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Effects of an undergraduate HIV/AIDS course on students' HIV risk

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Abstract

This study utilizes a quasi-experimental pre- and post-test survey design to examine the effects of a course, called *HIV/AIDS: Science, Behavior, and Society*, on undergraduate students' HIV knowledge, attitudes and risky sexual behaviors. With the assistance of social work faculty the course incorporates experiential learning pedagogy and a transdisciplinary perspective. Although the course was not designed as a prevention program, the theory of health behavior suggests the incorporation of experiential learning will impact crucial HIV/AIDS attitudes and behaviors. When regression models were applied, relative to the comparison group ($N = 111$), the HIV/AIDS class students ($N = 79$) reported an increase in post-test HIV knowledge, perceived susceptibility to HIV among females, and a reduction of risky sexual attitudes among sexually active students.

Keywords

HIV; AIDS; college students; prevention; risk behavior; theory of health behavior

In 2008, 1,997 new cases of HIV were diagnosed among young adults, living in the US, adding to the 6,044 individuals in this age group already identified as living with HIV (CDC, 2011). In a large national survey 75.1% of all college student reported ever having vaginal, oral or anal sex, with only half of those who reported vaginal sex and a third of those reporting anal sex also reported using a condom (Buhi, Marhefka & Hoban, 2010). In addition, it is estimated that 48% (9.1 million) of all new cases of STD diagnosed in the US occur among young (15-24) people (Weinstock, Berman, & Cates, 2004). The high rates of sexual activity, low rates of condom use, high rate of STD diagnosis and considerable number of new HIV cases among young adults makes this group a target for many U.S.

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prevention efforts. In addition to prevention campaigns, there has also been an effort in academia to design courses that create a greater awareness of both the social and biological challenges facing individuals living with HIV and acquired immunodeficiency syndrome (AIDS). This study examines the possible preventive impact of such a course on undergraduate students' HIV-related knowledge, attitudes, and risky sexual behaviors. The course was designed to raise student's awareness of HIV/AIDS by incorporating experiential learning pedagogical techniques. Although the course was not designed as an HIV prevention intervention, based on the theory of health behavior several aspects of the course suggest that prevention effects may result. Because school-based prevention efforts are considered to be essential by the Centers for Disease Control and Prevention (CDC, 2006) and given the concern that traditional prevention interventions reach only 20% of at-risk individuals (McCarthy, 2003), this college course is worthy of attention for its potential to affect a broad audience of young adults.

HIV risk among college students

College students have an elevated risk for HIV because although they are often informed about HIV risks (Lewis & Malow, 1997; MacDonald *et al.*, 1990; CDC, 2008), their knowledge does not automatically translate to safe behavior (Robin *et al.*, 2004; Scholly *et al.*, 2005; Wendt & Solomon, 1995). Students tend to be aware that HIV is an epidemic, is sexually transmitted, and can be prevented through the use of condoms. However, because of their lack of personal exposure to people with HIV/AIDS and their perception of being invincible to sexually transmitted infections (STIs), many college students feel disconnected from HIV and do not view themselves as susceptible to it (Barth, 2002; Opt & Loffredo, 2004; Polacek *et al.*, 2007; Lewis, Miguez-Burbano & Malow, 2009). College students also frequently underestimate their partner's susceptibility to infection, often citing the fact that they "seem" STI free as a reason for not using condoms (Downing-Matibag & Geisinger, 2009). Many students believe that condoms interrupt the sexual experience, inhibit pleasure, are unnecessary in the presence of birth control, and communicate lack of trust to their partner (Conley & Collins, 2005; Ferguson, Quinn, Eng & Sandelowski, 2006; Civic, 2000; Gebhardt, Kuyper, & Greunsven 2003; Bolton, McKay, & Schneider, 2010). Not surprisingly, college students have low rates of condom use (American College Health Association, 2007; Opt & Loffredo, 2004).

Effective HIV prevention

The HIV-risk behavior (e.g., unprotected sex, substance use during sex, and sex with multiple partners) among college students has made them the target of some prevention efforts (MacDonald *et al.*, 1990; Swanson *et al.*, 1999; Roberts & Kennedy, 2006). As with HIV prevention interventions in other populations, college interventions typically target the HIV-related knowledge, attitudes, and behaviors of participants (Basen-Engquist, 1994; Chernoff & Davison, 2005; Swanson *et al.*, 1999; Turner *et al.*, 1994; Turner *et al.*, 1993). Interventions aim to modify the knowledge and attitudes that shape behavioral intentions and behaviors themselves. Behaviors targeted for change include condom use, substance use during sex, and sex with multiple partners (Coates *et al.*, 2008). While HIV knowledge alone is insufficient to prevent disease transmission (Roberts & Kennedy, 2006; Robin *et al.*, 2004; Scholly *et al.*, 2005; Wendt & Solomon, 1995), some research has shown it to be associated with lower HIV risk (Carey & Schroder, 2002). Interventions, therefore, aim to inform participants of the ways in which the disease is transmitted, risk factors for disease contraction, and methods for prevention.

The theory of health behavior takes prevention efforts a step further, stating that in order to effect behavioral change, interventions must go beyond increasing awareness of HIV/AIDS,

to influence how an individual perceives their own susceptibility and potential consequences of not engaging in the new, less risky behavior (Rosenstock, 1974). This theory posits that people are motivated to change their behavior when risks feel personal (Mehrotra, et al., 2009). This theory was originally proposed and tested in the 1950's in response to the failure of tuberculosis (TB) prevention efforts to increase screening (Steers *et al.*, 1996; Winfield & Whaley, 2002; Lin *et al.*, 2005). The research found that a person's decision to be screened for TB was dependent on their belief that 1) personally contracting the infection was a real possibility, 2) they could be living with the disease with no perceivable signs or symptoms, 3) screening would detect TB, and 4) early detection and treatment would improve their health. This theory has since been successfully applied to preventative behaviors of HIV/AIDS (Steers *et al.*, 1996; Winfield & Whaley, 2002; Lin *et al.*, 2005). While general knowledge and awareness of HIV/AIDS increase an individual's understanding of the threat, prevention efforts will succeed in changing behavior only when the person believes themselves to be at risk of contracting the virus. In addition to understanding that the threat is real, the individual must also believe that the preventative behavior, in this case condom use, decreasing the number of partners, HIV/AIDS testing, will reduce their risk.

Like other theories of behavior change, the theory of health behavior also acknowledges the importance of self-efficacy (Rosenstock, Strecher & Becker, 1988; Lin *et al.*, 2005). In order to initiate and sustain a behavior over time a person must believe that they can perform that behavior successfully (Bandura, 1994). Persons with greater self efficacy – i.e., who feel they have the power to protect themselves from infection – are more likely to have safer sex (Sikkema *et al.*, 1995; Sanderson & Yopyk, 2007). Efficacy is greater when a person has peers who support safer sex behaviors (Chernoff & Davison, 2005) and/or has the skills necessary to negotiate safer sex with his/her sex partner(s) (O'Leary *et al.*, 1996; Lindemann, et al., 2005).

To promote changes in risky HIV-related attitudes, and behaviors, HIV prevention interventions draw from a common stock of strategies that have been shown to be effective in behavioral interventions targeting various health and social outcomes (Advocates for Youth, 2008; Basil & Brown, 2004; Ferrer-Wreder *et al.*, 2004; Gosin *et al.*, 2006; Thornton *et al.*, 2002). Rather than simple knowledge acquisition, prevention programs have emphasized interactive sessions, opportunities to practice the skills taught, providing role models or spokespersons to endorse desired attitudes and behaviors, and using personal narratives to convey information and cultivate desired attitudes.

How an HIV/AIDS course might affect students' HIV risk

Although the course under study, entitled *HIV/AIDS: Science, Behavior, and Society*, was not designed as an HIV prevention intervention, based on the theory of health behavior, it may reduce HIV risk by not only increasing knowledge and awareness but also perceived susceptibility and feelings of self efficacy. *HIV/AIDS: Science, Behavior, and Society* is an upper-division, elective, campus-wide HIV/AIDS class, covering basic epidemiology, virology, immunology, infectious disease principles, behavioral aspects of transmission prevention, and the social and public policy considerations of HIV and AIDS. The course draws students from a wide variety of academic majors addressing, albeit unintentionally, the concern that HIV prevention efforts reach only a small proportion of those at risk (McCarthy, 2003). The class aims to achieve its objectives through traditional academic methods (exams and homework) and innovative pedagogical approaches: including journaling, experiential activities, and guest speakers. In the course students write a semester-long online journal including their reactions to personal stories, descriptions of discussions with friends, strangers, and family, reactions to news stories, and movie commentaries. Students also complete 20 hours of HIV/AIDS-related experiential activities,

which may include participating in AIDS Awareness Week, volunteering at a service agency, taking an HIV test, watching films, reading books, or attending plays that deal with HIV/AIDS issues. The course features presentations by and Q & A sessions with guest speakers including people who are HIV positive, people living with AIDS, expert HIV physicians, community health leaders, social workers, nurses, HIV researchers, and others actively involved in HIV issues.

The course's innovative methods reflect the emergence of experiential learning and service- or community-based learning in higher education pedagogy (Scales *et al.*, 2006) which has been found to be a valuable tool when teaching lower-income and ethnic minority students – notably, two groups with higher risk for STIs (Centers for Disease Control, 2008, Ross *et al.*, 2006). Theory and a growing body of evidence suggest that personalizing academic material fosters a greater commitment not only to the course but also to one's education enhancing learning, and perhaps most importantly, to promote integration of the material into the students' lives (Owens & Wang, 2001). Experiential activities play a role in contextualizing the information for the students, making it more meaningful to them personally. For example, Harkavy and Romer (1999) examined numerous colleges offering service learning opportunities and found that student participants were better able to integrate their classroom learning. In addition to improving the acquisition and retention of knowledge, experiential learning has been shown to build skills, such as problem solving ability (Bonnett, 2006), and influence attitudes.

Studies suggest that participation in experiential learning is not only effective at imparting knowledge but also encouraging students to apply that knowledge in the real world. Jones and Abes (2004), for example, found that service learning experiences influenced students' identities and altered students' HIV-related life choices. Harkavy and Romer (1999) found that HIV-related service learning opportunities positively affected students' level of HIV awareness and empathy towards infected people. O'Donnell and colleagues (O'Donnell *et al.*, 2002; O'Donnell *et al.*, 1999) even documented a reduction in sexual risk taking among adolescents who participated in experiential learning activities. Experiential learning techniques put students in contact with individual living with HIV/AIDS increasing their perceived susceptibility of infection (Burkholder *et al.*, 1999; Opt *et al.*, 2004). Based on the theory of health behavior, when students perceive themselves to be at risk they are more likely to engage in safer sex behaviors, such as condom use (Winfield & Whaley, 2005). The course may also influence students' perceived self efficacy by asking them to reflect on their own attitudes and behaviors through journaling (Paxton, 2002) and increasing peer support for low-HIV-risk behavior. Course-related shifts in HIV-related knowledge and attitudes may then lead to behavioral changes resulting in reduced HIV risk.

Based on previous literature and theory, we hypothesize that relative to students in a comparison condition and controlling for baseline knowledge, behaviors and attitudes, students in the HIV/AIDS course will report greater HIV-related knowledge and lower risk attitudes and behaviors at post-test. The course thus provides a test case for assessing the prevention impact of an experiential learning approach to HIV education in a university setting.

Methods

The study utilized a pre- and post-test, comparison-group design and involved data collected via surveys completed in class, once at the beginning and once at the end of the semester-long (15 week) course. Participants included students from a large public university in the Southwest United States. The treatment group consisted of students in the HIV/AIDS course. The comparison group consisted of students in an upper-division sociology course

titled Sociology of Marriage and Family. The sociology course was selected as a comparison because it addresses some of the same themes addressed in the HIV/AIDS course, such as relationships and sexuality, but did not incorporate experiential learning techniques. The use of the sociology class as a comparison group allowed the study to control for history, testing and maturation effects, although the use of a quasi-experimental design opens the study up to issues of selection bias. In accordance with the requirements of the university's institutional review board, which approved the research, study participation was voluntary, students' identities were kept confidential, and referral to counseling services was available in the event of distress. All students present the day the pre-test was administered (N=420) received an informed consent letter. Of these 85% (N=358) chose to participate and signed a consent form which they then turned in to the research team, separate from their completed questionnaire.

The final sample for this analysis included the 190 students who completed both a pre-test, conducted during the second week of the spring 2007 semester, and a post-test, conducted during the last week of the Spring 2007 semester. The sample was 97% heterosexual and 68% female. The mean age was 22 years. The sample was 75% non-Latino White, 14% Latino, 5% Asian/Pacific Islander, 4% African American, and 2% other ethnicity. The majority of students identified as being in a committed relationship at the pre-test and post-test (54% and 60%, respectively), and 65% were sexually active (defined as engaging in oral, anal, or vaginal sex) during both waves. A notable portion of students (20%) were not sexually active at either wave.

The outcome measures in this analysis, assessed at post-test, were HIV-related knowledge, attitudes, and behaviors. In addition, covariates of HIV risk and demographic controls from the pre-test were included. All measures were pilot tested with college students prior to administration of the pre- and post-tests. The HIV knowledge was captured by a composite measure of 23 items. Ten items came from Carey & Schroder's (2002) HIV Knowledge Questionnaire, which assesses awareness of HIV risk and HIV transmission methods through true-false questions. This set of question has been found to be reliable when used with college students and has been demonstrated to capture changes in knowledge among individuals in intervention programs (Adefuye *et al.*, 2009; Mancosk *et al.*, 2006). Thirteen additional true-false items came from the professor of the HIV/AIDS course and covered specific HIV facts that he felt students should know by the end of the course. The total number of correct answers constituted the score on the measure. Higher values indicated greater HIV knowledge.

Students' HIV-related attitudes were evaluated using five subscales derived from DeHart and Birkimer's (1997) Sexual Risks Scale, with all items having Likert-type responses. The Risky Peer Norms subscale had five items measuring attitudes toward safer sex possessed by the student's peer group with possible responses including Strongly Agree, Agree, No Opinion, Disagree, or Strongly Disagree. The six-item subscale, Perceived Susceptibility to HIV, captured students' perceived personal vulnerability to HIV. Responses included Strongly Agree, Agree, Disagree, or Strongly Disagree. The Risky Sex Attitudes subscale was comprised of 15-items about attitudes towards safer sex, including sex with a condom. Again, responses included Strongly Agree, Agree, No Opinion, Disagree, or Strongly Disagree. Students' Safer Sex Intentions were assessed through questions about whether the student would engage in certain sexual behaviors under two different conditions: sex with a casual sex partner and sex with a long-term sex partner. Students answered "yes" or "no" to the questions under each of the two conditions. When the "yes" answer indicated intentions to engage in a safer sexual behavior (e.g., sex using a condom), the student scored a 1. The scores for each condition were summed and then the sums were averaged across the two conditions to generate a single value ranging from 0 to 5. The 4-item Safer Sex Self-

Efficacy subscale assessed the respondents' confidence in their ability to engage in safer sex behavior, possible response options were Very Confident, Confident, Not Confident, or Very Not Confident. The five subscales had good reliability with Cronbach's alphas equal to or greater than .78 at both the pre- and post-tests.

Five HIV-related behavioral outcomes were assessed: whether the student had unprotected sex in the last three months, used substances before or during sex in the last three months, had more than one sexual partner in the last three months, had been tested for HIV in the last 12 months, and had been tested for other sexually transmitted diseases (STDs) in the last 12 months. The original response options were collapsed into two categories: yes (1) and no (0), yielding dichotomous variables. Students who were not sexually active at the time of the survey were coded as 0 on all but the two testing behavior variables.

With two exceptions, the models included demographic controls, a condition variable (HIV/AIDS class vs. comparison class), pre-test scores on the dependent variables, and last 30-day substance use, a known covariate of HIV risk (National Institute on Drug Abuse, 2006). One exception was in the models predicting STD and HIV testing. They did not include the pre-test measure of the outcome to prevent multicollinearity associated with the temporal overlap of the two measures. The second exception was in the model predicting substance use during sex. That model excluded the control for substance use in the last 30 days due to content overlap with the dependent variable. Demographic variables, known to be covariates of STDs, included student's age, gender, and if the student was in a committed relationship (CDC, 2008; Roberts & Kennedy, 2006; Seal & Palmer-Seal, 1996; Thornton *et al.*, 2002; Wendt & Solomon, 1995; Winfield & Whaley, 2005; Wyatt & Riederle, 1994). Lack of variation in the sample on measures of race/ethnicity and sexual orientation prevented their use in the models. All analyses were conducted using the Statistical Package for the Social Sciences, version 15. Bivariate analyses were conducted to assess for differences between the two groups at base line. Linear regression was used to measure the effect of the HIV/AIDS course on knowledge and attitudes whereas logistic regression was used to measure the course's effect on behavior.

Results

Table 1 shows the means and standard deviations by class at pre-test. T-tests were conducted to assess the difference between the treatment and comparison group at base line. No statistically significant differences were found between the two groups, gender, substance use, HIV knowledge, attitudes and behaviors. A statistically significant difference between the students in the HIV class and the students in Sociology classes was, however, found in the average age ($M_{HIV}=23.11$, $M_{Soc}=20.68$, $t(181) = -3.21$, $p < .01$) and proportion of students in a committed relationship ($M_{HIV}=.63$, $M_{Soc}=.48$, $t(188) = -2.14$, $p < .05$). In addition, there were no differences between classes in the distribution of students by race/ethnicity or sexual orientation.

Table 2 shows the linear regression results for the models predicting HIV knowledge and attitudes. Students in the HIV/AIDS class had significantly greater post-test HIV knowledge and perceived susceptibility to HIV than comparison students did. The coefficients for the effect of the HIV/AIDS class on the remaining attitudinal variables – risky peer norms, risky sexual attitudes, safer sex intentions, and safer sex self-efficacy – were not statistically significant. Baseline knowledge and attitudes positively predicted the post-test values. Being in a committed relationship at baseline positively predicted risky sexual attitudes but not knowledge or other attitudes. No other significant effects were present. These models accounted for a substantial amount of variance in the outcomes, with r^2 s ranging from .29 to .58.

Results from the logistic regression models predicting the behavioral outcomes are presented in Table 3. The HIV/AIDS class had no statistically significant effects on the odds of the HIV-related behaviors. As in Table 2, the baseline behaviors predicted post-test behaviors. In addition, being male was associated with lower odds of getting tested for STDs at post-test. Last 30-day substance use was associated with higher odds of having more than one sexual partner and getting tested for STDs and with lower odds of getting tested for HIV. Being in a committed relationship at baseline was associated with greater odds of having unprotected sex, getting tested for STDs and getting tested for HIV at post-test. Age was not a significant predictor in any of the models.

Follow-up regression analyses examined the same models but with only the sub-sample of students who were sexually active at both the pre-test and post-test (results not shown in tables). In addition to a desirable statistically significant effect on knowledge ($\beta = .40$), a statistically significant treatment effect on risky sexual attitudes ($\beta = -.13$) was identified. Sexually active students in the HIV/AIDS class reported less risky sexual attitudes at post-test relative to their counterparts in the comparison class. The course had no statistically significant effect on behavior among the sexually active students.

An additional regression analysis separated the sample by gender since prior research indicates that HIV risk varies significantly by gender (Centers for Disease Control, 2008a) and that males and females may respond differently to interventions (Kulis *et al.*, 2007) (results not shown in tables). The HIV/AIDS class's effect on post-test HIV knowledge that was found in the full sample was also found to be statistically significant in the gender sub-samples. However, the coefficient was larger for males ($\beta = .42$) than females ($\beta = .31$). An interaction test revealed this difference to be statistically significant, meaning the HIV/AIDS course had a stronger effect on knowledge for males. The course's effect on perceived susceptibility to HIV ($\beta = .20$) was found to be statistically significant in the female sub-sample but not the male sub-sample, and this difference in effects was statistically significant. As in the full sample, no statistically significant effect on behavior was found in either of the gender sub-samples.

Discussion

This study explored whether an undergraduate course – called *HIV/AIDS: Science, Behavior, and Society* – positively affected students' HIV-related knowledge, attitudes, and behavior, although such effects were not explicitly part of the course objectives. The outcomes were evaluated due to several features of the course that, in accordance with theory and prior research, had the potential to decrease students' HIV risk. As hypothesized, the results showed that participation in the course was associated with desired changes in HIV knowledge and some HIV-related attitudes (perceived susceptibility), but not behavior. The attitudinal effects were limited to certain sub-groups.

Before interpreting the results, we should remind readers that the study's design was not experimental. Students were not randomly assigned to treatment and comparison conditions. Therefore, we cannot definitively conclude that relationships between the course and students' outcomes are causal. However, the longitudinal design of the study, by properly ordering the hypothesized stimulus and effect, makes more plausible the argument that causal relationships may exist. In addition, the attrition rate should also be considered when interpreting the study findings. While some of the participants surveyed at the pre-test may have not completed the post-test due to formally withdrawing from the class, it is also possible that less students were present in class on the day that the post-tests were administered because it was the end of the semester.

The finding that the course was associated with greater post-test HIV knowledge is no surprise given that the course was designed to convey HIV-related information. It is promising, however, that students did not come away from the course with only the “academic” HIV information – e.g., the details on HIV epidemiology, immunology, and virology. They also came away with practical HIV information – the details on disease transmission and prevention – which they can use to reduce their personal risk for infection. This increase in reported practical knowledge could be due to the incorporation of activities that asked the students to not only absorb new knowledge but also reflect on their own behavior, interact with persons with HIV, and participate in HIV/AIDS community events. The gender difference in the strength of the relationship may signal a greater responsiveness among males to HIV information when presented in the context of an academic course. The responsiveness of males may make this a viable strategy for presenting prevention information particularly to male students who have sex with men because it does not require them to identify as gay men or men who have sex with men.

Participation in the HIV/AIDS course was related only to females’ perceived susceptibility to HIV. This finding supports the idea that experiential learning pedagogy affects personal feelings of susceptibility to HIV/AIDS, but it raises the question, why did it only affect females? The pedagogical techniques of reflective journaling and hearing the stories of people living with HIV/AIDS may resonate more with woman than men. Contextual factors outside of the course that affect feelings of self efficacy may also be influencing female’s perceived susceptibility. Given that the sample was overwhelmingly heterosexual-identified, the more generalized use of male condoms and the low access to female condoms may explain this finding. Males continue to have more power over the decision to use or not use a condom. While females can be actively engage in condom use negotiation with their male partners, the fact that the condom needs to be placed on their partner’s, rather than their own, body may lower their feeling of self efficacy. This sense of less control may heighten their level of susceptibility in response to an increased level of HIV awareness acquired in the course.

The relationship between course participation and risky sexual attitudes appeared only for sexually active students. The reason may be due to the sexual attitudes subscale whose items pertained to condom use. Students who were not currently sexually active may have been less attuned to the topic of condoms when it came up in class due to their lack of immediate need for the information. Sexually active students, in contrast, may have been attuned to the topic since they could draw from their current sexual experience not only to interpret the information but also to integrate it into their thinking about safer sex. The difference in the degree of attention to the topic, then, may explain the difference in the attitudinal changes from pre- to post-test.

The finding that the course did not relate to behavior is understandable. Relative to knowledge and attitudes, behavior is arguably more difficult to change, especially because changes in knowledge and attitudes are often required before behavior itself can change. All of the outcomes were measured immediately upon completion of the course. Ideally, the outcomes would have also been measured some time after the course was completed, such as at three or six months, giving more time not only for any course effects to take hold but also for any effects on knowledge and attitudes to translate to behavioral change. Furthermore, the variables measuring behavior captured students’ actions not only at the end of the course but also during the course. For example, students reported whether they had unprotected sex in the previous three months – that is, while the course was still underway. Course effects on behavior may have been dependent on completion of the course, in which case they would only be present if captured by a measure whose timeframe did not include the course itself. However, we would expect, based on the theory of health behavior, that

changes in feelings of susceptibility, when accompanied by feelings of self efficacy, would lead to behavioral change over time.

Another explanation for the lack of effects on behavior may be that the course did not have an explicit behavioral component, which has been linked to increasing a person's belief that they can negotiate safer sex (self-efficacy). The course did not include, for example, role plays in which students practice negotiating safer sex practices with a sex partner. The absence of a specific focus on students' behavior is perhaps the biggest distinction between the course and traditional prevention interventions, which typically not only include behavior change in their objectives but also provide opportunities for developing skill in the desired behavior and strategies for overcoming barriers to behavior change (Advocates for Youth, 2008, Ross *et al.*, 2006). Because we did not see an increase in self efficacy at post-test, the lack of behavior change may be attributed to the lack of attention to building negotiation skills.

The students' own HIV risk, be it cognitive, attitudinal, or behavioral, was not explicitly targeted by the course, in its stated objectives or its learning activities. This omission likely explains the limited relationship of the course to not only student's HIV-related behaviors but also attitudes. However, the limited relationship that was identified – the course appeared to produce desirable changes in HIV knowledge and perceived susceptibility – is noteworthy. While the results do not mean that regular prevention efforts should be supplanted, the course's apparent influence on key antecedents of HIV risk behavior (Bandura, 1994; Fishbein, 1999) suggests that HIV-related academic courses might play a supplemental or auxiliary role in HIV prevention. They may help to ready students for change in response to behavioral interventions they encounter in other contexts. In addition, while further analysis would be needed to determine which course components facilitated the changes identified, the findings of this study lend support to the notion that experiential learning activities in academic courses may improve learning outcomes and facilitate the transfer of knowledge from the classroom to real life.

Future Research

While the design of this study was able to address the efficacy of the HIV/AIDS course in changing knowledge, attitudes and behaviors it was not able to address its effectiveness compared to other HIV/AIDS prevention strategies. Future research should draw a distinction between the use of experiential learning pedagogical techniques in HIV/AIDS education and traditional methods used to teach the same material. It would also be useful to contrast this rather lengthy course to more brief intervention strategies. Comparisons are needed between outcomes obtained in knowledge, perceived susceptibility and attitudes by the classroom based intervention and other brief interventions that require less time and resources. In addition, future research would benefit from including a six month follow up to assess if behavior was impacted and if changes in knowledge lasted over time. This research is warranted because the use of traditional venues for learning among young adults has been underutilized in HIV/AIDS prevention and the experiential learning pedagogical techniques may encourage students to transfer classroom learning into real world behaviors.

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Table 1

Means and standard deviations and mean differences between classes at pre test

	HIV/AIDS Class (N = 79)	Comparison Class (N = 111)	
	Pre-test <i>M(SD)</i>	Pre-test <i>M(SD)</i>	t-test
Knowledge	20.22(2.07)	19.70(2.08)	−1.68
Attitudes			
Risky Peer Norms	2.37(.84)	2.37(.84)	−.042
Perceived Susceptibility to HIV	1.83(.56)	1.72(.55)	−1.33
Risky Sexual Attitudes	2.32(.71)	2.36(.64)	.38
Safer Sex Intentions	2.51(1.12)	2.68(1.40)	.93
Safer Sex Self Efficacy	3.57(.54)	3.60(.50)	.39
Behaviors			
Used Substances Before Sex ¹	.49(.50)	.43(.50)	−.72
Had Unprotected Sex ¹	.54(.50)	.49(.50)	−.70
More Than 1 Sexual Partner ¹	.09(.29)	.09(.29)	.11
Tested for HIV ²	.24(.43)	.33(.47)	1.30
Tested for STD ²	.38(.49)	.47(.50)	−1.23
Controls			
Male Gender	.37(.49)	.28(.45)	−1.27
Age	23.11(6.44)	20.68(2.30)	3.20***
Substance Use ³	1.71(.57)	1.81(.73)	1.09
Committed Relationship	.63(.49)	.48(.50)	−2.15*

*
p < .05**
p < .01***
p < .001.¹ – Last 90 days.² – Last year.³ – Last 30 day.

Table 2

Linear regression coefficients and standard errors for knowledge and attitudinal outcomes.

	HIV Knowledge	Peer Norms	Perceived Susceptibility	Risky Sexual Attitudes	Safer Sex Intentions	Safer Sex Efficacy
	<i>B</i> (<i>SE</i>)	<i>B</i> (<i>SE</i>)	<i>B</i> (<i>SE</i>)	<i>B</i> (<i>SE</i>)	<i>B</i> (<i>SE</i>)	<i>B</i> (<i>SE</i>)
HIV/AIDS Class	.36*** 1.54 (.28)	-.03 -.05 (.10)	.14** .18 (.07)	-.09 -.13 (.08)	.06 .14 (.16)	-.09 -.09 (.07)
Pre-test Score	.36*** .37 (.07)	.67*** .65 (.06)	.72*** .85 (.06)	.69*** .71 (.06)	.60*** .59 (.07)	.61*** .59 (.06)
Male Gender	-.03 -.12 (.3)	.03 0.06 (.10)	.02 .03 (.07)	.03 .04 (.08)	-.11 ⁺ -.28 (.17)	-.07 -.07 (.07)
Age	.02 .01 (.03)	.02 .00 (.01)	.05 .01 (.01)	.04 .01 (.01)	.05 .01 (.02)	.06 .01 (.01)
Substance Use ^{<i>I</i>}	-.02 -.06 (.20)	.06 .08 (.07)	.08 .07 (.05)	.07 .07 (.06)	-.03 -.06 (.12)	-.01 -.01 (.05)
Committed Relationship	.07 .29 (.28)	.09 .14 (.09)	-.07 -.08 (.07)	.14* .19 (.08)	-.02 -.05 (.16)	.03 .03 (.07)
<i>N</i>	180	177	178	177	169	169
Adj. <i>R</i> ²	.29	.46	.58	.49	.38	.37

⁺ *p* < .10

* *p* < .05

** *p* < .01

*** *p* < .001.

^{*I*} – Last 30 days.

Table 3

Logistic regression coefficients, standard errors, and odds ratios for behavioral outcomes

	Used Substances Before Sex ¹		Had Unprotected Sex ¹		More Than 1 Sexual Partner ¹		Tested For STDs ²		Tested For HIV ²	
	B (SE)	OR	B (SE)	OR	B (SE)	OR	B (SE)	OR	B (SE)	OR
HIV/AIDS Class	.31 (.41)	1.37	.59 (.40)	1.80	-.54 (.61)	.58	--NA--	NA-	--NA--	--NA--
Pre-test Score	2.98*** (.42)	19.78	2.20*** (.40)	9.01	2.35*** (.65)	10.52	--NA--	NA-	--NA--	--NA--
Male Gender	.15 (.45)	1.16	-.56 (.42)	.57	.35 (.59)	1.42	-1.02* (.46)	.24	-.46 (.37)	.63
Age	-.06 (.06)	.94	-.02 (.04)	.98	.02 (.06)	1.02	-.01 (.04)	.99	.02 (.04)	1.02
Substance Use ³	--NA--	--NA--	.41 (.31)	1.51	.73+ (.37)	2.06	1.13*** (.34)	3.10	.71** (.26)	2.04
Committed Relationship	-.19 (.43)	.75	.85* (.41)	2.34	-.26 (.61)	.77	1.21** (.36)	3.36	1.44*** (.39)	4.24
N	174		172		172		178		178	
Cox-Snell PseudoR ²	.35		.32		.13		.21		.15	

+
p < .10*
p < .05**
p < .01***
p < .001.¹ - Last 90 days.² - Last year.³ - Last 30 day