5.1 Disaster mental health research

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5.1.1   Learning objectives

To understand the importance of the following for mental health research relevant to health emergency and disaster risk management (Health EDRM):

1. Mental health consequences of disasters;
2. Research methods appropriate for assessing mental health;
3. The importance of partnerships to support mental health research in disaster settings;
4. The role of culture in defining the experience and expression of distress.

5.1.2   Introduction

The accelerating risk of complex emergencies arising from climate change and human conflict will have major implications for mental health, making this an important aspect of Health EDRM. Exposure to trauma during disasters and conflict, together with the cascading effects of bereavement, forced displacement, injury and resource loss has the potential to cause long-term psychological distress *(1–3)*. Urbanization often compounds disaster risk, particularly in low-resource areas, where population density presents significant threats to health, social capital and community resilience in humanitarian emergencies *(4–5)*.

Despite high levels of need, mental health is a relatively neglected area in Health EDRM, with little focus on services funding, human resources or research in the field *(6–7)*. Consequently, there is tremendous opportunity to improve disaster mental health risk reduction through rigorous research and informed policy. This chapter presents an overview of methods applied in recent research and important considerations for developing rigorous protocols in mental health assessment.

5.1.3   Psychological responses to trauma

In the face of crisis, people naturally react with fear, horror, sadness and grief *(8)*. For most people, this early trauma response resolves over time *(9–10)*; and the provision of psychosocial and community support during the early stages of recovery will likely reduce the incidence of more severe psychological issues *(11–13)*. However, in a sizeable minority of cases, psychological distress remains high for months and even years *(1, 14)*. In fact, it is typical for PTSD and other forms of psychological distress to develop some time after the acute crisis. Despite the definition of mental health as a second-wave issue in disasters, its later timing does not lessen the severity of need *(15)*. However, the secondary surge in demand for health care and other forms of psychosocial support often occurs when attention has shifted away from the disaster, and funding for health services has already been channelled into the treatment of injuries, infectious diseases and pre-existing chronic conditions. Addressing mental health in the aftermath of disasters therefore requires careful long-term planning and substantial knowledge of the pattern of response across affected populations. These issues are similarly important for research design: early assessment will illustrate elevated patterns of distress across the population, which is likely to diminish over time for the vast majority. Thus, targeted and well-timed research is required to reliably demonstrate the mental health impacts of disasters.

Exposure to trauma has potential to induce a range of psychological and neuropsychiatric disorders. The rates of psychological disorders following disasters vary widely *(16)*, but consistent evidence indicates that up to one third of survivors develop PTSD, and one quarter report depression *(11)*. Substance use disorders are less likely to be caused by trauma, but may be exacerbated *(17)*. Less attention has been paid to the rates of anger disorders, suicide, psychosis, and traumatic brain injury following disasters *(18–20)*. Key risk factors for the cause or maintenance of psychological distress among survivors include severity of trauma exposure, female gender, pre-existing psychological conditions and the presence of ongoing chronic stressors in the post-disaster environment *(11, 18)*. Trauma related to interpersonal violence and conflict leads to poorer mental health outcomes than natural or technological disasters *(16)*. Research in this field has largely focused on the effects of exposure to earthquakes *(21)*, bushfires *(1)*, windstorms *(22)*, floods *(23)*, terrorism *(24)*, and war *(25)*. As climate change shapes the patterns of disaster risk and conflict globally, a greater focus on the consequences of extreme temperatures, water insecurity, trade disputes, civil unrest, and the compounding and interacting effects of pre-existing vulnerabilities will be needed.

5.1.4   Assessing mental health in disaster-affected areas

Research methodologies relevant to the assessment of mental health after disasters have expanded to include increasingly innovative techniques. These approaches can be applied to examine the full spectrum of psychological response, including examinations of resilience, subclinical mental health issues, acute reactions and long-term psychological distress and dysfunction. Research methods are discussed in greater detail in Section 4, but the following examples highlight ways in which quantitative and qualitative methods can be applied to the investigation of mental health issues.

5.1.5   Quantitative research

Quantitative research designs seek to answer questions related to the prevalence of mental health problems, their correlates, symptom course, and effects of intervention. The vast majority of disaster mental health studies have used cross-sectional survey designs, employed to report the rate of mental health issues evident in affected populations; however, a growing number of longitudinal and cohort studies have shed light on the trajectory of psychological response to disasters and the risk and protective factors associated with outcomes (Chapter 4.4) *(13, 26-27)*. For example, the English National Study of Flooding and Health, the Queensland Flood Study in Australia, and Project Ice Storm in Canada, have established important findings on the long-term consequences of disaster exposure across the lifespan, including the longitudinal effects of prenatal disaster stress *(28-30)*. Cohort studies are less common in conflict and post-conflict settings, although the Longitudinal Study of War-Affected Youth has illustrated the specific risk and protective factors associated with mental health trajectories for youth in Sierra Leone *(9)*. More recently, a range of innovative analytic techniques has emerged in the field. For example, various statistical methods have been employed in disaster mental health research (see also Chapters 4.2 and 4.4), including the use of time series data analysis to assess psychiatric hospital admissions associated with hot temperatures *(31-32)*, multilevel longitudinal analysis to determine the mental health effects of group involvement following bushfires *(26)*, latent class analyses to assess the psychological factors associated with urban evacuation preparedness *(33)*, and geospatial patterning of vulnerabilities after hurricanes *(34)*.

5.1.6   Disaster mental health services research

Understanding the likely and locally presenting mental health impacts of disasters is crucial to the design of strategies to reduce mental health risks and inform the delivery of effective support measures and services that optimally facilitate recovery *(35)*. As our scientific knowledge base regarding the mental health consequences of disasters consolidates, disaster mental health service research can play a vital role in furthering its effective translation into quality disaster mental health response and support services *(36–37)*. In this context, disaster mental health service research has been instrumental in monitoring ongoing mental health care needs, service demand and equitable service access of disaster-affected

populations *(38)*, whilst capturing important intervention outcomes *(39-40)* and key lessons to enhance the quality and organization of future disaster responses *(41)*. Evidence-based elements for effective disaster mental health response include: the effective coordination of multiple disaster response agencies and support services across varying sectors and jurisdictions *(42)*; the integration of enhanced disaster mental health services within existing support structures, such as primary care *(43)*; facilitation of ready access to care *(44-45)* and creation of pathways between different levels of care *(46)*; targeted capacity building for disaster responders in evidence-informed and scalable interventions *(47)*; as well as timely and transparent communication among all involved stakeholders and the wider community. Importantly, data from additional sectors, including schools (48-49), non-profit organizations *(50)*, and community groups *(51-52)* will augment services data to highlight the short- and long-term community needs and treatment outcomes. However, not all sectors or settings will have capacity for data collection and record keeping, particularly in the context of extensive damage to infrastructure and loss of human resources (Chapter 2.4). In such cases, it may be more appropriate to implement alternative techniques of inquiry, such as mixed methods research (Chapter 4.13).

The integration of health service research and evaluation into disaster preparedness and response is essential to develop the evidence base for effective interventions and critical to ensuring that the supports put in place are well-coordinated and are reaching those most affected. While each disaster context is unique, and there are psychosocial disaster response guidelines that can be tailored to local circumstances, comparative disaster mental health services research is now starting to elevate our understanding beyond the locally unique and allow the incorporation of what works well both within and across contexts *(42, 53-54)*, thereby establishing the key elements for more effective disaster mental health responses and proactive risk reduction efforts in future.

5.1.7   Qualitative research

Qualitative research presents an opportunity to gather in-depth or exploratory data on topics not always assessable via quantitative methods. As discussed in Chapter 4.12, qualitative research may be used to investigate sensitive or taboo topics related to mental health and to broaden inclusivity to populations not often included in the evidence base *(55)*. Often characterized by the use of smaller, purposive samples and collection of narrative data, qualitative research enables a deep exploration of meaning and relationships. Although a variety of approaches and analytic techniques are available, qualitative methods are usually focused on describing, exploring and interpreting the participants' frame of reference and worldview *(56-57)*. These methods are particularly relevant to disaster research. Recent applications have included the rapid assessment of needs following exposure to trauma *(58-59)*, social network analysis in communities preparing for hazards *(60)*, and the exploration of mental health symptoms among cultural groups rarely represented in the literature *(55, 61–62)*.

5.1.8   Participatory action research

Participatory action research (PAR) engages study participants in active co-researcher roles to broaden the scope of research with novel perspectives, disrupt dominant paradigms, and champion inclusive approaches (see examples in Chapters 3.1 and 4.15) *(63)*. Working within a co-design framework fosters ownership of the process and findings within the community, and supports innovative, meaningful outcomes. By disrupting the power imbalance between researcher and participant, PAR fosters a sense of agency among community members. PAR with children and adolescents affected by disasters has sought to dispel the perception of children as passive and vulnerable, instead recognizing their right to contribute to the decisions affecting their lives *(64)*. Similarly, PAR has been used to develop more inclusive policies and practices for marginalized groups and minorities across a range of disaster settings *(65–66)*. An example of PAR for mental health research is given in Case Study 5.1.1.

Case Study 5.1.1
Working with communities to assess the effects of disasters *(67)*

A participatory approach can add value to disaster research in many ways, including unique insights from community members and shared ownership of outcomes – but there are also many ways it can go wrong. The post disaster environment is chaotic, communication and social networks are often fractured, and the social bonding that can occur in response to a shared disaster experience can also deteriorate over time into disagreements and conflict. The ethical and academic implications for researchers are fraught, and need to be managed with care.

The Beyond Bushfires: Community Resilience and Recovery study was conducted in Victoria, Australia following the February 2009 bushfires, commonly referred to as the 'Black Saturday' bushfires because the worst of the fires occurred on Saturday 7 February *(68)*. The six-year study involved a cross-disciplinary team of academic investigators who valued cross-sectoral input and so invited a range of government, emergency, and health sector partners to attend all investigator/partner study meetings for shared decision making. Community expertise was also considered essential, and the lead investigators from the University of Melbourne began with a series of community visits to seek advice on the study methodology, recruitment locations and contextual differences. Twenty-five rural communities accepted the invitation to become study sites representing high, medium and low impact communities. It very quickly became clear to the investigators that there were so many diverse and sometimes conflicting views within and across those communities that it would be unhelpful and offensive to simply have a few community spokespersons join the investigator/partner study meetings held in the city to contribute to decision making. Instead, the lead investigators committed to ongoing community visits throughout the study, calling and visiting people for chats, attending local meetings and presenting emerging findings at local seminars. They maintained connections with a wide range of individual and organizational contacts and channelled the feedback and insights provided to the investigator/partner meetings to ensure community influence on study decision making occurred at all stages of the research process and that it was sufficiently nuanced to reflect the complexity of individual and community level experiences. This approach resulted in continuing adjustments to the study, including the study name, adjustment to the recruitment boundaries, the sampling strategy, communication methods, survey questions, focus of data analyses, interpretation of findings, study output and dissemination strategies. These continual responses to feedback demonstrated the investigator commitment to a participatory approach and greatly enhanced the relevance and impact of the findings *(67)*. As one community member noted about the Beyond Bushfires study "Most importantly, it has provided a safe, supportive environment for us to explore the lived experience of bushfire recovery" *(67)*. This shows the value of a participatory approach for those involved but also the potential for harm if the participatory efforts are merely tokenistic. A participatory approach requires genuine commitment on the part of the investigators to adapt to the realities of a post-disaster environment. If that can be achieved, the research quality and the study impacts are likely to exceed a traditional approach to research.

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5.1.9   Considerations for working with disaster-affected populations

Conducting research with traumatized populations

Mental health research often requires engaging with people who are actively experiencing distress or are required to remember difficult times. Accordingly, participating in research has the potential to exacerbate stress, irritation or fatigue, but is still valued by participants and, if carefully managed, is unlikely to contribute to further trauma *(69)*. Investigators working with disaster survivors must be mindful of the way they conduct their research to ensure that participants are protected from distressing or ethically compromised protocols. Possible means to address this concern might include:

- ensuring comprehensive training is provided for the research team, with a focus on research ethics, confidentiality, sensitivity, risk assessment and building rapport;

- developing a referral network prior to the commencement of research, so that higher risk cases may be referred to specialist care;

- engaging community stakeholders to guide research design and data collection.

- speaking with participants about their social support networks and ways that they can access further information and assistance.

Mental health stigma

The stigma associated with mental illness calls for thoughtful planning for conducting research and disseminating findings. The use of scientific evidence presents an important opportunity to reduce stigma around psychological responses to trauma, if done well. Discussions of mental illness that inadvertently reinforce community concerns (such as associations between psychological symptoms and weakness or danger) can reinforce stigma *(70)*. Challenging stereotypes through positive messages of change, associating help-seeking with strength, and normalizing trauma reactions has significant potential to mitigate stigma among survivors *(71)* and first responders *(72)*.

Cultural expressions of distress

Culture plays an important role in the expression of distress. Cultural expectations and socialization processes shape the norms for psychological and behavioural phenomena, which are dynamic and vary with time (for further detail, see Case Study 5.1.2). Using qualitative research to explore common descriptions of stress, mood and behaviour change may illuminate meaningful symptom clusters and idioms of distress *(73-74)*. In addition, adoption of a 'cultural lens' is required to effectively interpret the influence of gender, family composition, coping, social determinants, and developmental stages in the expression and experience of psychological distress *(75)*. Using culturally and (where suitable) developmentally appropriate terms to describe psychological expressions will significantly improve the validity of the research. Without careful consideration of culture, our research paradigms, sampling strategies, methods of data collection and interpretation of findings will be significantly flawed *(75)*.

Case Study 5.1.2
Expressions of distress among disaster-affected adolescents in China and Nepal *(74)*

China and Nepal have recently experienced devastating earthquakes. Both nations have large adolescent populations, for whom traumatic stress has potential for significant effects on mental and physical health, development and education *(59)*. To address these issues, it is vital that we understand the specific experiences of young people affected by disasters.

The Study on Adolescent Resilience after Disasters sought to investigate the range of expressions of psychological distress and any behavioural changes arising from exposure to natural disasters *(74)*. Ethnographic research in Nepal has illustrated a multifaceted model of psychological trauma, with particular emphasis on interpersonal relationships, social identity and loss *(61, 76)*. In China, mental health is conceptualized within a holistic systems approach with greater integration of the concepts of mind and body *(77)*. However, diversity in the conceptualizations of psychological distress in both countries, and a lack of attention to child and adolescent experiences warranted in-depth assessment *(74)*.

Key informant interviews and focus group discussions were conducted with adolescents, caregivers, teachers and experts in disaster-affected districts of Yunnan Province, China (n=79), and Kathmandu Valley, Nepal (n=62). A thematic analysis revealed that key indicators of distress emerged across four domains: anxiety and stress, mood difficulties, somatic complaints, and changes in behaviour. Young people frequently described fear of the earthquake recurring, anxiety triggered by trauma reminders, nightmares and hypervigilance. An adolescent participant from Nepal said "They say the sound of people shouting when the houses collapsed haunts them... I have not seen, but my friends say they are afraid to go anywhere in the dark, the sound of people shouting is heard" *(74)*. The magnitude of the Nepal earthquakes was associated with a sense of existential worry among adolescents who were forced to examine their future in light of new and worsened hardships. Concurrently, post-traumatic growth and strengthened connections between adolescents and their families were described in both settings. A number of participants described a sense of coping, mastery and self-efficacy arising from their experience *(74)*.

Many of the symptoms described by adolescents and their families reflect diagnostic criteria for PTSD, depression and anxiety, perhaps due to an increasingly globalized communication of mental health *(74)*. However, the nuanced descriptions of psychological distress highlight a significant need for psychological and community services that promote evidence-based interventions tailored to culturally specific understandings of mental health and the unique capabilities of adolescents.

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5.1.10 Establishing research partnerships

Identifying and engaging local partners is crucial to conducting field-based research. International studies should always be conducted in partnership with local organizations, service providers, government advisors, and/or community representatives. Such partnerships are also advisable when working in the researcher's home setting, where there may be opportunities to establish working relationships prior to the onset of a disaster. Local research partners play a vital role at multiple levels of the research process, from advising on study feasibility and acceptability, developing methodology, recruitment and sampling, obtaining ethics approvals, data collection, managing risk, interpreting results and disseminating findings within and beyond the community. Whether working in high-, middle- or low-income nations, building capacity in the mental health workforce (across both clinical and non-clinical settings) should be incorporated in the planning.

Successful partnerships are dependent on open communication, inquisitiveness, trust, humility and follow-through on decisions *(78)*. Regular team meetings and agreements regarding data ownership, respective roles in data collection and paper authorship facilitate this process *(79)*. Furthermore, an understanding of the political, economic, social, environmental and technical realities that shape interactions will foster stronger relationships *(80)*. Research partnerships are most successful when teams agree on a strong research plan, have respect for each other's capacities, engage in transparent and effective communication, clearly delegate roles and responsibilities, and develop a shared vision for the project *(79)*. Without collaboration, research conducted in disaster-affected settings is at risk of duplicating processes, drawing false conclusions, or failing to have a meaningful impact on policy and practice.

5.1.11 Dissemination and impact

The uptake of results and sustainability of new mental health initiatives are dependent upon the early engagement of partners and community members. An early process of joint decision making aiming to achieve multiple research project outcomes to meet the needs of all partners will support community engagement and research validity. In addition, it is important to foster progressive development of a knowledge translation plan to ensure wide dissemination of the findings and outputs tailored to different audiences and contexts. Scientific manuscripts and academic products can be complemented by community seminars and workshops, promotion through social and traditional media, and creating opportunities for partners to present findings in community forums. As funding bodies and individual donors become more interested in the efficiency of resources, providing reliable evidence on the level of need and effectiveness of humanitarian interventions will become increasingly valuable.

5.1.12 Conclusions

Mental health research plays a critical role in determining the health needs, trajectories of adjustment and treatment outcomes for disaster-affected populations. It has an important part to play in Health EDRM. Both clinical and non-clinical supportive services in the acute recovery phase have potential to support population-level improvements for adult and child mental health *(12)*. Rigorous research that pays careful attention to inclusive sampling, ethical processes, social determinants of risk and cultural considerations has the potential to expand the evidence base and highlight important areas for service development. Collaborative partnerships are vital: where possible, mental health researchers should seek to work in partnership with other agencies and local community members to guide the research and build capacity in the settings in which they work. The tremendous potential for research to inform and prevent mental health difficulties and deliver timely, evidence-based intervention will support the long-term resilience of disaster-affected communities.

5.1.13 Key messages

o **Rigorous mental health research is needed to determine the specific needs of disaster-affected populations and effectiveness of interventions in the months following a disaster.**

o **Consideration of the timeframe for psychological adjustment, sample characteristics and cultural expressions of distress will inform the research design.**

o **Partnerships with local community stakeholders, agencies and research collaborators are vital for valid research, capacity building and long-term uptake of results in Health EDRM.**

5.1.14 Further reading

Beaglehole, B., Mulder, R.T., Frampton, C.M., Boden, J.M., Newton-Howes, G., Bell, C.J. Psychological distress and psychiatric disorder after natural disasters: systematic review and meta-analysis. British Journal of Psychiatry. 2018: 213: 716-722.

Berry HL, Waite TD, Dear KB, Capon AG, Murray V . The case for systems thinking about climate change and mental health. Nature Climate Change. 2018: 8: 282.

Bryant RA, Gibbs L, Gallagher HC, Pattison P, Lusher D, MacDougall C, et al. Longitudinal study of changing psychological outcomes following the Victorian black Saturday bushfires. Australian & New Zealand Journal of Psychiatry. 2018: 52: 542-51.

Newnham, E.A., Dzidic, P., Mergelsberg, E., Guragain, B., Chan, E.Y.Y., Kim, Y., Leaning, J., Kayano, R., Wright, M., Kaththiriarachchi, L., Kato, H., Osawa, T., Gibbs, L. The Asia Pacific Disaster Mental Health Network: Setting a mental health agenda for the region. International Journal of Environmental Research and Public Health. 2020: 17: 6144-6153.

5.1.15 References

1. Bryant RA, Gibbs L, Gallagher HC, Pattison P, Lusher D, MacDougall C, et al. Longitudinal study of changing psychological outcomes following the Victorian Black Saturday bushfires. Australian & New Zealand Journal of Psychiatry. 2018: 52: 542-51.

2. Harms L, Block K, Gallagher HC, Gibbs L, Bryant RA, Lusher D, et al. Conceptualising post-disaster recovery: Incorporating grief experiences. British Journal of Social Work. 2015: 45: i170-87.

3. Newnham EA, Pearson RM, Stein A, Betancourt TS. Youth mental health after civil war: the importance of daily stressors. British Journal of Psychiatry. 2015: 206: 116-21.

4. McKenzie K. Urbanization, social capital and mental health. Global Social Policy. 2008: 8: 359-77.

5. Patel RB, Burke TF. Urbanization—an emerging humanitarian disaster. New England Journal of Medicine. 2009: 361: 741-3.

6. Berry HL, Waite TD, Dear KB, Capon AG, Murray V. The case for systems thinking about climate change and mental health. Nature Climate Change. 2018: 8: 282.

7. Davidson J, McFarlane AC. The extent and impact of mental health problems after disaster. Journal of Clinical Psychiatry. 2006: 67: 9-14.

8. Kirmayer L, Kienzler H, Afana AH, Pederson D. Trauma and disasters in social and cultural context. In: Morgan C, Bhugra D, editors. Principles of Social Psychiatry (2nd edition). John Wiley & Sons Ltd., London. 2010.

9. Betancourt TS, McBain R, Newnham EA, Brennan RT. Trajectories of internalizing problems in war-affected Sierra Leonean youth: Examining conflict and postconflict factors. Child Development. 2013: 84: 455-70.

10. Bonanno GA. Loss, trauma, and human resilience: have we underestimated the human capacity to thrive after extremely aversive events? American Psychologist. 2004: 59: 20.

11. North CS, Pfefferbaum B. Mental health response to community disasters: a systematic review. JAMA. 2013: 310: 507-18.

12. Tol WA, Barbui C, Galappatti A, Silove D, Betancourt TS, Souza R et al. Mental health and psychosocial support in humanitarian settings: linking practice and research. Lancet. 2011: 378: 1581-91.

13. van den Berg B, Wong A, van der Velden PG, Boshuizen HC, Grievink L. DIsaster exposure as a risk factor for mental health problems, eighteen months, four and ten years post-disaster - a longitudinal study. BMC Psychiatry. 2012: 12: 147-60.

14. Goldmann E, Galea S. Mental health consequences of disasters. Annual Review of Public Health. 2014: 35: 169-83.

15. Marshall RD, Amsel L, Neria Y, Suh EJ. Strategies for dissemination of evidence-based treatments. In: Norris FH, Galea S, Friedman MJ, Watson PJ, editors. Methods for Disaster Mental Health Research. The Guilford Press, New York. 2006.

16. Norris FH, Friedman MJ, Watson PJ, Byrne CM, Diaz E, Kaniasty K. 60 000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981–2001. Psychiatry: Interpersonal and Biological Processes. 2002: 65: 207-39.

17. North CS, Ringwalt CL, Downs D, Derzon J, Galvin D. Postdisaster course of alcohol use disorders in systematically studied survivors of 10 disasters. Archives of General Psychiatry. 2011: 68: 173-80.

18. Forbes D, Alkemade N, Waters E, Gibbs L, Gallagher C, Pattison P, et al. The role of anger and ongoing stressors in mental health following a natural disaster. Australian & New Zealand Journal of Psychiatry. 2015: 49: 706-13.

19. Keraite A, Sumathipala A, Siriwardhana C, Morgan C, Reininghaus U. Exposure to conflict and disaster: A national survey on the prevalence of psychotic experiences in Sri Lanka. Schizophrenia Research. 2016: 171: 79-85.

20. Ohto H, Maeda M, Yabe H, Yasumura S, Bromet EE. Suicide rates in the aftermath of the 2011 earthquake in Japan. Lancet. 2015: 385: 1727.

21. Powell T, Li S-J, Hsiao Y, Ettari C, Bhandari A, Peterson A, Shakya N. Investigating the aftershock of a disaster: a study of health service utilization and mental health symptoms in post-earthquake Nepal. International Journal of Environmental Research and Public Health. 2019: 16: 1369.

22. Lowe SR, Sampson L, Gruebner O, Galea S. Psychological resilience after Hurricane Sandy: the influence of individual-and community-level factors on mental health after a large-scale natural disaster. PLoS One. 2015: 10: e0125761.

23. Lamond JE, Joseph RD, Proverbs DG. An exploration of factors affecting the long term psychological impact and deterioration of mental health in flooded households. Environmental Research. 2015: 140: 325-34.

24. Tucker P, Pfefferbaum B, Nitiéma P, Wendling TL, Brown S. Intensely exposed Oklahoma City terrorism survivors: Long-term mental health and health needs and posttraumatic growth. Journal of Nervous and Mental Disease. 2016: 204: 203-9.

25. Catani C, Schauer E, Elbert T, Missmahl I, Bette JP, Neuner F. War trauma, child labor, and family violence: Life adversities and PTSD in a sample of school children in Kabul. Journal of Traumatic Stress. 2009: 22: 163-71

26. Gallagher HC, Block K, Gibbs L, Forbes D, Lusher D, Molyneaux R, et al. The effect of group involvement on post-disaster mental health: A longitudinal multilevel analysis. Social Science & Medicine. 2019: 220: 167-75.

27. Ikeda A, Tanigawa T, Charvat H, Wada H, Shigemura J, Kawachi I. Longitudinal effects of disaster-related experiences on mental health among Fukushima nuclear plant workers: The Fukushima NEWS Project Study. Psychological Medicine. 2017 : 47: 1936-46.

28. Jermacane D, Waite TD, Beck CR, Bone A, Amlôt R, Reacher M, et al. The English National Cohort Study of Flooding and Health: the change in the prevalence of psychological morbidity at year two. BMC Public Health. 2018: 18: 330.

29. Laplante DP, Brunet A, Schmitz N, Ciampi A, King S. Project Ice Storm: prenatal maternal stress affects cognitive and linguistic functioning in 5½-year-old children. Journal of the American Academy of Child & Adolescent Psychiatry. 2008: 47: 1063-72.

30. Simcock G, Kildea S, Elgbeili G, Laplante D, Cobham V, King S. Prenatal maternal stress shapes children's theory of mind: the QF2011 Queensland Flood Study. Journal of Developmental Origins of Health and Disease. 2017: 8: 483-92.

31. Chan E, Lam H, So S, Goggins W, Ho J, Liu S, Chung P. Association between ambient temperatures and mental disorder hospitalizations in a subtropical city: A time-series study of Hong Kong special administrative region. International Journal of Environmental Research and Public Health. 2018: 15: 754.

32. Lee S, Lee H, Myung W, Kim EJ, Kim H. Mental disease-related emergency admissions attributable to hot temperatures. Science of The Total Environment. 2018: 616: 688-94.

33. Newnham EA, Balsari S, Lam RPK, Kashyap S, Pham P, Chan EYY, et al. Self-efficacy and barriers to disaster evacuation in Hong Kong. International Journal of Public Health. 2017: 62: 1051-8.

34. Gruebner O, Lowe SR, Sampson L, Galea S. The geography of post-disaster mental health: spatial patterning of psychological vulnerability and resilience factors in New York City after Hurricane Sandy. International Journal of Health Geographics. 2015: 14: 16.

35. Watson P, Brymer MJ, Bonanno G. Postdisaster psychological intervention since 9/11. American Psychologist. 2011: 66: 482-94.

36. Rosen C, Young H. Mental health services and evaluation research: Precepts, pragmatics, and politics. In: Norris FH, Galea S, Friedman MJ, Watson P, editors. Methods for Disaster Mental Health Research. Guilford Press, New York. 2006: pp 194-207.

37. Te Brake H, Dückers M. Early psychosocial interventions after disasters, terrorism and other shocking events: Is there a gap between norms and practice in Europe? European Journal of Psychotraumatology. 2013: 4: 19093.

38. Elhai JD, Ford J. Utilization of mental health services after disasters. In: Neria Y, Galea S, Norris FH, editors. Mental Health and Disasters. Cambridge University Press, Cambridge. 2009: pp 366-84.

39. Litz BT, Gibson L. Conducting research on mental health interventions. In: Ritchie E, Watson P, Friedman M, editors. Interventions following mass violence and disasters: Strategies for mental health practice. Guilford Press, New York. 2006: pp 387-404.

40. Rahman A, Hamdani S, Awan N, Bryant R, Dawson K, Khan M. Effect of a multicomponent behavioral intervention in adults impaired by psychological distress in a conflict-affected area of Pakistan: A randomized clinical trial. JAMA . 2016: 316: 2609-17.

41. Reifels L, Pietrantoni L, Prati G, Kim Y, Kilpatrick D, Dyb G, et al. Lessons learned about psychosocial responses to disaster and mass trauma: An international perspective. European Journal of Psychotraumatology. 2013: 4: 22897.

42. Jacobs J, Oosterbeek M, Tummers L, Noordegraaf M, Yzermans C, Dückers M. The organization of post-disaster psychosocial support in the Netherlands: A meta-synthesis. European Journal of Psychotraumatology. 2019: 10: 1544024.

43. Bassilios B, Reifels L, Pirkis J. Enhanced primary mental health services in response to disaster. Psychiatric Services. 2012: 63: 868-74.

44. Behbod B, Leonardi G, Motreff Y, Beck CR, Yzermans J, Lebret E et al. An international comparison of the instigation and design of health registers in the epidemiological response to major environmental health incidents. Journal of Public Health Management and Practice. 2017: 23: 20-3.

45. Close R, Maguire H, Etherington G, Brewin CR, Fong K, Saliba V, et al. Preparedness for a major incident: Creation of an epidemiology protocol for a health protection register in England. Environment International. 2014: 72: 75-82.

46. IASC. A Common Monitoring and Evaluation Framework for Mental Health and Psychosocial Support in Emergency Settings. Inter-Agency Standing Committee, Geneva. 2017.

47. Reifels L, Bassilios B, Forbes D, Creamer M, Wade D, Coates S, et al. A systematic approach to building the mental health response capacity of practitioners in a post-disaster context. Journal of Advances in Mental Health. 2013: 11: 246-56.

48. Betancourt TS, McBain R, Newnham EA, Akinsulure-Smith AM, Brennan RT, Weisz JR, Hansen NB. A behavioral intervention for war-affected youth in Sierra Leone: a randomized controlled trial. Journal of the American Academy of Child & Adolescent Psychiatry. 2014: 53: 1288-97.

49. Gibbs L, Nursey J, Cook J, Ireton G, Alkemade N, Roberts M, et al. Delayed disaster impacts on academic performance of primary school children. Child Development. 2019: 90(4): 1402-12.

50. Raviola G, Eustache E, Oswald C, Belkin G. Mental health response in Haiti in the aftermath of the 2010 earthquake: A case study for building long-term solutions. Harvard Review of Psychiatry. 2012: 20: 68-77.

51. Cretney RM. Local responses to disaster: The value of community led post disaster response action in a resilience framework. Disaster Prevention and Management. 2016: 25: 27-40.

52. Gibbs L, Snowdon E, Block K, Gallagher HC, MacDougall C, Ireton G, et al. Where do we start? A proposed post-disaster intervention framework for children and young people. Pastoral Care in Education. 2014: 32:68-87

53. Dückers M, Thormar S, Juen B, Ajdukovic D, Newlove L, Olff M. Measuring and modelling the quality of 40 post-disaster mental health and psychosocial support programmes. PLoS One. 2018: 13: e0193285.

54. Reifels L, Bassilios B, Spittal M, King K, FLetcher J, Pirkis J. Patterns and predictors of primary mental health service use following bushfire and flood disasters. Disaster Medicine and Public Health Preparedness. 2015: 9: 275-82.

55. Gibson K, Haslam N, Kaplan I. Distressing encounters in the context of climate change: Idioms of distress, determinants, and responses to distress in Tuvalu. Transcultural Psychiatry. 2019: 56(4): 667-96.

56. Block K, Gibbs L, MacDougall C. Participant-guided mobile methods. In: Liamputtong P, editor. Handbook of Research Methods in Health Social Sciences Springer. 2017: pp.1-12.

57. Smith JA. Introduction. In: Smith JA, editor. Qualitative psychology: A practical guide to research methods. Sage. 2015.

58. Digidiki V, Bhabha J. Emergency within an Emergency: The Growing Epidemic of Sexual Exploitation and Abuse of Migrant Children in Greece. FXB Center for Health and Human Rights, Harvard University, Boston. 2017.

59. Newnham EA, Tearne J, Gao X, Guragain B, Jiaod F, Ghimire J, et al. Tailoring disaster risk reduction for adolescents: Qualitative perspectives from China and Nepal. International Journal of Disaster Risk Reduction. 2019: 34: 337-45.

60. Akama Y, Chaplin S, Fairbrother P. Role of social networks in community preparedness for bushfire. International Journal of Disaster Resilience in the Built Environment. 2014: 5: 277-91.

61. Kohrt BA, Hruschka DJ. Nepali concepts of psychological trauma: the role of idioms of distress, ethnopsychology and ethnophysiology in alleviating suffering and preventing stigma. Culture, Medicine, and Psychiatry. 2010: 34: 322-52.

62. Rasmussen A, Katoni B, Keller AS, Wilkinson J. Posttraumatic idioms of distress among Darfur refugees: Hozun and Majnun. Transcultural Psychiatry. 2011: 48: 392-415.

63. Wright M, O'Connell M. Negotiating the right path: Working together to effect change in healthcare service provision to Aboriginal peoples. Action Learning, Action Research Journal. 2015: 21: 108-23.

64. Gibbs L, Mutch C, O'Connor P, MacDougall C. Research with, by, for and about children: Lessons from disaster contexts. Global Studies of Childhood. 2013: 3: 129-41.

65. Haynes K, Tanner TM. Empowering young people and strengthening resilience: Youth-centred participatory video as a tool for climate change adaptation and disaster risk reduction. Children's Geographies. 2015: 13: 357-71.

66. Yoshihama M, Yunomae T. Participatory investigation of the Great East Japan Disaster: PhotoVoice from women affected by the calamity. Social Work. 2018; 63: 234-43.

67. Gibbs L, Block K, MacDougall C, Harms L, Baker E, Richardson J, et al. Ethical use and impact of participatory approaches to research in post-disaster environments: An Australian bushfire case study. Biomed Research International. 2018: 5621609.

68. Gibbs, L., E. Waters, R. Bryant, P. Pattison, D. Lusher, L. Harms, J. Richardson, C. MacDougall, K. Block, E. Snowden, H. C. Gallagher, V. Sinnott, G. Ireton and D. Forbes. "Beyond Bushfires: Community, Resilience and Recovery – A longitudinal mixed method study of the medium to long term impacts of bushfires on mental health and social connectedness." BMC Public Health. 2013: 13: 1036 - 1046.

69. Gibbs L, Molyneaux R. Whiteley S, Block K, Harms L, Bryant RA, et al. Distress and satisfaction with research participation: Impact on retention in longitudinal disaster research. International Journal of Disaster Risk Reduction. 2018: 27: 68-74.

70. Wang W, Liu Y. Discussing mental illness in Chinese social media: the impact of influential sources on stigmatization and support among their followers. Health communication. 2016: 31: 355-63.

71. Kranke D, Weiss EL, Gin J, Der-Martirosian C, Brown J, Saia R, Dobalian A. A "culture of compassionate bad asses": A qualitative study of combat veterans engaging in peer-led disaster relief and utilizing cognitive restructuring to mitigate mental health stigma. Best Practices in Mental Health. 2017: 13: 20-33.

72. Haugen PT, McCrillis AM, Smid GE, Nijdam MJ. Mental health stigma and barriers to mental health care for first responders: A systematic review and meta-analysis. Journal of Psychiatric Research. 2017: 94: 218-29.

73. Betancourt TS, Speelman L, Onyango G, Bolton P. A qualitative study of mental health problems among children displaced by war in northern Uganda. Transcultural Psychiatry. 2009: 46: 238-56.

74. Newnham EA, Gao X, Tearne J, Guragain B, Jiao F, Ghimire L, et al. Adolescents' perspectives on the psychological effects of natural disasters in China and Nepal. Transcultural Psychiatry. 2019: 57: 197-211.

75. Jones RT, Hadder JM, Carvajal F, Chapman S, Alexander A . Conducting research in diverse, minority, and marginalized communities. In: Norris FH, Galea S, Friedman MJ, Watson PJ, editors. Methods for Disaster Mental Health Research. The Guilford Press, New York. 2016. pp 265-77.

76. Muldoon OT, Acharya K, Jay S, Adhikari K, Pettigrew J, Lowe RD. Community identity and collective efficacy: A social cure for traumatic stress in post-earthquake Nepal. European Journal of Social Psychology. 2017: 47: 904-15.

77. Liu Z, Liu Y, Zhang Y, Chen Z, Hannak WJ. Developing a Chinese PTSD Inventory (CPI) based on interviews with earthquake victims in Sichuan. PsyCh Journal. 2014: 3: 101-12.

78. Wright M, Lin A, O'Connell M. Humility, inquisitiveness, and openness: key attributes for meaningful engagement with Nyoongar people. Advances in Mental Health. 2016; 14: 82-95.

79. Larkan F, Uduma O, Lawal SA, van Bavel B. Developing a framework for successful research partnerships in global health. Globalization and Health. 2016: 12: 17.

80. Bradley M. North-South research partnerships: challenges, responses and trends; a literature review and annotated bibliography. IDRC, Ottawa. 2007.