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HIV Risk Reduction Intervention for Rural Adolescents in Malawi

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Abstract

Malawian adolescents are at risk for HIV infection. Using a quasi-experimental two group research design, we determined the efficacy of *Mzake ndi Mzake Kuunikira Achinyamata* (MMKA) in enhancing 13-19 year old Malawian males' and females' HIV knowledge, attitude about HIV, self-efficacy for condom use and for safer sex, and HIV risk reduction behaviors. The regression analyses revealed that compared to their cohorts in the control community, the adolescents in the MMKA community had significantly better scores on the outcome variables. The intervention had significant benefits for male and 16-19 year old adolescents, but not for 13-15 year old female adolescents. Tailored interventions are needed for these females.

Keywords

Malawian adolescents; HIV intervention; community

Introduction

Approximately 3.7% of Malawian females and 0.4% of Malawian males between 15 and 19 years old are HIV positive (UNGASS, 2010) and 50% of new cases occur in people between 15 and 24 years (USAID, 2010). For Malawians living with HIV, 1 in 5 females and 1 in 12 males contract HIV before their 25th birthday (Foreman & Scalway, 2000).

Over 90% of HIV transmission in Malawi is attributed to heterosexual contact (Centers for Disease Control and Prevention, 2006), and Malawian adolescents have several heterosexual risk behaviors. More than 50% have their sexual debut before age 15 (Munthali, Chimbiri, & Zula, 2004), with 60% of the male and 37% of the female adolescents between ages 15 and 19 years having had sex (Bankole, Ahmed, Neema, Ouedraogo, & Konyani, 2007). Condom use continues to be low with only 29% of males and 6% of females between 15 and 19 years old reporting using condoms the last time they had sex (Guttmacher Institute, 2005). Among 15-24 year old Malawians, 64% of males and 77% of females do not know HIV risk reduction behaviors (UNAIDS, 2006): limiting the number of sexual partners, delaying sexual initiation, practicing abstinence, and consistently using condoms (Hearst & Chen, 2004). They also lack skills for practicing safer sex behaviors to protect against HIV (Republic of Malawi, 2005).

In several countries in Africa, school-based HIV risk reduction programs (Agha & Van Rossem, 2004; Clark, Friedrich, Ndlovu, Neilands, & McFarlan, 2006; Gallant & Maticka-Tyndale, 2004; James, Reddy, Ruiter, McCauley, & van den Borne, 2006; Karnell, Cupp, Zimmerman, Feist-Price, & Bennie, 2006; Obasi et al., 2006) and community-based HIV risk reduction programs (Baptiste et al., 2006) were designed to provide basic didactic information on HIV/AIDS and condom use. However, these programs provided limited behavioral skill building. James et al. (2006) reported success in increasing condom use and Agha and Van Rossem (2004), James et al. (2004) and Obasi et al. (2006) reported success in reducing the number of sexual partners.

Pedlow and Carey (2004) encouraged the development of HIV risk reduction programs that provide extensive behavioral skill building. The *Mzake ndi Mzake Kuunikira Achinyamata* (MMKA or Friend to Friend Guiding the Youth) intervention was developed in conjunction with adolescents, their parents, and community leaders to provide extensive behavioral skill building emphasizing decision-making, refusal, and assertiveness skills (Authors, 2007). This study tested the MMKA's efficacy in enhancing HIV knowledge, attitudes, self-efficacy, and HIV risk reduction behaviors for rural Malawian adolescent boys and girls between 13 and 19 years old. A secondary purpose was to determine whether the MMKA's efficacy differed by gender and age. Thus, the research team tested MMKA's efficacy in enhancing these dependent variables for four groups: boys between 13 and 15 years old and between 16 and 19 years old, and girls between 13 and 15 years old and between 16 and 19 years old. The research team hypothesized that compared to adolescents in the no-treatment control community, the adolescents in the MMKA community would report significantly greater HIV knowledge, better attitude, greater self-efficacy, and more HIV risk reduction behaviors; these more favorable outcomes would be present for all four age and gender groups.

Method

Research Design

To determine the efficacy of the MMKA intervention for independent random samples of adolescents from the MMKA community and the no-treatment control community, we used a quasi-experimental two group research design with assessments at baseline and post

intervention. This study was part of a larger research project that developed and evaluated a peer group intervention for HIV prevention among rural health workers, adults and adolescents (Authors, 2006). Two adjacent and demographically similar districts were selected and randomly assigned to the MMKA community or the no-treatment control community. The research team chose this approach to eliminate the likelihood of contamination of the control community that would occur with the individual level random assignment. At baseline, over a period of six months, adolescents in the MMKA community and in the control community completed the baseline assessment. During the next 20 months, the research team offered a peer group intervention to adults and developed the MMKA for adolescents (Authors, 2007). Upon completion of the development of the MMKA, a series of MMKA groups were conducted over a seven month period with adolescents in the MMKA community. At post-intervention, an average of six months after the implementation of the MMKA, adolescents in both communities received the final assessment. Because we used an independent sample of adolescents as baseline and post-intervention, the same individuals could not be followed over time.

The interdisciplinary research team consisted of members prepared at the doctoral and masters' levels with extensive research experience, of different ethnicity (American Caucasian, African-American and Malawian) and with diverse expertise. All research members had up-to-date Institutional Review Board certification. The Malawian team members involved in the conduct of the assessments received extensive training on the survey administration. The training process has been described in detail in Authors (2006).

Setting

Malawi, a landlocked country in sub-Saharan Africa, is one of the world's poorest countries (Republic of Malawi, 2005). Poverty combined with high rates of HIV infection have resulted in an estimated life expectancy of 54 years (UNICEF, 2009). The majority of rural residents are subsistence farmers whose precarious livelihood makes sustaining themselves and their families difficult (Bryceson, 2006).

Two Malawian rural districts were purposefully selected for this study because they are geographically near enough to reduce transportation costs but separated by enough distance to make communication between participants in the two districts unlikely. Within each district, the research team purposefully selected five rural health centers and their surrounding communities where no HIV prevention activities were currently occurring. Both districts had a population of over 400,000 persons (National Statistical Office & ORC Macro, 2005), with residents primarily belonging to Christian churches. The residents were predominately from the Chewa tribe in one district and from the Ngoni tribe in the other district.

Sample

The selection criteria were males and females between 13 and 19 years old and residing in one of the two districts. At baseline, the research team interviewed 499 adolescents between 13 and 19 years old. At post-intervention, 777 adolescents were interviewed. The different sample sizes at baseline and post-intervention were due to having the local leaders in the

MMKA community and the no-treatment control community announce the day and time researchers would be arriving to conduct the post-intervention assessments, a strategy that was not done at the baseline assessments. In the intervention district, 69% of those surveyed reported that they had participated in MMKA.

Procedure

We obtained approval from the University of Illinois at Chicago Institutional Review Board, the University of Malawi College of Medicine Research Committee appointed to conduct ethical reviews, and the two Malawi district commissioners who provide economic development, health, and administrative governance. Lastly, the research team obtained permission from the traditional authorities for the participating communities.

For the baseline and post-intervention assessments, the research team conducted a census of all households and randomly selected households to be interviewed using a random numbers table. In each selected household that included at least one adolescent, the research team listed and then randomly selected one adolescent per household. Signed parental permission was obtained from each adolescent's parent followed by signed adolescent's assent for the adolescent's participation in the baseline and the post-intervention assessments and for those adolescents who participated in the MMKA intervention. Because reading levels were low, the research team read parental permission and adolescent assent informed documents and ascertained that parents and adolescents understood what research involvement entailed. The research team also read the assessment instrument to each adolescent on an individual basis. All approached in the MMKA community and the no-treatment control community agreed to complete the assessment. To recruit adolescents to participate in the MMKA intervention, the research team provided the MMKA community a brief description of the research and announced the meeting date and time where the research team would discuss and describe the research in detail. The research team informed those adolescents less than 18 years of age to bring their parents to this meeting; adolescents aged 18 and 19 years were not required to bring parents. None of those who came to the meeting declined to participate in the intervention. Because those participating in the intervention were self-selected, we cannot rule out selection bias.

No financial incentives were provided for the completion of the assessment. During each session of the MMKA intervention, a soft drink and a roll were provided. At the end of each session, the adolescents were given the date and time of the upcoming session. This proved to be a successful retention strategy.

Intervention

MMKA was based on the integration of social-cognitive learning theory (Bandura, 1982), the theory of reasoned action (Fishbein & Ajzen, 1975), and an understanding of adolescent development (Steinberg, 2005). The social-cognitive learning theory and the theory of reasoned action have been used in African countries to develop and implement HIV prevention interventions for adolescents with success in reducing number of sexual partners (Agha & Van Rossem, 2004; James, Reddy, Ruiter, McCauley, & van den Borne, 2006) and in promoting intention to use condoms and sexual refusal self-efficacy (Karnell, Cupp,

Zimmerman, Feist-Price, & Bennie, 2006). The MMKA intervention groups were similar to the education work groups described by Toseland and Rivas (2005) in that both were grounded in Bandura's social learning theory.

MMKA consisted of seven weekly two hour sessions. Session 1 provided content on sexual development and the functions of female and male sexual body parts. In Session 2, the focus was on the physical, emotional, and cognitive processes of growing up. Session 3 provided facts about HIV and AIDS, including information about the importance of HIV testing and where one could be tested for HIV. Additionally, shortly after the adolescent groups were completed, the Ministry of Health launched a national HIV testing day where they went to communities throughout Malawi, including the target communities, to offer free HIV testing. Session 4 focused on sexually transmitted illnesses and risky sexual behaviors presented through the risky behavior game. Session 5 focused on the reasons for the high rates of HIV among Malawians and introduced HIV risk reduction skills. These skills included assertiveness, refusal, and decision-making skills learned during modeling, guided interactive group discussions and activities, structured games, and behavioral practice of culturally and developmentally sensitive role plays with constructive feedback. In Session 6, application of the male condom was demonstrated, and everyone practiced condom application with corrective feedback. Homework assignments were given for sessions 1 through 6 to encourage sharing of information with peers. During the seventh session, adolescents presented what they had learned to parents and friends.

MMKA was conducted in same sex groups of 8-12 adolescents by trusted adults who were approved by local leaders and parents. They received extensive training related to the content and delivery of the intervention. The training process has been described in detail in Authors. (2006). In addition to dividing the youth by gender, groups were also separated into middle (13-15 years) and late adolescence (16-19 years) to allow content to focus on their developmental needs. Same gender groups are consistent with the Malawian parents' request to have boys and girls taught in same gender groups (Authors, 2007) and with social norms that mandate that females are not to discuss sexual matters with males (Dzama, 2003). Of the 800 adolescents receiving the MMKA intervention, only eight failed to complete the seven sessions (attrition rate = 0.8%). Low attrition rates can be contributed to community leaders and parents encouraging adolescents to participate because they believed that the youth would benefit from participation after they themselves had participated in the peer HIV group intervention for adults. Another factor contributing to low attrition were the intervention was scheduled around school, school-sponsored sports activities, and church activities; besides these activities, there were few other recreational opportunities for youth in these rural communities.

Instrument

The assessment instrument was developed by Authors, 2004; Authors. (2006), and Authors (2007) for adults and had not been used with adolescents. HIV knowledge consisted of general HIV knowledge and HIV prevention knowledge. General HIV knowledge was measured with an index of 11 true/false dichotomous items scored based on the percent correct; 100% indicated maximal knowledge. This index assessed the adolescent's

knowledge about the cause, cure, and transmission of HIV/AIDS. The HIV prevention knowledge was measured with one item asking adolescents to list ways a person can prevent acquiring HIV. The person received one point each for mentioning abstinence, reducing the number of sexual partners, and using condoms. The maximal score was three. Attitude about the HIV epidemic in Malawi was measured with the hope scale that consisted of two items assessing feelings about the spread of HIV in Malawi and the likelihood that people would change their sexual behaviors to stop the spread of HIV. The hope scale was measured on a 4-point Likert format: very likely (4), likely (3), somewhat likely (2), and not likely (1) and was the mean of these two items. A score of 4 represented the most hope. The hope scale's Cronbach alpha was 0.71. Self-efficacy consisted of self-efficacy for condom use or confidence in one's ability to use condoms correctly and self-efficacy for safer sex or confidence in one's ability to practice safer sex. Self-efficacy for condom use was assessed with one item that asked the adolescents how confident they were in using a condom correctly. It was measured on a 3-point Likert format: not confident (1), somewhat confident (2), and very confident (3). A score of 3 connoted maximal confidence. Self-efficacy for safer sex was assessed with a 6-item scale that asked adolescents how confident they were talking with friends, relatives, and a sexual partner about HIV/AIDS prevention and safer sex, getting a partner to agree to use condoms, saying no to sex, refusing to have sex without a condom, and obtaining condoms. It was measured on a 3-point Likert format: not confident (1), somewhat confident (2), and very confident (3). The scale was the mean of the 6 items; 3 connoted maximal confidence. Its Cronbach alpha was 0.81. HIV risk reduction behaviors were communicating with one's partner(s) about sex, maintaining abstinence in the last two months, ever using condoms in the last two months, always using condoms in the last two months, reducing the number of sexual partners in the last two months, having an HIV test in the last 12 months, and participating in community HIV prevention activities. Partner communication was assessed using a scale with two yes/no dichotomous items that measured talking to one's partner(s) about safer sex and condoms. Failure to talk to one's partner(s) on either of the two items received a score of zero, and talking to one's partner(s) on either of the two items received a score of one. The scale was the sum of the two items with a maximal score of two. Its Cronbach alpha was 0.90. Abstaining from sex, ever used condom, always used condom, multiple partners, and having an HIV test were each measured with one item. Each was a yes/no dichotomous item with a score of one representing a positive response and zero representing a negative response. Community HIV prevention was measured with an index that was the sum of eight yes/no items describing the number of HIV prevention activities reported in the last two months, specifically, whether the adolescent had lead a discussion or talked about HIV/AIDS, talked about HIV prevention with partner, adults, parents, other young people, put up poster, worn a T-shirt, and contributed time, money or supplies for HIV/AIDS related projects. These activities were selected to include activities young people can and do engage in. The maximal score was eight.

All adolescents were asked to complete the forementioned scales, except ever used condom, always used condom, and multiple partners. Only adolescents who reported being sexually active were asked these items.

Analysis of Data

The research team compared the demographic characteristics and the dependent variables for adolescents in MMKA and the control communities at baseline to determine whether the two communities differed. At post-intervention, the research team used t-tests to compare means and percentages for the dependent variables. The research team then used zero-order and multivariate linear least-squares and logit regression to identify whether intervention effects remained significant after controlling for demographic variables most prominent in influencing vulnerability to HIV infection in rural communities (Gupta, Parkhurst, Ogden, & Muhal, 2008). These covariables were presently attending school, educational level, perception of family having adequate food, gender, and age.

The research team then examined the effects of the intervention for the four gender by age groups: females ages 13-15, males ages 13-15, female ages 16-19 and males ages 16-19. At post-intervention of the 13 to 19 year old adolescents, only about 23% in the control community and 26% in the MMKA community reported being sexually active. Dividing the adolescents into four age by gender groups resulted in fewer sexually active adolescents in each group: among the 13-15 year old females, four in the control community and five in the MMKA community; among the 13-15 year old males, six in the control community and 12 in the MMKA community; among the 16-19 year old females, eight adolescents in the control community and 12 in the MMKA community; and among the 16-19 year old males, 23 in the control community and 24 in the MMKA community. These small sub-samples did not allow adequate power to determine the impact of MMKA on ever using condoms and always using condoms for age by gender group. Therefore, these variables were omitted from the group analyses.

Results

At baseline, the 13-19 year old adolescents in the MMKA community and the no-treatment control community did not differ on mean age, percent of males, school enrollment, level of education and perception of family having adequate food. At post-intervention, compared to adolescents in the no-treatment control community, more adolescents in the MMKA community had higher than a primary education and perceived that their families had adequate food. See Table 1. Additionally at baseline, the 13-19 year old adolescents did differ significantly on HIV prevention knowledge, hope, and having an HIV test in the last 12 months. Compared to adolescents in the control community, adolescents in the MMKA community had lower scores on HIV prevention knowledge and higher scores on hope and having an HIV test in the last 12 months. (Not shown in Table).

The four separate gender by age groups also showed significant differences at baseline. Compared to the 13-15 year old males in the MMKA community, more of their cohorts in the control community were in school, and compared to the 16-19 year old males in the MMKA community, more of their cohorts in the control community were older. Compared to 16-19 year old males in the control community, more males in the MMKA had higher than a primary education and perceived that their families had adequate food. Compared to their counterparts in the control community, more 13-15 year old females in the MMKA

community perceived that their families had adequate food. Several post-intervention differences also existed. More 13-15 year old females and more 13-15 year old males in the MMKA had higher than primary education and perceived that their families had adequate food than their counterparts in the control community. Also, more 16-19 years old females in the MMKA community had higher than primary education than their counterparts in the control community. Additionally, females between 13-15 years old in the MMKA had higher community HIV prevention activities than their counterparts in the control community. (Not shown in Table.)

Intervention Effects for Adolescents 13-19 years old

Compared to adolescents in the control community, adolescents in the MMKA community had significantly higher scores on HIV knowledge, more positive attitudes related to hope, and higher self-efficacy for condom use and for safer sex. Adolescents in the MMKA community were also significantly more likely to communicate with their partner about safer sex, to have ever used condoms and to use condoms consistently, to have received an HIV test, and to have participated in community HIV prevention activities. These significant differences were maintained when the following were controlled: presently attending school, educational level, perception of family having adequate food, gender, and age. See Table 2.

Intervention Effects for Adolescent Females 13-15 years old

Compared to adolescent females in the control community, adolescent females in the MMKA community had significantly higher scores on HIV knowledge, hope, self-efficacy for condom use and for safer sex, and participation in community HIV prevention activities. However, when presently attending school, educational level, and perception of family having adequate food were controlled, none of these differences remained significant. See Table 3.

Intervention Effects for Adolescent Males 13-15 years old

Compared to adolescents in the control community, males in the MMKA community had significantly higher HIV knowledge, self-efficacy for condom use and for safer sex, communication with partner, and participation in community HIV prevention activities. When controlling for presently attending school, educational level, and perception of family having adequate food, self-efficacy for condom use was no longer significant. See Table 4.

Intervention Effects for Adolescent Females 16-19 years old

Compared to adolescents in the control community, adolescents in the MMKA community had significantly higher scores on hope, self-efficacy for condom use and for safer sex, having an HIV test, and participating in community HIV prevention activities. When controlling for presently attending school, educational level, and perception of family having adequate food, hope was no longer significant. See Table 5.

Intervention Effects for Adolescent Males 16-19 years old

Compared to adolescents in the control community, adolescents in the MMKA community had significantly higher scores on general HIV knowledge, hope, self-efficacy for condom

use and for safer sex, and participation in community HIV prevention activities. These variables continued to be significant when presently attending school, educational level, and perception of family having adequate food were controlled. See Table 6.

Discussion

Compared to male and female adolescents between 13 and 19 years old in the no-treatment control community, adolescent males and females between 13 and 19 years old in the MMKA community had significantly better scores on HIV knowledge, attitudes related to hope regarding the control of the HIV epidemic in Malawi, self-efficacy for condom use and for safer sex, and HIV risk reduction behavior: communication with partner about safer sex, ever using condoms, consistently using condoms in the last two months, receipt of HIV testing in the last 12 months, and participation in HIV prevention activities in the last two months. However, the efficacy of the MMKA community varied by gender and age: males regardless of age, and older females benefited from being in the MMKA community. These adolescents had significantly increased their self-efficacy for safer sex and their participation in HIV prevention activities. Males had significantly increased their general HIV knowledge, and older males and females had significantly increased their self-efficacy for condom use. Compared to females, males benefited more from the intervention. Similarly compared to Kenyan adolescent females, Kenyan adolescent males had significant increase in their knowledge about HIV and significant improvement on their self-efficacy for condom use (Maticka-Tyndale, Wildish, & Gichuru, 2007).

The MMKA community intervention had no effects on females between 13 and 15 years old. This phenomenon speaks to the need to have gender and age specific intervention for the 13-15 year old females. For this group, HIV prevention may have been especially difficult. Cultural norms in Malawi restrict discussion of sexual issues between partners (Dzama, 2003) and between parent and child (Munthali et al., 2004). Cultural norms also prohibit the display of assertive behaviors regarding safer sex practices for the young and for women in general (Dzama, 2003). Females requesting condom use are labeled prostitutes (Guttmacher Institute, 2005) and untrustworthy (Tiessen, 2005). Therefore, young females may have been at a disadvantage because they are influenced by both of these cultural norms that make practicing safer sex more challenging. Content on assertiveness, refusal and decision-making skills in the MMKA community intervention may have been too complicated for these young females. Feedback from these adolescents, their parents, and community leaders is needed to determine how to simplify this content and to determine what content needs to be added and/or deleted and how this content is to be successfully delivered.

Adolescents in the MMKA community did not differ from adolescents in the control community on abstaining from sex. Magnani et al. (2002), James et al. (2006), Shapiro, Meekers, and Tamashe (2003) also reported that their interventions had no effects on enhancing abstinence. Cultural influences in Malawi encourage sexual activity (Tiessen, 2005) for adolescent males who are under peer pressure to be sexually active and who do not view abstinence as a viable option for HIV prevention (Amuyunzu-Nyamongo, Biddlecom, Ouedraogo, & Woog, 2005). Males who are not sexually active are teased by

other males as not being men (MacPhail & Campbell, 2001) and may experience peer rejection (Amuyunzu-Nyamongo et al.; Author 2006). Malawian female adolescents are pressured by boyfriends to engage in sex and feel they have to have sex to maintain a relationship (Caldwell, 2000).

It is encouraging that compared to 13-19 year old adolescents in the control community, their cohorts in the MMKA community had significantly greater self-efficacy for condom use, had significantly ever used condom, and had consistently used condoms. Enhancing self-efficacy has been shown to be important in predicting HIV risk reduction behavior among youth in Cameroon (Meekers & Klein, 2002) and South Africa (Hendriksen, Pettifor, Lee, Coates, & Rees, 2007). Thus, HIV risk reduction interventions promoting adolescents' confidence for condom use is a viable strategy in the fight against HIV infection.

Limitations include self-reported sensitive data through face-to-face interviews. It is highly possible that adolescents in this study under-reported their sexual activity, although we have no reason to believe that the degree of under-reporting differed in the intervention and control communities. However, future assessment of the success of an HIV risk reduction intervention should include using the audio computer-assisted self interview (A-CASI) and biological measures of HIV risk reduction behaviors. Romer et al. (1997) found that the A-CASI provided privacy for adolescents to disclose sensitive information. Using biological measures would confirm the adolescents' sexually transmitted disease status and report of sexual abstinence or of condom use. Another limitation is not tracking adolescents receiving the intervention over time. Lastly, history and maturation may have an adverse impact on internal validity.

Conclusions

The MMKA intervention is a viable HIV risk reduction program for 13 to 19 year old Malawian males and for 16 to 19 year old Malawian females, but not for 13 to 15 year old Malawian females. More research is needed to determine and test more appropriate developmental behavioral skill building interventions to meet the specific needs of 13 to 15 year old Malawian females.

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References

- Agha S, Van Rossem R. Impact of a school-based peer sexual health intervention on normative beliefs, risk perceptions, and sexual behavior of Zambian adolescents. *Journal of Adolescent Health*. 2004; 34:441–452. [PubMed: 15093801]
- Amuyunzu-Nyamongo, M.; Biddlecom, AE.; Ouedraogo, C.; Woog, V. Qualitative evidence on adolescents' views of sexual and reproductive health in Sub-Saharan Africa, Occasional Report, No. 16. The Alan Guttmacher Institute; New York: 2005.

- Bandura A. Self-efficacy mechanism in human agency. *American Psychologist*. 1982; 37:122–147.
- Bankole A, Ahmed FH, Neema S, Ouedraogo C, Konyani S. Knowledge of correct condom use and consistency of use among adolescents in four countries in Sub-Saharan Africa. *African Journal of Reproductive Health*. 2007; 11(3):197–220. [PubMed: 18458741]
- Baptiste DR, Bhana A, Petersen I, McKay M, Voisin D, Bell C, Martinez DD. Community collaborative youth-focused HIV/AIDS prevention in South Africa and Trinidad: Preliminary findings. *Journal of Pediatric Psychology*. 2006; 31(9):905–916. [PubMed: 16452646]
- Bryceson DF. Ganyu casual labour, famine and HIV/AIDS in rural Malawi: Causality and casualty. *Journal of Modern African Studies*. 2006; 44(2):173–202.
- Caldwell JC. Rethinking the African AIDS epidemic. *Population and Development Review*. 2000; 26(1):117–135.
- Clark TS, Friedrich GK, Ndlovu M, Neilands TB, McFarlan W. An adolescent-targeted HIV prevention project using African professional soccer players as role models educators in Bulawayo, Zimbabwe. *AIDS Behavior*. 2006; 10:S77–83. [PubMed: 16791526]
- Centers for Disease Control and Prevention (CDC). The global HIV/AIDS pandemic, 2006. Morbidity and Mortality Weekly Report. 2006; 55(31):841–844. [PubMed: 16902393]
- Authors. Risky sexual behaviors of adolescents in rural Malawi: Evidence from focus groups. *Journal of National Black Nurses Association*. 2006; 17(1):22–28.
- Dzama, HA. Is the use of the rubber as a preventative measure to the spread of HIV/AIDS morally justifiable. Linköping University: Centre for Applied Ethics; Sweden: 2003.
- Fishbein, M.; Ajzen, I. Belief, attitude, intention and behavior: An introduction to theory and research. Addison-Wesley; Boston: 1975.
- Foreman, M.; Scalway, T. Men and HIV in Malawi. Panos Southern Africa and UNAIDS Country Office; Lusaka, Zambia and Lilongwe, Malawi: 2000.
- Gallant M, Maticka-Tyndale E. School-based HIV prevention programmes for African youth. *Social Science and Medicine*. 2004; 58:1337–1351. [PubMed: 14759680]
- Gupta GR, Parkhurst JO, Ogden JA, Muhal A. Structural approaches to HIV prevention. *Lancet*. 2008 published on-line August 6 DOI: 10.1016/S0140-6736 (03) 608879.
- Guttmacher Institute. Adolescents in Malawi: Sexual and reproductive health. Research in Brief. 2005; (2):1–4. 2005 Series.
- Hearst N, Chen S. Condom promotion for AIDS prevention in the developing world: Is it working? *Studies in Family Planning*. 2004; 35(1):39–47. [PubMed: 15067787]
- Hendriksen ES, Pettifor A, Lee SJ, Coates TJ, Rees HV. Predictors of condom use among young adults in South Africa: The Reproductive Health and HIV Research Unit National Youth Survey. *American Journal of Public Health*. 2007; 97(7):1241–1248. [PubMed: 17538062]
- James S, Reddy P, Ruiter RA, McCauley A, van den Borne B. The impact of an HIV and AIDS life skills program on secondary school students in KwaZulu-Natal, South Africa. *AIDS Education and Prevention*. 2006; 18(4):281–294. [PubMed: 16961446]
- Author. Community consultation to develop an acceptable and effective adolescent HIV prevention intervention. *Journal of the Association of Nurses in AIDS Care*. 2007; 18:72–77. [PubMed: 17403498]
- Karnell AP, Cupp PK, Zimmerman RS, Feist-Price S, Bennie T. Efficacy of an American alcohol and HIV prevention curriculum adapted for use in South Africa: Results of a pilot study in five township schools. *AIDS Education and Prevention*. 2006; 18(4):295–310. [PubMed: 16961447]
- MacPhail C, Campbell C. 'I think condoms are good but, aai, I hate those things': Condom use among adolescents and young people in a Southern African township. *Social Science and Medicine*. 2001; 52:1613–1627. [PubMed: 11327136]
- Magnani RJ, Karim AM, Weiss LA, Bond KC, Lemba M, Morgan GT. Reproductive health risk and protective factors among youth in Lusaka, Zambia. *Journal of Adolescent Health*. 2002; 30:76–86. [PubMed: 11755804]
- Maticka-Tyndale E, Wildish J, Gichuru M. Quasi-experimental evaluation of a national primary school HIV intervention in Kenya. *Evaluation Program Planning*. 2007; 30(2):172–186. [PubMed: 17689323]

- Meekers D, Klein M. Understanding gender differences in condom use self-efficacy among youth in urban Cameroon. *AIDS Education and Prevention*. 2002; 14(1):62–72. [PubMed: 11900111]
- Munthali, AC.; Chimbiri, A.; Zulu, E. Adolescent sexual and reproductive health in Malawi: A synthesis of research evidence: Occasional Report No. 15. The is Alan Guttmacher Institute; New York: 2004.
- National Statistical Office & ORC Macro. Malawi demographic and health survey 2004. NSO and ORC Macro; Calverton, Maryland: 2005.
- Authors. A primary health care intervention to mobilize health workers for HIV prevention in Malawi. *Primary Health Care Research and Development*. 2006; 7:318–330.
- Authors. HIV prevention for primary school teachers in Malawi: Short-term effects of peer groups. *African Journal of AIDS Research*. 2007; 6(3):239–249.
- Authors. Impact of peer group education for AIDS prevention for women in Botswana. *Health Care for Women International*. 2004; 25(3):210–226. [PubMed: 15195767]
- Obasi AI, Cleophas B, Ross DA, Chima KL, Mmassy G, Gavyole A, Plummer ML, Makokha M, Mujaya B, Todd J, Wight D, Grosskurth H, Mabey DC, Hayes RJ. Rationale and design of the MEMA kwa Vijana adolescent sexual and reproductive health intervention in Mwanza Region, Tanzania. *AIDS Care*. 2006; 18(4):311–322. [PubMed: 16809108]
- Pedlow CT, Carey MP. Developmentally appropriate sexual risk reduction interventions for adolescents: Rationale, review of interventions, and recommendations for research and practice. *Annual of Behavioral Medicine*. 2004; 27(3):172–184.
- Republic of Malawi. [September 8, 2008] Malawi HIV and AIDS monitoring and evaluation report 2005: Follow-up to the Declaration of Commitment on HIV and AIDS (UNGASS).. 2005. from http://data.unaids.org/pub/Report/2006/2006_country_progress_report_malawi_en.pdf
- Romer D, Hornik R, Stanton B, Black M, Li X, Ricardo I, Feigelman S. “Talking” computers: A reliable and private method to conduct interviews on sensitive topics with children. *The Journal of Sex Research*. 1997; 34:3–9.
- Shapiro D, Meekers D, Tambashe B. Exposure to the ‘SIDA dans la Cité’ AIDS prevention television series in Côte d’Ivoire sexual risk behaviour and condom use. *AIDS Care*. 2003; 15(3):303–314. [PubMed: 12745401]
- Steinberg, L. *Adolescence*. 7th ed.. McGraw Hill; Boston: 2005.
- Tiessen R. Mainstreaming gender in HIV/AIDS programs: Ongoing challenges and new opportunities in Malawi. *Journal of International Women's Studies*. 2005; 7(1):8–25.
- Toseland, RW.; Rivas, RF. *An introduction to group work practice*. Pearson, Allyn & Bacon; Boston, MA: 2005.
- UNAIDS: Joint United Nations Programme on HIV/AIDS. 2006 report on the global AIDS epidemic. UNAIDS; Geneva, Switzerland: 2006.
- UNGASS Country Progress Report. Malawi HIV and AIDS monitoring and evaluation report: 2008-2009. 2010. Retrieved from http://data.unaids.org/pub/Report/2010/malawi_2010_country_progress_report_en.pdf
- UNICEF. Malawi statistics. 2009. Retrieved from http://www.unicef.org/infobycountry/malawi_statistics.html
- USAID. HIV/AIDS health profile. 2010. Retrieved from http://www.usaid.gov/our_work/global_health/aids/Countries/africa/malawi_profile.pdf

Table 1

Demographic Characteristics of Adolescents

	Baseline		Post-intervention	
	No-Treatment Control community	MMKA Intervention Arm	No-Treatment Control community	MMKA Intervention Arm
A. Total Sample 13-19 Years	(n=193)	(n=306)	(n=393)	(n=384)
Age (years, mean)	16.01	15.40	15.70	15.51
Male %	48.19	50.49	51.65	50.52
In School %	69.84	68.20	65.65	68.49
More Than Primary Education %	42.49	56.35	38.68	59.38 **
Adequate Food %	35.75	47.23	43.52	54.83 **
B. Females 13-15 Years	(n=51)	(n=94)	(n=104)	(n=119)
Age (years, mean)	14.22	14.05	14.09	13.90
In School %	84.31	76.60	84.62	83.19
More Than Primary Education %	33.33	47.87	25.00	55.46 ***
Adequate Food %	31.37	48.94 *	42.31	64.41 **
C. Males 13-15 Years	(n=42)	(n=86)	(n=97)	(n=94)
Age (years, mean)	14.38	14.17	14.09	14.07
In School %	100.0	77.65 ***	85.57	80.85
More Than Primary Education %	35.71	47.67	24.74	39.36 *
Adequate Food %	42.86	38.37	35.05	51.06 *
D. Females 16-19 Years	(n=49)	(n=58)	(n=86)	(n=71)
Age (years, mean)	17.22	17.19	17.26	17.35
In School %	42.55	49.12	39.53	50.70
More Than Primary Education %	57.14	72.41	47.67	80.28 ***
Adequate Food %	38.78	53.45	47.67	59.15
E. Males 16-19 Years	(n=51)	(n=68)	(n=106)	(n=100)
Age (years, mean)	17.96	17.28 **	17.48	17.45
In School %	56.00	60.87	50.00	52.00
More Than Primary Education %	43.14	65.22*	57.55	68.00
Adequate Food %	31.37	50.72 *	49.06	44.00

*
p< .05, t-test significance

**
p< .01, t-test significance

p< .001, t-test significance

Table 2
Post-Intervention HIV Knowledge, Attitude, Self-Efficacy, and Behaviors (Age 13-19 years)

	Comparison					Regression Coefficient for Intervention			
		No-Treatment Control community (n=393)	MMKA Intervention Arm (n=384)	t	Df	O-order		With controls ^a	
						B	Std Error	B	Std Error
HIV Knowledge Index	%	82.07	87.22	4.83**	747	.573**	.117	.442**	.118
HIV Prevention	Mean (s.d.)	1.38 (.69)	1.53 (.64)	3.13**	775	.151**	.048	.103*	.048
Hope Scale	Mean (s.d.)	2.25 (1.13)	2.57 (1.12)	4.00**	775	.322**	.081	.247**	.082
Self-efficacy for Condom Use	Mean (s.d.)	1.70 (.90)	1.99 (.94)	4.43**	775	.295**	.066	.294**	.064
Self-efficacy for Safer Sex Scale	Mean (s.d.)	2.47 (.61)	2.73 (.40)	7.07**	679	.262**	.037	.213**	.037
Partner Communication Scale	Mean (s.d.)	.34 (.88)	.53 (1.03)	2.72**	750	.119**	.047	.130*	.046
Abstained Last 2 Months	%	86.96	83.81	-1.24	763	-.256	.204	-.344	.217
Ever used Condom Last 2 Months ^b	%	48.78	69.81	2.07*	82	.887*	.433	.895*	.456
Always used Condom Last 2 Months ^b	%	19.51	45.28	2.76**	92	1.228**	.481	1.075*	.513
More than one partner Last 2 Months ^b	%	12.20	15.09	0.40	92	.247	.612	.401	.736
HIV Test in Last 12 Months	%	6.62	13.54	3.22**	698	.796**	.252	.753*	.267
Community HIV Prevention Index	Mean (s.d.)	1.90 (1.92)	2.89 (1.85)	7.34**	775	.997**	.135	.811**	.130

* p<.05, t-test of significance

** p<.01, t-test of significance

^aControlling for in school, education, adequate food, gender, age

^bFor sexually active adolescents only

Table 3
Post-Intervention Female HIV Knowledge, Attitude, Self-Efficacy, and Behaviors (Age 13-15 years)

	Comparison					Regression Coefficient for Intervention			
		No-Treatment Control community (n=104)	MMKA Intervention Arm (n=119)	t	df	O-order		With controls ^a	
						B	Std Error	B	Std Error
HIV Knowledge Index	%	80.59	85.94	2.85**	221	.609**	.206	.419	.216
HIV Prevention	Mean (s.d.)	1.22 (.57)	1.45 (.58)	3.01**	217	.236**	.078	.245	.082
Hope Scale	Mean (s.d.)	2.01 (1.09)	2.47 (1.11)	3.09**	221	.452**	.148	.488	.160
Self-efficacy for Condom Use	Mean (s.d.)	1.37 (.74)	1.61 (.85)	2.26*	221	.245*	.107	.244	.114
Self-efficacy for Safer Sex Scale	Mean (s.d.)	2.32 (.70)	2.62 (.44)	3.87**	167	.311**	.078	.229	.083
Partner Communication Scale	Mean (s.d.)	.06 (.36)	.10 (.40)	.84	221	.029	.035	.013	.037
Abstained Last 2 months	%	96.15	95.80	-134	221	-101	.685	-140	.732
HIV Test in Last 12 Months	%	.96	3.36	1.25	186	1.285	1.126	1.087	1.182
Community HIV Prevention Index	Mean (s.d.)	1.29 (1.61)	2.23 (1.54)	4.46**	221	.949**	.211	.612	.216

* p<.05, t-test of significance

** p<.01, t-test of significance

^aControlling for in school, education, adequate food

Table 4
Post-Intervention Male HIV Knowledge, Attitude, Self-Efficacy, and Behaviors (Age 13-15 years)

		Comparison		df	t	Regression Coefficient for Intervention		
						O-order		With controls ^a
		No-Treatment Control community (n=97)	MMKA Intervention Arm (n=94)			B	Std Error	
								B
								Std Error
<i>HIV Knowledge Index</i>	%	79.76	85.20	189	2.46**	.599**	.244	.443*
<i>HIV Prevention</i>	Mean (s.d.)	1.29 (.66)	1.50 (.62)	189	2.28*	.211*	.093	.176*
<i>Hope Scale</i>	Mean (s.d.)	2.39 (1.17)	2.41 (1.15)	189	.14	.023	.168	-.082
<i>Self-efficacy for Condom Use</i>	Mean (s.d.)	1.66 (.89)	1.94 (.93)	189	2.11*	.276*	.131	.216
<i>Self-efficacy for Safer Sex Scale</i>	Mean (s.d.)	2.40 (.63)	2.71 (.46)	177	3.89**	.311**	.080	.247**
<i>Partner Communication Scale</i>	Mean (s.d.)	.15 (.58)	.49 (1.02)	147	2.76**	.206**	.084	.197*
<i>Abstained Last 2 months</i>	%	91.75	85.11	175	-1.43	-.666	.469	-.593
<i>HIV Test in Last 12 Months</i>	%	4.12	6.38	189	.70	.461	.662	.186
<i>Community HIV Prevention Index</i>	Mean (s.d.)	1.72 (1.68)	2.55 (1.51)	189	3.60**	.832**	.231	.596*

* p<.05, t-test of significance

** p<.01, t-test of significance

^aControlling for in school, education, adequate food

Table 5

	Comparison					Regression Coefficient for Intervention			
		No-Treatment Control community (n=86)	MMKA Intervention Arm (n=71)	t	df	O-order		With controls ^a	
						B	Std Error	B	Std Error
<i>HIV Knowledge Index</i>	%	83.30	86.68	1.31	155	.372	.284	.120	.300
<i>HIV Prevention</i>	Mean (s.d.)	1.42 (.76)	1.51 (.67)	.76	155	.088	.116	-.012	.122
Hope Scale	Mean (s.d.)	2.35 (1.14)	2.69 (1.12)	1.88*	155	.341*	.182	.142	.191
<i>Self-efficacy for Condom Use</i>	Mean (s.d.)	1.59 (.86)	1.97 (.94)	2.63**	155	.379**	.144	.404**	.154
<i>Self-efficacy for Safer Sex Scale</i>	Mean (s.d.)	2.54 (.51)	2.79 (.32)	3.74**	146	.252**	.070	.170*	.073
Partner Communication Scale	Mean (s.d.)	.40 (.90)	.59 (1.10)	1.21	134	.132	.113	.156	.121
Abstained Last 2 months	%	83.53	74.65	-1.348	138	-.544	.400	-.708	.444
HIV Test in Last 12 Months	%	4.65	23.94	3.45**	98	1.865**	.583	1.941**	.629
Community HIV Prevention Index	Mean (s.d.)	1.97 (2.00)	3.46 (2.26)	4.41**	155	1.500**	.340	1.200**	.359

⁷Controlling for in school, education, adequate food

Table 6
Post-Intervention Males HIV Knowledge, Attitude, Self-Efficacy, and Behaviors (Age 16-19 years)

		Comparison		df	T	Regression Coefficient for Intervention			
						O-order		With controls ^a	
		No-Treatment Control community (n=106)	MMKA Intervention Arm (n=100)			B	Std Error	B	Std Error
HIV Knowledge Index	%	84.65	91.00	168	3.09**	.699**	.216	.612**	.214
HIV Prevention	Mean (s.d.)	1.58 (.73)	1.66 (.68)	204	.76	.075	.099	.035	.097
Hope Scale	Mean (s.d.)	2.28 (1.12)	2.77 (1.09)	204	3.20**	.492**	.154	.445**	.152
Self-efficacy for Condom Use	Mean (s.d.)	2.14 (.93)	2.51 (.82)	203	3.02**	.368**	.123	.330**	.123
Self-efficacy for Safer Sex Scale	Mean (s.d.)	2.64 (.51)	2.84 (.29)	169	3.51**	.203**	.059	.189**	.059
Partner Communication Scale	Mean (s.d.)	.75 (1.23)	1.04 (1.27)	204	1.64	.181	.118	.157	.117
Abstained Last 2 months	%	76.19	74.75	202	-.238	-.078	.326	-.077	.331
HIV Test in Last 12 Months	%	16.04	25.00	194	1.59	.557	.351	.598	.370
Community HIV Prevention Index	Mean (s.d.)	2.60 (2.12)	3.59 (1.80)	204	3.58**	.986**	.275	.895**	.273

*p<.05, t-test of significance

** p<.01, t-test of significance

^aControlling for in school, education, adequate food