

A comparative evaluation of two interventions for educator training in HIV/AIDS in South Africa

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ABSTRACT

The purpose of this study was to compare two different methods to teach educators about HIV/AIDS. Sixty educators were selected from eight schools in KwaZulu-Natal Province, South Africa, to undergo HIV/AIDS training using an interactive CD-ROM intervention. Another sixty educators from other schools were selected to undergo a two-day Life Skills Training Programme provided by the Department of Education. The outcomes both before and after the interventions were measured by surveying the educators' knowledge and attitudes related to HIV/AIDS, as well as their self-efficacy with respect to dealing with HIV/AIDS in the classroom setting. Both interventions resulted in significant changes in knowledge and attitudes as well as in the self-efficacy with respect to ability to teach about HIV/AIDS and to deal with classroom situations involving HIV and blood. The Life Skills Training Programme proved superior in enhancing basic knowledge about HIV, and the CD-ROM was superior in teaching about HIV transmission risks.

INTRODUCTION

South Africa is at the epicentre of the HIV/AIDS epidemic severely affecting nearly all countries in sub Saharan Africa. South Africa has one of the highest HIV prevalence rates in the world. The Joint United Nations Program on HIV/AIDS (UNAIDS) in 2008 estimates South Africa has the most HIV positive individuals in the world with the number of people living with HIV totaling 5 700 000 [C.I. - 4 900 000 - 6 600 000], with the prevalence rate for adults aged 15 to 49 being 18.1% [C.I. - 15.4% - 20.9%], the number of adults aged 15 and up living with HIV totaling 5 400 000 [C.I.- 4 700 000 - 6 200 000] , with women aged 15 and up living with HIV being disproportionately affected totaling 3 200 000 [C.I. - 2 800 000 - 3 700 000], the number of children aged 0 to 14 living with HIV totaling 280 000 [C.I. - 230 000 - 320 000] and with the number of deaths due to AIDS in 2007 totaling 350 000 [C.I. - 270 000 - 420 000]. Because a vaccine against HIV is unlikely to be available in the foreseeable future and national antiretroviral treatment programs are very costly to the society as a whole, prevention through behavioral change remains an important vehicle to check the spread of the virus.

Two recent population based surveys with biomarkers for HIV reveal that the age group that has the lowest HIV prevalence is among children 19 years of age or younger. One study estimates that while adults age 25 and older have an HIV prevalence of 15.5%, the HIV prevalences for 15-24 year olds and for 2-14 year olds are 9.3% and 5.6%, respectively (Shisana and Simbayi, 2002). In fact, boys and girls 19 years or younger have average HIV prevalence rates of 4.5% and 6.5%, respectively, much lower than the national average. This numerical trend is corroborated by another population based survey of young South Africans, which found that while adults age 25 and older have an HIV prevalence of 15.5%, the HIV prevalences for 15-24 year olds and for 2-14 year olds are 9.3% and 5.6%, respectively (Shisana, Rehle et al, 2005). In fact, boys and girls 19 years or younger have average HIV prevalence rates of 4.5% and 6.5%, respectively, much lower than the national average.

These statistics indicate that even though some school-age children are already infected, the individuals most likely to be HIV-free are among 5-14 year olds and 15-19 year olds, which also is the age group most likely to be in primary and secondary school. This presents an invaluable window of opportunity for the teaching of life skills conducive to the continuation of HIV-free lifestyle, by disseminating the proper prevention information and techniques in the classroom. However, educators may not have enough knowledge and skills to take this task to fruition.

Some recent studies suggest that school educators in South Africa have HIV prevalence and AIDS mortality that may be at least as high as, if not higher than, the general population – despite the fact that educators should be more cognizant of various prevention skills and HIV risks (Shisana, Peltzer et al., 2005). Sexual practices (such as inconsistent condom use and multiple sexual partnerships), migration and mobility, and gaps in knowledge of HIV transmission were found to be determinants of this HIV transmission. The lack of HIV/AIDS education among educators is highly likely to be one of the causal factors. Moreover, if educators are not properly informed about HIV/AIDS and ill equipped to teach about HIV/AIDS to their pupils, few avenues are left among pupils to obtain vital information about HIV/AIDS, and many alternative information sources (peers, myths, etc.) may present inaccurate information, leading to counterproductive beliefs and attitudes (e.g., "having sex with a virgin will cure AIDS").

This study examined the feasibility and outcomes of using an interactive CD-ROM to teach in-service primary and secondary school educators how to engage in issues related to HIV/AIDS. The CD-ROM was developed by the American Association of Colleges for Teacher Education and the U.S. Centers for Disease Control and Prevention, and it is specifically aimed to teach educators how to deal with various situations related to HIV/AIDS in the classroom setting.

BACKGROUND

HIV/AIDS not only reduces total human capital through premature death of learned people, but also ravages the whole educational system. The illness and death induced by HIV/AIDS has two main effects. One, it decreases the supply of human capital (through the greater AIDS-related mortality, morbidity, and absenteeism among educators). It also decreases the demand for education (through increased mortality of children, competing time demands from caretaking of ill or dying family members, decreased return to education through premature mortality, and reduced financial assets available for schooling) (Malaney, 2000). While HIV/AIDS ruins the educational system, the system itself is in a position to play a significant role in curtailing the devastation by providing a mechanism for the transmission of information about the disease and its prevention.

In South Africa in 2006, there were 12.3 million learners in 26,300 primary and secondary schools, with 385,000 educators (Department of Education, 2008). Studies have shown that

these pupils become sexually active as young as age 12 (Smart, 1999; Coombe, 2002). Various programs exist for pupil-training in HIV/AIDS both in developed and developing countries (Aplasca et al., 1995). In South Africa, HIV/AIDS is addressed extensively in the formal school curriculum as part of the subject Life Orientation. The percentage of schools that provided Life Skills Programme HIV and AIDS education in the last academic year increased to 96% in 2006 (Republic of South Africa, 2008). In addition, peer education programmes are used to educate youth about HIV and AIDS prevention, care and treatment and to promote a caring attitude towards people living with AIDS.

A school drama program in KwaZulu-Natal (KZN), South Africa, has resulted in statistically significant improvement in students' KAP scores on HIV/AIDS and greater reported condom use among sexually active pupils (Harvey et al., 2000). In Tanzania, results from a randomized controlled community trial using a comprehensive AIDS education program also showed significant effects from the intervention, in terms of both KAP scores and subjective norms and behavioral intentions with respect to having sex (Klepp et al. 1997). South Africa also has HIV/AIDS education through the Life Skills Programme. However, these large scale programs needed massive logistical support and commanded large budgetary needs since they encompassed all levels of education and curricula, not just a targeted program focusing on HIV/AIDS. The impact of such large scale undertaking has been questioned (Swart and Reddy, 1999), and evidence suggests that even among schools that have implemented the Life Skills Programme, adolescents most needing advice are least likely to get it (Tulane, 2000). It is difficult to assess whether the marginal benefit from the continued use of these more traditional methods of AIDS education will be cost-effective or will have reached a plateau or is even diminishing. Moreover, most of these programs target pupils and not educators, who are the frontline source of information and support for pupils needing advice. Peltzer et al (2003) assessed secondary school educators' comfort in teaching adolescents about sexuality and HIV/AIDS and educator knowledge about HIV/AIDS. The sample consisted of 154 educators who were mostly life skills educators. Findings suggest that most educators, are knowledgeable about AIDS, feel moderately comfortable teaching students about AIDS-related topics, have the knowledge and ability to teach about HIV/AIDS, but lack some material and community support. Educator in-service training was found to have a significant impact on perceived behavioural control of HIV/AIDS education and HIV/AIDS knowledge. In Zambia, over 80 percent of educators in a survey indicated that they did not receive any training on HIV/AIDS, had to learn the topic on their own, and felt uncomfortable teaching pupils about the subject matter (Malambo, 2000). While educators in South Africa do undergo training under the Life Skills Programme, the question remains as to whether newer forms of educational methods, such as ones using computer technology, might be able to substitute for or at least be able to complement the traditional modes of teaching.

Computer assisted instruction is an avenue by which learners and educators could be trained in HIV/AIDS. An interactive CD-ROM game has been developed for students of higher education in South Africa, with seven thousand copies of the CD-ROM distributed to universities and technikons across the country (Michel, 2005; Peters, 2004). It is unknown at this time the effectiveness of such a new technology, but several randomized clinical trials in the U.S. have been shown that similar kinds of interactive computer games do motivate health behavior change in children and adolescents in the U.S. (Lieberman, 2001). For instance, children and adolescents with asthma or diabetes who have used the video games showed significant improvements in their self-care, reductions in emergency care, and increases in their resolve not to smoke. Moreover, the interactive video games have been shown to be very well received by the intended target audience. Computer assisted technology to teach students about sex and prevention of HIV/AIDS in the U.S. has also been shown to be significantly more effective than lecture-style interventions or no intervention in improving the learners' KAP scores related to AIDS prevention (e.g., Evans et al., 2000).

While these programs that targeted young people have resulted in significant improvement in knowledge, attitudes, and health related behavior among learners, the programs did not specifically train educators. No prior study has assessed the usefulness of this kind of technology to teach educators about HIV/AIDS prevention and the skills needed to deal with classroom situations involving HIV/AIDS.

This study was therefore designed to compare the efficacy of two interventions for training educators in HIV/AIDS.

METHODS

Study Design

Sixty educators were selected from among eight primary and secondary schools in the Pietermaritzburg (PMB) region in the KwaZulu-Natal (KZN) Province of South Africa to undergo an interactive CD-ROM training. These schools were formally established department schools. Another sixty educators from the same region were selected to attend a separate two-day workshop conducted by the Psychological Services group of the KZN Department of Education and Culture, PMB. The study was approved by the KZN Department of Education and Culture and the Institutional Review Board of the University of Pennsylvania. Before the start of the study, the investigators gave verbal descriptions about the study, the steps involved in the intervention, and the entirely voluntary nature of the participation. The participants were then asked for verbal informed consent. Those who consented (only one person refused) then answered a pre-intervention survey that tested their knowledge and attitudes about HIV/AIDS, their general demographic information, and their responses to statements about self-efficacy in handling HIV/AIDS situations. This survey was then followed by the actual intervention. The CD-ROM intervention lasted approximately two and a half hours, and the workshop program was designed for two days. Subsequent to the interventions, the participants completed a post-intervention survey, which was virtually identical to that administered before the intervention.

The CD-Rom Intervention

The first intervention tool was a CD-ROM called "Everything You Wanted to Know about HIV/AIDS in the Classroom, but Were Afraid to Ask: A Teacher's Interactive Journey," developed by the American Association of Colleges for Teacher Education and the Centers for Disease Control and Prevention. (An updated edition of the CD-ROM entitled "My Year with Tony" was used as the intervention.) This video-imbedded CD-ROM is designed to prepare educators to skillfully engage issues of HIV/AIDS, by providing a story about a pupil named Tony who was infected with HIV and has been plagued with illnesses and absences related to the disease. It explored the various challenges related to teaching students with HIV, including legal issues, professional responsibility, universal precaution and infectious disease control, mental health needs, and the emotional costs of compassion. Throughout the video, the educator-viewer is required to make a series of choices after various video clips, with each decision followed by a series of developments that affected other students, their parents, and the educator's career. Issues encountered included decisions regarding confidentiality, first aid and universal precautions, sports participation by an HIV infected child, the difficulties of educator-parent relationships, and the many questions children have regarding death. The CD-ROM also contains an extensive library of information related to HIV/AIDS that the viewer could review, including sections on the risks of HIV transmission in common everyday life situations, the proper precautions for handling bloody situations, etc.

PMB Workshop – Two Day Training Intervention

This intervention involved educators from the PMB region coming to a central spot to receive a two day workshop on the HIV transmission, risk factors, and action that educators should know and undertake when confronted by the many challenges that HIV/AIDS throws up. This involved lectures, workshops, role playing, and importantly, delivery of educational material which the educators can take back to their school to use as reference material. There is an important focus on empowering these educators to act as educators in their own school and thus spread the 'correct' message about HIV/AIDS to their colleagues.

Survey Instrument

One questionnaire was administered before the intervention, and another questionnaire was administered immediately after the intervention. The pre- and post-intervention questionnaires were mostly identical and collected information on the educators' demographics (age, gender, family composition, grade-level, ethnicity, etc.), their assessment of their own risk in having been infected with HIV and other people's risk in having been infected with HIV. In addition, questions from a survey instrument entitled the "HIV/AIDS Knowledge and Attitudes Scale for Educators," that was developed by Koch and Singer (1998) were also included and tested for reliability and validity amongst in-service educators in the U.S. Items from the Koch & Singer survey have also been used among pre- and in-service school counselors in Ohio in the U.S. (Costin et al., 2003) as well as among educators in Mozambique (Visser, 2004). A few questions were slightly modified to fit the South African context.

Participants

A total of 54 educators participated in the CD-ROM intervention, and another 65 took part in the workshop intervention. All 54 CD-ROM participants completed the intervention and the pre- and post-intervention surveys. Among the 65 workshop program participants, two educators did not do the post-intervention survey, one educator started but did not finish the pre-intervention survey and did not do the post-intervention survey, and another four participants did not answer major sections of the pre-intervention survey. These latter seven observations from the workshop intervention group were deleted from the subsequent analysis. Schools for the CD-ROM intervention were selected on the basis of not having received the workshop intervention previously and having educators available at the time of field work. The educators for the workshop intervention were those who were next scheduled to receive HIV/AIDS training.

Data Analysis

Statistical analysis was performed using SAS 9.0 (Cary, North Carolina, USA). The data determined the statistical tests. Most of the questionnaire items were of the Likert scale type; e.g., 1=strongly disagree, 2=disagree, 3=uncertain, 4=agree, and 5=strongly agree. Pre- and post-intervention scores within and between samples, both using the individual Likert scale items as well as the composite Likert scale scores were investigated. Because these Likert type items are not distributed normally and given the small sample size, comparisons between and within treatment groups cannot use methods like the t-test, which assumes normality or asymptotic normality. Tests of normality on the sample using the Shapiro-Wilk and the Kolmogorov-Smirnov Tests showed that most of the Likert scale variables, both as individual items and as composite scores, violated the normality assumption. Therefore, most of the analysis was performed using nonparametric tests [for various methods to analyze Likert scale items, (see Roberson et al., 1995; Clason and Dormody, 1994; Hennig, Mullensiefen, and Bargmann, 2003; Bajorski and Petkau, 1999).

For within-sample comparisons of the pre- and post-intervention survey responses (i.e., differences within sample), the sign test and the Wilcoxon signed rank test were used (Lehmann 1975, chap. 4). The sign test detects whether a significant directional change occurred in the pre- and post-intervention scores, and the Wilcoxon signed rank test, a more powerful test than the sign test, detects the directional change but also incorporates the additional information on the magnitude of the change. Comparisons of between-sample differences in specific item scores as well as in the composite scores were done using the Wilcoxon rank sum (Mann-Whitney) test. Difference-in-differences comparisons were conducted, whereby it was examined whether the change in the scores that occurred with each intervention differed. Since the participants were not randomly assigned to the two groups and the two groups did differ in some demographics, analysis of covariance was also conducted, adjusting for these demographics as well as the baseline KAP scores. Those living in urban areas and those with science or life skills as their favored subjects in school might also benefit less because of prior exposure to the didactic materials through other means. Baseline scores were controlled for because of possible regression to the mean as well as the fact that those with initial high scores at the baseline would benefit less from the interventions.

RESULTS AND DISCUSSION

Demographic Characteristics of the Two Samples

Because the participants were not randomized, the two groups did not have the same demographic profiles. However, the vast majority of the demographic variables did not exhibit any statistical difference, as shown in Table 1.

Table 1. Characteristics of the Participants according to Intervention Assignment

	CD-ROM		PMB Training	
	N	%	N	%
Full Sample	54	100.0	58	100.0
Age				
21-30	10	18.5	7	12.1
31-40	23	42.6	30	51.7
41-50	16	29.6	20	34.5
51-60	5	9.3	1	1.7
Gender				
male	13	24.1	13	22.4
female	41	75.9	45	77.6
Race				
black	51	94.4	44	75.9
Asian	3	5.6	8	13.8
white	0	0.0	5	8.6
coloured	0	0.0	1	1.7
University Degree	11	20.4	12	20.7
Science (preferred subject)	20	37.0	14	24.1
(p < 0.15)*				
Life Skills (preferred subject)	27	50.0	43	74.1
(p < 0.02)*				
Rural	34	63.0	20	34.5
(p < 0.005)*				

Marital				
single	22	40.7	19	32.8
married	25	46.3	26	44.8
partner	5	9.3	5	8.6
widowed	1	1.9	4	6.9
divorced	1	1.9	4	6.9
Ever used condom	44	81.5	48	82.8
Consistent use of condom	14	25.9	17	29.3

*Fisher's Exact Test

Most respondents in the CD-ROM and the workshop groups were between the ages of 20 and 49 (92% and 98%, respectively), were mostly female (76% and 78%), with some having completed college education (20% and 20%), single (41% and 33%), having used condoms in the past (81% and 82%), and having practiced consistent condom use (25% and 29%). None of these variables showed statistically significant differences between the two groups, with $p > 0.37$ for the most significant variable. The three variables that were statistically significantly different between the two groups (by Fisher's Exact Test) were the percentage of educators interested in science as a subject in their own schooling (37% for CD-ROM and 24% for workshop, $p < 0.15$), percentage interested in Life Skills as a subject matter (50% and 74%, $p < 0.020$), and percentage residing in rural areas (63% and 37%, $p < 0.005$).

Results from the Knowledge, Attitude, and Self-Efficacy Questionnaire

In the survey the Koch & Singer items and an additional self-efficacy module were used to test for various dimensions related to educator's HIV knowledge, attitudes, and ability to handle HIV-related situations. The first section of the survey used true-false questions to test for factual information about HIV. The second section used a Likert scale to test for knowledge related to the HIV transmission risks in various common situations. The third section also used a Likert scale to test the degree to which educators agree or disagree with various HIV-related Attitude statements. A fourth section used yes-no answers to test for self-efficacy with respect to handling HIV-related situations. Table 2 presents noteworthy items in each of the four sections, highlighting items that were answered mostly correctly or mostly incorrectly by the respondents.

In terms of factual knowledge, most educators knew that AIDS breaks down one's immunity, with TB and pneumonia as common common diseases found in people with AIDS, and that medicines can be used to slow down the progression of the disease. However, there were also major misconceptions. Between 40 to 50 percent of the educators believed that a vaccine exists in America to protect against AIDS, that HIV could live in most warm and moist environments for days outside the body, and that there has been confirmed cases of HIV transmission from students to educators through usual daily contact. Columns 5 and 8 indicate whether the items in the survey showed statistically significant change before and after the CD-ROM or the PMB Workshop interventions, respectively. It seems that knowledge about antiretrovirals' ability to slow AIDS progression has been significantly enhanced by the PMB intervention, while both interventions dispelled the belief that an AIDS vaccine existed.

Table 2. Percent Correct Response for KAP and Self-Efficacy by Intervention Groups

	Correct	CD-Rom		PMB Workshop			
	Response	Pre	Post	Diff	Pre	Post	Diff
1	2	3	4	5	6	7	8
Factual Knowledge about HIV							
AIDS breaks down the immunity	True	98	98		98	93	
Two common diseases found in HIV positive people are pneumonia and TB	True	94	89		98	98	
Medicines can be used to slow down the progression of AIDS	True	94	96		84	95	***
There has never been a confirmed case of HIV transmission from students to teachers through usual daily contact	True	61	69		62	72	**
HIV can live in most warm, moist environments for days outside the body	False	59	61		53	52	
A vaccine to protect against AIDS is available in America	False	56	69	*	53	71	***
Knowledge about Risk of HIV Transmission							
Having sexual intercourse with an HIV positive man without a condom	Risk > 0	96	96		95	97	
HIV positive mother to baby during pregnancy or birth	Risk > 0	91	98		97	98	***
HIV positive mother breastfeeding her baby	Risk > 0	83	94	****	91	91	
Eating food prepared by one with AIDS	Risk = 0	74	91	**	59	53	
Getting bitten by mosquitoes that have just bitten people with AIDS	Risk = 0	31	81	****	59	60	
Donating blood	Risk = 0	20	43		26	26	
Attitudes about AIDS							
Teachers should have the right to refuse students with HIV/AIDS in their classroom	No	94	98		93	97	
Students with HIV/AIDS should be allowed to fully participate in the day to day activities of the classroom	Yes	85	85		80	90	
I worry about possible contact with person with AIDS	No	44	59	***	52	72	***
Teachers should be notified if they have a student with HIV/AIDS	No	39	50	**	33	41	
Self-Efficacy with respect to Handling Classroom HIV Situations							
I am able to teach a pupil with HIV/AIDS in my classroom.	Yes	94	96	***	93	100	
I am ready to deal with situations such as bloody nose, scrapes, and other minor injuries in the classroom -- even if there	Yes	89	96	***	86	100	***

	Correct	CD-Rom		PMB Workshop			
	Response	Pre	Post	Diff	Pre	Post	Diff
are pupils with HIV/AIDS in my class.							
I am able to teach my pupils how to persuade their partners to use the condom	Yes	78	85		72	91	
I am able to teach my pupils how to correctly use condoms.	Yes	61	76	****	76	86	****

* $p < 0.15$, ** $p < 0.10$, *** $p < 0.05$, **** $p < 0.01$ based on within sample signed rank test

In terms of knowledge related to transmission risks for HIV, it is noteworthy that most educators knew about the transmission risks related to pregnancy, delivery, and breastfeeding, with the interventions producing further significant improvements in some items. However, at the baseline, it is surprising that a large percentage of educators thought that donating blood, mosquito bites, and eating food prepared by someone with AIDS carried a risk of HIV transmission. While the CD-ROM was helpful in dispelling some of these misconceptions, the PMB workshop did not result in much change. This is perhaps because the CD-ROM contains a specific module on the facts and myths about transmission risks, in addition to its extensive AIDS information library.

Both interventions seem to improve various negative attitudes; however, while the improvement was statistically significant, the percentage of educators with negative attitudes after the intervention was still fairly high. For instance, 30-40% of the educators still expressed that they worry about possible contact with a person with AIDS, even after having gone through one of the interventions. In terms of educators' self-efficacy in handling classroom situations involving HIV, both interventions seem to improve educators' confidence in handling blood and in teaching pupils how to use condoms. Therefore, although both interventions resulted in improvements in the various items in each of the sections of the survey, some misconceptions still persisted.

Baseline Composite Scores by Characteristics of Educators

It should be pointed out that there were significant differences in the baseline level (as well as in the post-intervention level) between the two intervention groups in many of the items in the survey. Examining individual items in each of the subsections of the survey is illuminating in deciphering which specific items changed values over time and between interventions. However, the items are not intended to be used alone, but rather, as composite scores for each of the subsections. Table 3 presents these composite scores for the full sample, as well as for various subsamples based on the characteristics of the respondents. It also highlights any statistically significant differences between the subsamples and the Cronbach's alpha associated with each of the composite scores. It is interesting to note that these baseline (pre-intervention) scores are similar for the CD-ROM and PMB Workshop groups, except a lower attitude score among the CD-ROM sample. Because the Koch & Singer instrument has not been used in South Africa before, it is important to test whether the composite scores for each of the subsections are internally consistent. Unfortunately, the Cronbach's alpha score for the section on the factual HIV knowledge was only 0.35, an indication that either the items were not particularly related to each other or that there were multiple factors imbedded in that one subsection.

Table 3: Baseline Composite Scores by Characteristics of Educators

	No. of Teachers	HIV Knowledge	Risk Knowledge	Attitudes	Self-Efficacy
Number of Items in Scale		15	13	23	6
Total Possible Score		15	52	115	30
Cronbach's Alpha		0.35	0.64	0.67	0.73
Full Sample	112	11.35	29.43	89.92	24.19
CD-Rom	54	11.13	28.70	87.72	23.74
PMB Workshop	58	11.55	30.10	91.97	24.60
Between Group Difference				***	
Age					
21-30	17	11.12	25.12	91.65	24.65
> 30	95	11.39	30.20	89.61	24.11
Between Group Difference			*		
Gender					
Male	26	11.69	32.04	89.46	23.00
Female	86	11.24	28.64	90.06	24.55
Between Group Difference					***
University Degree					
Yes	23	11.35	26.35	91.22	23.39
No	89	11.35	30.22	89.58	24.40
Between Group Difference			**		
Science (preferred subject)					
Yes	34	11.41	28.03	88.00	23.88
No	78	11.32	30.04	90.76	24.32
Between Group Difference					
Life Skills (preferred subject)					
Yes	70	11.51	29.16	90.01	24.94
No	42	11.09	29.86	89.77	22.98
Between Group Difference					***
Locality					
Rural	54	10.98	28.07	86.65	24.15
Urban	58	11.69	30.69	92.97	24.22
Between Group Difference		**		****	
Marital					
Single	41	11.44	30.02	90.68	24.10
Married, Cohabiting, Divorced	71	11.30	29.08	89.48	24.34
Between Group Difference					

* p < 0.15, ** p < 0.10, *** p < 0.05, **** p < 0.01 based on Wilcoxon Rank-Sum Test

Given the Koch & Singer instrument was used as originally constructed, subdivision of the composite score for HIV knowledge was not undertaken. The findings, especially those that relate to the factual HIV knowledge section, should therefore be interpreted with caution. Table 3 also shows that while one might expect that public health messages have targeted younger people in South Africa and that a university degree might connote higher levels of knowledge, it turns out that younger educators and educators with university degrees in the study actually scored lower in knowledge of HIV transmission risk. Educators who had life skills as a favorite subject in their own schooling scored higher in self-efficacy to handle HIV situations in the classroom, although their baseline scores for the other sections of the survey were no different from others. Finally, those who live in urban areas had higher knowledge and attitude scores.

Pre- and Post-Intervention Scores and Net Difference by Intervention Groups

Which of the interventions was most effective, the CD-ROM or the PMB Workshop? In order to answer this question, it was compared whether the change in scores to each of the subsections of the survey was statistically significantly different between the two intervention groups, adjusting for baseline scores and other demographic characteristics. This adjustment is needed because the educators were not randomly assigned to the two interventions. As shown in Table 4, the PMB Workshop improved the scores for factual HIV knowledge significantly more than the amount of improvement achieved by the CD-ROM intervention. However, the PMB Workshop actually resulted in declines in the scores for knowledge about HIV transmission risks, while the CD-ROM intervention improved these scores, resulting in a statistically significant difference between the two intervention results. The net difference in score-changes in other domains (attitudes and self-efficacy) did not reach statistical significance.

Table 4: Pre- and Post-Intervention Scores and Net Difference by Intervention Groups

	CD-Rom	PMB Workshop	Net Effect	p Level
Factual HIV Knowledge				
Baseline	11.13	11.55		
Follow-up	11.56	12.55	0.570	0.0069
HIV Transmission Risk Knowledge				
Baseline	28.70	30.10		
Follow-up	29.94	29.48	-1.860	0.0981
Attitudes about HIV/AIDS				
Baseline	87.72	91.97		
Follow-up	89.83	93.14	-0.940	0.9532
Self-Efficacy to Handle HIV Situations				
Baseline	23.74	24.60		
Follow-up	25.76	26.71	0.090	0.6591

Note: Net Effect = (PMB Post - PMB Pre) - (CD Post - CD Pre)

Note: p Level is calculated by adjusting for baseline score and science, lifeskill, university degree, locality, marital status, gender, and age.

Study Limitations

The pre-post test has limited internal and external validity. Hence, the results should be interpreted with caution.

CONCLUSIONS

This study explored the feasibility of implementing a novel interactive CD-ROM as an intervention to teach educators how to handle and engage in issues related to HIV/AIDS in the classroom in KwaZulu-Natal, South Africa. The CD-ROM intervention was compared with an existing intervention offered by Psychological Services, PMB region of the Department of Education and Culture using a pre- and a post-intervention survey on the knowledge, attitudes, self-efficacy, and risk perception among primary and secondary school educators in the PMB Region. The results showed that both interventions made significant improvements in all the major outcomes measured. Moreover, the CD-ROM outperformed the workshop intervention in increasing knowledge about HIV transmission risks, but the workshop intervention was superior for enhancing general factual knowledge about HIV/AIDS.

Given that the two interventions resulted in differential impact on the outcomes, it is concluded that the interventions could potentially be used together to improve the educators' overall knowledge, attitudes, and self-efficacy in their ability to handle situations with HIV/AIDS. In post-intervention surveys among educators who underwent the CD-ROM training, we also found that there was near universal consensus that the CD-ROM was very useful in facilitating educator-learning of issues related to HIV/AIDS and that they would recommend similar computer-based exercises for other educators in South Africa.

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