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Title

Systematic Review of the Neurobiological Links Between Loneliness and Wisdom

Permalink

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Journal

JOURNAL OF NEUROPSYCHIATRY AND CLINICAL NEUROSCIENCES, 33(3)

ISSN

0895-0172

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Publication Date

2021

Peer reviewed

Current Treatment Options in Psychiatry

Positive Psychiatry Interventions in Geriatric Mental Health

--Manuscript Draft--

Manuscript Number:	
Full Title:	Positive Psychiatry Interventions in Geriatric Mental Health
Article Type:	Invited Commentary
Section/Category:	Geriatric Disorders
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Corresponding Author's Institution:	University of California San Diego
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Funding Information:	
Abstract:	<p>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.</p> <p>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.</p> <p>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.</p>

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1

POSITIVE PSYCHIATRY INTERVENTIONS IN GERIATRIC MENTAL HEALTH

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Word Count: 3732

Tables: 2

Figures: 0

Revised: 4/19/2020

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.

Keywords: successful aging; resilience; wisdom; meaning in life; spirituality; compassion; social engagement

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 as a concept that emerged in the late 20th 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].

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4 Historically, positive psychiatry can be seen as the psychiatric offshoot of the positive
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6 psychology movement pioneered by Seligman and colleagues in the late 1990s [8]. Just as
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8 clinical psychology and psychiatry are over-lapping professions, positive psychology and
9
10 positive psychiatry also have over-lapping concepts and goals, with differences arising from
11
12 unique training backgrounds, skills, and perspectives of providers. Consequently, there is also no
13
14 strict distinction between ‘positive psychology interventions’ and ‘positive psychiatry
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16 interventions’ since interventions targeting PPCs can be beneficial in healthy individuals as well
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19 as individuals with psychiatric disorders.
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24 Although aging may be associated with challenges such as loss of monetary and social
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26 resources and deteriorating functional and cognitive abilities, aging may also be associated with
27
28 benefits, such as increases in spirituality, wisdom, emotional regulation, and problem-solving
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30 abilities. These increases in PPCs may explain the “paradox of aging,” or the tendency for
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32 subjective well-being to increase despite the challenges associated with age [9]. A growing body
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34 of literature suggests PPCs are associated with numerous favorable physical and mental health
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36 outcomes.
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41 An increasing number of interventional studies are using treatments that target modifiable
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43 PPCs and study their impact on mental health. For the purpose of this narrative review, a
44
45 literature search for pertinent articles was conducted using various combinations of key words
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47 (social connectedness, meaning in life, wisdom, resilience AND older adults) and utilizing the
48
49 databases PubMed, PsychINFO, and Google Scholar. Articles identified through the online
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51 search were subsequently hand searched and reviewed individually for further references of
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53 significance. We provide an initial overview of the literature on positive psychology
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55 interventions followed by a discussion of interventions targeting social connectedness, meaning
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4 in life, wisdom, and resilience as illustrative examples of contemporary research in positive
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7 psychiatry and geriatric mental health.

8 9 **Results**

10 11 **Positive Psychology Interventions**

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14 Positive Psychology Interventions (PPIs) are treatment methods and intentional activities
15
16 that aim to increase well-being by cultivating positive feelings, behaviors, or cognitions [10].

17
18 The focus of these interventions is to build strengths and positive attributes (such as optimism)
19
20 rather than fixing or remedying negative attributes (such as correcting cognitive distortions).

21
22 PPIs are designed using the principles of positive psychology as outlined by the seminal work of
23
24 Seligman and Csikszentmihaly [8]. PPIs have been studied in healthy, non-clinical samples as
25
26 well as in clinical samples such as in individuals with depression [10]. PPIs differ from
27
28 traditional psychological and psychiatric interventions in that they do not focus on aiming to
29
30 reduce symptoms, problems, or disorders, rather, they focus on promoting well-being.

31
32 Furthermore, PPIs typically focus on short, tangible tasks such as writing down three good things
33
34 each day or savoring a moment for two minutes with the goal of increasing positive emotions.

35
36 The outcomes measured in PPIs vary broadly, but studies attempt to measure and improve
37
38 optimism, happiness, or psychological-well-being [10].

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41 Overall, the published PPI studies have found small but significant effects on well-being
42
43 and depressive symptoms, though few of these interventions targeted older adults. A 2013 meta-
44
45 analysis of PPIs identified 39 studies with a total of 6,139 participants [11]. This study showed
46
47 that PPIs had small but significant effect sizes, with standardized mean difference (SMD) of 0.34
48
49 (95% CI: 0.22, 0.45) for subjective well-being and 0.23 (95% CI: 0.09, 0.38) for depressive
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51 symptoms, when compared to the control group. However, only a few PPIs have examined
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4 clinical populations such as suicidal inpatients [12], individuals with tobacco use disorder [13],
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6 and individuals with schizophrenia [14]. Additionally, only two of the 39 studies examined in the
7
8 meta-analysis targeted older adults [15, 16].
9

10
11 Examining PPIs specifically focusing on older adults, a 2017 systematic review identified
12
13 eight interventions targeting well-being in older adults [17], including seven interventions not
14
15 included in the 2013 meta-analysis described above. These interventions included exercises such
16
17 as reminiscence [18-21], gratitude [22], forgiveness, optimism, savoring positive experiences,
18
19 curiosity, and multicomponent interventions [23, 24]. PPIs were associated with significant
20
21 improvements in well-being and alleviated depressive symptoms in these studies, and the authors
22
23 noted gratitude interventions were maximally effective in promoting durable well-being for
24
25 healthy older adults [17].
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31 Other notable PPIs targeted at older adults have attempted to identify the individual
32
33 effects of “positive” exercises such as listing three good things each day, listing three funny
34
35 things each day, conducting a gratitude visit, and using “signature strengths” by creating multiple
36
37 intervention arms in an online setting [25]. Other investigators have demonstrated beneficial
38
39 effects for 8-week group-based positive psychology classes in community-based settings [26,
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41 27]. While positive psychology interventions have diverse intervention characteristics, many of
42
43 the interventions to date have demonstrated positive small to medium effect sizes.
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48 **Social Connectedness**

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50 Loneliness and social isolation have emerged as major health risk factors in the United
51
52 States. While the terms social isolation and loneliness are commonly used interchangeably in
53
54 everyday language, research generally indicates that social isolation describes an *objective*
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56 absence of connection whereas loneliness is the *subjective* state of feeling socially isolated [28].
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4 Many of the interventional literature focuses on loneliness, and the UCLA Loneliness scale is the
5 most commonly employed scale in clinical research studies [29]. Other scales include single item
6 measures and the de Jong Gierveld Scale [30], which was designed specifically to measure
7 loneliness in older adults. Social isolation measures include social network characteristics, social
8 interaction, and participation in social activities[31].
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16 Older populations are particularly vulnerable to feelings of loneliness and social isolation.
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18 Large survey data indicates the prevalence of loneliness *or* social isolation to be 22% and 23%
19 amongst adults over 65 in the United States and United Kingdom, respectively [32]. Estimates of
20 the prevalence of severe loneliness are 5-15% [33, 34]. One qualitative research study found that
21 older adult participants had more feelings of loneliness compared to their recalled feelings of
22 loneliness 10 years prior, indicating an underestimation of future feelings of loneliness [35].
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31 Loneliness and social isolation are associated with worse physical and mental health
32 outcomes [36]. Most notably, loneliness is independently associated with depression [37] and all-
33 cause mortality [38]. While there is an abundance of cross-sectional studies, the longitudinal data
34 are limited, impacting causal inferences. One longitudinal survey found increasing loneliness
35 was independently associated with changes in marital status, living arrangements, social
36 networks, and physical health [34].
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45 **Social Connectedness Interventions**

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48 An increasing number of interventions for loneliness and social isolation have been
49 developed in recent years. In one of the first quantitative analyses of these interventions, a 2011
50 meta-analysis identified 20 RCTs with a mean effect size of Hedges $g = -0.198$ (95% CI: -0.32 ,
51 -0.08) in reducing loneliness, with a moderator analysis demonstrating larger mean effect sizes
52 in interventions addressing maladaptive social cognition compared to those addressing social
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4 support, increasing opportunities for social access, or improving social skills [39]. Within these
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7 20 RCTs, 10 studies targeted individuals 60 years or older [39].
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10 There have also been numerous reviews on social connectedness interventions in older
11 adults [40]. A 2019 umbrella review of identified 16 reviews and 19 RCTs [41], finding an
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13 overall pooled effect size of -0.14 ($-0.37, 0.09$), indicating a non-significant decrease in
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15
16 loneliness. The review categorized the selected interventions into four categories, including
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18 enhancing social support ($n = 9$), increasing opportunities for social access ($n = 7$), improving
19
20 social skills ($n = 2$), and addressing maladaptive social cognition ($n = 1$). These interventions
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22
23 were mostly studied in trial durations of 5-8 weeks, although three interventions lasted on the
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25
26 scale of 1-3 years. There were 6 internet-based “e-Interventions” and 8 group-based
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29 interventions. There was significant diversity amongst intervention designs, with interventions
30
31 ranging from group-based friendship clubs and daycare programs to using videoconferencing
32
33 and technology to network with others [41]. Other interventions were therapy-driven, with the
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35
36 theoretical premise that loneliness is a modifiable trait. The heterogeneity of intervention designs
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39 and frameworks makes it difficult to find the common characteristics of interventions that may
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42 positively impact social connectedness amongst older adults [42]. Overall, social connectedness
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45 interventions have been extensively reviewed, with multiple reviews demonstrating mixed
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48 results [41, 43-45].
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50 51 52 **Meaning in Life (MiL)**

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55 Contrary to philosophical discussions of meaning *of* life, meaning in life (MiL) is the
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58 psychological perception of an individual regarding one’s own life and activities, and the value
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61 and importance ascribed to them, and the degree to which they generate a sense of
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65 meaningfulness or purpose [46]. MiL has received increasing attention in positive psychiatry as

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4 well as medicine at large. A 2012 review reported the presence of 59 validated instruments
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6 developed with the goal of measuring MiL for scientific study [46]. Commonly measured aspects
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8 of MiL include the presence of MiL, search for MiL, and sources of MiL.
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11 Multiple research studies have demonstrated a strong link between MiL and better
12
13 physical, mental, and overall health outcomes [47, 48], including in older adult populations [49]
14
15 and individuals with Alzheimer's disease [50] as well as in community samples across the entire
16
17 adult lifespan [51]. Longitudinal studies in college students have also demonstrated that MiL
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19 may be a protective factor against suicide [52].
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24 A recent study reported that the presence of MiL showed an inverted U-shaped pattern
25
26 across the lifespan, peaking around the age of 60 and decreasing subsequently as physical health
27
28 declines with age [51]. This underscores the importance of MiL interventions in older adults, as
29
30 well as near the end of life in oncologic and palliative care populations.
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33 **Meaning in Life Interventions**

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35 Overall, the published MiL interventions have demonstrated a significant effect on
36
37 overall well-being. A recent realist and meta-narrative evidence synthesis described nine
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39 interventions with the goal of enhancing MiL among patients with advanced diseases. The
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41 interventions ranged in length from 2 to 8 sessions of 30-90 minutes each [53]. The mean age of
42
43 participants in these intervention studies ranged from 54 to 65 years. Most interventions utilized
44
45 individual sessions with a trained therapist, while one intervention was in a group setting. The
46
47 interventions employed various theoretical models, with the most common being Viktor Frankl's
48
49 logotherapy [54]. Other frameworks explored topics such as sources of meaning, life priorities,
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51 and gratitude for life lived [53]. Another recent meta-analysis quantified meaning-centered
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53 interventions in a terminal cancer population, finding five meaning-focused RCTs had a
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4 weighted effect size of d of 0.46 (95% CI: 0.33, 0.58) for the pooled outcomes (meaning of life,
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6 spiritual well-being, quality of life, anxiety, and physical symptoms), with an effect size of d of
7
8 0.96 (95% CI: 0.64, 1.28) for the meaning of life outcome for MiL intervention compared to
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10 control [55].
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14 Another commonly studied type of MiL interventions in older adult populations are life
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16 review interventions, which are individual or group storytelling interventions with a focus on
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18 integrating life stories through different phases in life [56]. These interventions have a
19
20 demonstrable impact and are effective in enhancing MiL as well as other mental health outcomes
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22 in older adults [57]. A meta-analysis demonstrated that life review interventions had an effect
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24 size of d of 0.84 (95% CI: 0.31, 1.37) on depressive symptomatology in older adults [58], and d
25
26 of 0.54 (95% CI: 0.33, 0.75) on measures of psychological well-being in older adults [59], with
27
28 more recent studies finding similar effects for life review interventions in patients with dementia
29
30 [60]. Overall, MiL interventions demonstrate medium to large effect sizes, although much of the
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32 literature is limited to those at the end of life.
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38 **Wisdom**

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40 Although ‘wisdom’ is often used in everyday language and has origins stemming back to
41
42 ancient times, it has been an elusive construct to define in the psychological literature with
43
44 empirical studies starting in the 1970s. Bates and Smith (1990), pioneers in the field, defined
45
46 wisdom as “expert knowledge in the fundamental pragmatics of life” [61]. While wisdom is
47
48 related to knowledge, wisdom is commonly understood as the practical use, application, and
49
50 integration of knowledge [62]. A foundational 2010 study, aiming to find consensus amongst
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52 expert researchers in the field, summarizes wisdom as “a learned, advanced form of cognitive
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54 and emotional development that is experience driven”[63].
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4 A 2013 review identified that a majority of the definitions of wisdom in the peer
5
6 reviewed literature contained the following five subcomponents: 1) knowledge of life, 2)
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8 prosocial attitudes and behaviors, 3) self-understanding, 4) acknowledgment of uncertainty, and
9
10 5) emotional homeostasis. This review also identified five wisdom self-reported questionnaires
11
12 and four instruments using interview-based instruments scored by trained raters [64]. Given their
13
14 ease of use, self-reported questionnaires have been more commonly used for assessment. One of
15
16 the more widely used scales is the Three-Dimensional Wisdom Scale, given its rigorous
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18 development and good psychometric properties [65].
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24 Across the lifespan, wisdom is associated with positive outcomes including better overall
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26 physical and mental health [66], happiness [67], and lower levels of loneliness [68]. Amongst
27
28 older adults, numerous investigations using self-reported wisdom scales have demonstrated
29
30 wisdom is positively associated with life satisfaction [69, 70] and subjective well-being [69, 71],
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32 with one longitudinal study reporting that wisdom ameliorates the effect of adverse life
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34 circumstances on subjective well-being [72]. However, some studies using the Berlin Wisdom
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36 model, an interview-based scoring system, found that wisdom and subjective well-being were
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38 unrelated [73, 74]. Despite some contradictory results, on whole, wisdom seems to be associated
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40 with numerous psychosocial advantages to those who score high in the trait.
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46 Although there is a common perception that wisdom increases with age, some empirical
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48 evidence indicates that wisdom has a curvilinear relationship with age, peaking in the middle of
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50 life [66]. This underscores the importance of wisdom interventions in all ages of life.
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53 **Wisdom Interventions**

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55 Given the broad definition, it has been difficult to integrate all interventions targeting
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57 wisdom and its associated constructs. To date, there has been one meta-analysis of wisdom
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4 interventions, or interventions that target components of wisdom. This meta-analysis identified
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7 57 studies that addressed some component of wisdom: 29 focused on prosocial behavior, 13 on
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9 emotional regulation, and 15 on spirituality. There was considerable heterogeneity for
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11 populations targeted, scales use, and interventional characteristics. This meta-analysis revealed a
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13 pooled SMD of 0.43 (95% CI: 0.22, 0.30) for pro-social behavior, 0.67 (95% CI: 0.21,1.12)] for
14
15 emotional regulation, and 1.00 (95% CI: 0.41 to 1.60) for spirituality interventions, respectively
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17
18 [75].
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21 While none of the interventions reviewed in this meta-analysis were specifically targeted
22
23 toward older adults, seven of the interventions had mean ages above 50. Out of these
24
25 interventions, two focused on self-compassion [76, 77] and five focused on spirituality [78-82].
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27 Both a high intensity eight-week group-based self-compassion therapy intervention [76] and a
28
29 self-help intervention with seven self-compassion lessons and email guidance demonstrated
30
31 favorable self-rated self-compassion and well-being compared to control [77]. The five
32
33 spirituality interventions with sample mean ages over 50 also demonstrated significant
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35 improvements in spirituality [75]. While wisdom is a growing topic of interest in older adults, to
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37 date, few interventions directly target wisdom or its related constructs as an outcome.
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43 **Resilience**

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45 In everyday language, resilience is a term used to describe one who can recover, or
46
47 “bounce back” from difficult situations. In the psychological literature, a commonly cited
48
49 definition of resilience is the definition by the American Psychological Association (APA): “The
50
51 process of adapting well in the face of adversity, trauma, tragedy, threats, or significant sources
52
53 of stress” [83]. Consistent with this definition, recent literature conceptualizes resilience as an
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55 adaptable resource that can be learned, rather than a static personality trait [84]. Numerous scales
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4 have been developed to measure resilience, but researchers have yet to adopt one scale as a ‘gold
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6 standard’ [85].
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9 To date, many resilience interventions have targeted specific groups such as military and
10
11 healthcare workers, but there is a growing literature focusing on resilience in older adults [86].
12
13 Resilience amongst older adults is hypothesized to moderate the effect of the numerous stressors
14
15 associated with aging such as worsening health, bereavement, decline in socioeconomic status,
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17 disability, loss of autonomy, and depression, all of which may negatively impact overall well-
18
19 being [85, 87].
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24 In a study of 2,025 U.S. veterans over the age of 60, 70% of those with a high number of
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26 lifetime traumas were found to be resilient. This study demonstrated resilience was associated
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28 with the characteristics of higher educational attainment, marriage, emotional stability, social
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30 connectedness, community integration, and purpose in life [88]. Other cross-sectional studies
31
32 examining resilience in older adults suggest resilience is associated with numerous positive
33
34 physical, mental, and social health outcomes [86]. Most notably, higher resilience is associated
35
36 with independence in activities of daily living [89], decreases in all-cause mortality [90], lower
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38 rates of depression [91] , and social connection [92].
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43 **Resilience Interventions**

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45 Despite numerous cross-sectional studies, interventions specifically targeting resilience
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47 as an outcome is limited. To date, three systematic reviews [93-95] and one systematic review
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49 protocol published [96] have analyzed the efficacy of resilience interventions in all populations.
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51 One of the most rigorous reviews, which only included interventions utilizing three valid and
52
53 reliable measures of psychological resilience, reported a positive effect size of SMD of 0.44
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55 (95% CI: 0.23 to 0.64) [94]. These interventions vary widely and include mindfulness training,
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4 cognitive behavioral therapy sessions, online webinars, and phone coaching [94]. A recent 2018
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6 review explains the limitations of the resilience literature, citing major methodological problems,
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8 heterogeneity in resilience definitions, and poor reporting quality, amongst other conceptual
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10 challenges [97].
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14 A 2014 book by Helen Lavretsky about resilience and aging reviews numerous
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16 interventions believed to improve resilience in older populations, but it is important to note that
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18 these interventions described target outcomes *related* to resilience or that have theoretical links
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20 to resilience, such as well-being therapy, social support, lifestyle, mind-body, and exercise
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22 interventions [98], which we have described in other sections of this manuscript.
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26 We identified two interventions designed to enhance resilience amongst older adults. The
27
28 first intervention used the validated Connor-Davidson Resilience Scale [99] to examine the
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30 effects of a three-session group-based intervention aimed at 1) recognizing aging as an
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32 opportunity for continued growth and enjoyment, 2) increasing positive emotions, and 3)
33
34 engaging in values-driven activities [100]. This study demonstrated significant changes in
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36 resilience from pre-intervention to 3-month follow up. Another resilience intervention recruited
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38 older adults with chronic illness (heart conditions, diabetes, and arthritis) for six group-based
39
40 sessions to share lived experiences, relaxation techniques, management of stress, and coping
41
42 strategies. The trial found significant increases in perceived resilience, defined by the authors as
43
44 a composite between self-efficacy, social support, and overall well-being at the end of the course
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46 and at three-month follow-up [101]. Given the limited number of interventions, it remains to be
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48 determined whether resilience can be operationalized and taught to individuals in an attempt to
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50 buffer life stressors.
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4 A summary table of meta-analyses for select PPCs in older adults is summarized in Table

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7 1. Selected randomized controlled trials (RCTs) for PPC interventions are summarized in Table
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10 11 **Discussion**

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14 There is growing evidence that PPCs are associated with well-being and successful aging.
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16 The current evidence demonstrates it is possible to modify PPCs, and there is preliminary
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18 evidence to suggest that PPC enhancement can increase overall well-being.
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22 PPIs improve well-being and are supported by multiple RCTs, systematic reviews, and
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24 meta-analyses. However, the generalizability of these analyses is limited by the heterogeneity in
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26 construct definitions, measurements, and diversity of intervention characteristics. Studies in the
27
28 geriatric population are relatively limited in number, and primarily focus on healthy older adults,
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30 as opposed to clinical populations. Future research efforts should focus on remedying these
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32 deficiencies in the literature. There is support for interventions to promote PPCs but the
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34 methodological weaknesses and heterogeneity in these studies are limiting factors.
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39 It should also be noted this review artificially creates distinctions between PPCs such as
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41 meaning in life, resilience, and social connectedness to better outline the available literature;
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43 however, PPCs are highly overlapping and correlated constructs. For example, MiL is likely
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45 linked to resilience and wisdom, and an intervention on the former may also affect the latter two,
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47 and *vice versa*. Additionally, exercise, nutrition, and mind-body interventions likely influence
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49 many of these PPCs; however, this review did not capture these interventions as many of these
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51 studies have not examined the direct link between these interventions and PPCs or explicitly
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53 hypothesize a relationship between their intervention and PPCs. Understanding these complex
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55 relationships is one of the tasks of on-going and future research in positive psychiatry.
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4 In conclusion, our findings suggest that interventions aimed at promoting PPCs have the
5 potential to improve overall well-being and other positive health outcomes amongst older adults.
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7 While an increasing number of clinicians are recognizing the importance of positive psychiatry
8 principles, the current literature is restricted by heterogeneous methodology, limiting clinicians'
9 abilities to extrapolate these principles of positive psychiatry into everyday practice. With the
10 rapidly expanding body of evidence, positive psychiatry may have the potential to transform the
11 landscape of geriatric mental health in coming years.
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21 **Compliance with Ethical Standards**

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23 **Conflict of Interest**

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26 The authors declare no conflict of interest.
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29 **Human and Animal Rights and Informed Consent**

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

Notes: 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) 	Nine 90-minute weekly sessions with positive psychology, forgiveness, gratitude, and life review exercises
Killen, A., & Macaskill, A. (2015). (United Kingdom) [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)	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 Connectedness				
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

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20	Saito et al., 2012 (Japan) [103]	Pre-post- test design with intervention (n = 20) vs. wait-list control group (n = 40)	Community population of individuals who recently relocated (mean age = 73)	- Loneliness - Life satisfaction - Depression - Social support	Four 120-minute group sessions to talk about experiences, opportunities, and a city tour with opportunities to socialize with other participants
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25	Routasalo et al., 2009 (Finland) [104]	RCT pre- post- with intervention (n = 117) vs. control (n = 118)	Individuals with subjective feelings of loneliness (mean age = 80)	- Loneliness - Social network - Psychological well- being	Twelve group-based meal and activity sessions facilitated by a professional group leader aimed to improve social skills
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29	Banks and Banks, 2005 (USA) [105]	RCT pre- post- with intense intervention (n = 15) vs. moderate intervention n = 15), vs. control (n = 15)	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 six weeks
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36	Meaning in Life				
37	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-minute group-based life review program sessions exploring topics including childhood memories, job, friends, and greatest accomplishments
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42	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-minute individual sessions with computer exercise supplementation with life review intervention
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47	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-minute sessions with individual meaning-centered psychotherapy, which explored topics such as legacy, identity, limitations, creativity, connection, and hopes
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53	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-minute sessions with therapists aimed at exploring themes of the meaning of a cancer diagnosis, past life events, and future priorities
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Wisdom				
Neff & Germer, 2013 (USA) [76]	RCT pre- post- test design with intervention (n = 24) vs. wait-list control group (n = 27)	Community adults (mean age = 50)	<ul style="list-style-type: none"> - Self-compassion - Mindfulness - Compassion for others - Avoidance of negative feelings 	Eight 120-minute group-based sessions facilitated by clinical psychologists and self-compassion training with weekly topics and a half day meditation of
Labelle et al., 2015 (Canada) [82]	Pre-post- test design with intervention (n = 135) vs. wait-list control group (n = 76)	Cancer patients (mean age = 52.7)	<ul style="list-style-type: none"> - Spirituality - Post-traumatic growth - Mindfulness 	Eight 90-minute 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-minute 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 (United Kingdom) [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-minute group-based participatory activities including sharing lived experiences, relaxation techniques, and coping strategies

References and Recommended Reading

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. *Archives of General Psychiatry*. 1999;56(9):848-53.
2. Satcher D. Mental health: A report of the Surgeon General--Executive summary. *Professional Psychology: Research and Practice*. 2000;31(1):5.
3. Jeste DV, Palmer BW. A call for a new positive psychiatry of ageing. *The British Journal of Psychiatry*. 2013;202(2):81-3.
4. Jeste DV, Palmer BW, Rettew DC, Boardman S. Positive psychiatry: its time has come. *The Journal of Clinical Psychiatry*. 2015;76(6):675.
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. *Annual Review of Psychology*. 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. *Journal of Clinical Psychology*. 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. *General Hospital 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. *The Journal of Positive Psychology*. 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. *The Journal of Positive Psychology*. 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 Education and Counseling*. 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 and Mental 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. *Journal of Happiness Studies*. 2017;18(1):269-91.

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. doi:10.1002/gps.1824.
19. Meléndez Moral JC, Fortuna Terrero FB, Sales Galan A, Mayordomo Rodríguez T. Effect of integrative reminiscence therapy on depression, well-being, integrity, self-esteem, and life satisfaction in older adults. *The Journal of Positive Psychology*. 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 & Mental Health*. 2012;16(8):964-74.
22. Killen A, Macaskill A. Using a gratitude intervention to enhance well-being in older adults. *Journal of Happiness Studies*. 2015;16(4):947-64.
23. Ho HC, Yeung DY, Kwok SY. Development and evaluation of the positive psychology intervention for older adults. *The Journal of Positive Psychology*. 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 & Mental 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 & Mental 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. *Clinical Gerontologist*. 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. *Activities, Adaptation & Aging*. 2019;43(2):118-32.
28. Ernst JM, Cacioppo JT. Lonely hearts: Psychological perspectives on loneliness. *Applied and Preventive Psychology*. 1999;8(1):1-22.
29. Russell D, Peplau LA, Cutrona CE. The revised UCLA Loneliness Scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology*. 1980;39(3):472.
30. de Jong-Gierveld J. Developing and testing a model of loneliness. *Journal of Personality and Social Psychology*. 1987;53(1):119.
31. Cornwell EY, Waite LJ. Social disconnectedness, perceived isolation, and health among older adults. *Journal of health and social behavior*. 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 and Applied Social Psychology*. 2001;23(4):245-66.
34. Victor CR, Bowling A. A longitudinal analysis of loneliness among older people in Great Britain. *The Journal of Psychology*. 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.

- 1
2
3
4 37. Courtin E, Knapp M. Social isolation, loneliness and health in old age: A scoping review.
5 *Health & Social Care in the Community*. 2017;25(3):799-812.
- 6 38. Holt-Lunstad J, Smith TB, Baker M, Harris T, Stephenson D. Loneliness and social isolation
7 as risk factors for mortality: A meta-analytic review. *Perspectives on Psychological Science*.
8 2015;10(2):227-37.
- 9 39. Masi CM, Chen H-Y, Hawkey LC, Cacioppo JT. A meta-analysis of interventions to reduce
10 loneliness. *Personality and Social Psychology Review*. 2011;15(3):219-66.
- 11 40. Fakoya OA, McCorry NK, Donnelly M. Loneliness and social isolation interventions for
12 older adults: A scoping review of reviews. *BMC Public Health*. 2020;20(1):1-14.
- 13 41. Jarvis M-A, Padmanabhanunni A, Balakrishna Y, Chipps J. The effectiveness of
14 interventions addressing loneliness in older persons: An umbrella review. *International Journal*
15 *of Africa Nursing Sciences*. 2019:100177.
- 16 42. Gardiner C, Geldenhuys G, Gott M. Interventions to reduce social isolation and loneliness
17 among older people: An integrative review. *Health & Social Care in the Community*.
18 2018;26(2):147-57.
- 19 43. Cattan M, White M, Bond J, Learmouth A. Preventing social isolation and loneliness among
20 older people: A systematic review of health promotion interventions. *Ageing & Society*.
21 2005;25(1):41-67.
- 22 44. Cohen-Mansfield J, Perach R. Interventions for alleviating loneliness among older persons: a
23 critical review. *American Journal of Health Promotion*. 2015;29(3):e109-e25.
- 24 45. Dickens AP, Richards SH, Greaves CJ, Campbell JL. Interventions targeting social isolation
25 in older people: a systematic review. *BMC Public Health*. 2011;11(1):647.
- 26 46. Brandstätter M, Baumann U, Borasio GD, Fegg MJ. Systematic review of meaning in life
27 assessment instruments. *Psycho- Oncology*. 2012;21(10):1034-52.
- 28 47. Czekierda K, Banik A, Park CL, Luszczynska A. Meaning in life and physical health:
29 Systematic review and meta-analysis. *Health Psychology Review*. 2017;11(4):387-418.
- 30 48. Glaw X, Kable A, Hazelton M, Inder K. Meaning in life and meaning of life in mental health
31 care: An integrative literature review. *Issues in Mental Health Nursing*. 2017;38(3):243-52.
- 32 49. Hupkens S, Machielse A, Goumans M, Derkx P. Meaning in life of older persons: An
33 integrative literature review. *Nursing Ethics*. 2018;25(8):973-91.
- 34 50. Dewitte L, Vandenbulcke M, Dezutter J. Meaning in life matters for older adults with
35 Alzheimer's disease in residential care: Associations with life satisfaction and depressive
36 symptoms. *International Psychogeriatrics*. 2019;31(5):607-15.
- 37 51. Aftab A, Lee EE, Klaus F, Daly R, Wu TC, Tu X et al. Meaning in Life and Its Relationship
38 With Physical, Mental, and Cognitive Functioning: A Study of 1,042 Community-Dwelling
39 Adults Across the Lifespan. *Journal Clinical Psychiatry*. 2019;81(1).
40 doi:10.4088/JCP.19m13064.
- 41 52. Kleiman EM, Adams LM, Kashdan TB, Riskind JH. Gratitude and grit indirectly reduce risk
42 of suicidal ideations by enhancing meaning in life: Evidence for a mediated moderation model.
43 *Journal of Research in Personality*. 2013;47(5):539-46.
- 44 53. Guerrero-Torrelles M, Monforte-Royo C, Rodríguez-Prat A, Porta-Sales J, Balaguer A.
45 Understanding meaning in life interventions in patients with advanced disease: a systematic
46 review and realist synthesis. *Palliative Medicine*. 2017;31(9):798-813.
- 47 54. Frankl VE. Logotherapy and existential analysis—A review. *American Journal of*
48 *Psychotherapy*. 1966;20(2):252-60.
- 49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65

- 1
- 2
- 3
- 4 55. Kang K-A, Han S-J, Lim Y-S, Kim S-J. Meaning-Centered Interventions for Patients With
- 5 Advanced or Terminal Cancer: A Meta-analysis. *Cancer Nursing*. 2019;42(4):332-40.
- 6 doi:10.1097/NCC.0000000000000628.
- 7
- 8 56. Maercker A, Bachem R. Life-review interventions as psychotherapeutic techniques in
- 9 psychotraumatology. *European Journal of Psychotraumatology*. 2013;4(1):19720.
- 10
- 11 57. Wang C-W, Chow AY, Chan CL. The effects of life review interventions on spiritual well-
- 12 being, psychological distress, and quality of life in patients with terminal or advanced cancer: A
- 13 systematic review and meta-analysis of randomized controlled trials. *Palliative Medicine*.
- 14 2017;31(10):883-94.
- 15
- 16 58. Bohlmeijer E, Smit F, Cuijpers P. Effects of reminiscence and life review on late- life
- 17 depression: a meta- analysis. *International Journal of Geriatric Psychiatry*. 2003;18(12):1088-94.
- 18
- 19 59. Bohlmeijer E, Roemer M, Cuijpers P, Smit F. The effects of reminiscence on psychological
- 20 well-being in older adults: a meta-analysis. *Aging Ment Health*. 2007;11:291 - 300.
- 21
- 22 60. MacKinlay E, Trevitt C. Living in aged care: Using spiritual reminiscence to enhance
- 23 meaning in life for those with dementia. *International Journal of Mental Health Nursing*.
- 24 2010;19(6):394-401.
- 25
- 26 61. Baltes PB, Smith J. Toward a psychology of wisdom and its ontogenesis. *Wisdom: Its nature,*
- 27 *origins, and development*. 1990;1:87-120.
- 28
- 29 62. Staudinger UM, Lopez DF, Baltes PB. The psychometric location of wisdom-related
- 30 performance: Intelligence, personality, and more? *Personality and Social Psychology Bulletin*.
- 31 1997;23(11):1200-14.
- 32
- 33 63. Jeste DV, Ardel M, Blazer D, Kraemer HC, Vaillant G, Meeks TW. Expert consensus on
- 34 characteristics of wisdom: A Delphi method study. *The Gerontologist*. 2010;50(5):668-80.
- 35
- 36 64. Bangen KJ. Defining and assessing wisdom: A review of the literature. *The American*
- 37 *Journal of Geriatric Psychiatry*. 2013;21(12):1254 - EOA. doi:doi:10.1016/j.jagp.2012.11.020.
- 38
- 39 65. Ardel M. Empirical assessment of a three-dimensional wisdom scale. *Research on Aging*.
- 40 2003;25(3):275-324.
- 41
- 42 66. Webster JD, Westerhof GJ, Bohlmeijer ET. Wisdom and mental health across the lifespan.
- 43 *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*. 2014;69(2):209-
- 44 18.
- 45
- 46 67. Bergsma A, Ardel M. Self-reported wisdom and happiness: An empirical investigation.
- 47 *Journal of Happiness Studies*. 2012;13(3):481-99.
- 48
- 49 68. Lee EE, Depp C, Palmer BW, Glorioso D, Daly R, Liu J et al. High prevalence and adverse
- 50 health effects of loneliness in community-dwelling adults across the lifespan: Role of wisdom as
- 51 a protective factor. *International Psychogeriatrics*. 2019;31(10):1447-62.
- 52
- 53 69. Ardel M. Wisdom and life satisfaction in old age. *The Journals of Gerontology Series B:*
- 54 *Psychological Sciences and Social Sciences*. 1997;52(1):P15-P27.
- 55
- 56 70. Ardel M. Antecedents and effects of wisdom in old age: A longitudinal perspective on aging
- 57 well. *Research on Aging*. 2000;22(4):360-94.
- 58
- 59 71. Etezadi S, Pushkar D. Why are wise people happier? An explanatory model of wisdom and
- 60 emotional well-being in older adults. *Journal of happiness studies*. 2013;14(3):929-50.
- 61
- 62 72. Ardel M, Jeste DV. Wisdom and Hard Times: The Ameliorating Effect of Wisdom on the
- 63 Negative Association Between Adverse Life Events and Well-Being. *J Gerontol B Psychol Sci*
- 64 *Soc Sci*. 2018;73(8):1374-83. doi:10.1093/geronb/gbw137.
- 65
73. Mickler C, Staudinger UM. Personal wisdom: Validation and age-related differences of a
- performance measure. *Psychology and Aging*. 2008;23(4):787.

- 1
2
3
4 74. Wink P, Helson R. Practical and transcendent wisdom: Their nature and some longitudinal
5 findings. *Journal of Adult Development*. 1997;4(1):1.
6
7 75. Lee EE, Bangen KJ, Avanzino JA, Hou B, Ramsey M, Eglit G et al. Meta-analysis of
8 Randomized Controlled Trials to Enhance Components of Wisdom: Pro-social Behaviors,
9 Emotional Regulation, and Spirituality. *JAMA Psychiatry*. (in press)
10
11 76. Neff KD, Germer CK. A pilot study and randomized controlled trial of the mindful self-
12 compassion program. *Journal of Clinical Psychology*. 2013;69(1):28-44.
13
14 77. Sommers-Spijkerman M, Trompeter H, Schreurs K, Bohlmeijer E. Compassion-focused
15 therapy as guided self-help for enhancing public mental health: A randomized controlled trial.
16 *Journal of Consulting and Clinical Psychology*. 2018;86(2):101.
17
18 78. Ando M, Morita T, Akechi T, Okamoto T, Care JTFfS. Efficacy of short-term life-review
19 interviews on the spiritual well-being of terminally ill cancer patients. *Journal of Pain and
20 Symptom Management*. 2010;39(6):993-1002.
21
22 79. Breitbart W, Poppito S, Rosenfeld B, Vickers AJ, Li Y, Abbey J et al. Pilot randomized
23 controlled trial of individual meaning-centered psychotherapy for patients with advanced cancer.
24 *J Clin Oncol*. 2012;30(12):1304-9. doi:10.1200/JCO.2011.36.2517.
25
26 80. Chimluang J, Thanasilp S, Akkayagorn L, Upasen R, Pudtong N, Tantitrakul W. Effect of an
27 intervention based on basic Buddhist principles on the spiritual well-being of patients with
28 terminal cancer. *European Journal of Oncology Nursing*. 2017;31:46-51.
29
30 81. Chochinov HM, Kristjanson LJ, Breitbart W, McClement S, Hack TF, Hassard T et al. Effect
31 of dignity therapy on distress and end-of-life experience in terminally ill patients: a randomised
32 controlled trial. *The Lancet Oncology*. 2011;12(8):753-62.
33
34 82. Labelle LE, Lawlor-Savage L, Campbell TS, Faris P, Carlson LE. Does self-report
35 mindfulness mediate the effect of Mindfulness-Based Stress Reduction (MBSR) on spirituality
36 and posttraumatic growth in cancer patients? *The Journal of Positive Psychology*.
37 2015;10(2):153-66.
38
39 83. American Psychological Association. *The Road to Resilience*. 2004.
40 <http://helping.apa.org/resilience/>.
41
42 84. Bennett K. Emotional and personal resilience through life. *The Future of an Ageing
43 Population: Evidence Review*. 2015.
44
45 85. Windle G, Bennett KM, Noyes J. A methodological review of resilience measurement scales.
46 *Health and Quality of Life Outcomes*. 2011;9(1):8.
47
48 86. MacLeod S, Musich S, Hawkins K, Alsgaard K, Wicker ER. The impact of resilience among
49 older adults. *Geriatric Nursing*. 2016;37(4):266-72.
50
51 87. Windle G, Markland DA, Woods RT. Examination of a theoretical model of psychological
52 resilience in older age. *Aging and Mental Health*. 2008;12(3):285-92.
53
54 88. Pietrzak RH, Cook JM. Psychological resilience in older US veterans: results from the
55 national health and resilience in veterans study. *Depression and Anxiety*. 2013;30(5):432-43.
56
57 89. Gill TM, Robison JT, Tinetti ME. Predictors of recovery in activities of daily living among
58 disabled older persons living in the community. *Journal of General Internal Medicine*.
59 1997;12(12):757-62.
60
61 90. Shen K, Zeng Y. The association between resilience and survival among Chinese elderly.
62 *Demogr Res*. 2010;23(5):105-116.
63
64
65

- 1
2
3
4 91. Jeste DV, Savla GN, Thompson WK, Vahia IV, Glorioso DK, Martin AvS et al. Association
5 between older age and more successful aging: Critical role of resilience and depression.
6 *American Journal of Psychiatry*. 2013;170(2):188-96.
- 7 92. Netuveli G, Wiggins RD, Montgomery SM, Hildon Z, Blane D. Mental health and resilience
8 at older ages: Bouncing back after adversity in the British Household Panel Survey. *Journal of*
9 *Epidemiology & Community Health*. 2008;62(11):987-91.
- 10 93. Macedo T, Wilhelm L, Gonçalves R, Coutinho ESF, Vilete L, Figueira I et al. Building
11 resilience for future adversity: A systematic review of interventions in non-clinical samples of
12 adults. *BMC Psychiatry*. 2014;14(1):227.
- 13 94. Joyce S, Shand F, Tighe J, Laurent SJ, Bryant RA, Harvey SB. Road to resilience: A
14 systematic review and meta-analysis of resilience training programmes and interventions. *BMJ*
15 *Open*. 2018;8(6):e017858.
- 16 95. Robertson IT, Cooper CL, Sarkar M, Curran T. Resilience training in the workplace from
17 2003 to 2014: A systematic review. *Journal of Occupational and Organizational Psychology*.
18 2015;88(3):533-62.
- 19 96. Helmreich I, Chmitorz A, König J, Binder H, Wessa M, Lieb K et al. Psychological
20 interventions for resilience enhancement in adults. *The Cochrane Database of Systematic*
21 *Reviews*. 2017;2017(2).
- 22 97. Chmitorz A, Kunzler A, Helmreich I, Tüscher O, Kalisch R, Kubiak T et al. Intervention
23 studies to foster resilience—A systematic review and proposal for a resilience framework in future
24 intervention studies. *Clinical Psychology Review*. 2018;59:78-100.
- 25 98. Lavretsky H. Resilience and aging: Research and practice. JHU Press; 2014.
- 26 99. Connor KM, Davidson JR. Development of a new resilience scale: The Connor- Davidson
27 resilience scale (CD- RISC). *Depression and Anxiety*. 2003;18(2):76-82.
- 28 100. Treichler EBH, Glorioso D, Lee EE, Wu TC, Tu XM, Daly R et al. A pragmatic trial of a
29 group intervention in senior housing communities to increase resilience. *International*
30 *Psychogeriatrics*. 2020;32(2):173-82. doi:10.1017/S1041610219002096.
- 31 101. Robinson M, Hanna E, Raine G, Robertson S. Extending the comfort zone: building
32 resilience in older people with long-term conditions. *Journal of Applied Gerontology*.
33 2019;38(6):825-48.
- 34 102. Woodward AT, Freddolino PP, Blaschke-Thompson CM, Wishart DJ, Bakk L, Kobayashi
35 R et al. Technology and aging project: training outcomes and efficacy from a randomized field
36 trial. *Ageing International*. 2011;36(1):46-65.
- 37 103. Saito T, Kai I, Takizawa A. Effects of a program to prevent social isolation on loneliness,
38 depression, and subjective well-being of older adults: a randomized trial among older migrants in
39 Japan. *Archives of Gerontology and Geriatrics*. 2012;55(3):539-47.
- 40 104. Routasalo PE, Tilvis RS, Kautiainen H, Pitkala KH. Effects of psychosocial group
41 rehabilitation on social functioning, loneliness and well- being of lonely, older people:
42 randomized controlled trial. *Journal of Advanced Nursing*. 2009;65(2):297-305.
- 43 105. Banks MR, Willoughby LM, Banks WA. Animal-assisted therapy and loneliness in nursing
44 homes: use of robotic versus living dogs. *Journal of the American Medical Directors*
45 *Association*. 2008;9(3):173-7.
- 46 106. Henry M, Cohen SR, Lee V, Sauthier P, Provencher D, Drouin P et al. The Meaning-
47 Making intervention (MMi) appears to increase meaning in life in advanced ovarian cancer: A
48 randomized controlled pilot study. *Psycho-Oncology*. 2010;19(12):1340-7.
49 doi:10.1002/pon.1764.
- 50
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56
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60
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62
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Important Studies *

*17. Sutipan P, Intarakamhang U, Macaskill A. The impact of positive psychological interventions on well-being in healthy elderly people. *Journal of Happiness Studies*. 2017;18(1):269-91.

A good review of positive psychology interventions amongst older adults.

* 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. *Palliative medicine*. 2017;31(9):798-813.

A good systematic review of meaning in life interventions in patients with advanced disease

*90. Robertson IT, Cooper CL, Sarkar M, Curran T. Resilience training in the workplace from 2003 to 2014: A systematic review. *Journal of Occupational and Organizational Psychology*. 2015;88(3):533-62.

Up to date systemic review and meta-analysis of resilience interventions measuring psychological resilience for all populations.

*41. Jarvis M-A, Padmanabhanunni A, Balakrishna Y, Chipps J. The effectiveness of interventions addressing loneliness in older persons: An umbrella review. *International Journal of Africa Nursing Sciences*. 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 & Social care in the Community*. 2018;26(2):147-57.

A recent review summarizing approaches of previous social isolation interventions targeting older adults.

* 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.