

Positive Psychology Interventions to Improve Well-Being in
Older Adults: a Systematic

Review

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Abstract

Older adults are aging rapidly. Unfortunately, public services are not ready yet to take care of the rapidly aging older adults. Therefore, an approach is needed to improve their well-being. Positive psychology interventions (PPI's) are shown effective to improve well-being, but there is need for more research on PPI's in older adults. Besides, there is not an existing systematic review of the recent findings on PPI's in older adults yet. Therefore, this systematic review aims to analyse the recent types of (PPI's) and their effectiveness in community-dwelling older adults. It also analyses what well-being measures are most investigated in the recent PPI's. To evaluate the recent PPI's, a systematic literature search was conducted using databases PsycInfo, Web of Science and Scopus. The search identified 11 studies that examined PPI's and outcomes in well-being in older adults. The results suggest that PPI's improve well-being, with improvements in life satisfaction, positive emotions, psychological well-being, resilience, positive affect, calmness and happiness. Also, PPI's lead to a decrease in depressive symptoms, anxiety symptoms, hopelessness, perceived stress, tiredness and negative affect. Reminiscence interventions were the most used PPI's in older adults. Besides, PPIs consist of elements of CBT, well-being trainings, and teachings of the Dalai Lama. The most investigated well-being measures are life satisfaction and depressive symptoms, whilst other well-being measures were less investigated. Future research should take the age, gender and cultures of older adults into account, and should take other interventions than PPI's that can improve well-being in older adults into account as well.

Keywords: positive psychology intervention, well-being, older adults, systematic review

Introduction

The Netherlands is aging at an accelerated pace since 2011 (Garssen, 2011). It is expected that the number of people aged 65 years and older will increase from 3,2 to 4,2 million in 2030 (Centraal Bureau voor de Statistiek, 2016). Unfortunately, research shows that public services all over the world are not ready yet to take care of this increasing number of aging people (World Health Organization, 2015). This indicates a public health problem that needs a solution. The latest world report on aging and health suggests the need to focus on long term development of new health care systems (WHO, 2015). This could be done by encouraging the development of new approaches, and by promoting and enhancing well-being (WHO, 2015). Positive psychology is such a relatively new approach. Therefore, this research involves a systematic review that will focus on the effect and content of positive psychology interventions aimed to increase wellbeing. Besides, it is important to learn more about the well-being measures used in positive psychology interventions in older adults. By knowing the most investigated and most supported well-being measures, we can understand more about what specific measures of well-being can already be improved in older adults by conducting positive psychology interventions and therefore integrate this into practice. Also, we will understand on what well-being measures research is still needed. Therefore, the current study also focuses on well-being measures.

Well-being can be seen as a complex construct. It can be associated with optimal psychological functioning, experience in meaningful activities, social relationships, and pleasurable subjective experiences of an individual's life (Ryan & Deci, 2001). An accepted conceptualization of well-being involves hedonic and eudaimonic well-being (Ryan, Huta, & Deci, 2008). Hedonic or subjective well-being includes components as happiness, life satisfaction and positive affect (Deci & Ryan, 2008; Kahneman, Diener, & Schwarz, 1999). Eudaimonic well-being includes components as vitality, purpose in life, autonomy, self-realization (Deci & Ryan, 2008; McMahan & Estes, 2011). Eudaimonic well-being is most often connected to psychological well-being (PWB), which focuses on the optimal functioning of the individual (Ryff, 1989). From a psychological perspective, psychological well-being has been considered as not only the absence of disease or psychological problems, but also as the outcome of positive psychological resources. In this study, in line with the World Health Organization (2005), well-being will be considered in the broadest sense of the word. This will be done by using psychological well-being, including hedonic and eudaimonic well-being, as well as considering well-being as the absence of psychological

problems.

A way to focus on and investigate well-being in older adults is to use positive psychology. The aim of positive psychology is to make a change in the focus of psychology by not only focusing on treating disorders, but also on building positive aspects of oneself, like strengths, well-being and virtues (Seligman & Csikszentmihalyi, 2000). Positive psychology offers possibilities for subgroups that currently receive little attention, for example older adults (Kobau et al., 2011). Positive psychology was developed as a reaction to the focus on the disease model of human functioning in the field of psychology; i.e.; treating mental illnesses within a disease framework by repairing damage (Seligman & Csikszentmihalyi, 2000).

Positive psychology interventions (PPIs) are designed to apply positive psychology in practice. PPIs are defined as interventions aimed to cultivate positive emotions, cognitions and behaviour (Sin & Lyubomirsky, 2009). This research shows improvements in well-being due to positive psychology interventions. PPI's such as expressing gratitude, counting your blessings, practicing kindness, using personal strengths, show improvements in psychological well-being (life satisfaction, happiness, resilience), as well as in reducing depressive symptoms (Sin & Lyubomirsky, 2009). Another systematic review also showed that PPIs such as well-being training, hope therapy, thinking about positive life experiences, writing about best possible selves, savouring and optimism training, help to enhance subjective well-being, psychological well-being and reduce depressive symptoms (Bolier et al., 2013). However, it is not yet clear which PPI's work for what specific age group. In the context of the rapidly aging older adults, it becomes important to understand the effect of PPI's on older adults.

Research has been done on the effectiveness of positive psychology interventions in older adults. For example, the study of Ho, Yeung and Kwok (2014) showed that a positive psychology intervention increased levels of life satisfaction, gratitude and overall happiness, and reduced the number of depressive symptoms in older adults. Also, Sutipan, Intarakamhang and Macaskill (2016), showed in their literature review that multiple PPIs are associated with significant improvements in well-being (i.e. happiness, positive emotions, life satisfaction) and alleviates depressive symptoms in older adults.

However, the study of Sutipan et al. (2016) is the only existing literature review that investigates positive psychology interventions in older adults. Since the publication of their systematic review, nine new studies conducting PPIs in older adults have been done. These studies show types of PPIs that haven't been analyzed in the study of Sutipan et al. (2016), for

example the study of Cantarella, Borella, Marigo, & De Beni, (2017), Greenawalt, Orsega-Smith, Turner, Goodwin, & Rathie (2019), and Lai, Chin, Zhang, & Chan (2019). Also, some Spanish written studies that were done before 2016 weren't included in their review, showing that PPIs are effective to improve specific well-being outcomes that has not been shown in the systematic review of Sutipan et al. (2016), like improving specific positive memories, and decreasing hopelessness (Avia, Martínez-Martí, Rey-Abad, Ruiz, & Inés Carrasco, 2012; Cuadra-Peralta, Veloso-Besio, Puddu-Gallardo, Salgado-García, & Peralta-Montecinos, 2012).

The current study aims to add to the existing knowledge of PPI's and their effectiveness on well-being in older adults. Therefore, an additional systematic review is conducted, to analyze information from studies that haven't been analyzed in the systematic review of Sutipan et al. (2016). Three research questions are central in this research: 1) what is the content of recent PPI's, 2) what is the effectiveness of recent PPI's, 3) what well-being measures are most investigated. The current research aims to offer new insights about positive psychology interventions and their effectiveness that can be used as a source for scientists developing future interventions to improve well-being in older adults.

Methods

Study search

A systematic review was conducted in May 2020 using the following online databases: Web of Science, PsycINFO, and Scopus. The following combination of search terms were used: positive psychology intervention; well-being, life satisfaction, or happiness; and older adult, senior, aging, or elderly.

Eligibility criteria

Articles were only included in the analysis if:

1. The articles were available in English, Dutch or Spanish
2. The articles included only empirical studies (i.e., no books and/or review articles)
3. The articles reported PPI's in older adults with well-being as outcome measure
4. The study has not been analyzed already by the review of Sutipan et al. (2016)
5. The articles examined healthy older adults living in the community (i.e., not-institutionalized)

As United Nations (United Nations, Department of Economic and Social Affairs, 2013) refers “older adults” to people with the age from 60, this study only included studies with participants’ mean age of 60. Not much research has been done on older adults with an age of 60 and higher, therefore it has been chosen to also include studies that yielded participants from 49 years old. However, the mean age of all the participants in all the studies reviewed was always minimal 60, which follows the definition of older adults defined by the United Nations (2013).

6. The articles’ population had a mean age of 60 or higher

This study focuses on healthy older adults, so studies in which participants were specifically recruited on suffering from a clinical diagnosis or any mental or- physical health problem were excluded (Eaton, Bradley, & Morrissey, 2014). Since the current study aims to show the most recent studies done, studies that already have been reviewed in the review of Sutipan, Intarakamhang and Macaskill (2016) have been excluded.

Study selection

The study selection process is shown in Figure 1. In total, 313 articles were retrieved from the databases (i.e. Psycinfo, Web of science, Scopus). After removing duplicates, 302 articles were left for title and abstract screening. Of these 302 articles, 286 articles were excluded due to a combination of the exclusion criteria. Sixteen articles were identified as being potentially eligible for inclusion in the current study. After full text screening eleven articles remained. Therefore, the final sample consisted of eleven articles.

Data extraction

Data was collected on types of interventions, effectiveness of interventions and well-being measures.

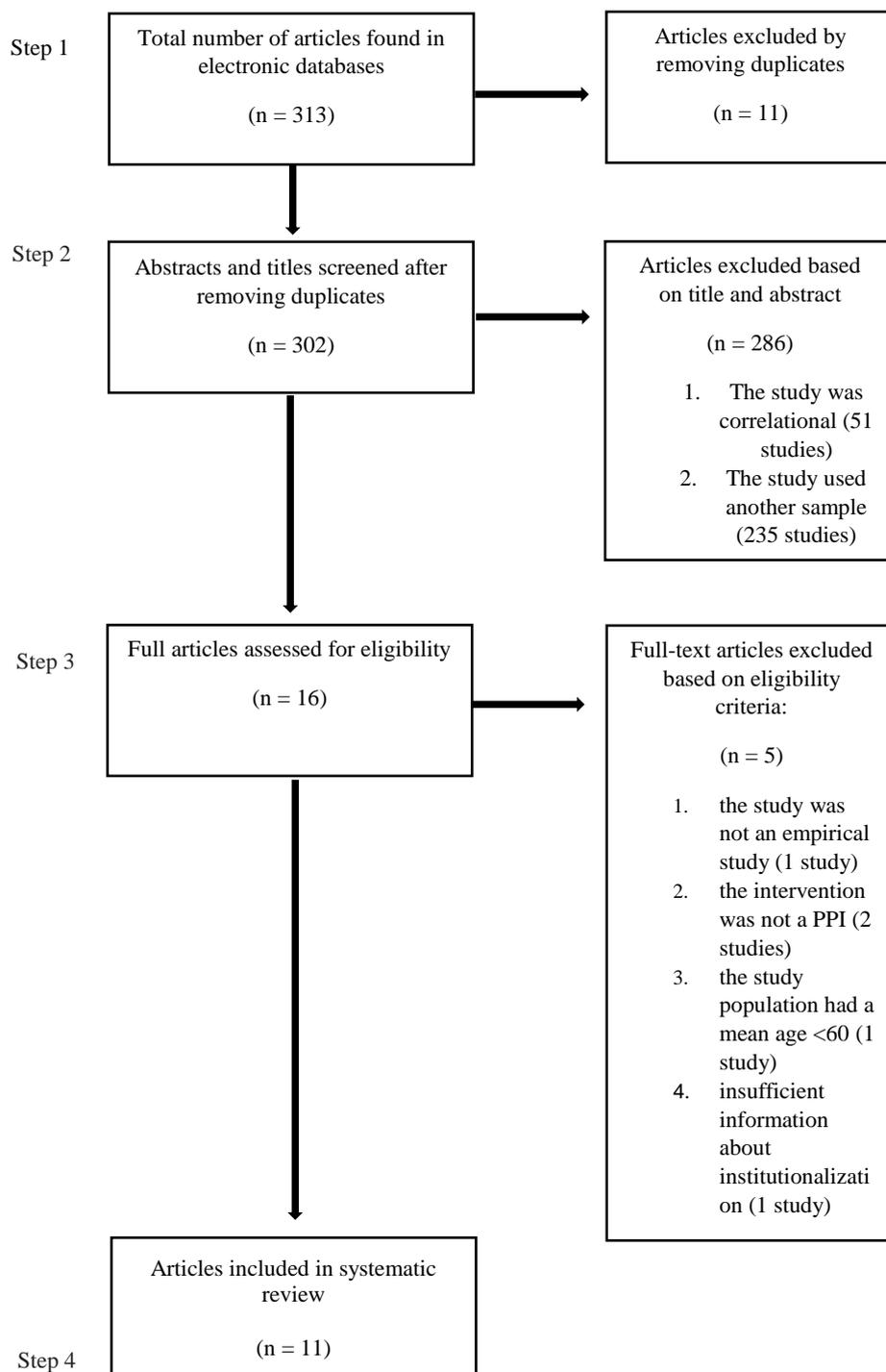


Figure 1. Flow diagram.

Results

Characteristics of studies

Main results and characteristics of each study are summarized in Table 1. The earliest study discussed in this review was published in 2012, which was a Spanish written study that has not been analyzed in the study of Sutipan et al. (2016). The most recent study was published in 2020.

Of the eleven articles reviewed, four used randomized designs, six studies used quasi-experimental designs, and one study used a quasi-experimental longitudinal design. Five studies used follow-up measures with varied time scales, varying in one month, three months, six months or eight months. The studies used different control groups: six studies used active control groups, three studies used waiting list control groups, and two studies used non-intervention comparison groups of older adults.

The eleven articles were conducted in different countries, including Iran (n = 1), Dominican Republic (n = 1), Spain (n = 3), Brazil (n = 2), Chile (n = 1), England (n = 1), Italy (n = 1) and Hong Kong (n = 1). The articles conducted group interventions (n = 9), one study conducted an individual intervention and one study was a follow-up study of another study. For the follow-up measures, self-reported measures were used.

Characteristics of participants

In the selected studies, different ages were considered for older adults: people over 49 years old (n = 3), people over 50 years old (n = 1), people over 53 years old (n = 1), people over 60 years old (n = 3), people over 61 years old (n = 1), and people over 65 years old (n = 2). The sample sizes varied from 32 (Cantarella, Borella, Marigo, & De Beni, 2017), to 244 participants (Lai, Chin, Zhang & Chan, 2018). The total number of participants was 924.

Table 1. Main results and characteristics of each study

Study	Sample	Positive psychology intervention, duration	Control conditions	Assessment	Measurements of well-being	Effects of well-being
Latorre et al. (2015)	N = 55, experimental group (N = 29), control group (N = 26), <i>M</i> age = 65.35, range: 53-89	Life Review (LR) intervention (ReViSEP): 8 weeks	Active control group: media workshop	Pre, post	LFS: LSI-A DEP: CES-D	Increase of life satisfaction ($p = .034$), decrease of depressive symptoms ($p = .027$) compared to control group. Effect sizes were medium.
Avia et al. (2016)	N = 45, experimental group (N = 38), control group (N = 7), <i>M</i> age = 71, range 65-NA	Life Review (LR) intervention: (ReViSEP) + positive poster: 5 weeks	Active control group: lecture course and cognitive stimulation	Pre, post	LFS: SWLS HOP: TWO POS: WIL	Decrease of hopelessness ($p = .033$) and increase of specific positive memories ($p = .04$). compared to control group. Life satisfaction increased in intervention group ($p = .013$, medium effect size).
Viguer et al. (2017)	N = 160, experimental group (N = 84), control group (N = 84) <i>M</i> age = 72.25, range: 65-NA	Reminiscence program: 10 weeks	Waiting list control group	Pre, post, three months	LFS: LSI-A DEP: GDS-30 PWB: PWBS	Increase of life satisfaction ($p = .005$) and psychological well-being, decrease of depressive symptoms ($p = .045$). Three months later, increase in life satisfaction ($p = .001$) environmental mastery ($p = .018$)

						and personal growth (p = .003), decrease in depressive symptoms (p = .006) compared to control group. Effect sizes were small.
Yousefi et al. (2014)	N = 29, experimental group (N = 14), control group (N = 15), <i>M</i> age = 60>, range: 60 - NA	Narrative Reminiscence: 3 weeks	Active control group: group discussions	Pre, third session, sixth session, one month	HAP: OHQ	No improvement, except for increase of happiness after third and sixth session (p = 0.03) in intervention group
Lai et al. (2019)	N = 244, experimental group (N = 124), control group (N = 120), <i>M</i> age = 77.10, range: 60-NA	Life Story Work (LSW) intervention: 4 to 6 weeks	Active control group: social activities	Pre, post, 3 months, 6 months	LFS: LSi-A SELF: RSES PWB: GHQ-12 DEP: GDS	No improvement, except for improvement of general well-being in control group at three months
Durgante & Dell'Aglio (2019)	N = 88, experimental group (N = 54), control group (N = 34), <i>M</i> age = 65.66, range: 49-86	PPI: Programa Vem Ser: 6 weeks	Waiting list control group	Pre, post	LSF: SWLS EMP: IRI DAA: GHQ OPT: LOT-R PSS: PSS-14 RES: RE	Increase in life satisfaction (p = .002) and resilience (p = .011, (small effect sizes). Decrease in depression and anxiety symptoms (p < .05) and perceived stress levels (p = .002) compared to control group. Effect sizes were medium.
Durgante et al. (2020)	N = 81, experimental group (N = 47), control group (N = 34), <i>M</i>	Follow-up of PPI: Programa Vem Ser: after 3 months	Waiting list control group	3 months	LSF: SWLS EMP: IRI DAA: GHQ OPT: LOT-R	Increase in life satisfaction (p = .015, small effect size), decrease in

	<i>age</i> = 65.38, range 49-83				PSS: PSS-14 RES: RE	depression and anxiety symptoms ($p = .006$, medium effect size) compared to control group
Cuadra-Peralta et al. (2012)	N = 43, experimental group (N = 13, active control group (N = 16), control group (N = 14), <i>M age</i> = 71, range 49-83	Positive Psychology workshop, 6 weeks	Active control group: recreational activities Inactive control group, no intervention	Pre, post	LFS: SWLS DEP: GDS-30	Increase in life satisfaction ($p = .04$), decrease in depressive symptoms ($p = .01$) compared to control group. Effect sizes were medium.
Cantarella et al. (2017)	N = 32, experimental group (N = 16), active control group (N = 16), <i>M age</i> = 69.97, range 61-82	Psychological Well-Being (PWB) training: 8 weeks	Active control group: discussing political and social topics	Pre, post	PWB: PWBQ QoL: WHO-QoL-BREF	Increase in psychological well-being ($p = .08$) compared to control group
Salces-Cubero et al. (2019)	N = 124, gratitude (N = 36), optimism (N = 28), savoring (N = 28), control (N = 32), <i>M age</i> = 69.05, range 60-89	Three positive interventions: Savoring, Gratitude and Optimism, 4 weeks	Non-intervention comparison group of older adults	Pre, post, 1 month	DAA: GADS LFS: SWLS HAP: SHS PAN: PANAS RES: RE	Increase in positive affect, life satisfaction, happiness and resilience decrease in negative affect and depression ($p = <.001$) compared to control group.
Greenawalt et al. (2019)	N = 52, experimental group (N = 34) control group (N = 18), <i>M age</i> = 71.40, range 50-NA	The Art-of Happiness Intervention, 8 weeks	Non-intervention comparison group of older adults	Pre, post	LFS: SWLS DEP: PhQ-10 SUB: 4item PSS: PSS MOO: AD/ACL MIND: FFMQ GRA: GQ	Decrease in perceived stress ($p = .015$), tiredness ($p < .0001$), calmness ($p = .039$) compared to control group. Subjective happiness increased in intervention group

(p <.001), life
satisfaction (p < .05),
mindfulness (p
<.005)

Abbreviations. NA = Not Available or Applicable; DEP = Depression; DAA = Depression And Anxiety, EMP = Empathy, OPT = Optimism, PSS = Perceived Stress, RES = Resilience, LFS = Life Satisfaction; HOP = Hopelessness; POS = Positive emotions, PWB = Psychological Well-Being, SELF = Self-Esteem; QoL = Quality of Life, HAP = Happiness, PAN = Positive and Negative Affect, MOO = Mood, MIND = Mindfulness, LSI-A = Life Satisfaction Index – version A, SWLS = Satisfaction With Life Scale, CES-D = Centre for Epidemiological Studies Depression Scale, TWO = Two questions of Buéla-Casal et al., (1996), WIL = Williams & Broadbent (1986), GDS-30 = Geriatric Depression Scale 30, PWBS = Psychological Well-being Scale, RSES = Rosenberg Self-Esteem Scale, GHQ -12 = General Health Questionnaire 12, GDS = Geriatric Depression Scale, IRI = Interpersonal Reactivity Index, LOT-R = Life Orientation Test Revised, RE = Resilience Scale, PSS = Perceived Stress Scale, PSS-14 = Perceived Stress Scale 14, Ben-SSC = PWBQ = Psychological Well-Being Questionnaire, WHO-QoL-BREF = World Health Organization Quality of Life Questionnaire Brief Form, GADS = Goldberg Anxiety and Depression Inventory, SHS = Subjective Happiness Scale, PANAS = Positive And Negative Affect Schedule, PhQ-10 = 4item = 4 item scale, AD/ACL = Activation Deactivation Adjective Check List, FFMQ = Five Facet Mindfulness Questionnaire, GQ = Gratitude Questionnaire, OHQ = Oxford Happiness Questionnaire

Types of interventions, effectiveness and well-being measures

Reminiscence interventions

Five of the studies consisted of reminiscence interventions. Reminiscence is an intervention strategy that recalls past personal experiences and constructs an autobiographical narrative (Viguer, Satorres, Fortuna, & Meléndez, 2017). A reminiscence intervention can be integrated in many ways. It could be integrated as a simple reminiscence intervention, as Viguer et al. (2017) did in their intervention, in which basic themes of reminiscence are used, for example interpersonal relationships, important dates and popular holidays. Their study significantly reduced depressed mood and significantly improved life satisfaction and psychological well-being. The effects maintained for life satisfaction and for some dimensions of psychological well-being (environmental mastery, personal growth and self-acceptance) for three months. Well-being measures were life satisfaction, depressive symptoms and psychological well-being. Another study conducting a reminiscence intervention (Yousefi, Sharifi, Tagharrobi, & Akbari, 2015), called this intervention a narrative reminiscence intervention. This intervention focused on more meaningful personal aspects of life, for example on love and hate and beliefs about the meaning and goals of life. Their study was not effective to improve happiness compared to the control group. Happiness was used as well-being measure.

Two studies used life review therapy as reminiscence intervention (Avia et al., 2012; Latorre et al., 2015). Life review therapy is an important developmental process for promoting psychological and spiritual well-being (Latorre et al., 2015), and focusses more on developmental stages of life instead of meaningful personal aspects. It is most often structured around family themes, ranging from childhood to the experience of being a parent or grandparent. The first study using life review therapy aimed to examine the effects of autobiographical retrieval practice based on life review training in specific positive events in a community sample of older adults (Latorre et al., 2016). Their study significantly decreased depressive symptoms in the intervention group. Life satisfaction significantly improved in the intervention group, but also in the control group. Life satisfaction and depressive symptoms were used as well-being measure. The other study using life review therapy, was conducted by Avia et al. (2012). Different than Latorre et al. (2016), they added the aspect of creating a positive poster with positive pictures of their lives to the intervention. This was done to strengthen the experience of positive emotions and an integration of participants' memories. Also, this study used a group intervention while Latorre et al. (2016) conducted their intervention individually. The life review therapy increased positive memories and

significantly decreased a feeling of hopelessness. Well-being measures were life satisfaction, hopelessness and positive emotions.

One study using a reminiscence intervention used creativity to express their feelings. Other to the interventions above, it is also possible to use creativity instead of your voice to express feelings. In the study of Lai et al. (2018), participants were working with a volunteer to prepare their life storybook, by integrating a person's social interests and lifestyle within a life course perspective. This intervention only improved general well-being in the control group after three months. The intervention wasn't effective in the intervention group. Well-being measures were life satisfaction, depressive symptoms, psychological well-being and self-esteem.

Interventions with CBT elements

Two studies added elements of Cognitive Behavioural Therapy (CBT) to their PPI. (Durgante et al., 2020; Durgante & Dell'Aglio, 2019). Their PPI existed of themes like developing optimism, positive visualizations, values for self-care and developing gratitude. Besides, psychoeducation was used as a tool from a CBT perspective (e.g. problem-solving, cognitive targets, cognitive rehearsal, action plan/homework, breathing and relaxation training and planning gradual tasks). By adding these tools from CBT to their PPI it provides ways to develop strengths and build resilience to cope with life stressors. The intervention significantly improved life satisfaction and resilience, and significantly decreased depression and anxiety symptoms, and perceived stress levels. No main effect was found for empathy and optimism. The study by Durgante et al. (2020) showed that these effects were sustained three months after the first study. Measures of well-being were life satisfaction, empathy, optimism, resilience, depressive and anxiety symptoms and perceived stress levels.

Well-being trainings

There were also studies that focused on only one aspect of well-being. The study of Cantarella et al. (2017) for example, connects the eudaimonic approach to psychological well-being by focusing on self-actualisation and the development of an individual's potential. Their PPI was called a PWB-training, and consisted of methods such as relaxation, emotion detection and expression, boosting efficacy, and trainings in well-being. The PWB-training significantly increased PWB of the intervention group. There was not an effect found in quality of life. Well-being measures were PWB and quality of life.

Instead of focusing only on one aspect of well-being, the study of Salces-Cubero et al. (2019) conducted multiple positive interventions in their study. They used three different PPIs that train savouring, gratitude and optimism. They used the 'good things in my life' that have

happened in the last six months, and ‘gratitude is the building block of life’ exercises for gratitude. In this last exercise, participants were asked to express all the thoughts and feelings that caused them to be grateful to situations or to people. The gratitude intervention found a significant decrease in negative affect. The intervention significantly improved life satisfaction, positive affect, happiness and resilience. The results were maintained for a month after the intervention. For optimism, participants had to draw a list of events they hoped would happen in the nearby future. To do this, they had to work through barrier thoughts by using humour to share something negative. The optimism intervention only led to a decrease in depression, which maintained a month after the intervention. For savouring, which is the set of behavioural or cognitive strategies that control the intensity and duration of positive feelings after positive experiences (Bryant, 2003), participants had to bring an object associated with a positive memory, they had to go on a pleasant walk for 15 minutes and they encouraged the power of positive imagination by training savouring focused on the future. Therefore, participants had to visualize positive events that could happen to them the next week. The savouring intervention led to a significant decrease in depression and negative affect, and a significant increase in positive affect, life satisfaction, happiness and resilience. These results also sustained for a month after the intervention, except for depression, which maintained after one month after the intervention. Well-being measures were life satisfaction, happiness, depressive and anxiety symptoms, positive and negative affect and resilience.

Another study used different elements of well-being in their PPI: satisfaction with the present, strengths and virtues, interpersonal relationships, expression of affection and giving and receiving compliments, satisfaction with the past, optimism with the future, and gratitude (Cuadra-Peralta et al., 2012). Their intervention led to a significant reduction in depressive symptoms and improvement in life satisfaction. Well-being measures were life satisfaction and depressive symptoms.

Teachings of the Dalai Lama

Finally, one study used teachings of the Dalai Lama for their “Art of Happiness” PPI (Greenawalt et al., 2019). Topics used in the intervention were happiness, stress management, reflecting on happiness, compassion and human connection, forgiveness, transforming suffering, mindfulness and humour. Their intervention significantly decreased stress, depression, tiredness, and significantly increased subjective happiness and calmness. Well-being measures were life satisfaction, depressive symptoms, perceived stress levels, mindfulness, gratitude, mood and subjective happiness.

Discussion

This review analyses the content of recent PPI's and their effectiveness on well-being in older adults. Thereby, it analyses information from previous studies that haven't been analysed in the systematic review of Sutipan et al. (2016). It also investigated which measures of well-being are the most used well-being measures in the positive psychology interventions. The goal was to conduct a systematic literature search, resulting in an analysis of 11 articles that described PPI's.

The review of Sutipan, Intarakamhang & Macaskill (2016), already demonstrated the effectiveness of positive psychology interventions on well-being in older adults. However, recent findings and Spanish articles were not included in their review. The current study showed that most PPI's (n = 9) significantly improved well-being. The results showed that positive psychology interventions improve well-being, with improvements in life satisfaction, psychological well-being, resilience, positive affect and happiness. Also, positive psychology interventions lead to a decrease in depressive symptoms, anxiety symptoms, perceived stress and negative affect. These findings are in line with the review of Sutipan et al. (2016). Also, these findings are in line with the review of Bolier et al. (2013) and Sin & Lyubomirsky (2009), showing improvements in well-being and decrease depressive symptoms in all age groups compared to control groups.

However, the current study also shows improvements in calmness and resilience, and a decrease in tiredness and hopelessness. These findings were not found in the review of Sutipan et al. (2016), Bolier et al. (2013) and Sin & Lyubomirsky (2009). Therefore, these findings show that PPI's are effective on more and different well-being outcomes than is already known. It is likely that by integrating positive psychology interventions in the health care systems, well-being in older adults will improve. Using positive psychology interventions as an approach to improve well-being is a powerful approach. Therefore, the current study gives support to the idea that positive psychology interventions could be used as a new approach for the development of new health care systems, which is a needed by the WHO (WHO, 2015).

A variety of PPI's have been analysed in this study. In the current study, reminiscence interventions are the most common used interventions in PPIs in older adults. The review of Sutipan et al. (2016) also showed that reminiscence interventions are the most common used interventions in PPIs in older adults. However, the reviews of Bolier et al (2013) and Sin & Lyubomirsky (2009) showed various interventions, reminiscence interventions were not the most common used interventions. This finding could be explained by the assumption of

Erikson (1997) that reminiscence intervention helps older adults to create and maintain their personal identity. Furthermore, the most reminiscence interventions analysed in this research, improved well-being in older adults. This finding in the current study suggests that conducting reminiscence interventions is a popular and effective way to improve well-being in older adults.

Besides reminiscence interventions, the current study shows new interventions using other kinds of PPI's. For example, it showed interventions based on teachings of the Dalai Lama (Greenawalt et al., 2019), a training based on Psychological Well-Being (Cantarella, 2017), life review therapy adding a positive poster (Avia et al., 2012), and a PPI using elements of CBT (Durgante et al., 2020; Durgante & Dell'Aglio, 2019). These interventions are based on elements that weren't analysed in the study of Sutipan et al. (2016). Also, most of these interventions improved well-being in older adults. This means that new information on the content of PPI's exist to improve well-being in older adults. With this finding, health workers, other practitioners and older adults themselves, are encouraged to use these positive psychology interventions in their clinical and social work, and in their lives.

Furthermore, the current study showed the most support for life satisfaction in improving well-being. Also, the current study showed that life satisfaction is the most investigated well-being measure. This is in line with Sutipan, Intarakamhang & Macaskill (2016) and supports their findings that life satisfaction is the most investigated well-being measure to improve well-being. Life satisfaction is an important well-being measure, since it is an indicator of successful aging, which means healthy ways of getting older that could defence the consequences of pathological aging (Krause, 2004). Since older adults are aging rapidly, the use of positive psychology interventions to improve life satisfaction in older adults becomes a useful and relevant approach to age successfully. Another well investigated well-being measure in the current study is depressive symptoms. An explanation for this is the expectation that depression will be increasingly more common in older adults (Laks & Engelhardt, 2010). Therefore, it could be relevant to use positive psychology interventions to decrease these expected depressive symptoms.

However, other measures of well-being were less investigated. Therefore not much is known about the improvement of other well-being measures conducting PPI's in older adults. With the information about life satisfaction and depression, we know something about the hedonic well-being part of psychological well-being (happiness, life satisfaction, positive affect) (Deci & Ryan, 2008) and something about the absence of psychological problems. It remains unclear whether eudaimonic well-being (e.g. vitality, purpose in life, autonomy, self

realization) (Deci & Ryan, 2008) improves in older adults after conducting PPI's. Although this study aimed to measure both eudaimonic and hedonic well-being, eudaimonic well-being has not really been measured in this study.

An interesting finding in the current study is that not all the interventions lead to an improvement of well-being. Two studies showed no improvement in well-being (Lai et al., 2019; Yousefi et al., 2015). An explanation given is that the intervention of Lai et al. (2019) would have larger effects in deprived individuals. Their intervention could therefore have more effect in residential care, where older adults have more mental health issues and a greater tendency to be socially isolated (Maillard, Antoine, & Billiet, 2012). Thereby, participation in social activities is positively related to life satisfaction (La Torre et al., 2015), which means that any kind of social activity could have benefits for older adults.

Other studies show that effects of the positive psychology intervention maintained after a period of time after the intervention, for example three months after the intervention (Durgante et al., 2020), and one month after the intervention (Salces-Cubero, 2019). This finding is in line with Sutipan et al. (2006), which also found that increases remained after one and three months after the intervention. This means that the PPI's have long term effects on well-being, which could prevent the emergence of mental health problems in older adults.

Limitations and future challenges

A number of limitations exist in this review. Overall, the number of involved studies was small. Important to say, evidence for positive psychology interventions in older adults is growing, as the past five years at least eight new studies conducting positive psychology interventions with outcomes on well-being measured in older adults were done. Future research should therefore maintain this growing line. This could be done by conducting and creating new interventions in this field of research to gain more insight in what positive psychology interventions could be integrated and what well-being outcomes exist in older adults.

An additional limitation of the current study is the ages of participants. While participant's mean age was always 60 years of older, the age defined by each article starts from 49 years old. This is the case for five of the examined studies in the current study. Whereas one can be considered as an older adult around the age of 60 (WHO, 2005). The current study chose to take the mean age of participants to find as much evidence as possible since not much PPI's have been conducted in older adults yet. However, future research could take the generalizability of age into account to have a greater comparability of the result

Furthermore, this review summarized recent positive psychology interventions and outcomes on well-being. Most PPI's analysed in this review improved well-being in older adults. However, it is not known yet what type of PPI is the most effective intervention to improve well-being in older adults. Therefore, future research could conduct a meta-analysis to investigate what type of PPI is most the effective intervention.

Another limitation of the current study is the gender in the population of the used articles. The population of the reviewed studies existed out of men and women, except for one study. The study of Yousefi et al. (2014) focused on women due to cultural differences between Iran and other Western and Asian countries. Research have showed that women and men could differ in well-being (Hintikka, Koskela, Kontula, Koskela, & Viinamäki, 2000). This could have influenced the comparability of results of the current study, since the other analysed studies used men and women. Future research should take this into account and focus more on the consequences of gender. Also, the cultural differences should be taken into account. The current study reviewed studies investigating people from different parts of the world (Europe, Asia, South-America). However research is needed in diverse populations (Bolier et al., 2013), it is not clear whether the analysed studies adapted their intervention to cultural needs of their population. This is important, since research showed that some positive psychology concepts require some adaptation to other cultures (Martínez-Martí, Avia, & Hernández-Lloreda, 2010). Future research should take this into account.

Future research could also focus on other aspects of well-being. This study showed that well-being measures as life satisfaction and depression are the most supported and most investigated well-being measures. However, this only explains something about the hedonic part of well-being and the absence of psychological problems. Future research could focus on other aspects of psychological well-being, for example on eudaimonic well-being. It could also focus on other aspects of well-being in general, for example on social well-being or emotional well-being, to explore which other aspects of well-being can be improved through PPI's in older adults.

A final limitation of this study might concern the definition of positive psychology interventions. The current study included positive psychology interventions, interventions based specifically on positive psychology. However, other studies using alternative interventions investigating well-being in older adults could also be beneficial. For example, the study of Botella, Banos & Guillen (2017) shows modern technologies that aim to improve well-being. One technology they describe is the EARTH of Well-Being, which is a virtual reality application created to strengthen psychological resources, including the eudaimonic

and hedonic levels, and to generate positive emotions in a controlled way. It is shown that positive affect and accomplishment of activities improve by these interventions, and is maintained at the 1-year follow-up. This is in line with the current study, showing that PPI's could improve also aspects of well-being. Future research should take other interventions that are not described as PPI's, like EARTH of Well-Being into account to investigate whether they can also lead to significant positive effects on aspects of well-being.

Conclusion

In conclusion, this review examined eleven articles systematically, investigating the content of PPI's, effectiveness of PPI's on well-being and the most investigated well-being measures in older adults. The results showed that most PPI's improve well-being, with improvements in life satisfaction, positive emotions, psychological well-being, resilience, positive affect, calmness and happiness. Also, positive psychology interventions lead to a decrease in depressive symptoms, anxiety symptoms, hopelessness, perceived stress, tiredness and negative affect. Reminiscence interventions were the most used PPI's in older adults. Besides, PPIs consist of elements of CBT, well-being trainings, and teachings of the Dalai Lama. Lastly, the current study showed that life satisfaction and depressive symptoms are the most investigated well-being measures in recent PPI's. Positive psychology interventions can be beneficial for older adults striving for more happiness and satisfaction in their lives. Future research could take the age, gender and cultures of older adults into account, and could focus on alternative interventions that can improve well-being in older adults.

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