in sub-Saharan African settings. However, research suggests that challenges exist in training counselors in these settings to have proficiency in delivering MI.

Sources of support

This research was funded by the National Institute of Allergy and Infectious Diseases of the National Institutes of Health under award number UM1 AI068619. Intervention adaptation and development, training, and manuscript development activities were supported by the University of North Carolina at Chapel Hill Center for AIDS Research (CFAR), an NIH Funded program P30 AI50410. Dr. Golin's salary was partially supported by Eunice B. ShriverK24 HD069204.

Acknowledgements

We are grateful to the individuals who participated in this study. We also appreciate the efforts of the following organizations, teams, and individuals: CHAVI, HPTN 062, the UNC Project, and the Kamuzu Central Hospital staff members who contributed to the implementation of this study; Niasha Fray and Sarah Rutstein, who assisted with the design of the intervention; and Kate Clouse who assisted with the design of the study instruments.

References

[1] Centers for Disease Control and Prevention, Basic Statistics, 2013, (2016) . http://www. cdc. gov/hiv/basics/statistics.html.
[2] M.S. Cohen, C.D. Pilcher, Amplified HIV transmission and new approaches to HIV prevention, J. Infect. Dis. 191 (2005) 1391–1393.
[3] Detection of acute HIV infection in two evaluations of a new HIV diagnostic testing algorithm – United States, 2011–2013, MMWR Morb. Mortal. Wkly. Rep. 62 (2013) 489–494.
[4] C.D. Pilcher, G. Joaki, I.F. Hoffman, F.E. Martinson, C. Mapanje, P.W. Stewart, K.A. Powers, S. Galvin, D. Chilongozi, S. Gama, M.A. Price, S.A. Fiscus, M.S. Cohen, Amplified transmission of HIV-1: comparison of HIV-1 concentrations in semen and blood during acute and chronic infection, AIDS 21 (2007) 1723–1730.
[5] K.A. Powers, A.C. Ghani, W.C. Miller, I.F. Hoffman, A.E. Pettifor, G. Kamanga, F.E. Martinson, M.S. Cohen, The role of acute and early HIV infection in the spread of HIV and implications for transmission prevention strategies in Lilongwe, Malawi: a modelling study, Lancet 378 (2011) 256–268.
[6] S.D. Pinkerton, How many sexually-acquired HIV infections in the USA are due to acute-phase HIV transmission? AIDS 21 (2007) 1625–1629.
[7] W.C. Miller, N.E. Rosenberg, S.E. Rutstein, K.A. Powers, Role of acute and early HIV infection in the sexual transmission of HIV, Curr. Opin. HIV AIDS 5 (2010) 277–282.
[8] L.A. Eaton, S.C. Kalichman, Changes in transmission risk behaviors across stages of HIV disease among people living with HIV, J. Assoc. Nurses AIDS Care 20 (2009) 39–49.
[9] G. Marks, N. Crepaz, J.W. Senterfitt, R.S. Janssen, Meta-analysis of high-risk sexual behavior in persons aware and unaware they are infected with HIV in the United States: implications for HIV prevention programs, J. Acquir. Immune Defic. Syndr. 39 (2005) 446–453.
[10] M.A. Schiltz, T.G. Sandfort, HIV-positive people, risk and sexual behaviour, Soc. Sci. Med. 50 (2000) 1571–1588.
[11] L.S. Weinhardt, HIV diagnosis and risk behavior, in: S. Kalichman (Ed.), Positive Prevention: Reducing HIV Transmission Among People Living with HIV/AIDS, Plenum, New York, 2004, pp. 29–64.
[12] K.A. Powers, M.S. Cohen, Acute HIV-1 infection in sub-Saharan Africa: a common occurrence overlooked, AIDS 28 (2014) 1365–1367.
[13] W.T. Steward, R.H. Remien, J.A. Higgins, R. Dubrow, S.D. Pinkerton, K.J. Sikkema, H.M. Truong, M.O. Johnson, J. Hirsch, R.A. Brooks, S.F. Morin, Behavior change following diagnosis with acute/early HIV infection-a move to serosorting with other HIV-infected individuals. The NIMH Multisite Acute HIV Infection Study: III, AIDS Behav. 13 (2009) 1054–1060.
[14] A. Pettifor, C. MacPhail, A. Corneli, J. Sibeko, G. Kamanga, N. Rosenberg, W.C. Miller, I. Hoffman, H. Rees, M.S. Cohen, Continued high risk sexual behavior following diagnosis with acute HIV infection in South Africa and Malawi: implications for prevention, AIDS Behav. 15 (2011) 1243–1250.
[15] M. Nasrullah, L.G. Wesolowski, W.A. Meyer 3rd, S.M. Owen, S. Masciotra, C. Vorwald, W.J. Becker, B.M. Branson, Performance of a fourth-generation HIV screening assay and an alternative HIV diagnostic testing algorithm, AIDS 27 (2013) 731–737.

[16] W. Miller, S. Rollnick, Motivational Interviewing Preparing People to Change Addictive Behavior, The Guilford Press, New York, 1991.
[17] W.R. Miller, G.S. Rose, Toward a theory of motivational interviewing, Am. Psychol. 64 (2009) 527–537.
[18] S. Rollnick, P. Mason, C. Butler, Health Behavior Change: A Guide for Practitioners, Churchill Livingston, 2002.
[19] R.C. Berg, M.W. Ross, R. Tikkanen, The effectiveness of MI4MSM: how useful is motivational interviewing as an HIV risk prevention program for men who have sex with men? A systematic review, AIDS Educ. Prev. 23 (2011) 533–549.
[20] M.C. Binford, S.Y. Kahana, F.L. Altice, A systematic review of antiretroviral adherence interventions for HIV-infected people who use drugs, Curr. HIV/AIDS Rep. 9 (2012) 287–312.
[21] C.E. Golin, J.A. Earp, C.A. Grodensky, S.N. Patel, C. Suchindran, M. Parikh, S. Kalichman, K. Patterson, H. Swygard, E.B. Quinlivan, K. Amola, Z. Chariyeva, J. Groves, Longitudinal effects of SafeTalk, a motivational interviewing-based program to improve safer sex practices among people living with HIV/AIDS, AIDS Behav. 16 (2012) 1182–1191.
[22] S. Hill, J. Kavookjian, Motivational interviewing as a behavioral intervention to increase HAART adherence in patients who are HIV-positive: a systematic review of the literature, AIDS Care 24 (2012) 583–592.
[23] S. Naar-King, J.T. Parsons, A.M. Johnson, Motivational interviewing targeting risk reduction for people with HIV: a systematic review, Curr. HIV/AIDS Rep. 9 (2012) 335–343.
[24] D.H. Cornman, S. Christie, L.M. Shepherd, S. MacDonald, K.R. Amico, L.R. Smith, P.A. Shuper, A. Adelaja, G. Mahlase, J.A. Frohlich, S. Pillay, U.G. Lalloo, W.A. Fisher, J.D. Fisher, Counsellor-delivered HIV risk reduction intervention addresses safer sex barriers of people living with HIV in KwaZulu-Natal, South Africa, Psychol. Health 26 (2011) 1623–1641.
[25] D.H. Cornman, S.M. Kiene, S. Christie, W.A. Fisher, P.A. Shuper, S. Pillay, G.H. Friedland, C.M. Thomas, L. Lodge, J.D. Fisher, Clinic-based intervention reduces unprotected sexual behavior among HIV-infected patients in KwaZulu-Natal, South Africa : results of a pilot study, J. Acquir. Immune Defic. Syndr. 48 (2008) 553–560.
[26] S. Dewing, C. Mathews, N. Schaay, A. Cloete, L. Simbayi, M. Chopra, The feasibility of implementing a sexual risk reduction intervention in routine clinical practice at an ARV clinic in Cape Town: a case study, AIDS Behav. 15 (2011) 905–910.
[27] M. Evangeli, S.K. Engelbrecht, L. Swartz, K. Turner, L. Forsberg, N. Soka, An evaluation of a brief motivational interviewing training course for HIV/AIDS counsellors in Western Cape Province, South Africa, AIDS Care 21 (2009) 189–196.
[28] M. Evangeli, M. Longley, L. Swartz, No reductions and some improvements in South African lay HIV/AIDS counsellors' motivational interviewing competence one year after brief training, AIDS Care 23 (2011) 269–273.
[29] M.M. Holstad, J.E. Essien, E. Ekong, M. Higgins, I. Teplinskiy, M.F. Adewuyi, Motivational groups support adherence to antiretroviral therapy and use of risk reduction behaviors in HIV positive Nigerian women: a pilot study, Afr. J. Reprod. Health 16 (2012) 14–27.
[30] R. Mash, G. Baldassini, H. Mkhatshwa, I. Sayeed, S. Ndapeua, Reflections on the training of counsellors in motivational interviewing for programmes for the prevention of mother to child transmission of HIV in sub-Saharan Africa, South Afr. Fam. Pract. 50 (2008) 53–59.
[31] A. Corneli, A. Pettifor, G. Kamanga, C. Golin, K. McKenna, S.S. Ou, G. Hamela, C. Massa, F. Martinson, J. Tharaldson, D. Hilgenberg, X. Yu, W. Chege, I. Hoffman, HPTN 062: a feasibility and acceptability pilot intervention to reduce HIV transmission risk behaviors among individuals with acute and early HIV infection in Lilongwe Malawi, AIDS Behav. 18 (2014) 1785–1800.
[32] A. Pettifor, A. Corneli, G. Kamanga, K. McKenna, N.E. Rosenberg, X. Yu, S.S. Ou, C. Massa, P. Wiyo, D. Lynn, J. Tharaldson, C. Golin, I. Hoffman, HPTN 062: a pilot randomized controlled trial exploring the effect of a motivational-Interviewing intervention on sexual behavior among individuals with acute HIV infection in lilongwe, Malawi, PLoS One 10 (2015) e0124452.
[33] J.D. Fisher, D.H. Cornman, C.Y. Osborn, K.R. Amico, W.A. Fisher, G.A. Friedland, Clinician-initiated HIV risk reduction intervention for HIV-positive persons: formative research, acceptability, and fidelity of the options project, J. Acquir. Immune Defic. Syndr. 37 (Suppl. 2) (2004) S78–87.
[34] J.D. Fisher, W.A. Fisher, D.H. Cornman, R.K. Amico, A. Bryan, G.H. Friedland, Clinician-delivered intervention during routine clinical care reduces unprotected sexual behavior among HIV-infected patients, J. Acquir. Immune Defic. Syndr. 41 (2006) 44–52.
[35] J.L. Richardson, J. Milam, A. McCutchan, S. Stoyanoff, R. Bolan, J. Weiss, C. Kemper, R.A. Larsen, H. Hollander, P. Weismuller, C.P. Chou, G. Marks, Effect of brief safer-sex counseling by medical providers to HIV-1 seropositive patients: a multi-clinic assessment, AIDS 18 (2004) 1179–1186.
[36] C. Grodensky, C. Golin, M.A. Parikh, R. Ochtera, C. Kincaid, J. Groves, L. Widman, C. Suchindran, C. McGirt, K. Amola, S. Bradley-Bull, Does the quality of safetalk motivational interviewing counseling predict sexual behavior outcomes among people living with HIV? Patient Educ. Couns. 100 (2017) 147–153.