Is 'knowing people with HIV/AIDS' associated with safer sex in men who have sex with men?

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Objective: To examine the sexually protective role of knowing person(s) with HIV/AIDS (PWHA) by conducting a multidimensional analysis distinguishing the number of PWHA known (by disease status and relationship category) and aspects of the relationship with the closest PWHA (emotional closeness, length of time known, disease status, type of relationship).

Design: Cross-sectional study of white, Latino, and African–American men who have sex with men recruited at street locations in West Hollywood, California, in 1997.

Methods: The analyses conducted with linear regression models focused on men (n = 334) who reported that they were seronegative or of unknown serostatus and thus at risk for HIV infection. Unprotected sex was defined as percentage of anal intercourse partners in the past 12 months with whom unprotected anal intercourse (UAI) occurred at least once.

Results: The number of PWHA known was not associated with the percentage of UAI partners in multivariate or univariate analyses. Greater emotional closeness to a person who was HIV-positive without AIDS was associated with reduced UAI in multivariate models even after excluding participants whose close PWHA was a lover or sex partner. Younger men (18–25 years) knew fewer PWHA, reported less emotional closeness to a PWHA, and had a higher level of UAI than did older men.

Conclusions: Emotional closeness to a seropositive person without AIDS may be a sexually protective factor. The results suggest the possibility that lower levels of emotional closeness to a PWHA may partially underlie the elevated sexual risk behavior of younger men who have sex with men.

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Introduction

Unsafe sex is increasing among men who have sex with men (MSM) after dramatic declines in the mid-1980s and relatively stable rates into the 1990s. A recent study in San Francisco of MSM who had had anal sex in the previous year found a significant decline in consistent use of condoms from 70% in 1994 to 61% in 1997 [1]. That study also reported an increase in male rectal gonorrhea during the same period, nearly doubling from 21 to 38 cases per 100 000 adult men. Increases in syphilis, gonorrhea, and chlamydia have also been

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documented in the Seattle area [2]. Further, in many North American urban areas the prevalence of unprotected anal intercourse (UAI) and the incidence of HIV infection is significantly higher among younger (< 30 years of age) than older MSM [3]. These findings reinforce the importance of identifying factors that reduce risk behavior in MSM, especially young men, and using that understanding to design new behavioral interventions.

The study reported here focuses on the potentially protective role of knowing person(s) with HIV or AIDS (PWHA). The assumption is that knowing PWHA makes the disease more salient in one's life and serves to promote safer sexual behavior. This variable, however, has multiple dimensions. One dimension is total number of PWHA known, which can be conceptualized as the 'quantitative salience' of HIV/AIDS in one's life. Studies have found mixed results for this type of variable [4–9]. Most of the analyses found no association between the number of PWHA known and sexual risk behavior of MSM. However, subanalyses in some studies found negative [5,9] and positive [6,9] associations with sexual risk-taking. These studies are clouded by the fact that few of them took into consideration the disease status of PWHA. Knowing people who have died from AIDS or knowing people who recently seroconverted may have the strongest motivational impact. In addition, these studies did not consider whether PWHA were lovers or primary sex partners, casual sex partners, friends, relatives, or acquaintances.

In addition to quantitative salience, there are more qualitative aspects of knowing a close PWHA that may be important, such as level of emotional closeness to that person, length of time one has known the person, current HIV disease status and type of relationship. Kelly *et al.* [8] examined sexual risk behavior of MSM in relation to level of emotional closeness to a person with HIV/AIDS with whom respondents had the strongest emotional bond. In a multivariate model that also included number of friends known with HIV/AIDS, no difference was found between high and low sexual risk groups in either total number of friends known or level of emotional closeness. Based on a single study, however, it is premature to conclude that emotional closeness or other qualitative aspects of knowing PWHA do not affect sexual risk behavior. Kelly's study [8] did not assess factors such as type and length of the relationship and the disease status of the closest PWHA.

The present study attempted to clarify the mixed results of prior investigations and advance understanding of the behavioral effect of knowing PWHA by examining the issue from a multidimensional perspective. Multiple aspects of knowing PWHA were assessed and the association of these variables with UAI in MSM at risk for HIV infection was examined.

Methods

Recruitment and data collection

The survey was conducted in 1997 in West Hollywood, California, a gay enclave of Los Angeles County. Three street locations were selected as recruitment sites by the principal investigators after observing several candidate locations. Sites were selected based on diversity of business establishments and volume of foot traffic in the immediate area. At each location, recruitment was conducted on Fridays, Saturdays, and Sundays during three time periods (12–3 p.m., 3–6 p.m. and 6–9 p.m.).

A group of research assistants (RA) worked together at a specific location to recruit participants. A single RA approached the first man available after the RA had finished interacting with a participant or study candidate. Occasionally men of white ethnicity were skipped in order to oversample men of color. The RA approached men walking alone or in groups. When a group appeared, the person closest in physical proximity to the RA was selected. The RA described the study as a survey about men's sexual behavior sponsored by the University of Southern California and informed each candidate that the questionnaire would take about 30 min to complete and that they would be paid $15 for their time. Each man was informed that no personal identification would be included on the survey and that the completed questionnaire would be sealed in an envelope and deposited in a covered box. At the time of the initial approach, the RA did not mention that the study focused on MSM. If an unselected man from a group expressed interest in the study (very few cases) he was allowed to participate if he and the selected man were not sexual partners (preventing non-independence of data) and if he met the following eligibility criteria: had anal intercourse with a man in the past year; had never been paid with drugs or money for sex; had never injected non-prescription drugs; was English speaking; was white, African–American, or Latino; was 18 years of age or older. Eligibility was determined with a brief self-administered screening questionnaire.

Of the men approached, 47% stated that they were not interested in participating and thus were not screened; the vast majority stated that they did not have adequate time. Of those who expressed interest and agreed to complete the screen, 52% were eligible to participate and all but eight eligible men signed a written informed consent agreement and self-administered the main questionnaire.

Forty-eight percent of the men screened were ineligible. Of those screened, 24% had not engaged in anal intercourse with another man in the past 12 months; this accounted for half of the ineligible group. Other

reasons for being ineligible (and percentages within each group) included injecting drug use (7%), being paid with money or drugs for sex (13%), ethnicity (5%), age (4%), uncomfortable with English (1%), and not being a biological male (1%). Other men were ineligible for other reasons (e.g. had already participated in the study, incomplete screen, intoxicated).

Analytic sample

Sixteen percent of the participants reported that they were HIV-positive. Analyses were limited to those who reported that they were seronegative or did not know their HIV serostatus because the intent was to examine associations between knowing PWHA and sexual risk behavior of those at risk for infection. Analyses were also limited to study participants 40 years of age or younger because only a very small proportion (5%) of the sample was aged $>$ 40 years.

Table 1 presents demographic characteristics of the analytic sample (n = 334). The participants were ethnically diverse, moderately-to-highly educated, and had a median age of 28 years. Of the 82% who reported being HIV-negative, average length of time since last HIV test was approximately 12 months (mean, 12.2; SD, 17.0).

Measures

Participants were asked if they personally knew (or had known) someone with HIV or AIDS. Participants answering affirmatively responded to a series of items that assessed the following quantitative salience variables: (i) number of people known who have died of AIDS. The number was then broken down by the following types of persons: lovers, casual sex partners, friends with whom one did not have sex, relatives, acquaintances or others; (ii) number of people currently living with AIDS (broken down by types of persons); (iii) number of people living with HIV but having no symptoms of AIDS (broken down by types of persons).

Another set of items asked participants about the one person with HIV or AIDS with whom they had the strongest emotional bond. Questions in this category included the following items: (i) 'How long have you known (or did you know) this person?' (in months); (ii) 'How close or intimate do (did) you feel to this person at the height of your relationship?' (on a scale from 0, 'not at all emotionally close or intimate' to 10, 'extremely emotionally close or intimate'); (iii) 'What is the current status of this person?' (HIV-positive but no symptoms of AIDS, currently living with AIDS, died of AIDS); (iv) 'What type of relationship do (did) you have with this person?' (check all that apply: lover/primary partner, friend, casual sex partner, relative, acquaintance or other).

Sexual behavior items included number of male anal intercourse (insertive or receptive) partners in past 12 months and number of anal partners with whom unprotected anal intercourse (UAI) occurred at least once in the past 12 months. Together, these items were used to calculate the percentage of anal sex partners in the past year with whom UAI occurred at least once. This continuous variable was the primary behavioral outcome measure. Demographic variables were assessed using standard formats.

Table 1. Demographic characteristics of the sample (n = 334).

Variable	n (%)
Age (years)	
18–24	84 (25)
25–30	126 (38)
31–40	124 (37)
Race/Ethnicity	
White	161 (48)
Latino	101 (30)
African–American	72 (22)
Education	
Less than high school	3 (1)
High school diploma/GED	33 (10)
Some college/2-year degree/technical training	124 (37)
4-Year college degree	128 (38)
Graduate training	46 (14)
Income	
$<$ $10 000	37 (11)
$10 000–19 999	38 (11)
$20 000–29 999	89 (27)
$30 000–39 999	76 (23)
$40 000–59 999	58 (17)
$\geqslant$ $60 000	36 (11)
HIV serostatus	
Negative	274 (82)
Unknown	60 (18)

GED, General Educational Development diploma.

Statistical analysis

Descriptive comparisons were made with Duncan Multiple Range Tests for continuous dependent variables (e.g. percent UAI partners, number of PWHA known, level of emotional closeness) and with χ^2 for discrete data (e.g. percent of men who knew someone who had died of AIDS). Participants were divided into three age groups (18–24, 25–30, 31–40 years) consistent with prior research [e.g. 10–14]. The following demographic and behavioral covariates of UAI were identified in univariate analyses (Pearson correlation, Duncan) and included in all multivariate models: age group, ethnicity [two comparisons: white (0) versus African–American (1); white (0) versus Latino (1)], education, and number of anal sex partners in the past 12 months.

The substantive analyses were performed with multivariate linear regression models (standardized coefficients presented). In the first model (n = 334), the total number of PWHA known and the covariates were

examined as simultaneous predictors of the percentage of UAI partners. Specific quantitative salience variables (number of people HIV-positive without AIDS, number of people living with AIDS, number of people who have died of AIDS, number of lovers, number of friends, number of relatives, etc.) were examined separately in additional covariate-adjusted models and in univariate regression models to confirm the findings.

The next set of multivariate analyses was conducted with a subsample (n = 298) of participants who knew a person with HIV/AIDS and reported on their closest PWHA. Here, the regression model included as simultaneous predictors: (i) the level of emotional closeness to the PWHA with whom one had the strongest emotional bond; (ii) disease status of the closest PWHA [HIV-positive without AIDS, living with AIDS, died of AIDS (ordinal categories)]; (iii) length of time they knew that person; (iv) total number of PWHA known; and (v) the covariates. To examine whether disease status of the closest person or length of time known moderated the predictive effect of emotional closeness, the model above was repeated adding a cross-product interaction term to the equation [emotional closeness (0–10) × disease status (1, 2, 3)] or emotional closeness × time known).

There were three additional issues of concern. First, the distribution on the dependent measure as well as on number of PWHA known was skewed somewhat. These variables were log-transformed and the regression models repeated; the results obtained were virtually identical to the untransformed variables reported below. Second, some participants reported that their only anal intercourse partner in the past 12 months was their primary partner (n = 47). Because unprotected sex with this partner is not necessarily unsafe, this subgroup was deleted and the multivariate models were repeated. The findings for the main predictor variables were highly similar to the findings obtained with the overall sample reported below. Third, an association between emotional closeness and protected sex may stem partially from participants who report that their closest PWHA is or was a lover or sex partner. Accordingly, this subgroup (n = 53) was deleted and the multivariate analyses was repeated; no substantive changes in the results were observed.

Results

Sexual risk behavior

The 334 participants reported a mean of 7.0 (SD, 10.1; median, 3) anal intercourse partners in the past 12 months, of which an average of 1.8 were partners with whom respondents had at least one occasion of UAI. Overall, a mean of 35% (SD, 35.2; median, 25%) of anal sex partners were UAI partners. Ninety-seven men reported that they had no UAI partners in the past 12 months, 57 had between 1 and 24% UAI partners, 67 had 25–49% UAI partners, 63 had 50–99% UAI partners, and 50 reported that all of their partners were UAI partners.

In univariate analyses (n = 334) of demographic and behavioral correlates of UAI, the mean percentage of UAI partners was higher among whites (mean, 39.5%) than among African–Americans (mean, 26.8%; $P < 0.01$) or Latinos (mean, 32.9%; non-significant). Age group was inversely associated with the percentage of UAI partners (r, −0.18; $P = 0.002$). Specifically, the mean percentage of UAI partners was 44%, 35%, and 28% for men aged 18–24, 25–30, and 31–40 years respectively. UAI was inversely associated with education (r, −0.16; $P = 0.004$) but was not related to income. Finally, the number of anal sex partners in the past 12 months was inversely associated with the percentage of UAI partners (r, −0.18; $P = 0.001$). This association was explored further and it was found to stem partly from the occurrence of unprotected activity among men whose only anal sex partner in the past 12 months was a primary partner: when this subgroup was omitted (n = 47), the association diminished to a non-significant level.

Descriptive data on knowing people with HIV/AIDS

The upper half of Table 2 shows data on the lifetime number of PWHA known. Among the full sample of 334, substantially more of the PWHA were reported to be friends than lovers/primary partners, relatives, casual sex partners, acquaintances or others. The 334 participants knew or had known an average of 11.5 PWHA (SD, 24; median, 5). They knew more persons who had died of AIDS than persons who were living with AIDS or were HIV-positive without AIDS. Older participants (31–40 years) knew significantly ($P < 0.05$) more PWHA (alive or deceased; mean, 20.4) than did the two younger groups (18–24 years: mean, 7.5; 25–30 years: mean, 4.2). Similar age-group differences were observed for each of the three disease status categories.

Characteristics of the closest PWHA are presented in the lower half of Table 2. Among the 298 participants who knew a PWHA and provided data on the one person with HIV/AIDS to whom they felt closest, 67% described that person as a friend. The mean rating of emotional closeness to the closest PWHA was 6.8 (on a scale of 0–10), with a moderate standard deviation. Older participants (aged 31–40 years) expressed a significantly ($P < 0.05$) higher level of emotional closeness to the person (mean, 7.6) than did men aged 25–30 years (mean, 6.4) or men aged 18–24 year (mean, 6.0). Most of the closest persons were either HIV-

Table 2. Aspects of knowing people with HIV/AIDS.

Variable	Mean (SD)	Median	n	%
Lifetime number of PWHA known (n = 334)				
Number of PWHA known	11.5 (24.2)	5		
By current disease status				
Died of AIDS	6.0 (13.7)	2		
Living with AIDS	2.9 (8.7)	1		
HIV-positive without AIDS	2.5 (7.1)	1		
By type of relationship category				
Friend	8.4 (19.5)	4		
Lover/primary partner	0.3 (0.8)	0		
Relative	0.3 (0.9)	0		
Casual sex partner	1.1 (3.6)	0		
Acquaintance or other	1.6 (7.6)	0		
Characteristics of closest PWHA (n = 298)				
Emotional bond to closest PWHA (0–10)	6.8 (2.9)	8		
Years knew closest PWHA	5.2 (5.6)	3.5		
Relationship with closest PWHA[a]				
Friend			199	67
Primary partner/lover			35	12
Relative			19	6
Casual sex partner			18	6
Acquaintance			25	8
Other			21	7
Current status of closest PWHA				
Died of AIDS			116	39
Living with AIDS			57	19
HIV-positive without AIDS			125	42

[a]The combined percentages slightly exceed 100% because categories were not mutually exclusive.
PWHA, Person(s) with HIV/AIDS.

positive without AIDS or had died of AIDS; fewer were currently living with AIDS. A significantly ($P < 0.05$) larger percentage of the oldest group (55%) compared to the younger groups (25–30 years: 36%; 18–24 years: 29%) reported that their closest PWHA had died of AIDS. Average length of time knowing the closest PWHA was slightly over 5 years (no age-group differences).

Lifetime number of people known with HIV/AIDS and sexual risk behavior

In multivariate analysis of the full sample (Table 3, Model 1), the lifetime number of known PWHA was not associated with the percentage of UAI partners after statistically controlling for the covariates. Nor was this quantitative salience variable associated with UAI in univariate analysis. Separate multivariate and univariate regression models for the number of PWHA known who (i) were HIV-positive without AIDS, (ii) were living with AIDS, or (iii) had died of AIDS yielded similar non-significant results for these predictor variables. Further, analyses that focused on the specific types of PWHA (numbers of lovers, friends, relatives, others) found no association with UAI. There was one exception; participants who knew more PWHA who were casual sex partners reported a higher percentage of UAI partners in the past 12 months after adjusting for the covariates.

Aspects of closest person known with HIV/AIDS and sexual risk behavior

In the multivariate analysis of the 298 participants who reported on a close PWHA (Table 3, Model 2), lifetime number of known PWHA again was not associated with UAI. Length of time participants had known the closest PWHA and disease status of the closest PWHA were not significant direct predictors. Level of emotional closeness to the closest PWHA, however, was inversely associated with UAI: higher emotional closeness was associated with a lower percentage of UAI partners. The predictive effect of emotional closeness was not moderated by the length of time participants had known the closest PWHA [i.e. the interaction term (closeness × time) added to Model 2 was not significant]. Emotional closeness did interact with disease status of the closest PWHA in predicting UAI (B, -0.41; $P = 0.02$). To ascertain the form of this interaction, analyses were conducted separately for each of the three disease status groups. Among participants who reported that their closest PWHA was HIV-positive without AIDS, emotional closeness was strongly predictive of UAI after statistically controlling for the length of time the person was known and the covariates (B, -0.36; $P < 0.001$). Emotional closeness was not significantly associated with UAI among participants whose closest PWHA was living with AIDS (B, 0.03; $P = 0.80$) or had died of AIDS (B, -0.04; $P = 0.69$).

Table 3. Results of multivariate regression models predicting percentage of unprotected anal intercourse partners.

Models	B	*P*
Model 1: Number of PWHA known and covariates (n = 334)		
Lifetime number of PWHA known	0.06	0.330
Ethnicity: White (0) versus African American (1)	−0.17	0.003
Ethnicity: White (0) versus Latino (1)	−0.14	0.020
Age group	−0.15	0.009
Education	−0.14	0.012
Number of anal sex partners in past 12 months	−0.18	0.002
Model 2: Aspects of closest PWHA, number of PWHA known, and covariates (n = 298)		
Lifetime number of PWHA known	0.08	0.210
Emotional closeness to closest PWHA	−0.19	0.003
Years knowing closest PWHA	0.10	0.110
Disease status[a]	−0.09	0.152
Ethnicity: White (0) versus African–American (1)	−0.17	0.007
Ethnicity: White (0) versus Latino (1)	−0.12	0.060
Age group	−0.12	0.063
Education	−0.11	0.062
Number of anal sex partners in past 12 months	−0.17	0.005

[a]Disease status of the closest person with HIV/AIDS (PWHA) was an ordinal variable (1, 2, 3). Similar non-significant results for disease status were obtained when two specific contrasts were tested (HIV-positive versus AIDS; HIV-positive versus died of AIDS); standardized coefficients presented.
PWHA, Person(s) with HIV/AIDS.

Discussion

Before discussing the findings, methodological aspects of the study warrant comment. The investigation was conducted with an ethnically diverse sample of well-educated, self-identified MSM aged 18–40 years, who were recruited on streets in the gay community of West Hollywood, California. Generalizing the findings to MSM residing in other urban centers or other regions of the country should be carried out with caution. Further, the Latino and African–American men in the study may not represent ethnic minorities from other locations and MSM of color who do not go to predominately white enclaves such as West Hollywood. Although only men who had anal sex with another man in the past 12 months were eligible to participate in the study, previous research ([11] and Centers for Disease Control and Prevention, unpublished data) indicates that the majority of MSM (> 75%) engage in anal sex and that the prevalence of anal intercourse is similar in younger and older men (e.g. < 25 versus 25+ years). Also, the overall prevalence of and age differences in UAI in this sample are consistent with the findings of other studies [15–18].

Several aspects of knowing people with HIV/AIDS were examined as predictors of UAI in MSM at risk for HIV infection. The total number of people known with HIV/AIDS, conceptualized as quantitative salience, was not associated with the percentage of UAI partners in the past year in multivariate or univariate analyses. Equally non-significant results were obtained in separate analyses of the number of people known who were HIV-positive without AIDS, number living with AIDS, number who had died of AIDS, and number of PWHA who were lovers, friends, relatives, acquaintances or others. These null findings, coupled with the null results of previous studies that examined quantitative salience, suggest that the number of people known with HIV/AIDS has little association with protected sex.

Another aspect of knowing people with HIV/AIDS, conceptualized as a dimension of qualitative salience of HIV/AIDS, was found to be more useful in understanding MSM's sexual risk behavior. Emotional closeness to a person who is HIV-positive without AIDS was associated with a smaller percentage of UAI partners in the past 12 months. This association was not merely a manifestation of being in a serodiscordant relationship with a close sexual partner who was HIV-positive, because the effect was found after excluding participants whose close PWHA was a lover or casual sex partner. It is possible that emotional involvement may heighten motivation to protect oneself beyond any motivational effect of merely knowing persons with HIV/AIDS. Even when a person knows of others who have HIV or have died of AIDS, that person may still be able to maintain the belief that 'I won't get infected, it won't happen to me' by rationalizing that 'I am different from those infected persons'. A strong affective bond with someone who is seropositive, however, may heighten a person's sense of vulnerability because the person may come to recognize that there is a good deal of similarity between himself and the infected person. This realization may increase motivation to protect oneself.

The fact that the association between emotional closeness and safer sex was limited to participants who

reported that their closest PWHA was HIV-positive without AIDS may represent a recency effect. Although there is no direct evidence from this study, the combination of high emotional closeness to a person who has recently learned of his seropositive status may strengthen the effect of emotional closeness on protected sexual behavior. Although the length of time participants had known their closest PWHA was measured, that measure may not reflect the recency of learning the HIV status of the close PWHA. This possibility needs to be examined in future research.

The study also provided some preliminary data about how knowing people with HIV/AIDS may partially explain why younger MSM are more likely than their older counterparts to engage in risky sex. First, although older participants knew more people with HIV/AIDS than did younger participants, the number of PWHA known was not found to be associated with safer sex, thus failing to affirm this variable as an explanation of the young-age risk effect. Second, older participants expressed a higher level of emotional closeness to their closest PWHA than did younger participants, suggesting that emotional closeness may partially explain why younger men were more sexually risky than older men. Younger MSM may express less emotional intensity with a PWHA because that PWHA may be less likely to be a same-age peer for younger than for older MSM. Another possibility is that younger MSM may be focused more strongly than their older counterparts on the formation of sexual and personal identities than on formation of close interpersonal relationships. Developmentally, formation of strong emotional bonds with other men typically comes after a gay person has worked through the psychological issues of identity, self-acceptance, and acceptance of others [19–21]. Longitudinal research designs are needed to examine the hypothesized role of emotional closeness to PWHA as an explanation of the young-age risk effect.

The cross-sectional nature of the study design does not enable conclusions about cause–effect associations to be drawn. However, these findings, if confirmed in future research, suggest that prevention programs for MSM that successfully build close social relations between HIV-negative and HIV-positive people may be beneficial in promoting sexual safety in some men. Importantly, younger men have the most to gain from such programs, because, relative to older men they have less intense emotional bonds with PWHA and know fewer PWHA. Mentor or buddy programs through community AIDS service agencies or community-based organizations may be effective in facilitating and supporting such relationships. Perhaps even something as simple as social, recreational, or educational programs that bring MSM together in a non-sexual context might facilitate stronger social relationships with PWHA and heighten motivation to protect oneself and one's sexual partners. These are challenges for the future.

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