

SYSTEMATIC REVIEW

Resilience–Rhetoric to Reality: A Systematic Review of Intervention Studies After Disasters

Gisela van Kessel, PhD, MHSN; Colin MacDougall, PhD; Lisa Gibbs, PhD

ABSTRACT

Objective: This report aimed to examine the literature regarding evidence about community-based interventions that use the concept of resilience to increase positive health outcomes after disaster.

Methods: A search was conducted of databases; gray literature, public health journals, and available key journals focused on disaster, emergency, and trauma from inception to December 2013. Excluded were non-English publications, only about children or adolescents, or a commentary or theoretical discussion on resilience.

Results: From a total of 1880 records, excluding duplicates, 8 studies were found. Exclusions included participants younger than age 18 years ($n = 74$), non-English ($n = 40$), nonempirical ($n = 265$), not referring to disaster ($n = 188$), not a public health intervention ($n = 319$), and not related to an intervention targeting resilience ($n = 890$).

Conclusions: This systematic review highlighted a gap in the evidence relating to interventions targeting the resilience of adults who have experienced a disaster. The results were mixed in relation to information provision but promising for strategies that promote social interactions or develop community competence. Future studies could explore the ability of interventions to build the intrinsic capacity of a system, community, or society at risk of a disaster to adapt and survive. (*Disaster Med Public Health Preparedness*. 2014;8:452-460)

Key Words: disaster, resilience, evidence based interventions

The expected increase in the frequency and scale of natural disasters as a result of climate change¹ poses immediate health problems through injuries; exacerbation of chronic health problems; loss of clean water, shelter, household goods, and sanitation; and a disrupted health system.² In the longer term, disasters have been linked to mental health problems and posttraumatic stress disorder.³ However, nearly one third of people exposed to a disaster demonstrate psychological resilience.⁴ Resilience is a nascent concept that can be understood in various ways when viewed through the lens of differing disciplines or epistemologies.

Understood as both a process and an outcome, resilience includes a number of intrapersonal and environmental factors.⁵ How resilience is defined and operationalized may affect the nature of intervention planning. In this report, resilience is understood as “the intrinsic capacity of a system, community or society predisposed to a shock or stress to adapt and survive by changing its non-essential attributes and rebuilding itself.”^{6(p446)} Thus, resilience can potentially be used in a strength-based approach, within a public health framework, to increase the proportion of the population that experiences efficient recovery.

Resilience is highlighted in the Hyogo Framework for Action 2005 to 2015, which is the International Strategy for Disaster Reduction, that aims to build the resilience of nations and communities to disasters.⁷ More recently, the United Kingdom developed the Strategic National Framework on Community Resilience,⁸ and the Council of Australian Governments have released the National Strategy for Disaster Resilience.⁹ Although the literature has expanded in understanding and measuring the resilience of populations after disaster, much less work has addressed the application and testing of the resilience construct into practice.⁵ As a consequence, the level of evidence for strategies planned to support resilience of a population affected by disaster is not clear. This report aims to examine the literature regarding evidence about community-based interventions that use the concept of resilience to increase positive health outcomes after disaster.

METHODS

Search Strategy

A search of databases was conducted from inception to December 2013 and included PsychArticles, Psychbooks, PsychInfo, Psychological and Behavioural

TABLE 1

Search Terms for Present Study

- 1 resilien* or adapt* or cope*
- 2 disaster planning OR disaster response OR public health OR preventive medicine OR social support OR Health planning OR community participation OR primary prevention OR health promotion OR social justice OR capacity building OR social control policy
- 3 natural disaster OR flood OR drought OR tidal wave OR hurricane OR typhoon OR fire OR earthquake OR tsunami OR technological disaster OR terrorism OR environmental disaster
- 4 1 AND 2 AND 3

Sciences collection, CINAHL, Sociological abstracts, and MEDLINE. A search of the gray literature included ProQuest Dissertation & Thesis, DART—Europe, Global Health database, WHOLIS, Libraries Australia, Conference Papers Index, and OpenGrey. An initial search of public health journals produced no results, so a final manual search of available key journals focused on disaster, emergency, and trauma. The journals included *Disaster Prevention and Management: an International Journal*, *Disasters*, *Journal of Traumatic Stress*, *Journal of Emergency Primary Health Care*, *Disaster Management and Response*, *Journal of Loss and Trauma*, and *Journal of Trauma Management and Outcomes*. The search terms were developed using the population, intervention, comparison, and outcome framework and the method of an earlier review on non-natural environmental incidents.¹⁰ Each term was then searched in MEDLINE to find related MeSH headings. The Scope notes for each were also checked to find the most appropriate terms. The final search terms were modified for each search engine (Table 1).

Study Selection

Reports of studies were included with participants older than age 18 years that investigated empirical improvement of resilience as a result of a public health intervention in a disaster setting. Also, reports were included if they studied a disaster that was technological (eg, transport accident) or natural, including geophysical (eg earthquakes), hydrological (eg, floods), meteorological (eg, hurricanes), and climatological (eg, drought and fires).¹¹ Biological disasters are often considered a separate category, and so were excluded from this review.¹¹ A process of screening titles, abstracts, and full texts excluded publications if they were not published in English, were only about children or adolescents, or were a commentary or theoretical discussion on resilience (Figure).

Quality Assessment

A modified version from the Centre for Reviews and Dissemination's *Guidance for Undertaking Reviews in Health Care* was used to extract data to assess bias.¹² Data included type of publication, country of origin, disaster type, aim/objectives, study design, inclusion and exclusion criteria, sampling, sample characteristics, control group characteristics, intervention, control intervention, measurement tool

or method used, statistical techniques used, follow-up, number of withdrawals, results, costs, and adverse events.

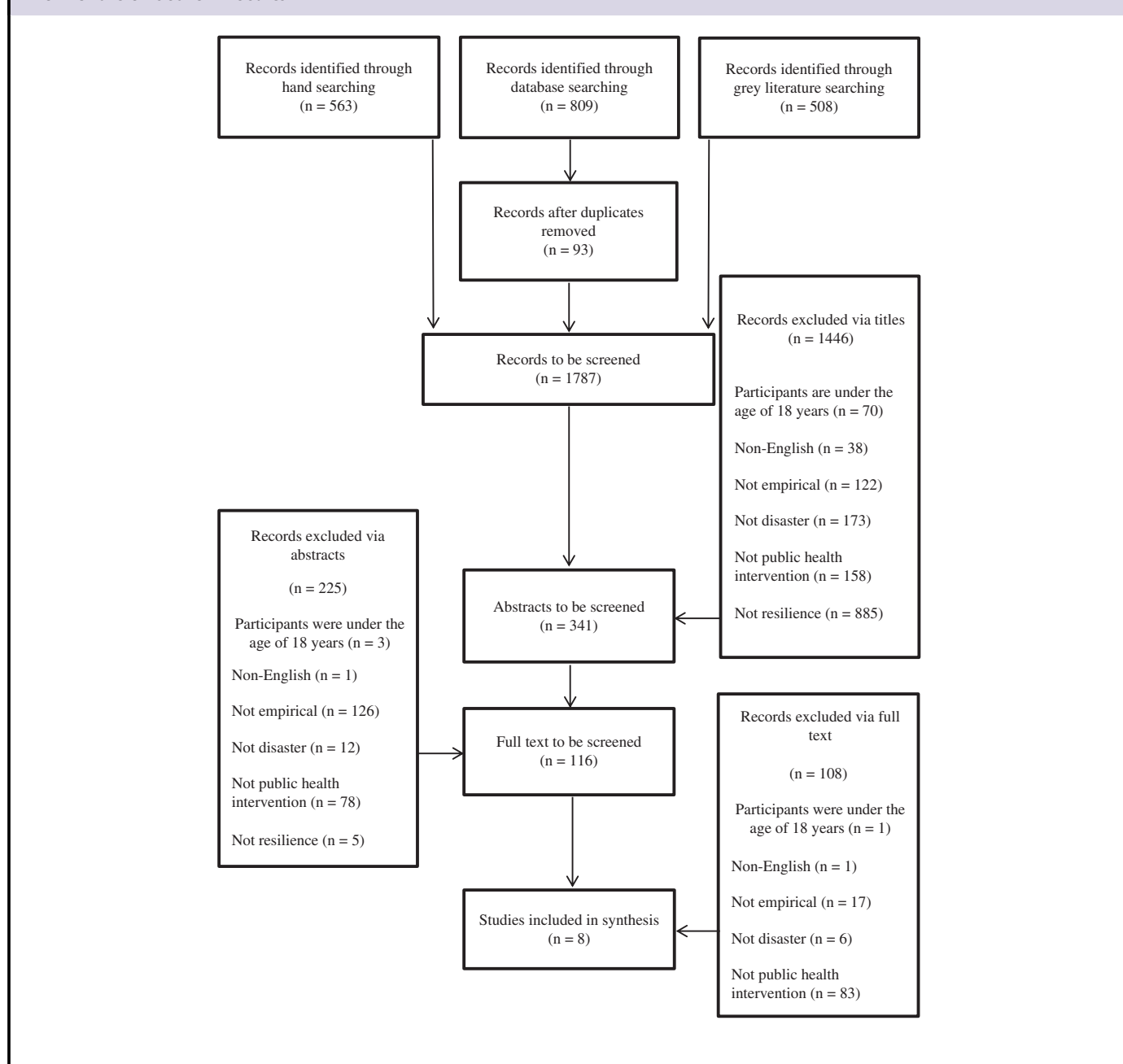
Confounding factors such as publication bias, provider bias, selection bias (sample characteristics), detection bias (types of outcome measures used), performance bias (provision), and attrition bias by calculating percentages that demonstrated unequal weighting were examined to assess risk of bias across studies.

The standard approach to examining the risk of bias in individual studies uses a critical appraisal tool to determine methodological rigor. This approach privileges study design and, in particular, the randomized control trial over other criteria. However, randomized control trials are recognized as lacking the flexibility required to accommodate multiple community driven public health interventions. While they may be the best design for strength of evidence, they are not always practical or appropriate.¹³ Consequently the quality of the selected full text articles that met the inclusion criteria was assessed using the mixed methods appraisal tool (MMAT) summarized in Table 2.¹⁴ This tool can adapt to a number of different methodologies and has an intraclass correlation of 0.72 to 0.94.¹⁵ Two reviewers (G.vK., and C.M.) independently used the MMAT to appraise the selected studies, and results of the appraisal were discussed to reach consensus.

The quantitative studies were ranked using the National Health and Medical Research Council guidelines.¹⁶ The qualitative studies were ranked using the qualitative hierarchy of evidence for practice.¹⁷ Both described 4 levels of evidence; however, nothing suggests that the different methods are contributing the same sort of evidence. Instead, each hierarchy provided an indication of the level of rigor used for that method within each study, and hence the applications of the findings in terms of informing policy and practice. In rankings of quantitative studies, systematic reviews were ranked level 1, providing the highest level of evidence for practice; randomized, control studies were ranked second; comparative studies were ranked level 3, and case studies were ranked level 4.¹⁶ In a proposed hierarchy for ranking the strength of evidence of qualitative studies, theoretical studies were ranked level 1, conceptual studies were ranked level 2, descriptive studies were ranked level 3, and case studies level 4.¹⁷

FIGURE

Flow Chart of Search Results.



Synthesis

A narrative synthesis of findings was conducted due to the heterogeneity of studies.¹² A narrative synthesis required a more systematic and rigorous approach than the broader concept of a narrative review. We used the framework outlined in the *Guidance for Undertaking Reviews in Health Care* to ensure a meticulous analysis underpinned by resilience theory.¹² A preliminary synthesis tabulated the included studies in Table 3. A textual approach was then used to

analyze the relationships within and between studies and included an assessment of the robustness of the evidence.

RESULTS

The search found a total of 1880 records, excluding duplicates (Figure). Reasons for exclusions included participants who were younger than age 18 years (n = 74), non-English

TABLE 2

Critical Appraisal Results Using the Mixed Methods Appraisal Tool (MMAT)^a

Type of Study	MMAT Question Number	Author and Date							
		Huang & Wong 2013	Coppock et al 2011	Romo-Murphy et al 2011	Rung et al 2011	Sugimoto et al 2010	Morin et al 2008	Páez et al 2007	Pérez-Sales et al 2005
Qualitative	Are the sources of qualitative data (archives, documents, informants, observations) relevant to address the research question (objective)?	✓	–	✓	–	✓	✓	–	✓
	Is the process for analyzing qualitative data relevant to address the research question (objective)?	✓	–	✓	–	✓	?	–	✓
	Is appropriate consideration given to how findings relate to the context, eg, the setting, in which the data were collected?	✓	–	✓	–	✓	✓	–	✓
	Is appropriate consideration given to how findings relate to researchers' influence, eg, through their interactions with participants?	x	–	?	–	?	?	–	x
Quantitative non randomized	Are participants (organizations) recruited in a way that minimizes selection bias?	–	✓	–	✓	–	–	–	✓
	Are measurements appropriate (clear origin, or validity known, or standard instrument; and absence of contamination between groups when appropriate) regarding the exposure/intervention and outcomes?	–	?	–	✓	–	–	–	✓
	In the groups being compared (exposed vs nonexposed; with intervention vs without; cases vs controls), are the participants comparable, or do researchers take into account (control for) the difference between these groups?	–	✓	–	✓	–	–	–	✓
	Are there complete outcome data (≥80%), and, when applicable, an acceptable response rate (≥60%), or an acceptable follow-up rate for cohort studies (depending on the duration of follow-up)?	–	?	–	✓	–	–	–	✓
Quantitative descriptive	Is the sampling strategy relevant to address the quantitative research question (quantitative aspect of the mixed methods question)?	–	–	✓	–	x	?	x	–
	Is the sample representative of the population understudy?	–	–	✓	–	x	?	?	–
	Are measurements appropriate (clear origin, or validity known, or standard instrument)?	–	–	✓	–	x	?	✓	–
	Is there an acceptable response rate (≥60%)?	–	–	✓	–	x	x	?	–
Level of evidence	3	3	3	4	3	3	4	3	

^aKey to responses: hyphen (–), indicates not applicable; check mark (✓), yes; question mark (?), can't tell; and x (x), no.

TABLE 3

Summary of Search Results

Authors	Disaster Type	Sample description	Research Design	Intervention	Outcome Assessment Instrument	Findings
Pérez-Sales et al, 2005	2001 El Salvador earthquakes	Random sample stratified by sex, age, and shelter (n = 115)	Comparative design Participation action research interviews, feedback to participants, leaflet, focus group with leaders to develop a self-management community plan	Grouping tents to reflect the community of origin of the survivors	Community cohesion interview and global clinical assessment	Community participation was doubled and prevalence of cases needing further emotional support was 4 times less in the shelter that grouped evacuees based on community of origin when compared to the shelter that allocated people in order of arrival
Páez et al, 2005	2004 Madrid train bombings	Convenience sample of college students and their relatives (n = 661) from 5 regions	Case series design; Repeated measure survey 1,3, and 8 weeks after	Social sharing through demonstrations as a social ritual	Izard differential emotions scale, ways of coping scale, subjective social support scale, UCLA loneliness scale, PANAS scale, PTGI scale of post-traumatic growth, emotional climate scale	Community participation in ceremonies and rituals is associated with social support and reinforces social cohesion
Morin et al, 2008	2004 Indonesian tsunami	8 high-risk cities for tsunami (n = 5000)	Descriptive design Program evaluation	Documentary, leaflets and posters advising how to respond and evacuate Followed by participation and discussion to develop bottom up plans	Informal interviews questionnaire administered to 91 children	Villagers were able to recognize warnings and felt capable of taking preventative action
Sugimoto et al, 2010	2004 Indonesian tsunami	Banda Aceh and Aceh Besar residents	Descriptive design field and participatory observation	85 Tsunami height poles installed as visible reminder to maintain disaster awareness	No specified measure	An increase in the understanding of the significance of the poles increased the number of people involved in pole construction; school teachers continued their role as education messengers
Rung et al, 2011	2005 New Orleans Hurricane Katrina	Convenience sample from 32 parks (n = 265)	Case series design Field survey	Recreation park use	Modified recreation experience preference scale, direct observation using Bedimo-Rung assessment tool- direct observation	Recreational parks are used less in flooded neighborhoods but they can help flood-affected people to use them for escape and physical activity.
Romo-Murphy et al, 2011	2004 Indonesian tsunami	Random/cluster (village/sub- village) sample (n = 984)	Descriptive design Field survey	Radio transmitting information about preparation	984 interviews, 8 focus groups, and 6 key informant interviews (Banda Aceh officials)	Radio broadcasting can contribute to information sharing and strengthen the capacity of communities but needs to be supplemented by personal communication through social networks
Coppock et al, 2011	2005–2008 drought	Random sample from 2 districts	Participation action research	Capacity building through linking with peers, establishing collective action groups, participatory education to improve literacy, promoting saving, microenterprise training, assisting in the generation of financial capital	Survey regarding personal, household, community and agricultural attributes as well as wealth status, hunger, and livelihood strategies	Poor women became community leaders. Both sites reported improvement in skills and knowledge, comfort in the home, quality of life, access to credit, and involvement in small business. These led to change in wealth status, reduced hunger, and shifted livelihood strategies to include diversification and intensification
Huang & Wong, 2013	2008 Wenchuan earthquake	Convenience sample of 2 groups, 1 of older people, 1 of women (n = 24)	Qualitative	2 recreational activity groups run by social workers. The older persons group did drumming and the women did dance	Focus group and in-depth interviews	Participating in group recreation led to self-reports of feeling better physically and psychologically, more meaningful lives, and broadened and strengthened social networks

Abbreviations: PANAS, positive and negative affect scale; PTGI, posttraumatic growth inventory; and UCLA, University of California Los Angeles.

($n = 40$), nonempirical ($n = 265$), not referring to disaster ($n = 188$), not a public health intervention ($n = 319$), and not related to an intervention targeting resilience ($n = 890$). The screening process found 8 reports that met the inclusion criteria^{18–24}; these are summarized in Table 3.

The included studies described interventions within 5 different natural disasters including the 2011 El Salvador earthquake,¹⁸ 2008 Wenchuan earthquake,¹⁹ 2005 to 2008 Ethiopian drought,²⁰ 2004 Indonesian tsunami,^{21–23} and 2005 Hurricane Katrina.²⁴ One technological disaster, the 2004 Madrid train bombings was also included.²⁵ Six different countries and continents were represented in the final sample of papers.

The risk of bias across studies was difficult to determine because the included papers provided insufficient information regarding how subjects were recruited, how the intervention was implemented, the attrition of subjects and confounding factors. The studies employed mixed methods for their assessments, with no single method dominating. No provider bias was evident, as each study covered a different intervention.

Overall the method rigor was low. Four reports used a qualitative methodology that ranked descriptive studies as level 3,^{18,19,21–23} while 2 reports^{18,20} used a level 3 comparative approach for the quantitative component. The remaining 2 reports were ranked as level 4 evidence.^{24,25} Resilience was conceptualized within the study aims and rationale but not in the methods, with ambiguous relationships to study design and measures for all included studies.

A narrative synthesis that explored relationships between the studies identified that strategies to enhance resilience in a disaster setting were either based on providing information, creating social capital (through social integration), or supporting community competence.

Resilience Supported Through the Provision of Information

Three reports described the effect on resilience of information provision after the 2004 Indonesian tsunami.^{21–23} Information was provided before a disaster occurrence to enable preventative action that would avoid adverse health outcomes and consequently support resilience. The strategies included a film supplemented by leaflets, posters on tsunami history, signs on how to respond and evacuate²³; the use of tsunami height poles to provide visual information of the effect of previous disasters to maintain disaster awareness²²; and radio transmission of information about disaster preparation.²¹

Information that sought to educate people about risks and the actions to minimize the effect of a disaster was reported by people to change their readiness to act. The combination of

85 poles built in Banda Aceh City and Ache Besar district to educate the community about the height of the 2004 Indonesian tsunami, and the distribution of a documentary and written promotional material about tsunami response and evacuation, enabled villagers to feel better prepared to face the 2006 tsunami.^{22,23} By contrast, information provided via radio had limited success, as 27% of villagers reported that they did not learn anything, because they did not have access to technology.²¹

Resilience Supported Through the Promotion of Social Integration

Three studies explored interventions that addressed social integration after the 2008 Wenchuan earthquake,¹⁹ the 2005 Hurricane Katrina,²⁴ and the 2004 Madrid train bombings.²⁵ These studies investigated strategies that theoretically increased resilience, and thereby psychosocial well-being, by enhancing social interaction and increasing social support.

Páez and colleagues established some support for this finding when they demonstrated that people who participated in gatherings that facilitated communication, social sharing, and communicating about events were able to create a positive emotional climate, which reinforced social integration.²⁵ Taking part in demonstrations to transmit a symbolic message against terrorism was also shown to predict posttraumatic growth.²⁵ On a smaller scale, participation in recreational groups (dance and drumming) could broaden and strengthen social networks and perceptions of feeling better physically and psychologically.¹⁹

The crucial aspect of these interventions may have been the ability to participate. Rung and colleagues found that people who were affected by the flooding during Hurricane Katrina were less likely to visit a park or to interact with an animal than those who were not flooded.²⁴ Consequently, this impact limited the opportunity for the use of local recreational parks to promote social interaction by strengthening informal social ties.²²

Resilience Through the Development of Community Competence

Two reports investigated strategies that sought to develop community competence to deal with the aftereffects of the 2001 earthquakes in El Salvador and the 2005 to 2008 drought in Ethiopia.^{18,20} Community competence through collective self-efficacy and community action may have mobilized the resources of a community to promote resilience and contribute to mental health and well-being.

Pérez-Sales and colleagues suggested that building community competence and resilience through strategies that create a sense of belonging, sense of community, social recognition, locus of control, and self-efficacy result in effective coping.¹⁸

The authors compared the experience in 2 shelters with different management processes after the 2001 earthquakes in El Salvador. In 1 shelter, the grouping of tents reflected the community of origin of evacuees. In this shelter, evacuees participated more often in developing community solutions and decision-making procedures and reported more positive emotional memories, fewer feelings of having been humiliated, and less emotional discomfort than evacuees in the second shelter that randomly allocated people to tents.¹⁸

Coppock and colleagues developed community competence in their participation action research through collective action, microfinance, and participatory education strategies with 2 communities affected by drought.²⁰ The results of a survey highlighted that women, in particular, were able to take leadership roles and increase their involvement in small business. This finding led to an increase in skills and knowledge, changes in wealth, reduction in hunger, and increased quality of life.²⁰

DISCUSSION

The significance of this review lies in establishing a substantial gap in the literature regarding evidence about interventions, underpinned by the concept of resilience in the disaster setting, to increase positive health outcomes in affected communities. The results of the review drew attention to a low level of evidence and a lack of generalizability to a range of disasters or countries. The search process did screen out some well-planned interventions, because they did not include empirical evidence of efficacy. The lack of evidence limited the potential to scale up, generalize, or implement strategies tried elsewhere for new disasters. The review itself was limited by the selection criterion of studies published in English. Within these limitations, some support was tentative, and further research into strategies based on providing information, promoting social integration, or developing community competence may have been able to demonstrate enhanced resilience in a disaster setting.

The findings provided some preliminary knowledge about the mechanisms underpinning interventions seeking to enhance the resilience of people subjected to the effects of a disaster. Translating resilience theory into effective interventions required strategies that were designed and evaluated in a logical, defensible, and sequential order.²⁶ If interventions were implemented effectively, then a set of outputs would be achieved, and they may be moderated by the characteristics of individuals, or the community as a collective. This review has identified activities that include producing and distributing a film, leaflets, posters, tsunami height poles, and radio transmissions that resulted in information provision outputs. Also, activities that promoted gatherings with a unified purpose, such as demonstrations or recreation, led to social integration outputs, while activities such as the strategic grouping of

tents, providing microfinance, and participatory education, have been observed to lead to community competence outputs. The review has provided some evidence that these outputs of effective information provision, promotion of social integration, and development of community competence go on to support resilience outcomes, and subsequently, improved mental health or well-being.

Future Research Directions

Disaster management interventions were targeted to the needs of the different chronological phases of disaster-related events. The information provision strategies in this review that addressed disaster preparation were notably more effective than the radio transmissions during the disaster event. The activities promoting social integration and development of community competence all occurred in the recovery phase. However, future work could consider evaluating the prevention effect of implementing similar strategies as part of disaster preparation.

Information provision (eg, when and how to move to a safe place) may support resilience through a mechanism of promoting a sense of safety.²⁷ Some work has already examined the effect of information provision on developing disaster awareness, and thus skills in preparation and evacuation planning.^{28,29} This review has provided further evidence that increased knowledge and action arising from disseminating information before a disaster subsequently has a relationship with promoting preparedness and, subsequently, resilience.^{19,20,21} This review also has highlighted the need for more research into the influence on resilience of effective access to information during times of major infrastructure damage. As the world has become more dependent on technology for communication, strategies that address infrastructure management and access, and their relationship with community well-being after a disaster may be worth researching. Furthermore, the studies in this review have concentrated on information as a strategy to improve community preparation. Thus, the effects on resilience of media strategies before and during the event and the role of information during recovery can be further explored.

Social integration activities foster positive emotions that enable a sense of calming and promote connectedness, and they may facilitate resilience by increasing access to information and resources.²⁷ Although informal networks can be effective,³⁰ formal interventions such as participation in meaningful public events can be implemented after a disaster, as they have been shown to influence recovery outcomes.³¹ The social integration strategies identified in this review indicate that interventions that increased social sharing of emotions about the event with others and built social connections through participating in recreational activities and social rituals, can increase resilience.^{19,22,23} While evidence of the relationship between resilience and social

networks or social engagement exists, further research could consider investigating the efficacy of the implementation of interventions designed to enhance social connections and emotional support.^{9,27}

Community competence can lead to resilience through interventions designed to encourage community action, critical reflection, problem solving, flexibility, creativity, collective self-efficacy, empowerment, and political partnerships.³² For example, promoting collective efficacy can be done through activities that are conceptualized and implemented by the community, including religious activities, rallies, and mourning rituals.^{27,33} Community action relies on the empowerment of community members, so that they have a sense of their ability to take control and develop the community competencies required to build capacity.^{34,35} Although limited to 2 studies, the preliminary indication is that the development of community competence may increase the intrinsic capacity of populations at risk to adapt, change, and rebuild and, as a consequence, be resilient in the wake of a disaster.^{18,20} The potential is to investigate the efficacy of interventions designed to facilitate other aspects of community competence such as the processes of governance that support community decision making.

Issues with Resilience Research

The intrinsic capacity of a system, community, or society to adapt and survive and consequently demonstrate resilience may also rely on the level of economic development within a particular society.^{4,9,32} Financial assistance can form a significant and sometimes substantial support provided by governments to a disaster-affected population. However, aid distribution is not guaranteed to reach marginalized communities.³⁶ On the other hand, microfinance in developing countries may contribute to capacity building and the ability to diversify and participate in small business activities.¹⁹ Therefore, further research investigating the implementation of financial assistance and its ability to contribute to resilience may be helpful. In addition to investigating the effect of providing grants on resilience provided after a disaster, longitudinal studies could investigate the effect of increasing the diversity of income sources for a community and targeting the inclusion of economically vulnerable populations before a disaster hits.³²

The paucity of results emerging from this review may be due to the complexity of resilience and the challenges of disaster-related research. Consequently, the search and subsequent analysis have been limited by the definition of resilience within a health context. Some reports may fail to use the word *resilience* but may contribute to community resilience. Theoretical resilience models demonstrate multiple domains that have numerous relationships that occur at many levels, from the individual to government.^{9,32} The studies identified in this review demonstrate an approach to facilitate a manageable research design by selecting simpler components of

resilience theory in the first instance. However, caution does need to be taken with a reductionist approach. In simplifying an understanding of resilience, the risk is omitting variables related to the context of the disaster, or the public health strategy, or characteristics of the affected population. This approach may influence the generalizability of the results and the capacity to measure effect. Consequently, Boon and colleagues argue for a design that incorporates a variety of methods that collect data from a range of ecological levels at baseline, which is followed up during the recovery time.⁵

The unpredictable nature of disasters creates a particular challenge for research into resilience interventions. Both the interventions themselves, and the opportunity to implement them, may emerge throughout the disaster. Researchers are required, therefore, to be alert and to preplan, or have the flexibility to design naturalistic projects. Study designs and evaluation frameworks in disaster resilience need to be flexible enough to accommodate emergent interventions and contextual variations; comprehensive enough to capture process data including intervention integrity, as well as impact and outcome data (both intended and unanticipated); and rigorous enough to provide sufficient strength of evidence to establish causality.²⁶

CONCLUSIONS

This systematic review highlighted a gap in the evidence relating to interventions targeting the resilience of adults who have experienced a disaster. Only 8 intervention studies were identified that met the inclusion criteria. These studies used a variety of strategies to enhance resilience based on either providing information, promoting social interactions, or developing community competence. The results were mixed in relation to information provision but promising for strategies that promote social interactions or develop community competence. However, the strength of evidence was low and the results should be considered inconclusive. Future studies could explore the ability of interventions to build the intrinsic capacity of a system, community, or society at risk of a disaster to adapt and survive. To date, the evidence that the construct of resilience is being translated into evidence-based practice has been minimal.

About the Authors

School of Health Sciences, University of South Australia, Adelaide, South Australia (Dr Van Kessel); Southgate Institute for Health, Society and Equity, and School of Medicine, Flinders University, Adelaide, South Australia & Jack Brockhoff Child Health & Wellbeing Program, University of Melbourne (Professor MacDougall); and Jack Brockhoff Child Health & Wellbeing Program, Centre for Health Equity, University of Melbourne, Melbourne, Victoria (Associate Professor Gibbs).

Correspondence and reprint requests to Gisela van Kessel, DrPH, MHSM, Division of Health Sciences, School of Health Sciences, City East Campus, Rm C-7-67, Level 3 – Centenary Bldg, Frome Rd, Adelaide SA 5000 (E-mail: Gisela.VanKessel@unisa.edu.au).

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