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Models of Trauma Exposure, Depression, and Suicidality in Safety-Net Primary Care

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Suicidality is a major public health concern, particularly for low-income, trauma-exposed patients with limited access to mental health providers. However, limited research has modeled pathways of suicidality in safety-net primary care samples. Patients ($N = 207$) in a safety-net primary care clinic completed measures of childhood and adult trauma exposure, depression, and suicidality. Participants (M age = 44.8 years, $SD = 11.6$), were 60.4% male, 63.8% Black/African American, and predominantly low-income (i.e., 69.1% reported an annual income less than $5,000 USD). Half of the sample reported at least four childhood traumatic events ($M = 3.9$ events, $SD = 3.0$) and approximately three adult traumatic events ($M = 3.0$ events, $SD = 2.1$). Most participants (82.1%) reported significant depressive symptoms, and 43.5% endorsed recent suicidality. Models showing the mediational effect of depression on the association between trauma exposure and suicidality, $\beta = .20$, $B = 0.23$, $SE = 0.05$, 95% CI [0.16, 0.32], and the moderational effect of trauma exposure on the association between depression and suicidality, $\beta = .16$, $B = 0.20$, $SE = 0.08$, $p = .007$, were both supported. These results underscore the high prevalence of trauma exposure, depression, and suicidality in a safety-net primary care sample. They also highlight the pervasiveness and complexity of suicidality in low-income primary care patients, emphasize the importance of trauma-informed suicide assessment, and identify trauma sequelae and depression as potential treatment targets to reduce suicidality.

Low-income and minority populations are more likely to receive mental health care from their primary care providers than from mental health specialists. For example, Black Americans are far more likely than their White counterparts to receive mental health care from a primary care physician than a mental health provider (U.S. Department of Health and Human Services, 2001), and racial/ethnic minority patients generally are less likely to report access to mental health care than their non-Latinx White counterparts (Cook et al., 2016), forcing many to seek mental health care in primary care settings. However, primary care providers are not well trained in administering comprehensive mental health care, contributing to a higher level of underdiagnosis and undertreatment of depression and other mental health problems among Black and Latinx individuals compared to non-Latinx White individuals (Akincigil et al., 2012; Manseau & Case, 2014). In addition, compared to non-Latinx White patients, racial/ethnic minority patients are less likely to have primary care visits that focus on mental health concerns (Jones et al., 2018), including suicidal ideation (Sheehan et al., 2018).

Despite the existing inequities in care, and in large part because of them, primary care settings offer a critical opportunity to screen for depression, mental disorders, and suicide. In a longitudinal study by Ahmedani and colleagues (2014), 83% of participants who died by suicide had seen a healthcare provider in the year before their death, but only half of these individuals had received a mental health diagnosis; furthermore, individuals with fewer resources were even less likely to have received a mental health diagnosis. In a review of similar studies, Luoma et al. (2002) reported that approximately 75% of the participants in the included studies who died by suicide had visited their primary care provider within a year of their death, 45% of whom had been seen in a primary care setting within 1 month of their death. However, only approximately one-third of these individuals had accessed mental health care services within the year before their death, with 20% accessing such services within 1 month of their death (Luoma et al., 2002). Thus, primary care represents a key opportunity for suicide risk assessment, particularly in populations that are less likely to receive outpatient mental health care (U.S. Surgeon General, 2012). Indeed, research has demonstrated that administering even a very brief screening tool for suicidality and depression, such as the nine-item Patient Health Questionnaire (PHQ-9;

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Kroenke et al., 2001), can help target resources and identify patients who may need further screening and referral (Bauer et al., 2012).

"Safety-net" primary care clinics are those that provide reduced-cost or free health care services to low-income individuals and, therefore, provide a unique opportunity for understanding and addressing suicide risk. Yet, there is a dearth of research examining suicidal ideation and its potential underpinnings in safety-net primary care clinics, and the broader research on suicidality indicates that depression and trauma exposure may interact to shape suicidal thoughts and behaviors.

One of the strongest predictors of suicidality is depression (Angst et al., 1999; Ashrafioun et al., 2016; Dobscha et al., 2014). Depression is one of the most common mental disorders in the United States, with 7.1% of adults meeting the criteria for major depressive disorder in 2017 (National Institute of Mental Health, 2017), although many more individuals experience symptoms of depression and go undiagnosed and untreated. Depression rates are higher in lower-income populations, a health disparity exacerbated by lower rates of treatment access and diagnosis (Lorant et al., 2003). Although most patients with depression do not attempt suicide, depression has been consistently linked to suicidality across decades of research (Corson et al., 2013; Guerra et al., 2011; Kramer et al., 1994; Lemaire & Graham, 2011; Lish et al., 1996; Pietrzak et al., 2010).

Trauma exposure is common, particularly for patients in safety-net primary care settings. The prevalence and impact of childhood trauma exposure have been extensively studied, starting with the landmark Adverse Childhood Experiences Study (ACE Study; Felitti et al., 1998), which aimed to assess trauma exposure in U.S. children. Subsequent waves of the study reported that approximately 38%–56% of children surveyed had experienced at least one traumatic event (Child and Adolescent Mental Health Institute, 2017), although this sample was not fully representative of the U.S. population with regard to racial or economic diversity. Although adverse childhood experiences (ACEs) are common across socioeconomic and racial/ethnic groups, they are disproportionately prevalent in low-income families as well as in Black children (Child and Adolescent Mental Health Institute, 2017).

Adverse experiences during childhood predict adult trauma exposure, particularly for low-income individuals (Finkelhor et al., 2009, 2013; Turner et al., 2010). In addition, the rates of adult trauma exposure are high across populations, with 51%–69% of adults having experienced at least one traumatic event (Norris & Stone, 2013) and even higher rates in lower-income and non-White populations (Alim et al., 2006; Gillespie et al., 2009; Merskey & Janczewski, 2018; Turner & Avison, 2003). Despite the high prevalence of childhood and adult trauma exposure in populations likely to use safety-net primary care services and the known association between ACEs and other mental health sequelae, relatively little research has examined ACEs in safety-net clinics.

Both adult and childhood trauma exposure are associated with depression. Research has pointed to a dose–response relationship between ACEs and depression such that higher levels of ACE exposure predict both more severe and more chronic depressive episodes (Dunn et al., 2017; Norman et al., 2012). In addition, a history of child abuse has been shown to predict suicidal ideation and attempt (Maniglio, 2011), and exposure to any adverse childhood event is associated with a 2–5-fold higher risk of attempted suicide compared to no ACE exposure (Dube et al., 2001). Similar to ACEs, adult trauma exposure has been associated with an increased risk of depression, although this association is less studied and more tenuous (Dennis et al., 2009). Trauma-exposed individuals are also more likely to attempt suicide than the general population, particularly if the traumatic event was assaultive, such as rape or abuse (Seedat et al., 2005; Stein et al., 2010). Specific forms of adult trauma exposure, including domestic abuse, have also been found to be associated with suicidal ideation in primary care samples (Chang et al., 2014). For example, one study found that 23% of women in a community sample who had been abused by a partner had attempted suicide compared to 3% of unabused women (Seedat et al., Forde, 2005). Taken together, this literature underscores the importance of trauma-informed suicide risk assessment in primary care settings, as well as a more nuanced understanding of the interplay between depression, suicidality, and trauma in safety-net clinics.

Central to any undertaking to reduce suicidality in safety-net primary care is a nuanced understanding of the associations among trauma exposure, depression, and suicidality in safety-net patients. As a result, the present study aimed to (a) characterize the prevalence and nature of trauma exposure, depression, and suicidality in a safety-net primary care sample and (b) develop and test theoretical models of the associations among these variables. The second research aim was approached using two competing analytic models. First, trauma exposure may exacerbate the relation between depression and suicidality, as trauma-exposed patients who are exposed to continued stress have a heightened risk of experiencing depression (Heim et al., 2008), which may lead to suicidality. Alternatively, trauma exposure may be a predecessor of depression and suicidality (Bahk et al., 2017; Kwon et al., 2017), as trauma exposure is a predictor of higher rates and reoccurrence of depression (Dunn et al., 2017; Kessler et al., 1997; Norman et al., 2012), which is itself a predictor of suicidality (Corson et al., 2013; Guerra et al., 2011; Kramer et al., 1994; Lemaire & Graham, 2011; Lish et al., 1996; Pietrzak et al., 2010). In other words, whereas the first model tests whether the statistical effect of depression on suicidality is exacerbated by trauma exposure, the second model tests whether the statistical effect of trauma exposure on suicidality occurs via depression such that individuals who experience traumatic events may be more likely to develop depression, which in turn makes them more likely to experience suicidality. By examining two models of this set of associations, the current study sought to inform clinical practice by calling attention to key factors that should be explored or targeted by primary care providers to manage and reduce suicidality in a safety-net primary care setting. We also aimed to add to a

burgeoning literature on the links between these factors and the critical public health outcome of suicidality (Bahk et al., 2017; Kwon et al., 2019).

Method

Participants and Procedure

Participants were recruited from a safety-net primary care clinic in Richmond, VA, which predominantly serves low-income individuals experiencing housing insecurity. This facility offers sliding-scale services for both mental and physical health care as well as access to on-site social workers. Participants were recruited from the waiting room via a public announcement from research assistants and completed the survey while waiting for their clinic appointment. Recruitment took place over the course of several weeks, with approximately 20 clinic patients completing surveys during each morning or afternoon shift. The clinic engaged in an average of approximately 170 unique patient encounters per day. In total, 207 participants completed a series of questionnaires concerning trauma history, depression, suicidality, and personal characteristics. All participants provided written Virginia Commonwealth University ethics committee–approved informed consent to participate and received $10 (USD) cash upon completion of the questionnaires.

Participants ranged in age from 21 to 67 years ($M = 44.75$ years, $SD = 11.62$), and 60.4% of participants were male ($n = 125$ men, $n = 82$ women). Participants were mostly Black/African American, and most identified as heterosexual. See Table 1 for further demographic information. The sample's demographic characteristics very closely mirrored the overall clinical population. For example, patients of the clinic from which participants were recruited are predominately uninsured (65%) or on Medicaid (17%), with 76% falling below the federal poverty line in 2018 (Daily Planet, 2018). In the present sample, 83.5% of participants fell below the federal poverty line, reporting less than $10,000 annual income or public assistance.

Table 1
Participant Characteristics

Variable	*n*	%
Gender		
Male	125	60.4
Female	82	39.6
Race		
Black/African American	132	63.8
White/European American	56	27.1
Multiracial/multiethnic	9	4.4
Latino/Hispanic	4	1.9
American Indian/Native American	3	1.5
Asian/Asian American/Pacific Islander	1	0.5
Other	2	1.0
Sexual orientation		
Heterosexual	176	85.0
Bisexual	11	5.3
Gay/lesbian	11	5.3
Queer	2	1.0
Missing	7	3.4
Age (years)		
21–34	49	23.7
35–49	64	30.9
≥ 50	92	44.4
Missing	2	1.0
Educational attainment		
Less than high school	19	9.2
High school	109	52.7
Some community college (no degree)	51	24.6
2-year/technical degree	7	3.4
4-year college degree	17	8.2
Master's degree	3	1.5
Missing	1	0.5
Income (USD)[a]		
$0–$4,999	143	69.1
$5,000–$9,999	29	14.0
$10,000–$14,999	13	6.3
$15,000–$19,999	9	4.4
$20,000–$24,999	4	1.9
$25,000–$29,999	4	1.9
≥ $30,000	4	1.9
Missing	1	0.5
Housing status		
Permanent housing	77	37.2
No permanent housing	130	62.8

Note. Due to rounding, not all percentages total 100%.
[a] Includes income from public assistance.

Measures

Demographic Characteristics

Participants were asked to complete a brief measure to assess their demographic characteristics, such as age, gender, sexual orientation, race/ethnicity, educational attainment, and housing status.

Trauma History

The Brief Trauma Questionnaire (BTQ; Schnurr et al., 1998) was used to assess adult trauma exposure. Participants were asked to endorse (i.e., "yes" or "no") whether they had experienced events including natural disasters, combat, unwanted sexual contact, serious illness, or the sudden death of a loved one as well as whether they were seriously injured and/or feared for their life as a result of the experience. Total scores on the BTQ range from 0 to 10, with higher numbers indicating more trauma exposure. The BTQ has demonstrated good convergent validity with participant interviews, with kappa coefficients ranging from .60 to 1.00 (Schnurr et al., 2002). For the purpose of the present analysis, Item 5 (i.e., "before age 18, were

you ever physically punished or beaten by a parent, caretaker, or teacher so that you were very frightened or you thought you would be injured or you received bruises, cuts, welts, lumps, or other injuries?") was removed from the total score due to its duplication of questions in the measure of child trauma exposure used in the present study; thus, the BTQ score range was limited to 0–9. In the present sample, Cronbach's alpha for the modified scale was .66.

Childhood Trauma Exposure

Childhood trauma exposure was assessed using the ACE Calculator (Anda, unpublished instrument, 2007), a measure of categories of childhood traumatic experiences, including personal and family trauma. Participants were asked to respond to all 10 items with a "yes" or "no" answer. The total summed ACE score ranges from 0 to 10, with higher scores indicating more childhood trauma exposure. Previous assessments of the measure's reliability have demonstrated Cronbach's alpha values ranging from .61 to .80 (Ford et al., 2014). In the present sample, Cronbach's alpha was .83.

Depressive Symptoms and Suicidality

Depression symptomatology and suicidality were assessed using the PHQ-9 (Kroenke et al., 2001). The nine-item scale is used to evaluate how much respondents have been distressed by depressive symptoms over the last 2 weeks. Items are measured on a 4-point Likert-type scale ranging from 0 (*not at all) to* 3 (*nearly every day)*. In the current study, Item 9, which measures suicidality (i.e., "Thoughts that you would be better off dead, or of hurting yourself") was separated from the PHQ-9 total score, as it was treated as a unique outcome variable; thus, the PHQ-8 was ultimately the measure used to assess depression (Kroenke et al., 2009). Because the data were collected fully anonymously, no follow-ups were possible for participants who reported suicidality. However, immediately after the suicidality question, participants were presented with the following information: "If you reported having suicidal thoughts, please tell your…health care provider, who can help refer you to the appropriate services. Additionally, a free 24-hr phone number where you can receive crisis counseling is 1-800-273-TALK."

Responses to each item on the PHQ-8 are summed, with total scores ranging from 0 to 24. Higher scores indicate more significant depressive symptomatology. Score cutoffs for clinical severity are 5 for mild depression, 10 for moderate depression, 15 for moderately severe depression, and 20 for severe depression. The scale has been validated in various clinical samples and has demonstrated good internal consistency (Kroenke et al., 2001). In the present sample, Cronbach's alpha for the PHQ-8 was .87.

Data Analysis

Measures of univariate normality (i.e., skewness and kurtosis) were conducted using SPSS (Version 26) on the primary study variables, and the Mahalanobis distance was calculated to identify multivariate outliers. Little's missing completely at random (MCAR) tests were conducted to assess systematic missingness of item data within each scale, and expectation maximization was used at the item level within each scale to impute missing data if a participant had data for at least 50% of the items on a given measure. Demographic variables and PHQ-9 Item 9 scores were not imputed. A bivariate correlation matrix of the primary study variables and participant demographic characteristics was calculated to determine which demographic variables might be associated with suicidality and, therefore, should be included as covariates in successive models; no demographic covariates were included.

The primary study analyses were conducted in SPSS AMOS (Version 26). The first primary analysis examined whether trauma exposure moderated the association between depression and suicidality. In this analysis, suicidality was the outcome, with the following three predictors: *z*-transformed depression, *z*-transformed and averaged adult and childhood trauma exposure, and the Depression x Trauma Exposure interaction term, which, if significant, would indicate a statistically significant moderation. The moderation was then graphed, and separate regression lines were created for participants who reported a level of trauma exposure that was 1 standard deviation below the mean (i.e., low), plus or minus 1 standard deviation of the mean (i.e., average), or 1 standard deviation above the mean (i.e., high).

The second primary analysis examined whether depression mediated the association between trauma exposure and suicidality. This was run as an indirect effects model using 2,000 bootstrap samples, and a significant indirect effect, with reported standardized and unstandardized effects and respective 95% confidence intervals, would indicate a significant mediation. Sensitivity power analyses, conducted using G*Power 3, suggested that with 80% power (1-β), regressions including three predictors in both the moderation and mediation analyses) and using the current sample size of 207 participants could detect large-, medium-, and small-sized effects (i.e., $f^2 \geq 0.05$).

Results

Data Preparation

Originally, 210 individuals participated in the study. The main outcome variable, Item 9 on the PHQ-9, was missing from two participants (0.97%). Due to the centrality of this item as the outcome variable, these two participants were removed from analyses, leaving a sample size of 208. All skewness and kurtosis coefficients for the combined trauma index, depression, and suicidality were at or below an absolute value of 1.2. As the sample size was larger than 80 participants, any outliers within 3 standard deviations of the mean were retained (Hair et al., 2010), although no outliers exceeded this cutoff. Similarly, Mahalanobis distance calculations suggested that no multivariate outliers were found in the data. Next, Little's MCAR tests for items within each scale suggested that data were

Table 2
Bivariate Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11
1. Adult trauma	–	.487*	.393*	.284*	−.077	.105	.102	−.078	.052	.179*	−.003
2. Childhood trauma		–	.340*	.369*	−.226*	.121	.117	−.045	−.082	.182*	−.074
3. Depression			–	.537*	−.053	.180*	.050	−.143*	.007	.180*	−.035
4. Suicidality				–	−.055	.073	.116	.080	−.067	.099	−.038
5. Age					–	.065	−.195*	.064	.184*	−.094	.029
6. Gender						–	.309*	.049	.064	−.133	−.028
7. Sexual orientation							–	.025	−.030	.095	.035
8. Race/ethnicity								–	−.176*	.004	−.076
9. Education									–	−.180*	.430*
10. Housing										–	−.162*
11. Income											–

Note. Gender (man = 1, woman = 2), sexual orientation (1 = heterosexual, 2 = non-heterosexual), race/ethnicity (1 = White, 2 = non-White), and housing status (1 = stable housing, 2 = no stable housing) were all recoded dichotomously for point-biserial correlations.
*$p < .05$.

missing completely at random. One participant fell short of the cutoff for expectation maximization data imputation (i.e., having at least 50% of the items on the given scale) on the PHQ-8 and was deleted, leaving a total final sample size of 207.

Bivariate Relationships and Prevalence

The bivariate correlation matrix (Table 2) suggested that all primary study variables were associated with each other as expected. Childhood and adult trauma exposure, with the childhood trauma item excluded from the BTQ, were positively correlated. No demographic variables were significantly correlated with suicidality, and, as a result, no covariates were included in the primary moderation and mediation models. Data on trauma exposure rates can be found in Table 3 and indicate that approximately half the participants reported experiencing at least four traumatic events. The mean total count for childhood traumatic events was 3.86 ($SD = 3.01$), and the mean total count for adulthood traumatic events was 2.96 ($SD = 2.09$). Data about depression symptoms are also displayed in Table 3 and indicate that 82.1% of individuals were in the clinical range for depression and 43.5% of the sample endorsed some level of suicidality over the past two weeks (Table 3).

Moderation Analysis

Depression, $\beta = .48$, $B = 0.48$, $SE = .06$, $p < .001$, and trauma exposure, $\beta = .20$, $B = 0.23$, $SE = 0.07$, $p = .002$, significantly predicted suicidality. The association between depression and suicidality was significantly moderated by trauma exposure, $\beta = .16$, $B = 0.20$, $SE = 0.08$, $p = .007$. This moderation effect can be seen in Figure 1 and suggests that higher levels of trauma exposure exacerbated the association between depression and suicidality. The overall model accounted for 34.0% of the variance in suicidality (vs. 31.7% without the interaction term). To determine whether the inclusion of the interaction term improved the model relative to a model with only the two main effect predictors, a follow-up model was run with the interaction path constrained to 0. A comparison of Bayesian information criterion (BIC) values suggested that the addition of the interaction term did indeed improve the model, as the BIC value decreased from 55.33 to 55.10 after the interaction path was constrained.

Mediation Analysis

In the mediation analysis, trauma exposure predicted depression, $\beta = .43$, $B = 0.49$, $SE = .07$, $p < .001$, as well as suicidality, controlling for depression, $\beta = .18$, $B = 0.21$, $SE = .07$, $p = .004$. Depression also predicted suicidality, $\beta = .46$, $B = 0.46$, $SE = .06$, $p < .001$. The standardized bootstrap estimate (i.e., β) of the indirect effect was .20, $B = 0.23$, $SE = .05$, 95% CI [0.16, 0.32]. This result suggests a significant partial mediational effect of depression on the association between trauma exposure and suicidality. The overall model accounted for 31.7% of the variance in suicidality.

Discussion

The current study modeled the associations among trauma exposure, depression, and suicidality in a safety-net primary care sample. Rates of trauma exposure, depression, and suicidality were extremely high in this sample, including a mean childhood trauma exposure count of 3.86; in addition, 82.1% of individuals scored in the clinical range for depression, and 43.5% of the sample endorsed some level of suicidality over the past 2 weeks. The overall rate of trauma exposure of approximately 85% was higher than other estimates, which are typically reported as approximately 51%–69% (Norris & Stone, 2013), and the prevalence of depression was substantially

Table 3
Trauma Counts and Depression and Suicidality Scores

Variable	*n*	%
Total childhood trauma count		
0	39	18.8
1	23	11.1
2	22	10.6
3	19	9.2
4	13	6.3
5	24	11.6
6	21	10.1
7	16	7.7
8	14	6.8
9	7	3.4
10	9	4.4
Total adult trauma count[a]		
0	34	16.4
1	28	13.5
2	30	14.5
3	24	11.6
4	40	19.3
5	24	11.6
6	19	9.2
7	6	2.9
8	2	1.0
Depression severity[b]		
Subclinical	37	17.9
Mild	48	23.2
Moderate	60	29.0
Moderately severe	34	16.4
Severe	28	13.5
Suicidality during the past 2 weeks		
Not at all	117	56.5
Several days	48	23.2
More than half the days	21	10.1
Nearly every day	21	10.1

Note. Imputed trauma scores were rounded to the nearest integer.
[a]Assessed using the Brief Trauma Questionnaire, excluding Item 5 (i.e., exposure to childhood trauma). [b]Based on the Patient Health Questionnaire–9, including Item 9 (i.e., suicidality).

higher than the 7% national average (National Institute of Mental Health, 2017).

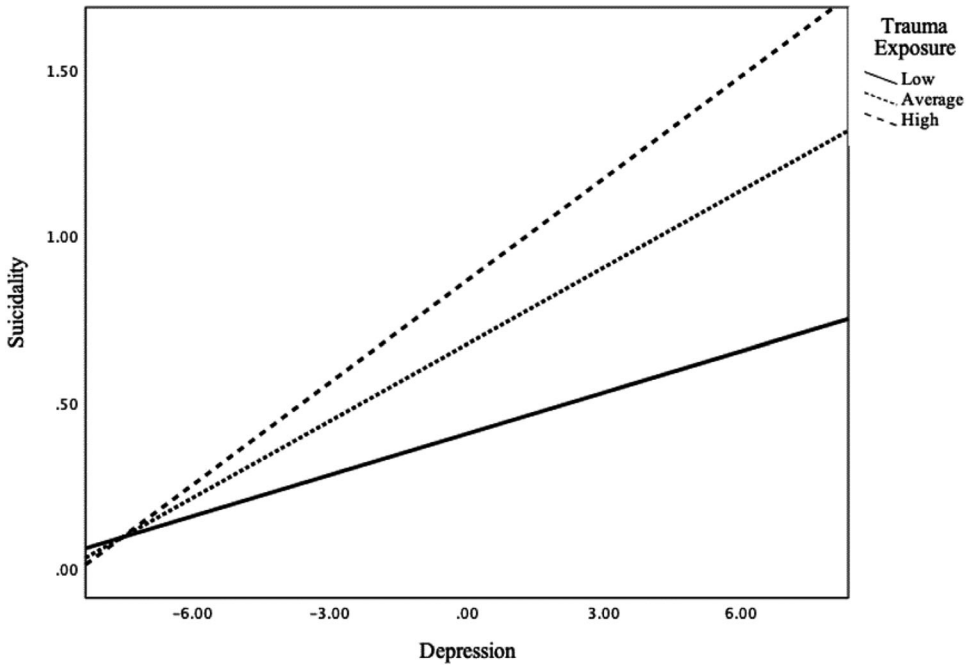
As expected, depression was a direct predictor of suicidality in this sample (Corson et al., 2013; Guerra et al., 2011; Kramer et al., 1994; Lemaire & Graham, 2011; Lish et al., 1996; Pietrzak et al., 2010). Similarly, trauma exposure predicted suicidality (Stein et al., 2010). In addition, trauma exposure predicted depression, in line with extant research (Dunn et al., 2017; Kessler et al., 1997; Norman et al., 2012).

The association between depression and suicidality was moderated by trauma exposure, meaning that trauma exposure strengthened this relation. This is in line with research showing a stable association between trauma exposure and suicidality (Stein et al., 2010), the latter of which is intimately related to depression (Corson et al., 2013; Guerra et al., 2011; Kramer et al., 1994; Lemaire & Graham, 2011; Lish et al., 1996; Pietrzak et al., 2010). In addition, the association between trauma exposure and suicidality was mediated by depression. This result is in line with varied research demonstrating the direct relations between trauma exposure and depression (Dunn et al., 2017; Kessler et al., 1997; Norman et al., 2012) and depression and suicidality (Corson et al., 2013; Guerra et al., 2011; Kramer et al., 1994; Lemaire & Graham, 2011; Lish et al., 1996; Pietrzak et al., 2010).

Examination of the two theoretical models indicated evidence for both a mediational effect of depression on the link between trauma exposure and suicidality and for a moderational effect of trauma exposure on the link between depression and suicidality. This suggests that clinicians who are working with trauma-exposed individuals should monitor for the development of depressive symptoms, as they represent a key predictor of the progression to suicidality. In addition, similar attention ought to be paid to patients being treated for depression who may have been experienced traumatic events. Even though this latter, moderational model is a less parsimonious reflection of the associations between these variables, the high rates of comorbidity and the association between the three key variables (i.e., trauma exposure, depression, and suicidality) suggest that clinicians, especially those working in safety-net settings, must assess their patients for suicide risk with these nuances in mind. Although the current study applied two different models, both models seemed to work. As a result, further research is needed to tease apart nuances in trauma exposure, such as assaultive versus nonassaultive traumatic events, and nuances in patient experience, such as demographic factors, access to care, and social support.

Overall, the current results call attention to the high prevalence of trauma exposure, depression, and suicidality in safety-net primary care settings. Unfortunately, many primary care providers are uncertain how to screen for suicide (Grimholt et al., 2014; Palmieri et al., 2008), screening in primary care settings remains infrequent and imperfect (Bostwick & Rackley, 2012), and certain demographic groups (e.g., men and individuals of color, as found in the current study) are more likely to deny suicidality when asked about it in primary care settings, even if they are actively suicidal or die by suicide soon after the assessment (Cukrowicz et al., 2013; Denneson et al., 2010). Similarly, despite the high prevalence of trauma exposure in the current sample, primary care clinicians frequently report a lack of confidence in their ability to work with patients in a trauma-informed manner (Green et al., 2015). Trauma exposure can predispose patients to mistrust authority and power, which can disrupt the patient–provider relationship (Green et al., 2012) and make trauma-informed care especially important for patient outcomes. As a result, if individuals are identified as having been exposed to trauma, as was the case among the majority of the safety-net primary care patients in the current sample,

Figure 1
Moderating Effect of Combined Trauma Exposure



Note. Suicidality values reflect a range of 0–3, and depression values represent centered scores.

the evaluation of suicide risk should also be informed by an assessment of trauma history. The nature of trauma exposure as a risk factor for depression and suicidality regardless of the specific directional nature of the associations necessitates detailed and explicit assessment for the risk of suicidality when these factors are identified in a clinical case. In addition, trauma-informed risk protocols should be in place to enable providers to respond when individuals are identified as at risk for suicide.

Despite these potential implications, the current study had several limitations that should be taken into account when interpreting the findings. We relied upon cross-sectional data that were collected in an omnibus manner. As a result, causality among the series of variables can only be inferred very indirectly; however, in the vast majority of cases, trauma preceded depressive symptoms and suicidality, which both were reported in relation to the past 2 weeks. Therefore, recent suicidality and depression would be extremely unlikely to cause prior trauma exposure. Relatedly, there are limitations in comparing mediation and moderation models to reveal the correct causal structure underlying the data. These models are conceptually different and reflect different theories about the structure of the data as opposed to competing models that can be compared using cross-sectional data. The most correct interpretations of these models are that both seemed to hold in cross-sectional data, both would benefit from validation in future longitudinal studies, and neither can be inferred to be superior based on the current findings.

In addition, there were potential threats to internal validity, including self-report bias. Specifically, concerns about underreporting suicidality are a crucial but, unfortunately, somewhat unavoidable challenge to validity (Cukrowicz et al., 2013; Denneson et al., 2010). Therefore, suicidality rates in the current sample may have been even higher than the extremely high rates found. Moreover, as this study used a single site for data collection, the possibility of sampling bias was introduced, such that the results may not be generalizable to all safety-net primary care settings. However, it should be noted that the demographic characteristics of the sample largely mirrored those of the larger clinic; thus, the magnitude of this limitation should be appropriately considered.

Despite these limitations, the present study adds to the literature in meaningful ways. First, the study focused on a sample that has been historically difficult to reach both clinically and in research. As a result, the characterization of the prevalence of these high rates of trauma exposure, depression symptoms, and suicidality, let alone the development of models of their associations, are meaningful additions to the literature in this area. In addition, the development of a replicable model of the association between trauma exposure and suicidality offers promise for continued clinical research in an area that is a major public health concern. Finally, these findings argue for the importance of embedding mental health providers in safety-net primary care settings, as well as teaching other providers the skills to detect and refer patients to these providers. Specifically, the integration of mental health providers within primary care may

help identify and manage patient suicidality (Dueweke et al., 2017). Similarly, national calls for trauma-informed care in primary care settings have also recognized the vital importance of providing mental health services in this setting to mitigate the impact of trauma exposure on mental and physical health outcomes (Machtinger et al., 2015).

Open Practices Statement

The study reported in this article was not formally preregistered. Neither the data nor the materials have been made available on a permanent third-party archive; requests for the data or materials can be sent via email to the corresponding author at pperrin@vcu.edu .

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