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Exploring Distress Tolerance as an Underlying Mechanism in the Relation Between Negative Affectivity and Anxiety/Depression Among Persons Living with HIV/AIDS

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Abstract

Persons living with HIV/AIDS (PLHIV) suffer disproportionately from a variety of mood disorders relative to the general population, yet, there is little understanding of the underlying nature behind this. The present study explored the indirect effect of perceived distress tolerance in relation between negative affectivity and anxiety/depressive symptoms and disorders among PLHIV. Participants included 97 PLHIV (60.8% male; 66% Minority; $M_{age} = 48.5$ years, $SE = 7.7$). Results revealed indirect effects of negative affectivity via perceived distress tolerance in relation to social anxiety, depression symptoms, as well as the existence of any anxiety disorder; findings were evident after controlling for covariates. Perceived distress tolerance may serve as a construct to aid understanding in the relation between negative affectivity and the expression of anxiety/depressive symptoms and disorders among PLHIV. Future work may consider addressing distress tolerance in efforts to offset the severity of the expression of anxiety/depressive symptoms among PLHIV.

Keywords

distress tolerance; negative affectivity; HIV; AIDS; Anxiety; depression

Human immunodeficiency virus (HIV) HIV/AIDS affects 36.7 million individuals across the globe (Joint United Nations Programme on HIV/AIDS (UNAIDS), 2016). The number of diagnosed AIDS cases has remained stable from 2002 to 2006 and there has been a 'shift' to the management of HIV/AIDS as a chronic (vs. terminal) illness in the United States and other developed countries (Siegel & Lekas, 2002). Although significant clinical progress has been made in regard to the treatment and disease management of HIV/AIDS in recent years

(e.g., Lima et al., 2007), efforts to understand the psychosocial consequences of this disease are only beginning to emerge. For example, although some initial work indicated that there may not be a robust or consistent relation between HIV/AIDS and risk for depressive disorders (e.g., Chuang, Jason, Pajurkova, & Gill, 1992; Rabkin, Ferrando, Jacobsberg, & Fishman, 1997), other studies have consistently supported a linkage (Maj et al., 1994). Additionally, PLHIV have a higher prevalence of anxiety disorders than those in the general population and many other medically ill groups (Brandt, Zvolensky, et al., 2017). For example, in a systematic review by Brandt and colleagues (2017) anxiety disorders had an estimated past-year prevalence rate of 23% among PLHIV compared to 18% in the general population (Kessler, Chiu, Demler, & Walters, 2005).

Recent work in psychopathological science proposes that the underlying cause of many forms of emotional symptoms and disorders as well as their comorbidity may be underpinned by a smaller set of transdiagnostic vulnerability processes (Dozois, Seeds, & Collins, 2009; Sauer-Zavala et al., 2012). One of the most well-studied transdiagnostic constructs related to general mental health is negative affectivity. Negative affectivity is a trait-like variable representing vulnerability to distressing stimuli leading to a number of unpleasant moods (e.g., anxiety, depression, guilt; Clark, Watson, & Mineka, 1994). Theory and research suggests recurrent and unpleasant mood states could impact adverse emotional learning experiences. Research focused on negative affectivity and mental health among PLHIV is limited. Yet, available work indicates significant relations with an array of negative mood states and emotional disorders (e.g., Capron, Gonzalez, Parent, Zvolensky, & Schmidt, 2012; Gonzalez, Zvolensky, Parent, Grover, & Hickey, 2012). Although negative affectivity has been linked to anxiety, depression, and somatic symptoms among PLHIV (Vassend, Eskld, & Halvorsen, 1997), relatively few studies have examined factors that may mediate relations. Identifying mediators may help establish which factors represent mechanisms involved in the expression, onset, maintenance, and remediation of psychopathology (Kazdin, 2007).

One transdiagnostic factor that may be particularly relevant to relations between negative affectivity and negative emotional symptoms/disorders among PLHIV is distress tolerance. Distress tolerance includes one's perceived or behavioral capacity to withstand distress related to affective, cognitive, and/or physical states (Simons & Gaher, 2005; Zvolensky, Bernstein, & Vujanovic, 2011). Past work suggests that distress tolerance is a transdiagnostic individual difference factor for stress responsivity and psychological vulnerability among non PLHIV samples (Linehan, 1993; McHugh & Otto, 2011). Among PLHIV, perceived distress tolerance is significantly related to depression (Brandt, Bakhshaie, Zvolensky, Grover, & Gonzalez, 2015; Garey et al., 2015), anxiety symptoms (Brandt, Gonzalez, Grover, & Zvolensky, 2013; Brandt, Zvolensky, & Bonn-Miller, 2013), medication adherence (Oser, Trafton, Lejuez & Bonn-Miller, 2013), and substance use (O'Cleirigh, Ironson, & Smits, 2007). Although limited in overall scope, available work suggests there is merit to further exploring the role of distress tolerance among PLHIV. Theoretically, distress tolerance could partially explain the relation between negative affectivity and anxiety/depressive symptoms and disorders among PLHIV. Specifically, negative affectivity may diminish tolerance for distress and thereby exacerbate anxiety and depressive symptoms and disorders.

The present investigation sought to address whether perceived distress tolerance would explain relations between negative affectivity and anxiety and depressive symptoms (Watson et al., 2007), as well as the presence of any anxiety disorder and presence of any depressive disorder among PLHIV. Although they are no longer considered anxiety disorders per the DSM-5, obsessive-compulsive disorder and posttraumatic stress disorder diagnoses were included as anxiety disorders, in line with transdiagnostic conceptualizations of anxiety and related disorders (e.g., Norton & Paulus, 2017). Specifically, we hypothesized an indirect effect of negative affectivity via distress tolerance in relation to depressive and social anxiety symptoms, as well as the presence of any anxiety or depressive disorder among PLHIV.

Method

Participants

The sample consisted of 97 participants (60.8% male, 37.1% female, 2.1% transgender; $M_{\text{age}} = 48.5$ years, $SD = 7.7$). Individuals self-reported a diagnosis of HIV/AIDS. Over half (55.7%) identified their ethnicity as Black/Non-Hispanic with 34% White/Caucasian, 5.2% Black/Hispanic, 3.1% Hispanic, and 2.1% as “other.” In terms of education, 3.1% of participants reported completing grade 6 or less, 13.4% grade 7–12 (without completing high school), 33% completing high school, 29.9% partial college, 7.2% graduating from a 2-year college, 8.2% graduating from a 4-year college, 3.1% partial graduate/professional school, and 2.1% completing graduate/professional school. Half (51.5%) of the participants identified as heterosexual, 33% as homosexual, 13.4% as bisexual, and 2.1% as transgender. The average length of time participants reported living with HIV diagnosis was 17.12 years ($SD = 8.51$ years). On average participants reported a CD4 T-cell count of 681.68 ($SD = 992.27$).

Participants were considered eligible if they met the following criteria: (1) age 18–65, (2) positive diagnosis of HIV/AIDS, and (3) ability to provide informed written consent. Participants were excluded if they: (1) reported suicidal ideation requiring emergent care, (2) were unable to meet for their scheduled appointments, (3) were unable to provide consent, or (4) were unable to provide accurate answers due to limited literacy.

Procedure

These data were collected during the baseline portion of a primary study examining the effects of anxiety-reduction therapy on HIV medication adherence (Brandt, Paulus, et al., 2017). Potential participants responded to flyers that were posted at local HIV/AIDS Service Organizations, and were screened over the telephone for study eligibility. Eligible participants were scheduled for an in-person baseline intake assessment. The baseline intake involved informed consent, and the administration of a structured clinical interview and self-report instruments. Participants were compensated \$20 in gift certificates. The Institutional Review Board (IRB) at the University of Houston approved all study procedures.

Measures

Mini International Neuropsychiatric Interview 5.0 (M.I.N.I.; Sheehan et al., 1998).—The M.I.N.I. is a structured interview used in the identification of Diagnostic and

Statistical Manual of Mental Disorders IV Text Revision (DSM-IV-TR) Axis I disorders. In the current study, the M.I.N.I. was used to identify presence of anxiety (i.e., generalized anxiety disorder, social anxiety disorder, panic disorder with and without agoraphobia, post-traumatic stress disorder, obsessive compulsive disorder) and depressive disorders (i.e., major depressive episode, dysthymia). The M.I.N.I. has good test-retest, inter-rater reliability and validity (Sheehan et al., 1997, 1998). The current study had a trained doctoral-level rater check for reliability on 12.5% of the M.I.N.I. interviews and no cases of disagreement were found.

Distress Tolerance Scale (DTS; Simons & Gaher, 2005).—The DTS is a 15 item self-report measure used to assess perceived tolerance to distressing emotional states. Each of the 15 items (e.g., ‘I can’t handle feeling distressed or upset’) is rated on a 5-point scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). The DTS has been implemented successfully among PLHIV (e.g., Brandt et al., 2013) and has good test-retest reliability and construct validity (Simons, & Gaher, 2005). The DTS contains a total score and four subscales: tolerance (3 items; e.g., ‘feeling distressed or upset is unbearable to me’), appraisal (6 items; e.g., ‘I am ashamed of myself when I feel distressed or upset’), absorption (3 items; e.g., ‘my feelings of distress are so intense that they completely take over’), and regulation (3 items; e.g., ‘I’ll do anything to avoid feeling distressed or upset’). Scores for each subscale are generated via the mean of the subscale. Internal consistency for global distress tolerance was excellent in the current sample (Cronbach’s $\alpha = .90$). Post-hoc analyses used the four DTS subscales: tolerance (Cronbach’s $\alpha = .66$), appraisal (Cronbach’s $\alpha = .75$), absorption (Cronbach’s $\alpha = .75$), and regulation (Cronbach’s $\alpha = .76$).

Inventory of Depression and Anxiety Symptoms (IDAS; Watson et al., 2007).—The IDAS is a 64-item self-report measure used to assess specific symptoms of depression and anxiety. Each of the 64 items (e.g., ‘I felt depressed’) is rated on a 5-point scale ranging from 1 (*not at all*) to 5 (*extremely*). The IDAS has shown significant incremental validity predicting DSM-IV disorders after accounting for scores on the Beck Depression Inventory-II and Beck Anxiety Inventory (Watson et al., 2008). The IDAS also demonstrates good convergent and divergent validity (Watson et al., 2007, 2008). Other studies have implemented the IDAS successfully among PLHIV (e.g., Garey et al., 2015). In the current study, the general depression (20 items; e.g., ‘I felt exhausted’) and social anxiety (5 items; e.g., ‘I felt self-conscious knowing that others were watching me’) subscales served as indices of depressive and social anxiety symptoms, respectively. Internal consistency for general depression subscale was excellent (Cronbach’s $\alpha = .92$) and social anxiety subscale was good (Cronbach’s $\alpha = .84$) in the current sample.

Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988).—The PANAS is a two subscale, 20-item measure that is used to measure trait levels of Positive Affectivity (PA) and Negative Affectivity (NA). Past-week ratings for each of the 20 items (e.g., ‘upset’) were made using a 5-point scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*). In the current study, the negative affectivity subscale (10 items; PANAS-NA) served as the predictor. The PANAS has shown sound validity and reliability (Watson, Clark, & Tellegen, 1988). Other studies have successfully implemented the PANAS

among PLHIV (e.g., Capron et al., 2012). Internal consistency for the NA subscale was good in the current study (Cronbach's $\alpha = .86$).

Data Analytic Plan

Analyses were conducted using the PROCESS macro for SPSS 21.0 (Hayes, 2013) to calculate the indirect effect of negative affectivity (PANAS-NA; X) via distress tolerance (DTS; M) with the following criterion variables (Y_i): social anxiety symptoms (IDAS-Social Anxiety), depressive symptoms (IDAS-General Depression), presence of any anxiety disorder (via M.I.N.I.), and presence of any depressive disorders (via M.I.N.I.). Global distress tolerance was used as the mediating variable. 'Path $a*b$ ' was calculated as the product of 'a path' (the regression of M onto X, controlling for covariates) multiplied by the 'b path' (the regression of Y onto M, controlling for associations of X and covariates). Covariates included racial/ethnic minority status, sex, sexual orientation, and time since diagnosis. Ten thousand bootstrapped re-samples with replacement were performed to obtain 95% confidence intervals (CI) around the indirect association ($a*b$); a CI not containing 0 indicates statistical significance (Hayes, 2013). Effect sizes (i.e., percent mediation; P_m) were calculated for the indirect associations (Ditlevsen, Christensen, Lynch, Damsgaard, & Keiding, 2005; Preacher & Kelley, 2011). P_m indicates the percent of the total effect (negative affectivity on outcomes) that can be statistically accounted for by the indirect effect of negative affectivity via distress tolerance. Following these primary analyses, planned post-hoc analyses were also conducted to evaluate specific indirect effects of negative affectivity via distress tolerance sub-factors (i.e., tolerance, appraisal, absorption, and regulation).

Results

Zero-Order Correlations

Distress tolerance (total score) was significantly negatively correlated with all criterion variables (see Table 1). Negative affectivity was significantly positively correlated to all criterion variables, and negatively correlated with distress tolerance.

Mediation Analyses

In terms of social anxiety symptoms, there was a significant total effect of negative affectivity on social anxiety symptoms ($b = 0.37$, $SE = 0.05$, $p < .001$, $CI [0.28, 0.47]$) and a significant indirect association of negative affectivity via global distress tolerance in relation to social anxiety symptoms ($b = 0.04$, $SE = 0.03$, $CI [0.01, 0.12]$; completely standardized estimate = .07). Specifically, the effect of negative affectivity on distress tolerance (path a; $b = -0.45$, $SE = 0.16$, $p = .01$) and the effect of distress tolerance on social anxiety symptoms (path b; $b = -0.10$, $SE = 0.03$, $p = .001$) were statistically significant. Global distress tolerance accounted for approximately 12% ($P_m = .12$) of the effect of negative affectivity on social anxiety symptoms. See Table 2.

In terms of depressive symptoms, there was a significant total effect of negative affectivity on depressive symptoms ($b = 1.23$, $SE = 0.14$, $p < .001$, $CI [0.95, 1.51]$) and a significant indirect association of negative affectivity via global distress tolerance in relation to

depressive symptoms ($b = 0.08$, $SE = 0.06$, $CI[0.01, 0.25]$; completely standardized estimate = .05). Specifically, the effect of distress tolerance on depressive symptoms (path b; $b = -0.19$, $SE = 0.09$, $p = .04$) was statistically significant. Distress tolerance accounted for approximately 7% ($P_m = .07$) of the effect of negative affectivity on depressive symptoms. See Table 2.

There was a significant total effect of negative affectivity on the presence of any anxiety disorder ($b = 0.09$, $SE = 0.03$, $p = .001$, $CI[0.04, 0.15]$) and significant indirect effect of negative affectivity via global distress tolerance in relation to the presence of any anxiety disorder ($b = 0.03$, $SE = 0.02$, $CI[0.003, 0.07]$). Specifically, the effect of distress tolerance on the presence of any anxiety disorder (path b; $b = -0.06$, $SE = 0.02$, $p = .003$) was statistically significant. When predicting the presence of any anxiety disorder, global distress tolerance accounted for approximately 28% ($P_m = .28$) of the effect of negative affectivity on the presence of any anxiety disorder. See Table 2.

Regarding the presence of any depressive disorder, there was a significant total effect of negative affectivity on the presence of any depressive disorder ($b = 0.10$, $SE = 0.03$, $p < .001$, $CI[0.05, 0.16]$). There was not a significant indirect effect ($b = 0.01$, $SE = 0.01$, $CI[-0.01, 0.04]$) of negative affectivity via global distress tolerance in relation to the presence of any depressive disorder. Specifically, the effect of distress tolerance on the presence of any depressive disorder did not result in statistical significance (path b; $b = -0.02$, $SE = 0.02$, $p = .17$). See Table 2.

Post-hoc Analysis

Post-hoc analyses were conducted to examine the distress tolerance subscale (i.e., appraisal, tolerance, regulation, absorption) as concurrent explanatory variables in relation to negative affectivity and anxiety/depressive symptoms and disorders.

Regarding social anxiety symptoms, only DTS-appraisal helped explain the association between negative affectivity and social anxiety symptoms ($B = 0.07$, $SE = 0.04$, $CI[0.02, 0.17]$; completely standardized estimate = .12). Specifically, the effect of negative affectivity on DTS-appraisal (path a_4 ; $b = -0.21$, $SE = 0.06$, $p = .001$) and the effect of DTS-appraisal on social anxiety symptoms (path b_{40} ; $b = -0.33$, $SE = 0.12$, $p = .01$) were statistically significant. The appraisal subscale mediated approximately 19% ($P_m = .19$) of the effect of negative affectivity on social anxiety symptoms. See Table 3.

For depressive symptoms, there was a significant indirect effect of negative affectivity via only DTS-appraisal ($B = 0.17$, $SE = 0.10$, $CI[0.04, 0.47]$; completely standardized estimate = .09) in relation to depressive symptoms. The effect of negative affectivity on DTS-appraisal (path a_4 ; $b = -0.21$, $SE = 0.06$, $p = .001$) and the effect of DTS-appraisal on depressive symptoms (path b_{41} ; $b = -0.80$, $SE = 0.35$, $p = .02$) were statistically significant. The mediation ratio for DTS-appraisal was slightly smaller when explaining the association between negative affectivity and depressive symptoms ($P_m = .14$). See Table 3.

For the presence of any anxiety disorder, there were no significant DTS subscale effects. See Table 3.

Regarding the presence of any depressive disorder, the effect of negative affectivity on DTS-appraisal (path a_4 ; $b = -0.21$, $SE = 0.06$, $p = .001$) and the effect of DTS-appraisal on the presence of any depressive disorder (path b_{43} ; $b = -0.19$, $SE = 0.07$, $p = .01$) were significant. However, there was no significant indirect association of negative affectivity via DTS-appraisal ($b = 0.04$, $SE = 0.03$, $CI[-0.004, 0.10]$) in relation to the presence of any depressive disorder. See Table 3.

Discussion

The present study examined the indirect association of negative affectivity via perceived distress tolerance in relation to anxiety/depressive symptoms and disorders among PLHIV. Results partially supported a priori hypotheses. Specifically, there was a significant indirect effect of negative affectivity via perceived global distress tolerance in relation to social anxiety symptoms, depressive symptoms, as well as the presence of any anxiety disorder. After accounting for global distress tolerance, the direct effect of negative affectivity on all criterion variables (i.e., social anxiety symptoms, depressive symptoms, presence of any anxiety disorders and any depressive disorders) was statistically significant. Contrary to prediction, there was not a significant indirect effect of negative affectivity via distress tolerance in relation to the presence of any depressive disorder. Notably, the significant indirect effects were apparent after accounting for a range of clinically significant covariates (i.e., minority status, sex, sexual orientation and time since diagnosis). Moreover, global distress tolerance explained 12% of the total effect of negative affectivity on social anxiety symptoms, 7% of the total effect of negative affectivity on general depression symptoms, and 28% of the total effect of negative affectivity and the presence of an anxiety disorder.

Post-hoc analyses were conducted to evaluate distinct facets of distress tolerance (i.e., appraisal, tolerance, regulation, absorption) as potential concurrent mediators of negative affectivity and the criterion variables. Significant effects were evident only for DTS-appraisal. Specifically, effects of DTS-appraisal on social anxiety (path b_{40}) and depressive symptoms (path b_{41}) were significant. The indirect effect of negative affectivity via DTS-appraisal in relation to social anxiety and depressive symptoms suggests that a PLHIV's lack of acceptance of distressing states could be a clinically-important pathway in the expression of certain anxiety/depressive symptoms. Although speculative, theoretically, if PLHIV experience stigmatization due to their HIV status (Mahajan et al., 2008), their ability to tolerate subjective distress could become diminished due to a chronic, taxing effort to manage such stigmatization. This type of account should be viewed cautiously, however, given the lack of effects via DTS-appraisal in relation to the other criterion variables. Moreover, the lack of significant indirect effects of negative affectivity via tolerance, regulation, or absorption in relation to the criterion variables is noteworthy. These data suggest that these facets of perceived distress tolerance may play a less important role linking negative affectivity to the expression of anxiety/depression among PLHIV. Given the limited amount of work in this area, future research is needed to replicate and extend the current findings to broaden our theoretical and empirical understanding of distress tolerance from a multidimensional perspective.

Although there are initial efforts to target distress tolerance among PLHIV (e.g., Brandt, Paulus, et al., 2017; Duncan et al., 2012), the present findings could potentially aid such clinical research. For example, the present data add to theory and research suggesting that there may be merit to addressing distress tolerance through tailored interventions to offset the severity of the expression of anxiety/depressive symptoms among PLHIV. Drawing from such clinical research, there may be merit to incorporating distress tolerance-based therapeutic tactics in social service programming for PLHIV. For example, social workers may benefit from learning about the clinical importance of distress tolerance as an individual difference factor that is relevant to an array of clinically important health behaviors among PLHIV. With such knowledge, social workers, along with other healthcare professionals, may be better positioned to improve medication adherence and the psychological health of PLHIV. To illustrate, because mindfulness-based interventions can be used to increase distress tolerance (e.g., Tanay, Lotan, & Bernstein, 2012), social workers and other social service providers could recommend PLHIV learn how to engage in mindfulness activities and directly link them with community-based resources for such activities (e.g., meditation workshops). Further, once connected to such community-based resources, social workers could provide supportive service care for PLHIV attempting to learn such tactics, including giving them resources for continued learning opportunities and checking in on their experience with mindfulness-based approaches and providing encouragement for the use of such techniques.

The current study has several limitations. First, these cross-sectional data do not permit causal inferences. Longitudinal data would be beneficial to determine the nature of the observed relations and explicate the direction of the effects (e.g., distress tolerance predicting anxiety/depression during HIV treatment). Second, we focused on the present study on *perceived* distress tolerance. There also may be merit to exploring behavioral distress tolerance, which is typically measured as the duration of time that one can tolerate a physically or emotionally distress task (e.g., mirror-tracing persistence task; Quinn, Brandon, & Copeland, 1996). Third, the lack of a significant indirect effect of negative affectivity via distress tolerance in relation to the presence of any depressive disorder may be due to more limited statistical power for this dependent variable. Specifically, there can be less power to detect effects in relation to dichotomous outcomes (Ragland, 1992). Although an effect was detected for presence of an anxiety disorder, results suggest that this effect was larger than that for depression, and thus, more likely to be detected in the current sample. Finally, the study contained a total sample of 97 PLHIV. Future work is therefore needed with larger samples sizes.

Overall, the current study demonstrates the potentially important role of distress tolerance in better understanding the relation between negative affectivity and anxiety/depressive symptoms and disorders among PLHIV. Future longitudinal work is needed to replicate and extend the current findings among PLHIV.

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Table 1

Correlations among study variables

Variable	Mean (n)	SD (%)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. PANAS – NA ^a	24.01	9.07	-	-0.29**	-.24**	-.10	-.29**	-.33**	.64**	.68**	.34**	.40**	-.12	-.10	.09	-.20
2. DTS – Total ^b	43.56	14.29		-	.91**	.81**	.89**	.92**	-.41**	-.35**	-.37**	-.26*	.13	.09	-.06	-.03
3. DTS – Tolerance ^b	8.64	3.27			-	.70**	.80**	.75**	-.31*	-.25**	-.29**	-.18	.13	.12	-.04	-.09
4. DTS – Regulation ^b	8.04	3.58				-	.64**	.63**	-.21*	-.17	-.25*	-.10	.06	.08	-.11	-.02
5. DTS – Absorption ^b	8.82	3.52					-	.73**	-.38**	-.32**	-.31**	-.21*	.16	.01	-.03	.04
6. DTS – Appraisal ^b	18.01	5.79						-	-.47**	-.41**	-.39**	-.34**	.12	.11	-.04	-.03
7. IDAS – Social Anxiety ^c	11.84	5.45							-	.73**	.26**	.38**	-.15	.03	.12	-.20
8. IDAS – General Depression ^c	49.82	16.19								-	.42**	.60**	-.15	.07	.01	-.08
9. Any Anxiety Disorder ^c	(60)	(61.9)									-	.27**	-.25*	.02	-.21*	-.003
10. Any Depressive Disorder ^c	(51)	(52.6)										-	-.16	-.001	-.01	-.03
11. Minority Status ^d	(64)	(66)											-	-.09	.03	-.04
12. Sex ^d	(59)	(60.8)												-	-.48*	.10
13. Sexuality ^d	(50)	(51.5)													-	-.28**
14. Time Since Diagnosis ^d	205.4	102.1														-

Note: PANAS – NA = Positive and Negative Affect Schedule-negative affectivity subscale; DTS – Total = Distress Tolerance Scale-total score; DTS – Tolerance = Distress Tolerance Scale-tolerance scale; DTS – Regulation = Distress Tolerance Scale-regulation scale; DTS – Appraisal = Distress Tolerance Scale-appraisal scale; IDAS – General Depression = Inventory of Depression and Anxiety Symptoms-general depression subscale; IDAS – Social Anxiety = Inventory of Depression and Anxiety Symptoms-social anxiety subscale; Any Anxiety Disorder = presence of any anxiety disorder, coded as Yes = 1 and No = 0; Any Depressive Disorder = presence of any anxiety disorder, coded as Yes = 1 and No = 0; Minority Status, coded as Non-white = 1 and White = 0; Sex, coded as Male = 1 and Other = 0; Sexuality, coded as Heterosexual = 1 and Non-heterosexual = 0; Time Since Diagnosis = time (in months) since known diagnosis

^aPredictor^bMediator^cCriterion Variables^dCovariates* $p < .05$.

10=1
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Table 2

Summary of mediation models

	Model	b	SE	t (Z)	p	CI (I)	CI (U)
1	NA → DTS-Total (a)	-.45	.16	-2.82	.01	-.77	-.13
	DTS-Total → IDAS-Soc Anx (b)	-.10	.03	-3.22	.001	-.16	-.04
	NA → IDAS-Soc Anx (c)	.37	.05	7.74	<.001	.28	.47
	NA → IDAS-Soc Anx (c')	.33	.05	6.88	<.001	.23	.43
	NA → DTS-Total → IDAS-Soc Anx (ab)	.04	.03	-	-	.01	.12
2	DTS-Total → IDAS-Gen Dep (b)	-.19	.09	-2.08	.04	-.36	-.01
	NA → IDAS-Gen Dep (c)	1.23	.14	8.81	<.001	.95	1.51
	NA → IDAS-Gen Dep (c')	1.14	.14	8.01	<.001	.86	1.43
	NA → DTS-Total → IDAS-Gen Dep (ab)	.08	.06	-	-	.01	.25
3	DTS-Total → Any Anx (b)	-.06	.02	-2.91	.003	-.09	-.02
	NA → Any Anx (c)	.09	.03	3.16	.001	.04	.15
	NA → Any Anx (c')	.08	.03	2.59	.01	.02	.14
	NA → DTS-Total → Any Anx (ab)	.03	.02	-	-	.003	.07
4	DTS-Total → Any Dep (b)	-.02	.02	-1.37	.17	-.06	.01
	NA → Any Dep (c)	.10	.03	3.62	<.001	.05	.16
	NA → Any Dep (c')	.09	.03	3.22	.001	.04	.15
	NA → DTS-Total → Any Dep (ab)	.01	.01	-	-	-.01	.04

Note: PANAS – NA = Positive and Negative Affect Schedule-negative affectivity subscale; DTS – Total = Distress Tolerance Scale-total score; DTS – Tolerance = Distress Tolerance Scale-tolerance scale; DTS – Regulation = Distress Tolerance Scale-regulation scale; DTS – Appraisal = Distress Tolerance Scale-appraisal scale; IDAS – General Depression = Inventory of Depression and Anxiety Symptoms-general depression subscale; IDAS – Social Anxiety = Inventory of Depression and Anxiety Symptoms-social anxiety subscale; Any Anxiety Disorder = presence of any anxiety disorder, coded as Yes = 1 and No = 0; Any Depressive Disorder = presence of any anxiety disorder, coded as Yes = 1 and No = 0; a_j = effect of X on M_j; b_j = effect of X on Y_j; c = indirect effect of X on Y_j; c' = direct effect of X on Y_j controlling for M_j; Path a_j is equal in models 1–4; therefore, it's only presented in model 1 to avoid redundancies

Table 3

Post-hoc analysis multiple mediation models

	Model	b	SE	t (Z)	p	CI (l)	CI (U)
1	NA → DTS-Tolerance (a ₁)	-.09	.04	-2.37	.02	-.16	-.01
	NA → DTS-Regulation (a ₂)	-.04	.04	-.89	.37	-.12	.05
	NA → DTS-Absorption (a ₃)	-.11	.04	-2.64	.01	-.18	-.03
	NA → DTS-Appraisal (a ₄)	-.21	.06	-3.32	.001	-.34	-.09
	DTS-Tolerance → IDAS-Soc Anx (b ₁₀)	.10	.24	.41	.68	-.39	.59
	DTS-Regulation → IDAS-Soc Anx (b ₂₀)	.08	.16	.50	.62	-.25	.41
	DTS-Absorption → IDAS-Soc Anx (b ₃₀)	-.07	.21	-.31	.75	-.48	.35
	DTS-Appraisal → IDAS-Soc Anx (b ₄₀)	-.33	.12	-2.88	.01	-.56	-.10
	NA → IDAS-Soc Anx (c)	.37	.05	7.74	<.001	.28	.47
	NA → IDAS-Soc Anx (c')	.31	.05	6.27	<.001	.21	.41
	NA → DTS-Tolerance → IDAS-Soc Anx (ab)	-.01	.02	-	-	-.07	.03
	NA → DTS-Regulation → IDAS-Soc Anx (ab)	-.003	.01	-	-	-.04	.01
	NA → DTS-Absorption → IDAS-Soc Anx (ab)	.01	.02	-	-	-.04	.06
	NA → DTS-Appraisal → IDAS-Soc Anx (ab)	.07	.04	-	-	.02	.17
2	DTS-Tolerance → IDAS-Gen Dep (b ₁₁)	.71	.73	.96	.34	-.75	2.16
	DTS-Regulation → IDAS-Gen Dep (b ₂₁)	.06	.49	.11	.91	-.92	1.04
	DTS-Absorption → IDAS-Gen Dep (b ₃₁)	-.26	.63	-.42	.68	-1.51	.98
	DTS-Appraisal → IDAS-Gen Dep (b ₄₁)	-.80	.35	-2.30	.02	-1.49	-.11
	NA → IDAS-Gen Dep (c)	1.23	.14	8.81	<.001	.95	1.51
	NA → IDAS-Gen Dep (c')	1.09	.15	7.46	<.001	.80	1.39
	NA → DTS-Tolerance → IDAS-Gen Dep (ab)	-.06	.08	-	-	-.27	.06
	NA → DTS-Regulation → IDAS-Gen Dep (ab)	-.002	.03	-	-	-.10	.03
	NA → DTS-Absorption → IDAS-Gen Dep (ab)	.03	.07	-	-	-.10	.21
	NA → DTS-Appraisal → IDAS-Gen Dep (ab)	.17	.10	-	-	.04	.47
3	DTS-Tolerance → Any Anx (b ₁₂)	.06	.16	.35	.72	-.25	.37
	DTS-Regulation → Any Anx (b ₂₂)	-.10	.10	-.99	.32	-.30	.10

Model	b	SE	t (Z)	p	CI (l)	CI (U)
DTS-Absorption → Any Anx (b ₃₂)	.02	.13	.14	.89	-.24	.28
DTS-Appraisal → Any Anx (b ₄₂)	-.14	.08	-1.77	.08	-.30	.02
NA → Any Anx (c)	.09	.03	3.16	.001	.04	.15
NA → Any Anx (c')	.08	.03	2.50	.01	.02	.14
NA → DTS-Tolerance → Any Anx (ab)	-.004	.02	-	-	-.07	.02
NA → DTS-Regulation → Any Anx (ab)	.003	.01	-	-	-.01	.04
NA → DTS-Absorption → Any Anx (ab)	-.001	.02	-	-	-.04	.04
NA → DTS-Appraisal → Any Anx (ab)	.03	.03	-	-	-.01	.10
4 DTS-Tolerance → Any Dep (b ₁₃)	.10	.15	.65	.51	-.20	.39
DTS-Regulation → Any Dep (b ₂₃)	.07	.11	.62	.54	-.14	.27
DTS-Absorption → Any Dep (b ₃₃)	.04	.13	.30	.76	-.21	.29
DTS-Appraisal → Any Dep (b ₄₃)	-.19	.07	-2.50	.01	-.33	-.04
NA → Any Dep (c)	.10	.03	3.62	<.001	.05	.16
NA → Any Dep (c')	.09	.03	2.84	.004	.03	.15
NA → DTS-Tolerance → Any Dep (ab)	-.01	.02	-	-	-.06	.01
NA → DTS-Regulation → Any Dep (ab)	-.002	.01	-	-	-.03	.01
NA → DTS-Absorption → Any Dep (ab)	-.004	.02	-	-	-.04	.04
NA → DTS-Appraisal → Any Dep (ab)	.04	.03	-	-	-.004	.10

Note: PANAS – NA = Positive and Negative Affect Schedule-negative affectivity subscale; DTS – Total = Distress Tolerance Scale-total score; DTS – Tolerance = Distress Tolerance Scale-tolerance scale; DTS – Regulation = Distress Tolerance Scale-regulation scale; DTS – Appraisal = Distress Tolerance Scale-appraisal scale; IDAS – General Depression = Inventory of Depression and Anxiety Symptoms-general depression subscale; IDAS – Social Anxiety = Inventory of Depression and Anxiety Symptoms-social anxiety subscale; Any Anxiety Disorder = presence of any anxiety disorder, coded as Yes = 1 and No = 0; Any Depressive Disorder = presence of any anxiety disorder, coded as Yes = 1 and No = 0; a₁ = effect of X on M₁; b₁ = effect of X on M₁; b₂ = effect of X on M₂; b₃ = effect of X on M₃; c = indirect effect of X on Y₁; c' = direct effect of X on Y₁ controlling for M₁; Path a₁ is equal in models 1–4; therefore, it's only presented in model 1 to avoid redundancies