

# The Mental Health Effects of Natural Hazards



## Introduction

Each year, over 200 million people are impacted by disasters.<sup>1</sup> Those exposed to disasters may be at risk of physical, mental, and behavioral health impacts. Disasters have been linked to an increased burden of mental and behavioral disorders in affected communities. Research suggests that anywhere from one third to one half of those exposed to disasters could develop mental distress such as post-traumatic stress disorder (PTSD), depression, or anxiety disorders.<sup>2-4</sup> Estimates show that 5-10% of all survivors will need significant clinical care.<sup>3</sup> While most survivors recover from mental and behavioral health impacts within the weeks following the disaster, some may have symptoms months and even years after the disaster.<sup>2,3</sup> This factsheet provides an overview of disaster-related mental health impacts from the current literature.

## Culture Context

Much of the research on the mental and behavioral health impacts of disasters uses Western frameworks, diagnostic tools, and interpretations. The literature thus may misrepresent the morbidity, sequelae, and healing/coping mechanisms related to mental distress in non-Western contexts.

- Mental disorders like PTSD and depression may manifest differently across cultures. Not accounting for cultural differences might lead to flawed or unproductive research and treatment processes.<sup>3,5</sup>
- Diagnostic tools may not be culturally sensitive, leading to potential misinterpretation or under-estimation of mental distress.<sup>3</sup>
- Stigma can cause people to hide their illness and potentially seek treatment outside of “professional” healthcare settings, such as religious or traditional healers.<sup>6</sup>



# Mental Health Impacts of Disasters

The most well-documented manifestations of mental distress post-disaster are stress-related diagnoses, such as PTSD, depression, and generalized anxiety.<sup>7</sup> However, the prevalence of depression and anxiety tends to drop in the months after a disaster.<sup>7</sup> Still, at least in the short term, disaster-exposed populations have shown higher rates of PTSD, anxiety, and depression than those who were not exposed.<sup>7-10</sup> Other documented impacts include perceived stress, psychological distress, death anxiety, panic disorder, phobias, prolonged grief disorder, and remorse, as well as associated sleep disorders.<sup>2</sup>

Evidence is mixed around post-disaster suicidal ideation. While some studies have found declines in suicidal ideation post-disaster, others have reported that rates drop shortly after a disaster and then increase above the norm several months later.<sup>1,11,12</sup> Rates tend to be higher for those who have experienced or are currently experiencing a mental disorder.<sup>1</sup>

Mental and behavioral health impacts rarely occur in isolation from each other; for example, individuals with disaster-related PTSD also often experience depression, anxiety and/or substance abuse disorders.<sup>2</sup> Mental health comorbidities are common both in the general and disaster-exposed population, and having an additional disorder can increase the risk of developing a chronic disorder.<sup>2</sup>

Disasters can also reduce self-reported happiness and life satisfaction.<sup>13</sup> Disasters that harm the natural environment (such as wildfires) may cause ecological grief, eco-anxiety, or solastalgia.<sup>14,15</sup> These “ecosystem distress syndromes” are an emerging category in the literature and suggest that disasters can have varied mental health impacts related to one’s attachment to place.<sup>14,15</sup>

Major individual risk factors for mental health disorders include family or personal history of mental health disorder,<sup>7,16</sup> previous trauma,<sup>7,10</sup> exposure to high temperatures of ambient heat,<sup>17-19</sup> low social support,<sup>7,20</sup> or being female.<sup>7,20</sup> Certain characteristics of the disaster and the response and recovery process can also increase the prevalence of mental health impacts; these include the extent of personal damages (such as the amount of property lost), how long it takes to return to perceived normalcy, and the level of perceived ineffectiveness of help post-disaster.<sup>5</sup>

Repeated exposures to major disasters increase the risk of developing adverse mental health outcomes.<sup>21-24</sup> Even exposure to less severe disasters (such as moderate flooding) is a risk factor.<sup>24,25</sup> Experiencing one kind of disaster makes one more likely to experience mental health impacts from disasters of any kind.<sup>25</sup>

# Infrastructure/ Health Care Impacts

In the wake of a disaster, survivors may experience additional lifestyle changes that have important implications for their future wellbeing and mental and emotional health. For example, exposure to multiple kinds of abuse is also more likely after a disaster.<sup>28</sup> Sexual violence and abuse increase in prevalence post-disaster, particularly for women under 18. Those who have lower socioeconomic status or are experiencing food or shelter insecurity are more likely to suffer abuse.<sup>28</sup> These childhood traumas may also reduce one's psychological resilience to disasters across a lifetime, increasing the risk of re-victimization later in life.<sup>10</sup>

Intimate partner violence (IPV) occurrence and severity may increase post-disaster, both in the short and long term. Losses in safe housing, social support systems, and community networks can worsen pre-existing abuse.<sup>28</sup> IPV victimization itself is associated with heightened risks of depression and PTSD both pre- and post-disaster.

Damages to property and infrastructure can impact the likelihood of developing mental distress and its severity. For at least one year post-disaster, displacement has been shown to increase rates of depression, anxiety, and PTSD.<sup>30-32</sup> After the Great East Japan Earthquake, those who had more significant property loss experienced more severe symptoms for longer.<sup>30-32</sup> In addition to level of property loss, the impact of displacement on psychological vulnerability is also dictated by distance displaced; type of temporary housing (such as a shelter or apartment) and the time spent in it; the number of moves after the event; disruption of mental and behavioral health care (such as an inability to access medications); loss of family or friends; and social network disruption.<sup>32-34</sup> Following the Great East Japan Earthquake, property damage and the loss of mental and behavioral health care access were shown to be particularly impactful; in contrast, people who experience loss of friends or family members tend to recover more quickly.<sup>32</sup>





## Responders

Responders and recovery workers may also be at risk of mental distress due to their contact with survivors and work in the affected area. Some disaster workers may be victims themselves or have close personal connections with victims. Identifying victims as friends, working on traumatic events, and a lack of social support can contribute to mental and behavioral health impacts.<sup>35,36</sup> Reported rates of these impacts tend to be higher among volunteers than professional workers.<sup>36</sup> Still, professional workers are impacted as well. Medical responders, particularly nurses, experience increased rates of depression and PTSD post-disaster, in part due to a lack of institutional preparedness that can result in inadequate or inappropriate forms of communication, social support, and training.<sup>37</sup>

# References

11. Kölves K, Kölves KE, De Leo D. Natural disasters and suicidal behaviours: a systematic literature review. *J Affect Disord.* 2013;146(1):1-14. doi:10.1016/j.jad.2012.07.037
12. Goldmann E, Galea S. Mental health consequences of disasters. *Annu Rev Public Health.* 2014;35:169-183. doi:10.1146/annurev-publhealth-032013-182435
13. Ghodse H, Galea S. Tsunami: understanding mental health consequences and the unprecedented response. *Int Rev Psychiatry.* 2006;18(3):289-297. doi:10.1080/09540260600709149
14. Rezaeian M. The association between natural disasters and violence: A systematic review of the literature and a call for more epidemiological studies. *J Res Med Sci.* 2013;18(12):1103-1107. <https://www.ncbi.nlm.nih.gov/pubmed/24523804>
15. Jogia J, Kulatunga U, Yates GP, Wedawatta G. Culture and the psychological impacts of natural disasters: Implications for disaster management and disaster mental health. *Built and human environment review.* 2014;7(1):1. <http://dx.doi.org/>
16. Marthoenis M, Yessi S, Aichberger MC, Schouler-Ocak M. Mental health in Aceh--Indonesia: A decade after the devastating tsunami 2004. *Asian J Psychiatr.* 2016;19:59-65. doi:10.1016/j.ajp.2016.01.002
17. Cénat JM, McIntee SE, Blais-Rochette C. Symptoms of posttraumatic stress disorder, depression, anxiety and other mental health problems following the 2010 earthquake in Haiti: A systematic review and meta-analysis. *J Affect Disord.* 2020;273:55-85. doi:10.1016/j.jad.2020.04.046
18. Fergusson DM, Horwood LJ, Boden JM, Mulder RT. Impact of a major disaster on the mental health of a well-studied cohort. *JAMA Psychiatry.* 2014;71(9):1025-1031. doi:10.1001/jamapsychiatry.2014.652
19. Vins H, Bell J, Saha S, Hess JJ. The Mental Health Outcomes of Drought: A Systematic Review and Causal Process Diagram. *Int J Environ Res Public Health.* 2015;12(10):13251-13275. doi:10.3390/ijerph121013251
20. Silveira S, Kornbluh M, Withers MC, Grennan G, Ramanathan V, Mishra J. Chronic Mental Health Sequelae of Climate Change Extremes: A Case Study of the Deadliest Californian Wildfire. *Int J Environ Res Public Health.* 2021;18(4). doi:10.3390/ijerph18041487
21. North CS. Disaster Mental Health Epidemiology: Methodological Review and Interpretation of Research Findings. *Psychiatry.* 2016;79(2):130-146. doi:10.1080/00332747.2016.1155926
22. Traumatic stress and suicide after disasters. Published February 2, 2023. Accessed April 26, 2023. <https://www.samhsa.gov/resource/dbhis/traumatic-stress-suicide-after-disasters>
23. Zhang R, Zhang Y, Dai Z. Impact of Natural Disasters on Mental Health: A Cross-Sectional Study Based on the 2014 China Family Panel Survey. *Int J Environ Res Public Health.* 2022;19(5). doi:10.3390/ijerph19052511
24. Albrecht G, Sartore GM, Connor L, et al. Solastalgia: the distress caused by environmental change. *Australas Psychiatry.* 2007;15 Suppl 1:S95-S98. doi:10.1080/10398560701701288
25. To P, Eboeime E, Agyapong VIO. The Impact of Wildfires on Mental Health: A Scoping Review. *Behav Sci.* 2021;11(9). doi:10.3390/bs11090126
26. North CS, Pfefferbaum B. Mental health response to community disasters: a systematic review. *JAMA.* 2013;310(5):507-518. doi:10.1001/jama.2013.107799
27. Hansen A, Bi P, Nitschke M, Ryan P, Pisaniello D, Tucker G. The effect of heat waves on mental health in a temperate Australian city. *Environ Health Perspect.* 2008;116(10):1369-1375. doi:10.1289/ehp.11339
28. Liu J, Varghese BM, Hansen A, et al. Is there an association between hot weather and poor mental health outcomes? A systematic review and meta-analysis. *Environ Int.* 2021;153:106533. doi:10.1016/j.envint.2021.106533
29. Nori-Sarma A, Sun S, Sun Y, et al. Association Between Ambient Heat and Risk of Emergency Department Visits for Mental Health Among US Adults, 2010 to 2019. *JAMA Psychiatry.* 2022;79(4):341-349. doi:10.1001/jamapsychiatry.2021.4369
30. Yokoyama Y, Otsuka K, Kawakami N, et al. Mental health and related factors after the Great East Japan earthquake and tsunami. *PLoS One.* 2014;9(7):e102497. doi:10.1371/journal.pone.0102497
31. Sansom GT, Thompson C, Sansom L, Fawkes L, Boerlin E. Compounding impacts of hazard exposures on mental health in Houston, TX. *Nat Hazards.* 2022;111(4):1-10. doi:10.1007/s11069-021-05158-x
32. Lowe SR, McGrath JA, Young MN, et al. Cumulative Disaster Exposure and Mental and Physical Health Symptoms Among a Large Sample of Gulf Coast Residents. *J Trauma Stress.* 2019;32(2):196-205. doi:10.1002/jts.22392
33. Meltzer GY, Zacher M, Merdjanoff A, Do MP, Pham NK, Abramson D. The Effects of Cumulative Natural Disaster on Adolescent Psychological Distress. *J Appl Res Child.* 2021;12(1):6. <https://eric.ed.gov/?id=EJ1310576>
34. Leppold C, Gibbs L, Block K, Reifels L, Quinn P. Public health implications of multiple disaster exposures. *Lancet Public Health.* 2022;7(3):e274-e286. doi:10.1016/S2468-2667(21)00255-3
35. Lowe SR, Bonumwezi JL, Valdespino-Hayden Z, Galea S. Posttraumatic Stress and Depression in the Aftermath of Environmental Disasters: A Review of Quantitative Studies Published in 2018. *Curr Environ Health Rep.* 2019;6(4):344-360. doi:10.1007/s40572-019-00245-5
36. Seddighi H, Salmani I, Javadi MH, Seddighi S. Child Abuse in Natural Disasters and Conflicts: A Systematic Review. *Trauma Violence Abuse.* 2021;22(1):176-185. doi:10.1177/1524838019835973
37. Rao S. A natural disaster and intimate partner violence: Evidence over time. *Soc Sci Med.* 2020;247:112804. doi:10.1016/j.socscimed.2020.112804
38. Gearhart S, Perez-Patron M, Hammond TA, Goldberg DW, Klein A, Horney JA. The Impact of Natural Disasters on Domestic Violence: An Analysis of Reports of Simple Assault in Florida (1999-2007). *Violence and Gender.* 2018;5(2):87-92. doi:10.1089/vio.2017.0077
39. Schumacher JA, Coffey SF, Norris FH, Tracy M, Clements K, Galea S. Intimate partner violence and Hurricane Katrina: predictors and associated mental health outcomes. *Violence Vict.* 2010;25(5):588-603. doi:10.1891/0886-6708.25.5.588
40. Schwartz RM, Liu B, Lieberman-Cribbin W, Taioli E. Displacement and mental health after natural disasters. *Lancet Planet Health.* 2017;1(8):e314. doi:10.1016/S2542-5196(17)30138-9
41. Munro A, Kovats RS, Rubin GJ, et al. Effect of evacuation and displacement on the association between flooding and mental health outcomes: a cross-sectional analysis of UK survey data. *Lancet Planet Health.* 2017;1(4):e134-e141. doi:10.1016/S2542-5196(17)30047-5
42. Tsuboya T, Aida J, Hikichi H, et al. Predictors of depressive symptoms following the Great East Japan earthquake: A prospective study. *Soc Sci Med.* 2016;161:47-54. doi:10.1016/j.socscimed.2016.05.026
43. Jang S, Ekyalongo Y, Kim H. Systematic Review of Displacement and Health Impact From Natural Disasters in Southeast Asia. *Disaster Med Public Health Prep.* 2021;15(1):105-114. doi:10.1017/dmp.2019.125
44. Fussell E, Lowe SR. The impact of housing displacement on the mental health of low-income parents after Hurricane Katrina. *Soc Sci Med.* 2014;113:137-144. doi:10.1016/j.socscimed.2014.05.025
45. Harada N, Shigemura J, Tanichi M, Kawaida K, Takahashi S, Yasukata F. Mental health and psychological impacts from the 2011 Great East Japan Earthquake Disaster: a systematic literature review. *Disaster Mil Med.* 2015;1:17. doi:10.1186/s40696-015-0008-x
46. Thormar SB, Gersons BPR, Juen B, Marschang A, Djakababa MN, Olf M. The mental health impact of volunteering in a disaster setting: a review. *J Nerv Ment Dis.* 2010;198(8):529-538. doi:10.1097/NMD.0b013e3181ea1fa9
47. Naushad VA, Bierens JJ, Nishan KP, et al. A Systematic Review of the Impact of Disaster on the Mental Health of Medical Responders. *Prehosp Disaster Med.* 2019;34(6):632-643. doi:10.1017/S1049023X19004874

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*Content by Matias Kormacher and Ashley Moore  
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