Public Health 218 (2023) 173–175

Contents lists available at ScienceDirect

Public Health

journal homepage: www.elsevier.com/locate/puhe

Themed Paper – Original Research

The potential for property-level flood adaptation as a flood disaster mental health intervention

P. Hudson*

Department of Environment and Geography, University of York, York, UK

ARTICLE INFO

Article history:
Received 20 September 2022
Received in revised form
21 February 2023
Accepted 9 March 2023

Keywords:
Flooding
Mental health
Property-level adaptation
Public health
Flood

ABSTRACT

Objectives: This study aimed to discuss the overlap between property-level flood adaptation and public health and flood risk management and identify areas of future research.
Design and Methods: A short essay-based contribution arguing in favour of a future research direction from the perspective of a disaster risk researcher.
Results: Promoting property-level flood adaption has multiple areas of benefit to both flooding and mental health risk management as a potential invention. This is because both fields display common interests in enabling and promoting personal responsibility to limit disaster consequences and build resilience.
Conclusions: The promotion and development of property-level flood adaptation strategies can be a productive locus of behaviour for further active collaboration and research, as well as a joint intervention for improving human welfare postdisaster. However, more proactive research is required.

Introduction

Climate change is recognised as a major public health challenge in the coming century.[1] Flooding is a significant avenue through which the impacts of climate change will manifest, as floods will alter both in terms of their occurrence probability and magnitude.[2] There is also a robust evidence basis for concluding that experiencing a flood leads to a range of negative mental health outcomes, which can last a long time and have diverse recovery pathways.[3] However, flood disasters and emergencies are the product of complex interactions between humans and the environment.[2] This complex problem requires integrated management approaches, which have an increasing role for individual behaviour and responsibilities.[4] For example, through promoting the use of property-level flood adaptation (PLFA) measures, such as mobile water barriers.[4]

Personal responsibility is a concept of growing importance in both flood and health risk management perspectives. The concept of integrated flood risk management means that all those at risk of flooding should play a role in reducing impacts.[4] This movement also overlaps with community-focused public health, which aims to promote behavioural changes and reduce vulnerability through greater personal responsibility.[5] The focus on both fields on personal responsibility and action implies that for risk management, a wide network of strategies and stakeholder interactions are required from disaster risk management and public health concerns.[6]

Within this joint behavioural focus, PLFA could limit the impacts of a flood and aid in the recovery process for both physical and mental health impacts via the intangible psychological benefits PLFA provides. Therefore, the promotion of PLFA can be seen as both a public health intervention and a flood risk management intervention through the multifunctional benefits generated. This short contribution proposes the use of PLFA as a joint policy intervention across these two fields that can promote disaster resilience and recovery. Developing this area of research is important, as there is relatively little consensus on how health is included and acted upon in disaster risk management[7] and very little research evaluating the success of PLFA in terms of their ability to prevent intangible rather than physical monetary disaster impacts.[4] Closing this gap in research and action could generate new avenues to protect and improve human welfare in limiting the incidence and magnitude of postdisaster mental health deterioration.

* Department of Environment and Geography, 290 Wentworth Way, Heslington, York YO10 5NG, UK
E-mail address: paul.hudson@york.ac.uk.

https://doi.org/10.1016/j.puhe.2023.03.008

Lines of potential impact and interaction requiring research

Promoting precautionary behaviour predisaster

It can be argued that PLFA helps manage the mental health impacts of flooding, as PLFA effectively limits the magnitude of the flood impacts suffered.[4] It is known that the flood impact experienced is a significant driver of the probability of developing negative postdisaster mental health. Therefore, by limiting flood impacts with *a priori* adaptation, we lower the effective postdisaster incidence of negative mental health outcomes. However, this potentially protective ability depends on the PLFA being effective and perceived as such by the user. For example, dry flood-proofing may offer higher mental protection than wet flood-proofing. This is because of a potential psychological difference between dry flood-proofing, which limits damage by preventing water entry into a building, whereas wet flood-proofing limits damage once water has entered a building. This means that the joint health and flood risk management benefits could differ significantly, even if the same level of damage is prevented.

These more intangible outcomes from PLFA are a relatively unexplored area within flood risk management research,[4] whereas the experiences of a flood overall are comparatively better studied in the health field. Integrating these areas of research could further demonstrate and assess how PLFA can be used as a public mental health intervention. Further research is needed to understand the conditions under which, and the types of PLFA, that successfully provide mental health protection from a societal perspective to prevent each field undermining the social resilience objectives of the other.

Promoting precautionary behaviour postdisaster

A second avenue for PLFA to act as a public mental health intervention regards those who did not use PLFA before a flood, as they can be encouraged to implement PLFA postflood. Research on the psychological motivations behind PLFA employment has shown that people's perceived coping capacity is an important determinant.[4] Coping capacity is composed of three elements: response efficacy (the measures are seen to be effective), response costs (the cost of implementing the measure are bearable) and self-efficacy (the person can use the measure), following the concept developed by the Protective Motivation Theory (originating from within health research).[4] The response efficacy and self-efficacy components could be relevant for aid in the postdisaster recovery process, as correctly and sustainably stimulating them could lead to an increase in a person's perceived autonomy to address future floods and restore a suitable sense of place enabling the recovery process.

Mental health recovery has been described as a personal journey that involves creating an increased sense of control and agency, and this can help replace the perception of lack of control or isolation, reducing the loss in sense of place.[8] Many mental health risk factors also operate at the intersection of disaster vulnerability and could also drive differing levels of adaptation potential and capacity across society. Therefore, by enabling individuals to have a greater capacity to adapt and implement PLFA, we could see a faster mental health recovery trajectory as people begin to feel more psychologically comfortable and capable.

Therefore, future research is needed to understand how postflood PLFA adaptation affects a person's mental recovery process and at which recovery stage an intervention is most useful from a social perspective. Moreover, additional work would also be required to understand the mechanism through which postflood adaptation could aid the recovery trajectory.

Path dependency in the face of multifunctionality and consortium building

PLFA is a multifunctional investment in both flood and public health risk management, making PLFA a viable locus for joint activity, whether led by practitioners or researchers. This can also extend to other areas of proactive risk reduction, such as nature-based solutions. Reports from Public Health England and the Environment Agency emphasise the importance of working with nature for their core roles, highlighting another area of multifaceted intervention.[9,10] There are multiple entry points of overlapping interest that would benefit from collaboration, though there are often institutional barriers to overcome. However, overcoming these barriers assumes that these benefits provided can be captured within the decision-making process of a given actor. This may not be the case when the co-benefits are intangible, non-monetisable or fall outside of the institution's expertise and confidence.

To effectively integrate these concerns, skills, and competencies outside the purview of individual organisations must be developed. This is because although it can be acknowledged that this overlap exists, institutional knowledge and skills are divided across different aspects of the disaster cycle based on the needs at a given point in the cycle. Although institutional knowledge is important, actions are driven in specific directions by the training of members and the culture of the institution making the decision. Thus, there is a need for public health and flood risk managers to converge towards holistic working practices that embrace a broader set of risk management needs.

An integrated coalition of actors would have to merge accounting frameworks and cultural practices so that the multifaceted objectives of multifunctional flood risk management can be achieved. Furthermore, such collaboration and partnerships offer multiple potential narratives and incentivisation mechanisms to promote PLFA beyond what is currently used. Future research should, therefore, explore the most suitable ways to merge overlapping institutional foci, allowing organisations and actors to provide suitable expertise, prevent duplication of effort and incentivise integrated action.

Conclusion

Disaster outcomes are not isolated within sectors but are interconnected, allowing risk management interventions to have multiple impacts beyond what a single actor may consider when making decisions. One such intervention is the implementation of PLFA before and after flooding to proactively prevent mental health decline after the disaster or to potentially aid in recovery. Although this approach could be a viable intervention for protecting both financial and mental well-being, further research is needed to determine how and under what conditions PLFA can be effective in this role. Formally identifying the role that PLFA could display in public mental health risk management requires closer collaboration between flood and health risk researchers. Quantifying both the effectiveness of PLFA and the conditions under which PLFA works best at holistically preventing damage from a flood and understanding the mechanism through which PLFA does so is the first required step in this area. Further research is required in this area, as there are valuable insights and actions that can be transmitted across fields of research to improve risk management. Not investigating and developing avenues of bridging this gap in both research and action means that valuable opportunities to manage the full range of human impacts are forgone.

Author statements

Ethical approval

Ethical approval was not required for the research presented within this paper.

Funding

There is no additional funding.

Competing interests

There is no conflicts of interest to declare with this submission.

References

1. Bourque F, Cunsolo Willox A. Climate change: the next challenge for public mental health? *Int Rev Psychiatr* 2014;**26**:415–22.
2. IPCC. *Climate change 2022: impacts, adaptation and vulnerability*. Press: Cambridge University Press; 2022.
3. Bubeck P, Berghäuser L, Hudson P, Thieken AH. Using panel data to understand the dynamics of human behavior in response to flooding. *Risk Anal* 2020;**40**(11):2340–59.
4. Kuhlicke C, Seebauer S, Hudson P, Begg C, Bubeck P, Dittmer C, et al. The behavioural turn in Flood Disaster Risk Management and its implication for future research and policy. *WIREs Water* 2020:e1418.
5. Keim ME. Preventing disasters: public health vulnerability reduction as a sustainable adaptation to climate change. *Disaster Med Public Health Prep* 2011;**5**:140–8.
6. Banwell N, Rutherford S, Mackey B, Chu C. Towards improved linkage of disaster risk reduction and climate change adaptation in health: a review. *Int J Environ Res Publ Health* 2018;**15**:793.
7. Gray B, Hanna F, Reifels L. The integration of mental health and psychosocial support and disaster risk reduction: a mapping and review. *Int J Environ Res Publ Health* 2020;**17**:1900.
8. Zheng C, Zhang J, Guo Y, Zhang Y, Qian L. Disruption and reestablishment of place attachment after large-scale disasters: the role of perceived risk, negative emotions, and coping. *Int J Disaster Risk Reduc* 2019;**40**:101273.
9. Ridgley H, Hands A, Lovell R, Petrokofsky C, Stimpson A, Feeley A, et al. *Improving access to greenspace A new review for 2020*. Public Health England; 2020.
10. Environment Agency. *Flood and coastal erosion risk management strategy roadmap to 2026*. Environment Agency; 2022.