

The Impact of Stigma and Social Support on Development of Post-traumatic Growth Among Persons Living with HIV

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Abstract Given high rates of trauma in people living with HIV (PLH) and the health benefits of posttraumatic growth (PTG), understanding how to foster PTG in PLH exposed to trauma could be of interest to clinical psychologists working with this population. The current study examined factors theoretically related to development of PTG in PLH, namely HIV-related stigma, disclosure of HIV status, and emotional support. A sample of 334 HIV-positive adults answered a battery of self-report questionnaires. HIV-related stigma, disclosure to sexual partners, and emotional support were significant predictors of PTG: stigma was associated with lower PTG, whereas disclosure and emotional support were associated with higher PTG. Disclosure and emotional support remained significantly associated with PTG in the model including demographic factors and stigma. These findings highlight the need for development of interventions that can aid PLH in disclosing their HIV status to sexual partners and increasing available social support.

Keywords Post-traumatic growth · Stigma · Social support · HIV

Introduction

Studies estimate that nearly 90 % of the approximately 1.2 million people living with HIV (PLH) in the United States have been exposed to at least one traumatic event in their lifetime (Center for Disease Control and Prevention, 2011; Kalichman, Sikkema, DiFonzo, Luke, & Austin, 2002; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Exposure to trauma among PLH is linked to numerous negative outcomes including risky sexual behaviors (Pence et al., 2012), reduced rates of medication adherence (Keuroghlian et al., 2011), and increased incidence of stress, substance abuse, and needle sharing (Brief et al., 2004; Gore-Felton & Koopman, 2008). While the bulk of research to date has focused on the negative consequences of trauma, a growing body of evidence has begun to emphasize positive outcomes that can follow a traumatic experience. Posttraumatic growth (PTG), a positive psychological change that can occur in the wake of a traumatic life event, is one such outcome. Evidence suggests that rates of PTG in HIV-positive persons are high, ranging from 59 to 83 % (Milam, 2004). Moreover, PTG in PLH is associated with enhanced health-related behaviors including improved diet and regular exercise, as well as decreased sexual and drug-related risk behavior (Siegel & Schrimshaw, 2000). Given the high rates of trauma in the HIV-positive population and the potential benefits of fostering growth experiences, it is important that research on this topic characterizes variables related to PTG among PLH.

Posttraumatic Growth

PTG occurs when individuals cognitively revise their basic schemas about the world and their self-efficacy in the wake

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of trauma, developing a new and more positive self-narrative (Tedeschi & Calhoun, 2004). PTG differs from related concepts including coping and resilience because it involves a qualitative improvement in functioning rather than a return to baseline (Linley & Joseph, 2004). PTG can manifest in many ways, including an increased appreciation of life, heightened interest in spirituality, enhanced self-efficacy and personal strength, and an improved ability to forge intimate relationships, express emotion, set positive priorities, and express hope for the future (Cadell, Regehr, & Hemsworth, 2010; Linley & Joseph, 2004).

One predominant model of PTG, developed by Tedeschi and Calhoun (2004), proposes two paths by which individuals may undergo growth. Both paths begin with the experience of a trauma severe enough to challenge the individual's worldview. This experience creates emotional distress and intrusive, automatic rumination. In one path to PTG, these unproductive ruminations are met with healthy emotion regulation, which allows the individual to disengage from previous beliefs and ascribe new and positive meaning to the trauma, thereby experiencing PTG. In the alternate path, which we examine in this paper, a traumatic experience can lead to self-disclosure about the trauma, which in turn elicits social support and helps individuals find meaning and create a new narrative around the trauma experience.

While many studies have examined variables that can lead to PTG, including coping and schema change, few have examined variables unique to the experience of living with HIV. Consequently, the current study builds on Tedeschi and Calhoun's (2004) model by examining the influence of HIV-related stigma and disclosure of HIV-serostatus, in addition to social support, on PTG among PLH.

HIV Stigma and Disclosure

In Tedeschi and Calhoun's (2004) model, disclosure of the traumatic experience and subsequent acquisition of social support can foster PTG. While HIV-positive persons are exposed to significantly higher rates of trauma than the population in general (Kalichman et al., 2002), being diagnosed and living with HIV can also be a highly stressful and stigmatizing experience (Boarts, Buckley-Fischer, Armelie, Bogart, & Delahanty, 2009). HIV-related stigma may reduce the likelihood that an individual would disclose his or her HIV status, and could thereby negatively impact acquisition of social support and subsequent PTG. Stigma is generally defined as social rejection that results from discrimination and ridicule towards a particular group or condition (Goffman, 1974). PLH may be exposed to stigma due to associations of HIV with intravenous drug use, multiple sexual partners, or sexual practices with

same-sex partners (Fife & Wright, 2000). A significant majority of HIV-positive individuals do in fact report experiencing discrimination or social rejection related to their diagnosis (Nachega et al., 2012).

Fear of discrimination hampers disclosure of concealable, stigmatized identities, such as sexual identity (Corrigan, 2003), and has been shown to inhibit disclosure of HIV status in previous studies (Derlega, Winstead, Greene, Serovich, & Elwood, 2002). Stigma may therefore inhibit the type of disclosure necessary to elicit social support and begin the process of PTG. One particularly critical form of disclosure is disclosure of HIV status to sexual partners. Disclosure of HIV status to sexual partners is important for three reasons: HIV status is directly relevant in the context of a sexual relationship, more so than in non-sexual relationships with family or friends; disclosure to a sexual partner facilitates communication about HIV transmission risk and safer sexual behaviors; and disclosure to a sexual partner can lead to increased social support from these partners (Derlega, 1993; World Health Organization, 2003). Feeling stigmatized by an HIV diagnosis, by contrast, may reduce self-disclosure of HIV status to sexual partners. To the extent that HIV status is a stigmatized and stressful identity, lack of disclosure could limit social support and positive social interaction that could lead to PTG, following Tedeschi and Calhoun's (2004) model. In addition to these indirect effects on PTG through HIV status disclosure and social support, both stigma and disclosure may directly decrease PTG by hampering individuals' ability to appropriately express emotion, develop an enhanced understanding of their trauma, and begin the process of meaning-making (Calhoun, Cann, Tedeschi, & McMillan, 2000).

Social Support

Social support is critical to the process of PTG, as having others listen to, understand, and reflect on an individual's traumatic experience can facilitate the development of new schemas and a revised and meaningful narrative about the trauma (Neimeyer, 2004). Among PLH, receiving emotional support in particular, rather than informational or tangible support, is related to higher levels of PTG (Barskova & Oesterreich, 2009; Cieslak et al., 2009). It appears that disclosure and discussion of emotion is the component of social support most directly linked to PTG (Nenova, DuHamel, Zemon, Rini, & Redd, 2013), perhaps because this type of support enhances emotion regulation. Furthermore, social support from a sexual partner following disclosure of HIV status is unique, in that: it can ensure that safer sex practices are used; represents an affirmation of the disclosing individual despite being HIV-positive; and also involves the continuation of a social and sexual

relationship (Perry et al., 1994; Reilly & Woo, 2004). Given the inhibiting effects of stigma on disclosure and the prevalence of stigma among PLH, it is important to specifically investigate the relationship between stigma, disclosure, social support, and PTG in HIV-positive individuals.

Minority Status and PTG

Additional factors may be associated with the development of PTG in PLH. The communities most impacted by HIV are also most impacted by other forms of racial and sexual prejudice (Boarts, Bogart, Tabak, Armelie, & Delahanty, 2008). Minority status and concomitant exposure to prejudice may affect individuals' relationships with the health care system and may influence their experience with social stigma or social support (Nachege et al., 2012). In a sample of homeless and unstably housed persons living with HIV/AIDS, women experienced higher levels of stigma than men, as did homeless participants and persons with lower levels of education (Wolitski, Pals, Kidder, Courtenay-Quirk, & Holtgrave, 2009). In this same study, increased stigma amongst these minority groups was associated with decreased HIV status disclosure. The connection between a stigmatized group identity and negative mental and physical health consequences is especially strong among the HIV/AIDS positive population (Bluthenthal et al., 2012; Kamen, Bergstrom, Koopman, Lee, & Gore-Felton, 2012). Minority groups experiencing social stigma may have fewer opportunities for social mobility and increased rates of mental illness (Logie, James, Tharao, & Loutfy, 2011). Minority status can also result in a lack of social support at an interpersonal level, a community level, and a systemic level (Logie et al., 2011; Parker & Aggleton, 2003). Given that stigma and decreased social support related to minority status may have a negative impact on PTG, this study examined the impact of minority status, which includes gender, race/ethnicity and sexual orientation, on development of PTG.

The Current Study

The current study sought to explicate the factors related to PTG in HIV-positive individuals. Specifically, we examined HIV stigma, disclosure of HIV status, and received emotional support as predictors of PTG following a traumatic stressor among PLH. We hypothesized the following:

H1 PTG among PLH is negatively related to HIV-related stigma and positively related to disclosure of HIV status and social support, particularly to emotional support.

H2 Minority adults living with HIV (i.e., female, non-Caucasian, and non-heterosexual or sexual minority)

experience greater stigma related to their HIV-positive status, and this is related to decreased disclosure of HIV status, social support and PTG.

H3 HIV-related stigma, disclosure of HIV status, and emotional support serve as independent significant predictors of PTG.

Methods

Participants and Procedure

The current sample consisted of seropositive men and women living in the San Francisco Bay Area ($N = 334$). Participants were recruited as part of a larger study examining a novel group psychotherapy intervention to reduce trauma symptoms and co-occurring HIV-related sexual risk behavior. The present study had a cross-sectional design and analyzed data from baseline questionnaires collected from participants before they were randomized into intervention conditions. Inclusion criteria established that participants: (1) were age 18 years or older; (2) were HIV-positive; (3) reported engaging in HIV risk behavior (unprotected anal or vaginal sex, sharing needles, or contracting a sexually transmitted infection in the past 3 months); (4) reported experiencing one or more trauma-related symptoms (i.e., reexperiencing, hyperarousal, or avoidance) occurring within the past 3 months; (5) and were able to speak and understand English. Individuals with low functional performance scores (below 60) measured by the Karnofsky Performance Status Scale (Royal et al., 2012) were excluded from the current study. The Karnofsky scale is a brief assessment of functioning, taking into account both activities of daily living and medical status. Of the 542 persons who presented for screening, 9 did not provide their age, 10 did not provide their HIV status, 115 did not report HIV risk behavior, 46 reported not experiencing trauma symptoms, and no one was excluded for a low Karnofsky score. A final sample of 334 participants screened as eligible and presented for a baseline assessment.

Participants were 26 % female ($n = 87$), and the mean age of participants was 45.9 (range 23–67). Study participants identified as 16.8 % Hispanic/Latino ($n = 56$), 38.6 % African American ($n = 129$), 32.6 % Caucasian ($n = 109$), 5.7 % Asian/Asian-American ($n = 19$), and 6.0 % other race/ethnicity ($n = 20$). The majority of participants were unemployed (85.6 %, $n = 286$) and had a modal level of education of high school graduate or GED (32.9 %, $n = 110$). A total of 38.9 % were heterosexual ($n = 130$), while 61.1 % were lesbian, gay, bisexual, or transgendered ($n = 204$). Participants were paid \$25 for completing the baseline assessment. The study received

institutional review board approval before study procedures commenced. All participants provided informed consent. All participants were administered self-report questionnaires via audio computer-assisted self-interview (ACASI) technology, and items were presented to all participants in the same order. The quality of psychological and behavioral data is enhanced through use of ACASI because data entry errors due to skip patterns are removed (NIMH Multisite Group, 2008).

Measures

Demographics

Measures included a questionnaire assessing demographic characteristics such as age, employment status, income, education, race/ethnicity, sex and sexual minority status (identifying as heterosexual vs. lesbian/gay/bisexual). The last three variables were dichotomized for the purpose of making comparisons; following the methodology used by Sikkema, Hansen, Meade, Kochman, & Fox (2009), we dichotomized males (coded as 0) and females (coded as 1), Caucasians (0) and racial and ethnic minority group members (1), and heterosexuals (0) and sexual minority group members (1).

Posttraumatic Growth

The Posttraumatic Growth Inventory (PTGI) was used to assess the presence of benefits and positive outcomes associated with being exposed to a traumatic event. The PTGI is a 21-item self-report questionnaire that asks participants to rate the degree to which a change occurred in their life as the result of a crisis on a 6-point Likert scale, ranging from: 0 = *I did not experience this change as a result of my crisis* to 5 = *I experienced this change to a very great degree as a result of my crisis*. Scores range from 0 to 105, with higher scores equating to more PTG. The five factors of the PTGI include: New Possibilities, Relating to Others, Personal Strength, Spiritual Change, and Appreciation of Life. Sample items from this measure include “I changed my priorities about what is important in life” and “I established a new path for my life.” The PTGI has been shown to have satisfactory test-retest reliability and overall utility in determining positive post-trauma changes (Shakespeare-Finch & Lurie-Beck, 2014; Tedeschi & Calhoun, 1996). In the current study, the PTGI displayed excellent internal consistency ($\alpha = .96$).

Stigma

HIV-related stigma was evaluated using the HIV-Stigma Scale (Berger, Ferrans, & Lashley, 2001). This instrument is a 40-item self-report questionnaire that assesses

perceived stigma in HIV-positive persons and is scored on a 4-point Likert scale, ranging from: 1 = *strongly disagree* to 4 = *strongly agree*. Scores range from 40 to 120, with higher scores equating to more HIV stigma. Sample items include “People with HIV are treated like outcasts” and “I regret having told some people that I have HIV.” The HIV-Stigma Scale has been shown to have satisfactory reliability and validity in a diverse sample of people with HIV (Berger et al., 2001). In the current study, the HIV-Stigma Scale displayed excellent internal consistency ($\alpha = .95$).

Disclosure

Disclosure of HIV status was assessed using a single item from a communication scale (Kalichman & Nachimson, 1999), which asked participants to respond to the prompt, “I tell all my partners that I am HIV positive,” using a Likert-type scale from: 0 = *strongly disagree* to 4 = *strongly agree*. For purposes of interpretation, participants were dichotomized based on their responses, with those reporting less than agreement or strong agreement (i.e., 0, 1, or 2) coded as less likely to disclose (0), and those reporting agreement or strong agreement (i.e., 3 or 4) coded as more likely to disclose (1).

Social Support

Social support was assessed using the UCLA Social Support Inventory (UCLA-SSI; Dunkel-Schetter, Feinstein, & Call, 1986). The UCLA-SSI is a 70-item self-report questionnaire that consists of a total of 14 scales, but the developers of the inventory designed it with the intention of allowing researchers to flexibly examine research questions related to social support, i.e., to select specific clusters of items from the total pool of items in order to assess specific types of social support. In the current study, recommendations of Dunkel-Schetter et al. (1986) were considered when assessing an individual’s level of received emotional support, and thus a total score of 15 items was used to define a received emotional social support index. Answers are scored on a 5-point Likert scale, ranging from 1 = *never* to 5 = *very often*. Sample items include “How often did your...parent convey love and caring within the past 3 months?” and “How often did your friend understand and empathize with you within the past three months?” Possible total scores ranged from 15 to 75, and higher scores indicated greater support. Our emotional support variable demonstrated adequate internal consistency ($\alpha = .68$) in the current study.

For purposes of comparison, we also calculated scores for the 13-item Information/advice-based social support scale and the 13-item tangible/assistance-based social support scale (Dunkel-Schetter et al., 1986). Sample information/advice based items included: “How often did

your partner provide information or advice about your relationship with another person within the past 3 months (whether you wanted it or not)?" Sample tangible/assistance-based items included: "How often did your friend provide minor assistance within the past 3 months (whether you wanted it or not)?" Possible total scores ranged from 13 to 65 on both scales and higher scores indicated greater support. Our Information/advice-based social support scale demonstrated adequate internal consistency ($\alpha = .70$) in the current study, as did the tangible/assistance-based social support scale ($\alpha = .76$).

Data Analysis

Descriptive statistics were computed for demographic characteristics as well as all questionnaires included in the current study. Then, to test hypothesis 1, Pearson correlation coefficients were computed to examine the bivariate associations between PTG, HIV-related stigma, likelihood of disclosure of HIV status, and different types of social support. Next, to test hypothesis 2, we conducted independent samples *t*-tests to compare group means on PTG, stigma, and emotional support and Chi square tests to compare likelihood to disclose for women versus men, non-White vs. White individuals, and sexual minority individuals versus heterosexuals.

Finally, to test hypothesis 3, we constructed a hierarchical regression equation to examine the relative contribution of HIV-related stigma, disclosure of HIV status, and emotional support to endorsement of PTG by adults living with HIV. We entered the predictors in four blocks, based on the theoretical framework provided by Tedeschi and Calhoun (2004): in the first block we entered demographic characteristics expected to covary with PTG, namely sex, race, and sexual minority status; in the second block we entered the total score from the HIV stigma scale; in the third block we entered the dichotomous variable for likelihood to disclose HIV status; and in the fourth block we entered the scale score for emotional support. This approach allowed us to examine whether HIV-related stigma, disclosure and emotional support independently predicted variance in PTG, and whether emotional support predicted additional variance above and beyond HIV-related stigma and disclosure of HIV status. All statistical analyses were performed using SPSS 19.0 (SPSS Inc., Chicago, IL).

Results

Descriptive Statistics

The mean score on the PTGI for this sample was 66.80 ($SD = 23.36$), similar to other large-scale examinations of

the PTGI (Purc-Stephenson, 2014) but slightly lower than the mean reported in Tedeschi and Calhoun's (1996) original validation study. The mean score on the HIV Stigma scale for this sample was 101.35 ($SD = 23.04$), again similar to other large-scale examinations of this measure (Bunn, Solomon, Miller, & Forehand, 2007). This mean score falls near the median for the scale (range 40–160), indicating that participants in this study experienced an approximately average amount of HIV-related stigma.

With regard to disclosure, 59.3 % of the sample ($n = 198$) reported that they agreed that they would disclose their HIV status to sexual partners, while 40.7 % ($n = 136$) reported that they either disagreed or were neutral about disclosing their HIV status. Finally, with regard to social support, the mean score on the emotional support subscale was 12.23 ($SD = 3.69$); similar to statistics reported for other HIV/AIDS relevant samples (Schwartz, Dunkel-Schetter, & Kemeny, 1994), 27.3 % of the sample ($n = 91$) reported that relatives "very often" or "often" provided emotional support, 37.2 % ($n = 124$) reported that friends provided this type of support, 39.9 % ($n = 133$) reported that partners provided this type of support, and 52.1 % ($n = 174$) reported that groups/institutions provided this type of support.

Bivariate Relationships

As hypothesized, PTG was negatively, though weakly, correlated with HIV-related stigma ($r = -.14, p < .05$). PTG was positively correlated with likelihood of disclosure of HIV status to sexual partners ($r = .17, p < .01$), information/advice-based social support ($r = .22, p < .001$), tangible/assistance-based social support ($r = .20, p < .001$), and emotional social support ($r = .34, p < .001$). Furthermore, HIV-related stigma was negatively correlated with disclosure of HIV status ($r = -.13, p < .05$), tangible/assistance-based social support ($r = -.13, p < .05$), and emotional social support ($r = -.32, p < .001$). Disclosure of HIV status was positively correlated with information/advice-based ($r = .13, p < .05$), tangible/assistance-based ($r = .17, p < .01$), and emotional social support ($r = .15, p < .01$). Given the high correlation between emotional support and both PTG and HIV-related stigma, and given the theoretical importance of emotional social support (Nenova et al., 2013), this variable was carried forward as a proxy for social support in subsequent analyses. See Table 1 for bivariate associations between variables in the current study.

Comparing Diverse Groups on PTG, HIV-Related Stigma, Disclosure, and Social Support

Total scores for PTG were significantly higher on average among women ($M = 71.76$) than among men ($M = 65.14$;

Table 1 Bivariate relationships among PTG, HIV-related stigma, disclosure, and social support ($N = 334$)

	1.	2.	3.	4.	5.
1. PTGI total score					
2. HIV stigma total score	-.14*				
3. HIV status disclosure to partners	.17**	-.13*			
4. Informational social support	.22**	-.06	.13*		
5. Tangible social support	.20**	-.13*	.17**	.56**	
6. Emotional social support	.34**	-.32**	.15**	.54**	.63**

* $p < .05$, ** $p < .01$ (two-tailed)

Table 2 Hierarchical regression predicting variance in PTG from demographic characteristics, HIV-related stigma, disclosure, and social support ($N = 334$)

Variable	β , Step 1	β , Step 2	β , Step 3	β , Step 4
Step 1: $R^2 = .03^*$				
Racial/ethnic minority vs. caucasian	.14*	.14*	.15**	.12*
Male vs. female	.01	.02	.02	.01
Sexual minority vs. heterosexual	.10	.09	.09	.09
Step 2: $\Delta R^2 = .02^{**}$				
HIV stigma total score		-.15**	-.12*	-.03
Step 3: $\Delta R^2 = .02^{**}$				
HIV status disclosure to partners			.16**	.12*
Step 4: $\Delta R^2 = .08^{**}$				
Emotional social support				.31**

Final $R^2 = .16$; * $p < .05$, ** $p < .01$ (two-tailed)

$t = -2.23, p < .05$). There were no other mean differences by gender. Total scores for PTG were also significantly higher on average among non-whites ($M = 69.42$) than among whites ($M = 61.45; t = -2.93, p < .01$). There were no other mean differences by race/ethnicity. Total scores for HIV-related stigma were significantly higher on average among heterosexuals ($M = 106.71$) than among non-heterosexuals or sexual minority group members ($M = 97.99; t = 3.40, p < .001$). There were no other mean differences by sexual orientation.

Explaining Variance in Post-traumatic Growth

Given the correlation between predictor variables (i.e., HIV stigma, disclosure of HIV status to sexual partners, and emotional support), as well as the outcome variable of PTG, we centered all continuous predictor variables around their means before entering them into the regression model in order to reduce multicollinearity.

In Block 1, we allowed the demographic variables of race/ethnicity, gender, and sexual minority status to enter the model predicting variance in PTG. Only racial/ethnic minority identity was significantly associated with PTG ($\beta = .14, p < .05$), explaining 3 % of the variance in the outcome. In Block 2, we allowed HIV-related stigma to enter the model predicting variance in PTG. HIV-related stigma was significantly associated with PTG ($\beta = -.15,$

$p < .01$), explaining an additional 2 % of the variance. In Block 3, the relationship between HIV-related stigma and PTG remained significant when the dichotomous variable representing disclosure of HIV status to sexual partners was entered into the model, though disclosure was also significantly related to PTG ($\beta = .16, p < .01$). When we allowed emotional support to enter the model in Block 4, however, the association of HIV-related stigma with PTG became non-significant ($\beta = -.03, p > .05$), while racial/ethnic minority identity ($\beta = .12, p < .05$), disclosure of HIV status ($\beta = .12, p < .05$), and emotional support ($\beta = .31, p < .001$) were significantly associated with PTG. Together, the variables predicted approximately 16 % of the variance in the outcome. See Table 2 for results of the hierarchical regression equation.

Discussion

In Tedeschi and Calhoun’s (2004) model of PTG, disclosure leads to social support, which leads to PTG. Unfortunately, among HIV-positive individuals, stigma is pervasive and may inhibit the disclosure necessary to experience such growth. The current study affirms the expected positive relationships among PTG, social support and disclosure for HIV-positive individuals. Our findings suggest, however, that at least among this sample of HIV-

positive adults, HIV-related stigma was a less significant factor in development of PTG than availability of social support. As this study made use of cross-sectional data, it is difficult to make firm conclusions about the sequential pathway to PTG for the population under study. The correlations among the variables examined suggest that decreased disclosure could prevent individuals from eliciting emotional support and experiencing PTG, following Tedeschi and Calhoun's model (2004). There may be other mediating factors that influence the relationship between stigma and PTG, such as other forms of support, which were not analyzed in the current study. The other pathway to PTG, through emotion regulation and cognitive reappraisal, may also be associated with both stigma and growth. Longitudinal examinations are necessary to test these theoretical pathways.

Disclosure was found to be significantly and independently associated with PTG. This may suggest that the ability and willingness to disclose one's HIV-positive status increases PTG independent of social support elicited by the disclosure; conversely, higher PTG may lead to higher willingness to disclose. Disclosure of HIV status to a sexual partner is particularly complex. This form of disclosure may result in the sexual partner withdrawing from sexual contact and terminating the relationship; thus, disclosure of HIV status in the context of a sexually intimate relationship risks loss of both a social and sexual relationship, a risk greater than might be incited by similar disclosure in a non-sexual relationship. Future research should study the link between disclosure to a range of potentially supportive others and PTG, in order to increase the generalizability of this finding. Clinicians interested in enhancing PTG and social support may need to specifically utilize interventions to help PLH disclose their HIV status to their sexual partners. Further research is needed to test the hypothesis that inability to disclose ultimately limits PTG.

Our findings indicate that social support, and specifically emotional support, may be a particularly important predictor of PTG. These findings are in line with existing research showing the importance of social support in the development of PTG (Barskova & Oesterreich, 2009; Cieslak et al., 2009) and highlight the potential clinical efficacy of promoting social support among HIV-positive individuals. It is important to note that an ability to relate to others that improves in the wake of trauma may also affect an individual's capacity to elicit social support, and therefore the relationship between PTG and emotional support may be bidirectional.

Lastly, we examined the association of minority status (non-White, female gender, and non-heterosexual) on stigma and PTG, assuming that higher exposure to stigma and prejudice in minority communities would be related to PTG. These results were largely contrary to our

hypotheses. As hypothesized, PTG was significantly higher in women. PTG was also significantly higher in non-Whites than among Whites. This may have been due to several factors, including the intersection of gender and race in this sample, where many of the non-White participants were also female; in addition, non-White groups may actually have greater access to social support from families and community networks. Also contrary to our hypothesis, HIV-related stigma was significantly higher for heterosexuals than for non-heterosexuals. This may reflect the unique culture of the community in which our study was conducted. The San Francisco Bay Area is diverse and encapsulates numerous non-profit organizations that serve men and women living with HIV/AIDS, many of which have specific programs that target gay or bisexual men who are seropositive. Services specifically targeting heterosexuals, by contrast, are more limited, and this lack may lead to increased stigma among heterosexual men in particular. Heterosexuals, specifically White heterosexuals, may not have developed appropriate coping mechanisms to handle discrimination, and may thus report experiencing higher levels of stigma when diagnosed with a stigmatizing illness such as HIV. It is important to note that even when accounting for demographic characteristics, however, availability of social support remained a significant independent predictor of PTG in the current study.

These findings suggest several research and clinical implications for those working within the HIV-positive community. Given the strong relationship between social support and PTG, more research is needed to study the elements that foster positive social relationships, specifically those that enhance emotional support. Due to the difference seen in the development of PTG between minority ethnic groups, more research is also needed to determine the impact of different forms of social stigma (racial, serostatus-based, etc.) on disclosure of HIV status and the development of social support. Additionally, as our data were cross-sectional in nature, longitudinal research is necessary in order to further characterize the relationship between stigma, disclosure, social support, and PTG.

Based on our findings, training of clinicians on the importance of and ways to bolster social support is warranted. Clinical interventions, whether provided individually, in groups, or through public awareness campaigns, should include information about and opportunities to increase social support. It is also important to promote education and messages that may reduce stigma surrounding HIV both on a systemic and individual level. Finally, public awareness campaigns and support groups that provide a venue for safe and supportive disclosure could be beneficial for the facilitation of PTG among PLH.

The findings of the current study should be interpreted in light of several limitations. First, disclosure of HIV status

was assessed using a single item from a communication scale (Kalichman & Nachimson, 1999) that specifically asked participants about disclosure to sexual partners. HIV serostatus disclosure often involves revelation to various groups extending beyond sexual partners to include family, close friends, and other members of primary support groups or social environments. This narrower methodological approach limits the extent to which conclusions can be drawn regarding disclosure, and future studies should include measures of disclosure that assess communication with a broader range of social groups. Second, the cross-sectional design of the study allows for the simultaneous examination of associations among the variables of stigma, disclosure, social support, and PTG but does not allow for the examination of temporal associations and prevents inferences regarding causality to be drawn. Future research should consider examining our hypotheses using longitudinal methodology, as such an approach would contribute to the generalizability and validity of the current findings. Lastly, although we gathered data from a unique and ethnically diverse sample of individuals living in the San Francisco Bay Area, the majority of our participants were male sexual minority group members. The imbalance in our sample with regards to gender and sexual orientation may limit generalizability. Future studies should consider using more geographically and demographically diverse samples to ensure generalizability of results.

HIV is a devastating disease with both individual and interpersonal implications. Given the high rates of trauma in this population and the negative health outcomes associated with trauma, bolstering PTG is a promising course for improving the lives of individuals living with HIV. Our findings suggest the need to develop effective interventions aimed at facilitating disclosure and bolstering social support among HIV-positive individuals. Social support groups, as well as public awareness campaigns, could help reduce stigma in this marginalized population and encourage disclosure to broader social networks. Future research needs to focus on tailoring interventions to address these variables and thereby increase PTG. Such interventions have the potential to facilitate engagement in health-related behaviors and to improve the lives of those who are living with HIV.

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Compliance with Ethical Standards

Conflicts of Interest Charles Kamen, Chaniga Vorasarun, Ty Canning, Eliza Kienitz, Carolyn Weiss, Sergio Flores, Darryl Etter, Susanne Lee, and Cheryl Gore-Felton declare that they have no conflicts of interest.

Human and Animal Rights and Informed Consent All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all patients for being included in the study.

References

- Barskova, T., & Oesterreich, R. (2009). Post-traumatic growth in people living with a serious medical condition and its relations to physical and mental health: a systematic review. *Disability and Rehabilitation*, *31*, 1709–1733. doi:10.1080/09638280902738441.
- Berger, B. E., Ferrans, C. E., & Lashley, F. R. (2001). Measuring stigma in people with HIV: psychometric assessment of the HIV stigma scale. *Research in Nursing & Health*, *24*(6), 518–529. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/11746080>.
- Bluthenthal, R. N., Palar, K., Mendel, P., Kanouse, D. E., Corbin, D. E., & Derose, K. P. (2012). Attitudes and beliefs related to HIV/AIDS in urban religious congregations: barriers and opportunities for HIV-related interventions. *Social Science and Medicine*, *74*, 1520–1527. doi:10.1016/j.socscimed.2012.01.020.
- Boarts, J. M., Bogart, L. M., Tabak, M. A., Armelie, A. P., & Delahanty, D. L. (2008). Relationship of race-, sexual orientation-, and HIV-related discrimination with adherence to HIV treatment: a pilot study. *Journal of Behavioral Medicine*, *31*, 445–451. doi:10.1007/s10865-008-9169-0.
- Boarts, J. M., Buckley-Fischer, B. A., Armelie, A. P., Bogart, L. M., & Delahanty, D. L. (2009). The impact of HIV diagnosis-related vs. non-diagnosis related trauma on PTSD, depression, medication adherence, and HIV disease markers. *Journal of Evidence-Based Social Work*, *6*, 4–16. doi:10.1080/15433710802633247.
- Brief, D. J., Bollinger, A. R., Vielhauer, M. J., Berger-Greenstein, J. A., Morgan, E. E., Brady, S. M.,... Keane, T. M. (2004). Understanding the interface of HIV, trauma, post-traumatic stress disorder, and substance use and its implications for health outcomes. *AIDS Care*, *16*(1), S97–120. doi: 10.1080/09540120412301315259.
- Bunn, J. Y., Solomon, S. E., Miller, C., & Forehand, R. (2007). Measurement of stigma in people with HIV: a reexamination of the HIV Stigma Scale. *AIDS Education and Prevention: Official Publication of the International Society for AIDS Education*, *19*, 198–208. doi:10.1521/aeap.2007.19.3.198.
- Cadell, S., Regehr, C., & Hemsworth, D. (2010). Factors contributing to posttraumatic growth: A proposed structural equation model. *American Journal of Orthopsychiatry*, *73*, 279–287.
- Calhoun, L. G., Cann, A., Tedeschi, R. G., & McMillan, J. (2000). A correlational test of the relationship between posttraumatic growth, religion, and cognitive processing. *Journal of Traumatic Stress*, *13*, 521–527. doi:10.1023/A:1007745627077.
- Center for Disease Control and Prevention. (2011). HIV Surveillance—United States. *Morbidity and Mortality Weekly Report*, *60*, 689–693.
- Cieslak, R., Benight, C., Schmidt, N., Luszczynska, A., Curtin, E., Clark, R. A., & Kissinger, P. (2009). Predicting posttraumatic growth among Hurricane Katrina survivors living with HIV: the role of self-efficacy, social support, and PTSD symptoms. *Anxiety, Stress, and Coping*, *22*, 449–463. doi:10.1080/10615800802403815.
- Corrigan, P. (2003). Beat the stigma: come out of the closet. *Psychiatric services*, *54*, 1313. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/14557512>.

- Derlega, V. J. (1993). *Self-disclosure*. Newbury Park: Sage Publications.
- Derlega, V. J., Winstead, B. A., Greene, K., Serovich, J., & Elwood, W. N. (2002). Perceived HIV-related stigma and HIV disclosure to relationship partners after finding out about the seropositive diagnosis. *Journal of Health Psychology, 7*, 415–432. doi:10.1177/1359105302007004330.
- Dunkel-Schetter, C., Feinstein, L., & Call, J. (1986). UCLA Social Support Inventory (UCLA-SSI). Unpublished psychometric instrument. University of California, Los Angeles.
- Fife, B. L., & Wright, E. R. (2000). The dimensionality of stigma: a comparison of its impact on the self of persons with HIV/AIDS and cancer. *Journal of Health and Social Behavior, 41*, 50–67. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/10750322>.
- Goffman, E. (1974). *Stigma: Notes on the management of spoiled identity*. New York: J. Aronson.
- Gore-Felton, C., & Koopman, C. (2008). Behavioral mediation of the relationship between psychosocial factors and HIV disease progression. *Psychosomatic Medicine, 70*, 569–574. doi:10.1097/PSY.0b013e318177353e.
- Kalichman, S. C., & Nachimson, D. (1999). Self-efficacy and disclosure of HIV-positive serostatus to sex partners. *Health Psychology, 18*(3), 281–287. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/10357509>.
- Kalichman, S. C., Sikkema, K. J., DiFonzo, K., Luke, W., & Austin, J. (2002). Emotional adjustment in survivors of sexual assault living with HIV-AIDS. *Journal of Traumatic Stress, 15*, 289–296. doi:10.1023/A:1016247727498.
- Kamen, C., Bergstrom, J., Koopman, C., Lee, S., & Gore-Felton, C. (2012). Relationships among childhood trauma, posttraumatic stress disorder, and dissociation in men living with HIV/AIDS. *Journal of Trauma & Dissociation: The Official Journal of the International Society for the Study of Dissociation, 13*, 102–114. doi:10.1080/15299732.2011.608629.
- Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of general psychiatry, 52*, 1048–1060. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/7492257>.
- Keuroghlian, A. S., Kamen, C. S., Neri, E., Lee, S., Liu, R., & Gore-Felton, C. (2011). Trauma, dissociation, and antiretroviral adherence among persons living with HIV/AIDS. *Journal of Psychiatric Research, 45*, 942–948. doi:10.1016/j.jpsychires.2011.05.003.
- Linely, P. A., & Joseph, S. (2004). Positive change following trauma and adversity: A review. *Journal of Traumatic Stress, 17*, 11–21.
- Logie, C. H., James, L., Tharao, W., & Loutfy, M. R. (2011). HIV, gender, race, sexual orientation, and sex work: a qualitative study of intersectional stigma experienced by HIV-positive women in Ontario, Canada. *PLoS Medicine, 8*, e1001124. doi:10.1371/journal.pmed.1001124.
- Milam, J. (2004). Posttraumatic growth among HIV/AIDS patients. *Journal of Applied Social Psychology, 34*, 2353–2376.
- Nachega, J. B., Morroni, C., Zuniga, J. M., Sherer, R., Beyrer, C., Solomon, S.,... Rockstroh, J. (2012). HIV-related stigma, isolation, discrimination, and serostatus disclosure: a global survey of 2035 HIV-infected adults. *Journal of the International Association of Physicians in AIDS Care, 11*, 172–178. doi:10.1177/1545109712436723.
- Neimeyer, R. A. (2004). Fostering posttraumatic growth: A narrative elaboration. *Psychological Inquiry, 15*, 53–59.
- Nenova, M., DuHamel, K., Zemon, V., Rini, C., & Redd, W. H. (2013). Posttraumatic growth, social support, and social constraint in hematopoietic stem cell transplant survivors. *Psychoncology, 22*, 195–202. doi:10.1002/pon.2073.
- NIMH Multisite Group. (2008). Designing an audio computer-assisted self-interview (ACASI) system in a multisite trial: a brief report. *Journal of Acquired Immune Deficiency Syndromes, 49*, S52–S58. doi:10.1097/QAI.0b013e318184481a.
- Parker, R., & Aggleton, P. (2003). HIV and AIDS-related stigma and discrimination: a conceptual framework and implications for action. *Social Science & Medicine, 57*, 13–24. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/12753813>.
- Pence, B. W., Mugavero, M. J., Carter, T. J., Leserman, J., Thielman, N. M., Raper, J. L.,... Whetten, K. (2012). Childhood trauma and health outcomes in HIV-infected patients: an exploration of causal pathways. *Journal of Acquired Immune Deficiency Syndromes, 59*, 409–416. doi:10.1097/QAI.0b013e31824150bb.
- Perry, S. W., Card, C. A., Moffatt, M., Jr., Ashman, T., Fishman, B., & Jacobsberg, L. B. (1994). Self-disclosure of HIV infection to sexual partners after repeated counseling. *AIDS Education and Prevention: Official Publication of the International Society for AIDS Education, 6*, 403–411. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/7818976>.
- Purc-Stephenson, R. J. (2014). The posttraumatic growth inventory: Factor structure and invariance among persons with chronic diseases. *Rehabilitation psychology, 59*, 10–18. doi:10.1037/a0035353.
- Reilly, T., & Woo, G. (2004). Social support and maintenance of safer sex practices among people living with HIV/AIDS. *Health & Social Work, 29*, 97–105. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/15156842>.
- Royal, W. 3rd., Cherner, M., Carr, J., Habib, A. G., Akomolafe, A., Abimiku, A.,... Blattner, W. A. (2012). Clinical features and preliminary studies of virological correlates of neurocognitive impairment among HIV-infected individuals in Nigeria. *Journal of Neurovirology, 18*, 191–199. doi:10.1007/s13365-012-0097-y.
- Schwartz, R., Dunkel-Schetter, C., & Kemeny, M. (1994). The multidimensional nature of received social support in gay men at risk of HIV infection and AIDS. *American Journal of Community Psychology, 22*, 319–339.
- Shakespeare-Finch, J., & Lurie-Beck, J. (2014). A meta-analytic clarification of the relationship between posttraumatic growth and symptoms of posttraumatic distress disorder. *Journal of Anxiety Disorders, 28*, 223–229. doi:10.1016/j.janxdis.2013.10.005.
- Siegel, K., & Schrimshaw, E. W. (2000). Perceiving benefits in adversity: stress-related growth in women living with HIV/AIDS. *Social Science & Medicine, 51*(10), 1543–1554. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/11077956>.
- Sikkema, K. J., Hansen, N. B., Meade, C. S., Kochman, A., & Fox, A. M. (2009). Psychosocial predictors of sexual HIV transmission risk behavior among HIV-positive adults with a sexual abuse history in childhood. *Archives of Sexual Behavior, 38*, 121–134. doi:10.1007/s10508-007-9238-4.
- Tedeschi, R. G., & Calhoun, L. G. (1996). The Posttraumatic Growth Inventory: measuring the positive legacy of trauma. *Journal of Traumatic Stress, 9*, 455–471. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/8827649>.
- Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. *Psychological Inquiry, 15*, 1–18.
- Wolitski, R. J., Pals, S. L., Kidder, D. P., Courtenay-Quirk, C., & Holtgrave, D. R. (2009). The effects of HIV stigma on health, disclosure of HIV status, and risk behavior of homeless and unstably housed persons living with HIV. *AIDS and Behavior, 13*, 1222–1232. doi:10.1007/s10461-008-9455-4.
- World Health Organization. (2003). *Gender dimensions of HIV status disclosure to sexual partners: Rates, barriers and outcomes for women*. Geneva: World Health Organisation.