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Emotional and personal resilience through life

Future of an ageing population: evidence review

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Emotional and personal resilience through life

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Executive summary

This Evidence Review examines the evidence for factors influencing emotional and personal resilience in later life.

Operationalised definition of resilience

The definition used (Windle, 2011: 163) is: “The process of effectively negotiating, adapting to, or managing significant sources of stress or trauma. Assets and resources within the individual, their life and environment facilitate this capacity for adaptation or ‘bouncing back’ in the face of adversity.”

Resilience is operationalised as a significant challenge; an obvious sign of (di)stress; maintenance of a life of meaning and satisfaction (a sign of bouncing back); active participation in life (a sign of managing); and a sense that current life is positive (a sign of adaptation).

The factors of resilience – individual, community and societal – can be understood within an ecological framework (Windle and Bennett, 2012; Donnellan *et al.*, 2014).

Systematic review of resilience

Fifty-six papers met the review criteria. Resilience was defined as a trait or as bouncing back from adversity. Five domains were identified: physical health, mental health, later life, bereavement and trauma. Resilience was considered a predictor of well-being, as a mediator or moderator between adversity and well-being, or as an outcome. Resilience was enhanced by personal characteristics, by social support and social networks, and support services, culture and spirituality. These resources can be understood within an ecological framework, where individual, community and societal resources interact to promote resilience. The review identified additional factors including the influence of pre-late life experiences, multiple life events, gender, age and socio-economic factors.

Systematic review of interventions for resilience

Eight papers were identified. Interventions included bibliotherapy, t'ai chi, occupational therapy and relaxation. Two trials are awaiting results.

Review of the grey literature

The review of the grey literature showed that government, the NHS and the third sector recognise resilience for older adults.

Conclusion

There are some universal factors that facilitate resilience, but more work is needed in a British context.

Changing factors influencing resilience to 2025 and 2040

The extended working life and other political and policy changes were identified. Changes in dementia and physical and mental health were also important, as were community, cultural, social and technological changes. Technological advances and as yet unimagined influences were also identified.

I. Aims of the Evidence Review

The Evidence Review was commissioned by Foresight and its aims were agreed at proposal stage. They were to examine the evidence for factors influencing emotional and personal resilience in later life and to:

- propose an operationalised definition of resilience;
- systematically review peer-reviewed literature on personal and emotional resilience;
- draw on evidence that focuses on pre-late life resilience, ecological resilience, interventions and the grey literature;
- consider the impact this will have on factors likely to change to 2025;
- consider the impact this will have on factors likely to change to 2040.

2. Definition and operationalisation of resilience

2.1 Definition of resilience

The term 'resilience' is one that has come into common parlance, and is used to mean many things to many people. In general dictionary definitions it is used to mean a person recovering easily and quickly from misfortune or illness. It is often used by lay people to mean being able to withstand stressful situations. However, these definitions are too vague and as a consequence are unhelpful. Turning to more academic definitions and conceptualisations, there are two approaches to resilience. Psychological resilience is defined in two ways – as a trait moderating stress and enhancing adaptation (Windle, 2011). In this view, resilience is inherent in an individual. Resilience can be defined as reduced vulnerability to environmental risk experiences, the overcoming of a stress or adversity, or a relatively good outcome despite risk experiences (Rutter, 2012). Luthar *et al.* (2000) suggest that resilience is defined as the ability to bounce back from adversity, and there are variations on that theme such as flourishing in the face of adversity (Hildon *et al.*, 2008). Key to all of these definitions, whether as a trait or as an outcome, is that some challenge or adversity must be present for us to know whether someone is resilient or will respond resiliently until they are faced with a challenge. Thus, it differs from other conceptualisations of well-being, and optimal or successful ageing. It is important, therefore, to keep a clear and tight focus on resilience, or else the Evidence Review becomes diffuse and unfocused. It is important to note, however, that the majority of people reaching later life will have experienced major challenges, and will continue to face them – and increasingly so.

One of the greatest challenges in the field of resilience is the variety of definitions of resilience used in research and in practice. It is also the case that researchers often don't define resilience clearly, or indeed at all, and often researchers refer in passing to resilience but without evidence or use it in lay person's terms. Thus it's important to frame any Evidence Review using clear definitions.

The positioning of this Evidence Review draws on the extensive work of the Resilience and Healthy Ageing Network, funded by the MRC (<http://resilience.bangor.ac.uk>). The aim of the network was to bring together researchers, practitioners and lay people to identify to what extent resilience was determined by community, individual and biological characteristics, and to examine how resilience could best be defined, conceptualised and measured. In addition, it aims to examine how resilience could be developed, maintained and enhanced to reduce health and social inequalities across the life course. This Evidence Review focuses on the individual and community levels (because as demonstrated, they are intertwined), on enhancing resilience, and on later life.

Following an extensive conceptual review (Windle, 2011), the following definition was adopted by ResNet, and this definition is adopted here (Windle, 2011: 163):

The process of effectively negotiating, adapting to, or managing significant sources of stress or trauma. Assets and resources within the individual, their life and environment facilitate this capacity for adaptation or 'bouncing back' in the face of adversity.

Although this definition suggests that resilience is a process, it is suggested here that resilience is an outcome that comprises sub-outcomes, i.e. people may achieve resilience and then face further challenges that must be met. For example, in work on dementia carers there is evidence that carers may become resilient but then they may be faced with further challenges that need to be overcome (Donnellan *et al.*, 2014). Resilience is dynamic (Kalisch *et al.*, 2014).

The Evidence Review focuses on emotional and personal resilience. For the purposes of the review these are considered to concern primarily resilience as it affects an individual (as opposed to a community, country or region), and the focus is on those aspects of resilience that are associated with psychological, health, emotional and social well-being. An ecological framework is used, developed out of the ResNet work, which is described in more detail below (Figure 1). The focus of the review is on the individual and where relevant the interaction with the community; it doesn't cover basic biology or neuroscience.

2.2 Operationalisation of resilience

It is important to operationalise the definition – research often does not do that. Drawing on ResNet and on the author's work, the definition is operationalised here (Bennett, 2010; Donnellan *et al.*, 2014) and so resilience is operationalised by:

- a significant challenge;
- no obvious sign of (di)stress;
- maintenance of a life of meaning and satisfaction (bouncing back);
- active participation in life (managing);
- a sense that current life is positive (adaptation).

The focus is on personal and emotional resilience.

2.3 Ecological framework

The factors of resilience (individual, community and societal), can be understood within an ecological framework (Windle and Bennett, 2012; Donnellan *et al.*, 2014) adapted in Figure 1. The model illustrates how individual resilience is understood in relationship to other levels of resilience. Each of the levels can be seen in light blue. Dark blue text highlights those aspects of each level for which evidence emerges from the review.

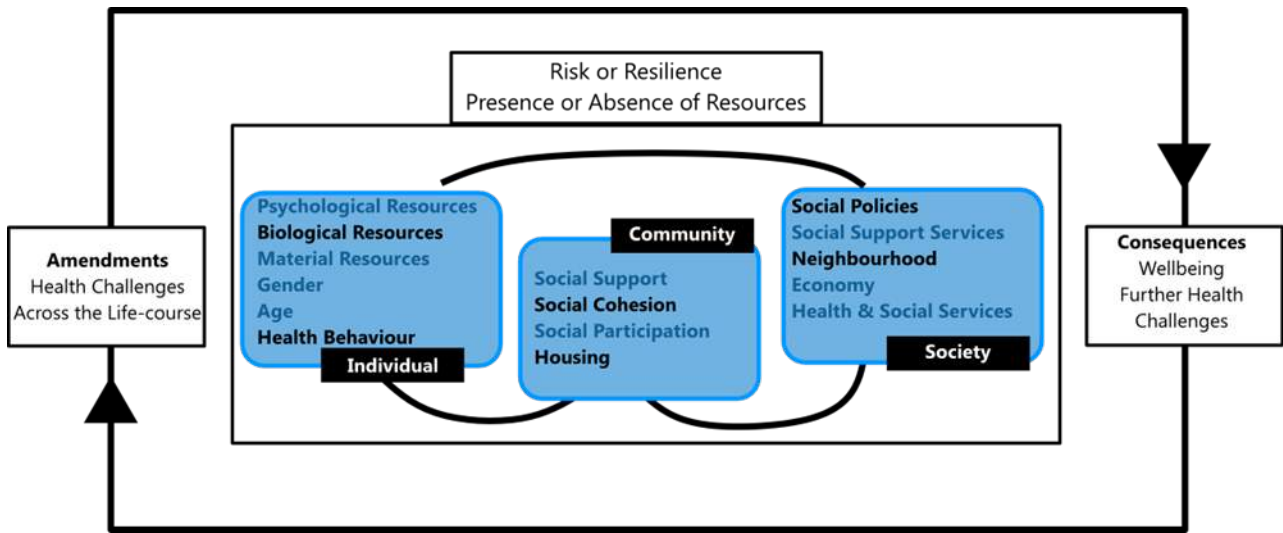


Figure 1: Ecological model of resilience

3. Systematic review of emotional and personal resilience

3.1 Review objectives

The literature on mental capital, psychological well-being and quality of life is vast. However, this review aims to identify the factors that influence emotional and personal resilience in later life, and the associations between resilience and health, productivity and well-being. Thus, the review only considers evidence if it refers directly to resilience and where it measures or explores resilience specifically. It is beyond the scope of this review to examine whether papers infer resilience.

3.2 Methods

In order to focus the review on personal and individual resilience in later life, a mixed methods systematic review was conducted. The search strategy focused on peer-reviewed journal articles published between 2004 and 2014, although key papers published before 2004 were included. In addition, hand searches were undertaken for the following journals: *Journal of Aging Studies*, *Journal of Health Psychology*, *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *Psychology and Aging*, and *Aging and Mental Health*. The inclusion and exclusion criteria are shown in Table 1. Only papers that included the terms 'resilience', 'resilient' or 'resiliency' were included. We also focused our search on older adults but did not exclude papers if they were relevant to later life. Key words included:

AB=Resilien* and ((AB=Elderly) or (AB=aged 65+*) or (AB=Older Adults)) and ((AB=social) or (AB=individual) or (AB=psy*) or (AB=emot* or AB=pers*))

Databases included: MEDLINE, Global Health, CINAHL Plus, PsycINFO, PsycARTICLES, AMED, Scopus, Academic Search Complete, Science Direct, Science Citation Index, and Social Science Citation Index. The ResNet bibliography was used ([http://resilience.bangor.ac.uk/Bibliography%20 final .pdf](http://resilience.bangor.ac.uk/Bibliography%20final.pdf)).

The initial selection criteria were broad to ensure that as many studies as possible were assessed ($n = 455$). Titles and abstracts were assessed and articles not relevant were excluded, for example if they did not address later life ($n = 220$). We then read the remaining articles in detail ($n = 101$). Further exclusions were made if they did not explicitly measure or explore resilience in any substantial manner, or if their focus was not on personal or emotional resilience. Fifty-six articles were found to address resilience in later life. Of those 19 were qualitative, 36 were quantitative and one used mixed methods (Figure 2).

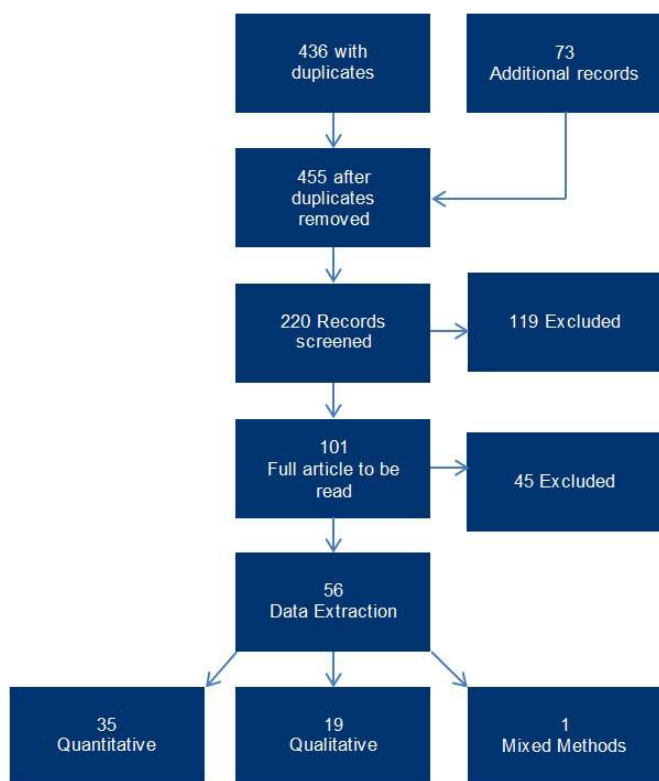


Figure 2: The article selection process

Table 1: Inclusion and exclusion criteria for the systematic review

Inclusion criteria	Exclusion criteria
Participants aged 55 years and over	Participants all aged 54 and under
Peer-reviewed journals	Paper not available in time frame
Published since 2004	Measurement scale development
Empirical study	Not community, geographical or biological resilience
English language	Not developing world unless universal issue

3.3 Results of systematic review

3.3.1 Domains in which resilience is studied; how it is measured and explored

The papers in the systematic review cover five main domains: physical health, mental health, well-being and dementia, bereavement, trauma, and older age more generally (Table 2). Surprisingly few focus on mental health and well-being. More than half of the papers included a validated measure of resilience [e.g. papers by Ong *et al.* (2004, 2010a,b); Wells (2009, 2010), Wells *et al.* (2012)]. As Windle *et al.* (2010) point out there is no gold standard for the measurement of resilience and most focus on psychological resilience. Other studies infer resilience using the relationship between high burden or demand and high well-being or low depression (e.g. Hildon *et al.*, 2008; Galatzer-Levy and Bonanno, 2012). In qualitative studies

resilience is either discussed in the introduction or emerges clearly from the analysis. Papers in the review are listed in Appendix 1, Section A.

Table 2: Resilience domains by method

Domains	Method	
	Quantitative and mixed methods	Qualitative methods
Health	11	7
Mental health/well-being/dementia	5	3
Older adult	15	5
Bereavement	5	2
Trauma	1	2
Total	37	19

3.3.2 The role of resilience

As we have seen from the definitions, the evidence suggests that resilience is viewed either as a trait or psychological resource (Ong, 2010b), or as an outcome (Rutter, 2012). There are also some studies that identify resilience as a moderator or mediator between adversity and later life outcomes.

Some studies work from the premise that psychological resilience is a trait ($n = 17$), and thus acts as a protective factor against challenging situations. These papers do not focus on means of enhancing trait resilience, and therefore are less useful than other work from a policy or practice standpoint.

Research also examines whether resilience moderates or mediates the relationship between adversity and later life outcomes. Resilience may have a moderating effect on later life: it is effective when high degrees of adversity are encountered, buffering the negative effects of the adversity on health. On the other hand, mediation suggests that resilience directly benefits later life, regardless of the degree of adversity. Work examining caregivers categorised resilience as a high care burden and low care demands (Gaugler *et al.*, 2007). They found that resilience was lower when the carer had greater instrumental needs, the care recipient lived at home and had greater cognitive impairment. Interestingly, those with higher income and education were also less resilient. In turn lower resilience predicted institutionalisation and greater likelihood of the death of the care recipient. On a more positive note volunteering, as a proxy for resilience, moderated the relationship between role absences and purpose in life (Greenfield and Marks, 2004), suggesting that involvement in community activities enhanced well-being. In a Welsh study, Windle *et al.* (2010) found that a resilient personality moderated the relationship between ill health and well-being for all but the youngest old (50–59 years). However, there were age differences. For those in their 60s resilience helped maintain well-being in the face of increasing ill health, but this was less so for those aged 70 and over. Psychological resilience (and positive affect as a resilience factor) has also been found to moderate the relationship between pain and physical function (Strand *et al.*, 2006; Torma *et al.*, 2013). In widowhood trait resilience

mediated the relationship between loss and life satisfaction and moderated the effects of bereavement and well-being in situations of high stress (Rossi and Bisconti, 2007). From a policy position those studies which highlight positive affect or volunteering are more valuable because they point to potentials for intervention. In a longitudinal study, Landes *et al.* (2014) found that following childhood adversities, mid-life generativity (guiding the next generation), as an example of resilience, mediated the relationship between childhood adversities and adjustment to ageing, and moderated the relationship between social class and adjustment to ageing. Contrary to previous thought, Jopp and Rott (2006) found that psychological resilience did not reach a critical limit in advanced old age. The relationship between resilience and resources was mediated by self-efficacy and optimism.

With the exception of Windle's work none of the studies discussed so far have been British and only two have been European; the rest have been from the USA. However, all of the findings are relevant to a British context.

In the context of the ecological model most of the papers focus on the individual. However some studies, those focusing on care, generativity and volunteering, underscore the interaction of individual and community resources in the facilitation or hindrance of resilience.

3.3.3 Facilitators of resilience

Using the ecological framework of resilience (Figure 1), the findings of the systematic review are examined in terms of individual, community and societal factors that promote or hinder resilience in older adults. Although the papers concern a range of domains as outlined earlier, from broad domains such as later life per se and physical and mental health, to specific areas such as trauma and bereavement, there are no findings that appear only relevant to one domain. That is to say, these facilitators are likely to be transferable from one domain to another.

Individual factors

A range of individual factors that promote resilience were identified in the research. First, a number of psychological factors are found amongst those who are resilient. These include the trait of psychological resilience already discussed (Ong, 2004). Psychological resilience as a personality trait may be a component of resilience as an outcome but is neither necessary nor sufficient for resilience.

A number of studies have identified other psychological factors that promote resilience, including positivity and optimism. For example, Karoly and Ruehlman (2006) found that resilient individuals with chronic pain were more likely to report higher control perceptions. Harris (2008) found that resilient people with dementia were more likely to display a positive attitude and Emler *et al.* (2011) found that optimism was associated with resilience in older adults with HIV/AIDS (see also Bennett, 2010). Others have found that positive self-concept, high self-esteem and self-reliance were also associated with resilience (Harris, 2008; Lee *et al.*, 2008; Cheung and Kam, 2012; Ferreira *et al.*, 2012). Determination and flexibility and compassion were also important (O'Dwyer *et al.*, 2013). In a UK study comparing older and younger participants, resilience in older participants was predicted by emotional regulation (Gooding *et al.*, 2012).

As with the early mediation studies, generativity and productivity have also been identified as important factors promoting resilience. Becker and Newsom (2005), in a study of chronically ill Black Americans, found that their participants emphasised the importance of generativity to their

resilience in the face of adversity. This was also found to be the case amongst older people with HIV/AIDS (Emlert *et al.*, 2001), those experiencing hospice care (Nelson-Becker, 2006) and survivors of Hurricane Katrina (Thomas, 2012). Harris (2008) found that resilient people with dementia also emphasised the importance of maintaining social investments.

A strong philosophy or life view was also seen as an important resource in resilience. For example following a stroke, Filipino people who were resilient reported the conviction or belief that they could bounce back from adversity (de Guzman *et al.*, 2012). Others found that those who reported willingness to face challenges head on were more likely to be resilient (Kinsel, 2005). Openness and openness to uncertainty were also important views on life that promoted resilience (Nelson-Becker, 2006; Cheung and Kam, 2012). Reinterpreting the past in the light of new experiences was also an important factor in resilience (Hildon *et al.*, 2008). Relatedly, Heppenstall *et al.* (2013) found that experiencing prior hardship was also related to resilience. One specific aspect of life view which occurs throughout the literature is the role of spirituality (e.g. Harris, 2008; Vahia *et al.* 2011; Cheung and Kam, 2012; de Guzman *et al.*, 2012; Manning, 2013). This is important because it appears in studies across a variety of cultures, countries and ethnic groups, although it is not present in the British studies.

There is a small niche of work, coming from related groups, which focuses on resilience in widowhood and that suggests resilience is a more frequent outcome than might be expected (Bonanno *et al.*, 2002; Boerner *et al.*, 2005). The majority of this work does not focus specifically on the characteristics of resilience, rather it focuses on the trajectories. However, in their most recent work, they do find that financial strain predicted depression across all groups, including the resilient group, and that health status in particular predicted depression in the resilient group (Galatzer-Levy and Bonanno, 2012). These findings are important because they suggest that even resilient people can be at risk of poor well-being, and that resilience is a dynamic process.

Finally, three other factors are also identified in the research reviewed. Two are related – O'Dwyer *et al.* (2013) highlight the role of information seeking amongst resilient people, and Donnellan *et al.* (2014) found that resilient dementia carers were more likely to be knowledgeable and to stress their knowledge in comparison to non-resilient participants. Thus the role of expertise or wishing to be an expert appears to be important in resilience. Netuveli *et al.* (2008) found that women were more likely to be resilient than men. It is interesting to note that other studies, where men and women are compared, do not note this gender difference.

Although this section has focused on individual resources, some of the factors identified also have linkages with both community and societal resources. Generativity, while an individual resource, is dependent on and contributes to, community level resources. This is true also for the maintenance of social investments. As Antonucci (1990) suggests, the giving of social support is as important as the receipt of support for psychological well-being. The influence of spirituality on resilience also links to societal level resources such as culture and religion.

As before, few of these studies have been conducted in the UK (Hildon *et al.*, 2008; Netuveli *et al.*, 2008; Bennett, 2010; Gooding *et al.*, 2012; Donnellan *et al.*, 2014). For the most part the individual resources that have been discussed are relevant to the UK, with perhaps the caution that spirituality is maybe less well articulated amongst some sections of the British population. More work is needed to see what influence spirituality has on resilience within a UK population.

Community factors

The reviewed papers not only identified individual factors that contributed to personal and emotional resilience but also, often within the same paper, identified community factors that facilitate resilience.

One of the most important factors highlighted by the review is the provision of social support and strong social networks. Papers found that both strong and large social networks made significant contributions (both in the statistical and non-statistical senses) to resilience. For example, Fuller-Iglesias *et al.* (2008) examined the role of social relations in contributing to resilience in multiple adversities (see Harris, 2008; Emlet *et al.*, 2011; Gooding *et al.*, 2012). Larger social networks promoted resilience. Wells (2009) found correlations between resilience, social network and physical health. However, much of the research focused on social support, i.e. the functional aspects of social relationships. Social support, both emotional and tangible, was found to promote resilience (Károly and Ruehlman, 2006; Harris, 2008; Netuveli *et al.*, 2008; Hildon *et al.*, 2008; Heppenstall *et al.*, 2013). Both family and friends were identified as important sources of support in relationship to resilience (Bellamy *et al.*, 2014). Cheung and Kam (2012) found that family support was important for Hong Kong Chinese. In other studies the quality of the spousal relationships is also important in supporting resilience (Fuller-Iglesias *et al.*, 2008). However, Donnellan *et al.* (2014) found in a UK study that friends were a more important source of support in terms of resilience than family. Family could challenge the independence of the dementia carer.

A number of studies also examine the role of formal support in relationship to resilience. Nakashima and Canda (2005) found that supportive care relationships were an important factor in resilience amongst people with dementia. Bennett (2010) found that both formal and informal support was common amongst resilient widowers, and was especially helpful when widowers were initially struggling with their bereavement. Heppenstall *et al.* (2013) found that following the Christchurch earthquake the involvement of statutory organisations was important in facilitating resilience. Interestingly, Bellamy *et al.* (2014) discovered that bereaved older people found formal support services less helpful with respect to resilience than informal support. Donnellan *et al.* (2014) also suggest that the availability of social support, both formal and informal, is not always sufficient to promote resilience; people need to be able to and indeed want to access them. Bennett (2010) also suggested that the time had to be right for intervention; support might be rejected if offered too early but on the other hand it could be offered too late.

A third strand of community resources that promote resilience concerns social participation. Thomas (2012) found that following Hurricane Katrina, resilient older adults were able to activate resources, and create a sense of community. Likewise, amongst dementia caregivers, social participation and involvement in the care community was associated with resilience (see Donnellan *et al.*, 2014). Ferreira *et al.* (2012) found that social bonding promoted resilience and Kinsel (2005) emphasised social connectedness.

Although most of the research has not been conducted in the UK, the role of community factors such as social networks, support and participation are likely to be universal across countries and culture. The British work by Netuveli *et al.* (2008) and Hildon *et al.* (2008), working from the same group, both found social support to be important. Bennett (2010) and Donnellan *et al.* (2014), working from a different British group, found that social support (both formal and informal) was important. However, Donnellan *et al.* (2014) also found that friends contributed more to resilience than family (and this is currently being explored in more detail). Thus, there is

a need for a more detailed exploration of the relationship between social support and resilience, especially within a British context.

Societal factors

Research suggests several societal level factors contribute to personal and individual resilience. As already mentioned, with respect to individual factors, spirituality was discussed in many studies, but not in British ones. It is unclear how far this represents a genuine difference between other societies and Britain. None of the studies specifically examined organised religion, which could be seen to be a societal level factor. However, it would be important to investigate this with respect to Britain to discover whether or not it makes an important contribution to resilience.

Some of the studies, for example Lee *et al.* (2008) and Thomas (2012), found that culture was an important facilitator of resilience. The former study examined Korean immigrants to the USA and their daughters, and the latter African Americans following Hurricane Katrina. Their experiences as ethnic minorities may be transferable in some way to British minority ethnic groups. Similarly it may be possible to learn from the experiences of Hong Kong Chinese and Filipinos (Cheung and Kam, 2012; de Guzman *et al.*, 2012), at least in respect of ethnicity and resilience.

Other societal factors that contribute to resilience included the role of formal or statutory services such as respite care, health and welfare services, and other services such as fire and rescue. For example, Heppenstall *et al.* (2013) found that engagement with statutory services promoted resilience following the Christchurch earthquake. O'Dwyer *et al.* (2013) found that use of respite was associated with resilience amongst dementia caregivers, and Donnellan *et al.* (2014) also found that dementia caregivers who engaged with services were more resilient. On the other hand, Bellamy *et al.* (2014) found that bereaved participants questioned the value of formal services. This raises the question of whether services are always appropriate and also whether they vary by the nature of the challenge.

Three other societal resources were raised in the research. Lee *et al.* (2008) emphasised the importance of education in Korean immigrants to the USA. Cheung and Kam (2012) also found that living conditions in early life were an important factor in resilience in older Hong Kong Chinese. Of particular interest was the finding by Netuveli *et al.* (2008) in a British study that socio-economic status was not an important factor in resilience, and Gaugler *et al.* (2007) found in caregivers that higher levels of both income and education were associated with lower levels of resilience. Thus, the relationship between some societal factors and resilience is more complex than might be first thought.

It is at the societal level where the resilience is most influenced by cultural and social structures and policy. Thus, evidence from research from one country may not be transferable to another. In the review, only seven papers were from British studies, and of those only three considered societal level factors (Hildon *et al.*, 2008; Netuveli *et al.*, 2008; Donnellan *et al.*, 2014). Thus, more work needs to be undertaken to understand the societal influences on personal and individual resilience in a UK context.

Interactions between individual, community and societal factors

Individual factors alone are not always sufficient to promote resilience. More often it is the relationship between individual and community factors such as social support and networks that has enhanced resilience. Alternatively, societal factors including the provision of services or

support groups and religious culture have important roles to play, and in interaction with other levels of resource. These interactions are evidenced by the papers that have been discussed. For example, Netuveli *et al.*'s (2008) work focuses on community and society level factors, Karoly *et al.* (2006) on individual and community factors, and the work by Cheung and Kam (2012) refers to individual, community and societal factors.

3.3.4 Additional factors

In addition to the research identified in the systematic review, there are also additional factors that influence resilience in later life, which have only been touched on so far. These include both the influence of prior experience and the influence of multiple challenging events.

Older people do not arrive at later life without having experienced challenges, and challenges are necessary for resilience to develop. Many older British people were influenced by the challenges of World War II. Participants grew up with financial hardship, and at times when educational opportunities were widening. Women have experienced change as traditional gender roles become less entrenched and as they have entered the workforce in greater numbers. Retirement, and the extended working life, pose challenges to retirement (Hildon *et al.*, 2008). Demographic changes have posed challenges for older people, with higher rates of divorce and longer lives. Changes to health and welfare, improvements in the standard of living, and medical advances have meant that older people are living longer but often carry with them ill health, or caring responsibilities (Nelson-Becker, 2006; O'Dwyer *et al.*, 2013). Any of these experiences provide older people with the opportunity to develop resilience. They may have life-long resilient traits such as positivity, but they may also have developed resilience as they have aged either through their own actions, interactions with other people and support from voluntary and statutory agencies, or the influence of social policy and wider culture, such as religion or ethnicity (Bennett, 2010).

As the systematic review has demonstrated, most resilience literature has focused on a single domain, although some have focused on ageing more generally. Little work has focused on the impact of multiple challenges (Fuller-Iglesias *et al.*, 2008). However, as people age they may face multiple challenges such as bereavement, poor health and caring responsibilities. Rutter (2012) suggests that multiple exposures to adversities may have a steeling effect. Seery *et al.* (2010) found that people with some lifetime adversity reported better well-being outcomes compared to those with high levels of adversity but also compared to people with no experience of adversity. Thus, some adversity may foster resilience. Further research is needed to understand steeling effects, and whether there may be a tipping point where a once resilient individual is no longer able to maintain resilience.

One of the aims of the review was to examine resilience within a British focus. This is challenging because only seven papers reported British research. Those seven papers did not reveal findings that would suggest, for example, regional differences. For example, Windle *et al.*'s work (2008, 2010) was on a Welsh sample but the findings were generalizable to other populations; this is true for Gooding *et al.*'s (2012) study. The work by Netuveli *et al.* (2008) and Hildon *et al.* (2008) was taken from the Boyd-Orr cohort and thus was not regionally based. The work of Bennett (2010) and Donnellan *et al.* (2014) was conducted in the East Midlands and North West of England, but again the findings were not regionally specific. Well's (2010) American study on rural, urban and suburban influences on resilience found no differences. This may also be the case in the UK.

While those papers that have considered ethnicity and migration have not been British or European, there are issues which are relevant to a UK context. Work conducted in Hong Kong and China may have relevance to older Chinese migrants living in the UK. US studies of African Americans may be relevant to people of African descent living in the UK. An important feature is the importance of spirituality and of organised religion, which may have relevance to some British communities. Also potentially relevant is the experience of migration on resilience. However, it is clear that relatively little is known about ethnicity, culture and migration and its influence on resilience, especially within the British context.

The evidence related to the impact of gender is mixed. One study suggests that men are more resilient (Fuller-Iglesias *et al.*, 2008), while another suggests the reverse (Netuveli *et al.*, 2008). More studies examine women than men. The more important question is which adversities are more likely to affect one gender or another, and how do they differentially deal with them, and how do they promote resilience? In bereavement studies the factors that promoted resilience did not appear to be gender specific (Bennett, 2010). However, Donnellan *et al.* (2014) found a higher proportion of the male dementia spousal carers were resilient. Thus, it may be necessary to look at gender and resilience in a domain-specific context.

Socio-economic factors are examined in several studies. Although one might expect that socio-economic factors may play a role in resilience, the evidence suggests that this is not the case. However, other factors such as employment and neighbourhood do impact resilience. Employment appears to foster resilience, although the effects of the extended working life and phased retirement have not yet been studied. Strong neighbourhoods and neighbourhood cohesion are shown to enhance resilience.

Papers have focused on adults over the age of 65, and many studies have assumed that people over this age are homogeneous. This is not the case, and it is likely that the resilience will be influenced by age differentially (Windle *et al.*, 2010). Only one piece of evidence has focused on the oldest old, finding that there was not a finite capacity resilience with respect to age (Jopp and Rott, 2006). More work is needed to examine the differential effects of ageing on resilience.

4. Systematic review of interventions

Peer-reviewed papers were examined reporting programmes designed to enhance resilience or where resilience was a component of an intervention to improve well-being. As with the more general review above, the strategy was to focus only on those that explicitly aimed to enhance resilience and which focused on older adults. While there are many interventions to increase well-being and quality of life in later life, most do not target resilience in any specific way. It is important that this review focuses on the evidence on resilience rather than speculate whether an intervention may facilitate resilience or not.

The search strategy seeks to examine peer-reviewed data and only considers those interventions which explicitly target resilience (or resiliency, or intend to make people more resilient). Key words included:

AB=Resilien* and ((AB=Elderly) or (AB=aged 65+*) or (AB=Older Adults)) and ((AB=Intervent*) or (AB=promot*) or (AB=factor)) or ((ab=associat) or (AB=determin*) or (AB=relat*) or (AB=predict*) or (AB=review))

The ResNet review of interventions was also used:

[http://resilience.bangor.ac.uk/Intervention%20tables%20 final .pdf](http://resilience.bangor.ac.uk/Intervention%20tables%20final_.pdf)

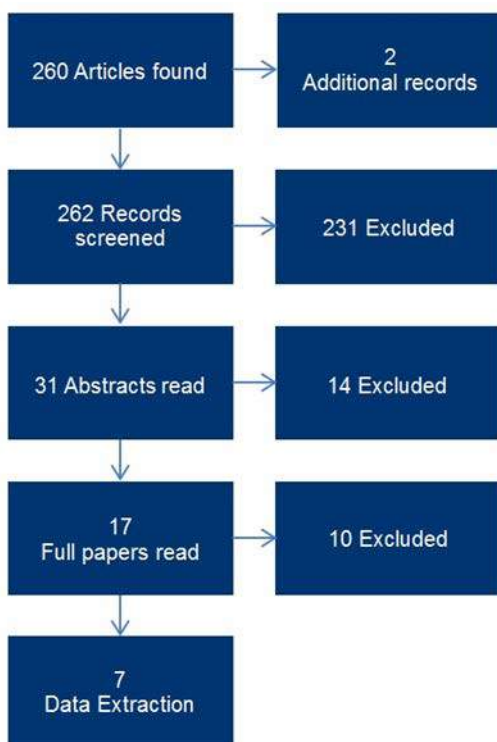


Figure 3: The article selection process for resilience interventions

Two hundred and sixty-two articles were identified in the initial search. Of these, 231 were excluded on the basis of their title. Abstracts of the remaining 31 were read, and 14 were excluded. The remaining 18 articles were read in detail. However, only seven peer-reviewed articles met the criteria for inclusion in the review. Thus, there were surprisingly few

interventions that targeted resilience which were directed at older adults. Papers are listed in Appendix 1, Part B.

Two interventions targeted depression. Songprakun and McCann (2012) report the effectiveness of a self-help manual for adults with moderate depression. Their results indicated that bibliotherapy was effective in increasing resilience. Konradt *et al.* (2013) found that a humour intervention improved depressive symptoms and there was a trend for improvement in resilience. Sun *et al.* (2014) report a t'ai chi intervention for heart failure patients. They found that participating in t'ai chi for 6 months improved outcomes in domains including resilience, although improvements were small. Resnick *et al.* (2011) report a cluster-randomised trial of assisted care staff and residents focusing on functional care. There was no improvement in resilience although residents had high levels of resilience at baseline. Vranceanu *et al.* (2013) report an intervention focusing on the management of pain: the Relaxation Response (RR) Resiliency Program. However, the resiliency component is unclear. Results indicate improvement in dimensions of pain, and mental and physical health.

Two trials are currently under way. Sprange *et al.* (2013) report a UK-based intervention to improve mental well-being of older adults. The intervention is a community-based occupational therapy intervention. Although the primary outcome is mental health, a secondary outcome is resilience. Clark *et al.* (2011) report a 4-year intervention targeting healthy lifestyles. The intervention uses a manual, telephone coaching and newsletters. A secondary outcome is resilience.

To conclude, there are few interventions that incorporate resilience, either as a component or as a secondary outcome, and none are designed specifically to enhance resilience in older adults. Clearly there is a need for further development which targets resilience in older adults that is well designed and well specified.

5. Grey literature

5.1 Which grey literature was examined?

The search for grey literature focused on British reports. Once more only reports that explicitly discuss resilience and focus on later life were included. Searches were made for reports published by central and local government, the NHS and the third sector. The search revealed 20 reports, of which nine were relevant.

5.2 Results from the grey literature

Cheshire West and Chester District Council focused on the oldest old and on integrated needs assessment (Cheshire West and Cheshire NHS Trust, 2005). They aimed to encourage communities to build resilient support networks and offer practical support for older family/neighbours/friends, using 'community navigator' roles. In the South East, an NHS report focused on promoting emotional resilience in the population and amongst those at risk from mental health problems (Nurse and Campion, 2006). They recommended a lead in each NHS Trust and local authority.

Ward *et al.* (2012) reported on participatory research in Brighton where one theme was developing resilience. Participants discussed the ways in which past experiences helped them to cope, and the importance of positivity. A report on preventing social isolation and isolation (Callan, 2013) suggested that resilience was important for well-being. The emphasis was on family rather than individual resilience. The Mentoring and Befriending Foundation (2011) suggested that individual time-limited befriending packages could help individuals to become more socially and emotionally resilient. Wealleans (2013) argued that personal resilience is important in increasing well-being but that people may need to work at becoming resilient. Factors in promoting resilience were close family networks, established communities and social support networks.

The Young Foundation identified factors in personal and community resilience including friends and family; making decisions; regularly talking to people; and feeling able to overcome difficulties (Mguni *et al.*, 2012). Unemployment best predicted low resilience. Amongst older adults they found high levels of well-being but low resilience, which was a paradox. Another report (co-produced with MIND; Mguni *et al.*, 2013) focused on an intervention to increase resilience amongst unemployed men. The group intervention worked to enhance coping strategies, improve social networks, and encourage participation in activities to foster well-being. The outcomes are not reported.

A report by UCL on behalf of the ESRC Priority Network on Capability and Resilience (Bartley, 2006) summarised a 3-year programme on resilience across the lifespan. One project focused on social support and social participation in older adults and the benefits to well-being. They both point to implications for policy that include facilitating longer working lives, flexible retirement, continuing education and for GPs to be aware of the quality of a patient's relationships.

6. Changing factors influencing resilience to 2025

6.1 Extended working life

A key finding in the review was the importance of generativity. Generativity and productivity can be viewed similarly, especially if defined broadly. Generativity may be influenced by changes in the working life, especially around the extended working life and phased retirement. It is likely that for many older people an extended working life with accompanying flexibility may promote resilience. On the other hand, if extended working is not by choice or comes with accompanying health difficulties, it may undermine resilience. Generativity and productivity may also be unpaid, such as volunteering, grandparenting and caring. The former two are likely to promote resilience; the latter may provide some opportunities for resilience but also challenges.

6.2 Dementia and mental health

As the population lives longer, more people will live longer with dementia (Department of Health, 2013; Alzheimer's Society, 2014), and more older people will care for people with dementia (Carers UK, 2014). Both challenge resilience, but there is evidence that resilience can develop in both situations. However, it is important to ensure that not only personal resources are in place but also community and societal mechanisms as well. These challenges will continue beyond 2025. As the population ages, other mental health challenges will also increase into old age, including depression, anxiety and psychosis. Resilience is possible for both the individuals with the conditions and for their carers. However, appropriate resources at all levels of the ecological framework will be necessary.

6.3 Demographic changes

A variety of demographic changes will influence resilience. An ageing population and an increasing number of people living into advanced old age will impact on resilience. People are likely to spend some of that time with health problems and disability (MRC-CFAS, 2001), and these challenge resilience. Changes in patterns of marital status and living arrangements are also challenging. Increases in divorce, LAT relationships and never-married status will influence resilience, but as yet there is little evidence to suggest how this will play out (Office for National Statistics, 2009). Changes in ethnicity are also influential as there is evidence that different ethnic groups value different resources.

6.4 Political and policy changes

There are uncertainties at political and policy levels with respect to issues which may impact resilience, and this is also true with Scottish devolution. Changes in welfare and benefits may impact the resilience of older adults. The policy developments with respect to health and social care will also impact on resilience, as will financial austerity, although perhaps in ways that are unpredictable.

6.5 Community, cultural and social changes

As social support from families, friends and support groups was an important factor in resilience, the influence of changes in local communities, geographic mobility and culture are likely to impact on resilience.

7. Changing factors influencing resilience to 2040

7.1 Changes in health

An increasingly older population, and changes in health prevention and in medicine, will all impact on resilience going forward to 2040. While some areas of health and disability will improve, it is also the case that in some areas health may deteriorate as time passes. Increasingly, levels of obesity and diabetes, especially amongst children and current young adults, may impact on the health of older people towards 2040 (Wilding and Halford, 2012). People may be living longer, or indeed living less long, with chronic illnesses (MRC-CFAS, 2011). Managing chronic conditions such as obesity (and its associated conditions) and diabetes will challenge resilience, and impact on resources at community and societal levels. There is a need for accurate health projections that will enable policy and service providers to enhance resilience in the longer term.

7.2 Technological developments

Technological developments that will enhance resilience are moving quickly, and will be influential both before 2025 and afterwards. For example, the use of personalised eHealth and apps to promote resilience are likely developments (McNichol *et al.*, 2015). Devices to promote both individual and community-based interventions are promising. However, as technology moves apace, it is likely that the technological landscape for resilience will be quite different looking forward to 2024. In addition, the current younger generation will be more comfortable with such technology compared with the current older generation.

7.3 Unimagined influences

Finally, there are likely to be as yet unimagined influences on resources, perhaps with respect to the geographic, political and social landscape. However, it is likely that the fundamental components of resilience will remain constant: individual resources; social support and networks; social, health and welfare services and culture.

8. Conclusions

Although the word resilience has come into common usage recently, it has specific meanings in the context of human development and ageing. It is important in examining the evidence to keep in view those specific meanings, otherwise the task of reviewing the evidence becomes both unmanageable and unhelpful. Indeed, the lack of clarity with respect to resilience has been recognised as problematic (Windle, 2011). Within the field of resilience two approaches have been taken. The first suggests that resilience is a psychological trait which then determines outcomes in well-being, for example. The second identifies resilience as an outcome, which is dependent on resources or factors, as identified for example in the ecological model. They are not mutually exclusive – psychological resilience as a trait can contribute to resilience as an outcome (Spahni *et al.*, 2015). However, the weight of this review has focused on resilience as an outcome, because it is more amenable to change and intervention. However, whether resilience is viewed as a trait or an outcome, both require a challenge or adversity to be demonstrated. Most older people, of course, will have faced or will be facing adversity in later life.

The results of the Evidence Review demonstrate that key factors influence resilience. Individual factors such as outlook on life, optimism and spirituality are important. At the community levels, family, social support and social participation facilitate resilience. Finally, at the societal level, culture and service provision are important. It was also evident that these factors from the different levels interact to enhance resilience. Lacking in the evidence were many papers that focused on the British context, although many of the resilience factors are transferable across countries and cultures, but not all. Additional factors such as age, gender, prior experience, multiple adversity and ethnicity were also important.

Striking was the lack of interventions that focused on resilience in later life. In some ways this was not surprising because an earlier systematic review across the lifespan, conducted by ResNet, had similar findings. However, there are two promising trials for which results are awaited. It was pleasing to see that the third sector, NHS and local government were all beginning to recognise the importance of enhancing resilience in later life, although again the term was often used in a fairly loose fashion.

Overall, it is clear that more work is needed on personal and emotional resilience, both with respect to understanding what facilitates it, and how to promote it, especially for older adults and in the British context.

Appendix: Summary of peer-reviewed papers in systematic review

A. Included systematic review papers

Title	Author	Year	Sample	Domain	Resilience measure	Other measures	Definition	Out-come	Results
Resilience in the face of serious illness among chronically ill African Americans in later life.	Becker and Newsom	2005	US African Americans, <i>n</i> = 38, aged 65–91	Health			Adaptation	Yes	Analysis of data coded as philosophy, autonomy, spirituality.
'But I do believe you've got to accept that that's what life's about': older adults living in New Zealand talk about their experiences and loss and bereavement support.	Bellamy <i>et al.</i>	2014	NZ 68% women, aged 71–90	Bereavement			Adaptation	Yes	Four themes: (i) equanimity and resilience; (ii) views of formal bereavement support services; (iii) family and friends; (iv) existing community and religious organisations.
How to achieve resilience as an older widower: Turning points or gradual change?	Bennett	2010	UK <i>n</i> = 23, aged 55–98	Bereavement			Adaptation	Yes	Turning points, gradual change, always resilient. Importance of formal and informal support, personal characteristics.
Resilient or at risk? A 4-year study of older adults who initially showed high or low distress following conjugal loss.	Boerner <i>et al.</i>	2005	US <i>n</i> = 92, aged 65+	Conjugal loss	CES-D	Adjustment, loss	Adaptation	Yes	Resilient group showed most positive picture.
Resident strategies for making a life in a nursing home: a qualitative study.	Brandburg <i>et al.</i>	2013	US <i>n</i> = 21, aged 65–93	Health			Adaptation	No	Personal resilience was identified as the core variable.

Title	Author	Year	Sample	Domain	Resilience measure	Other measures	Definition	Out-come	Results
Resiliency in older Hong Kong Chinese: using the grounded theory approach to reveal social and spiritual conditions.	Cheung and Kam	2012	HK n =15, aged 60+	Ageing			Trait	Yes	Resiliency compromises self-reliance, openness, relaxation and early life experiences – living conditions, family socialisation, religious faith.
Self-concept, disposition, and resilience of poststroke Filipino elderly with residual paralysis.	de Guzman <i>et al.</i>	2012	Philippines n = 9, aged 60–70	Health			Adaptation	Yes	Two themes were conviction and condition. Key characteristics were support network, physical and spiritual measures.
What are the factors that facilitate or hinder resilience in older spousal dementia carers? A qualitative study.	Donnellan <i>et al.</i>	2014	UK n = 20, aged 62–86	Dementia care			Adaptation		Ecological model. Knowledgeable and supported by family but especially friends. More actively engaged with services such as respite care.
“I’m not going to die from the AIDS”: resilience in aging with HIV disease.	Emler <i>et al.</i>	2011	US n =25, aged 50+	Health			Adaptation	Yes	Seven major themes: self-acceptance, optimism, the will to live, generativity, self-management, relational living, and independence.
Resilience among the elderly cared for by the Primary Healthcare Network in a city of Northeast Brazil.	Ferreira <i>et al.</i>	2012	Brazil n = 20, aged 60+	Health users	Resilience scale	Self-esteem, social support, MMSE	Bouncing back/adaptation	Correlation	Correlation between resilience and self-esteem not social support.
Group of elderly as a strategy of resilience empowering of its members.	Ferreira <i>et al.</i>	2014	Brazil n = 13, aged 71–84	Ageing			Adaptation	Yes	Group as empowering of resilience in the elderly, promoting bonds and ties.
Resilience in old age: social relations as a protective factor.	Fuller-Iglesias <i>et al.</i>	2008	US n = 99, aged 65+	Social relations	CES-D	Network size, spousal relations, adversity, personal characteristics	Adaptation	Yes	Larger social support network promoted resilience. A high quality spousal relationship important.

Title	Author	Year	Sample	Domain	Resilience measure	Other measures	Definition	Out-come	Results
Beyond normality in the study of bereavement: heterogeneity in depression outcomes following loss in older adults.	Galatzer-Levy and Bonanno	2012	US <i>n</i> = 92, aged 65+	Bereavement	CES-D	Grief, financial strain, functional health, emotional stability	Adaptation	Yes	Network helped promote resilience.
Resilience and transitions from dementia caregiving.	Gaugler <i>et al.</i>	2007	US <i>n</i> = 1979, mean age = 63	Dementia caregivers	Medicare Alzheimer's disease demonstration evaluation	Care recipient status, resources, context of care	Adaptation	No	Financial strain is a general stressor; functional health predicts variability in resilience.
Psychological resilience in young and older adults.	Gooding <i>et al.</i>	2012	UK <i>n</i> = 120, aged: old 65+ (<i>n</i> = 60) and young 18–25 (<i>n</i> = 60)	Comparison young old	Appraisal	GDS, Beck Hopelessness Scale, MOS, SF-36	Trait	No	Older more resilient group with respect to emotional regulation ability and problem solving. Poor perceptions of general health and low energy levels predicted low levels of resilience regardless of age. Low hopelessness scores predicted greater resilience in both groups.
Formal volunteering as a protective factor for older adults' psychological well-being.	Greenfield and Marks	2004	US <i>n</i> = 373, aged 65–74	Volunteering	None	Negative and positive affect, role absences, purpose in life, volunteer status	Adaptation	Moderation	Volunteering provides a mechanism through which older adults with more role-identity absences in life domains can maintain goals, aims and direction.
Another wrinkle in the debate about successful aging: The undervalued concept of resilience and the lived experience of dementia.	Harris	2008	US 71 year man; 61 year woman	Health			Adaptation	Yes	Assets and protective factors which vary between people.
Impacts of the emergency mass evacuation of the elderly from residential care facilities after the 2011 Christchurch earthquake.	Heppenstall <i>et al.</i>	2013	NZ <i>n</i> = 50 older people <i>n</i> = 34 informal caregivers	Trauma			Adaptation	Yes	Resilience and factors including personal attitudes, life experiences, enhanced family support and social supports.

Title	Author	Year	Sample	Domain	Resilience measure	Other measures	Definition	Out-come	Results
Maintaining mastery despite age-related losses. The resilience narratives of two older women in need of long-term community care.	Janssen <i>et al.</i>	2012	Netherlands Two women, aged 89 and 78	Health			Adaptation	Yes	Three important strengths; perceptions of situation; openness about one's vulnerability; responsiveness to help and support.
Adaptation in very old age: exploring the role of resources, beliefs, and attitudes for centenarians' happiness.	Jopp and Rott	2006	German <i>n</i> = 91, aged 99+	Centenarians	Happiness	MMSE, health resources, social resources, extraversion, self-efficacy, optimism, happiness, training	Adaptation	Yes	Some resource effects were mediated through self-referent beliefs and attitudes toward life.
Psychological "resilience" and its correlates in chronic pain. Findings from a national community sample.	Karoly and Ruehlman	2006	US In older sample <i>n</i> = 190, aged 65–80	Pain	Profile of chronic pain: screen	Pain coping, pain attitudes and beliefs, catastrophizing, positive and negative social responses, treatment status	Adaptation	Yes	Differences favouring resilient individuals in coping style, pain attitudes and beliefs, catastrophizing, positive and negative social responses to pain, and health care and medication utilisation. Resilient sample also reported more tangible (but not emotional) social support.
Elderly people coping with the aftermath of war: resilience versus vulnerability.	Kimhi <i>et al.</i>	2012	Lebanon <i>n</i> = 822, 108 older, aged 65+	War	Sense of coherence; community and national resilience	Brief Symptoms Inventory, effects of war inventory	Bouncing back/adaptation	No	Older people may have a sense of self-efficacy and positive self-regard which may help them cope with events.
Resilience as adaptation in older women.	Kinsel	2005	<i>n</i> = 17, aged 70–80	Ageing			Adaptation	Yes	Social connectedness, extending self to others, moving forward with life, curiosity and ever seeking, head-on approach to challenge, maverick, spiritual grounding.

Title	Author	Year	Sample	Domain	Resilience measure	Other measures	Definition	Out-come	Results
Correlates of resilience in the face of adversity for Korean women immigrating to the US.	Lee <i>et al.</i>	2008	US <i>n</i> = 200 mothers, aged 61–104 <i>n</i> = 170 daughters, aged 39–68	Immigration of Korean women and daughters	Resilience scale	Self-esteem, optimism, religiosity, cultural interdependency and belief in education, adversity	Bouncing back/adaptation	Yes	Two psychosocial variables, self-esteem and optimism, were significantly associated with resilience in both mothers and daughters in bivariate correlations. Religiousness and cultural interdependency were additional correlates for mothers, while belief in education was an additional correlate for daughters. For both mothers and daughters, self-esteem and optimism remained the significant predictors.
Chinese older adults' resilience to the loneliness of living alone: a qualitative study.	Lou & Ng	2012	Chinese <i>n</i> = 13, aged 62–78 years	Ageing			Adaptation	No	Cognitive resilience, self and personality and social relations as contributing to resilience to loneliness.
Hardships in old age: exploring the relationship between spirituality and resilience in later life.	Manning	2013	US <i>n</i> = 6 women, aged 82–94	Ageing			Adaptation	Yes	Spirituality as pathway to resilience; spirituality and resilience lead to well-being.
Resilience-as-process: Negative affect, stress, and coupled dynamical systems.	Montpetit <i>et al.</i>	2010	US <i>n</i> = 42, aged 65–92	Ageing	Dispositional resilience	Daily negative affect; social support	Adaptation	Process	Higher levels of resilience resources resulted in greater protection from the cost to negative affect from stress.
Positive dying and resiliency in later life: A qualitative study.	Nakashima and Canda	2005	US <i>n</i> = 16, aged 65–103	Health			Adaptation	Yes	Two resilience processes: creating life narratives and engaging in generative-dialectic tension, growth through adversity of dying.

Title	Author	Year	Sample	Domain	Resilience measure	Other measures	Definition	Out-come	Results
Voices of resilience: older adults in hospice care.	Nelson-Becker	2006	US n = 30, aged 65+	Health			Adaptation	Yes	Four major themes appeared in the voices of older adults in this study: (i) redefining the self; (ii) engaging spirituality or openness to uncertainty; (iii) social investment; and (iv) independence.
Resilience, sense of coherence, purpose in life and self-transcendence in relation to perceived physical and mental health among the oldest old.	Nygren <i>et al.</i>	2005	Sweden n = 125, aged 85+	Oldest old – 85+	Resilience scales	Sense of coherence, purpose in life, SF-36, self-transcendence scale	Adaptation	No	Correlations between scores on the Resilience Scale, the Sense of Coherence Scale, the Purpose in Life Test, and the Self-Transcendence Scale.
Suicidal ideation and resilience in family carers of people with dementia: A pilot qualitative study.	O'Dwyer <i>et al.</i>	2013	Australia n = 10, aged 25–82, six women	Health			Adaptation	Yes	Four factors: practical coping strategies, personal characteristics, social support and faith.
The role of daily positive emotions during conjugal bereavement.	Ong <i>et al.</i>	2004	US n = 34, aged 61–83	Widows, daily negative emotions	Ego-Resiliency Scale	PANAS, stress; and in studies 2 and 3: neuroticism	Trait	No	Occurrence of daily positive emotions serves to moderate stress reactivity and mediate stress recovery.
Prospective predictors of positive emotions following spousal loss.	Ong <i>et al.</i>	2010 a	US n = 208, aged 27–74	Bereavement	Measurement instrument for primary and secondary control strategies	Depressive symptoms; spousal strain; positive emotions	Trait	No	Results indicate that adjustment may stem from pre-loss factors.
Psychological resilience predicts decreases in pain catastrophizing through positive emotions.	Ong <i>et al.</i>	2010 b	US n = 95, aged 52–95	Pain	Ego-Resiliency Scale	Pain intensity; pain catastrophizing; neuroticism; positive and negative emotions	Trait	No	Resilient individuals rebound from pain catastrophizing via positive emotions.

Title	Author	Year	Sample	Domain	Resilience measure	Other measures	Definition	Out-come	Results
Psychological resilience predicts decreases in pain catastrophizing through positive emotions.	Ong <i>et al.</i>	2010 b	US <i>n</i> = 95, aged 52–95	Pain	Ego-Resiliency Scale	Pain intensity; pain catastrophizing; neuroticism; positive and negative emotions	Trait	No	Resilient individuals rebound from pain catastrophizing via positive emotions.
The association between resilience and diabetic neuropathy by socioeconomic position: Cross-sectional findings from the KORA-Age study.	Perna <i>et al.</i>	2013	Germany <i>n</i> = 3942, aged 65	Diabetic neuropathy	Resilience Scales	Neuropathy education, body weight, physical activity, nutrition	Trait	No	In low SES, higher resilience had a lower probability of suffering from neuropathy as compared to participants with lower resilience.
Socioeconomic position, resilience, and health behaviour among elderly people.	Perna <i>et al.</i>	2012	Germany <i>n</i> = 3347, aged 65 +	Health behaviour	Resilience Scales	SES, Health Behaviour, Health Status; Living Status	Trait	No	Resilient people were more likely to consume five servings of fruit and vegetables a day and to perform high/moderate physical activity.
Psychological resilience and depressive symptoms in older adults diagnosed with post-polio syndrome.	Pierini and Stuijbergen	2013	US <i>n</i> = 630, aged 65+	Post-polio syndrome	None	Incapacity Scale, SRH, Acceptance Of Illness, Self-Efficacy CES-D Social Support, etc.	Trait	No	Spiritual growth, social support, acceptance and SRH were predictors.
The role of dispositional resilience in regaining life satisfaction after the loss of a spouse.	Rossi and Bisconti	2007	US <i>n</i> = 55, aged 57–83	Widowhood	Dispositional Resilience Scale	Perceived Stress, Life Satisfaction Scale	Trait	No	Dispositional resilience a mediator; and support for moderator hypothesis.
Resilience: resistance factor for depressive symptom.	Smith	2009	US <i>n</i> = 158, aged 65+	Depression	CD-RISC	CES-D, willingness to seek help for depressive symptoms	Adaptation	No	Higher health ratings tended to report low depressive symptom scores and higher resilience scores on the CD-RISC.

Title	Author	Year	Sample	Domain	Resilience measure	Other measures	Definition	Out-come	Results
Positive affect as a factor of resilience in the pain-negative affect relationship in patients with rheumatoid arthritis.	Strand <i>et al.</i>	2006	Norway <i>n</i> = 43, aged 33–80	Health		Pain, PANAS, GHQ, SF-36, etc.	Adaptation	Yes	Positive affect is most influential in reducing negative affect during weeks of higher pain and may be a factor of resilience, helping patients experiencing pain fluctuations as less distressful than at lower levels of PA.
Exploring resiliency factors of older African American Katrina survivors.	Thomas	2012	US, African Americans, <i>n</i> = 10, aged 55+	Trauma			Adaptation	Yes	Themes: (a) trusting in a higher power; (b) living in the moment; (c) activating resources; (d) creating community; and (e) doing for others.
Resilience and coping as predictors of general well-being in the elderly: A structural equation modelling approach.	Tomás <i>et al.</i>	2012	Spain <i>n</i> = 225, aged 60–95	Well-being	Brief Resilient Coping Scale	Psychological Resilience Coping Scale, Coping Strategies Coping Scale	Adaptation	No	Resilient coping predicted well-being.
Growing old with fibromyalgia: factors that predict physical function.	Torma <i>et al.</i>	2013	US <i>n</i> = 224, aged 50+	Fibromyalgia	Resilience Scales	Social Support, Physical Function, Fibromyalgia Impact, Gds, Community Health Activities	Adaptation	No	Resilience was moderately high. Resilience was not a moderator of fibromyalgia pain and physical function, but contributed uniquely to physical function variance.
Resilience in rural community-dwelling older adults.	Wells	2009	US <i>n</i> = 106, aged 65+	Rural	Resilience Scale	SF-12, Patient Health Questionnaire, Physical Performance Battery	Trait	Yes	The mean resilience level of the sample was high. Weak positive correlation between social networks and resilience levels of rural older adults. Both physical and mental health status were positively correlated with resilience. Mental health status was the strongest predictor of resilience.

Title	Author	Year	Sample	Domain	Resilience measure	Other measures	Definition	Out-come	Results
Resilience in older adults living in rural, suburban, and urban areas.	Wells	2010	US <i>n</i> = 277, aged 65+	Rural, suburban and urban	Resilience Scale	SF-12, Social Networks	Trait	Yes	No differences were found in resilience levels across the three locations. In analysis, stronger family networks, lower household income, and good mental and physical health status were found to be significantly associated with high resilience levels.
Resilience, physical performance measures, and self-perceived physical and mental health in older Catholic nuns.	Wells <i>et al.</i>	2012	US <i>n</i> = 54, aged 55–94	Catholic nuns	Resilience Scale	SF-12, Social Networks	Adaptation	Yes	Moderate levels of resilience. Fewer depressive symptoms and better health had higher resilience levels.
Living with ill-health in older age: the role of a resilient personality.	Windle <i>et al.</i>	2010	UK <i>n</i> = 1847, aged 50–91	Older adults	Windle	Life Satisfaction Index, Health, Demographics	Adaptation	Moderation	Main effects of resilience and ill health on life satisfaction were found in all of the age groups. A resilient self moderated the negative effect of ill health on subjective well-being.
Examination of a theoretical model of psychological resilience in older age.	Windle <i>et al.</i>	2008	UK <i>n</i> = 1893, aged 50–90	Older adults	Resilience Scales	Self-Esteem, Control	Bouncing back/adaptation	Yes	A common factor provided the best explanation of the relationships between the resources.
Psychological resilience and the onset of activity of daily living disability among older adults in China: a nationwide longitudinal study.	Yang and Wen	2014	Chinese <i>n</i> = 11,112, aged 65+	ADL	Resilience Scale	ADL, Demographics, Age, Resources, Marital Status, Coresidence, SRH, Cognitive Impairment	Trait	No	Higher levels of resilience at the baseline are associated with reduced risk of becoming ADL. Higher resilience more protective against the onset of disability for the younger old.

B. Included systematic review interventions papers

Title	Author	Year	Sample	Domain	Resilience measure	Other measures	Intervention	Results
Maintaining exercise and healthful eating in older adults: The SENIOR project II: Study design and methodology.	Clark <i>et al.</i>	2011	US <i>n</i> = 968, aged 80+	Exercise and nutrition	Resilience Scale	Psychosocial; Cognitive; Physical Functioning	Manual and calls	Resilience as secondary outcome. No results from this trial are yet available.
Evaluation of a standardized humor group in a clinical setting: a feasibility study for older patients with depression.	Konradt <i>et al.</i>	2013	Germany <i>n</i> = 49 (intervention) , <i>n</i> = 50 (control), aged 61+	Depression	Resilience Scale 11	SF-12, GDS-15; suicide; BDI; Dementia screen; State-trait cheerfulness: Satisfaction with life scale	Humour therapy	No significant differences in resilience.
Testing the effect of function-focused care in assisted living.	Resnick <i>et al.</i>	2011	US <i>n</i> = 171, mean age 87	Assisted care	Resilience Scale	GDS; physical activity; function; self-efficacy for functional activity; outcome expectations for functional activity	Function-focused care	No improvement in psychosocial variables but high levels at baseline.
Effectiveness of a self-help manual on the promotion of resilience in individuals with depression in Thailand: a randomised controlled trial.	Songprakun and McCann	2012	Thailand <i>n</i> = 26 (intervention) ; 28 (control), aged 18–60	Depression	Resilience Scale		Bibliotherapy	Bibliotherapy for increasing resilience in people with moderate depression.
Lifestyle matters for maintenance of health and wellbeing in people aged 65 years and over: study protocol for a randomised controlled trial.	Sprange <i>et al.</i>	2013	UK <i>n</i> = 134 (intervention) , <i>n</i> = 134 (control), aged 65+	Ageing	Brief Resilience Scale	SF-36; EQ-5D-3L; self-efficacy; PHQ9; Loneliness; Health and social care resources use; Well-being questions	Occupational therapy	No results from this trial are yet available.

Title	Author	Year	Sample	Domain	Resilience measure	Other measures	Intervention	Results
Effects of community-based meditative Tai Chi programme on improving quality of life, physical and mental health in chronic heart-failure participants.	Sun <i>et al.</i>	2014	Australia <i>n</i> = 41, aged 51–91	Heart failure	Resilience Scale	HRQoL; physical health; GHQ	T'ai chi	Participants at post-intervention had higher resilience scores across six subscales with small to medium effects.
The Relaxation Response Resiliency Enhancement Program in the management of chronic refractory temporomandibular joint disorder: Results from a pilot study.	Vranceanu <i>et al.</i>	2013	US <i>n</i> = 24, aged 24–72	Chronic temporomandibular disorder	None	Modified Symptom Severity Index [SSI]; Perceived Stress Scale [PSS]; SF-36; Symptom Checklist-90-R	Relaxation	Significant increase in SF-36 mental health functioning, physical health dimension and overall health.

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