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Avoidant Coping Mediates the Relationship between Self-Efficacy for HIV Disclosure and Depression Symptoms among Men who have Sex with Men Newly Diagnosed with HIV

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Abstract

HIV diagnosis presents a critical opportunity to reduce secondary transmission, improve engagement in care, and enhance overall well-being. To develop relevant interventions, research is needed on the psychosocial experiences of newly diagnosed individuals. This study examined avoidant coping, self-efficacy for HIV disclosure decisions, and depression among 92 newly diagnosed men who have sex with men (MSM) who reported recent sexual risk behavior. It was hypothesized that avoidant coping would mediate the relationship between self-efficacy and depression. Cross-sectional surveys were collected from participants three months after HIV diagnosis. To test for mediation, multiple linear regressions were conducted while controlling for HIV disclosure to sexual partners. Self-efficacy for HIV disclosure decisions showed a negative linear relationship to depression symptoms, and 99% of this relationship was mediated by avoidant coping. The index of mediation of self-efficacy on depression indicated a small-to-medium effect. Higher self-efficacy was related to less avoidant coping, and less avoidant coping was related to decreased depression symptoms, all else held constant. These findings highlight the role of avoidant coping in explaining the relationship between self-efficacy for HIV disclosure decisions and depression.

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COMPLIANCE WITH ETHICAL STANDARDS

Conflict of Interest: Emily M. Cherenack declares that she has no conflict of interest. Kathleen J. Sikkema declares that she has no conflict of interest. Melissa H. Watt declares that she has no conflict of interest. Nathan B. Hansen declares that he has no conflict of interest. Patrick A. Wilson declares that he has no conflict of interest.

Ethical approval: 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 participants included in the study.

Keywords

HIV; coping; self-efficacy; depression; MSM

INTRODUCTION

Men who have sex with men (MSM) account for 67% of new HIV diagnoses in the United States [1]. HIV disparities among MSM have been partially attributed to mental health burden and psychosocial stressors [2–5]. Poor mental health among newly diagnosed individuals has been linked to less HIV care engagement and a decreased likelihood of initiating antiretroviral therapy (ART) [6,7]. This is significant because early treatment with ART is critical for improving disease outcomes and secondary prevention [8]. Mental health treatments have been proposed as a method to reduce secondary transmission of HIV, improve HIV disease outcomes, and promote adherence to ART [9–12]. Although receiving an HIV diagnosis may be a stressful event, it also presents an opportunity for linkage to mental health care and may be a “teachable moment” during which change is more likely to occur [13–16]. There is a need for additional research on mental health, stress, and coping among newly diagnosed MSM to understand correlates of poor mental health after diagnosis and develop targeted mental health interventions. It is particularly urgent to focus on MSM who are sexually active before and after diagnosis, as mental health has been associated with HIV transmission risk behavior and potentially forward transmission of the virus [9,10]. To address this need, the current study focuses on stress, coping, and depression among newly diagnosed individuals who have had recent condomless sex and represent a high-risk group.

Depression is common among people living with HIV (PLWH). In a 2009 study, 53% of recently diagnosed PLWH in the United States had a lifetime history of major depression or another mood disorder, and in all cases the onset of the mood disorder occurred prior to HIV diagnosis [17]. Depression among people living with HIV has been associated with poor care engagement, risk behaviors, and HIV disease progression [6,18–20]. Although PLWH may have experienced depression before being diagnosed with HIV, diagnosis provides opportunities to treat pre-existing depression or prevent new symptoms. It is important to understand the mechanisms contributing to depression among newly diagnosed individuals to develop evidence-based depression treatments relevant to the early stages of HIV care.

Qualitative studies show that HIV status disclosure is a major source of stress among newly diagnosed individuals [13,21,22]. HIV status disclosure may be beneficial in eliciting social support, promoting coping, and allowing for risk reduction through serosorting and strategic condom use decisions [23–25]. However, HIV disclosure can also result in rejection and stigma [22]. Self-efficacy for making HIV disclosure decisions – how well someone believes they can make an effective decision about whether to disclose their HIV status in a given situation – may be important for mental health. In one study, those who had lower self-efficacy for making HIV disclosure decisions were less likely to disclose their HIV status, and individuals who did not disclose their HIV status had more emotional distress [26]. However, the role of self-efficacy for HIV disclosure decisions as a source of stress or

resilience above and beyond that of actual HIV disclosure behavior has not been fully examined.

Coping is an ongoing behavioral and cognitive process individuals engage in to manage potential stressors [27]. It is important to examine the ways newly diagnosed individuals cope with demands such as HIV disclosure decisions. The effectiveness of a coping strategy in reducing stress, improving mood, and enhancing health is dependent upon context, and adaptive strategies may differ for novel versus ongoing stress [27,28].

Coping strategies are often described as being “avoidant” or “active/approach” oriented [28–36]. Although definitions vary slightly between studies, avoidant coping can be defined as behavioral or cognitive strategies that act to ignore HIV or other potential methods to cope with HIV and employ withdrawal, distancing, avoidance, inaction, and prolonged distraction in ways that are self-destructive (such as substance use). Avoidant coping does not change the nature of an HIV-related stressor or the individual’s emotional response to the stressor. In contrast, active coping attempts to manage HIV through an approach orientation, which includes problem-solving, cognitive reframing, and social-support seeking techniques to directly reflect upon, non-judgmentally accept, and address HIV-related stress [32,33]. Prior literature shows that active coping and avoidant coping are orthogonal constructs, indicating that they are distinct rather than opposite forms of coping [31].

There is evidence that avoidant coping is related to depression among PLWH. A meta-analysis of 37 studies showed that avoidant coping predicts negative affect, which includes depression and other mood disorders [32]. In a study by Clement and Schonnsson [37], avoidant coping predicted 70% of the variance in depressed mood among PLWH. Gore-Felton and colleagues [30] found that men and women using more avoidant coping showed greater depression at two time points across three months. Further supporting this research are randomized controlled trials in which decreases in depression and PTSD following cognitive behavioral stress management and coping interventions were mediated by decreases in avoidant coping [29,38,39]. However, other studies suggest avoidant coping may be adaptive immediately after receiving an HIV diagnosis, and as time since diagnosis increases, avoidant coping is related to greater depression, anxiety, and negative affect [32,40]. To address mental health burden after diagnosis, it is important to continue examining coping strategies among newly diagnosed individuals.

A coping strategy is consciously or unconsciously employed when an individual appraises the strategy as being able to produce the desired outcome and when an individual believes they will be able to implement the coping strategy. This latter belief is what Bandura [41] conceptualizes as “self-efficacy,” or the strength of one’s belief that they can do a specific behavior. Self-efficacy beliefs determine the types of behaviors people engage in and the amount of effort spent implementing the behaviors [42].

Self-efficacy may be associated with both depression and avoidant coping. Across diverse samples and among PLWH, self-efficacy in general, as well as interpersonal self-efficacy, romantic self-efficacy, and AIDS-prevention self-efficacy, has shown bi-directional

relationships to depressed mood, with higher self-efficacy related to better mood and less depression [43–48].

In addition, among HIV-positive older adults and among others with medical issues, lower self-efficacy to cope has been linked to more avoidant coping [31,49]. More broadly, a study of adults showed that having a low sense of control during a stressful event was related to higher than usual levels of avoidant coping and negative affect [50]. These studies provide evidence that self-efficacy may be associated with avoidant coping; however, the relationship between self-efficacy and avoidant coping remains understudied as it pertains to HIV. Although there are demonstrated associations between self-efficacy and depression, self-efficacy and avoidant coping, and avoidant coping and depression, research that explores the potential for avoidant coping to mediate the relationship between self-efficacy and depression among PLWH is lacking.

In addition, few studies specifically examine self-efficacy for making a decision about whether or not to disclose one's HIV status (*self-efficacy for HIV disclosure decisions*), even though HIV disclosure is a major, novel stressor for newly diagnosed individuals. Kalichman and Nachimson [26] found that lower self-efficacy for making HIV disclosure decisions was related to not disclosing one's HIV status to sexual partners. This highlights the ways in which self-efficacy to perform a behavior and the actual successful performance of the behavior may be cyclically reinforcing, as was proposed by Bandura [41]. To understand how self-efficacy for HIV disclosure decisions may relate to avoidant coping and depression symptoms, it is essential to differentiate between HIV disclosure (a behavior) and self-efficacy for HIV disclosure decisions (a cognitive-emotional construct). Although HIV disclosure behaviors may relate to coping and depression, self-efficacy may show unique relationships to coping and depression and require specific targeting in interventions [13,22,25,26,51–54]. In addition, it is important to examine self-efficacy for HIV disclosure decisions among newly infected MSM who report sexual risk behavior after diagnosis, because HIV disclosure to partners may reduce secondary transmission risk by allowing for strategic use of serosorting, condom use, or pre-exposure prophylaxis.

Overall, the goal of this study was to examine the associations between self-efficacy for HIV disclosure decisions, avoidant coping with HIV, and depression symptoms among newly diagnosed MSM who report recent sexual intercourse with men. Based on prior research showing the importance of HIV disclosure decisions as a major stressor, as well as the connections between self-efficacy, depression, and avoidant coping, it was hypothesized that greater self-efficacy for HIV disclosure decisions would be associated with less frequent depression symptoms over the past week. It was proposed that this relationship would be mediated by avoidant coping, with greater self-efficacy associated with less avoidant coping, and less avoidant coping associated with less depression. It was further expected that these relationships would exist while controlling for actual HIV disclosure to sexual partners, which allows for the examination of self-efficacy for HIV disclosure decisions separate from disclosure behaviors. It was anticipated that these relationships would be bi-directional, showing how avoidant coping may partially explain the relationship between self-efficacy and depression. Figure 1 depicts the proposed mediation model.

METHODS

Data for this analysis were collected from participants prior to their condition assignment in a randomized controlled trial of a secondary prevention intervention, and study methods have been described in previous work [16,51].

Participant Characteristics

This study took place from 2009-2011 in a federally qualified community health center in New York City focusing on lesbian, gay, bisexual, transgender, and queer individuals. To be eligible for this study, participants had to be at least 18 years old, have been assigned male sex at birth (although current self-identification as male was not required, and transgender participants were included), understand English, have been diagnosed with HIV in the past three months, be receiving health services at the study center, and have had condomless anal intercourse with a man in the three months before receiving their HIV diagnosis. The present analysis only includes participants who had sex with a partner in the three months after receiving their HIV diagnosis to focus on a group at higher risk for onward transmission and include those who had at least one opportunity to disclose their HIV status to a sex partner.

Sampling Procedures

Participants were recruited at the community health center. Study brochures were placed throughout the health center, and participants were told about the study by their healthcare provider during HIV post-test counseling or their first HIV care visit at the center. If participants were interested in the study, they were referred to study staff to complete an eligibility assessment.

Overall, 119 individuals were eligible for the study, 102 consented and completed the baseline assessment, and 92 were included in the final sample for this analysis. Eight participants were excluded from this analysis because they did not report having sexual partners in the three months following diagnosis, and two were excluded because they did not provide data on HIV disclosure.

Procedures

All participants provided written informed consent before taking part in this study, and all procedures were approved by Institutional Review Boards at participating institutions. After completing a face-to-face eligibility assessment with study staff, participants completed a baseline assessment approximately three months ($M = 86$ days) after their initial HIV diagnosis. The baseline assessment included a survey delivered via computer assisted self-interview (CASI) software.

Measures

Demographic data were collected during the interviewer-administered eligibility assessment. All other measures were administered using the CASI survey.

Depression—Symptoms of depression were measured with the Center for Epidemiological Studies Depression Scale (CES-D) [55]. The CES-D is a 20-item self-

report measure assessing the frequency of depression symptoms in the past week. The total possible range of the scale is 0 to 60, with a score of 16 or more indicating elevated depression [56] ($\alpha = .94$).

Avoidant Coping—Avoidant coping was measured using the Brief Cope [57], a 28-item (14 subscales) measure of coping behaviors based partly on Lazarus and Folkman's [27] model of stress and coping that shows high validity with diverse populations [57–59]. In this study, the items asked specifically about coping with one's HIV diagnosis, with responses ranging from "I haven't been doing this at all" to "I've been doing this a lot." To identify whether items could be grouped into an avoidant coping factor, a principal axis factor analysis was conducted with direct oblimin rotation. A two-factor solution was found, with eight avoidant coping items grouped together in one factor, which was theoretically sound and generally congruent with previous factor analyses of the Brief COPE [34] and conceptually similar coping measures [31–33,60]. The final avoidant coping score was the mean of four subscales representing denial (e.g., refusing to believe it has happened), self-blame (e.g., blaming myself for things), behavioral disengagement (e.g., giving up trying to deal), and substance abuse (e.g., using alcohol or other drugs to help me get through it). ($\alpha = .94$).

Self-Efficacy for HIV Disclosure Decisions—Self-efficacy for HIV disclosure decisions was measured using a subscale of Kalichman and Nachimson's [26] measure of Self-Efficacy for HIV Serostatus Disclosure and Safer Sex Practices. Participants read three hypothetical scenarios about disclosing their HIV status to a sexual partner in the context of various challenges, such as being intoxicated or extremely attracted to the partner. Participants rated how confident they were that they could make a decision about disclosing their HIV status to their partner if they experienced each scenario, from 0 = "cannot do" to 9 = "certain I can do." Scores were summed for a total possible score from 0 to 27. ($\alpha = .90$).

HIV Disclosure to Sexual Partners—Participants provided continuous counts of the number of sexual partners they had over the past three months and the number of sexual partners to whom they had disclosed their HIV status.

Demographics—Sexual orientation, self-reported current gender, age, race, ethnicity, highest education level completed, and current employment were measured via self-report.

Analytic Plan

All analyses were conducted using SPSS Version 23 [61].

Descriptive statistics—Univariate descriptive and reliability statistics were examined to confirm there were no sources of bias. One-way ANOVAs were run to examine levels of avoidant coping and self-efficacy for HIV disclosure decisions among those with and without elevated depression (≥ 16 on the CES-D). Bivariate Pearson correlations were obtained to examine zero-order relationships between self-efficacy for HIV disclosure decisions, avoidant coping, depression, and HIV disclosure to sexual partners. Two-tailed p

values were set to .05, and percentile bootstrapped confidence intervals (95%) were constructed with 1,000 samples.

Mediation—A mediation model proposes a path by which the independent variable (self-efficacy for HIV disclosure decisions) is associated with a mediator (avoidant coping), which is associated with the dependent variable (depression) [62]. Using validated methods, seven steps were followed to test the fit of the mediation model (Figure 1) [62–65]. Step 1 tested *Path a*, the relationship between self-efficacy and avoidant coping. Step 2 tested *Path b*, the relationship between avoidant coping and depression while controlling for self-efficacy. Step 3 tested *c*, the total effect of self-efficacy on depression. Step 4 tested *c'*, the direct effect of self-efficacy on depression while controlling for avoidant coping.

For Steps 1–4, multiple linear regressions were conducted using Ordinary Least Squares estimates with percentile bootstrapped confidence intervals (95%) constructed with 1,000 samples. Forced entry of the independent variables placed all predictors into the individual models simultaneously. The covariate of HIV disclosure to sexual partners was controlled for in each step of the analysis. Two-tailed *p* values were set to .05, and missing data were excluded listwise.

According to Baron and Kenny [62], in complete mediation, *c'* will be less than *c*, and *c'* will not be statistically significant. A second method to explore the level of mediation is to consider the significance of the indirect effect through which self-efficacy impacts depression via avoidant coping [63]. In Step 5, a product of coefficients approach was used to measure and test the significance of the indirect effect. This technique provides confidence intervals and effect sizes while also providing high power and accurate Type I error rates [64]. The null hypothesis for this test states that the unstandardized product of *Path a* and *Path b* (*ab*) is equal to zero. Confidence limits for *ab* are constructed using bootstrapping resampling methods, and the null hypothesis is retained if the 95% bootstrapped confidence interval includes zero. The test of indirect effects was completed using the PROCESS Version 2.16 macro for SPSS to determine bootstrapped confidence intervals for *ab* [65].

In Step 6, the index of mediation, a completely standardized indirect effect, was computed as a measure of effect size. The index of mediation can be helpful in comparing effect sizes across studies, as it standardizes *ab* by multiplying *ab* by the quotient of the standard deviations of the predictor and outcome [63].

Lastly, in Step 7, the proportion of the total effect of self-efficacy for HIV disclosure on depression that was mediated by avoidant coping ($ab/(c' + ab)$) was computed. In steps 5, 6, and 7, unrounded coefficients were entered into the equations, and coefficients were obtained using the PROCESS Version 2.16 macro for SPSS [65].

RESULTS

Demographics

See Table I for a full description of sample demographics. The majority of participants were gay/homosexual cisgender men, although bisexual individuals and straight/heterosexual transgender women were also included. The sample was racially and ethnically diverse, with 63% of the sample representing racial/ethnic minority individuals. Participants reported a range from 1 to 60 sexual partners. About one-third of participants disclosed their HIV status to all of their sexual partners, one-third disclosed to none of their sexual partners, and one-third disclosed to some of their sexual partners. Most participants (72.8%) were not taking antiretroviral therapy, and 20% of participants on ART reported missing their medications within the last three months. Among participants who reported intercourse with a primary sexual partner, 52.1% had engaged in condomless intercourse.

Descriptive Results and Correlations

See Table II for a description of participants' scores on avoidant coping, HIV disclosure to sexual partners, depression, and self-efficacy for HIV disclosure decisions.

Notably, about half of the sample indicated having elevated depression ($M = 16$ on CES-D). Individuals with elevated depression had higher avoidant coping scores ($M = 2.07$) than those without elevated depression ($M = 1.35$), $F(1, 89) = 47.66$, $p < .001$. Those with elevated depression had mean self-efficacy for HIV disclosure decision scores 3.25 points lower than those without elevated depression, but this difference was not statistically significant ($p = .09$). Table III provides zero-order Pearson correlation coefficients for all factors included in the mediation model. Self-efficacy for HIV disclosure decisions significantly correlated with avoidant coping and depression, and avoidant coping also correlated with depression. HIV disclosure to sexual partners only correlated with self-efficacy for HIV disclosure decisions.

A linear regression was conducted to further examine the relationship between self-efficacy for HIV disclosure decisions and the number of sexual partners to whom a participant disclosed their HIV status. HIV disclosure contributed to 4.9% of the variation in self-efficacy for HIV disclosure decisions ($Adj. R^2 = .049$, $F(1, 90) = 5.726$, $p = .019$).

Avoidant Coping as the Mediator of Self-Efficacy and Depression

Summary—Table IV summarizes the results of the mediation model. At the 5% significance level, we can reject the null hypothesis and conclude that there was a significant relationship between self-efficacy and avoidant coping (Path *a*); avoidant coping and depression, while controlling for self-efficacy (Path *b*); and self-efficacy and depression when avoidant coping is not included in the model (Path *c*). In support of a mediation effect, there was no significant relationship found between self-efficacy and depression when controlling for avoidant coping (Path *c'*). There was a significant indirect effect wherein for each point increase in self-efficacy, predicted depression decreased indirectly through avoidant coping.

Path a: Effect of Self-Efficacy for HIV Disclosure Decisions on Avoidant Coping

—Self-efficacy for HIV disclosure decisions and HIV disclosure to sexual partners together significantly predicted 12% of the variance in avoidant coping in the population ($Adj. R^2 = .12$, $F(2, 89) = 7.45$, $p = .001$). For every standard deviation increase in self-efficacy ($SD = 9.24$), predicted avoidant coping scores decreased by .38 standard deviations (5.44 points), when holding HIV disclosure constant.

Path b: Effect of Avoidant Coping on Depression, Controlling for Self-Efficacy

—Self-efficacy, avoidant coping, and HIV disclosure together significantly predicted 47% of the variance in depression in the population ($Adj. R^2 = .47$, $F(3, 87) = 27.23$, $p < .001$). For every standard deviation increase in avoidant coping ($SD = .62$), predicted depression scores increased by .68 standard deviations (9.73 points), all else held constant.

Path c: Direct Effect of Self-Efficacy on Depression—Self-efficacy and HIV disclosure together significantly predicted 7% of variation in depression in the population ($Adj. R^2 = .07$, $F(2, 88) = 4.29$, $p = .017$). For every standard deviation increase in self-efficacy, predicted depression scores decreased by .26 standard deviations (3.72 points), when HIV disclosure was held constant.

Path c'—When controlling for avoidant coping and HIV disclosure, the relationship between self-efficacy and depression was not statistically significant ($p = .98$).

Path ab: Indirect Effect of Self-Efficacy on Depression via Avoidant Coping

The indirect effect of self-efficacy on depression through the pathway of avoidant coping was $-.47$, 95% CI $[-.64, -.19]$. As the bootstrapped confidence interval did not contain zero, the indirect effect is considered statistically significant. Thus, predicted depression decreased .47 points indirectly through avoidant coping per each point increase in self-efficacy.

The index of mediation, (i.e., the standardized indirect effect) of self-efficacy on depression through avoidant coping was $-.26$, 95% CI $[-.39, -.13]$. This indicates a small-to-medium effect size. Thus, predicted depression decreased .26 standard deviations for every standard deviation increase in self-efficacy, via avoidant coping.

Ratio $ab/(c'+ab)$: Proportion of Total Effect Mediated by Avoidant Coping

Controlling for HIV disclosure, 99% of the total effect of self-efficacy for HIV disclosure on depression scores was mediated by avoidant coping.

In summary, mediation was found, as self-efficacy was significantly associated with depression scores in Step 1, but when avoidant coping was added to the model in Step 3, self-efficacy was no longer a statistically significant predictor of depression scores, and avoidant coping mediated the majority of the total effect.

DISCUSSION

To better understand factors associated with depression among newly diagnosed individuals, this study examined self-efficacy for HIV disclosure decisions, avoidant coping with HIV,

and depression among newly diagnosed MSM. The rate of elevated depression in our sample (48.9%) was similar to other studies of HIV-infected individuals [66,67], and our diverse sample was generally representative of racial and ethnic composition of newly diagnosed MSM in the United States [1].

Overall, self-efficacy for HIV disclosure decisions showed a negative linear relationship with depression symptoms, and this relationship was fully mediated by avoidant coping. Having higher self-efficacy for HIV disclosure decisions was related to less avoidant coping. Engaging in less avoidant coping was related to decreased frequency of depression symptoms in the past week. Furthermore, individuals with elevated depression scored an average of 1.16 standard deviations higher in avoidant coping compared to those without elevated depression.

All of the relationships in the mediation model were significant when controlling for HIV disclosure to sexual partners in the past three months. HIV disclosure to sexual partners was not associated with avoidant coping or depression when other factors were held constant. This finding demonstrates the importance of self-efficacy for HIV disclosure decisions above and beyond that of HIV disclosure behavior and highlights the role of cognitive-emotional factors in promoting avoidant coping and depression.

Furthermore, this study provides new empirical support for the association between self-efficacy and avoidant coping. Individuals who were more certain they could make a decision about whether to disclose their HIV status were less likely to cope using avoidant strategies. This reinforces the transactional model of stress and coping [27] and provides novel insight into the lives of newly diagnosed MSM. The positive linear relationship between self-efficacy and avoidant coping may be bi-directional; it is important to acknowledge both the potential for self-efficacy appraisals to impact the types of coping strategies used, as well as the possibility that successful or failed coping experiences may affect future self-efficacy beliefs.

The present findings highlight the role of avoidant coping in largely explaining the association between self-efficacy and depression. This must be interpreted in light of the small-to-medium-sized relationship between self-efficacy and depression. Stronger relationships were found between avoidant coping and self-efficacy and avoidant coping and depression. One possible interpretation of these findings is that low self-efficacy prompts avoidant coping, which heightens depression. Because this is a bi-directional, cross-sectional model, it is also possible that avoidant coping and low self-efficacy are both influenced by a confounding construct, such as general avoidance tendencies, or that depression causes avoidant coping, which causes low self-efficacy. Further research is needed to explore causality.

Current evidence suggests that whether relationships are bi-directional or have a shared origin, avoidant coping and self-efficacy may be appropriate intervention targets. Prior research supports the usefulness of reducing avoidant coping as a mechanism to decrease depression, and this approach allows for the development of targeted behavioral treatments for depression [38,39,68–71]. There are multiple theories as to why avoidant coping may

increase depression. Suppressing negative thoughts and emotions may be counterproductive, as the attempt to ignore painful cognitions and emotions only serves to make them more frequent and distressing [68,69]. Furthermore, in attempting to avoid distress, individuals may avoid the people, places, resources, and reinforcing experiences that would promote active coping and improve overall wellbeing, and individuals using drugs or alcohol as a method of avoidant coping may experience the compounding negative effects of substance abuse [70,71].

In this study, avoidant coping consisted of denial, self-blame, behavioral disengagement, and substance abuse. Further exploring these specific types of avoidant coping may facilitate greater understanding of the mechanisms through which avoidant coping impacts depression. Specific attention should be paid to substance use, as co-occurring substance use has been reported among HIV-infected individuals, and substance use can negatively impact HIV care and disease outcomes [17,72].

Previous research has indicated the potential for avoidant coping to be adaptive immediately after a stressful event [28]. However, our work provides evidence that interventions to reduce avoidant coping may be needed as early as the first three months after diagnosis to improve mental health during this stressful period and capitalize on diagnosis as an opportunity for behavior change. Furthermore, although we found a small-to-medium indirect effect, it is possible that this relationship would become stronger as time since diagnosis increases, and further research is needed.

This study suggests the utility of interventions that address the relationships between self-efficacy for HIV disclosure decisions, avoidant coping, and depression. Currently, there are promising interventions for PLWH to reduce avoidant coping and increase self-efficacy through skills training, motivational interviewing, and other cognitive behavioral therapies [38,39,54,73–77]. However, few interventions have focused on newly diagnosed individuals. Project ACCEPT, which has been pilot tested with newly diagnosed HIV-positive youth, was designed in part to improve self-efficacy, coping, and mood, and it is particularly well-supported by the current analysis [75]. Project ACCEPT showed high acceptability and feasibility among young PLWH. However, Project ACCEPT's pilot-sized sample may have been underpowered to provide evidence of consistent decreases in avoidant coping. Our work suggests that despite these inconsistent findings, coping interventions may benefit newly diagnosed individuals, and a better understanding of mechanisms of action or a new approach to intervention may prove useful [75].

Prior interventions have typically focused on increasing self-efficacy (including self-efficacy for coping, HIV disclosure, and sexual discussion) and decreasing avoidant coping (or other maladaptive behaviors) simultaneously [73,75]. For example, in motivational interviewing, increasing self-efficacy is key to improving motivation and subsequent behavior change [78]. However, the present findings provide evidence that an alternative strategy may exist. It may be fruitful to diminish the relationship between self-efficacy and avoidant coping, so that low self-efficacy beliefs become less influential in prompting avoidance behavior, and individuals with low self-efficacy remain willing and able to engage in less avoidant coping. An example of an evidence-based treatment focused on reducing the negative impact of

cognitions on avoidance behaviors is acceptance and commitment therapy (ACT). ACT aims to modify the functional impact of distressing emotions or thoughts, rather than changing their frequency or content, to reduce avoidant coping and increase active coping in the context of pain that cannot be eliminated [79]. Future research may seek to test whether an ACT-informed approach could improve coping and treat depression among newly diagnosed individuals with low self-efficacy.

This analysis is limited in that it cannot infer causality because of the cross-sectional design. Based on prior theory and research, it is likely that relationships are bi-directional [27,43,45,47]. Indeed, a previous longitudinal analysis of this data showed that depression measured via the Beck Depression Inventory at screening predicted self-efficacy for HIV disclosure decisions at baseline [51]. This work is supported by the current findings, which provide further evidence of a reciprocal relationship between depression and self-efficacy at baseline, in addition to highlighting the role of avoidant coping in mediating this relationship.

This analysis suggests longitudinal studies to examine avoidant coping and self-efficacy over time could facilitate our understanding of depression among newly diagnosed individuals. Technology-based daily diaries, which have shown high feasibility and acceptability among HIV-positive individuals, may allow for more intensive investigations of coping and mental health [80]. Furthermore, although the relationships between depression, self-efficacy, and avoidant coping may ultimately prove to be reciprocal, this should not hinder the development of interventions. The transactional, interacting nature of these factors may create a beneficial synergistic intervention effect. Additional research is needed to examine this possibility.

Overall, our findings show high rates of depressive symptoms among newly diagnosed MSM and suggest there is a need to address HIV-related coping among newly diagnosed individuals with depression. Prior research shows the relationship of depression to HIV-related outcomes [6,18–20]. This supports a call for greater funding to develop mental health interventions for people newly diagnosed with HIV.

In conclusion, this study used empirical data collected from a diverse sample of newly HIV-infected MSM with recent sexual behavior to highlight the importance of avoidant coping in mediating the relationship between self-efficacy for HIV disclosure decisions and depression. These findings provide evidence that interventions to improve self-efficacy and coping may be useful for reducing depressive symptoms and enhancing the lives of newly diagnosed MSM. Further research on the interrelationships between self-efficacy, coping, and mental health is warranted to improve the well-being newly diagnosed of individuals living with HIV and limit onward transmission of the virus.

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Figure 1. Mediation model in which the relationship between self-efficacy for HIV disclosure decisions and depression symptoms is mediated by avoidant coping. HIV disclosure to sexual partners is controlled for in each step of the analysis.

Table I

Demographic Characteristics

	<u><i>M (SD)</i></u>
<i>Age</i>	<u>31.78 (8.42); Range = 19–60</u>
	<u><i>N (%)</i></u>
<i>Sexual Orientation</i>	
Gay/Homosexual	87 (95)
Bisexual	2 (2)
Straight/Heterosexual	3 (3)
<i>Transgender</i>	4 (4)
<i>Race/Ethnicity</i>	
African American/Black	14 (15)
White	34 (37)
Hispanic/Latino	29 (31)
Asian/Pacific Islander	5 (5)
Mixed-Race/Other	10 (11)
<i>Highest Education Level Completed</i>	
<12 th	4 (4)
12 th /GED	18 (20)
Some college/Associates/Bachelors	56 (61)
Masters/Doctoral Degree	14 (15)
<i>Current Employment Status</i>	
Working/Student	64 (70)
Unemployed/Disability	28 (30)
<i>Elevated Depression (16 on CES-D)</i>	45 (48.9)
<i>Taking Antiretroviral Therapy</i>	25 (27.2)

Table II

Descriptive Information for Factors in the Model

	<i>n</i>	<i>M</i>	<i>SD</i>	Possible Range	Actual Range
Avoidant Coping	92	1.71	.62	1–4	1–3.63
# of Sexual Partners Disclosed HIV status to	92	2.25	3.62	0–60 ^a	0–24
Depression (CES-D)	91	19.77	14.31	0–60	0–54
Self-Efficacy for Disclosure Decisions	92	16.23	9.24	0–27	0–27

Note.

^aSixty is the maximum number of partners reported in the past three months.

Table III

Summary of Zero-Order Correlations between Avoidant Coping, Depression, Self-Efficacy for HIV Disclosure Decisions, and HIV Disclosure to Sexual Partners.

Factor	Coping	Depression	Self-Efficacy	HIV Disclosure
Coping	–	.69 **	–.34 **	.07
Depression	.69 **	–	–.21 *	.15
Self-Efficacy	–.34 **	–.21 *	–	.25 *
HIV Disclosure	.07	.15	.25 *	–

Note.

**
p < .01.

*
p < .05 (two-tailed).

Table IV

Linear Models Representing the Relationship Between Self-Efficacy and Depression as Mediated by Avoidant Coping

Outcome	Predictor	Path	<i>b</i> *	<i>b</i>	95% CI	SE	<i>p</i>
Avoidant Coping	Self-Efficacy	<i>a</i>	-.38	-.03	[-.04, -.01]	.01	.001
Depression	Avoidant Coping	<i>b</i>	.68	15.71	[12.05, 19.31]	1.9	.001
	Self-Efficacy	<i>c'</i>	-.003	-.004	[-.25, .2]	.12	.98
Depression	Self-efficacy	<i>c</i>	-.26	-.41	[-.72, -.13]	.15	.008
Depression	Self-Efficacy via Avoidant Coping (Indirect Effect)	<i>ab</i>		-.4	[-.64, -.19]		

Note. All models adjusted for the number of sex partners the participant disclosed their HIV status to in the past three months. CI: percentile bootstrap confidence interval. *b**: standardized beta coefficient. Confidence intervals, *p* values, and standard errors based on 1000 bootstrapped samples.