

Compassion-based interventions for people
with (chronic) physical diseases:
A systematic review on effects and experiences

Bachelor Thesis

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Abstract

The prevalence of physical diseases is rising, and people are facing challenges in coping with the impact of their disease. Furthermore, compassion seems to be beneficial in mitigating the negative impact of diseases and there is a growing interest and quick uptake of compassion-based interventions. However, little is known about compassion interventions for this population. This systematic review investigated what compassion interventions exist and what the effect and beneficial experiences are regarding mental health, physical health and coping. Four electronic databases were searched using adapted search terms from previous reviews on compassion interventions. Seventeen studies were identified as eligible and were included. The review followed the PRISMA guidelines for systematic reviews. Results indicated positive effects and experiences regarding mental health, including one adverse experience of the intervention, triggering anxiety. The data on physical health and coping outcomes was too limited to draw conclusions, yet few studies suggested positive effects regarding physical health. However, the overall quality of included studies was low, and results need to be treated with caution. Future research is needed to investigate the promising effects of compassion and should focus on physical health in people with physical diseases as a crucial indication of overall well-being.

Keywords: Systematic review, self-compassion, compassion, interventions, physical disease

Compassion-based interventions for people with (chronic) physical diseases: A systematic review on effects and experiences

The prevalence of chronic diseases is higher than ever. The number of people affected by a chronic disease drastically rose in the past decades and a further rise is predicted in the future (Ursum, Rijken, Heijmans, Cardol, & Schellevis, 2011; RIVM, 2018; Megari, 2013). For 2040 the percentage of people with a chronic disease among the Dutch population is estimated to be 54%, with an even higher increase of the absolute number of chronic diseases due to multimorbidities (RIVM, 2018). However, to estimate the number of people with a chronic disease involves some difficulties due to the lack of a universal definition of the term (Diederichs, Berger, & Bartels, 2011). Available definitions vary on key elements such as duration (> 3 months to permanent), need for medical attention and functional limitations (Goodman, Posner, Huang, Anand, & Koh, 2013). The world health organization used to define chronic diseases as 'not being passed from person to person, long of duration and generally slow progression'. This definition excludes viral diseases such as HIV, that are passed from person to person from being categorized as a chronic disease (WHO, 2011 in Bernell, Howard, & Paterson, 2016). In other definitions 'incurability' is included as an element and thereby excludes cancer from being categorized as a chronic disease (Goodman et al., 2011). Megari (2013) states that a chronic disease can be generally defined as a disease that is '*slow in progress, long in duration and requires medical treatment*'. This paper will rely on the latter definition and focus on physical (chronic) diseases and excludes psychiatric conditions and mental disorders.

Being physically ill can be challenging and burdensome. Foremost, the physical health is impaired. Common symptoms in people with physical diseases are pain, fatigue, stiffness, nausea (Dekker & Groot, 2018) and shortness of breath (Lorig, Sobel, Ritter, Laurent, & Hobbs; 2001). Additionally, there are condition specific physical impairments, such as for example high blood glucose levels (Ferrari, Dal Cin, & Steele, 2017) or disfunction of joints (Dekker & Groot, 2018). Further burdens are, that having a physical chronic disease often decreases health-related quality of life (Megari, 2013) and is associated with less well-being (Stewart et al. 1989). Moreover, becoming aware of a diagnosis and its implications for life, is a stressful event. Dekker and Groot (2018) differentiate between acute illness stressors and ongoing illness stressors. First, the acute illness stressors are the diagnosis, relapse expectations and the treatment (Dekker & Groot, 2018) for example in cancer patients, who must often deal with severe side-effects (KWF, 2018). The second type of stressors are ongoing illness stressors. They can be threats to autonomy or relationships and uncertainty about the future. Ongoing illness stressors evoke frequently occurring emotional responses of worrying, depressive mood and anxiety (Dekker & Groot, 2018). Besides, doctor visits, hospitalization and medication become a necessity (Lorig, Sobel, Ritter, Laurent, & Hobbs, 2001) and can constitute as ongoing stressor. Furthermore, the

stressors of physical disease require adjustment and self-management. For instance, coping with the ongoing stressor of medication requires self-management behaviours, such as strict medical adherence and dietary changes in people with diabetes type I and II (Ferrari et al., 2017). Altogether, a physical disease not only requires adjustment on a physical level but also requires psychological adjustment (Dekker & Groot, 2018). People with physical diseases are facing the challenges of adapting and self-managing a changed health status and life circumstances. To cope with these changed circumstances and the impact of a physical disease can be a real challenge. Therefore, interventions should be investigated to support physically ill people that are facing these challenges.

Compassion

Compassion is a promising construct from positive psychology to cope with challenges in life. Gilbert (2009a) defined compassion as a sensitivity to suffering, combined with the desire to relieve and alleviate the suffering. Compassion thus consists of two main components. First, to be compassionate a person needs to be open, aware and willing to notice, but also to make sense out and engage in the suffering (sensitivity). Secondly, a person needs the mindset to put one's intention into wise action and therefore needs skills and tools (or knowledge on how to acquire them) in order to alleviate the suffering (Gilbert, 2014). According to Gilbert (2009b), compassion can be directed in three ways. First there is the compassion someone feels for someone else. Second, the compassion someone receives and third, the compassion that is directed towards the self, also called self-compassion. In times of difficulties and personal suffering, self-compassion entails forgiveness towards the self as opposed to harsh self-criticism and judgment or self-pity. Self-compassion is defined by Neff (2003) as a construct consisting of three main elements: First, self-kindness – being kind towards the self, understanding and being open for one's own emotions and meeting one's own feelings with gentleness. Second, common humanity – in the sense of grasping one-self as part of humanity and thereby gaining a feeling of interconnectedness but also understanding and accepting human beings as imperfect and suffering as an inevitable part of humanity. Third, mindfulness – keeping one's own emotions in a balance and neither exaggerating nor suppressing feelings towards personal failure or suffering.

Compassion seems to be beneficial for mental health, physical health and coping in physically ill people. Pinto-Gouveia, Duarte, Matos and Fráguas (2014) showed that higher levels of self-compassion are associated with lower levels of depressive symptoms and stress, but higher levels of quality of life in cancer patients. Furthermore, self-compassion is related to better mental and physical health outcomes in an adult population with diabetes type I and II (Ferrari et al., 2017). Likewise, Sirois, Molnar and Hirsch (2015) showed that self-compassion is linked to positive coping behaviour in clinical samples affected by inflammatory bowel disease or arthritis.

Fortunately, compassion is not only positively related to general health, but can also be cultivated by interventions. Kirby (2017) provides an overview of current compassion-based interventions and showed that the cultivation of (self)-compassion in interventions has a positive effect on mental health and well-being in different population. Two frequently used compassion-based interventions are Compassion Focused Therapy (CFT) and Mindful Self-Compassion (MSC). Firstly, CFT developed by Gilbert (2009b) is based on evolutionary psychology, attachment theory and applies psychological processes from social psychology and neuroscience. CFT provides psychoeducation on three basic emotion-regulation systems, the threat and self-protect system, the drive and reward system, and the affiliative and soothing system (Gilbert, 2014). It is hypothesized that the threat system dominates in people with high self-criticism and shame. Compassionate mind training is used to facilitate the affiliate and soothing system and to develop a more compassionate self to engage in and alleviate suffering (Gilbert, 2009). Secondly, Mindful Self-compassion (MSC) is an 8-week programme developed to cultivate self-compassion (Neff & Germer, 2013 in Kirby, 2017). MSC is based on self-compassion by Neff (2003) and contains meditation, psychoeducation about self-compassion and mindfulness exercises. Further, empirically supported programs to cultivate compassion are among others Compassion Cultivation Training (Jazaieri et al., 2013 in Kirby, 2017) and Cognitively Based Compassion Training (Pace et al., 2009 in Kirby, 2017).

People with physical diseases struggle with physical health, emotional responses to their changed health status and face challenges of coping with their condition. Although, the number of compassion-based interventions is rising and compassion seems to be beneficial in regard to these challenges, there is however no review yet that provides an overview of which compassion-based interventions exist for people with physical diseases. Insight into the effectiveness of compassion-based interventions and their utility for people with physical diseases would be beneficial in order to mitigate the negative impact of their condition. Therefore, the aim of this study is to systematically review the literature to provide an overview and answer the question: **which (self)-compassion-based interventions currently exist and what are the effects and beneficial experiences of (self)-compassion-based interventions on psychological health/well-being, physical health and coping in patients with (chronic) physical diseases?**

METHOD

This systematic review was conducted following the PRISMA guidelines and Covidence, a tool for systematic reviews (Covidence.org) was utilized.

Search Strategy

A search was conducted in the electronic databases PsycINFO, PubMed, Scopus and Web of Science in November 2018. To search the databases a search string was developed, consisting of three key elements addressing 'compassion', 'intervention' and 'physical disease'. These three parts were combined by the Boolean operator AND. Within the latter two parts, the Boolean operation OR was used as well. The 'compassion' part consisted of the word "compassion". The second part was described by the words "intervention", "training", "program" and "therapy". The third part was more complex to translate into search terms. Therefore, the decision was made not only to translate the concept of a 'physical condition' into "chronic illness", "physical illness", "somatic illness" and "somatic" but also to include a list of conditions such as "HIV", "cancer", "diabetes", "heart", "stroke", "MS", "epilepsy", "chronic pain", "dementia", "Arthritis", "asthma", "COPD", "ALS", "bowel", "obesity", "Parkinson" and "fibromyalgia". In PsycINFO the thesaurus term DE "Physical Disorders" was included and in PubMed the Mesh term "Disease"[Mesh]" to search indexed terms as well. In Scopus the indexed terms are searched automatically, and Web of Science does not provide this function.

Eligibility and Exclusion criteria

An article had to meet the following eligibility criteria to be included in the systematic review: a) an intervention had taken place, b) the main objective of the intervention was the cultivation of (self)-compassion, c) the population addressed by the intervention was affected by a physical disease (clinical sample). Articles were excluded if they were a) not written in English, Dutch or German, b) not available/accessible, c) a single case study.

Study Selection

The four database searches revealed a total of 1798 papers. The search results were imported into Covidence for the screening process. Covidence detected 607 duplicates. Additionally, the automatic duplicate detection of the reference management software EndNote (7) and Mendeley (3) were used and detected 10 more sets of duplicates. Then, the articles were manually checked for duplicates twice, sorted by author and by title. After removing the duplicates, 1159 articles were left to be independently screened by two researchers. The articles were screened based on title/abstract and conflicts resolved by discussion. After the initial screening, 59 articles (+ 1 Erratum) were selected for the full-text review and examined by the first and second researcher, disagreements were resolved by discussion. Another 42 studies were excluded due to reasons such as full-text not available/accessible (n = 17), less than half of the intervention objective is directed at the cultivation/increase of compassion (n = 11), not a physical illness population (n = 3), text not in English (n = 3), duplicate (n = 2), no manipulation/intervention (n = 3), the intervention did not address compassion (n = 2) and being a

(single) case study ($n = 1$). Finally, 17 studies (+ 1 Erratum) were selected for data extraction and included in the review (See Figure 1, for diagram flow of study selection).

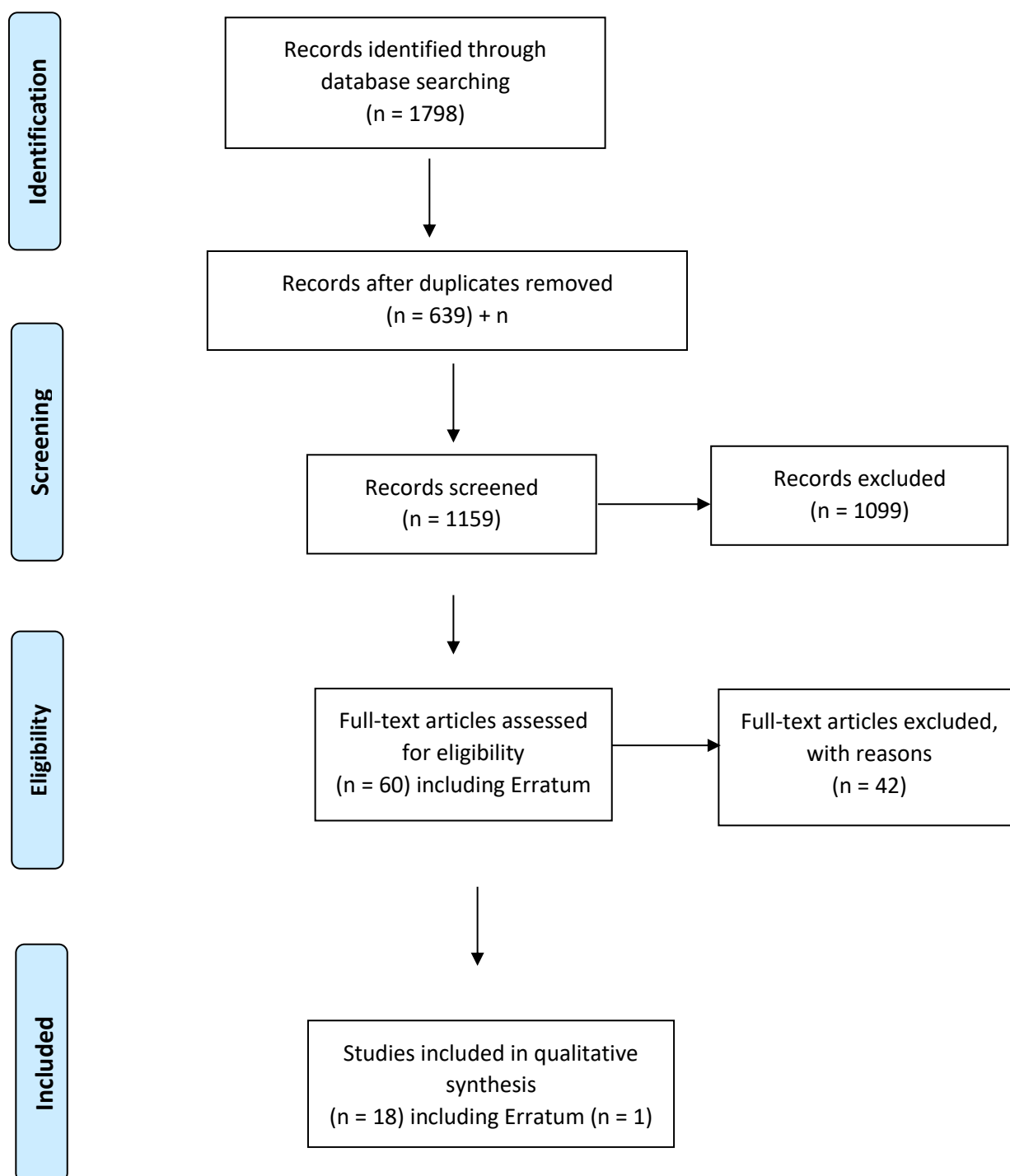


Figure 1. PRISMA flow diagram

Data Extraction

Intervention and study characteristics were extracted by the first researcher and controlled by the second researcher. The following data was extracted from the selected studies. Intervention characteristics: Intervention title, type, target group, duration and intensity, and delivery mode. Study characteristics: Title, year of publication, author data and study design, number of participants per study and per condition, age and sex of participants. Finally, the outcome measures, including results and indication of significance were extracted. Three outcome categories were selected to organize the results: 'Psychological health and well-being', 'Physical health' and 'Coping'. All outcome measures and results were extracted from the intervention group.

RESULTS

CHARACTERISTICS INCLUDED STUDIES

Intervention characteristics

Seventeen articles were included in the review, each describing an intervention. Several types of interventions were included, encompassing CFT, MSC, Compassion cultivation course (CCT), Cognitively based compassion training (CBCT), holistic medication (HOME), Attachment-Based-Compassion Training (ABCT), Resilient Mind course, self-compassion-based interventions informed by self-compassion by Neff (2003) and Loving-Kindness meditation. All intervention population were affected by physical diseases. The most common diagnosis was cancer (6 studies, including 4 x breast cancer) followed by chronic pain (3); head/brain injury (2); dementia (1); Diabetes type I and II (1); heart failure (1); Fibromyalgia (1) and one study with hospice-residents with secondary cancer or another life limiting illness (1). The size of the intervention group varied from 7 to 84 with an average of 26,4 participants. The duration of interventions varied greatly and can be divided into 12 long (6-18 weeks) and 5 brief (1 day-3 weeks) interventions (see Table 1, for details on duration). Out of 17 interventions, 3 were compassionate writing interventions. All 3 writing interventions belonged into the category of brief interventions. Most interventions were delivered face-to-face (13) and in groups (12 including one study group + individually), see Table 1, for details on delivery mode. Furthermore, 13 interventions were guided, 4 were unguided and 1 was without data about guidance. All instructors were specifically trained for their program. All studies were published within the last decade, the earliest in 2012 (1) and most studies published were in 2018 (5).

Table 1. *Intervention Characteristics*

Author and Year	Title Article	Title and type Intervention	Target group	Duration / Intensity	Mode of delivery	Guidance / Instructor
Ashwort et al. (2015)	An exploration of compassion focused therapy following acquired brain injury	Compassion-focused therapy (CFT) neuropsychological rehabilitation outpatient program	Acquired brain injury patients	18 weeks 6 group + 18 individual weekly sessions	Group + individual Face-to-face	2 CP - received monthly supervision from Gilbert and attended a 3-day workshop training in CFT
Campo et al. (2017)	A mindful self-compassion videoconference intervention for nationally recruited posttreatment young adult cancer survivors: feasibility, acceptability, and psychosocial outcomes	Mindful self-compassion (MSC) videoconference intervention Adaption of MSC and Making Friends with yourself program	Young adult cancer (various types) survivors	8-weeks 8 weekly 90-min sessions	Group Online	1 instructor - received the MSC teacher training program and had 3 years of mindfulness-based instructor experience.
Chapin et al. (2014)	Pilot study of a compassion meditation intervention in chronic pain.	Compassion cultivation training (CCT)	Chronic pain patients	9 weeks 9 weekly 2-hour meetings	Group Face-to-face	1 instructor - certified through CCARE's instructor training program with no formal pain training
Collins et al. (2017)	The Evaluation of a Compassion-Focused Therapy Group for Couples Experiencing a Dementia Diagnosis.	Compassion-Focused Therapy (CFT) not manualized, dynamic group process	Dementia patients	6 weeks 6 weekly 2-hour sessions	Group Face-to-face	1 CP/clinical neuropsychologist - advanced clinical skills training in CFT, experience working with dementia patients + trainee CP, trained in CFT model
Craig et al. (2018)	Compassion focused therapy for people with dementia: A feasibility study	Compassion focused therapy (CFT) - adapted for dementia Integrated components of MSC	Dementia patients with depression and/or anxiety	10 weeks 10 weekly one-hour sessions	Individual Face-to-face	4 CP (including 1 trainee CP) - training in CFT
Dodds et al. (2015)	Feasibility of Cognitively-Based Compassion Training (CBCT) for breast cancer survivors: a randomized, wait list-controlled pilot study.	Cognitively-Based Compassion Training (CBCT) -Meditation based program	Breast cancer survivors	8 weeks 8 weekly 2-hour classes + booster session	Group Face-to-face	1 clinically trained social work researcher with 20-year experience as meditator, fulfilling requirements for CBCT teacher certification

Including: Erratum

Table 1. *Intervention Characteristics (continued)*

kdnk	Kindness matters: A randomized controlled trial of a mindful self-compassion intervention improves depression, distress, and HbA _{1c} among patients with diabetes	mindful self-compassion (MSC) intervention standardized, without adaption to Diabetes	Diabetes type I and II patients	8-weeks 8 weekly 2.5-hour sessions	Group Face-to-face + <i>online supervision</i>	A health psychologist - trained to teach the program according to manualized MSC protocols
Gonzalez-Hernandez et al. (2018)	Cognitively-Based Compassion Training (CBCT®) in Breast Cancer Survivors: A Randomized Clinical Trial Study.	Cognitively-Based Compassion Training (CBCT)	Breast cancer survivors	8-weeks 8 weekly 2-hour sessions	Group Face-to-face	1 CP - 18-year meditator experience, fulfilling requirements for CBCT teacher certification
Heo et al. (2018)	Testing a Holistic Meditation Intervention to Address Psychosocial Distress in Patients with Heart Failure A Pilot Study	holistic meditation (HOME) intervention based on MSC	Heart failure patients	12 weeks 12 weekly 90-min sessions (including 8 group sessions)	Individual + group Face-to-face	1 nurse - certified as a trained teacher in MSC meditation
Lathren et al. (2018)	Young adult cancer survivors' experiences with a mindful self-compassion (MSC) video-chat intervention: A qualitative analysis	mindful self-compassion (MSC) video-chat intervention adapted from adult MSC and the Making Friends with Yourself program for teens	Young adult cancer survivors, various cancer types	8 weeks 8 weekly 90-min sessions + home practice	Group Online	1 MSC instructor - trained and certified MSC instructor
Montero et al. (2017)	Efficacy of "Attachment-Based Compassion Therapy" in the Treatment of Fibromyalgia: A Randomized Controlled Trial.	"Attachment-based compassion therapy" (ABCT) including a compassion training program adapted for FM patients	Fibromyalgia patients	8 weeks 8 weekly 2-h sessions + 3 monthly reminder sessions	Group Face-to-face	1 therapist who is a psychologist specifically trained to conduct teacher training in ABCT.
Penlington (2018)	Exploring a compassion-focused intervention for persistent pain in a group setting	'ResilientMind' course Informed by Compassion-focused model developed for the intervention	Patients with long-term pain conditions	8 weeks 8 weekly 2-hour sessions	Group Face-to-face	A clinician – no further information

Table 1. *Intervention Characteristics (continued)*

Brief Interventions						
Przedzi ecki and Sherma n (2016)	Modifying affective and cognitive responses regarding body image difficulties in breast cancer survivors using a self-compassion- based writing intervention	Self- compassionate writing intervention Self-compassion	Breast cancer survivors	1 day 1 session	Individual Paper- based (per post)	-
Wren (2016)	Investigating the efficacy of a lovingkindness meditation intervention for patients undergoing breast cancer surgery: A randomized controlled pilot study	Loving kindness meditation adapted version specifically designed for use during biopsy	Breast cancer patients undergoing surgery	1 day 1 session + 1 booster conversatio n	Individual Face-to- face	Radiologist and research assistants - no prior experience with intervention - received brief, structured training sessions
Ziemer (2015)	Self-compassion and the expressive writing paradigm: A study of therapeutic effectiveness for chronic pain	Brief online self- compassion writing intervention Based in self- compassion	Chronic pain patients	3 weeks 3 weekly 20-minutes sessions	Individual Online	No guidance, written instructions
Campbe ll et al. (2017)	Brief compassion focused imagery for treatment of severe head injury.	Brief compassion focused imagery (CFI) intervention Based on CFT	Severe head injury patients	1 day One 50- minute sessions	Group Face-to- face	Guided reflection components No further information
Imrie and Troop (2012)	A pilot study on the effects and feasibility of compassion- focused expressive writing in Day Hospice patients	Self- compassionate expressive writing intervention Based on self- compassion - wrote about recent stressful experiences	Day-hospice patients with life-limiting illnesses	2 weeks 2 weekly 20-min sessions	Group Face-to- face	Written instruction for writing task

- Denotes missing data; CP = Clinical psychologist

Study characteristics

Seventeen studies, all comprising an intervention with the objective to increase (self)-compassion in a physical disease population were selected for the systematic review. Quantitative and qualitative studies were included, comprising randomized control trials (8), mixed method designs (4), single-armed designs (3); single-armed case series design (1) and qualitative interview study (1). Six of these studies were pilot studies and five designated as feasibility studies. Sample sizes varied from 11 to 105 participants per study with an average of 41.17 participants, including control conditions (see Table

2, for more details on design and sample size). The overall quality of studies was low. The quality was limited due to weak study designs, most studies were uncontrolled and due to limited number of participants in for example pilot studies or case series.

OUTCOMES

A detailed summary and overview of all outcomes is provided in Table 2. Nine studies reported quantitative measures of (self)-compassion, 6 of them reported an increase of compassion pre to postintervention, 2 reported an increase and 1 reported no significant changes in levels of compassion. The remaining 8 studies did not report any measures of compassion. Self-compassion was measured by 52% of the studies, self-compassion was thereby the third most frequently reported outcome measure, after mood and anxiety. (Self)-compassion was not addressed in any of the qualitative studies as an outcome. A total of five studies comprised qualitative data; four used semi-structured interviews and one study used free-text responses to gain insight into the experience of participants.

Psychological health/well-being

The first outcome category consists of three components. First, measures of depression and positive and negative affect constitute the ‘mood’ component. Second, measures of anxiety and fear are combined to ‘anxiety’. Third, measures of well-being, Quality of Life, including Health-Related Quality of Life (QoL and HRQoL) and life satisfaction are reported under the same category to give an indication about ‘well-being’. All together, these three components form the outcome measure ‘psychological health/well-being’.

Quantitative outcomes. Fourteen studies reported measures on depression or positive-negative affect (1 study measured both), making ‘mood’ the most frequently reported outcome measure. Twelve studies reported a decrease in depression or negative affect scores, whereof 9 studies reported a significant reduction. One study reported a significant reduction in depression scores, but the effect in occurred in both, the experimental and control condition and therefore is not considered to be caused by compassion. Of the 4 studies measuring affect, one significant decrease in negative and one significant main effect in positive affect were reported. Out of the 5 interventions categorized as brief, 4 included negative and positive affect as outcome measure, in none of the long interventions affect was measured. Overall there was a decrease in depression scores pre to post intervention with 70% of the studies suggesting an improvement in ‘mood’.

Measures of anxiety and fear were the second most frequently reported outcome encompassing 10 quantitative (+1 qualitative study), including 2 studies that measured fear of cancer recurrence. Out of 10 quantitative studies, 9 indicated a reduction in anxiety/fear scores whereof 6 studies reported a significant reduction in scores and 2 studies that reported a reduction that does not seem to be caused by the compassion component of the respective intervention. Nine out of 10 studies suggest a reduction in anxiety indicating a positive effect of compassion interventions on this outcome.

Measures of well-being, Quality of Life and life satisfaction were used as indication of psychological well-being. Out of 17 studies, 7 studies reported measures on this outcome. Five studies reported measures on QoL (QoL in Alzheimer's disease, HRQoL, emotional QoL) whereof 3 reported significant improvements. One study assessed mental well-being and one satisfaction with life, used as marker for subjective well-being, both reported no significant changes. Overall, 3 significant changes were reported, suggesting the interventions did not have a strong effect on well-being.

Qualitative outcomes. Four studies reported qualitative outcomes on psychological health/well-being. Participants replied to semi-structured, open-ended interviews and in one case free-text responses regarding their experience with the respective intervention. In all four studies several superordinate/emergent themes were reported. Psychological health/well-being was mentioned in all 4 studies as part of a superordinate or a subordinate theme. *Depression* did not emerge as a theme and experiences regarding depression were not explicitly mentioned.

Anxiety: Regarding anxiety, participants of a young adult cancer survivor population reported general health-related anxiety and particularly fear of cancer recurrence. Moreover, they discussed difficulties to trust, that the body is healed and to let go vigilance towards cancer symptoms, as well as anxiety associated with medical scans, fear that cancer might be found, and anxiety associated with less available support after transitioning into the survivorship phase. Two subordinate themes emerged, resulting from the MSC intervention. First, 'MSC practices eased anxiety'. Participants reported that mindfulness practices were very useful in combating health-related anxiety. MSC practices were described as useful and applicable in daily life situations and during doctor visits to reduce anxiety. On the other hand, the second emergent theme 'Body awareness triggered health-related anxiety' was reported to have an adverse effect in some participants. Practices that brought attention to the body, triggered feelings of anxiety and evoke interpretation of body sensations in favour of fear of cancer recurrence (Lathren, Bluth, Campo, Tan, Futch, 2018). Another study reported under the theme 'Doing things different' that participants in a long-term pain sample, commented to use breathing practices as part of CFT in order to keep calm with day to day anxiety and emotions and were perceived to be helpful (Penlington, 2018). Moreover, participants reported under the superordinate theme 'Changes in self

and other relating', that they found ways to regulate threat-based feelings and were able to increase the activation of their soothing-system. A subordinate theme in the same study named "I am calmer now" encompassed participants reports of 'feeling more relaxed' and 'able to manage feelings of anger and anxiety' (Craig, Hiskey, Royan, Poz, & Spector, 2018).

Well-being: Participants with acquired brain injury (ABI) of a further CFT reported beneficial experiences regarding psychological well-being. Under the emergent theme 'Developing trust and safeness' the presence of a consistent caregiver and the 'In it together-security' created by the group experience with other ABI patients, were reported as a primary source of comfort. Participants reported finding safeness in the group allowed them to draw strength from each other and was described as nice and helpful (Ashworth, Clarke, Jones, Jennings, & Longworth, 2015). Overall, all four studies reported experiences to be beneficial in reducing anxiety, one study reported both beneficial and adverse effects of the intervention. One study reported beneficial experiences regarding well-being and no study reported experiences regarding depression.

Physical health (illness specific outcomes)

The second outcome category 'physical health' includes self-reported measures that give indication of the self-perceived overall physical health status of participants. For instance, included are pain measures as indication of the overall health status in chronic pain patients. Self-reported measures of heart rate were excluded as they do not give an indication of the overall health of cancer patients.

Quantitative outcomes. Seven studies reported measures that allowed to draw conclusions on the general (physical) health status of the participants. Four of these studies reported significant improvements in health symptoms and 1 study reported a reduction in pain intensity. One study reported a significant main effect on the reduction of pain severity, but no significant difference between conditions (Ziemer, 2015). Therefore, the reduction in pain severity is not considered to be caused by the compassion part of the intervention. The remaining study reported no significant changes in scores. Out of 7 studies, 5 reported an improvement in physical health suggesting that self-compassion interventions might have a positive effect on physical health.

Qualitative outcomes. Out of the four studies that reported qualitative outcomes, in none emerged physical health as a theme or outcome.

Coping

The third outcome category encompasses direct measures of coping, including coping behaviours and attitudes. Further, measures of self-efficacy are integrated into the category as a predictor of coping.

Quantitative outcomes. Out of 17, 3 studies reported quantitative measures on coping related behaviours and attitudes (coping). A single study reported a significant increase in pain self-efficacy. The remaining 2 studies reported non-significant changes in coping and non-significant changes in both adaptive and maladaptive coping. In total 3 of studies (17%) reported measures of coping and one study reported a significant positive change in coping.

Qualitative outcomes. Out of 4 qualitative studies, one study reported outcomes associated with coping. Patients with ABI discussed their experience of CFT in semi-structured interviews. Under the superordinate theme of 'A new approach' participants described how CFT gave them 'a new way to relate to themselves'. The subordinate theme 'New tools' encompasses participants reports on how they developed a toolkit/repertoire of practices, including 'soothing rhythm breathing' exercise and compassionate self-focusing, facilitating participants to develop a more personal sense of control. According to a participant *"With the compassionate mind training it's much easier to cope"*. Under the second subordinate theme 'Revaluating self', all participants reported that CFT prompted them to show care towards themselves. Participants described that through CFT, they were more able to engage in activities that help managing the consequences of their condition. A participant reported: *"I have started caring more about myself and what I want out of my life... I have started to put myself first now"* (Ashworth et al., 2015). Resulting from these interview reports, CFT seems to have a beneficial impact on coping in patients with acquired brain injury.

Table 2. Study Characteristics

Author	Title	Study Design	Study Population (Gender) Age (years): Mean (SD)	Outcome measures - results		
				Psychological health/ well-being	Physical health (illness specific)	Coping
Ashwort et al. (2015)	An exploration of compassion focused therapy following acquired brain injury	mixed methods single-armed + semi-structured interviews	n = 12 acquired brain injury patients (F = 5, M =7) F: 33.5 (8.36) M: 46.1 (9.64)	Hospital Depression and Anxiety Scale (HADS) Anxiety: significant reduction anxiety pre to post intervention ($r = 0.52, p < 0,05$) Depression: significant decrease in depression pre to post intervention ($p < 0.005, d = 1.43$) Qualitative analysis: interpretative phenomenological analysis Beneficial experience for anxiety, (n = 6)	--	Qualitative analysis: Beneficial experience for coping
Campo et al. (2017)	A mindful self-compassion videoconference intervention for nationally recruited posttreatment young adult cancer survivors: feasibility, acceptability, and psychosocial outcomes.	single-arm Feasibility study	n = 25 young adult cancer survivors (F=25) F: 26.9 (2.12)	Patient-Reported Outcomes Measurement Information System (PROMIS) Anxiety: significant decrease anxiety pre to post intervention ($p < 0.0001, d = 1.24$) Depression: Significant decrease in depression pre to post intervention ($p < 0.001, d = 0.99$)	--	--

Table 2. *Study Characteristics*

Chapin et al. (2014)	Pilot study of a compassion meditation intervention in chronic pain.	Mixed method Pilot clinical trial – within subjects, wait-list control + qualitative interview and survey	n = 12 chronic pain patients (F = 10, M = 2) F: 48.33 (10.80) M: 46 -	Post-treatment online survey: <i>0–10 rating scale</i> (0 = no improvement, 10 = completely improved) <i>how much participants thought the course improved their:</i> Quality of Life: improved moderate degree ($M = 6.58$, $SD = 1.98$) – raw scores	Brief Inventory Pain Severity: (average of four questions of the Brief Pain Inventory short form (BPI)) Pain Severity: Significant reduction in pain severity treatment baseline to post intervention ($p = 0.03$) Post-treatment online survey: Pain Severity: patients reported that the course improved their pain to a moderate degree ($M = 4.58$, $SD = 3.62$) – raw scores Qualitative analysis: not relevant	--
Collins et al. (2017)	The Evaluation of a Compassion-Focused Therapy Group for Couples Experiencing a Dementia Diagnosis.	Before-and-after comparison (repeated measures) Single-armed Evaluative study	n = 64 participants (32 dementia patients, 32 spousal caregivers) Intervention group: (F = 12, M = 20) F+M: 74.12 (5.98)	Hospital Anxiety and Depression Scale (HADS) Anxiety: no significant decrease in anxiety pre to post intervention ($p = 0.76$, $d_{mr} = 0.07$), n = 20 Depression: significant decrease in depression pre to post intervention ($p = 0.03$, $d_{rm} = 0.53$), n = 20 Quality of Life in Alzheimer’s Disease (QOL- AD) Significant increase of QoL pre to post intervention, $p = 0.01$, $d_{rm} = 1.03$ (large effect size), n = 8	--	--

Table 2. *Study Characteristics*

Craig et al. (2018)	Compassion focused therapy for people with dementia: A feasibility study	mixed-methods multiple case series + semi-structured interviews	n = 13 participants (7 dementia patients, 6 supportive others) Dementia patients: (F=6, M=1)	<p>Rating Anxiety in Dementia: There was a reduction of anxiety scores in all participants (n=7) pre to post intervention, N = 2 reliable reduction anxiety scores, no participant met reduction of clinical significance (n = 7)</p> <p>Cornell Scale for depression in dementia: Depression/Mood: n = 7 N = 5 reliable reduction depression scores, N = 3 clinically significant decrease depression pre to post intervention out of all (n = 7)</p> <p>Quality of Life in Alzheimer's disease (QOL-AD): No reliable change in scores (n = 7) No clinically significant change (n = 7)</p> <p>Qualitative outcomes: analysed using thematic analysis (n = 6) Beneficial experience for anxiety</p>	--	--
Dodds et al. (2015)	Feasibility of Cognitively-Based Compassion Training (CBCT) for breast cancer survivors: a randomized, wait list-controlled pilot study. Including Erratum	randomized wait-list controlled trial pilot feasibility study	n = 33 breast cancer survivors (12 experimental condition, 16 control group) Intervention group: (F=12) F: 54.7 (12.1)	<p>Depression questionnaire (CES-D-10) (depressive symptoms in the past 7 days) Significant reduction in depression between experimental and control group ($p < 0.01$)</p> <p>Fear of cancer reoccurrence Inventory - subscale: Severity: no significant difference psychological distress: no significant difference</p> <p>Medical Outcomes Study Short Form 12-Item Health Survey (SF-12): subscales: mental well-being: No significant difference</p>	--	--
				<p>Medical Outcomes Study Short Form 12-Item Health Survey (SF-12) – subscale:</p> <p>physical well-being: No significant difference</p>		

Table 2. Study Characteristics

Friis et al. (2016)	Kindness matters: A randomized controlled trial of a mindful self-compassion intervention improves depression, distress, and HbA _{1c} among patients with diabetes	RCT	n = 63 participants type 1 or 2 diabetes (32 experimental group (MSC), 31 wait-list control group) Intervention group: (F=20, M=12) F+M: 42.16 (14.70)	Patient Health Questionnaire (PHQ-9) Depression: clinically significant reduction depression scores pre to post intervention ($p < 0.001$) No significant main effect for group ($p > 0.005$) Significant time-by group interaction effect ($p < 0.05$)	--	--
Gonzalez-Hernandez et al. (2018)	Cognitively-Based Compassion Training (CBCT®) in Breast Cancer Survivors: A Randomized Clinical Trial Study.	RCT	n = 56 breast cancer survivors (28 experimental condition/CBCT, 28 Control condition/treatment as usual) Intervention group: (F=28) F: 51.64 (6.87)	Cancer recurrence fear: Significant reduction of psychological stress in the experimental group, significant time x group interaction ($p < 0.05$) Brief Symptom Inventory (BSI-18) Depression: No significant time x group effect ($p > 0.05$) significant reduction pre to post intervention within group comparison ($p < 0.05$, $d = 0.44$) Functional Assessment of Cancer Therapy– Breast Cancer (measures health related QoL in BC) subscales: Emotional QoL: no significant time x group effect ($p > 0.05$) Significant increase within group comparison pre to post intervention ($p < 0.05$) General QoL: significant increase within group comparison pre to post intervention ($p < 0.05$)	Functional Assessment of Cancer Therapy– Breast Cancer (health related QoL) subscales: Physical QoL: no significant changes of physical QoL scores ($p > 0.05$)	Cancer recurrence fear – subscale: FCR Cop: Coping: no sig. time x group interaction effect ($p > 0.05$) no significant changes within-group comparison pre to post intervention
Heo et al. (2018)	Testing a Holistic Meditation Intervention to Address Psychosocial Distress in Patients with Heart Failure A Pilot Study	Pilot pretest and posttest study	n = 11 heart failure patients (F=9, M=3) F+M: 60.9 (12.8)	Depressive symptoms: Significant decrease in depressive symptoms pre to post intervention ($p < 0.001$, $d = 1.54$) Minnesota Living with Heart Failure Questionnaire HRQoL: Significant improve HRQoL baseline to follow up ($p < 0.001$, $d = 1.82$)	Symptom status	--
		single armed			Questionnaire -Heart Failure: Physical symptoms: Significant decrease in hearth failure symptoms scores baseline to follow up ($p < 0.001$, $d = 1.91$)	

Table 2. *Study Characteristics*

Lathren et al. (2018)	Young adult cancer survivors' experiences with a mindful self-compassion (MSC) video-chat intervention: A qualitative analysis	Qualitative Feasibility and acceptability study, pilot semi-structured interviews	n = 20 Young adult cancer survivors (F=20) F: 27.00 (2.2)	Descriptive qualitative analysis: <i>(Semi-structured open-ended interview questions in group discussion about experience with MSC)</i> MSC was reported to be experienced as beneficial in reducing anxiety	--	--
Montero et al. (2017)	Efficacy of "Attachment-Based Compassion Therapy" in the Treatment of Fibromyalgia: A Randomized Controlled Trial.	RCT Three-armed	n = 42 fibromyalgia patients (18 experimental, 18 control group) Intervention group: - 50.83 (8.70) (Both conditions were combined with treatment as usual)	Hospital Anxiety and Depression Scale (HADS) Anxiety: significant decrease in anxiety scores ($p < 0.001$, $d = 1.03$) Depression: significant decrease in depression scores ($p < 0.001$, $d = 0.94$) VAS of the EuroQoL (EQ-5D): HRQoL: Significant change in VAS scores ($p = 0.002$, $d = -0.84$)	Fibromyalgia Impact Questionnaire (FIQ): Significant improvement in Fibromyalgia impact scores post intervention between group ($p = 0.003$, $d = 1.33$)	--
Penlington (2018)	Exploring a compassion-focused intervention for persistent pain in a group setting	mixed-method single-armed, unpowered + qualitative comments	n = 58 patients with long-term pain conditions; (F=45, M=13)	Patient Health Questionnaire-4 (PHQ-4) Anxiety (GHQ-2): reduced anxiety scores pre to post intervention ($d = 0.72$) Depression (PHQ-2): reduced depression scores pre to post ($effect\ size = 0.46$) Qualitative analysis: <i>Thematic analysis of free-text responses</i> Beneficial experience for mental health/well-being	Pain intensity: (1-10 rating) Reduced pain intensity pre to post intervention ($effect\ size = 0.23$)	Pain Self-Efficacy Scale (PSEQ): increase in self-efficacy scores pre to post intervention ($d = 0.36$)

Table 2. Study Characteristics

				Brief Interventions		
Przedziecki and Sherman (2016)	Modifying affective and cognitive responses regarding body image difficulties in breast cancer survivors using a self-compassion-based writing intervention	RCT two-group experimental (randomized)	n = 105 breast cancer survivors (57 experimental, 48 control condition) Intervention group: (F=84) F: 54.93 (9.85) (self-com- passionate writing with prompts vs. control, writing with no prompts).	<p>Short form Depression, Anxiety and Stress Scale (DASS21): Psychological distress: depression used as covariate</p> <p><i>negative affect was positively correlated with psychological distress</i></p> <p>Overall main effect for condition was revealed (<i>Wilks' $\lambda = 0.92$, $F(2, 104) = 4.70$, $p = 0.01$, $\eta^2 = 0.08$)</i></p> <p>Significant decrease negative affect ($p = 0.01$) compared to control group</p>	--	--
Wren (2016)	Investigating the efficacy of a lovingkindness meditation intervention for patients undergoing breast cancer surgery: A randomized controlled pilot study	Randomized controlled pilot study three-armed	n = 56 patients undergoing surgery as treatment for breast cancer/breast cancer patients (23 experimental, 16 active control, 17 standard care control) Intervention group: (F=23) F: 57.61 (11.87)	<p>State Anxiety Scale: Significant decrease anxiety in experimental condition compared to standard care condition, significant treatment x time interaction ($p = 0.046$) No significant difference between experimental and active control condition ($p = 0.021$)</p> <p>Anxiety significantly decreased over time in the lovingkindness condition ($p < 0.001$)</p> <p>Cohen's Affect Scale: Positive affect: No significant overall treatment x time interaction ($p = 0.22$), thus no significant difference between experimental condition to active control and standard care</p> <p>Negative affect: No significant overall treatment x time interaction effect, ($p = 0.80$), thus no sig difference between experimental condition to active control and standard care</p>		<p>Brief-Cope: Adaptive coping: No significant changes in adaptive coping ($p > 0.05$)</p> <p>Maladaptive coping: No significant changes in maladaptive coping ($p > 0.05$)</p>

Table 2. *Study Characteristics*

Ziemer (2015)	Self-compassion and the expressive writing paradigm: A study of therapeutic effectiveness for chronic pain	Experimental field study randomized to one condition two-armed active control	n = 93 chronic pain patients (50 experimental/SC condition, 43 control/self-efficacy condition) Intervention group: (F=41, M=9) --	<p>Center for Epidemiological Studies – Depression Scales (CES-D): No significant reduction in depression scores over time, no significant main effect for time ($p = 0.06$) No significant main effect for condition ($p = 0.99$) (However, trend towards decrease depression scores post intervention ($p = 0.06$))</p> <p>Satisfaction with Life Scale (SWLS): (<i>marker of subjective well-being</i>) no significant increases in life satisfaction</p> <p>Positive and Negative Affect Schedule (PANAS): higher scores indicate higher positive and negative affect Positive affect (PA) significant main effect for reported positive affect over time ($p < 0.01$) No significant main effect of writing condition ($p = 0.90$) No significant interaction between writing condition and positive affect over time ($p = 0.97$)</p> <p>Negative affect (NA) no significant main effect for negative affect over time ($p = 0.29$) no significant main effect of writing condition ($p = 0.13$) no significant interaction between writing condition and negative affect over time ($p = 0.88$)</p>	<p>Pain severity: the average pain decreased pre to post intervention, significant main effect for time ($p < 0.01$)</p> <p>no significant difference between conditions, no significant main effect for experimental condition ($p = 0.57$)</p> <p>no significant interaction between time and writing condition ($p = 0.74$)</p>	--
Campbell et. al. (2017)	Brief compassion focused imagery for treatment of severe head injury	RCT feasibility and pilot study	n = 24 severe head injury (SHI) patients (12 experimental/CFI, 12 control/RI) -- --	<p>State-Trait Anxiety Inventory, Short form (STAI). no significant difference in anxiety scores between groups (<i>Mann-Whitney, $U = 67.50, p = 0.346$</i>) -significant decrease in anxiety scores pre to post intervention ($p < 0.05$)</p> <p>Positive and Negative Affect Schedule (PANAS): Negative Affect: No significant changes in negative affect pre to post preparatory information ($p > 0.05$) - no measures post intervention</p>	--	--

Table 2. *Study Characteristics*

Imrie and Troop (2012)	A pilot study on the effects and feasibility of compassion-focused expressive writing in Day Hospice patients	Pilot case series	n = 13 patients with life-limiting illnesses in a day hospice (F = 8, M = 5) (F=8, M=8) F +M: 67.5 (14.9)	<p>The Short Depression-Happiness Scale (SDHS)- DHS Depression-Happiness Scale: (raw changes in scores) Mood/happiness: score increased pre to post intervention in all participants (n=3)</p> <p>Qualitative analysis: (n = 13) Text analysis to detect changes in Word use: significant main effect showing reduction in the use of negative emotion words between pre to post intervention ($p < 0.02$) Significant interaction between group and writing session ($p < 0.01$), indicating a significant increase in causal words in the experimental group compared to the control group (> causal words indicate > health improvements)</p>	--	--
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d = Cohen's d estimations, small = 0.20, medium = 0.50, large = 0.80; dRM = effect size estimation, small = 0.2, medium = 0.5, large = 0.8 a large effect; '--' denotes missing data

DISCUSSION

This literature review was aimed to investigate effects and beneficial experiences of self-compassion interventions on the three outcomes psychological health/well-being, physical health and coping in people with (chronic) physical diseases. Findings of the current review regarding the outcome categories are: Firstly, compassion interventions appear to improve mental health and psychological well-being by reducing depression and anxiety and increasing quality of life. Qualitative results indicated beneficial experiences in reducing anxiety with one adverse effect of increasing anxiety. One intervention was experienced to be a source of comfort and well-being. No experiences regarding depression were reported. Secondly, there was limited data on physical health outcomes. The limited number of studies that reported measures of physical health, suggest a positive effect of compassion intervention. No qualitative results regarding physical health were reported. Thirdly, the data on coping outcomes, as it was defined in this review, was very limited. The data on the outcome of coping was too limited to draw a conclusion about the effects of compassion interventions. However, qualitative results indicated that individual cases experienced compassion interventions to be beneficial regarding coping. An additional finding is, that the designs of included studies are of great heterogeneity.

The first finding is similar to that of Kirby's (2017) overview study, suggesting that compassion-based interventions improve mental health and well-being in healthy and clinical population (psychological conditions). The present review suggests that this effect also occurs in population with physical disease. Furthermore, merely few studies in the review gave an indication for the positive association of self-compassion and physical health outcomes as described by Ferrari et al. (2017). Additionally, Sirois (2015) reported that little research is conducted on self-compassion and coping in the context of chronic illness.

A remarkable result that emerged from the included studies was the recency of publication. All studies were published within the past seven years with a strong rise in numbers, resulting in most studies being published in 2018. The observed novelty of compassion-based interventions in physically ill population coincides with Kirby, Tellegen and Steindl (2017), stating that the entire field of compassion-based interventions is still within its infancy. Another indication of recency and growing body of research is the high number of pilot studies (35%) included. Pilot studies form an initial step in the development of outcome research (Kirby et al., 2017) and following larger scale research can be expected. This recent, yet growing interest in compassion interventions for people with physical diseases might explain the initial focus on 'classical' psychological outcome measures such as depression and anxiety. However, since the research interest of compassion-based interventions for physically ill

people is growing, it may be beneficial to expand the scope of outcome measures as well. It is recommended to shift the focus from primarily classical psychological outcomes towards integrating population specific outcome measures, such as physical health in physically ill population.

The data on the outcome measures of physical health was limited. This lack of data may be predominantly caused by two reasons. First, it was attempted to include measures that give an indication of the overall health status of participants and not to report single symptoms. Therefore, single symptom measures such as cortisol levels, heart rate or HbA1c in diabetes type I and II patients were not reported. Furthermore, only self-reported measures of physical health were included, yet physical health cannot always be assessed entirely by self-report, resulting in that only outcome measures about self-perceived health were reported in the review. The second reason for the limited data is the distinction between the outcome categories of psychological health/well-being and physical health. The distinction between mental health and physical health and its measures is not always clear. For instance, measures of Quality of Life were reported as indication of psychological health, yet they include physical symptom measures as well and could have been reported in that outcome category as well. Both issues lead to a limited number of results in the outcome category of physical health. However, even without the named restrictions of the review, the data on physical health outcomes was limited due to a low number of studies that assessed physical health. Nevertheless, physical health seems to be a crucial indication of general well-being in people with physical diseases and should be further measured in this population. Therefore, clear definitions of what falls under the scope of physical health are necessary and should be taken into consideration in further reviews compiling this outcome category.

Furthermore, the data on the outcome measure coping was very limited. Only four studies reported outcomes on coping and one study reported a beneficial experience of the intervention regarding coping. Therefore, the current study was not able to draw a conclusion on effects and hence the question, what the effects and experiences of compassion-based interventions on coping are, remains open. The limited data might be caused by the manner of how coping was reported. In this review coping was categorized as an outcome measure and only studies that explicitly named coping as an outcome were reported except for self-efficacy measures that were reported as a predictor of coping. However, Ridder and Schreurs (2001) state that many interventions address coping without explicitly presenting these interventions as such. Therefore, it can be assumed that compassion-based interventions have a larger effect on coping, but the effect was not reported, since the interventions did not explicitly mention or assessed coping with a coping scale. Coping is a broad concept and consists of many facets (Ridder & Schreurs, 2001) and it is assumed that the current review was not able to

adequately report coping. Therefore, to further assess the effects of (self)-compassion interventions on coping it is recommended to select and clearly define specific aspects of coping that will be investigated.

Strengths and Limitations

There were several limitations to the current study. To begin with, the data on the outcomes of physical health and coping was limited. Less than half of the studies (41%) reported measures on physical health. The few reported outcomes on physical health suggest a positive influence of compassion-based interventions. However, the small number of studies limits the generalizability of this finding and should be treated with caution. Furthermore, the quality of included studies was low due to a high number of weak study designs and largely low numbers of participants per study. This limits the generalizability of reported effects and claims of effectiveness in this review should be considered with particular caution. Another limitation was the restricted number of studies included due to unavailability (17) and language restriction to English, Dutch and German language (3). This limits the comprehensiveness of the review. Furthermore, the interventions included were of great heterogeneity. Interventions varied severely in duration (long and brief), delivery mode, intervention type and the number of compassion and other components, for example mindfulness, thus interventions varied with the amount of compassion addressed. This limits the generalizability of conclusions for all compassion-based interventions and it is not clear, whether the reported effects of compassion-based intervention are merely caused by the compassion component or other components in the respective intervention.

On the other hand, the great heterogeneity of included studies demonstrates a strength. The review includes all accessible compassion-based interventions for people with physical diseases, regardless of study design and intervention duration. Thereby a broad overview is provided. Furthermore, the comprehensiveness of the review demonstrates knowledge gaps that can be addressed by further research.

Future research

Future research needs to be carried out to provide an evidence base, whether compassion-based interventions improve physical health, to determine utility of compassion-interventions for physically ill people that are not affected by psychological conditions. Besides, further studies should pilot compassion-based interventions in further physically ill population, not addressed in this review to determine utility and enable more people to benefit from compassion-interventions. Future research would benefit from investigating the working mechanism in interventions. RCT's can be used to further investigate what components increase compassion and subsequently the relation of compassion with outcomes. By determining the effective ingredient, reluctant and less effective components can be excluded to improve feasibility and adherence for critically ill population. Future studies should target

the duration impact of interventions and investigate if there is a duration optimum, that might be shorter than the 'long' interventions in this review and thereby beneficial for attrition on long interventions.

Conclusion

This review provides an overview of which current compassion-based interventions exist and suggests utility of compassion-based interventions to improve mental health and well-being in clinical population with physical disorders. A remarkable finding was the recency and the strong rise of publications, indicating a novel and fast-growing research interest of compassion intervention in physically ill population and an extension of outcome measures is anticipated and recommended. The data on coping and physical health was too limited to draw conclusions regarding effects on these outcomes. Limited data was reported in the review due to difficulties of conceptualization of physical health and coping and restricted inclusion of measures and results. Furthermore, the included studies measured and reported limited results on physical health and coping outcomes. Although, the limited data outlines a shortcoming in order to estimate general effects of compassion interventions, it demonstrates important gaps in knowledge regarding physical health outcomes and coping assessment. Another shortcoming is that the overall quality of studies was low, this severely limits the generalizability of reported effects and the question of what the effects of compassion based-interventions are, remains not fully answered. The obtained knowledge gaps combined with the suggested utility for mental health improvement in physically ill population open new possibilities for compassion-based interventions. Researchers can use the review to get insight into the current state of research and simultaneously use it to sharpen their focus for future research. Future research should investigate effects of interventions on physical health and utility for further population. The rising prevalence of chronic physical diseases constitutes a need for new solutions and compassion-based interventions are shown to mitigate the negative impact of those diseases. Therefore, the promising capabilities of compassion and its cultivation need to be further investigated in this population. The current review provides a comprehensive overview as starting point and suggests further promising effects of (self)-compassion, that are yet in need to be investigated.

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