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Psychological Well-Being in the Years after a Flood and During a Pandemic

by

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Psychological Well-Being in the Years after a Flood and during a Pandemic

Individuals who experience traumatic events, including natural disasters, may develop post-traumatic stress (PTS) symptoms. Louisiana residents who survived the Great Flood of 2016 experienced higher levels of post-traumatic stress (PTS) when they had increased flood stressors (Cherry, Calamia, Birch, & Moles, 2021). Pandemics, including the ongoing COVID-19 pandemic, can also be a source of trauma (Ferreira, 2020). Some research suggests that individuals who experience multiple traumatic events may develop resilience rather than increased PTS symptoms (Bonanno, 2004). The present study assessed survivors of the Great Flood of 2016, who are now living through the COVID-19 pandemic to examine relationships among prior flood stress, ongoing COVID-stress, and current wellbeing and health. Participants who completed an online survey in 2017-18 were recontacted at least three years later to assess current PTS symptoms. Findings show that survivors of the flood who experienced increased flood stress in 2017-18 have lower rates of wellbeing in 2022. Specifically, stress related to finances, timely Federal Emergency Management Association (FEMA) assistance, conflicts with loved ones, and cleaning homes were negatively correlated with wellbeing in 2022. The majority of participants had experienced other natural disasters and been impacted by the COVID-19 pandemic since 2016. Increased COVID stress was found to be negatively correlated with physical health, which in turn was negatively correlated with rates of PTS, anxiety, and depression. This study indicates that responses to natural disasters and pandemics need to address physical, financial, psychological, and relational needs, while also recognizing the challenges that repeated trauma survivors may face.

Background information on Trauma

Post-Traumatic Stress Disorder (PTSD) is characterized by an individual experiencing a traumatic event, and then having significant, impairing worry and fear as a result of this event (American Psychological Association [APA], 2021). People with PTSD can experience many symptoms, such as flashbacks or nightmares about the traumatic event, avoidance of stimuli that remind them of the event, difficulty sleeping, negative feelings about themselves or the world, and loss of interest in activities they once enjoyed. PTSD is prevalent among adults in the United States. In the last year, 3.6% had current symptoms of PTSD and the lifetime prevalence was 6.8% (National Institute of Mental Health [NIMH], 2017).

The trauma that leads to PTSD differs between individual cases. Trauma can include any event that is exceedingly stressful for the individual and is usually caused by the amount of stress being greater than what that person is able to cope with. Examples of traumatic events are natural disasters, time spent in war combat, sexual violence, and domestic abuse. Surviving the disaster is traumatizing in itself, but the negative impacts on home and social environments that come after a disaster can further exacerbate the issue and increase the severity of PTSD symptoms. These hardships can include losing homes and belongings, experiencing the death of a family member, and seeing their entire community destroyed. In 2016, when a flood devastated several areas of Louisiana, multiple flood stressors occurred as a result. These stressors, such as damages to homes and properties, were associated with more symptoms of post-traumatic stress disorder (Cherry et.al., 2021). Considering the ongoing effects of climate change, traumatic natural disasters will likely become more common over the coming decades. Additionally, pandemics, which can also be a source of trauma, will likely be on the rise (Ferreira, 2020). However,

traumatic events do not result in PTSD symptoms for every individual. Many other outcomes, such as resilience, are possible (Bonanno, 2004).

Trauma, PTSD, and Resilience

Although PTSD dominates most of the conversation surrounding responses to traumatic events, resilience has been shown to be a common experience after a trauma (Bonanno, 2004). Resilience has been defined as, “the maintenance or improvement in mental or physical health following challenges” (Cherry & Galea, 2015). When a person experiences resilience after trauma, they seem to have no drastic, negative effects on their mental health. Individuals who exhibit resilience differ from those who show recovery in that in order for recovery to occur, psychopathological symptoms must occur and then be improved. Those with resilience show stability after trauma (Bonanno, 2004).

Resilience resources. Although responses to trauma are unique to each individual, there are certain factors that can predict whether or not a person will exhibit resilience. Having a hardy personality, or a commitment to being able to grow through both positive and negative situations, is one predictor of resilience. Those with hardy personalities tend to have more confidence in themselves and are better able to use healthy coping techniques (Kobasa et. al., 1982 as cited in Bonanno, 2004). Self-enhancement is also linked to resilience, as those with higher rates of self-enhancement may have higher self-esteem (Paulhus, 1998). Repressive coping, which includes avoiding negative feelings and showing defensiveness, while not the most healthy coping method, can also lead to resilience. As people avoid confronting the trauma they have experienced, they may postpone any decline in their mental health (Weinberger et. al., 1979). Lastly, continuing to experience positive emotions and laughter can lead to resilience after

trauma (Bonanno et. al., 2003). These are just a few factors that have been shown to lead to resilience after trauma.

Threats to resilience. In the same way certain factors lead to a greater chance for resilience, other factors can be threats to resilience. Studies have shown that a lack of social support can put the individual at a higher risk for developing PTSD symptoms. Family history of mental illness can also be a threat to resilience (Brewin et. al., 2003 as cited in Bonanno, 2004). Additionally, lack of education and low income can be threats to resilience, as people of low socioeconomic status may not have access to proper resources after trauma. The details of the trauma experienced also have a great impact on how the person responds to it (Ozer et. al., 2003 as cited in Bonanno, 2004). Gender has also been shown to be a threat to resilience. The NIMH found that the prevalence of PTSD was higher for women, 5.2%, than for men, 1.8%, over the past year (2020). This indicates that men may show greater rates of resilience than women. Prior lifetime trauma has a unique role in predicting resilience. Some research has shown that childhood trauma does not put an adult at risk for higher levels of PTSD, but adulthood trauma does (Eriksson et. al., 2013).

Pandemic. In 2019, the first cases of the novel coronavirus appeared around the globe, and by the start of 2020, it was a full-fledged pandemic. In March 2020, the majority of the world went under strict quarantine. People were asked to stay home and avoid close contact with anyone who was not an immediate family member with no timeline of when things would return to normal. Even as some sense of normalcy has returned, drastic changes have been made to our way of life. In most areas, masks are required in public spaces. Many students are taking their classes online and the most tragic, nearly three million people have died from COVID-19 (Browning et. al., 2021). The pandemic has separated families and loved ones, and created a

heightened sense of anxiety surrounding in-person interactions. Coronavirus has been a source of collective trauma, and just like any other traumatic incident, different people have unique responses to it. Some may be experiencing symptoms of PTSD, while others may exhibit resilience and maintenance of their mental health thus far (Skalski et. al., 2021). This poses the question of how individual lives have changed due to the COVID-19 pandemic, and whether factors such as prior lifetime trauma and perceived social support impact individual responses to said changes.

Specific Aims

The purpose of this study was to examine associations among prior trauma and stress in relation to an individual's mental health in the years after the trauma of a flood and during a global pandemic. The present research has been designed to answer two core questions:

Research Question 1: How do different levels of flood stressors assessed in 2017-2018 relate to an individual's wellbeing in 2022? For the purpose of the present study, wellbeing will be operationally defined as symptoms of post-traumatic stress, so that those with higher wellbeing will have fewer PTS symptoms.

Research Question 2: How does prior flood stress and current pandemic stress relate to overall physical and mental health? Do prior flood stressors and ongoing covid stressors threaten wellbeing as reflected in symptoms of post-traumatic stress, and/or make people vulnerable to depression, anxiety, or worsened physical health?

Method

Participants. Table 1 presents a summary of the demographic features of the sample. There were 94 participants in this follow-up study, all of whom participated in an initial study in 2017-18. In all, 24 participants were male, 67 were female, and 2 preferred to self-describe their

gender. With respect to the racial composition of the sample, 80 participants were Caucasian or White, 11 were African American or Black, 1 was Asian, 1 was multiracial, and 1 was another race not listed in the survey. Only 1 participant was Hispanic/Latinx. Most of the participants (56) were residents of East Baton Rouge Parish, 20 were residents of Livingston Parish, 10 were residents of Ascension Parish, and 8 lived in another parish not listed on the survey. Only 6 participants had relocated to the Greater Baton Rouge Area following Hurricanes Katrina and/or Rita. Of these, 5 participants relocated directly to Baton Rouge and 1 initially relocated somewhere else and later came to Baton Rouge.

All participants were living in Louisiana during the Great Flood of 2016. As can be seen in Table 1, 60 participants experienced damage to their place of residence or personal property as a result of the flood. Water entered the home of 54 participants. Of those participants, the average height of the water in their home was 2.49 feet ($SD = 1.39$). With respect to prior severe weather events, 13 had experienced damage to their home due to another storm or hurricane, besides the 2016 flood. See Table 1 for more demographic information of the sample.

Table 2 presents the average PTS, anxiety, and depression levels for participants at Wave 1 (2017) testing and Wave 2 (2022) testing. The table also includes information on the mental health of the entire sample at Wave 1. The data is separated between those who did experience flooding in their home and those who did not. The data in Table 2 exemplifies that the participants of this study are representative of the full sample from Wave 1 in flood experience and mental health outcomes.

Procedure. From the spring of 2017 to late summer of 2018, Cherry and her associates conducted an online study to examine the impact of the 2016 flood (Cherry, et. al., 2021). They collected basic demographics, prior lifetime trauma, mental health history, flood stress, anxiety,

depression and PTSD levels for 506 participants exposed to the Great Flood of 2016. Permission to re-contact these persons was also collected at the time of the initial survey. In the present study, 273 of these individuals who consented to be re-contacted and provided email addresses were contacted again and asked to complete a follow-up online survey to assess their current physical health, anxiety, PTSD and depression symptoms. Importantly, we added a new module to the online survey to assess their COVID-19 exposure and experience, the Epidemic-Pandemic Impact Inventory (EPII) (Grasso et al., 2020). IRB approval was obtained for the inclusion of additional questions related to COVID-19 exposure. Utilizing data that Cherry and her colleagues collected before as a pre-pandemic baseline, we measured the impact of COVID-19 stressors on current physical and mental health based on self-reported physical health and anxiety, depression and PTS symptom counts collected in the present study. Composite COVID-19 stress was assessed using the sum of ratings for nine of the sixteen questions on the EPII. Seven questions that had a less than ten percent response rate were not utilized in data analysis. Additionally, only the stress ratings for events the participant directly experienced, not those experienced by someone in their household, were analyzed in this study. At the start of the online survey, participants were asked if they consent to have their name entered into a drawing to win one of five \$100 awards. The survey for this study was open from February 15th, 2022 to March 15th, 2022.

Results

The data collected in this survey was analyzed to answer the two research questions according to the following plan. To address the first research question concerning the relationship between prior flood stressors and PTSD symptoms at baseline versus current, we counted flood stressors by participants in 2017 and ran correlations between stress caused by

those flood stressors in 2017 and wellbeing reported in 2022. Table 3 presents a summary of flood stressors experienced by participants in the full and present sample whose homes flooded. In the present sample, 54 participants reported that they had experienced flooding in their home in 2016. Among those, 50 had to rebuild or repair their home as a result. Further, 52 suffered the loss of household contents, 48 lost sentimental possessions, 37 experienced damage to their automobiles. 2 lost pets and 27 lost gardens or crops. In addition, 35 were displaced from their home as a result of the flood, with 16 being displaced for 1 to 6 months, 10 being displaced for 6 months to 12 months, 8 being displaced for 1 to 2 years, and 1 still displaced at the time of the survey.

In 2017, all participants reported how stressful certain experiences caused by the flood were for them. Stress was rated on a Likert scale from 0 to 3 with 0 being “Did not experience,” 1 being “Not stressful,” 2 being “Moderately stressful,” and 3 being “Extremely stressful.” Participants rated 16 items, meaning they could have a maximum composite score of 48. The average composite score for all participants in the present study ($n=94$) was 18.60 ($SD=14.09$). Table 4 shows a summary of correlations between composite and individual flood stressors reported in 2017 and PTS symptoms reported in 2022. A Pearson’s correlation test showed a significant positive correlation between composite flood stress in 2017 and PTS symptoms in 2022, $r(87) = 0.21$, $p < .05$. A significant positive correlation was found between stress caused by “Difficulties with finances because of the flood” in 2017 and current PTS symptoms, $r(87) = 0.28$, $p < .01$. Significant positive correlations were also found between stress caused by “Conflicts or arguments with friends or family members related to the flood or its aftermath” and current PTS symptoms, $r(87) = 0.25$, $p < .05$. There was also significant positive correlations between stress relating to repairing one’s home after the 2016 flood and current PTS symptoms,

“Locating and making work arrangements with repair persons” was positively correlated with PTS, $r(87) = 0.22$, $p < .05$. “Problems with the quality of repairs to your home” was also positively correlation with PTS in 2022, $r(87) = 0.28$, $p < .01$. “Problems with the timeliness or repairs to your home” was positively correlated with PTS, $r(87) = 0.21$, $p < .05$.

The second research question concerned whether prior flood stress and current COVID stress makes an individual more vulnerable to mental or physical health issues. Table 5 presents a summary of participants’ hurricane exposures, lifetime trauma and COVID exposure since the 2016 flood. With regard to natural disasters, 61 participants had been exposed to another disaster and 38 experienced property damage due to Hurricane Ida, which hit Louisiana in August 2021. Participants were not only exposed to more natural disasters, 49 reported experiencing some additional lifetime trauma and other potentially traumatic event (PTE) since 2016. To provide more insight into prior lifetime trauma and potentially traumatic events, we counted the number of prior lifetime trauma or potentially traumatic events reported (range 0 – 3) and calculated an average. As can be seen in Table 5, the average was 1.68 events, indicating that most individuals in this study had experienced at least some prior trauma. .Regarding COVID experience, 61 participants reported having quarantined due to exposure to the disease and 44 also had someone in their home quarantined due to exposure. Additionally, 42 participants were quarantined due to symptoms of the disease and 34 had someone in their home quarantined due to symptoms. Of those who had to quarantine, 39 had to quarantine for a week or longer and 20 had someone in their home who had to do so. Some quarantined out of concern for their health, with 27 participants isolating due to preexisting health conditions and 17 living with someone who was isolating. Several participants had or know someone who had COVID, with 28 participants testing positive, but no longer having it and 18 living with someone who once tested positive.

Some of these cases were especially severe, 11 participants had to receive medical treatment due to severe COVID symptoms and 6 had someone in their home who needed said treatment.

Lastly, 19 experienced the death of a close family member or friend from COVID and 9 live with someone who lost a loved one to COVID.

Table 6 provides a summary of correlations between composite COVID stress in 2022, composite flood stress in 2017, mental health and physical health measures. Prior flood stress was shown to have a significant, positive correlation with PTS symptoms, $r(87) = 0.21$, $p < .05$ and anxiety levels, $r(87) = 0.21$, $p < .05$. Ongoing pandemic stress was not significantly correlated with PTS symptoms. However, ongoing COVID stress did have a significant negative correlation with participants' self-reported physical health, $r(87) = -0.26$, $p = .01$. Participants' physical health was shown to be significantly, negatively correlated with PTS symptoms, $r(87) = -0.38$, $p < .01$, depression symptoms, $r(87) = -0.41$, $p < .01$, and anxiety symptoms $r(87) = -0.30$, $p < .01$.

Discussion

Overall, the results of this study show that prior flood stress and ongoing COVID-19 stress can both be negatively related to mental and physical health. With pandemics and natural disasters expected to be increasing due to climate change (Ferreira, 2020), this study demonstrates the need for government and community organizations to be prepared to address a decline in physical and mental health of populations impacted by these disasters. Although the data used in this study is correlational, should it be causal, there are a few key concerns these organizations must prepare for.

The flood stressor counts, as shown in Table 3, demonstrate the range of loss that can occur after a natural disaster. For instance, 89% of the current sample reported losing sentimental

possessions in the flood. Disaster response teams should recognize the emotional toll of losing items, especially cherished possessions of sentimental value, can place on disaster survivors, in addition to the physical and financial toll of rebuilding. Psychological first-aid should be available to assist survivors who have lost sentimental possessions. Survivors will have to be taught how to cope with no longer having the comfort of these important items. Additionally, 65% of the current sample was displaced from their home following the flood. FEMA and other disaster-response organizations must be prepared to provide temporary housing to survivors of natural disasters. The physical needs of survivors have to be considered when preparing for a natural disaster.

The preparedness of response teams to address physical, financial, and emotional needs is especially important when considering the long-term relationship with wellbeing flood stressors were shown to have. Overall flood stress in 2017 was related to lower levels of wellbeing in 2022. Even after five years, individuals with increased stress after the flood show higher levels of PTS than their less-stressed peers. If disaster-response organizations are not adequately prepared to help survivors of disasters cope with the stress associated with rebuilding, survivors will be more vulnerable to long-lasting PTS. Specifically, disaster recovery organizations should be prepared to provide financial assistance to those recovering from a disaster, as difficulties with finances was positively correlated with higher rates of PTS, meaning those individuals had lower wellbeing in 2022. These organizations also need to be prepared to provide said assistance in a timely manner, as stress associated with the timing of FEMA assistance was shown to be related to lower levels of wellbeing. Information about local repairmen and what a survivor's rights and expectations are when receiving repairs following a disaster should be disseminated

by these organizations, as positive correlations were found between stress surrounding receiving quality repairs in a timely manner and symptoms of PTS four to five years later.

Another consideration of disaster-response organizations should be assisting survivors of disasters relationally when they are going through the rebuilding process, as conflicts with friends or family members related to the flood was related to lower rates of wellbeing in 2022. Healthy, positive relationships can be extremely helpful in coping with trauma, and damaging or losing these relationships through disaster-related conflicts could further limit an individual's ability to cope. Prior research confirms that lack of social support can threaten resilience (Bonanno, 2004), while the presence of perceived social support predicts wellbeing even five years post disaster (Cherry et al., 2015). Disaster-response organizations should consider offering marriage and family counseling to disaster survivors in addition to psychological first-aid.

When planning responses to pandemics and natural disasters, it's important to consider that individuals impacted by these events will likely also have trauma from other experiences. As shown in Table 5, 61 participants in this study had experienced another natural disaster since the 2016 flood, and 38 of them had property damage to Hurricane Ida, which hit Louisiana in August 2021. Additionally, the majority of participants had life changes occur due to the COVID-19 pandemic, with many having to quarantine, isolate, or experience the loss of a loved one. As COVID stress did not have a significant relationship with current PTS, anxiety, or depression levels, participants may have been experiencing resilience as a result of their previous trauma. Although the development of resilience is possible, disaster-response teams must be prepared to address the impact living through multiple traumatic events has on survivors of disasters and pandemics. It's also important to remember that flood survivors did experience a negative correlation between physical health and COVID stress, and physical health is included in the

definition of resilience (Cherry & Galea, 2015). As pandemics and disasters increase, the negative psychological and health effects cannot be ignored. Policy makers and responders must recognize the collective trauma experienced by communities repeatedly impacted by disasters.

Considering that prior flood stress was positively correlated with increased levels of PTS, not adequately addressing the psychological effects of natural disasters can make survivors vulnerable to increased damage to their mental health if/when pandemics or epidemics occur in their communities. Additionally, pandemic stress was shown to be negatively correlated with physical health, and physical health was shown to be negatively correlated with levels of PTS, depression, and anxiety. Therefore, health organizations, such as the Center for Disease Control (CDC) and World Health Organization (WHO) should be prepared to instruct individuals on how to maintain physical health during a pandemic. These organizations should also provide guidance on how to cope with the stress of living through a pandemic. Adequately addressing the stress of both natural disasters and pandemics could lead to increased physical health of survivors, which is related to increased mental health.

Future research should address not only whether disaster and pandemic stress are related to physical and mental health, but which of these stressors negatively impacts health. Additionally, researchers should assess if stress and mental health outcomes differ between different kinds of natural disasters (i.e., hurricanes, earthquakes, tsunamis, blizzards, wildfires, etc.) and between pandemics versus epidemics. Future research also needs to focus on several states and countries, especially considering that the COVID-19 pandemic has impacted individuals across the globe. Some methodological limitations of the present research also deserve brief mention. The present study only utilizes a small sample of flood survivors in Louisiana. A larger and more heterogeneous sample could have provided more significant

findings. Additionally, this study occurred two years into the COVID-19 pandemic. Testing COVID-stress, mental health, and physical health earlier in the pandemic could have provided information on how the individual's prior disaster experience impacted their initial response to the pandemic. Additionally, the EPII, which was used to assess COVID-19 stress, is a fairly new measure that was only developed during this pandemic. In this study, we discarded items that were completed by less than 10% of the sample, but future researchers may choose another way to score this measure. This study makes it clear that increased stress from disasters and pandemics can be related to lower mental and physical health, and demonstrates the need for an increased capacity to address the physical, mental, and relational needs of survivors of these events.

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Table 1

Flood Status and Sociodemographic Characteristics of the Sample at Wave 2 follow-up

	<i>n (%)</i>	<i>M (SD) and Range</i>
Current place of residence		
East Baton Rouge	56 (60%)	
Livingston	20 (21%)	
Ascension	10 (11%)	
Other	8 (9%)	
Did the flood damage the place you were living or any other personal property of yours?		
No	34 (36%)	
Yes	60 (64%)	
Did water enter your home in 2016?		
No	40 (43%)	
Yes	54 (57%)	
If yes, how deep was the water in your home (in feet)?		2.49 (1.39) 0 to 5
Other than the 2016 flood, have you ever had flood damage to your home in a storm or hurricane?		

No	81 (86%)
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Yes	13 (14%)
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Did you permanently relocate to the Baton Rouge area because of damage from the 2005
Hurricanes, Katrina and Rita?

No	63 (67%)
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Yes	6 (6%)
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Did not answer	25 (27%)
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Which of the following describes your relocation experience after Hurricanes Katrina or Rita?

I relocated directly to the greater Baton Rouge area	5 (5%)
------------------------------------------------------	--------

I first relocated to somewhere outside of the greater Baton Rouge area	1 (1%)
---------------------------------------------------------------------------	--------

Gender

Male	24 (26%)
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Female	67 (71%)
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Prefer to self-describe	2 (2%)
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Race

African American or black	11 (12%)
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Asian	1 (1%)
Caucasian or white	80 (85%)
Biracial or multiracial	1 (1%)
Other	1 (1%)
Ethnicity	
Hispanic	1 (1%)
Non-Hispanic	93 (99%)

Notes. Numbers vary slightly across variables due to missing data and percentages do not always add up to 100% due to rounding.

Table 2

Mental Health Outcomes

Flooded in 2016? (Q19)	M(SD)	
	No <i>n</i> = 39	Yes <i>n</i> = 55
Post-traumatic stress symptoms (PCL-5)		
Wave 1 (full sample; N=508)	12.97 (15.39)	22.54 (19.09)
Wave 1 (current sample; N=94)	12.88 (11.66)	19.99 (17.91)
Wave 2 (follow-up; N=94)	13.63 (13.43)	16.02 (13.87)
Depression symptoms (PHQ-9)		
Wave 1 (full sample; N=508)	4.61 (5.95)	6.52 (6.41)
Wave 1 (current sample; N=94)	4.46 (4.62)	6.11 (5.89)
Wave 2 (follow-up; N=94)	4.86 (4.48)	5.28 (5.00)
Anxiety symptoms (GAD -7)		
Wave 1 (full sample; N=508)	4.79 (5.80)	6.37 (6.25)
Wave 1 (current sample; N=94)	4.79 (4.98)	5.61 (5.94)
Wave 2 (follow-up; N=94)	4.49 (4.48)	5.39 (5.66)

Notes. Sample sizes differ slightly due to missing data (i.e., PCL-5: flooded n = 54, non-flooded = 35; PHQ-9: flooded n = 54, non-flooded n= 35; GAD-7: flooded n = 54; non-flooded n = 35).

Table 3

Flood Stressors for Those Participants whose Homes Flooded in 2016

	Wave 1 (Full sample N = 224)		Wave 2 (Follow-up N=54)	
	Frequency	%	Frequency	%
Did you have to repair / rebuild your home as a result of the flood?				
No	24	(11%)	4	(7%)
Yes	199	(89%)	50	(93%)
Did you suffer the loss of:				
Household contents				
No	6	(3%)	2	(4%)
Yes	213	(97%)	52	(96%)

Sentimental possessions

No	31	(14%)	5	(9%)
Yes	187	(86%)	48	(89%)

Automobiles, trucks

No	80	(38%)	16	(30%)
Yes	132	(62%)	37	(69%)

Pets

No	190	(96%)	50	(93%)
Yes	8	(4%)	2	(4%)

Crops, trees, garden

No	99	(46.5%)	25	(46%)
Yes	114	(53.5%)	27	(50%)

Were you or are you still displaced from your home as a result of the flood?

No	87	(39%)	19	(35%)
Yes	137	(61%)	35	(65%)

How long were you displaced from your home?

Less than 1 month	8	(6%)	0	(0%)
1 to 6 months	42	(31%)	16	(30%)
6 to 12 months	45	(33%)	10	(19%)
1 to 2 years	20	(15%)	8	(15%)
Still displaced	22	(16%)	1	(2%)

Notes. Entries reflect responses for participants who flooded only (Wave 1 = 224 and Wave 2 = 54). Numbers vary slightly across variables due to missing data and percentages do not always add up to 100% due to rounding.

Table 4

Correlation Coefficients between Flood Stressors and PCL-5 Composite Scores

	PCL 5 Composite Score
Flood Stress Composite	0.21*
Moving out of your home	0.16
Housing people after the flood who did not live with you prior to the flood	0.04
Cleaning your flood-damaged home and throwing away possessions	0.08
Filing an insurance claim	0.11
Receiving timely payment(s) from an insurance carrier	0.05
Receiving less money than expected from an insurance claim	0.11

Filing for assistance from FEMA	0.07
Receiving timely assistance from FEMA	0.09
Receiving less financial or other assistance than expected from FEMA	0.09
Obtaining permits to rebuild or repair your home	0.18
Locating and making work arrangements with repair persons	0.22*
Problems with the quality of repairs to your home	0.28**
Problems with the timeliness of repairs to your home	0.20*
Difficulties with finances because of the flood	0.28**
Having to make new purchases for items	0.16

lost in the flood

Conflicts or arguments with friends or

family members related to the flood or its

aftermath

0.25*

Notes. N = 89 (Number varies due to participants who did not complete mental health questionnaires).

PCL-5 = Post-traumatic Stress symptoms; PHQ-9 = depression symptoms; GAD -7 = Anxiety symptoms

* $p < 0.05$ ** $p < 0.01$

Table 5

Prior Natural Disaster Exposures, Lifetime Trauma / Potentially Traumatic Events since 2016, and Covid-19 Exposure at Wave 2 follow-up

	<i>n (%)</i>	<i>M (SD)</i>
Prior natural disaster exposures		
Hurricanes, other floods, earthquakes, tornados	61 (64.9%)	
Hurricane Ida property damage	38 (40.4%)	
Other potentially traumatic event since 2016 flood	49 (52.1%)	
Prior lifetime trauma / potentially traumatic events		1.68 (.94)
Isolated or quarantined due to possible exposure to Covid-19		
No	19 (20.2%)	
Yes (me)	61 (64.9%)	
Yes (person in home)	44 (46.8%)	
Isolated or quarantined due to symptoms of Covid-19		
No	35 (37.2%)	
Yes (me)	42 (44.7%)	
Yes (person in home)	34 (36.2%)	

Isolated due to existing health conditions

No	46 (48.9%)
Yes (me)	27 (28.7%)
Yes (person in home)	17 (18.1%)

Close family member not in the home was quarantined

No	30 (31.9%)
Yes (me)	35 (37.2%)
Yes (person in home)	29 (30.9%)

Entire household was quarantined for a week or longer?

No	38 (40.4%)
Yes (me)	39 (41.5%)
Yes (person in home)	20 (21.3%)

Tested positive for this disease but no longer have it

No	49 (52.1%)
Yes (me)	28 (29.8%)
Yes (person in home)	18 (19.1%)

Got medical treatment due to severe symptoms of this disease

No	69 (73.4%)
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Yes (me)	11 (11.7%)
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Yes (person in home)	6 (6.4%)
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Death of close friend or family member from this disease

No	57 (60.6%)
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Yes (me)	19 (20.2%)
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Yes (person in home)	9 (9.6%)
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Covid-19 stressor composite	3.24 (2.38)
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Notes. Numbers vary slightly across variables due to missing data and percentages do not always add up to 100% due to rounding.

Table 6

Means, Standard Deviations, and Correlation Coefficients for Health Measures, Flood and Covid Stressors

	<i>M (SD)</i>	1	2	3	4	5	6	7
Age (1)	53.7 (15.4)	--						
PCL-5 (2)	15.1 (13.7)	-.08	--					
PHQ-9 (3)	5.11 (4.8)	-.33**	.70**	--				
GAD-7 (4)	5.0 (5.2)	-.30**	.68**	.82**	--			
Health today (5)	73.4 (18.8)	.07	-.38**	-.41**	-.30**	--		
Flood stressors at Wave 1 (6)	34.7 (14.2)	.05	.21*	.14	.21*	-.18	--	
Covid stressors at Wave 2 (7)	3.2 (2.4)	-.10	.08	.14	.11	-.26**	.10	--

Notes. PCL-5= Post-traumatic stress symptoms; PHQ-9 = depression symptoms; GAD -7 = Anxiety symptoms

* $p < 0.05$ ** $p < 0.01$

