



HHS Public Access

Author manuscript

Arch Sex Behav. Author manuscript; available in PMC 2021 August 01.

Published in final edited form as:

Arch Sex Behav. 2020 August ; 49(6): 2091–2101. doi:10.1007/s10508-020-01703-0.

Effects of a Decision-Making Intervention to Help Decide Whether to Disclose HIV-Positive Status to Family Members on Well-Being and Sexual Behavior

Julianne M. Serovich¹, Tanja C. Laschober¹, Monique J. Brown², Judy A. Kimberly³, Celia M. Lescano⁴

¹College of Behavioral and Community Sciences, University of South Florida, Tampa, FL, 33612

²Department of Epidemiology and Biostatistics, Arnold School of Public Health, University of South Carolina, Columbia, SC

³Division of Biology and Medicine, Brown University, Providence, RI

⁴College of Behavioral and Community Sciences, Department of Mental Health Law and Policy, University of South Florida, Tampa, FL

Abstract

An HIV diagnosis is often followed by uncertainty, questions over next steps, and concerns over how to share the diagnosis with others. The goal of the current study was to investigate the effects of an intervention designed to help people living with HIV decide whether or not they want to disclose their status to family members (i.e., decision-making process rather than actual disclosure) and the subsequent decision on their well-being and sexual behavior. Additionally, differences in outcomes among men who have sex with men (MSM), heterosexual men (HSM), and women were examined. A total of 346 women and men living in the Southeastern part of the United States, participated in the study, which consisted of a baseline assessment, followed by randomization into either the disclosure intervention or attention control case management group. Both treatments consisted of seven sessions over a 12-month period. Results from repeated measures ANOVA indicated that although there was no significant intervention effect, participants in both groups reported some improvements in well-being and decreases in risky sexual behavior. However, no consistent differences in outcomes emerged among MSM, HSM, and women.

Assisting with the disclosure decision-making process and reducing HIV transmission risk should

Terms of use and reuse: academic research for non-commercial purposes, see here for full terms. <https://www.springer.com/aam-terms-v1>

jserovich@usf.edu.

COMPLIANCE WITH ETHICAL STANDARDS

Conflict of Interest: The authors declare that they have no conflict of interest.

Statement of Human Rights: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent: Informed consent was obtained from all individual participants included in the study.

Publisher's Disclaimer: This Author Accepted Manuscript is a PDF file of an unedited peer-reviewed manuscript that has been accepted for publication but has not been copyedited or corrected. The official version of record that is published in the journal is kept up to date and so may therefore differ from this version.

continue to be an essential focus in future research endeavors and for frontline professionals dedicated to HIV-related care and prevention.

Keywords

living with HIV; HIV status communication; HIV transmission prevention; decision-making

INTRODUCTION

The National HIV/AIDS Strategy: Updated to 2020 lists as its three primary goals the reduction of HIV diagnoses, increase in access to care and quality of life improvement for people living with HIV (PLWH), and reduction of HIV disparities and inequities (Office of National AIDS Policy, 2015). In 2017, 38,739 people living in the United States were newly diagnosed with HIV (CDC, 2019). These numbers have been relatively stable between 2012 and 2016. Of those newly diagnosed, gay and bisexual men accounted for 66% of diagnoses, heterosexual men for 7%, and heterosexual women for 16% of diagnoses (CDC, 2019).

An HIV diagnosis is often followed by anxiety, depression, uncertainty, and questions related to how this diagnosis may change one's life (U.S. Department of Health and Human Services, 2019). There are several decision points an HIV-positive individual is required to navigate. Laws in many states require that sexual and injection drug-use partners be told of one's seropositive status (i.e., disclosure) regardless of the risk of HIV transmission (CDC, 2018a). This disclosure allows partners to make better informed choices regarding HIV testing and prevention of HIV transmission. Disclosure to health care providers and HIV-related service providers is another essential decision to assure that PLWH are afforded access to appropriate care including antiretroviral therapy (ART) to achieve viral suppression, reduce HIV transmission risk, and improve their quality of life including physical and mental well-being (CDC, 2018b).

HIV disclosure to family members is another important decision, because disclosure has been linked to increased social support from family (Kalichman, DiMarco, Austin, Luke, & DiFonzo, 2003; Rodkjaer, Sodemann, Ostergaard, & Lomborg, 2011), which in turn is related to the well-being of PLWH (Vyavaharkar, Moneyham, Murdaugh, & Tavakoli, 2011; Zea, Reisen, Poppen, Bianchi, & Echeverry, 2005). Serovich, Kimberly, Mosack, and Lewis (2001) found that perceived social support from family was associated with reduced loneliness, stress, and depressive symptoms in a small sample of women living with HIV. Similar findings were confirmed in a larger study of men and women living with HIV (McDowell & Serovich, 2007). Fekete, Antoni, Duran, Stoelb, Kumar, and Schneiderman (2009a) found that women's disclosure to their mothers and children was related to decreased cortisol levels, with social support from family mediating the relationship. In a similar study of men, Fekete et al. (2009b) found that interactions between ethnicity, family social support, and disclosure to mothers were significantly positively affecting CD4 counts.

The benefits to PLWH associated with increased support from family and improved well-being may extend to reductions in risky sexual behavior. Kimberly and Serovich (1999) found a negative relationship between intentions to engage in risky sexual behavior and

family support among gay men living with HIV. Increased depression and other mental health issues either alone, or comorbid with drug and alcohol use, may also be significantly related to sexual risk-taking in men who have sex with men (MSM) (Hirshfield, Remien, Humerstone, Walavalkar, & Chiasson, 2004; Mustanski, 2008; Reisner et al., 2009; Stall et al., 2001).

Disclosure Decision-Making Process

To date, most research on HIV disclosure has focused on the act of disclosing to whom, what, where, and when rather than the decision-making process of whether or not to disclose. However, PLWH may obtain benefits from the decision whether or not to disclose rather than the act of disclosing and increase their comfort and acceptance of the decisions they have reached. In a qualitative study, Rodkjaer, Sodemann, Ostergaard, and Lomborg (2011) found that HIV disclosure decisions involve stress, whether or not the decision is made to disclose. They also found that decisions about disclosure changed over time, and that stress reduction was related to perceptions of making the right decision about disclosure given the current situation. Thus, the decision-making process may be more important for well-being than the actual act of disclosing and should be considered with regard to personal decision preferences as well as the benefits and costs of disclosing.

The Consequences Theory of HIV Disclosure (Serovich, 2001) states that PLWH are more likely to disclose their seropositive status when the benefits of disclosing outweigh the costs of disclosing (Serovich, Laschober, Brown, & Kimberly, 2018). Studies of women living with HIV suggest that those who disclose to family do so because they want to preserve honesty in the relationship, gain social support, and avoid the anxieties of concealing their HIV-positive status (Simoni et al., 1995). For others, the decision about disclosure can create considerable emotional strain (e.g., Holt et al., 1998; Leask, Elford, Bor, Miller, & Johnson, 1997). Anticipated reactions such as rejection or emotional abandonment can heighten disclosure-related anxiety or stress.

Men who fear the loss of closeness or support may choose not to disclose to family in order to avoid disruption of important relationships (Holt et al., 1998; Kalichman et al., 2003). While non-disclosure may be chosen as a way to avoid costs, there are positive reasons arising from a focus on the person to whom disclosure would be made (Derlega, Winstead, Greene, Serovich, & Elwood, 2004; Simoni et al., 1995). For example, family members' mental and physical health, or lack of financial resources, might limit their abilities to cope with the diagnosis. Thus, non-disclosure serves as a way of protecting individuals. Additionally, disclosure might also be avoided as a way to assert one's right to privacy (Derlega et al., 2004).

Current Study

Interventions may help PLWH navigate the disclosure decision-making process, evaluate the pros and cons of disclosing to specific family members, reduce disclosure-related stress, and promote well-being. The current study examined the effects of a disclosure intervention on changes in participants' well-being and risky sexual behavior over a 12-month period. The intervention was specifically designed to assist PLWH decide whether or not they wanted to

tell family members of their seropositive status. Thus, the primary focus of the intervention was on individuals' conscious and informed disclosure decision-making process instead of promoting disclosure, the act of disclosing, or the number of disclosures.

For the current study, the following hypotheses were tested: (H1) PLWH participating in the disclosure intervention (DI) will report greater mean differences in well-being (i.e., depression, anxiety, physical functioning, general health) between baseline and each post-intervention follow-up than those in the attention control case management (ACCM) group, and (H2) PLWH participating in the DI group will report greater mean differences in risky sexual behavior (i.e., number of sexual partners, number of sexual encounters, number of condomless sexual encounters) between baseline and each post-intervention follow-up than those in the ACCM group. Additionally, two research questions (RQs) were posed: (RQ1) Do changes in well-being differ among MSM, heterosexual men (HSM), and women? and (RQ2) Do changes in risky sexual behavior differ among MSM, HSM, and women?

METHOD

Participants

Longitudinal data were obtained over seven sessions taking 12-months to complete from men and women living with HIV who participated in a randomized controlled disclosure of HIV to family intervention project in a large Southeastern metropolitan area in the United States. Data were collected between 2014 and 2017. The purpose of the intervention was to assist PLWH in making decisions regarding the disclosure of their HIV seropositive status to family members rather than to promote disclosure. All procedures were approved by the University of South Florida Institutional Review Board. Informed consent was obtained prior to data collection.

To be eligible for participation in the study, participants had to be living with HIV, 18 years or older, English-speaking, interested in learning more about disclosure to family, have at least one family member who was not yet aware of their HIV-positive status, be interested in disclosing to at least one family member, and planned on living in the area for the next year. Participants were compensated \$50 for their time at baseline and each follow-up. Main recruitment strategies included HIV-related venues, advertisements with local AIDS service organizations, and advertisements in local newspapers.

Randomized Controlled Disclosure of HIV to Family Intervention Project

Random assignment to the DI or ACCM group occurred at baseline after completion of the baseline survey. Each intervention consisted of seven one-on-one sessions (50–90 minutes each) with a trained facilitator over 12-months. The DI and ACCM group followed the same data collection timeline including five sessions of data collection (baseline and 1.5 months, 3 months, 6 months, and 12 months post-baseline) using audio computer-assisted self-interviewing (ACASI) software and four in-person treatment sessions (1 week, 2 weeks, 1.5 months, and 3 months post-baseline). The 3-month follow-up was a booster session that served as reinforcement rather than a treatment session during which participants could

check in with facilitators regarding questions and concerns they may have, clarification on previous exercises and materials presented, and a review of past treatment materials.

Although timelines were the same for the DI and ACCM group, the content of each session differed, with one exception; both groups received information on sexual transmission risk reduction. The treatment content for the DI group focused on disclosure decision-making to family members including identification of costs and benefits, potential disclosure strategies, navigation of potential reactions and responses to disclosure, and exercises and role-play related to disclosure. The content for the ACCM group came from the “Comprehensive Risk Counseling and Services” (CRCS) developed by the CDC’s HIV prevention case management program (CDC, 2015). In brief, the CRCS integrates traditional case management and psychosocial and medical needs. Disclosure decision-making was not addressed in the ACCM group.

Measures

Mental Health—Depression was assessed at each of the five data collection time points using the Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977). The CES-D is a 20-item self-report measure of depression in the general population. Sample items are: “I felt that I could not shake off the blues even with help from my family or friends.” and “I had trouble keeping my mind on what I was doing.” Response options ranged from 0 = Rarely or none of the time (less than 1 day), to 3 = Most or all of the time (5–7 days). Items were summed, with higher scores indicating greater depressive symptoms. Cronbach’s alpha ranged from .91 and .92 across time points.

Anxiety was examined at each data collection using the nine anxiety-related items developed by Costello and Comrey (1967). Sample items are: “I get rattled easily.” and “When faced with excitement or unexpected situations, I become nervous and jumpy.” Response options ranged from 1 = Never, to 9 = Always. Items were summed, with higher scores indicating greater anxiety. Cronbach’s alpha ranged from .85 and .87 across data collection time points.

Health and Physical Functioning—Health and physical functioning were measured at each data collection timepoint using two subscales from the health-related quality of life measure (QOL 601–2) developed by the AIDS Clinical Trials Group (ACTG, 1999). General health was measured with two items asking about overall health and well-being. Participants were asked: In general, would you say “My health is excellent. I have been feeling bad lately (reversed).” Response options ranged from 1 = Definitely false, to 5 = Definitely true. Correlation coefficients (r) ranged from .32 and .47 across time points.

Physical functioning was assessed with four items that addressed physical limitations. Sample items are: “Does your health now limit you in these activities: The kinds or amounts of vigorous activities you can do, like lifting heavy objects, running or participating in strenuous sports? Walking uphill or climbing (a few flights of stairs)?” Response options were 1 = Yes, limited a lot, 2 = Yes, limited a little, and 3 = No. Cronbach’s alpha ranged from .83 and .86 across time points.

Because subscales had different response options, each subscale was first summed across the number of corresponding items and then transformed to a 0 to 100 scale to allow for comparisons (ACTG, 1999). Higher scores indicated greater health and physical functioning.

Sexual Behavior—At each data collection point, participants were asked to report on the number of different sexual partners they had in the past 30 days. Participants who had at least one sexual partner were asked about the number of sexual encounters they had in the past 30 days and the number of encounters that involved condomless sexual activities (anal, vaginal sex) in the past 30 days. For the purpose of this study, condomless sexual behavior for MSM included insertive and receptive anal sex, and insertive vaginal sex; for HSM included insertive anal and vaginal sex; and for women included receptive anal and vaginal sex. Due to differences in the number of sexual activities (insertive and receptive anal sex, vaginal sex) among MSM, HSM, and women, the mean rather than a sum score was created across sexual activities.

Gender and Sexual Partners—Participants were asked: “Do you consider yourself male, female, or “other”?” All participants selected either male or female. Additionally, participants were asked: “When you have sex, who do you have sex with?” Response options ranged from 1 = only men, to 5 = only women. To examine differences in outcomes by gender and sexual partners, the following categories were created: MSM were defined as participants who self-identified as male and had sex with only men, mostly men, both men and women, or mostly women. HSM were defined as participants who self-identified as male and had sex with only women. For women, sample sizes were too small for more fine-grained analyses, because 83% of women had sex with only men ($n = 128$), 7% had sex with only women ($n = 11$), and 10.33% had sex with men and women ($n = 16$).

Control Variables—Three control variables were included in all analyses. Race was coded 0 = White, 1 = Non-White. Continuous control variables included years since HIV diagnosis and age in years.

Data Analyses—Descriptive statistics were used to examine participants’ demographic characteristics overall and differences in characteristics between the DI and ACCM group using chi-square tests for categorical variables and F-tests for continuous variables. Hypotheses and research questions were assessed using repeated measures ANOVA. For significant findings, effect sizes (partial eta-squared; η_p^2) were calculated. All analyses were conducted in SAS 9.4.

RESULTS

Description of Participants

At baseline, 346 participants completed a survey; 180 (52.02%) were randomized into the DI group and 166 (47.98%) into the ACCM group. Of the 346, 298 (86.13%) completed the 1.5-months post-baseline survey; 286 (82.66%) the 3-months post-baseline survey; 280 (80.92%) the 6-months post-baseline survey; and 271 (78.32%) the 12-months post-baseline survey. There were no statistically significant differences in survey completion rates over time between the DI and ACCM group ($\chi^2 = 0.44$, $df = 4$, $p = 0.979$).

Overall, the average age of participants was 46 years and the average time since HIV diagnosis was 13 years. The majority of participants were males (55%), heterosexual (52%), non-White (63%), and non-Hispanic (88%). Level of education varied with 22% having not graduated high school or its equivalent, 29% having graduated high school 29% having some college experience, and 20% having earned a college degree. Regarding monthly incomes, 32% earned \$500 or less and 39% earned between \$501 and \$1,000. Table 1 includes the demographic characteristics of participants by treatment group. There were no statistically significant differences ($p > .05$) in demographic characteristic between participants in the DI compared to the ACCM group.

Differences in Well-Being Over Time Overall and by Treatment Group

Table 2 shows the mean differences in mental and physical well-being between baseline and post-intervention follow-ups overall and by treatment group. There was a significant time by treatment group interaction effect for depression ($\eta_p^2 = 0.01$) but not for anxiety, physical functioning, and general health (HI). The DI group saw a decrease in depression at each post-intervention follow-up with one exception; there was no significant change at 3-months follow-up. In contrast, the ACCM group reported a decrease in depression between baseline and each post-intervention follow-up.

There was also no significant main effect for treatment group for any of the well-being outcomes. To explore the lack of treatment intervention further, we conducted post-hoc analyses (not shown) to see whether certain treatment characteristics (e.g., number of treatment sessions attended, length of treatment sessions) might be related to the outcomes. There were no statistically significant findings. However, there were main effects for time for depression ($\eta_p^2 = 0.02$) and general health ($\eta_p^2 = 0.02$) but not for anxiety and physical functioning. Compared to the baseline assessment, all participants reported a decrease in depression at each follow-up and an increase in general health at 1.5-months, 3-months, and 6-months follow-up.

Differences in Sexual Behavior Over Time Overall and by Treatment Group

Table 3 displays the mean differences in sexual behavior between baseline and each postintervention follow-up overall and by treatment group. There was no significant time by treatment interaction effect for number of sex partners, sexual encounters, and number of condomless sexual encounters (H2). There were also no significant main effects for treatment group. However, there were significant main effects for time for number of sex partners ($\eta_p^2 = 0.01$), sexual encounters ($\eta_p^2 = 0.03$), and condomless sexual encounters ($\eta_p^2 = 0.01$). Compared to baseline reports, the number of sex partners in the past 30 days were lower at each post-intervention follow-up. For number of sex encounters in the past 30 days, reports at 1.5-months, 6-months, and 12-months post-intervention follow-up were lower compared to baseline reports. Regarding number of condomless sex encounters, compared to baseline, reports were lower at 3-months and 12-months follow-up.

Differences in Well-Being Over Time Overall and Among MSM, HSM, and Women

Table 4 presents the mean differences in mental and physical well-being between baseline and each post-intervention follow-up overall and among MSM, HSM, and women. There

was a significant time by gender interaction effect for physical functioning ($\eta_p^2 = 0.02$) but not for depression, anxiety, or general health (RQ1). Whereas physical functioning remained unchanged over time for MSM and women, HSM reported an increase in physical functioning between baseline and 1.5 months and 6-months post-intervention follow-up. Findings also indicated significant main effects for gender ($\eta_p^2 < 0.01$) and main effects for time ($\eta_p^2 = 0.01$ for physical functioning). MSM compared to HSM and women had greater physical functioning; no significant differences were found between HSM and women. For physical functioning, compared to baseline reports, there was an increase in physical functioning at 1.5 months and 6-months post-intervention follow-up.

Additionally, there were main effects for time for depression ($\eta_p^2 = 0.02$) and general health ($\eta_p^2 = 0.02$). Men and women both reported a decrease in depression between baseline and all follow-ups. Regarding general health, compared to baseline, better general health was found for men and women at 1.5-months, 3-months, and 6-months post-intervention follow-up.

Differences in Risky Sexual Behavior Over Time Overall and among MSM, HSM, and Women—Table 5 shows the mean differences in risky sexual behavior over time overall and among MSM, HSM, and women. Findings indicated only a time by gender interaction effect for number of sexual encounters (RQ2) ($\eta_p^2 = 0.03$). MSM, HSM, and women showed a decline in sexual encounters between baseline and 1.5-months and 12-months post-intervention follow-up. However, MSM also showed a decline in number of sexual encounters between baseline and 3-months post-intervention follow-up. There was also a main effect for time for number of sexual encounters ($\eta_p^2 = 0.03$). Participants reported a decline in sexual encounters between baseline and 6-months and 12-months post-intervention follow-up.

Additionally, main effects for time were found for number of sex partners ($\eta_p^2 = 0.02$) and number of condomless sexual encounters ($\eta_p^2 = 0.01$) as well as main effects for gender for number of sex partners ($\eta_p^2 < 0.01$). For number of sex partners, there was a decrease in reports overall between baseline and 3-months and 6-months follow-up. Additionally, MSM reported a greater number of sexual partners overall than HSM and women; no significant differences were seen between HSM and women. Finally, compared to baseline reports, the number of condomless sexual encounters was significantly lower at 12-months post-intervention follow-up.

DISCUSSION

This study examined changes in well-being and sexual behavior following an HIV disclosure decision intervention and differences in changes in outcomes among MSM, HSM, and women. In general, findings did not support an intervention effect. Additionally, there were limited effects on gender differences in outcomes over time. Lack of intervention effects pertaining to well-being and risky sexual behavior were contrary to expectations. The single finding that the DI group compared to the ACCM group did not show a significant difference in depression between baseline and 3-months post-intervention follow-up is

mentioned with caution, considering that both groups showed declines for all other follow-ups.

The intervention group (DI) was the only group that received extensive exposure to disclosure decision-making content during the in-person sessions. The ACCM treatment only integrated the CDC's (2015) CRCS during the in-person sessions. These findings suggest that both treatments are equally effective in reducing depressive symptoms and increasing general health, as well as reducing the number of sexual partners, sexual encounters, and to a lesser extent, the number of condomless sexual encounters over time. The decline in risky sexual behavior despite the lack of intervention effects can be explained by the fact that both treatment groups received information on reducing risky sexual behavior.

The similarities between the DI and ACCM group in well-being may perhaps be associated with the similarities in the treatment sequence. Both groups participated in all treatment and data collection sessions. Although the content of the treatment sessions vastly differed between groups, it may be that participants derived benefits from regular meetings with facilitators or people perceived as helpful.

Although no intervention effect was found, the fact that a treatment effect was observed for well-being and sexual behavior is important to highlight. Depression is two to four times higher in PLWH compared to those who are HIV negative (Nanni, Caruso, Mitchell, Meggiolaro, & Grassi, 2015). Depression in PLWH is associated with lack of ART adherence (Uthman, Magidson, Safren, & Nachega, 2014), which is vital for viral suppression and decreasing the likelihood of transmission of HIV. Unfortunately, because the current study did not assess ART adherence, it is not possible to examine a potential link with well-being and sexual behavior.

Pertaining to differences in outcomes over time among MSM, HSM, and women, there were inconsistent and limited findings regarding changes in well-being and sexual behavior. Thus, attempts to draw general conclusions about possible gender differences seem premature. Prior research has shown that more MSM are diagnosed with HIV than HSM and women, which is associated with sexual behaviors (CDC, 2019). MSM compared to HSM and women have been shown to have more sexual partners (Glick et al., 2013; Levin, Koopman, Aral, Holms, & Foxman, 2009) and both insertive and receptive anal sex, with the latter being more risky in terms of HIV acquisition (CDC, 2018c). There was evidence in the current study that MSM had a greater number of sexual partners, although MSM were not more or less likely to engage in condomless sexual encounters. More research is needed to support or refute the current findings before more definitive conclusions regarding differences among MSM, HSM, and women can be drawn.

Limitations and Conclusions

The findings in this study need to be interpreted with the following limitations in mind, which may also affect generalizability to other PLWH. All data were obtained through self-report. It is possible that mental and physical well-being as well as sexual behavior may have been over- or under-reported considering the sensitive and potentially embarrassing

behaviors being reported on. However, ACASI has been found to be an ideal data collection tool for self-report health-related data (Brown, Swartzendruber, & DiClemente, 2013; Des Jarlais et al., 1999; Hewett, Mensch, & Erulkar, 2004). Thus, self-report or desirability bias may be limited. It is also important to note that when significant differences were found in the outcomes based on time or time x group interaction, the observed effect sizes were small. Thus, findings may have minimal real world and clinical meaningfulness.

Additionally, the current study did not assess viral suppression, which is associated with HIV transmission risk. It may be that participants who are virally suppressed differ in sexual behaviors from those who are not virally suppressed. Future research should consider viral suppression and ART adherence when examining well-being and sexual behaviors.

Further, some gender-related sample sizes (e.g., women who have sex with both men and women, women who only have sex with women) were too small for conducting more fine-grained analyses. Clearer patterns of differences among MSM, HSM, and women may emerge in studies with larger sample sizes that allow for the investigation of more diverse groupings, especially among women. Larger studies may also yield more racially and ethnically diverse participants, which is important for designing and implementing interventions with PLWH from different backgrounds. Future research should also examine how disclosure (e.g., number of family members disclosed to, type of disclosure) might affect well-being and changes in sexual behaviors.

Finally, additional limitations might be based on the treatment groups and treatment content. The current study included two treatment groups (DI and ACCM) that were both instructed in reducing sexual risk behavior but had otherwise vastly different treatment content. It is possible that the “active” treatments and some of the similarities between groups account for the lack of treatment effects for some of the outcomes. Future research should consider whether alternative treatment groups (e.g., those that reflect real world or usual care), treatment groups that do not overlap in content, and groups with no treatment at all (e.g., waiting list control group) have different treatment outcomes. An additional consideration, however, pertaining to no treatment at all is whether it is ethical to delay participation in an intervention study to assist PLWH in deciding whether and how to disclose their HIV-positive status to family.

Despite these limitations, this study made unique contributions to the field. To our knowledge, this is the first study to investigate the effectiveness of a decision-making intervention to help PLWH decide whether or not they would want to disclose their HIV positive status to family members and subsequent outcomes related to well-being and sexual behavior. Although the intervention did not differentially affect participants in the DI compared to the ACCM group, there was a positive treatment effect regarding depression, physical functioning, and general health as well as risky sexual behavior. More research is needed that addresses the goals of eliminating HIV transmission, improving access to care and quality of life for PLWH, and reducing HIV disparities and inequities. Lastly, frontline professionals dedicated to HIV-related care and prevention are essential in achieving these goals.

Acknowledgments

Funding: This study was supported by a grant from the National Institute of Mental Health (author anonymity) awarded to the first author.

REFERENCES

- AIDS Clinical Trials Group. (1999). ACTG OOL 601–602 (OOL 601–2) Health Survey Manual. Retrieved from <https://www.frontierscience.org/apps/cfm/apps/common/QOLAdherenceForms/resources/actg/manualql601-2799pdf>
- Brown JL, Swartzendruber A, & DiClemente RJ (2013). The application of audio computer-assisted self-interviews (ACASI) to collect self-reported health data: An overview. *Caries Research*, 47, 40–45. [PubMed: 24107606]
- Centers for Disease Control and Prevention. (2019). HIV in the United States and dependent areas. Retrieved from <https://www.cdc.gov/hiv/statistics/overview/ata glance.html>
- Centers for Disease Control and Prevention. (2018a). HIV and STD criminal laws. Retrieved from <https://www.cdc.gov/hiv/policies/law/states/exposure.html>
- Centers for Disease Control and Prevention. (2018b). Telling others. Am I legally required to share my HIV status with others? Retrieved from <https://www.cdc.gov/hiv/basics/livingwithhiv/telling-others.html>
- Centers for Disease Control and Prevention. (2018c). Anal sex and HIV risk. Retrieved from <https://www.cdc.gov/hiv/risk/analsex.html>
- Centers for Disease Control and Prevention. (2015). Comprehensive Risk Counseling and Services (CRCS). Retrieved from <https://effectiveinterventions.cdc.gov/en/highimpactprevention/publichealthstrategies/CRCS.asp>
- Costello CG, & Comrey AL (1967). Scales for measuring depression and anxiety. *Journal of Psychology*, 66, 303–313. [PubMed: 6076427]
- Derlega VJ, Winstead BA, Greene K, Serovich J, & Elwood WN (2004). Reasons for HIV disclosure/nondisclosure in close relationships: Testing a model of HIV-disclosure decision making. *Journal of Social and Clinical Psychology*, 23, 747–767.
- Des Jarlais DC, Paone D, Milliken J, Turner CF, Miller H, Gribble J, ... Friedman SR (1999). Audio-computer interviewing to measure risk behaviour for HIV among injecting drug users: A quasi-randomised trial. *Lancet*, 15, 353 (9165), 1657–1661.
- Fekete EM, Antoni MH, Duran R, Stoelb BL, Kumar M, & Schneiderman N. (2009a). Disclosing HIV serostatus to family members: Effects on psychological and physiological health in minority women living with HIV. *International Journal of Behavior Medicine*, 16, 367–376.
- Fekete EM, Antoni MH, Lopez CR, Duran R, Penedo FJ, Bandiera FC, ...Schneiderman N. (2009b). Men's serostatus disclosure to parents: Associations among social support, ethnicity, and disease status in men living with HIV. *Brain, Behavior, and Immunity*, 23, 693–699.
- Glick SN, Morris M, Foxman B, Aral SO, Manhart LE, Holmes KH, & Golden MR (2013). A comparison of sexual behavior patterns among men who have sex with men and heterosexual men and women. *Journal of Acquired Immune Deficiency Syndromes*, 60, 83–90.
- Hewett PC, Mensch BS, Erulkar AS (2004). Consistency in the reporting of sexual behaviour by adolescent girls in Kenya: A comparison of interviewing methods. *Sexually Transmitted Infections*, SO, Suppl.2, ii43–48.
- Hirshfield S, Remien RH, Humerstone M, Walavalkar I, & Chiasson MA (2004). Substance use and high-risk sex among men who have sex with men: A national online study in the USA. *AIDS Care*, 16, 1036–1047. [PubMed: 15511735]
- Holt R, Court P, Vedhara K, Nott KH, Holmes J, & Snow MH (1998). The role of disclosure in coping with HIV infection. *AIDS Care*, 10, 49–60. [PubMed: 9536201]
- Kalichman SC, DiMarco M, Austin J, Luke W, & DiFonzo K. (2003). Stress, social support, and HIV-status disclosure to family and friends among HIV-positive men and women. *Journal of Behavioral Medicine*, 26, 315–332. [PubMed: 12921006]

- Kimberly JA, & Serovich JM (1999). The role of family and friend support in reducing risk behaviors among HIV-positive gay men. *AIDS Education and Prevention*, 11, 465–475. [PubMed: 10693644]
- Leask C, Elford J, Bor R, Miller R, & Johnson M. (1997). Selective disclosure: A pilot investigation into changes in family relationships since HIV diagnosis. *Journal of Family Therapy*, 19, 59–69.
- Levin EM, Koopman JS, Aral SO, Holmes KK, & Foxman B. (2009). Characteristics of men who have sex with men and women who have sex with women and men. Results from the 2003 Seattle Sex Survey. *Sexually Transmitted Diseases*, 36, 541–546. [PubMed: 19543142]
- McDowell TL, & Serovich JM (2007). The effect of perceived and actual social support on the mental health of HIV-positive persons. *AIDS Care*, 19, 1223–1229. [PubMed: 18071966]
- Mustanski B. (2008). Moderating effects of age on the alcohol and sexual risk taking association: An online daily diary study of men who have sex with men. *AIDS and Behavior*, 12, 118–126. [PubMed: 18034298]
- Nanni MG, Caruso R, Mitchell AJ, Meggiolaro E, & Grassi L. (2015). Depression in HIV infected patients: A review. *Current Psychiatry Reports*, 17, 530. [PubMed: 25413636]
- Office of National AIDS Policy. (2015). National HIV AIDS Strategy for the United States. Updated to 2020. Available at, <https://files.hiv.gov/s3fs-public/nhas-update.pdf>
- Radloff LS (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385–401. Available at, <https://journals.sagepub.com/doi/pdf710.1177/0146621677001003Q6>
- Reisner SL, Mimiaga MJ, Skeer M, Bright D, Cranston K, Isenberg D, ... Mayer KH (2009). Clinically significant depressive symptoms as a risk factor for HIV infection among black MSM in Massachusetts. *AIDS and Behavior*, 13, 798–810. [PubMed: 19462228]
- Rodkjaer L, Sodemann M, Ostergaard L, & Lomborg K. (2011). Disclosure decisions: HIV-positive persons coping with disease-related stressors. *Qualitative Health Research*, 21, 1249–1259. [PubMed: 21483024]
- Serovich JM (2001). A test of two HIV disclosure theories. *AIDS Education and Prevention*, 13, 355–364. [PubMed: 11565594]
- Serovich JM, Kimberly JA, Mosack KE, & Lewis TL (2001). The role of family and friend support in reducing emotional distress among HIV-positive women. *AIDS Care*, 13, 335–341. [PubMed: 11397335]
- Serovich JM, Laschober TC, Brown MJ, & Kimberly JA (2018). Assessment of HIV disclosure and sexual behavior among Black men who have sex with men following a randomized controlled intervention. *International Journal of STD & AIDS*, 29, 673–679. [PubMed: 29361887]
- Simoni JM, Mason HRC, Marks G, Ruiz MS, Reed D, & Richardson JL (1995). Women's self-disclosure of HIV infection: Rates, reasons, and reactions. *Journal of Consulting and Clinical Psychology*, 63, 474–478. [PubMed: 7608361]
- Stall R, Paul JP, Greenwood G, Pollack LM, Bein E, Crosby GM, ... Catania JA (2001). Alcohol use, drug use and alcohol-related problems among men who have sex with men: The Urban Men's Health Study. *Addiction*, 96, 1589–1601. [PubMed: 11784456]
- US Department of Health and Human Services. (2019). Just diagnosed: Next steps after testing positive for HIV. Available at, <https://aidsinfo.nih.gov/understanding-hiv-aids/fact-sheets/21/65/just-diagnosed—next-steps-after-testing-positive-for-hiv>
- Uthman OA, Magidson JF, Safren SA, & Nachege JB (2014). Depression and adherence to antiretroviral therapy in low-, middle-and high-income countries: A systematic review and meta-analysis. *Current HIV AIDS Report*, 11, 291–307.
- Vyavaharkar M, Moneyham L, Murdaugh C, & Tavakoli A. (2011). Factors associated with quality of life among rural women with HIV disease. *AIDS and Behavior*, 16, 295–303.
- Zea MC, Reisen CA, Poppen PJ, Bianchi FT, & Echeverry JJ (2005). Disclosure of HIV status and psychological well-being among Latino gay and bisexual men. *AIDS and Behavior*, 9, 15–26. [PubMed: 15812610]

Table 1.

Demographic Characteristics Overall and Differences by Treatment Group

	DI(N= 180)	AC CM (N= 166)	χ^2 or <i>F</i>	<i>P</i>
Age [M, (SD)]	44.3 (11.7)	46.6(10.9)	3.56	.060
Years diagnosed [M, (SD)]	12.5 (8.3)	13.2(9.0)	0.54	.461
Gender, male [n, (%)]	99 (55.0)	92 (55.4)	0.01	.937
Non-White [n, (%)]	117(65.0)	102 (61.5)	0.47	.493
Non-Hispanic [n, (%)]	157(87.2)	147 (88.6)	0.14	.704
Sexual Identity [n, (%)]			2.18	.336
Lesbian/gay	62 (34.4)	49 (29.5)		
Heterosexual	93 (51.7)	85 (51.2)		
Bisexual/other	25 (13.9)	32(19.3)		
Level of Education [n, (%)]			0.56	.905
No high school/GED	41 (22.9)	36(21.8)		
High school degree/GED	48 (26.8)	50 (30.3)		
Some college experience	52 (29.1)	47 (28.5)		
College degree	8 (21.2)	32(19.4)		
Monthly Income [n, (%)]			4.22	.378
up to \$500	50 (27.8)	60 (36.1)		
\$501-\$1,000	77 (42.8)	59 (35.5)		
\$1,001-\$1,500	28 (15.6)	22(13.3)		
\$1,501 -\$2,000	14(7.8)	17(10.2)		
Over \$2,000	11(6.1)	8 (4.8)		

Table 2.
Mean Differences in Well-Being Over Time Overall and by Treatment Group

	Overall		Time		DI ^a		ACCM ^b		Group	Timex Group
	LS-M ^c	SE	F	LS-M	SE	LS-M	SE	F	F	
Depression ^d			6.12***						0.49	3.17*
Baseline	23.16	0.63		22.37	0.87	23.94	0.90			
1.5 months post-base	20.76	0.65 ^o		20.47	0.91 ^o	21.06	0.91 ^o			
3-months post-base	20.81	0.67 ^o		21.52	0.92	20.10	0.94 ^o			
6-months post-base	21.37	0.67 ^o		20.55	0.94 ^o	22.19	0.94 ^o			
12-months post-base	20.89	0.68 ^o		20.19	0.94 ^o	21.60	0.96 ^o			
Anxiety ^e			1.92						0.89	0.03
Baseline	42.87	0.78		42.35	1.08	43.39	1.11			
1.5 months post-base	41.51	0.81		40.96	1.13	42.07	1.13			
3-months post-base	41.30	0.80		40.65	1.09	41.94	1.12			
6-months post-base	42.00	0.80		41.31	1.10	42.69	1.11			
12-months post-base	42.04	0.83		41.29	1.14	42.78	1.17			
Physical Functioning ^f			1.67						1.73	0.44
Baseline	63.45	1.49		65.33	2.06	61.57	2.12			
1.5 months post-base	65.41	1.52		66.59	2.12	64.23	2.12			
3-months post-base	63.85	1.71		64.71	2.36	62.98	2.42			
6-months post-base	65.50	1.53		67.45	2.13	63.55	2.15			
12-months post-base	62.85	1.63		65.42	2.26	60.29	2.31			
General Health ^f			4.56**						0.64	0.26
Baseline	52.12	1.45		52.36	2.01	51.88	2.07			
1.5 months post-base	55.96	1.49 ^o		57.10	2.08	54.81	2.08			
3-months post-base	56.38	1.51 ^o		57.11	2.09	55.66	2.14			
6-months post-base	55.99	1.64 ^o		57.56	2.29	54.42	2.31			
12-months post-base	51.93	1.55		53.08	2.15	50.78	2.20			

^aDI = disclosure intervention group.

^bACCM = attention control case management group.

^cControlling for participant age, race, and time since diagnosis.

^dPossible range from 0–60.

^ePossible range from 9–81.

^fPossible range from 0–100. LS-M = Least squares means. SE = standard error.

^oSignificant difference between baseline and post-intervention follow-up.

p < .001;

**
 $p < .01$;

*
 $p < .05$.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 3.

Mean Differences in Risky Sexual Behaviors Over Time Overall and by Treatment Group

	Overall		Time	DI ^a		ACCM ^b		Group	Timex Group
	LS-M ^c	SE	F	LS-M	SE	LS-M	SE	F	F
Number of Sexual Partners			8.95 ^{***}					1.66	0.92
Baseline	1.59	0.22		1.35	0.30	1.83	0.31		
1.5 months post-base	1.08	0.12 ^o		0.91	0.17	1.24	0.17		
3-months post-base	1.08	0.17 ^o		0.93	0.23	1.22	0.24		
6-months post-base	0.73	0.08 ^o		0.70	0.11	0.76	0.11		
12-months post-base	1.06	0.14 ^o		0.88	0.19	1.25	0.20		
Number of Sexual Encounters			5.18 ^{***}					0.26	1.70
Baseline	6.55	0.67		6.63	0.90	6.47	0.98		
1.5 months post-base	5.06	0.65 ^o		5.64	0.91	4.48	0.92		
3-months post-base	5.40	0.97		5.12	1.35	5.68	1.39		
6-months post-base	4.14	0.71 ^o		3.71	0.96	4.57	1.02		
12-months post-base	3.85	0.67 ^o		2.61	0.92	5.08	0.97		
Number of Condomless Sex Encounters			3.41 ^{**}					0.03	0.87
Baseline	1.42	0.25			1.72	0.35	1.12	0.37	
1.5 months post-base	2.94	1.50			3.23	2.15	2.66	2.10	
3-months post-base	0.83	0.14 ^o			0.73	0.20	0.92	0.20	
6-months post-base	0.97	0.19			0.84	0.26	1.09	0.26	
12-months post-base	0.61	0.11 ^o			0.50	0.15	0.71	0.16	

^aDI = disclosure intervention group.

^bACCM = attention control case management group.

^cControlling for participant age, sexual orientation, employment status, location, race, income, education, time since diagnosis, number of sexual partners, and viral suppression. LS-M = Least squares means. SE = standard error.

^oSignificant differences between baseline and post-intervention follow-up.

p < .001;

**
p < .01.

Table 4.

Differences in Well-Being Over Time Overall and among Men who have Sex with Men (MSM), Heterosexual Men (HSM), and Women

	Overall		Time	MSM		HSM		Women		Gender	Time x Gender
	LS-M ^c	SE	F	LS-M	SE	LS-M	SE	LS-M	SE	F	F
Depression ^d			5.72***							1.66	0.65
Baseline	23.26	0.73		22.09	1.00	23.79	1.73	23.89	0.93		
1.5 months post-base	20.57	0.75 ^o		20.03	1.03	20.07	1.76	21.59	0.95		
3-months post-base	20.62	0.77 ^o		20.34	1.04	19.97	1.79	21.55	0.97		
6-months post-base	21.33	0.77 ^o		19.65	1.05	21.49	1.81	22.83	0.97		
12-months post-base	20.70	0.79 ^o		19.45	1.07	20.45	1.89	22.22	0.97		
Anxiety ^e			1.55							0.49	1.96
Baseline	42.54	0.90		41.92	1.21	41.56	2.11	44.13	1.13		
1.5 months post-base	41.12	0.93		41.73	1.27	39.71	2.16	41.92	1.16		
3-months post-base	40.94	0.91		41.84	1.23	39.64	2.12	41.35	1.15		
6-months post-base	41.71	0.91		43.97	1.23	40.38	2.12	40.79	1.14		
12-months post-base	41.65	0.97		42.97	1.30	40.21	2.28	41.79	1.18		
Physical Functioning ^f			4.82***							9.08***	2.73**
Baseline	62.22	1.67		71.87	2.28	56.98	3.95	57.82	2.13		
1.5 months post-base	65.79	1.71 ^o		72.22	2.38	65.91	4.01	59.24	2.17		
3-months post-base	62.26	1.94		69.39	2.64	56.41	4.52	60.98	2.47		
6-months post-base	65.75	1.74 ^o		70.90	2.38	65.80	4.09	60.54	2.21		
12-months post-base	60.73	1.88		70.33	2.55	52.86	4.47	59.01	2.31		
General Health ^f			4.63**							0.96	1.90
Baseline	50.66	1.67		55.53	2.28	45.45	3.95	51.00	2.13		
1.5 months post-base	56.63	1.70 ^o		56.89	2.38	58.80	4.00	54.20	2.17		
3-months post-base	55.27	1.71 ^o		60.07	2.36*	51.02	4.02	54.73	2.20		
6-months post-base	55.29	1.89 ^o		56.96	2.58	52.88	4.45	56.03	2.40		
12-months post-base	52.11	1.82		53.34	2.48	52.37	4.35	50.63	2.24		

^aDI = disclosure intervention group.

^bACCM = attention control case management group.

^cControlling for participant age, race, and time since diagnosis.

^dPossible range from 0–60.

^ePossible range from 9–81.

^fPossible range from 0–100. LS-M = Least squares means. SE = standard error.

^oSignificant differences between baseline and post-intervention follow-up.

 $p < .001$;

**
 $p < .01$.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 5.

Mean Differences in Risky Sexual Behavior Over Time Overall and Among Men who have Sex with Men (MSM), Heterosexual Men (HSM), and Women

	Overall		Time	MSM		HSM		Women		Gender	Time x Gender
	LS-M ^c	SE	F	LS-M	SE	LS-M	SE	LS-M	SE	F	F
Number of Sex Partners			6.11***							10.48***	1.86
Baseline	1.41	0.24		2.49	0.32	0.73	0.56	1.00	0.30		
1.5 months post-base	1.06	0.13		1.64	0.18	0.91	0.31	0.61	0.17		
3-months post-base	0.97	0.19 ^o		1.61	0.25	0.60	0.43	0.70	0.24		
6-months post-base	0.67	0.09 ^o		1.08	0.12	0.45	0.21	0.47	0.12		
12-months post-base	1.00	0.16		1.73	0.21	0.71	0.38	0.56	0.19		
Number of Sexual Encounters			4.57**							1.20	2.23*
Baseline	6.62	0.81		6.43	0.99	6.86	1.98	6.56	1.03		
1.5 months post-base	6.62	0.76		4.19	0.93 ^o	11.47	1.86 ^o	4.19 ^o	1.00		
3-months post-base	5.93	1.15		4.24	1.40	7.03	2.72	6.53	1.59		
6-months post-base	4.72	0.86 ^o		2.89	1.02 ^o	6.07	2.07	5.19	1.14		
12-months post-base	3.72	0.81 ^o		3.68	1.01 ^o	3.21	1.93 ^o	4.25 ^o	1.07		
Number of Condomless Sex			2.75*							0.27	1.60
Baseline	1.15	0.31		1.71	0.37	0.26	0.77	1.48	0.39		
1.5 months post-base	2.64	1.78		2.81	2.12	1.32	4.23	3.79	2.46		
3-months post-base	0.76	0.17		0.91	0.21	0.52	0.40	0.85	0.24		
6-months post-base	1.09	0.23		0.95	0.26	1.47	0.56	0.86	0.31		
12-months post-base	0.47	0.13 ^o		0.99	0.16	0.14	0.30	0.28	0.18		

^aDI = disclosure intervention group.

^bACCM = attention control case management group.

^cControlling for participant age, race, and time since diagnosis. LS-M = Least squares means. SE = standard error.

^oSignificant differences between baseline and the other time points.

p < .001;

**
p < .01;

*
p < .05.