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ORIGINAL PAPER

An Adolescent-targeted HIV Prevention Project Using African Professional Soccer Players as Role Models and Educators in Bulawayo, Zimbabwe

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Abstract The calamitous effects of HIV in Africa demand novel approaches to prevention. Young people are an ideal target as early intervention may have long-term benefits. Given their high social status, professional soccer players may be effective in HIV education as role models and educators. In our study, professional soccer players provided HIV education in an interactive curriculum for 7th grade boys and girls in Bulawayo, Zimbabwe. Students in intervention classrooms demonstrated significant increases in knowledge and attitudes using pre-, immediately post- and five-month post-intervention surveys. There was a delayed increase in these factors among control students, suggesting a possible diffusion of information from their peers who received the intervention curriculum. Given these results and the magnitude of the HIV epidemic, this pilot program should be replicated in other communities in sub-Saharan Africa. Continual efforts should be made to rigorously evaluate the approach and improve its effectiveness.

Keywords School-based HIV prevention · Zimbabwe · Youth · Sports · Soccer

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Introduction

The devastation of HIV demands effective prevention programs that target early adolescents. Fifty percent of new HIV infections occur in the 15–24-year-old age group (2004). Recent meta-analyses and reviews show that HIV interventions can successfully promote the adoption of protective sexual behaviors among adolescents in the United States (Kim, Stanton, Li, Dickersin, & Galbraith, 1997; Mullen, Ramirez, Hedges, & Sogolow, 2002; Peersman & Levy, 1998). Zimbabwe has been disproportionately affected by HIV, with over 200,000 thought to have died (CIA World Fact Book, 2001) and 1.8 million estimated to be infected with HIV (Center for Disease Control Global AIDS Program (CDC GAP) M&E Annual Report, 2003). Yet in Zimbabwe, only 10% of sexually active males and 11% of sexually active females use condoms in the 15–19 year age range (Human Development Hub, 2004, World Bank Report, 2004).

While African youth are at enormous risk, there are too few evaluations of programs to know what factors will be key to successful interventions in these high-risk populations (Gallant & Maticka-Tyndale, 2004). A review of published studies assessing the effectiveness of HIV prevention programs in developing countries found only two that were rigorously evaluated and aimed at adolescents (Merson, Dayton, & O'Reilly, 2000). The most common approach to reach youth is through school-based health education programs. However, evaluations of typical school-based interventions have noted the following limitations of using regular curriculum teachers: fear of community disapproval, reluctance to discuss sex and HIV, curriculum overload, and preference for doctrinaire instruction

(Kinsman et al., 2001; Visser, 1996). These factors have been cited as barriers to successful HIV prevention interventions for youth globally (Applegate, 1998).

The use of local professional soccer players to provide HIV education remains a potentially untapped resource. Soccer is the world's most popular sport, including sub-Saharan Africa. Despite this popularity there are no examples in the literature of using soccer players as health educators for HIV prevention.

We present an evaluation of an innovative school-based program that capitalizes on the celebrity of African professional soccer players to prevent HIV among youth in Zimbabwe. The program, called "*Grassroot Soccer*", is a non-profit organization that trains African professional soccer players to deliver an HIV prevention curriculum. The theoretical basis for the program is Social Learning Cognitive Theory (SCT, Bandura, 1997). A main premise of that theory is that role models are highly effective at generating self-efficacy in others, which in turn is critical to behavior change. Using soccer players also addresses many of the problems noted above with traditional school-based programs. Professional soccer players generally have time during the school day to participate in this program. As they are trained specifically for the program and do not teach other courses, they develop comfort with the content and are able to embrace an interactive teaching style. While not immune to fear of community disapproval, professional soccer players are in a position to change community norms. In addition, professional and school or after-school soccer teams provide an infrastructure upon which to build future interventions.

The present paper presents data collected on HIV-related knowledge, attitudes and intended behaviors in 12–14-year-old Zimbabwean school children. The importance of initiating prevention programming in primary schools is evident from the conclusions of reviews of interventions demonstrating that those conducted prior to sexual debut are the most effective in reducing rates of sexually transmitted infections (Grunsheit, 1997). By focusing on 12–14-year-olds it is likely that most participants are approaching sexual activity, are currently HIV-negative, and are at high risk of becoming HIV-positive in the next decade. In addition, it is likely that some of the adolescents in this age group are already sexually active. Some data suggest that in Bulawayo, 80% of in-school youth had their first sexual experience between ages 11 and 15 (UNICEF, May 2001).

We compare responses of students experiencing the new curriculum led by professional soccer players to those in same-school classrooms with the traditional curriculum. The aim of the evaluation data collected was to assess if the curriculum and approach were feasible, effective and culturally acceptable. In addition, student surveys conducted before the intervention, 2 weeks after the intervention, and 5 months after the intervention provides for the evaluation of evidence of effectiveness in changing HIV-related knowledge, attitudes and intentions. Lastly, the curriculum encourages peer-to-peer discussion following the classes. The 5-month follow-up therefore provides a measure of how program specific messages diffused to control students.

Methods

Overall Study Design

The soccer-based HIV prevention curriculum was implemented as a demonstration or pilot project in four schools. Our analysis uses data collected to evaluate the pilot project compared to an existing health education curriculum. To gauge the impact of the intervention and the diffusion of the program information through the students, a quasi-experimental design was used. Students from four schools in the Bulawayo area of Zimbabwe participated, while comparable students from the same schools served as controls. Main outcomes were HIV/AIDS knowledge, attitudes, and intentions. Data include qualitative and quantitative components collected before, immediately after the 2-week intervention, and 5 months after the intervention. There are no identifiers linking data to students.

Setting

The program was conducted in Bulawayo, Zimbabwe's second largest city. While Ndeble is the primary language, English is widely spoken. The schools that participated in the project are located in high-density townships characterized by high levels of poverty. Economically, the country is struggling, in part due to the devastation caused by HIV/AIDS. Zimbabwe is currently experiencing high rates of unemployment (Update: Zimbabwe, Epidemiological Fact Sheets on HIV/AIDS & Sexually Transmitted Infections, 2002).

Curriculum Development and Formative Research

To develop the HIV/AIDS curriculum, formative research was conducted comprising interactive teaching sessions with feedback from professional soccer players and in-depth interviews and discussion groups

with schoolteachers, headmasters, parents, and community members. A noted limitation is the somewhat large size of the discussion groups, which makes our findings less valid. Soccer player educators were recruited from two professional teams in Bulawayo. Five players were initially trained in several sessions including two who also played on the Zimbabwean men's national team and one from the Zimbabwean women's national team. One discussion group included 22 teachers and headmasters; a second comprised a mix of people from the township of Luveve, a high-density, low socio-economic suburb of Bulawayo. Professional soccer players were paid US $1 per hour, which is equivalent to the rate received by local teachers. One headmaster of a prominent local high school took a 6-month sabbatical to help develop the curriculum.

The initial curriculum was assembled by two of the research team with the consultation on SCT, and the five professional soccer players. In addition, we obtained assistance and feedback from several HIV/AIDS prevention organizations including the US Centers for Disease Control and Prevention (CDC) office in Harare, the Matabeleland AIDS Council, and local community-based organizations. The current paper presents results of the pilot testing of the curriculum in four schools.

Participants

Participating students were enrolled in one of the 7th grades of four selected township primary schools. These schools had pre-existing HIV/AIDS education incorporated into a general health education curriculum. The intervention comprised incorporation of the *Grassroot Soccer* HIV/AIDS specific curriculum delivered to four classrooms in the four schools; control comprised the HIV/AIDS content of the general health education curriculum in four other classrooms. Headmasters were not willing to have their schools act as controls without some of their students getting the perceived benefit of the intervention. We therefore had only intervention classes and control classes within the same school and no separate control schools. During the study period, both intervention and control groups received standard health education curriculum. Of note, the schools were selected by convenience, the headmaster choose the control and intervention classrooms, and the nature of the program did not allow for blinding.

Intervention Activities

The intervention group participated in four 2-h sessions over 2 weeks. The sessions were interactive, game-based with an emphasis on participation of all students. Four soccer player/educators were present at each session and worked with approximately 40 students. Smaller breakout groups during the intervention allowed students more focused time with the player/educators. Topics covered included basic knowledge about HIV transmission and ways to protect oneself, understanding personnel risk, AIDS stigma, and ways to facilitate peer-to-peer education. At the conclusion of the intervention, a graduation ceremony took place on the weekend at which certificates and T-shirts were given to the participants. Family members and friends were encouraged to attend. This was an opportunity to reach others in the community with prevention messages and also to let participants feel that their families and community supported their involvement in this program.

Measures

Quantitative and qualitative measures were based on SCT. Data were collected from a total of 304 students, 155 subjects and 149 controls. Students from both the control and intervention groups completed a self-administered questionnaire before, immediately after the intervention, and at 5-months. The quantitative component was comprised of survey items which examined a range of HIV related topics including basic knowledge on condom effectiveness, social support networks (e.g., ''List 3 or more people you can talk to about HIV''), knowledge of local HIV prevention services (e.g., ''Do you know where to get help for HIV-related problems?''), and stigma (e.g., ''Would you support a classmate who is HIV-positive?''). The rationale for this approach is based in the SCT; for an individual to change he must feel supported by his/her community. These survey questions assess how supportive an environment the individual perceives (stigma, social support, HIV-related social services) in addition to basic knowledge.

Qualitative measures were collected from five discussion groups. Three were conducted prior to the intervention (5 soccer players, 24 teachers, and 22 community members) ($n = 22$) to assist in curriculum development and to ensure that the intervention would be culturally and socially appropriate (see above). A consistent finding of these discussion groups was that we could not ask students of this age and community directly about their sexual activity. After the intervention we had two additional discussion groups with soccer players ($n = 5$) and with teachers ($n = 5$) for evaluation and feedback. Qualitative data were also collected from students in open-ended survey items.

Data Analyses

The primary analysis focuses on differences between intervention and control student responses to the quantitative surveys at baseline, immediately post-intervention, and 5-months post-intervention. Key outcome measures compared include belief in condom effectiveness at preventing HIV, social support, HIV stigma, and awareness of HIV prevention services in the community. Differences were assessed using logistic regression analysis adjusting for the clustering effect of the classroom. The framework for our analysis is that students will show no differences at baseline, significant differences immediately post-intervention, but a decrease in differences after 5 months as information diffuses from one classroom to another in each school. We also anticipate overall measures to be low at baseline, higher for the intervention group immediately after the delivery of the content, a period of increase for the control group to 5 months post-intervention with slight tapering of effect for the intervention group. These patterns or trends were assessed qualitatively. Interpretations were enhanced by information collected from the focus group discussions, key informant interviews, and responses of students to the open-ended questions.

Results

As noted, a total of 304 students were enrolled, 155 students in the intervention group and 149 in the control. At baseline, intervention and control participants did not significantly differ with respect to gender, grade, and father's education level (see Table 1). Mother's education level was different in that more control students had mothers with high school education, although mother's education level of intervention students was more likely to be unknown. The control and intervention students did not significantly differ on three of the four key HIV-related knowledge and attitude outcomes prior to the education program (see Fig. 1). Students in the intervention group reported having more social support than students in the control group. Of the 304 students who participated in the study and completed the initial survey, 302 (99%) completed the post intervention survey and 156 (51%) completed the 5-month follow-up survey. No significant difference in attrition was noted between the intervention and control groups.

Effects of the intervention on the four key outcomes are presented in Fig. 1. Relative to participants in the standard curriculum (control), participants in the HIV intervention led by professional soccer players demonstrated significantly higher levels of belief in condom effectiveness, social support, stigma and awareness of HIV prevention services immediately post-intervention. These factors improved from baseline to post-intervention for the intervention students relative to the control students. The percentage of students in the intervention group who could correctly answer that condoms are effective in preventing HIV increased from 53% to 78%; the percentage who could list 3 people who they could talk to about HIV increased from 48% to 64%; the percentage who reported they would not avoid a classmate who is HIV positive increased from 49% to 60%; and the percentage of students who reported that they knew where to look for HIV related problems increased form 51% to 78%. During this same time interval, students in the control group showed little or no change in responses to these items. Of note, girls and boys demonstrated similar responses for all items at all time points.

At 5 months, effects were generally sustained for the intervention students, although there were slight decreases in belief in condom effectiveness and social support from immediate post to 5 months post-intervention. A notable finding is that the control group had ''caught up'' with intervention group in all items as measured by the 5-month post-intervention survey.

Discussion groups with soccer players revealed that players felt comfortable with the content and interactive curriculum, and increasing confidence in teaching with time involved in the program. All players report that this is a meaningful activity and that they wish to continue with the program. Open-ended questions as part of the survey administered to participants in the intervention at 5-months reveal that almost all of the students report remembering what they had learned, a large majority of students liked what they had learned, and reported used the knowledge in some way. Slightly more than half of the students reported that they would not change anything about the program. Twenty-two percent said that they had taught others what they had learned. Girls reported identifying most strongly with the women's national team player who conducted the intervention.

Discussion groups with teachers and health administrators revealed high levels of satisfaction with the program. All teachers reported that students have increased interest in HIV and increased openness to discussing these matters. They also report that they have ''consistently seen'' graduates of the *Grassroot Soccer* program teaching other 7th grade students and younger students what they have learned. In some classes it was noted students started ''AIDS Clubs''

Table 1 Study subjects: Adolescent-targeted HIV prevention project using African professional soccer players to teach 7th grade students in Bulawayo, Zimbabwe

Variable	Intervention *N* (%)	Control *N* (%)
Total	155	149
Number of schools	4	4
Number of classrooms	4	4
7th Grade (age 12–14 years)	155 (100%)	149 (100%)
Female	79 (51%)	74 (50%)
Male	76 (49%)	75 (50%)
Mother's highest level of education		
Unknown	34 (22%)	20 (13%)
Grade school	16 (10%)	26 (17%)
High school	92 (59%)	96 (64%)
University	13 (8%)	7 (4%)
Fathers's highest level of education:		
Grade school	12 (8%)	10 (7%)
High school	89 (57%)	94 (65%)
University	19 (12%)	14 (9%)
Retention immediately post-intervention	153 (99%)	149 (100%)
Retention 5 months post-intervention	79 (51%)	77 (52%)

without help from teachers or *Grassroot Soccer* staff. Teachers concerns included that program was not sustained and teachers suggested that we provide ''simple reading materials with pictures and facts'' to allow students to reflect on what they had learned. They also noted that such material could be a resource for other students. Teachers also requested that *Grassroot Soccer* staff (professional soccer players) be involved in the students' AIDS Clubs. Teachers also felt that it was important to include the teachers and headmasters as part of this intervention but noted that students were more willing to discuss sex when teachers were not present. Teachers involved in the focus group also noted that teacher education was important as often teachers were unable to answer students' follow-up questions or would provide misinformation.

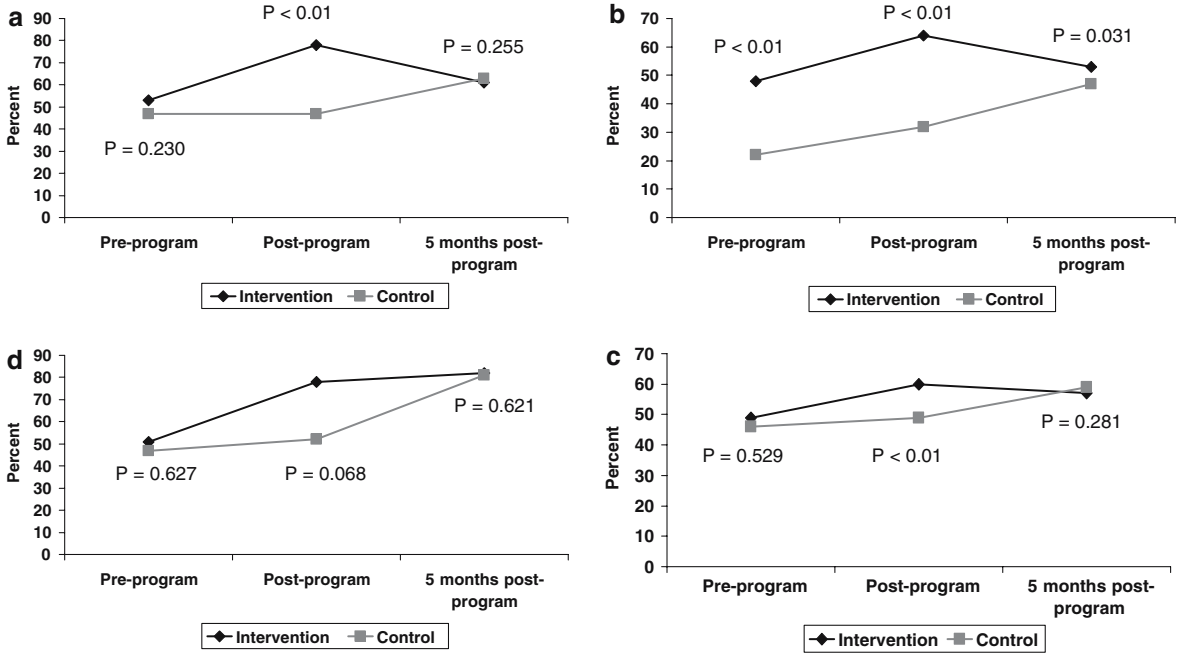

Fig. 1 (**a**) Belief in condom effectiveness, before and after HIV educational program led by professional soccer players, Zimbabwe primary school students, 2004. (**b**) Social support (knowing 3 or more persons with whom they are able to talk about HIV), before and after HIV educational program led by professional soccer players, Zimbabwe primary school students, 2004. (**c**) Awareness of HIV prevention services in community, before and after HIV educational program led by professional soccer players, Zimbabwe primary school students, 2004. (**d**) HIV stigma (not endorsing avoidance of persons with HIV) before and after HIV educational program led by professional soccer players, Zimbabwe primary school students, 2004

Discussion

This pilot study demonstrated that using Zimbabwean professional soccer players, local heroes, as HIV educators was innovative, feasible, affordable, and culturally appropriate. Not only was the curriculum well received by students and teachers in the demonstration project, but also following the program, we received and continue to receive many requests for this program. In addition, data collected during implementation of the pilot suggest that the program was effective at improving knowledge and attitudes above baseline and above students in the control curriculum immediately post intervention. These effects were generally sustained at 5 months.

An additional finding was that the control group ''caught-up'' with the intervention group at 5 months. While it is possible that this is due to other educational messages, we feel that it is likely that the information from the intervention subsequently diffused to the controls via peer-to-peer interaction. This diffusion is supported by the curriculum itself, which encouraged students to educate others as part of their ''take home'' activities. Also, qualitative data from the teachers and students further corroborate this effect. Of note, 22% of students specifically reported teaching others at 5-month follow-up is consistent with a 20% ''tipping point'' for the diffusion of innovation. The finding has encouraging implications in maximizing the reach to large numbers of children with limited resources. Also, as this intervention evolves we will seek to further augment this peer educator effect.

We recognize the limitations of the evaluation of this pilot program. The demonstration project was not designed as a large, community-based randomized controlled trial, but rather represents our effort to evaluate an innovative educational curriculum as rigorously as possible within a practical time frame. Importantly, students were not randomly assigned to intervention or control. Despite this, students in both groups were similar. Second, blinding was not possible, a fact common to many group and community education studies. Third, cross-contamination likely occurred as control and intervention groups came from the same school and part of the intervention was to tell others what you had learned. The other side to cross-contamination, however, was the desire that information spread from peer-to-peer over time. Admittedly, we did not expect the diffusion to have a powerful effect by as early as 5 months. Nonetheless, the overall temporal pattern of no baseline difference, difference in intervention group immediately post-intervention, and increase in control by 5-months is encouraging and supports a cause–effect association with the intervention. We cannot, however, exclude that this effect was not due to some external influence without further study. Finally, a limitation was that we did not ask directly about sexual risk behavior, in accordance with expressed community concerns.

Given the overwhelmingly positive reception of the program by students and teachers, the overall positive results of this program, and the context of so few effective HIV prevention programs for youth in sub-Saharan Africa, we feel the use of soccer players for HIV prevention education is very promising. The approach should be replicated on a larger scale with improved study design rigor and powered to detect significant differences in changes in attitudes and, where possible, behaviors. Increasing efforts to recruit and train women's national team soccer players as HIV educators would provide many adolescent women with powerful female role models. Given the magnitude of the problem and the intense popularity of soccer in Africa, there exists a wonderful opportunity to create effective, innovative, and large-scale interventions that use soccer to reach adolescents with effective HIV prevention messages.

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