

Post disaster resilience

Racially different correlates of depression symptoms among hurricane Katrina-Rita volunteers

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Keywords: depressive symptom, racial differences, previous trauma, hurricanes Katrina- and Rita-related stress, optimism, peritraumatic positive emotions

The present analyses examined the differential risks of and protective factors against depressive symptoms of African American and Non-Hispanic White American student volunteers, respectively after Hurricanes Katrina and Rita (H-KR). A total sample of 554 student volunteers were recruited from mental health professional programs at five universities located in the Deep South, namely areas severely impacted by H-KR during fall semester 2005. The response rate was 91% (N = 505). African American respondents (N = 299) and Non-Hispanic White Americans (N = 206) completed the survey questionnaires. Respondents retrospectively provided information on peritraumatic emotional reactions and previous trauma that were recalled by H-KR and H-KR stressors. African American respondents reported higher levels of depressive symptoms (65.2%) than their Non-Hispanic White counterparts (34.8%). Hierarchical regression analyses revealed that disaster related stressors affected African Americans ($p < 0.001$), but not Non-Hispanic Whites. However, African Americans who experienced peritraumatic positive emotions had lower depression levels. Lower rates of recollection of prior traumas during H-KR were reported by African American respondents, whereas previous trauma recollections predicted symptoms among Non-Hispanic White Americans ($p < 0.05$). Exhibiting more optimism had lower depression levels among Non-Hispanic White Americans. Peritraumatic negative emotion was the only shared risk for depressive symptoms of both groups. Findings underscore racially different levels of depressive symptoms that may contribute to varying degrees of resilience among student volunteers. Future research and practice may address these racial differences by understanding the risk factors for depressive symptoms to develop appropriate interventions for racial groups, and cultivating the protective factors that contribute to resilience from traumatic experiences.

Introduction

Traumatic events like September 11 and Hurricanes Katrina and Rita (H-KR) have heightened national awareness on the effects that such events can have on communities and specific populations. These disasters not only had major effects on those directly impacted by the hurricane, but also on first responders and the subsequent teams of personnel who provided aid to residents and evacuees. Students in social service fields were particularly prone to volunteer to provide help and those experiencing hurricane-related stressors were even more likely to be volunteers, yet it is probable that many were also suffering from some psychological symptomology.¹ Most studies examining the effects of traumatic events on health, mental health, and behavioral health have focused their research efforts on those hardest hit by these traumas, the survivors.²⁻⁴ However, a less studied area is the impact of exposure to traumatized populations on helping professionals and lay volunteers providing services, particularly related to the examination of depressive symptoms, anxiety, and posttraumatic

stress disorder (PTSD).⁵⁻⁸ This area of study is important because healthy helping professionals and volunteers (both physically and mentally) are better able to provide effective services to trauma survivors than those providers who suffer from symptoms of depression, compassion fatigue, and burnout.

The current study focuses its examination of risk and protective factors associated with symptoms of depression among African American and Non-Hispanic White volunteers working with survivors of H-KR. In particular, we are interested in the racial differences given that African Americans and Non-Hispanic White Americans may hold different opinions about the unprecedented traumatic impact of H-KR.⁶ Below, we provide an overview of the existing research on H-KR, trauma as predictors of depression, and the literature on racial differences for depression. Next, we outline the documented studies on protective factors including faith and positive mindedness, followed by our study findings.

Compared with rapid recovery (a state of symptom reduction after crisis), *resilience* refers to “the ability to maintain a stable

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Submitted: 10/16/2012; Accepted: 11/30/2012
<http://dx.doi.org/10.4161/dh.23077>

equilibrium⁹ or to achieving “good outcomes in spite of serious threat.”¹⁰ Bonanno⁹ asserted that trauma research has mainly focused on predictors of stress reactions rather than those of *resilience*. In view of positive psychology, massive crises may illuminate a claim of “the role of crisis as a possible crucible for what is best about people.”¹¹ Trauma and disaster may sometimes pave a way to positive outcomes.¹² Few studies, however, have examined the prediction of human strengths and positive characteristics for resilience after a collective trauma.¹³ Integrating a positive view may enhance interventions, moving from a variable-focused (negative) to a person-focused (strength) orientation.¹⁰

Related research on the impact of hurricanes Katrina and Rita. Determining differences in how mental health outcomes occur for African Americans and Non-Hispanic White Americans is critical to anticipating post-disaster needs and providing quality assistance. One prior study showed some differences in attribution of responsibility for system-response problems after these hurricanes, with differences found between African American and Non-Hispanic White American respondents. In that study, social identity based on ethnicity was seen as influential in the interpretation of events, with African Americans more likely to attribute the poor response to the hurricanes to racism.¹³ Similarly, PTSD symptoms had distinctive differences regarding their appearance in African American vs. Non-Hispanic White American student service providers in a different study.⁶

Trauma as predictor of depressive symptoms and PTSD. Studies have investigated risk factors including trauma that are linked to psychiatric conditions, but explanations for such linkages are inconsistent. For instance, one study claimed that those with cumulative trauma exposure predicted psychological distress, which was “partially mediated through impaired psychosocial resources” such as social support, self-esteem and optimism.¹⁴ Prior history of major depression has also been strongly associated with higher peritraumatic dissociative symptoms.¹⁵ Most notably, PTSD is often associated with previous trauma, as well as other risk factors including peritraumatic dissociation, psychiatric history, acute stressors, substance abuse, depressive disorders, social support, age and anxiety.^{16,17} Individuals are more susceptible for developing PTSD if they have a prior history of trauma and developed PTSD as a response to the prior trauma.¹⁸ Distress associated with prior trauma has also been found to predict PTSD.¹⁹

However, as indicated, the link between trauma and PTSD has produced mixed findings. Traumatic events including the terrorist attacks of September 2001, campus shootings and H-KR have assessed the predictability of PTSD and depression. For example, research on the aftermath of 9/11 indicated an association between PTSD and peritraumatic emotional responses, defined as immediate emotional reactions to a disaster.²⁰ In one study on the 9/11 attacks, peritraumatic negative emotions predicted higher levels of PTSD, and minorities experienced higher levels of PTSD symptoms.²¹ When the relationship between trauma and depression was tested, the association between depression and previous trauma recollection was positive.²⁰ In another study, Hobfoll, Tracy and Galea²² tested whether resource loss would predict PTSD and depression following the 9/11 attacks,

controlling for cumulative exposure to stress, previous trauma, peritraumatic experience and social support. Results from the study confirmed the relationship only between resource loss, PTSD, and depression. Similar findings have been reported indicating that resource loss predicted PTSD symptoms among college students, independent of predictors such as previous trauma and psychological distress.²³ Still, limited studies have compared racial differences in depression comparing African American and Non-Hispanic White American disaster trauma volunteers.

Racial differences in mental health: Response to trauma.

The prevalence of depression in the general population is similar among ethnic groups.²⁴⁻²⁶ However, differences have been detected in various studies researching post-disaster mental health outcomes. It should be noted that the impact of traumatic events on individual mental health seems to be determined by many factors other than just race/ethnicity,²⁷ such as prior history of mental disorder, the degree of exposure to a stressful event, severity of trauma, female gender, family separation and low socio-economic status.

Compared with Non-Hispanic White Americans, African Americans were found to have higher levels of depression and psychological stress after experiencing Hurricane Katrina.²⁸⁻³¹ Adeola²⁸ and Elliott and Pais²⁹ analyzed data from a Gallup/CNN/USA Today random digit dialing telephone survey of approximately 1,510 survivors of Hurricane Katrina and found that African Americans reported higher levels of psychosocial problems including trouble sleeping, having feelings of depression, anxiety and worrying about immediate and nearest futures than their White counterparts. However, Kessler et al.³¹ found that White survivors of Hurricane Katrina exhibited higher rates of suicide and suicidal ideation than did African American survivors.

In another study, Mills et al.³² found that African American victims of Hurricane Katrina reported higher levels of Acute Stress Disorder (ASD) than their White counterparts. ASD includes such symptoms as difficulty sleeping, irritability, poor concentration, hypervigilance, exaggerated startle response, motor restlessness, recurrent images, thoughts, dreams, illusions, flashback episodes or a sense of reliving the experience; or distress on exposure to reminders of the traumatic event. Additionally, DeSalvo and colleagues³³ surveyed Hurricane Katrina survivors who were also employees of Tulane University and found that Whites had higher rates of PTSD symptoms after Hurricane Katrina than did their African American counterparts. However, their sample was predominantly White and employed, which does not seem to be representative of the population affected most by Hurricane Katrina.

Protective factors. Several studies have investigated the association of depressive symptoms with optimism among college students. The role of optimism has been shown to decrease suicidal ideation for college students, and prevention programs that promote optimism may contribute to reducing the risk of suicide.³⁴ While negative life events have been shown to affect mental health outcomes, optimism around negative or traumatic life events can reduce suicidal ideation “above and beyond the effects of hopelessness and depression.”³⁵ In another study following the

9/11 terrorist attacks, optimism and hope explained the role of prayer in coping and adjustment in a sample of college students.²¹ In addition to measurements of optimism to predict depression, protective factors such as self-esteem and social support were associated with psychological health. Self-esteem and optimism were not predictive of PTSD when also accounting for risk factors.³⁶ Psychosocial resources like social support from religious organizations have sometimes been shown to serve as protective factors in buffering depressive symptoms.³⁷ A study of college freshmen revealed that optimism and social support predicted less stress and depression.³⁸ Perceived social support, less exposure to adverse life events and higher levels of self-esteem were also identified as predictors of mental health.³⁹

Gender and racial differences predicting the association between optimism and depression have produced varied results. In a study of disadvantaged African American and Non-Hispanic White American women, there were no racial differences in optimism and perceived control as buffers to chronic and acute stressors.⁴⁰ Grote et al.'s⁴⁰ study determined that optimism and perceived control predicted lower risk for depression among disadvantaged African American and Non-Hispanic White American women, despite being exposed to higher levels of stressors, compared with those women with less exposure to chronic or acute stressors. Similarly, in a community sample of low-income, inner-city African American women, optimism served as a buffer for depression and self-reported physical symptoms. Specifically, those women reporting more optimism, combined with higher depressive symptoms, had fewer physical symptoms compared with those women who reported having less optimism and high levels of depressive symptoms.⁴¹ Optimism, as demonstrated in these studies,^{40,41} does not necessarily reveal racial differences in predicting depressive symptoms among African American and Non-Hispanic White American women.

Another protective dimension often studied is faith factors, including use of prayer for coping, degree of faith and hope. Faith factors are an integral part of individuals' worldviews and can serve as a source of inspiration and strength in facing multiple crises.^{21,42} However, the research investigating the link between faith and PTSD after experiencing collective trauma is inconsistent.⁴³⁻⁴⁵ In Ai et al.'s²¹ sample, faith factors served as an indirect protective effect on PTSD following collective trauma post-9/11, particularly for ethnic minorities. Findings from this study point to the racial differences of trauma effects linked to peritraumatic emotions as well as PTSD symptoms.²¹

The present study examined racially differential predictors for depressive symptoms in African American and Non-Hispanic White American samples, respectively. Hierarchical regression models were performed following preplanned steps: 1) demographics (age, gender, schooling, and employment); 2) current and previous trauma factors (H-KR Stressors, peritraumatic emotional responses, and previous trauma recalled by H-KR); 3) faith factors (faith and prayer); and 4) positive mindedness (hope, optimism). Based on the literature and the previous findings on PTSD, we hypothesized 1) a stronger positive association between previous traumas recalled by H-KR and current symptom levels in the Non-Hispanic White American sample,

Table 1. The CES-D Depression Scale Cutoff Score for African-American and White-American Volunteers

Depression severity	African Americans N (%)	White Americans N (%)
Moderate to Major Depression (21 – 53)	107 (65.2)	57 (34.8)

and 2) a stronger positive association between current H-KR stressors with symptoms in the African American sample. We also expect to find differential protective factors between the two racial groups.

Method

The sample. During the fall semester, 2005, a sample of 554 student volunteers was recruited from mental health professional programs at five universities located in the Deep South in areas severely impacted by H-KR. Among them, about 11.3% transferred from New Orleans due to the closure of their universities after the disasters.¹ These students had all been exposed to and influenced by H-KR to varying degrees. Under highly stressful circumstances (the dual pressure of administering intensive disaster relief and completing their academic work during the term), students also participated in direct provision of social services for evacuees.

The response rate was 91% (N = 505). The current analysis involved 505 undergraduate and graduate student volunteers who offered their consent, including African-American (N = 299, 59.2%) and Non-Hispanic White- (N = 206, 40.8%) volunteers. Of the sample, the majority were women (88.6%), and the average age was 30.1 (SD = 9.2). The distributions of gender and age were comparable to those of current student cohorts at the five schools involved. The average years of college education was 5.9 (SD = 4.7), and employment was 4.4 y (SD = 6.2). Low symptom levels of depression have been used as one indicator of the latent factor resilience following trauma.^{46,47} We adopted this strategy to examine the association between depressive symptoms and peritraumatic emotions, faith factors, and positive mindedness three months after Hurricanes Katrina-Rita (H-KR), though this symptom-deduction is seen only as one aspect of resilience.

Procedure. Because personal interviews at that time were not feasible under the extreme pressure three months after H-KR, we collected survey questionnaires to reduce the burden on participants. At each site, investigators distributed a survey packet, approved by the Institutional Review Board at each university (Southern University and Agricultural and Mechanical College, Louisiana State University, Jackson State University, University of Alabama, and University of Houston). The survey packet contained an informed consent letter, the consent form, the survey, and a return stamped envelope. The questionnaire required 30–40 min to be completed and included measures regarding major constructs (e.g., depressive symptoms), expectations for the future and demographics. To encourage participation, researchers employed various recruitment strategies (e.g., posters, emails, direct faculty contact, etc.).

Table 2. Descriptive data for the sample (N and % or mean and SD)

Variables	Total sample (N = 505)	African Americans (N = 299)	White Americans (N = 206)	t
Age (in years)	30.1 (9.2)	30.1 (9.7)	29.6 (8.1)	0.7
Female (%)	88.6	89.9	85.9	1.4
Employment (in years)	4.4 (6.2)	5.3 (7.1)	3.3 (5.0)	3.2**
Education (in years)	5.9 (4.7)	4.8 (4.2)	7.5 (5.1)	-6.3***
Positive emotion	23.7 (4.0)	24.0 (4.2)	23.2 (3.9)	2.3*
Negative emotion	12.3 (4.0)	12.4 (4.3)	12.3 (3.6)	0.2
Reminding trauma	0.43 (0.9)	0.47 (0.9)	0.37 (0.9)	1.1
H-KR stressor	5.0 (3.2)	4.9 (3.3)	5.0 (2.8)	-0.2
Faith	9.8 (2.0)	10.4 (1.5)	9.0 (2.3)	7.9***
Prayer	13.2 (3.1)	14.1 (2.4)	12.0 (3.5)	8.1***
Optimism	22.2 (4.9)	22.4 (5.0)	21.9 (5.0)	1.1
Hope	32.9 (4.4)	32.7 (4.8)	33.0 (3.6)	-0.7

*p < 0.05; **p < 0.01; ***p < 0.001.

Table 3. Multiple regression model of determinants of depressive symptoms (African Americans, N = 299)

	Model 1	Model 2	Model 3
	Beta (SE)	Beta (SE)	Beta (SE)
Age	0.001 (0.006)	0.001 (0.005)	-0.001 (0.005)
Female	0.153 (0.177)	0.024 (0.156)	-0.055 (0.155)
Education	-0.009 (0.023)	0.022 (0.020)	0.007 (0.020)
Employment	-0.005 (0.008)	-0.008 (0.007)	-0.009 (0.007)
Model 1 $F = 0.405$ ($df = 4$, $p = 0.805$) Adj. $R^2 = -0.02$			
Positive emotion		-0.346 (0.097)**	-0.262 (0.105)*
Negative emotion		0.224 (0.063)**	0.224 (0.067)**
Reminding trauma		0.011 (0.050)	0.024 (0.049)
H-KR Stressor		0.063 (0.015)***	0.058 (0.015)***
Model 2 $F = 5.980$ ($df = 8$, $p = 0.000$) Adj. $R^2 = 0.26$			
Faith			0.203 (0.120)
Prayer			-0.088 (0.079)
Optimism			-0.098 (0.099)
Hope			-0.199 (0.111)
Model 3 $F = 5.290$ ($df = 12$, $p = 0.000$) Adj. $R^2 = 0.31$			

*p < 0.05; **p < 0.01; ***p < 0.001.

As requested, participants retrospectively recalled their direct experiences around H-KR nearly three months earlier. They also responded on the following: (1) faith factors (prayer used for coping with H-KR), (2) positive attitudes (hope and optimism), (3) H-KR stressors, (4) previous traumas of which they were reminded by H-KR and (5) peritraumatic positive and negative emotional responses. Completed surveys were returned independently by participants on average, three months after H-KR. To ensure quality, all data were entered into databases at the data collection sites using double entry. Five subsets were aggregated and cleaned at Louisiana State University, factored at the University of Pittsburgh, and then analyzed using SPSS 19 at the University of the Pacific.

Measures. Demographics. Race and gender were dichotomized (0 = African American, 1 = Non-Hispanic White American; 0 = Male, 1 = Female). College education and employment were assessed by years.

Depression was assessed with the 20-item CES-D.⁴⁸ Participants stated how often they had experienced each symptom during the previous week. Cronbach's α or α was 0.90 ($M = 16.28$, $SD = 0.10.78$).

Using prayer for coping was assessed by Using private prayer as a means for coping.⁴⁹ Originally, the three items included aspects of 1) belief in the importance of prayer, 2) faith in the efficacy of prayer for coping and 3) the use of prayer to cope. The H-KR version was modified slightly to include an additional question,

Table 4. Multiple regression model of determinants of depressive symptoms (Non-Hispanic White Americans, N = 206)

	Model 1	Model 2	Model 3
	Beta (SE)	Beta (SE)	Beta (SE)
Age	-0.009 (0.009)	-0.006 (0.008)	-0.001 (0.007)
Female	0.030 (0.252)	0.137 (0.237)	0.334 (0.199)
Education	-0.019 (0.042)	0.000 (0.039)	-0.022(0.033)
Employment	-0.008 (0.016)	-0.009 (0.015)	-0.002 (0.012)
Model 1 $F = 0.753$ ($df = 4$, $p = 0.559$) Adj. $R^2 = -0.01$			
Positive emotion		-0.037 (0.137)	0.017 (0.119)
Negative emotion		0.307 (0.106)**	0.245 (0.088)*
Reminding trauma		0.225 (0.100)*	0.213 (0.083)*
H-KR Stressor		0.010 (0.023)	0.023 (0.019)
Model 2 $F = 3.018$ ($df = 8$, $p = 0.006$) Adj. $R^2 = 0.19$			
Faith			0.067 (0.095)
Prayer			-0.037 (0.101)
Optimism			-0.538 (0.101)***
Hope			0.105 (0.139)
Model 3 $F = 5.874$ ($df = 12$, $p = 0.000$) Adj. $R^2 = 0.46$			

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

namely (4) prayer with others to cope with H-KR. Respondents indicated their level of agreement or disagreement using a 4-level scale (1 = Strongly disagree, 4 = Strongly agree) to answer questions related to use of prayer *during the time following H-KR* ($\alpha = 0.82$, $M = 13.25$, $SD = 3.07$).

Strength of faith was assessed with selected questions from the *Three-Factor Religiosity Scale*⁵⁰ and used in a prior 9/11 study (i.e., “How important would you say religion is in your life? How religious would you say you are? How strongly spiritually oriented do you consider yourself to be?”).⁵¹ Respondents answered on a 4-level scale (1 = Not at all, 4 = Very) concerning each item ($\alpha = 0.76$, $M = 9.83$, $SD = 2.00$).

Hope was assessed with the 8-item *hope scale*.⁵² Participants’ responses were rated how they felt about each item *during the past month* ($\alpha = 0.85$, $M = 32.88$, $SD = 4.38$) using two 5-level scales (1 = Definitely false, 5 = Definitely true).

Optimism was assessed with the 8-item *Life Orientation Test*.^{53,54} Participants rated how they felt about each item *during the past month* ($\alpha = 0.76$, $M = 22.21$, $SD = 4.93$) based on two 5-level scales (1 = Strongly disagree, 5 = Strongly agree).

Hurricane-related stressors were assessed using the 18-item checklist hurricane-related stressors experienced *during the month following H-KR*, developed by investigators immediately following the disasters.¹ Respondents answered “Yes” or “No” to questions related to the stressors they experienced (e.g., being an evacuee, sharing a home with evacuees, food and gasoline shortages, compassion fatigue or guilt, loss of personal property, health and financial problems, job loss). Responses to items were summed, with higher scores reflecting greater numbers of stressors.

Previous traumatic experiences was assessed with a 7-item list adapted from the 9/11 study.²⁰ Respondents were asked *during the month following H-KR* whether the disasters reminded them

of prior tragedies such as experiencing another serious natural disaster; witnessing violence; being a war veteran; or being the victim of a stranger assault, child abuse, or domestic violence. Rather than focusing on past trauma, the checklist assessed whether H-KR triggered recollections of prior traumatic experiences. Items selected on the list were summed to create a composite score for participants who were reminded of previous traumatic experiences.

Peritraumatic emotional responses were assessed using the checklist, *Types of Peritraumatic Emotional Responses*, adapted from the 9/11 study²⁰ with the context modified to H-KR. Respondents indicated *during the month following H-KR* the extent to which they experienced 12 types of emotional reactions (e.g., horror/shock, anger/hatred, fear/worry, gratitude for support, compassion toward those who have experienced similar tragedy and feeling of relief for the safety of one’s beloved persons) and an “Other” item *during the month following H-KR*, on a 5-level scale (1 = Not at all, 5 = A great deal). The first five items constituted the score for *peritraumatic negative emotions* ($\alpha = 0.82$, $M = 12.27$, $SD = 4.03$), and the next seven items constituted the score for *peritraumatic positive emotions* ($\alpha = 0.83$, $M = 23.69$, $SD = 4.05$), following principal axis factoring.²⁰

Data analysis. Analysis of data included two phases. First, we conducted independent t-tests to reveal racial differences on the predictors of depressive symptoms. Second, we performed hierarchical multiple regression to explore predictors of depressive symptoms in African- and White-American volunteers. This analysis followed preplanned steps: 1) demographics, 2) disaster experience factors pertaining to reactions to H-KR (*peritraumatic emotional responses*, *H-KR related stressors*, and *traumatic experiences reminded by H-KR*) (Step-II), 3) potential protective factors (*strength of faith*, *using prayer for coping*, *hope*,

and *optimism*). The significance of these analyses was set at $p < 0.05$, two tailed.

Results

Bivariate comparisons. Results of independent t-tests indicated race-based differential patterns in depressive symptoms. In other words, there were significant differences in mean depression scores for African Americans ($t = -2.3$, $p < 0.05$) and Non-Hispanic White Americans ($t = 2.0$, $p < 0.05$). **Table 1** indicates that more African Americans (65.2%) reported scores higher than the clinical cutoff score of 21 on the CES-D depression scores compared with White Americans (34.8%). Descriptive data for the two subsamples are presented in **Table 2**. To summarize, results from the independent t-test showed significant race-based differences in employment, education, peritraumatic positive emotions, faith and prayer.

Multiple regression predicting depression. **Table 3** displays the results of hierarchical multiple regression models predicting depression for the African American sample according to pre-planned steps. In Step I, the sociodemographic variables were not significant predictors for depression. However, when peritraumatic reaction factors were added to the model in Step II, some variables were significant predictors for depression: negative emotion ($\beta = 0.22$, $p < 0.01$), positive emotion ($\beta = -0.35$, $p < 0.01$), and H-KR stressors ($\beta = 0.06$, $p < 0.001$). Therefore, peritraumatic emotional responses and stressors related to H-KR were predictive of depression.

This pattern of peritraumatic reaction and H-KR stressors remained the same in Step III: negative emotion ($\beta = 0.22$, $p < 0.01$), positive emotion ($\beta = -0.26$, $p < 0.05$), and H-KR stressors ($\beta = 0.06$, $p < 0.001$). Adding faith factors and optimistic expectations in Step III did not result in significant predictors for depression. The overall model was significant for Step II ($f = 5.98$, $R^2 = 0.31$, $p < 0.001$) and explained 31% of the variance in depression among African Americans. Similarly, the overall model for Step III was significant ($f = 5.29$, $R^2 = 0.38$, $p < 0.001$) and explained 38% of the variance in depression among African Americans. Those who experienced more negative emotions and H-KR stressors had higher depression levels, whereas those who experienced peritraumatic positive emotions had lower depression levels.

Table 4 presents results of the hierarchical multiple regression models predicting depression for the Non-Hispanic White American sample which followed preplanned steps. Sociodemographic variables were not significant predictors (Step I). Peritraumatic reaction factors were added to the model in Step II, resulting in two variables significantly predicting depression: negative emotion ($\beta = 0.31$, $p < 0.01$) and being reminded of trauma ($\beta = 0.23$, $p < 0.05$). Peritraumatic negative emotional responses and traumatic reminders were predictive of depression.

Faith factors and optimistic expectations added in Step III yielded the same pattern as the previous Step II: negative emotion ($\beta = 0.25$, $p < 0.05$) and trauma reminders ($\beta = 0.21$, $p <$

0.05), with optimism ($\beta = -0.54$, $p < 0.001$) also significantly predicting depression. Overall the model was significant for Step II ($f = 3.018$, $R^2 = 0.28$, $p < 0.05$) and explained 28% of the variance in depression among Non-Hispanic White Americans. Similarly, the overall model for Step III was significant ($f = 5.87$, $R^2 = 0.46$, $p < 0.001$) and explained 55% of the variance in depression among Non-Hispanic White Americans. Those who suffered more negative emotions and were reminded of traumatic experiences related to H-KR had higher depression levels, whereas those exhibiting more optimism had lower depression levels.

Discussion

Traumatic events, whether natural (H-KR) or human-caused (9/11, campus shootings, etc.), often involve both volunteers and professionals who provide various forms of assistance to survivors and victims. The mental health of survivors has been the subject of research, particularly on ways in which traumatic events negatively impact victims.^{43-45,55} Studies, however, have seldom examined the racial differences for exposure to trauma and stressors, and the protective factors for disaster volunteers, particularly college students.^{1,6} This study analyzed predictors for depression in a sample of African American and Non-Hispanic White American college volunteers immediately following H-KR. In contrast to previous studies documenting the higher prevalence rates of major depressive disorders in Non-Hispanic White Americans,^{56,57} our results illustrate the opposite. Higher rates of depressive symptoms were reported in our African American volunteers, compared with our Non-Hispanic White American volunteers. Further, we found variation in risk factors and protective factors between our African American and Non-Hispanic White American volunteers. Our findings provide supporting evidence that there are indeed racial differences for depressive symptoms, meaning that levels of resilience after a traumatic event may differ between African American and Non-Hispanic White American college volunteers.

With respect to our first hypothesis, our results confirm that in the Non-Hispanic White American sample, there was a stronger positive association between trauma recollection and depressive symptoms. Those with more trauma recollection reported higher levels of depression. Additionally, there was a positive association between peritraumatic negative emotional responses and depressive symptoms, meaning that Non-Hispanic White Americans who experienced more negative emotional responses to the event had higher levels of depressive symptoms.

As for our second hypothesis, results provide support to indicate differential predictors for depressive symptoms in the African American sample. There was a stronger positive association between H-KR stressors and depressive symptoms in the African American sample, indicating that those students experiencing more H-KR-related stressors reported higher depression levels. Similar to the Non-Hispanic White American volunteers, African American volunteers with more peritraumatic negative emotional responses reported higher levels of depression. The inclusion of sociodemographic variables (age, gender, education and employment) were not significant predictors for depression among the

African American and Non-Hispanic White American samples. In Plummer et al.¹ results from the same data sample revealed that the majority of student volunteers experienced a number of stressors following H-KR, and nearly one quarter recalled previous trauma which was triggered by H-KR. Risk factors such as trauma recollection and H-KR stressors suggest a differential impact on African American and Non-Hispanic White American college volunteers, similar to PTSD.⁶

The model which included faith factors revealed unexpected findings. Our findings were inconsistent with previous research showing that faith factors buffer negative life events,^{44,55} particularly following traumatic incidences. Yet the body of research examining PTSD and distress on the aftermath of 9/11 indicated that hope, faith and spirituality lowered depression levels and anxiety.^{20,51,58} Faith factors only had an indirect influence on PTSD through optimism and hope.²¹ In fact, we expected faith factors to moderate depressive symptoms, but results for the African American sample show that degree of faith was not a significant predictor ($p = 0.09$) and neither was hope ($p = 0.07$). Only in the Non-Hispanic White American sample was optimism associated with depressive symptoms ($p = 0.000$). The negative association between optimism and depressive symptoms for Non-Hispanic White Americans can perhaps be linked to differences in faith factors and experiencing trauma, which may partially explain how higher levels of optimism among Non-Hispanic White Americans may mitigate depressive levels (more optimism, less depression). On the other hand, African Americans may be more vulnerable to additional stressors (less education, lower income, discrimination, violence/trauma, racism, etc.), given their experiences of historical trauma.^{12,59}

Our study findings add to previous work on the same sample data by examining the impact of a natural disaster on college student volunteers.^{1,6} Ai et al.⁶ highlighted racial differences predicting PTSD symptoms among African American and Non-Hispanic White American volunteers, with higher PTSD levels found among African Americans (consistent with existing studies). Similarly, in our findings, significant racial differences were revealed for depression rates, with African Americans reporting higher rates of depression (65.2%) compared with Non-Hispanic White Americans (34.8%). These differences were based on the standard depression scale cutoff score of 21.

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Other studies have shown African Americans and Latinos have the highest rates of depressive symptoms, and African Americans have higher levels of depressive symptoms compared with Non-Hispanic White Americans.^{60,61} Moreover, African Americans have lower odds for the use of depression therapies,⁶² and being African Americans and young predicted treatment attrition.⁶³ Given these lower odds and higher attrition in therapeutic use for African Americans, more attention is needed to address the mental health needs of minorities, especially related to disaster responses. Mental health professionals must not only recognize racial differences in depression, but also address the mental health needs of trauma volunteers. This requires designing interventions appropriate to meeting the needs of a diverse group of volunteers and service providers in post-disaster settings.

Some limitations of our study must be noted. First, using a convenience sample does not allow for generalizability. Second, this study sample included volunteers from the social work discipline, and a larger number of African American volunteers,¹ which again restricts generalizability. Additional limitations include the measurement reliability for the scales used by researchers.¹ Lastly, depressive symptoms were self-reported and not evaluated by psychiatric professionals for diagnostic accuracy, which calls for development of more reliable measures for future studies.⁶ Despite these limitations, our study findings have broad implications for future research, namely identifying the extent to which known protective factors can be strengthened to minimize depressive symptoms among disaster volunteers. In other words, the evidence points to the positive relationship between reliance on religious/spiritual coping and trauma survivors.⁴⁴ To develop resilience among trauma volunteers, researchers should consider applying a cross-cultural understanding⁴² of depressive symptoms among disaster volunteers to better understand the protective and risk factors specific to racial groups. Further, there is a need to identify other possible stressors that may put volunteers at higher risk for depressive symptoms, and the coping mechanisms utilized,⁵⁵ such as accessing social support, that may help buffer trauma-related stress.

Disclosure of Potential Conflicts of Interest

No potential conflicts of interest were disclosed.

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