

BMJ Open Theory development of under what circumstances and what works for promoting disaster preparedness among long-term care facility (LTCF) stakeholders: protocol for realist review

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ABSTRACT

Introduction The incidence of severe natural disasters has been increasing worldwide. The residents of long-term care facilities (LTCFs) are particularly vulnerable to such events. Therefore, promoting disaster preparedness among LTCF stakeholders is urgent. However, the optimal preparedness process remains unclear. To close this gap, we use a realist review (RR) to promote an understanding of under what circumstances and what works for promoting the disaster preparedness among LTCF stakeholders and develop theories for the process.

Methods and analysis RR will be guided by the Realist and Meta-Narrative Evidence Synthesis: Evolving Standard. The following five steps will be employed: (1) literature review and search for evidence, (2) study selection, (3) data extraction, (4) data synthesis and (5) development of the initial programme theory (IPT). Evidence will be searched using MEDLINE, CINAHL, PsycINFO, Web of Science, Cochrane Library, Scopus and ICHUSHI (a Japanese database). Grey literature and citation tracking will also be used. Documents of any design or publication type will be included. The study selection, coding and synthesis will be conducted independently by two authors. An IPT will be developed in the Context–Mechanism–Outcome configuration to understand how to promote disaster preparedness among LTCF stakeholders. The developed IPT will be verified by experts or stakeholders to enhance its validity.

Ethics and dissemination Ethical approval will not be required because this is a review of published literature. The results will be disseminated at scientific conferences and peer-reviewed journals. The developed IPT will be used in subsequent research and iteratively tested or refined to better explain under what circumstances and what works for promoting disaster preparedness among LTCF stakeholders.

Registration details This protocol has been registered at the Open Science Framework <https://doi.org/10.17605/OSF.IO/J4TU6>.

INTRODUCTION

Recently, natural disasters have been occurring all over the world. Floods and heat have

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ A realist review will offer a rich understanding of under what circumstances and what works for promoting disaster preparedness for living in long-term care facility stakeholders.
- ⇒ Our less exclusive criteria for study selection will enable the development of more detailed and practical theories.
- ⇒ The developed IPT will be verified by experts or stakeholders to enhance its validity.
- ⇒ Because the language is limited to English and Japanese, findings or information from relevant studies published in other languages may be missed.
- ⇒ Due to limited time and resources, a full iterative review process will not be possible. Citation tracking and hand search will be used to overcome this limitation.

increased fivefold over the last five decades, and this trend has been attributed to climate change caused by global warming.¹ The number of such natural disasters is expected to reach 1.5 times per day (560 times per year) worldwide by 2030.² Older adults are considered susceptible to such events. Almost half of the victims of Hurricane Katrina in 2005 were over 75 years old,³ and 66% of those who perished in the Great East Japan Earthquake in 2011 were over 60 years old.⁴ Of older adults, residents living in long-term care facilities (LTCFs) are particularly vulnerable.^{5–7}

Vulnerability of LTCF residents to natural disasters

LTCF residents are vulnerable to natural disasters for several reasons.⁸ First, their physical decline inhibits proper disaster response.^{9–12} Second, they are likely to experience relocation stress syndrome after a disaster.^{13 14} Older

adults with dementia are susceptible to this syndrome,¹⁵ and their psychological distress, deterioration due to dementia and social isolation require special attention.¹⁴ Previous studies^{16–20} have reported a significant increase in postdisaster mortality.

These results are concerning, particularly in Japan. Its ageing rate has reached 29.1%,²¹ and the number of LTCFs is increasing annually.²² Furthermore, natural disasters have been frequently occurring throughout the country.²³ The recent Noto Peninsula earthquake caused significant damage to several LTCFs.²⁴ Ageing and the frequency of such disasters are expected to occur simultaneously in other countries. Given this concern, there is an urgent need to examine how to mitigate the disaster-induced negative impacts on LTCF residents. The key is the disaster preparedness of the LTCF stakeholders.

Disaster preparedness of LTCF stakeholders and the research gap

Disaster preparedness is defined as ‘the knowledge and capacities developed by governments, response and recovery organisations, communities and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent or current disasters’.²⁵ Preparedness is a component of the four-phase disaster cycle.²⁶ It includes initiatives such as contingency planning, stockpiling of equipment and supplies, development of arrangements for coordination, and associated training.²⁵ The Sendai Framework for Disaster Risk Reduction 2015–2030 emphasises its importance because preparedness could contribute to responding effectively and building back better in recovery, rehabilitation and reconstruction.²⁷ The operational definition of LTCF includes nursing homes, assisted-living communities, care homes, residential aged care facilities and skilled nursing facilities. The LTCF stakeholders are operationally defined as staff, residents, families, local disaster management agencies, neighbouring facilities, and community members.

Various relevant studies have considered ways to promote disaster preparedness among LTCF stakeholders. Retrospective cohort studies focused on the correlation between evacuation and mortality rates.^{16–20} Cross-sectional studies have been conducted to investigate the association between LTCF characteristics and deficiencies in their disaster plans.^{28–31} Intervention studies have been conducted to test the effectiveness of disaster education programmes.^{32–33} LTCF staff, managers and evacuees were interviewed to explore what they experienced in both evacuation and shelter-in-place,^{7,34–37} how their disaster plans changed after disasters,³⁸ how they perceived their plans,⁷ and what role they played during disasters.³⁹ A previous study summarised the factors affecting the disaster preparedness of LTCFs by reviewing these studies.⁴⁰ However, the process for promoting disaster preparedness remains unclear. A realist review (RR) will allow us to fill this gap.

RR methodology

RR is a new synthesis method that provides a rich and practical understanding of complex interventional processes.⁴¹ This method is based on realism, which explains outcomes not directly achieved by interventions but rather generated through contexts and mechanisms affecting the outcomes.⁴² Given this idea, the approach begins with a theory of under what circumstances (context), what works (mechanism) and for whom (outcome) and then seeks information from a wide range of literature to support and refine the initial theories.⁴³ The ‘Context’ is preintervention circumstances inviting the mechanisms, while the ‘Mechanism’ corresponds to both intervention resources and stakeholders’ response to the intervention leading to outcomes. The ‘Outcome’ is the main result of interactions between contexts and mechanisms. These three factors are expressed as Context+Mechanism=Outcome (CMO).⁴⁴ The CMO helps identify specific contexts and mechanisms leading to the outcomes⁴⁵ and inform policymakers of the interventions and how they work effectively.^{41,46}

The process of promoting disaster preparedness among LTCF stakeholders is complex and involves mutual interactions. RR allows us to gain a deeper understanding of such complex processes and develop these theories.⁴¹ The developed theories are iteratively tested or refined using a realist evaluation cycle.⁴⁴ The iterative process could offer more plausible theories to policymakers specialising in this domain.

Aims

We aim to (1) understand under what circumstances and what works for promoting disaster preparedness among LTCF stakeholders and (2) develop theories for the process.

METHODS AND ANALYSIS

Our study will follow the Realist and Meta-narrative Evidence Syntheses: Evolving Standards.⁴³ Our review will be guided by the following five steps⁴⁷: (1) literature review and search for evidence, (2) study selection, (3) data extraction, (4) data synthesis and (5) development of an initial programme theory (IPT).

An RR is not a linear review, and the listed processes may legitimately occur in parallel or must be revised later as a review process.⁴¹ Furthermore, the review steps will move back and forth iteratively and reflectively.⁴⁸ Due to this non-linearity, the review scope, search strategies and study selection criteria may change several times.⁴¹ Any changes between the protocol and the RR manuscript will be described in the publication. This review has been registered in the Open Science Framework (<https://doi.org/10.17605/OSF.IO/J4TU6>). We are currently referring to relevant studies to prepare for conducting a RR, which will formally commence within 3 months of protocol acceptance and last until July 2025.

Table 1 Eligibility criteria

Inclusion criteria	
Research papers	Non-research papers
1. Original articles reporting qualitative or quantitative findings for building IPTs on the disaster preparedness of LTCF stakeholders	1. Including information for building IPTs on the disaster preparedness of LTCF stakeholders
2. Accessibility to the full texts and abstracts	2. Accessibility to the full texts
3. Published in English or Japanese	3. Published in English or Japanese
Exclusion criteria	
1. Review, protocol and synthesis	
2. Focusing on the disaster preparedness of LTCF stakeholders against infection	
IPT, initial programme theory; LTCF, long-term care facility.	

Step 1: literature review and search for evidence

A literature review will be conducted in a non-systematic manner. The following databases will be used: MEDLINE, Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Web of Science. This preliminary literature review aims to provide an overview of this topic, specify the review scope, and reconsider the review strategies.⁴¹ Government documents and international guidelines (eg, the Sendai Framework) will also be reviewed. In addition, some existing theories may be identified.

After completing the literature review, evidence will be more widely searched. The following seven databases will be used: MEDLINE, CINAHL, PsycINFO, Cochrane Library, Web of Science, Scopus and Igaku Chuo Zasshi (ICHUSHI) (a Japanese database). A hand search for government documents will also be conducted. An RR is highly likely to use grey literature rather than rely solely on articles in academic journals.⁴¹ In addition, a purposive search and citation tracking of the relevant documents will be implemented. The search for evidence will be continued until the theories reach saturation. No limitations will be applied to the year of publication. A combination of search terms will be developed with help from a librarian. Examples of the search-term combinations are as follows:

1. #“nursing home*” OR “long term care facilit*” OR “care home*” OR “assisted living communit*” OR “assisted living facilit*” OR “residential care facilit*” OR “residential aged care facility*” OR “intermediate care facilit*”
2. “disaster preparedness” OR “disaster response” OR “disaster reduction” OR “disaster prevention” OR “disaster plan*” OR “disaster relief plan” OR “disaster drill*” OR “disaster training*” OR “disaster education” OR “disaster awareness”
3. (covid-19 NOT infection*)
4. #1 AND #2 NOT #3

Step 2: study selection

RR includes a wide range of evidence,⁴³ and few exclusive eligibility criteria will be applied (table 1). Unlike traditional systematic reviews, RR tends to reject the approach to evidence hierarchy because multiple methods are required to illuminate a richer picture.⁴¹ Given this idea, our review will target both research and non-research papers (eg, government documents, commentaries, short reports, and guidelines). Conference or meeting abstracts, including useful information for theorising will be included. The publication language will be limited to English or Japanese.

The term ‘disaster’ will be limited to natural disasters (eg, earthquakes, hurricanes, tornadoes/water sprouts, floods, fires and heat) and the relevant literature on infections will be excluded. The justification is based on the point that disaster preparedness for infections needs to be separated from that for natural disasters because what is damaged and how the damage spreads are quite different among them. Furthermore, implications related to disaster preparedness of LTCFs for infections using an RR have already been explored.⁴⁹ A two-stage screening process will be used. First, after removing duplicates, the first author (SMit) will primarily screen the titles and abstracts of all the literature. Next, the second author (HO) will join the process of a full-text reading. The quality of the included literature will be appraised by relevance and rigour.⁴¹

Relevance will be appraised by ‘whether it can contribute to theory building’.⁴⁸ The Realist Synthesis Appraisal Form⁵⁰ will be used with four scales: high, moderate, low or none. The number of phrases related to the context, mechanism and outcome of each study will be noted. For example, one paper including phrases regarding all three factors would be rated as ‘high’, whereas another paper that contains only a phrase related to ‘outcome’ would be rated as ‘low’. Only those rated as ‘none’ will be excluded.

Rigour will be assessed by ‘whether the method used to generate that particular piece of data is credible and trustworthy’.⁴⁸ The Mixed Methods Appraisal Tools⁵¹ will be applied. First, the reviewers will answer ‘yes’, or ‘no’ or ‘cannot tell’, to the following two questions: (S1) Are there clear research questions? and (S2) Do the collected data address the research questions? Answering ‘yes’ to both questions will allow for further appraisal using five methodological questions in each study design. For instance, the following question would be asked regarding qualitative design: Is the qualitative approach appropriate for answering the research question? Answering ‘yes’ would score one, whereas answering ‘no’ or ‘cannot tell’ would score zero. The total score ranges from 0 to 5. A previous study using RR⁵² included documents with a total score exceeding two. The criteria will be followed.

Research papers that meet both relevance and rigour criteria will be included (non-research papers will be included only if they meet relevance criteria). Disagreements between the two reviewers (SMit and HO) will be resolved through discussions until a consensus is reached.

Where necessary, an independent reviewer will join the discussions. All the authors will finally agree on the documents included in this review. The screening process will be presented using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram of selection.⁵³ All relevant documents will be managed using EndNote (<https://www.myendnoteweb.com/>).

Step 3: data extraction

The following data will be extracted: author(s), publication year, country of origin, aims, participants, study methods, disaster preparedness contents and appraisal results. Non-research papers will not include some data (eg, aims and study methods). The first author (SMit) will primarily chart these data in tabular form using an Excel sheet (www.microsoft.com). The charted data will be verified by the research team.

Step 4: data synthesis

Realist analysis⁵⁴ will be used, and the data will be coded both deductively and inductively. Some data will be coded deductively, based on the content of disaster preparedness²⁵ (eg, developing a contingency plan, coordinating with related agencies, and conducting disaster training). Inductive coding will be used if new data are identified. Our coding will focus on what has already been practised or what is currently being practised, not what researchers or authors recommend or find important. The coding methods will be referred to in some studies.^{55 56} Quotations from the dataset are placed in the outcomes, whereas mechanisms or contexts involve abductive thinking and quotations.⁵⁵ Appropriate coding options will be selected.⁵⁶ For example, causation coding will help to identify the CMO, whereas value coding will be useful for coding mechanisms. Furthermore, in vivo, process, and descriptive coding will be employed accordingly. Data related to the CMO will be marked in different colours and coded for each factor. After coding, the data related to each factor will be synthesised based on their similarities. The following five activities⁵⁷ will be referred to: juxtaposition, reconciliation, adjudication, consolidation and situating. As the synthesis proceeds, possible patterns and connections between each factor will be searched.

The aforementioned coding and synthesis will be conducted by two authors (SMit and HO) to increase reliability. Discrepancies in data interpretation will be addressed through discussions between the authors. Where necessary, the last author (HF) will join the discussions until a consensus is reached. Given the expected amount of data, the use of qualitative analysis software (eg, NVivo) will be considered. Their use will contribute to the effective management of large amounts of data. Coding and synthesis processes are conducted iteratively,⁴¹ and the iterative process will allow us to develop richer, more robust and practical theories.

Table 2 Interim initial programme theory for coordination with local disaster management agencies

If Long-Term care facilities (LTCFs) have geographical proneness to the increase in extreme weather	(C1)
lessons from previous disasters	(C2)
poorly developed disaster plans	(C3)
then, coordination with local disaster management agencies (MI) would lead to	
enhancing communication	(MR1)
allowing LTCF staff to find it useful to work with the local agencies	(MR2)
increasing LTCF staff's sense of connectedness and responsibility	(MR3)
resulting in building supportive structures for LTCFs to better prepare for disaster (O)	

Step 5: development of an IPT

An IPT for each disaster preparedness will be developed using the CMO framework. Confusing interventions and mechanisms should be avoided.⁵⁵ Therefore, we shall divide the mechanisms into Mechanism Intervention (MI) and Mechanism Reasoning (MR). MI is regarded as an initiative or activity that can promote disaster preparedness, whereas MR is interpreted as stakeholders' responses to MI. Anticipating contradictory data or conflicting interpretations, the results will be verified not only by the research team but also by experts or stakeholders. Their participants will help address these discrepancies and enhance the validity of the study. The developed IPT will be employed in subsequent qualitative studies. By exploring not only which disaster preparedness LTCF staff have made but also whether their preparations worked, our IPT will be refined, and the iterative process will allow us to better explain under what circumstances and what works for promoting the disaster preparedness of LTCF stakeholders. An interim IPT (eg, coordination with local disaster management agencies) is demonstrated using some relevant documents in an 'if-then statement' manner⁴¹ (table 2).

Patients and public involvement

No patients and public involvement will be identified in this review.

ETHICS AND DISSEMINATION

Ethical approval will not be required because this is a review of published literature, and no primary research data will be generated.

Several dissemination strategies have been proposed for this purpose. After the publication of this review, the article will be released through public websites. Our results will be presented at relevant national and international conferences. These strategies will contribute to sharing findings with domestic and international

stakeholders facing both population ageing and the frequency of natural disasters.

Contributors Conceptualisation and Writing—review and editing: SMit, HO, SMiy, AZD and HF. Methodology, Visualisation, and Writing the original draft: SMit, HO and HF. Project administration and Funding acquisition: SMit and HF. Supervision: HF. SMit is the guarantor.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

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