



Positive Psychiatry Interventions in Geriatric Mental Health

Jeffrey Lam, BA¹

Awais Aftab, MD^{2,3}

Ellen Lee, MD^{4,5,6}

Dilip Jeste, MD^{4,5,7,*}

Address

¹Warren Alpert Medical School, Brown University, Providence, RI, USA

²Department of Psychiatry, Case Western Reserve University, Cleveland, OH, USA

³Northcoast Behavioral Healthcare (Ohio Department of Mental Health and Addiction Services), Northfield, OH, USA

⁴Sam and Rose Stein Institute for Research on Aging, University of California San Diego, La Jolla, CA, USA

⁵Department of Psychiatry, University of California San Diego, La Jolla, CA, USA

⁶Veterans Affairs San Diego Healthcare System, San Diego, CA, USA

⁷Department of Neurosciences, University of California San Diego, La Jolla, CA, USA

Email: djeste@ucsd.edu

Published online: 29 August 2020

© Springer Nature Switzerland AG 2020

This article is part of the Topical Collection on *Geriatric Disorders*

Keywords Successful aging · Resilience · Wisdom · Meaning in life · Spirituality · Compassion · Social engagement

Abstract

Purpose of review Positive psychiatry shifts the focus of geriatric mental healthcare beyond studying disorders and psychopathology to studying factors that contribute to mental well-being and successful aging. An increasing number of interventional studies are using treatments that target modifiable positive psychosocial characteristics (PPCs) and study their impact on mental health. Here we provide an overview of the literature on positive psychiatry interventions using illustrative examples of interventions targeting social connectedness, meaning in life, wisdom, and resilience.

Recent findings There is growing evidence that PPCs are modifiable constructs that may be associated with improved well-being, physical health, and mental health outcomes.

Summary The preliminary evidence summarized in this narrative review indicates that positive psychiatry interventions targeting social connectedness, meaning in life, wisdom, and resilience can improve overall well-being and other positive health outcomes amongst older adults. The effect sizes of these interventions reported in RCTs and meta-analyses are typically small to medium, but occasionally large effect sizes are also reported. Current

literature is restricted by heterogeneous methodology, limiting clinicians' abilities to extrapolate these principles of positive psychiatry into everyday practice. With the expanding body of evidence, positive psychiatry may have the potential to transform the landscape of geriatric mental health.

Introduction

With the global trend of decreasing birth rates and increasing life expectancy, caring for the physical and mental health of an increasingly older population has become a public health challenge. In particular, the current healthcare system appears ill-equipped to cope with the rising burden of psychiatric disorders in older populations [1]. From a provider perspective, there is a substantial dearth of professionals needed to diagnose and treat mental illness amongst older adults. From a patient perspective, older adults are less likely to utilize mental health resources and receive adequate care [2]. Given these growing challenges, there is an impetus to reconsider the current framework of providing mental healthcare to older adults.

Positive psychiatry has gained substantial momentum in the field of geriatric psychiatry in recent years [3]. Historically, psychiatry has focused on the diagnosis and treatment of individuals with psychopathology and has excluded or ignored the study of factors contributing to mental well-being beyond the absence of disease; positive psychiatry aims to remedy this state of affairs. Positive psychiatry is the science and practice of psychiatry that seeks to understand and promote well-being through assessment and interventions improving positive psychosocial characteristics (PPCs) in people who suffer from or are at high risk of developing mental or physical disorders [4]. Positive psychiatry aims to target and enhance PPCs to improve well-being as well as mental health outcomes [4, 5]. In geriatric psychiatry, positive psychiatry also fits in with the notion of successful aging [6]. Successful aging is a concept that emerged in the late twentieth century to better understand older adult individuals who were able to preserve the following characteristics: (1) freedom from disease and disability, (2) high mental and physical capacities, and (3) social and productive engagement [7].

Historically, positive psychiatry can be seen as the psychiatric offshoot of the positive psychology movement pioneered by Seligman and colleagues in the late 1990s [8]. Just as clinical psychology and psychiatry are

overlapping professions, positive psychology and positive psychiatry also have overlapping concepts and goals, with differences arising from unique training backgrounds of providers, patient populations, and treatment approaches. Positive psychiatry is a branch of medicine with a focus on individuals with medical disorders, psychiatric disorders, biological interventions (i.e., transcranial magnetic stimulation, deep brain stimulation, neuropsychotropics), and the neurobiological foundations of PPCs. Despite these differences, there are no strict distinction between "positive psychology interventions" and "positive psychiatry interventions" since interventions targeting PPCs can be studied in the general population as well as individuals with medical and psychiatric disorders. Figure 1 outlines some salient commonalities and differences between the two fields.

Although aging may be associated with challenges such as loss of monetary and social resources and deteriorating functional and cognitive abilities, aging may also be associated with benefits, such as increases in spirituality, wisdom, emotional regulation, and problem-solving abilities. These increases in PPCs may explain the "paradox of aging," or the tendency for subjective well-being to increase despite the challenges associated with age [9]. A growing body of literature suggests PPCs are associated with numerous favorable physical and mental health outcomes.

An increasing number of interventional studies are using treatments that target modifiable PPCs and study their impact on mental health. For the purpose of this narrative review, a literature search for pertinent articles was conducted using various combinations of keywords (social connectedness, meaning in life, wisdom, resilience AND older adults) and utilizing the databases PubMed, PsycINFO, and Google Scholar, with the goal of identifying randomized controlled trials (RCTs) of selected interventions targeting PPCs and systematic reviews/meta-analyses of these RCTs. Where available, we focused on studies conducted in psychiatric populations, but we did not exclude studies conducted in the

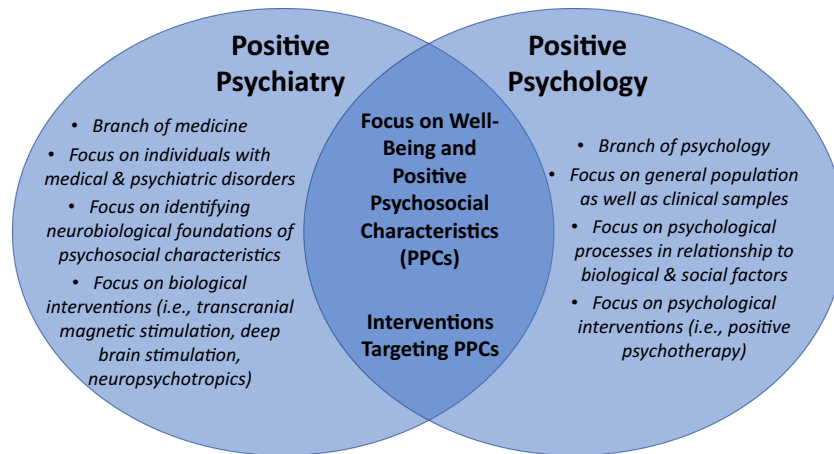


Fig. 1. Relationship between positive psychiatry and positive psychology.

general population. Articles identified through the online search were subsequently hand searched and reviewed individually for further references of significance. We provide an initial overview of the literature on positive psychology interventions followed by a

discussion of interventions targeting social connectedness, meaning in life, wisdom, and resilience as illustrative examples of contemporary research in positive psychiatry and geriatric mental health.

Results

Positive psychology/psychiatry interventions

Positive psychology/psychiatry interventions (PPIs) are a broad category of treatment methods and intentional activities that aim to increase well-being by cultivating positive feelings, behaviors, or cognitions [10]. The focus of these interventions is to build strengths and positive attributes (such as optimism) rather than fixing or remedying negative attributes (such as correcting cognitive distortions). PPIs are designed using the principles of positive psychology as outlined by the seminal work of Seligman and Csikszentmihaly [8]. PPIs have been studied in healthy, non-clinical samples as well as in clinical samples such as in individuals with depression [10]. PPIs differ from traditional psychological and psychiatric interventions in that they do not focus on aiming to reduce symptoms, problems, or disorders; rather, they focus on promoting well-being. Furthermore, PPIs typically focus on short, tangible tasks such as writing down three good things each day or savoring a moment for 2 min with the goal of increasing positive emotions. The outcomes measured in PPIs vary broadly, but studies attempt to measure and improve optimism, happiness, or psychological well-being [10].

Overall, the published PPI studies have found small but significant effects on well-being and depressive symptoms, though few of these interventions targeted older adults. A 2013 meta-analysis of PPIs identified 39 studies with a total of 6139 participants [11]. This study showed that PPIs had small but significant effect sizes, with standardized mean difference (SMD) of 0.34 (95% CI 0.22, 0.45) for subjective well-being and 0.23 (95% CI 0.09, 0.38) for

depressive symptoms, when compared to the control group. However, only a few PPIs have examined clinical populations such as suicidal inpatients [12], individuals with tobacco use disorder [13], and individuals with schizophrenia [14]. Additionally, only two of the 39 studies examined in the meta-analysis targeted older adults [15, 16].

Examining PPIs specifically focusing on older adults, a 2017 systematic review identified eight interventions targeting well-being in older adults [17•], including seven interventions not included in the 2013 meta-analysis described above. These interventions included exercises such as reminiscence [18–21], gratitude [22], forgiveness, optimism, savoring positive experiences, curiosity, and multicomponent interventions [23, 24]. PPIs were associated with significant improvements in well-being and alleviated depressive symptoms in these studies, and the authors noted gratitude interventions were maximally effective in promoting durable well-being for healthy older adults [17•].

Other notable PPIs targeted at older adults have attempted to identify the individual effects of “positive” exercises such as listing three good things each day, listing three funny things each day, conducting a gratitude visit, and using “signature strengths” by creating multiple intervention arms in an online setting [25]. Other investigators have demonstrated beneficial effects for 8-week group-based positive psychology classes in community-based settings [26, 27]. While positive psychology interventions have diverse intervention characteristics, many of the interventions to date have demonstrated positive small to medium effect sizes.

Social connectedness

Loneliness and social isolation have emerged as major health risk factors in the USA. While the terms social isolation and loneliness are commonly used interchangeably in everyday language, research generally indicates that social isolation describes an *objective* absence of connection whereas loneliness is the *subjective* state of feeling socially isolated [28]. Many of the interventional literature focuses on loneliness, and the UCLA Loneliness Scale is the most commonly employed scale in clinical research studies [29]. Other scales include single-item measures and the de Jong Gierveld Scale [30], which was designed specifically to measure loneliness in older adults. Social isolation measures include social network characteristics, social interaction, and participation in social activities [31].

Older populations are particularly vulnerable to feelings of loneliness and social isolation. Large survey data indicates the prevalence of loneliness or social isolation to be 22% and 23% amongst adults over 65 in the USA and UK, respectively [32]. Estimates of the prevalence of severe loneliness are 5–15% [33, 34]. One qualitative research study found that older adult participants had more feelings of loneliness compared to their recalled feelings of loneliness 10 years prior, indicating an underestimation of future feelings of loneliness [35].

Loneliness and social isolation are associated with worse physical and mental health outcomes [36]. Most notably, loneliness is independently associated with depression [37] and all-cause mortality [38]. While there is an abundance of cross-sectional studies, the longitudinal data are limited, impacting causal inferences. One longitudinal survey found increasing

loneliness was independently associated with changes in marital status, living arrangements, social networks, and physical health [34].

Social connectedness interventions

An increasing number of interventions for loneliness and social isolation have been developed in recent years. In one of the first quantitative analyses of these interventions, a 2011 meta-analysis identified 20 RCTs with a mean effect size of Hedges $g = -0.198$ (95% CI $-0.32, -0.08$) in reducing loneliness, with a moderator analysis demonstrating larger mean effect sizes in interventions addressing maladaptive social cognition compared to those addressing social support, increasing opportunities for social access, or improving social skills [39]. Within these 20 RCTs, 10 studies targeted individuals 60 years or older [39].

There have also been numerous reviews on social connectedness interventions in older adults [40]. A 2019 umbrella review identified 16 reviews and 19 RCTs [41•], finding an overall pooled effect size of -0.14 ($-0.37, 0.09$), indicating a non-significant decrease in loneliness. The review categorized the selected interventions into four categories, including enhancing social support ($n=9$), increasing opportunities for social access ($n=7$), improving social skills ($n=2$), and addressing maladaptive social cognition ($n=1$). These interventions were mostly studied in trial durations of 5–8 weeks, although three interventions lasted on the scale of 1–3 years. There were 6 Internet-based “e-Interventions” and 8 group-based interventions. There was significant diversity amongst intervention designs, with interventions ranging from group-based friendship clubs and daycare programs to using videoconferencing and technology to network with others [41•]. Other interventions were therapy-driven, with the theoretical premise that loneliness is a modifiable trait. The heterogeneity of intervention designs and frameworks makes it difficult to find the common characteristics of interventions that may positively impact social connectedness amongst older adults [42•]. Overall, social connectedness interventions have been extensively reviewed amongst healthy older adults, with multiple reviews demonstrating mixed results [41•, 43–45].

Meaning in life

Contrary to philosophical discussions of meaning of life, meaning in life (MiL) is the psychological perception of an individual regarding one’s own life and activities, and the value and importance ascribed to them, and the degree to which they generate a sense of meaningfulness or purpose [46]. MiL has received increasing attention in positive psychiatry as well as medicine at large. A 2012 review reported the presence of 59 validated instruments developed with the goal of measuring MiL for scientific study [46]. Commonly measured aspects of MiL include the presence of MiL, search for MiL, and sources of MiL.

Multiple research studies have demonstrated a strong link between MiL and better physical, mental, and overall health outcomes [47, 48], including in older adult populations [49] and individuals with Alzheimer’s disease [50] as well as in community samples across the entire adult life span [51]. Longitudinal studies in college students have also demonstrated that MiL may be a protective factor against suicide [52].

A recent study reported that the presence of MiL showed an inverted U-shaped pattern across the life span, peaking around the age of 60 and decreasing subsequently as physical health declines with age [51]. This underscores the importance of MiL interventions in older adults, as well as near the end of life in oncologic and palliative care populations.

Meaning in life interventions

Overall, the published MiL interventions have demonstrated a significant effect on overall well-being. A recent realist and meta-narrative evidence synthesis described nine interventions with the goal of enhancing MiL amongst patients with advanced diseases. The interventions ranged in length from 2 to 8 sessions of 30–90 min each [53•]. The mean age of participants in these intervention studies ranged from 54 to 65 years. Most interventions utilized individual sessions with a trained therapist, while one intervention was in a group setting. The interventions employed various theoretical models, with the most common being Viktor Frankl's logotherapy [54]. Other frameworks explored topics such as sources of meaning, life priorities, and gratitude for life lived [53•]. Another recent meta-analysis quantified meaning-centered interventions in a terminal cancer population, finding five meaning-focused RCTs had a weighted effect size of d of 0.46 (95% CI 0.33, 0.58) for the pooled outcomes (meaning of life, spiritual well-being, quality of life, anxiety, and physical symptoms), with an effect size of d of 0.96 (95% CI 0.64, 1.28) for the meaning of life outcome for MiL intervention compared to control [55].

Another commonly studied type of MiL interventions in older adult populations are life review interventions, which are individual or group storytelling interventions with a focus on integrating life stories through different phases in life [56]. These interventions have a demonstrable impact and are effective in enhancing MiL as well as other mental health outcomes in older adults [57]. A meta-analysis demonstrated that life review interventions had an effect size of d of 0.84 (95% CI 0.31, 1.37) on depressive symptomatology in older adults [58], and d of 0.54 (95% CI 0.33, 0.75) on measures of psychological well-being in older adults [59], with more recent studies finding similar effects for life review interventions in patients with dementia [60]. Overall, MiL interventions demonstrate medium to large effect sizes, although much of the literature is limited to those at the end of life.

Wisdom

Although "wisdom" is often used in everyday language and has origins stemming back to ancient times, it has been an elusive construct to define in the psychological literature with empirical studies starting in the 1970s. Bates and Smith (1990), pioneers in the field, defined wisdom as "expert knowledge in the fundamental pragmatics of life" [61]. While wisdom is related to knowledge, wisdom is commonly understood as the practical use, application, and integration of knowledge [62]. A foundational 2010 study, aiming to find consensus amongst expert researchers in the field, summarizes wisdom as "a learned, advanced form of cognitive and emotional development that is experience driven" [63].

A 2013 review identified that a majority of the definitions of wisdom in the peer-reviewed literature contained the following five subcomponents: (1) knowledge of life, (2) prosocial attitudes and behaviors, (3) self-understanding, (4) acknowledgment of uncertainty, and (5) emotional homeostasis. This review also identified five wisdom self-reported questionnaires and four instruments using interview-based instruments scored by trained raters [64]. Given their ease of use, self-reported questionnaires have been more commonly used for assessment. One of the more widely used scales is the Three-Dimensional Wisdom Scale, given its rigorous development and good psychometric properties [65].

Across the life span, wisdom is associated with positive outcomes including better overall physical and mental health [66], happiness [67], and lower levels of loneliness [68]. Amongst older adults, numerous investigations using self-reported wisdom scales have demonstrated wisdom is positively associated with life satisfaction [69, 70] and subjective well-being [69, 71], with one longitudinal study reporting that wisdom ameliorates the effect of adverse life circumstances on subjective well-being [72]. However, some studies using the Berlin Wisdom model, an interview-based scoring system, found that wisdom and subjective well-being were unrelated [73, 74]. Despite some contradictory results, on whole, wisdom seems to be associated with numerous psychosocial advantages to those who score high in the trait.

Although there is a common perception that wisdom increases with age, some empirical evidence indicates that wisdom has a curvilinear relationship with age, peaking in the middle of life [66]. This underscores the importance of wisdom interventions in all ages of life.

Wisdom interventions

Given the broad definition, it has been difficult to integrate all interventions targeting wisdom and its associated constructs. To date, there has been one meta-analysis of wisdom interventions, or interventions that target components of wisdom. This meta-analysis identified 57 studies that addressed some component of wisdom: 29 focused on prosocial behavior, 13 on emotional regulation, and 15 on spirituality. There was considerable heterogeneity for populations targeted, scales use, and interventional characteristics. This meta-analysis revealed a pooled SMD of 0.43 (95% CI 0.22, 0.30) for prosocial behavior, 0.67 (95% CI 0.21, 1.12) for emotional regulation, and 1.00 (95% CI 0.41 to 1.60) for spirituality interventions [75•].

While none of the interventions reviewed in this meta-analysis were specifically targeted toward older adults, seven of the interventions had mean ages above 50. Out of these interventions, two focused on self-compassion [76, 77] and five focused on spirituality [78–82]. Both a high-intensity 8-week group-based self-compassion therapy intervention [76] and a self-help intervention with seven self-compassion lessons and e-mail guidance demonstrated favorable self-rated self-compassion and well-being compared to control [77]. The five spirituality interventions with sample mean ages over 50 also demonstrated significant improvements in spirituality [75•]. While wisdom is a growing topic of interest in older adults, to date, few interventions directly target wisdom or its related constructs as an outcome. Moreover, the interventions to date have not targeted psychiatric clinical population.

Resilience

In everyday language, resilience is a term used to describe one who can recover, or “bounce back,” from difficult situations. In the psychological literature, a commonly cited definition of resilience is the definition by the American Psychological Association (APA): “The process of adapting well in the face of adversity, trauma, tragedy, threats, or significant sources of stress” [83]. Consistent with this definition, recent literature conceptualizes resilience as an adaptable resource that can be learned, rather than a static personality trait [84]. Numerous scales have been developed to measure resilience, but researchers have yet to adopt one scale as a “gold standard” [85].

To date, many resilience interventions have targeted specific groups such as military and healthcare workers, but there is a growing literature focusing on resilience in older adults [86]. Resilience amongst older adults is hypothesized to moderate the effect of the numerous stressors associated with aging such as worsening health, bereavement, decline in socioeconomic status, disability, loss of autonomy, and depression, all of which may negatively impact overall well-being [85, 87].

In a study of 2025 US veterans over the age of 60, 70% of those with a high number of lifetime traumas were found to be resilient. This study demonstrated resilience was associated with the characteristics of higher educational attainment, marriage, emotional stability, social connectedness, community integration, and purpose in life [88]. Other cross-sectional studies examining resilience in older adults suggest resilience is associated with numerous positive physical, mental, and social health outcomes [86]. Most notably, higher resilience is associated with independence in activities of daily living [89], decreases in all-cause mortality [90], lower rates of depression [91], and social connection [92].

Resilience interventions

Despite numerous cross-sectional studies, interventions specifically targeting resilience as an outcome is limited. To date, three systematic reviews [93–95] and one systematic review protocol published [96] have analyzed the efficacy of resilience interventions in all populations. One of the most rigorous reviews, which only included interventions utilizing three valid and reliable measures of psychological resilience, reported a positive effect size of SMD of 0.44 (95% CI 0.23 to 0.64) [94]. These interventions vary widely and include mindfulness training, cognitive behavioral therapy sessions, online webinars, and phone coaching [94]. A recent 2018 review explains the limitations of the resilience literature, citing major methodological problems, heterogeneity in resilience definitions, and poor reporting quality, amongst other conceptual challenges [97].

A 2014 book by Helen Lavretsky about resilience and aging reviews numerous interventions believed to improve resilience in older populations, but it is important to note that these interventions described target outcomes *related* to resilience or that have theoretical links to resilience, such as well-being therapy, social support, lifestyle, mind-body, and exercise interventions [98], which we have described in other sections of this manuscript.

We identified two interventions designed to enhance resilience amongst older adults. The first intervention used the validated Connor-Davidson Resilience Scale [99] to examine the effects of a three-session group-based intervention aimed at (1) recognizing aging as an opportunity for continued growth and enjoyment, (2) increasing positive emotions, and (3) engaging in values-driven activities [100]. This study demonstrated significant changes in resilience from pre-intervention to 3-month follow-up. Another resilience intervention recruited older adults with chronic illness (heart conditions, diabetes, and arthritis) for six group-based sessions to share lived experiences, relaxation techniques, management of stress, and coping strategies. The trial found significant increases in perceived resilience, defined by the authors as a composite between self-efficacy, social support, and overall well-being at the end of the course and at three-month follow-up [101]. Given the limited number of interventions, it remains to be determined whether resilience can be operationalized and taught to individuals in an attempt to buffer life stressors. Neither of these two interventions focused on clinical psychiatric populations.

A summary table of meta-analyses for select PPCs in older adults is summarized in Table 1. Selected randomized controlled trials (RCTs) for PPC interventions are summarized in Table 2.

Table 1. Meta-analyses of positive psychiatry interventions targeting meaning in life and social connectedness

	Recent reviews	Inclusion criteria	Number of RCTs included in review	Effect size (95% confidence interval) compared to control	Outcome measures
Social connectedness	Jarvis et al., 2019 [41•]	Umbrella review of social connectedness identifying 19 RCTs	19	0.14 (–0.09, 0.37)	Pooled effect size across multiple measures
Meaning in life	Kang et al., 2019 [55]	Meaning-centered interventions for terminal or advanced cancer patients	5	0.46 (0.33, 0.58)	Pooled effect size across multiple measures
	Wang et al., 2017 [57]	Life review interventions for terminal or advanced cancer patients	8	0.35 (0.15, 0.56)	Overall quality of life
	Bohlmeijer et al., 2007 [59]	Life review interventions in older adults	15	0.54 (0.33, 0.75)	Psychological well-being

RCT randomized controlled trial
Positive effect sizes indicate beneficial results

Table 2. Illustrative examples of RCTs of positive psychiatry interventions characteristics

	Design	Age/population	Primary outcome measures	Experimental intervention
Positive psychology	interventions			
Ramirez et al., 2014 (Spain) [24]	Pre-post-RCT design with experimental (n=26) vs. active control group (n=20)	Community population (mean age=71)	<ul style="list-style-type: none"> - Anxiety - Depression - Subjective happiness - Life satisfaction - Memory (specific and general) - Gratitude - Flourishing - Satisfaction with life - Positive and negative experiences - Perceived stress - Health-related quality of life 	Nine 90-min weekly sessions with positive psychology, forgiveness, gratitude, and life review exercises
Killen, A., & Macaskill, A. (2015). (UK) [22]	Pre-post-RCT with online (n=48) vs. paper group (n=40)	Community population (mean age=71)	<ul style="list-style-type: none"> - Gratitude - Flourishing - Satisfaction with life - Positive and negative experiences - Perceived stress - Health-related quality of life 	Two weeks of typing or writing down three positive events during each intervention day
Proyer et al., 2014 (online) [25]	Pre-post-RCT with multiple intervention arms including gratitude visit (n=30) vs. three good things (n=44) vs. three funny things (n=20), vs. using signature strengths (n=35) vs. active placebo (early memories) (n=34) connectedness	Online sample of female participants (mean age=56)	<ul style="list-style-type: none"> - Subjective happiness - Depression 	One-week online intervention with individuals being assigned to a particular exercise
Social				
Woodward et al., 2011 (USA) [102]	Pre-post-RCT with experimental (n=45) vs. control (n=38)	Community population (mean age=72)	<ul style="list-style-type: none"> - Loneliness - Quality of life - Depression - Social network size - Perceived social support 	Twelve sessions aiming to increase social opportunities by teaching basic computer, email, and Internet skills
Saito et al., 2012 (Japan) [103]	Pre-post-test design with intervention (n=20) vs. waitlist control group (n=40)	Community population of individuals who recently relocated (mean age=73)	<ul style="list-style-type: none"> - Loneliness - Life satisfaction - Depression - Social support 	Four 120-min group sessions to talk about experiences, opportunities, and a city tour with opportunities to socialize with other participants
			- Loneliness	

Table 2. (Continued)

	Design	Age/population	Primary outcome measures	Experimental intervention
Routasalo et al., 2009 (Finland) [104]	Pre-post-RCT with intervention (n=117) vs. control (n=118)	Individuals with subjective feelings of loneliness (mean age=80)	- Social network - Psychological well-being	Twelve group-based meal and activity sessions facilitated by a professional group leader aimed to improve social skills
Banks and Banks., 2005 (USA) [105]	Pre-post-RCT with intense intervention (n=15) vs. moderate intervention (n=15), vs. control (n=15) reported)	Long-term care facilities (no mean age reported)	- Loneliness	Six weeks of dog assisted therapy (one or three sessions each week depending on intervention level), allowing residents to walk and play with the same animal for the 6 weeks
Meaning in life				
Chiang et al., 2008 (Taiwan) [18]	Pre-post-RCT with experimental (n=36) vs. waitlist control (n=39)	Taiwanese veterans (mean age=78)	- Self-esteem - Life satisfaction	Eight 60- to 90-min group-based life review program sessions exploring topics including childhood memories, job, friends, and greatest accomplishments
Preschl et al., 2012 (Germany) [21]	Pre-post-RCT with experimental (n=20) vs. waitlist control (n=16)	Individuals with mild-moderate depression (median age=70)	- Depressive symptoms - Self-esteem - Life satisfaction - Well-being - Obsessive reminiscence	Six 60- to 90-min individual sessions with computer exercise supplementation with life review intervention
Breitbart et al., 2012 (USA) [79]	Pre-post-RCT with experimental (n=64) vs. control (therapeutic massage) (n=56)	Advanced stage ovarian cancer (mean age=54)	- Spiritual well-being - Quality of life	Seven 60-min sessions with individual meaning-centered psychotherapy, which explored topics such as legacy, identity, limitations, creativity, connection, and hopes
Henry et al., 2010, (Canada) [106]	Pre-post-RCT with experimental (n=12) vs. control of typical hospital and community-based supports (n=12)	Advanced stage ovarian cancer (mean age=55)	- Meaning in life - Existential distress	One to four 30- to 90-min sessions with therapists aimed at exploring themes of the meaning of a cancer diagnosis, past life events, and future priorities
Wisdom				
Neff & Germer, 2013 (USA) [76]	RCT pre-post-test design with intervention (n=24) vs. waitlist control group (n=27)	Community adults (mean age=50)	- Self-compassion - Mindfulness - Compassion for others - Avoidance of negative feelings	Eight 120-min group-based sessions facilitated by clinical psychologists and self-compassion training with weekly topics and a half day meditation of

Table 2. (Continued)

	Design	Age/population	Primary outcome measures	Experimental intervention
Labelle et al., 2015 (Canada) [82]	Pre-post-test design with intervention (n=135) vs. waitlist control group (n=76)	Cancer patients (mean age=52.7)	- Spirituality - Post-traumatic growth - Mindfulness	Eight 90-min group-based sessions facilitated by psychologist and a half day intensive session.
Resilience				
Treichler et al. (USA) [100]	Modified stepped-wedge trial design (alternative cluster-randomized trials) (n=89)	Suburban senior housing communities (mean age=84.9)	- Resilience	Three 90-min group-based sessions facilitated by a trained residential facilitator aimed at (1) recognizing aging as an opportunity for continued growth and enjoyment, (2) increasing positive emotions, and (3) engaging in values-driven activities, with additional savoring and gratitude exercises at home
Robinson et al., 2019 (UK) [101]	Pre-post-test design (n=191)	Individuals with chronic disease (age range=45–80)	- Composite resilience score made up of scales of self-efficacy, social support, and overall well-being	Six 120-min group-based participatory activities including sharing lived experiences, relaxation techniques, and coping strategies
RCT randomized controlled trial				

Discussion

There is growing evidence that PPCs are associated with well-being and successful aging. The current evidence demonstrates it is possible to modify PPCs, and there is preliminary evidence to suggest that PPC enhancement can increase overall well-being.

PPIs improve well-being and are supported by multiple RCTs, systematic reviews, and meta-analyses. However, the generalizability of these analyses is limited by the heterogeneity in construct definitions, measurements, and diversity of intervention characteristics. Studies in the geriatric population are relatively limited in number, and primarily focus on healthy older adults, as opposed to clinical populations. Moreover, it is important to note our search methodology utilized disease-focused databases, meaning this review likely underestimates the number of interventions targeted toward general populations. This review reveals the relative paucity of research studies of interventions targeting PPCs in psychiatric subjects, and hence the generalizability of the current body of literature to psychiatric subjects is uncertain. Future research should focus on studying these interventions in clinical populations, including those with cognitive impairment, frailty, or psychiatric conditions.

It should also be noted that this review artificially creates distinctions between PPCs such as meaning in life, resilience, and social connectedness to better outline the available literature; however, PPCs are highly overlapping and correlated constructs. For example, MiL is likely linked to resilience and wisdom, and an intervention on the former may also affect the latter two, and vice versa. Additionally, exercise, nutrition, and mind-body interventions likely influence many of these PPCs; however, this review did not capture these interventions as many of these studies have not examined the direct link between these interventions and PPCs or explicitly hypothesize a relationship between their intervention and PPCs. Understanding these complex relationships is one of the tasks of ongoing and future research in positive psychiatry.

In conclusion, our findings suggest that interventions aimed at promoting PPCs have the potential to improve overall well-being and other positive health outcomes amongst older adults. While an increasing number of clinicians are recognizing the importance of positive psychiatry principles, the current literature is restricted by heterogeneous methodology, limiting clinicians' abilities to extrapolate these principles of positive psychiatry into everyday practice. With the rapidly expanding body of evidence, positive psychiatry may have the potential to transform the landscape of geriatric mental health in coming years.

Compliance with Ethical Standards

Conflict of Interest

Jeffrey Lam declares that he has no conflict of interest. Awais Aftab declares that he has no conflict of interest. Ellen Lee declares that she has no conflict of interest. Dilip Jeste declares that he has no conflict of interest.

Human and Animal Rights and Informed Consent

This article does not contain any studies with human or animal subjects performed by any of the authors.

Glossary of Key Terms

Meaning in Life—A positive characteristic reflecting an individual's perception of life and activities, the value and importance ascribed to them, and the degree to which they generate a sense of meaningfulness or purpose [46].

Positive Psychiatry—A branch of medicine and psychiatry that seeks to understand and promote well-being through assessment and interventions improving positive psychosocial characteristics in individuals who suffer from or are at high risk of developing mental or physical disorders [4].

Positive Psychology—A branch of psychology that seeks to achieve scientific understanding of positive human functioning and develop interventions to enhance well-being and flourishing in individuals, families, and communities.

Positive Psychology and Positive Psychiatry Interventions—Scientific interventions and designed activities that aim to increase well-being by cultivating positive feelings, behaviors, or cognitions [10].

Social Connectedness—A positive characteristic measuring the degree to which an individual has close meaningful, and constructive relationships with others. The opposite of loneliness (subjective distress arising from discrepancy between desired and perceived social relationships) and social isolation (objective absence of social contacts).

Resilience—A positive characteristic measuring the degree to which an individual can adapt well in the face of adversity, trauma, tragedy, threats, or significant sources of stress [83].

Wisdom—A positive grouping of characteristics within an individual that includes an having (1) knowledge of life and social advising, (2) prosocial attitudes and behaviors (e.g., empathy, compassion, altruism), (3) self-understanding, (4) acceptance of uncertainty and divergent values, (5) emotional regulation, and (6) decisiveness [64].

References and Recommended Reading

Papers of particular interest, published recently, have been highlighted as:

- Of importance

1. Jeste DV, Alexopoulos GS, Bartels SJ, Cummings JL, Gallo JJ, Gottlieb GL, et al. Consensus statement on the upcoming crisis in geriatric mental health: research agenda for the next 2 decades. *Arch Gen Psychiatry*. 1999;56(9):848–53.
2. Satcher D. Mental health: a report of the surgeon general—executive summary. *Prof Psychol Res Pract*. 2000;31(1):5–13.
3. Jeste DV, Palmer BW. A call for a new positive psychiatry of ageing. *Br J Psychiatry*. 2013;202(2):81–3.

4. Jeste DV, Palmer BW, Rettew DC, Boardman S. Positive psychiatry: its time has come. *J Clin Psychiatry*. 2015;76(6):675–83.
 5. Palmer BW. *Positive psychiatry: a clinical handbook*: American Psychiatric Publishing; 2015.
 6. Martin P, Kelly N, Kahana B, Kahana E, Willcox BJ, Willcox DC, et al. Defining successful aging: a tangible or elusive concept? *The Gerontologist*. 2015;55(1):14–25.
 7. Rowe JW, Kahn RL. *Human aging: usual and successful*. Science (New York, NY). 1987;237(4811):143–9.
 8. Seligman ME, Csikszentmihalyi M. *Positive psychology: an introduction*. Vol 1. American Psychological Association; 2000.
 9. Ryan RM, Deci EL. On happiness and human potentials: a review of research on hedonic and eudaimonic well-being. *Annu Rev Psychol*. 2001;52(1):141–66.
 10. Sin NL, Lyubomirsky S. Enhancing well-being and alleviating depressive symptoms with positive psychology interventions: a practice-friendly meta-analysis. *J Clin Psychol*. 2009;65(5):467–87.
 11. Bolier L, Haverman M, Westerhof GJ, Riper H, Smit F, Bohlmeijer E. Positive psychology interventions: a meta-analysis of randomized controlled studies. *BMC Public Health*. 2013;13(1):119.
 12. Huffman JC, DuBois CM, Healy BC, Boehm JK, Kashdan TB, Celano CM, et al. Feasibility and utility of positive psychology exercises for suicidal inpatients. *Gen Hosp Psychiatry*. 2014;36(1):88–94.
 13. Kahler CW, Spillane NS, Day A, Clerkin EM, Parks A, Leventhal AM, et al. Positive psychotherapy for smoking cessation: treatment development, feasibility, and preliminary results. *J Posit Psychol*. 2014;9(1):19–29.
 14. Meyer PS, Johnson DP, Parks A, Iwanski C, Penn DL. Positive living: a pilot study of group positive psychotherapy for people with schizophrenia. *J Posit Psychol*. 2012;7(3):239–48.
 15. Frieswijk N, Steverink N, Buunk BP, Slaets JP. The effectiveness of a bibliotherapy in increasing the self-management ability of slightly to moderately frail older people. *Patient Educ Couns*. 2006;61(2):219–27.
 16. Kremers IP, Steverink N, Albersnagel FA, Slaets JP. Improved self-management ability and well-being in older women after a short group intervention. *Aging Ment Health*. 2006;10(5):476–84.
 17. • Sutipan P, Intarakamhang U, Macaskill A. The impact of positive psychological interventions on well-being in healthy elderly people. *J Happiness Stud*. 2017;18(1):269–91
- A good review of positive psychology interventions amongst older adults.
18. Chiang KJ, Lu RB, Chu H, Chang YC, Chou KR. Evaluation of the effect of a life review group program on self-esteem and life satisfaction in the elderly. *Int J Geriatr Psychiatry*. 2008;23(1):7–10. <https://doi.org/10.1002/gps.1824>.
 19. Meléndez Moral JC, Fortuna Terrero FB, Sales Galan A, Mayordomo RT. Effect of integrative reminiscence therapy on depression, well-being, integrity, self-esteem, and life satisfaction in older adults. *J Posit Psychol*. 2015;10(3):240–7.
 20. Meléndez-Moral JC, Charco-Ruiz L, Mayordomo-Rodríguez T, Sales-Galán A. Effects of a reminiscence program among institutionalized elderly adults. *Psicothema*. 2013;25(3):319–23.
 21. Preschl B, Maercker A, Wagner B, Forstmeier S, Baños RM, Alcañiz M, et al. Life-review therapy with computer supplements for depression in the elderly: a randomized controlled trial. *Aging Ment Health*. 2012;16(8):964–74.
 22. Killen A, Macaskill A. Using a gratitude intervention to enhance well-being in older adults. *J Happiness Stud*. 2015;16(4):947–64.
 23. Ho HC, Yeung DY, Kwok SY. Development and evaluation of the positive psychology intervention for older adults. *J Posit Psychol*. 2014;9(3):187–97.
 24. Ramírez E, Ortega AR, Chamorro A, Colmenero JM. A program of positive intervention in the elderly: memories, gratitude and forgiveness. *Aging Ment Health*. 2014;18(4):463–70.
 25. Proyer RT, Gander F, Wellenzohn S, Ruch W. Positive psychology interventions in people aged 50–79 years: long-term effects of placebo-controlled online interventions on well-being and depression. *Aging Ment Health*. 2014;18(8):997–1005.
 26. Friedman E, Ruini C, Foy C, Jaros L, Love G, Ryff C. Lighten UP! A community-based group intervention to promote eudaimonic well-being in older adults: a multi-site replication with 6 month follow-up. *Clin Gerontol*. 2019;42(4):387–97.
 27. Greenawalt KE, Orsega-Smith E, Turner JL, Goodwin S, Rathie EJ. The impact of “the art of happiness” class on community dwelling older adults: a positive psychology intervention. *Act Adapt Aging*. 2019;43(2):118–32.
 28. Ernst JM, Cacioppo JT. Lonely hearts: psychological perspectives on loneliness. *Appl Prev Psychol*. 1999;8(1):1–22.
 29. Russell D, Peplau LA, Cutrona CE. The revised UCLA Loneliness Scale: concurrent and discriminant validity evidence. *J Pers Soc Psychol*. 1980;39(3):472–80.
 30. de Jong-Gierveld J. Developing and testing a model of loneliness. *J Pers Soc Psychol*. 1987;53(1):119–28.
 31. Cornwell EY, Waite LJ. Social disconnectedness, perceived isolation, and health among older adults. *J Health Soc Behav*. 2009;50(1):31–48.
 32. DiJulio B, Hamel L, Muñana C, Brodie M. Loneliness and social isolation in the United States, the United Kingdom, and Japan: an international survey. Kaiser Family Foundation. 2018.
 33. Pinquart M, Sorensen S. Influences on loneliness in older adults: a meta-analysis. *Basic Appl Soc Psychol*. 2001;23(4):245–66.
 34. Victor CR, Bowling A. A longitudinal analysis of loneliness among older people in Great Britain. *J Psychol*. 2012;146(3):313–31.

35. Victor C, Scambler S, Bond J. The social world of older people: understanding loneliness and social isolation in later life: understanding loneliness and social isolation in later life. McGraw-Hill Education (UK); 2008.
36. Ong AD, Uchino BN, Wethington E. Loneliness and health in older adults: a mini-review and synthesis. *Gerontology*. 2016;62(4):443–9.
37. Courtin E, Knapp M. Social isolation, loneliness and health in old age: a scoping review. *Health Soc Care Community*. 2017;25(3):799–812.
38. Holt-Lunstad J, Smith TB, Baker M, Harris T, Stephenson D. Loneliness and social isolation as risk factors for mortality: a meta-analytic review. *Perspect Psychol Sci*. 2015;10(2):227–37.
39. Masi CM, Chen H-Y, Hawkey LC, Cacioppo JT. A meta-analysis of interventions to reduce loneliness. *Personal Soc Psychol Rev*. 2011;15(3):219–66.
40. Fakoya OA, McCorry NK, Donnelly M. Loneliness and social isolation interventions for older adults: a scoping review of reviews. *BMC Public Health*. 2020;20(1):1–14.
41. • Jarvis M-A, Padmanabhanunni A, Balakrishna Y, Chipps J. The effectiveness of interventions addressing loneliness in older persons: an umbrella review. *Int J Afr Nurs Sci*. 2019:100177
- A comprehensive umbrella review summarizing many systemic reviews, meta-analyses, and randomized controlled trial loneliness interventions targeting older adults.
42. • Gardiner C, Geldenhuys G, Gott M. Interventions to reduce social isolation and loneliness among older people: an integrative review. *Health Soc Care Community*. 2018;26(2):147–57
- A recent review summarizing approaches of previous social isolation interventions targeting older adults.
43. Cattan M, White M, Bond J, Learmouth A. Preventing social isolation and loneliness among older people: a systematic review of health promotion interventions. *Ageing Soc*. 2005;25(1):41–67.
44. Cohen-Mansfield J, Perach R. Interventions for alleviating loneliness among older persons: a critical review. *Am J Health Promot*. 2015;29(3):e109–e25.
45. Dickens AP, Richards SH, Greaves CJ, Campbell JL. Interventions targeting social isolation in older people: a systematic review. *BMC Public Health*. 2011;11(1):647.
46. Brandstätter M, Baumann U, Borasio GD, Fegg MJ. Systematic review of meaning in life assessment instruments. *Psycho-Oncology*. 2012;21(10):1034–52.
47. Czekierda K, Banik A, Park CL, Luszczynska A. Meaning in life and physical health: systematic review and meta-analysis. *Health Psychol Rev*. 2017;11(4):387–418.
48. Glaw X, Kable A, Hazelton M, Inder K. Meaning in life and meaning of life in mental health care: an integrative literature review. *Issues Ment Health Nurs*. 2017;38(3):243–52.
49. Hupkens S, Machielse A, Goumans M, Derckx P. Meaning in life of older persons: an integrative literature review. *Nurs Ethics*. 2018;25(8):973–91.
50. Dewitte L, Vandenbulcke M, Dezutter J. Meaning in life matters for older adults with Alzheimer's disease in residential care: associations with life satisfaction and depressive symptoms. *Int Psychogeriatr*. 2019;31(5):607–15.
51. Aftab A, Lee EE, Klaus F, Daly R, Wu TC, Tu X, et al. Meaning in life and its relationship with physical, mental, and cognitive functioning: a study of 1,042 community-dwelling adults across the lifespan. *J Clin Psychiatry*. 2019;81(1). <https://doi.org/10.4088/JCP.19m13064>.
52. Kleiman EM, Adams LM, Kashdan TB, Riskind JH. Gratitude and grit indirectly reduce risk of suicidal ideations by enhancing meaning in life: evidence for a mediated moderation model. *J Res Pers*. 2013;47(5):539–46.
53. • Guerrero-Torrelles M, Monforte-Royo C, Rodríguez-Prat A, Porta-Sales J, Balaguer A. Understanding meaning in life interventions in patients with advanced disease: a systematic review and realist synthesis. *Palliat Med*. 2017;31(9):798–813
- A good systematic review of meaning in life interventions in patients with advanced disease.
54. Frankl VE. Logotherapy and existential analysis—a review. *Am J Psychother*. 1966;20(2):252–60.
55. Kang K-A, Han S-J, Lim Y-S, Kim S-J. Meaning-centered interventions for patients with advanced or terminal cancer: a meta-analysis. *Cancer Nurs*. 2019;42(4):332–40. <https://doi.org/10.1097/NCC.0000000000000628>.
56. Maercker A, Bachem R. Life-review interventions as psychotherapeutic techniques in psychotraumatology. *Eur J Psychotraumatol*. 2013;4(1):19720.
57. Wang C-W, Chow AY, Chan CL. The effects of life review interventions on spiritual well-being, psychological distress, and quality of life in patients with terminal or advanced cancer: a systematic review and meta-analysis of randomized controlled trials. *Palliat Med*. 2017;31(10):883–94.
58. Bohlmeijer E, Smit F, Cuijpers P. Effects of reminiscence and life review on late-life depression: a meta-analysis. *Int J Geriatr Psychiatry*. 2003;18(12):1088–94.
59. Bohlmeijer E, Roemer M, Cuijpers P, Smit F. The effects of reminiscence on psychological well-being in older adults: a meta-analysis. *Ageing Ment Health*. 2007;11:291–300.
60. MacKinlay E, Trevitt C. Living in aged care: using spiritual reminiscence to enhance meaning in life for those with dementia. *Int J Ment Health Nurs*. 2010;19(6):394–401.
61. Baltes PB, Smith J. Toward a psychology of wisdom and its ontogenesis. *Wisdom: Its nature, origins, and development 1990*;1:87–120.
62. Staudinger UM, Lopez DF, Baltes PB. The psychometric location of wisdom-related performance: intelligence, personality, and more? *Personal Soc Psychol Bull*. 1997;23(11):1200–14.

63. Jeste DV, Ardel M, Blazer D, Kraemer HC, Vaillant G, Meeks TW. Expert consensus on characteristics of wisdom: a Delphi method study. *The Gerontologist*. 2010;50(5):668–80.
64. Bangen KJ. Defining and assessing wisdom: a review of the literature. *Am J Geriatr Psychiatry*. 2013;21(12):1254–EOA. <https://doi.org/10.1016/j.jagp.2012.11.020>.
65. Ardel M. Empirical assessment of a three-dimensional wisdom scale. *Res Aging*. 2003;25(3):275–324.
66. Webster JD, Westerhof GJ, Bohlmeijer ET. Wisdom and mental health across the lifespan. *J Gerontol B Psychol Sci Soc Sci*. 2014;69(2):209–18.
67. Bergsma A, Ardel M. Self-reported wisdom and happiness: an empirical investigation. *J Happiness Stud*. 2012;13(3):481–99.
68. Lee EE, Depp C, Palmer BW, Glorioso D, Daly R, Liu J, et al. High prevalence and adverse health effects of loneliness in community-dwelling adults across the lifespan: role of wisdom as a protective factor. *Int Psychogeriatr*. 2019;31(10):1447–62.
69. Ardel M. Wisdom and life satisfaction in old age. *J Gerontol Ser B Psychol Sci Soc Sci* 1997;52(1):P15–P27.
70. Ardel M. Antecedents and effects of wisdom in old age: a longitudinal perspective on aging well. *Res Aging*. 2000;22(4):360–94.
71. Etezadi S, Pushkar D. Why are wise people happier? An explanatory model of wisdom and emotional well-being in older adults. *J Happiness Stud*. 2013;14(3):929–50.
72. Ardel M, Jeste DV. Wisdom and hard times: the ameliorating effect of wisdom on the negative association between adverse life events and well-being. *J Gerontol B Psychol Sci Soc Sci*. 2018;73(8):1374–83. <https://doi.org/10.1093/geronb/gbw137>.
73. Mickler C, Staudinger UM. Personal wisdom: validation and age-related differences of a performance measure. *Psychol Aging*. 2008;23(4):787–99.
74. Wink P, Helson R. Practical and transcendent wisdom: their nature and some longitudinal findings. *J Adult Dev*. 1997;4(1):1–15.
75. Lee EE, Bangen KJ, Avanzino JA, Hou B, Ramsey M, Eglit G et al. Meta-analysis of randomized controlled trials to enhance components of wisdom: pro-social behaviors, emotional regulation, and spirituality. *JAMA Psychiatry*. (in press).
- Up-to-date meta-analysis of wisdom interventions for all populations.
76. Neff KD, Germer CK. A pilot study and randomized controlled trial of the mindful self-compassion program. *J Clin Psychol*. 2013;69(1):28–44.
77. Sommers-Spijkerman M, Trompeter H, Schreurs K, Bohlmeijer E. Compassion-focused therapy as guided self-help for enhancing public mental health: a randomized controlled trial. *J Consult Clin Psychol*. 2018;86(2):101–15.
78. Ando M, Morita T, Akechi T, Okamoto T. Care JIFFS. Efficacy of short-term life-review interviews on the spiritual well-being of terminally ill cancer patients. *J Pain Symptom Manag*. 2010;39(6):993–1002.
79. Breitbart W, Poppito S, Rosenfeld B, Vickers AJ, Li Y, Abbey J, et al. Pilot randomized controlled trial of individual meaning-centered psychotherapy for patients with advanced cancer. *J Clin Oncol*. 2012;30(12):1304–9. <https://doi.org/10.1200/JCO.2011.36.2517>.
80. Chimluang J, Thanasilp S, Akkayagorn L, Upasen R, Pudtong N, Tantitrukul W. Effect of an intervention based on basic Buddhist principles on the spiritual well-being of patients with terminal cancer. *Eur J Oncol Nurs*. 2017;31:46–51.
81. Chochinov HM, Kristjanson LJ, Breitbart W, McClement S, Hack TF, Hassard T, et al. Effect of dignity therapy on distress and end-of-life experience in terminally ill patients: a randomised controlled trial. *Lancet Oncol*. 2011;12(8):753–62.
82. Labelle LE, Lawlor-Savage L, Campbell TS, Faris P, Carlson LE. Does self-report mindfulness mediate the effect of Mindfulness-Based Stress Reduction (MBSR) on spirituality and posttraumatic growth in cancer patients? *J Posit Psychol*. 2015;10(2):153–66.
83. American Psychological Association. The road to resilience. 2004. <http://helping.apa.org/resilience/>.
84. Bennett K. Emotional and personal resilience through life. *The Future of an Ageing Population: Evidence Review*. 2015.
85. Windle G, Bennett KM, Noyes J. A methodological review of resilience measurement scales. *Health Qual Life Outcomes*. 2011;9(1):8.
86. MacLeod S, Musich S, Hawkins K, Alsgaard K, Wicker ER. The impact of resilience among older adults. *Geriatr Nurs*. 2016;37(4):266–72.
87. Windle G, Markland DA, Woods RT. Examination of a theoretical model of psychological resilience in older age. *Aging Ment Health*. 2008;12(3):285–92.
88. Pietrzak RH, Cook JM. Psychological resilience in older US veterans: results from the national health and resilience in veterans study. *Depress Anxiety*. 2013;30(5):432–43.
89. Gill TM, Robison JT, Tinetti ME. Predictors of recovery in activities of daily living among disabled older persons living in the community. *J Gen Intern Med*. 1997;12(12):757–62.
90. Shen K, Zeng Y. The association between resilience and survival among Chinese elderly. *Demogr Res*. 2010;23(5):105–16
- Up-to-date systemic review and meta-analysis of resilience interventions measuring psychological resilience for all populations.
91. Jeste DV, Savla GN, Thompson WK, Vahia IV, Glorioso DK, Martin AS, et al. Association between older age and more successful aging: critical role of resilience and depression. *Am J Psychiatr*. 2013;170(2):188–96.
92. Netuveli G, Wiggins RD, Montgomery SM, Hildon Z, Blane D. Mental health and resilience at older ages: bouncing back after adversity in the British Household

- Panel Survey. *J Epidemiol Community Health*. 2008;62(11):987–91.
93. Macedo T, Wilhelm L, Gonçalves R, Coutinho ESF, Vilete L, Figueira I, et al. Building resilience for future adversity: a systematic review of interventions in non-clinical samples of adults. *BMC Psychiatry*. 2014;14(1):227.
94. Joyce S, Shand F, Tighe J, Laurent SJ, Bryant RA, Harvey SB. Road to resilience: a systematic review and meta-analysis of resilience training programmes and interventions. *BMJ Open*. 2018;8(6):e017858.
95. Robertson IT, Cooper CL, Sarkar M, Curran T. Resilience training in the workplace from 2003 to 2014: a systematic review. *J Occup Organ Psychol*. 2015;88(3):533–62.
96. Helmreich I, Chmitorz A, König J, Binder H, Wessa M, Lieb K, et al. Psychological interventions for resilience enhancement in adults. *Cochrane Database Syst Rev*. 2017;2017(2).
97. Chmitorz A, Kunzler A, Helmreich I, Tüscher O, Kalisch R, Kubiak T, et al. Intervention studies to foster resilience—a systematic review and proposal for a resilience framework in future intervention studies. *Clin Psychol Rev*. 2018;59:78–100.
98. Lavretsky H. *Resilience and aging: research and practice*: JHU Press; 2014.
99. Connor KM, Davidson JR. Development of a new resilience scale: the Connor-Davidson resilience scale (CD-RISC). *Depress Anxiety*. 2003;18(2):76–82.
100. Treichler EBH, Glorioso D, Lee EE, Wu TC, Tu XM, Daly R, et al. A pragmatic trial of a group intervention in senior housing communities to increase resilience. *Int Psychogeriatr*. 2020;32(2):173–82. <https://doi.org/10.1017/S1041610219002096>.
101. Robinson M, Hanna E, Raine G, Robertson S. Extending the comfort zone: building resilience in older people with long-term conditions. *J Appl Gerontol*. 2019;38(6):825–48.
102. Woodward AT, Freddolino PP, Blaschke-Thompson CM, Wishart DJ, Bakk L, Kobayashi R, et al. Technology and aging project: training outcomes and efficacy from a randomized field trial. *Ageing Int*. 2011;36(1):46–65.
103. Saito T, Kai I, Takizawa A. Effects of a program to prevent social isolation on loneliness, depression, and subjective well-being of older adults: a randomized trial among older migrants in Japan. *Arch Gerontol Geriatr*. 2012;55(3):539–47.
104. Routasalo PE, Tilvis RS, Kautiainen H, Pitkala KH. Effects of psychosocial group rehabilitation on social functioning, loneliness and well-being of lonely, older people: randomized controlled trial. *J Adv Nurs*. 2009;65(2):297–305.
105. Banks MR, Willoughby LM, Banks WA. Animal-assisted therapy and loneliness in nursing homes: use of robotic versus living dogs. *J Am Med Dir Assoc*. 2008;9(3):173–7.
106. Henry M, Cohen SR, Lee V, Sauthier P, Provencher D, Drouin P, et al. The Meaning-Making intervention (MMi) appears to increase meaning in life in advanced ovarian cancer: a randomized controlled pilot study. *Psycho-Oncology*. 2010;19(12):1340–7. <https://doi.org/10.1002/pon.1764>.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.