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Engagement in HIV Prevention Advocacy Associated with Increased Consistent Condom Use Among HIV Clients in Uganda

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Abstract

We examined whether engagement in prevention advocacy among HIV clients is associated with their own condom use and HIV care adherence. Longitudinal data merged from three studies in Uganda produced a sample of 1882 participants who were administered assessments at baseline and months 6 and 12. The measure of prevention advocacy was the mean of two Likert scale items assessing encouragement of others to (1) use condoms, and (2) get HIV tested. In regression analyses controlling for demographics and known correlates of the dependent variables, increased prevention advocacy from baseline to Month 12 was significantly associated with increased consistent condom use and marginally associated with increased antiretroviral adherence and clinic attendance. These results suggest that empowering HIV clients to engage in prevention advocacy with others may benefit their own HIV protective behaviors and should be promoted as a component to interventions targeting positive living among people living with HIV.

INTRODUCTION

HIV prevalence in Uganda has stagnated at 7% for the past decade and incidence rates are on the rise despite the scale-up of antiretroviral therapy (ART) [1], indicating the need for innovative approaches to HIV prevention. People living with HIV/AIDS (PLWHA) can play a crucial role in HIV prevention, not only in the context of Positive Health, Dignity and Prevention (PHDP) interventions [2–4] and Treatment as Prevention [5,6] (i.e., reduced risk behavior and achieving viral suppression through HIV treatment among PLWHA), but as powerful change agents for HIV protective behaviors within their social networks.

As PLWHA receive HIV treatment and experience restored health and improved functioning, our prior research suggests that many are motivated to protect their loved ones and engage in prevention advocacy (i.e., encourage friends and family to seek HIV testing and care, and reduce risk behavior) [7,8]. There may be no more credible messenger of HIV prevention than an HIV-infected individual who is healthy, effectively managing their disease and is familiar to and trusted by the recipients of such messages. In high prevalence settings such as Uganda, where nearly every family is touched by someone living with HIV, mobilizing the over 1 million Ugandans who may eventually receive HIV care to be change

agents within their social networks has the potential to make a dramatic impact on the fight against HIV.

The Peer Change Agent model [9], theories of social diffusion [10] and influence [11], and the success of peer advocacy interventions [12–15] suggest that mobilizing PLWHA as prevention advocates could result in behavioral change and risk reduction in advocacy recipients. However, engagement in advocacy can also influence the behavior of the advocate. Cognitive consistency theory suggests that encouraging others to adopt a behavior increases the likelihood that the advocate will adopt the behavior as well [16], perhaps resulting from internal pressure to “practice what you preach”. This hypothesis is supported by some studies of peer advocacy interventions [17], but we are not aware of studies examining this in PLWHA or in sub-Saharan Africa.

This paper reports on longitudinal analyses of prevention advocacy among HIV clients in Uganda. We examined the prevalence of prevention advocacy, change in prevention advocacy over the first year of HIV care or ART, and whether engagement and change in prevention advocacy is associated with the advocate’s own condom use and HIV care adherence (ART adherence and clinic attendance) behavior.

METHODS

Study Design

Data from three longitudinal studies were merged for the secondary analysis presented in this paper. Participants in Studies A and B enrolled in studies of ART impact on multiple health outcomes and involved patients just entering HIV care and included patients starting ART and those not yet eligible for ART. Enrollment for Study A was between January and September 2008, while Study B enrolled patients from July 2008 to August 2009. Participants in Study C had been in HIV care for different lengths of time but were about to start ART at study enrollment (between January 2010 and February 2011). Study C was designed to examine the role of depression and antidepressant therapy on the socioeconomic outcomes of ART; in addition to depression being assessed at each time point, antidepressants were prescribed to those who were clinically depressed. In each of the three studies, participants completed assessments at baseline and months 6 and 12.

Setting

Study A was conducted at two HIV clinics operated by Joint Clinical Research Center in Kampala and Kakira (about 100 km. outside Kampala). Study B was conducted at two HIV clinics in Kampala, one operated by Reach Out Mbuya and one by Mulago-Mbarara Teaching Hospitals Joint AIDS Program (MJAP). Study C was conducted at four HIV clinics operated by Mildmay Uganda, in Kampala and the rural towns of Mityana, Naggalama and Mukono (all within 120 km. of Kampala). All sites are located in the eastern region of the country and serve clients mostly in the lower socioeconomic strata.

Sample

Eligibility criteria for Studies A and B included being age 18 years or older, just started receiving care at the clinic and completed evaluation for ART eligibility, and if ineligible for ART CD4 cell count was less than 400 cells/mm³ (which signifies some immune suppression). In Study C, participants needed to be 18 years of age or older and about to start ART. In all studies, the primary eligibility criteria for initiation of ART was having a CD4 cell count $\geq$ 250 cells/mm³ or a WHO HIV disease stage III or IV (AIDS diagnosis). Eligible patients were enrolled consecutively in each study. Providers referred eligible patients who were interested in participating to the study coordinator for consent procedures, screening and scheduling of baseline interviews. All participants were required to provide written informed consent. Study coordinators in each study reported that very few (<5%) eligible patients refused to participate. The study protocol was approved by IRBs at RAND, Makerere University (Studies B and C), and JCRC (Study A), as well as the Uganda National Council of Science and Technology.

Measures

The measures administered in the three original studies were all interviewer-administered in Luganda by trained interviewers, the predominant language in this region of Uganda. The same questionnaire was used in each study and was translated into Luganda using standard translation and back-translation methodology. All measures were administered at each of the three assessment time points, unless otherwise noted.

Independent Variable

HIV prevention advocacy: Respondents were asked to indicate their level of agreement with the following statements on a 4-point Likert scale from 1 'strongly disagree' to 4 'strongly agree': "I tell people I know to use condoms;" and "I encourage others to get tested for HIV." A mean item score was calculated, with higher scores representing greater prevention advocacy.

Dependent Variables

Condom use: Condom use during sexual intercourse over the past 6 months with one's primary partner (if present) was measured separately using a 5-point rating scale from "never" to "always." A binary variable was created to represent consistent condom use (equated with always using condoms).

ART adherence: After a preamble in which the interviewer normalized non-adherence by indicating it was common for people to have challenges with always taking medication as directed, and emphasized the importance of the study and the clinic understanding the difficulties that people have in taking their medication, participants were asked, "How many doses of your HIV medication did you miss in the past 7 days?" For analyses, a binary variable was created to represent whether any doses were missed in the past 7 days. This measure was assessed at months 6 and 12.

Clinic attendance: Respondents were asked to report the number of missed clinic appointments in the past 6 months. For analyses, a binary variable was created to represent whether any appointments had been missed in the past 6 months. This measure was assessed at months 6 and 12.

Covariates—Demographic and medical characteristics included age, gender, education (a binary variable was created to represent whether the respondent had any secondary education), work status (engaged in food or income generating activity over the past 7 days), and CD4 cell count (abstracted from the participant's medical chart).

Relationship characteristics: Relationship status (single, married, in a committed relationship) and presence of a regular or primary sex partner (among those not married or not in a committed relationship) were assessed. HIV status (positive, negative, unknown) of the primary sex partner was assessed, as well as whether the respondent had disclosed their HIV status to this partner.

Internalized HIV stigma was assessed with an 8-item scale developed by Kalichman and colleagues [18]. Participants were asked to rate their level of agreement with statements such as "I feel guilty that I am HIV positive" using a 5 point rating scale; mean item scores were computed and higher scores represent greater stigma.

Depression was assessed with the 9-item Patient Health Questionnaire (PHQ-9) [19]. The 9 items are the 9 DSM symptom criteria for Major Depression; a "past 2 weeks" time frame is used and each item is scored from 0 'never' to 3 'every day'. Total score ranges from 0–27 and is the sum of all the items, and scores > 9 represent major depression.

Data Analysis

Descriptive statistics were used to examine sample characteristics. Longitudinal analyses of condom use involved only participants who reported a primary sex partner at baseline and at least one of the two follow-up assessments, while analyses for both ART adherence and clinical attendance included participants who had data for these variables at both months 6 and 12 (these two variables were not measured at baseline because most participants had either just entered HIV care or were just starting ART at study entry). McNemar tests were used to examine change in the dependent binary variables (consistent condom use, any missed ART doses, and any missed clinic appointments) from baseline or month 6, to month 12. Paired t-tests were used to examine change in the continuous prevention advocacy measure from baseline to month 12.

Multivariate random-effects logistic regression models were used to examine how engagement in prevention advocacy at baseline and change in prevention advocacy over 12 months was related to change in the dependent variables. Separate models were estimated for the three dependent variables. A hierarchical structure was assumed with repeated assessments within each participant, and multiple participants nested within a study site. The model specification included a random intercept for each study site and participant to allow for baseline (or month 6 in the case of ART adherence and clinic attendance) differences in the dependent variables across sites and participants. This approach produces valid standard

errors that take into account correlations among repeated assessments conducted with each person, and among participants at the same study site. To account for dropout between baseline and month 12, the regression models included attrition weights estimated using non-linear generalized boosting models [20] that included an extensive list of baseline variables as predictors of dropout.

Each model included the following independent variables: baseline measure of prevention advocacy, change in prevention advocacy from baseline to month 12, time (ordinal variable representing the change in the dependent variable for each additional unit of time or 6-month period), the interaction of the change in prevention advocacy and time (representing the change in the dependent variable with each unit of time by each unit of change in prevention advocacy) and covariates (age, gender, any secondary education, depression, internalized HIV stigma). Partner HIV status was included only in the models predicting consistent condom use. Predicted probability of condom use at month 12 was plotted against amount of change in prevention advocacy from baseline to month 12. The predicted probabilities were estimated using a multivariate logistic regression model that included all of the covariates listed above, with covariates being set to an individual's actual values. All analyses were conducted in Stata 12.

RESULTS

The merged dataset consisted of 1,882 participants, with 602 from Study A, 482 from Study B, and 798 from Study C; 1,451 (77%) completed the 12-month study. Mean age of the sample was 35.6 (SD = 9.8), 34% were male, 14% had any secondary education, 46% were currently in a relationship, and 65% had worked in the week prior to their baseline assessment. Mean CD4 count was 204 (SD = 149), 72% were about to start ART, and 12% met criteria for major depression.

Engagement in HIV prevention advocacy

At baseline, 82% agreed (strongly or somewhat) with the statement, "I encourage others to get tested for HIV," and 71% agreed with the statement, "I tell people I know to use condoms." The mean score on the two 4-point Likert scale items was 3.17 (SD = .93). Among those who completed the survey at month 12, 89% agreed (strongly or somewhat) with the statement, "I encourage others to get tested for HIV," and 76% agreed with the statement, "I tell people I know to use condoms." The mean score of the two items increased to 3.38 (SD = .89), which was a significant increase from baseline ($t = 6.13$, $df = 1433$, $p < .001$), and for 41% of the sample this mean had changed (26% increased and 15% decreased) by at least 1.0 unit.

Consistent Condom Use With Primary Partner

The analysis of condom use involved 713 participants who had a primary partner at baseline and at least one of the two follow-up assessments (though the primary partner did not have to be the same person across time points). At baseline, half (50%) had a primary partner who was also HIV-positive, while 17% reported that their partner was HIV-negative, and the other 33% did not know the HIV status of their partner. The distribution of baseline condom

use was largely bimodal with 41% reporting that they ‘always’ used a condom during sexual intercourse with their primary partner in the 6 months prior to baseline, and 37% reporting that they ‘never’ used condoms; only 22% reported using condoms ‘rarely’, ‘sometimes’ or ‘often’. Condom use differed significantly by partner’s HIV status as those with an HIV-negative partner had the highest rate of consistent condom use at 60%, compared to 41% among those whose partner was also HIV-positive, and 32% among those who did not know the HIV status of their partner (chi square = 24.5, df = 2, $p < .001$).

Consistent condom use with primary partner at the last study assessment (either month 6 or month 12, depending on changes in partner status or due to study attrition) increased to 60% (chi square=7.91, df = 1, $p = .005$). When looking at consistent condom use across baseline and last follow up, 30% reported always using condoms at both baseline and last follow-up, 22% reported not always using condoms at both time points, and the remaining 48% reported either starting to always use condoms (37%) or no longer using condoms consistently (11%).

ART Adherence

The analysis of ART adherence involved 917 participants who were starting ART at baseline and had adherence data at both months 6 and 12. At month 6, 82% reported no missed doses in the past week. Similarly, at month 12, 85% reported no missed doses (McNemar test = 0.11); however, almost a quarter of the sample (23%) had a change in their adherence status: 12% improved from reporting missed doses at month 6 to no missed doses at month 12, while 11% reported no missed doses at month 6 but did miss doses in the week prior to month 12.

Clinic Attendance

The analysis of clinic attendance involved 1330 participants who had clinic attendance data at both months 6 and 12. At month 6, 79% reported no missed appointments in the past 6 months, and this increased to 84% at month 12 (McNemar test = .0003), with 25% having a change in their clinic attendance: 15% went from missing appointments to no missed appointments in the prior 6 months, while 10% went from no missed appointments to missing at least one appointment.

Relationships between Prevention Advocacy, Condom Use and HIV Care Adherence

We first examined bivariate cross-sectional relationships between prevention advocacy and the participant’s own condom use, ART adherence, and clinic attendance. This was then followed up with a regression model for each health behavior, in which we examined whether baseline prevention advocacy and change in prevention advocacy from baseline to Month 12 predicted change in the health behavior over the course of the study.

Consistent condom use—At baseline, those who reported consistent condom use with their primary partner reported similar levels of prevention advocacy compared to those who did not always use condoms (mean = 3.34 vs. 3.23; $t = -1.38$, $p = .17$); however, when we examined the single prevention advocacy item that assessed encouragement of others to use condoms, those who reported consistent condom use reported greater advocacy (mean =

3.23 vs. 3.06; $t = -1.95$, $p = .05$). In the regression model, consistent condom use increased over time in the sample, and it was positively associated with prevention advocacy at baseline and increased prevention advocacy over time (see Table 1); a change of one unit of prevention advocacy was associated with an average 6.2% increase in the predicted probability of consistent condom use at month 12, as graphically illustrated in Figure 1. Similar results were observed when only the single prevention advocacy item related to condom use was used in the model (data not shown).

ART adherence—At month 6, levels of prevention advocacy did not differ between those who did or did not miss any ART doses in the past week (mean = 3.12 vs. 3.12; $t = -0.03$, $p = .97$). In the regression model, ART adherence marginally improved in the sample over time, and both baseline prevention advocacy and change in prevention advocacy over time were marginally associated with ART adherence.

Clinic attendance—Participants who reported no missed clinic visits in the 6 months prior to month 6 had higher prevention advocacy at month 6 compared to those who had missed at least one scheduled clinic appointment (mean = 3.25 vs. 3.02; $t = 4.00$, $p < .001$). In the regression model, rates of perfect clinic attendance improved over time in the sample, and it was not associated with prevention advocacy at baseline, but was marginally related to increased prevention advocacy over time (see Table 1).

DISCUSSION

This study of prevention advocacy among HIV clients reveals a high level of engagement in prevention advocacy, specifically the encouragement of others to get HIV-tested and to use condoms, and engagement in advocacy increased over the course of the first year of ART or HIV care. This increase may result from the improvement in health that a client experiences from receiving HIV care and treatment, but may also reflect structural and community-level factors. The data used in this analysis were collected between 2008–2012, during which ART scale-up was continuing to expand, and contributed to HIV becoming more of a manageable, chronic disease in Uganda. This advancement in HIV care management has likely contributed to a lessening of HIV stigma in the community, which may help PLWHA to become more comfortable and empowered to engage in HIV prevention advocacy. If so, this process has likely continued and may be even more evident today, providing further support for the potential benefits to facilitating HIV prevention advocacy among PLWHA.

Increased engagement in prevention advocacy was significantly associated with the client using condoms more consistently and marginally associated with improved ART adherence and clinic attendance. The correspondence between engagement in prevention advocacy and use of condoms and HIV care adherence provides support for cognitive consistency theory. This theory posits that a person's internal cognitive processes strive for their behavior to be consistent with their attitudes and beliefs [16], which in this case are manifested in the behaviors they are encouraging others to practice. The observed relationship between prevention advocacy and the HIV protective behaviors of the advocates is particularly noteworthy considering that the analysis controlled for variables (e.g., depression,

internalized stigma, gender, HIV status of partner) that have been found to be associated with these protective behaviors in this and other studies [21–23].

With prevention advocacy being common among PLWHA, and our data supporting the positive associations between engagement in advocacy and increased HIV protective behaviors on the part of those engaging in such advocacy, as well as the potential for such advocacy to affect the protective behaviors of those on the receiving end of advocacy, efforts to empower and optimize prevention advocacy engaged in by PLWHA should be considered for inclusion in Positive Health, Dignity and Prevention (PHDP) [2–4] interventions. PHDP interventions support PLWHA to lead a complete and healthy life and reduce the risk of transmission of the virus to others; therefore, helping PLWHA to engage in effective prevention advocacy within their social networks would serve as an important complement to this package of services, benefiting individual and public health through health behavior change on the part of PLWHA and the recipients of their advocacy.

The limitations of this study include a relatively crude measure of prevention advocacy, with its inclusion of only two items and a lack of information to more fully understand the frequency of engagement in advocacy or the advocacy process. The measures of ART adherence and clinic attendance were reliant on self-report, and could be bolstered with more objective measures and a longer time frame (particularly for ART adherence). Also, the sample was comprised solely of PLWHA in HIV care, so the findings are not generalizable to those not receiving HIV care who may have less access to HIV prevention information and support. Furthermore, while our longitudinal data enable us to examine associations and temporal precedence, we cannot draw causal conclusions from our data and it is certainly plausible that the relationships between advocacy and the behaviors examined are bidirectional.

In summary, our findings suggest that many HIV clients engage in prevention advocacy and that such advocacy is associated with the client practicing HIV protective behaviors, especially consistent condom use. The implications of these findings for HIV prevention and care is that mobilizing PLWHA as change agents and prevention advocates is an approach that could result not only in increased HIV protective behaviors among the targets of advocacy, but also the behaviors of the HIV-positive advocates and thus serve as an important complement to PHDP interventions. Further research is needed to better our understanding of how to optimize the potential role that PLWHA can play as prevention advocates and in HIV prevention in general. Such research should include more comprehensive and nuanced measures of prevention advocacy, PLWHA who are not engaged in HIV care, and experimental designs to examine the impact of PLWHA engaging in advocacy.

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Figure 1. Predicted Probability (and 95% confidence interval) for Consistent Condom Use at Month 12 by Change in Prevention Advocacy

*A positive score indicates an increase in prevention advocacy between baseline and month 12; a negative score indicates a decrease in prevention advocacy; zero indicates no change.

Table 1

Multivariate Analysis of Change in Prevention Advocacy Related to Consistent Condom Use, ART Adherence and Clinic Attendance over 12 Months of HIV Treatment

	Consistent Condom Use OR (95% CI)	Perfect ART Adherence OR (95% CI)	Perfect Clinic Attendance OR (95% CI)
Baseline prevention advocacy	1.21 (1.08, 1.34) ^b	1.32 (1.03, 1.61) ^a	1.04 (0.83, 1.25)
Time	1.32 (1.20, 1.44) ^d	1.30 (1.00, 1.61) ^a	1.50 (1.26, 1.73) ^d
Time x change in prevention advocacy	1.14 (1.07, 1.21) ^c	1.13 (0.99, 1.26) ^a	1.09 (0.99, 1.19) ^a
Covariates			
Age	1.00 (0.99, 1.02)	1.00 (0.97, 1.02)	1.02 (1.00, 1.03) ^b
Male gender	1.54 (1.30, 1.79) ^d	1.13 (0.73, 1.53)	0.86 (0.59, 1.14)
Any secondary education	1.05 (0.73, 1.37)	0.74 (0.80, 1.89)	0.60 (0.22, 0.98) ^c
Baseline depression	0.97 (0.94, 1.01)	0.95 (0.90, 1.00) ^b	0.97 (0.93, 1.00) ^b
Baseline internalized HIV stigma	0.92 (0.77, 1.08)	0.96 (0.72, 1.20)	0.89 (0.73, 1.06)
Partner is HIV-positive	0.98 (0.75, 1.21)		

^a p<.10,

^b p<.05,

^c p< .01,

^d p<.001