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**A systematic review of the effectiveness of self-compassion related interventions for  
individuals with chronic physical health conditions**

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### **Abstract**

Self-compassion, defined as a mindful way of coping with pain and suffering by showing kindness, care, and concern towards the self, may improve psychological adjustment in people living with a chronic physical health condition (CPHC). Various studies illustrate that self-compassion is associated with positive outcomes in general. The aim of this systematic review is to establish the effect of compassion-related therapies on self-compassion specifically in people with CPHCs. Secondary aims are to; i) establish the effect on other psychological and physiological outcomes and; ii) explore the relative effectiveness of different therapy types among those identified. Cochrane, Embase, Medline, PsychInfo, and CINAHL databases were searched using “compassion” AND “chronic disease” AND “psychological outcomes” and their synonyms, from 2004 to March 2019. Eligible studies had an experimental design using a self-compassion scale with an adult population. Risk of bias (RoB) was assessed using the Cochrane RoB tool. Effect sizes were calculated for study outcomes. Fifteen studies, including a total of 1,190 participants, seven different CPHCs, and eleven types of therapies, were included in the review. Nearly all included therapies significantly increased self-compassion with medium to large effect sizes, and reported positive outcomes, such as decreased depression. None of the therapy types appeared clearly superior to the others. Findings from this review show that included therapies increased self-compassion and improved various outcomes, which may represent clinically significant benefits for patients. However, there is a need to further understand how self-compassion exerts its benefits and determine the best methods to increase self-compassion.

*Keywords:* self-compassion, chronic physical health condition, therapy, review, distress

**A systematic review of the effectiveness of self-compassion related interventions for individuals with chronic physical health conditions**

*Compassion* or *self-compassion* is the recognition of suffering and inclination to relieve it with an act of kindness (Gilbert, 2009) rather than criticizing, blaming, or pitying. Self-compassion may be a useful tool for managing psychopathology related to persistent mental and physical ill health as suffering is inevitable and learning to be compassionate may help us to reframe our attitudes towards hardships and thereby lessen their impacts (Neff, 2003a). In the last 23 years, investigation of self-compassion and its application as a treatment method has increased significantly (Leaviss & Uttley, 2015; Muris & Petrocchi, 2017).

Neff (2003b) defines the concept of self-compassion as reflected in six dimensions - *self-kindness vs. self-judgement* (showing kindness and understanding in the face of difficulty), *common humanity vs. isolation* (noticing experience as a shared part of human life), and *mindfulness vs. over-identification* (seeing one's identity as distinct from the experienced problem). It is proposed that self-kindness, common humanity, and mindfulness may lead to better mental wellbeing because of the ways these processes undermine effects of self-criticism, isolation, or either painful or limiting views of our own identity (Neff, 2003a).

Studies examining the link between self-compassion and psychopathology show promising findings with negative correlations between these variables. A meta-analysis including mostly cross-sectional studies of community samples experiencing mental health problems found large effect sizes for the association between self-compassion and psychopathology ( $r = -0.54$ ) regardless of age or gender (MacBeth & Gumley, 2012). Another meta-analysis, including similar samples but based on a significantly different set of studies, found similar effect sizes ( $r = -0.53$ ) for the link between self-compassion and psychopathology (Muris & Petrocchi, 2017). Muris & Petrocchi (2017) also found that

although positive sub-scales of self-compassion (known as self-kindness, common humanity, and mindfulness) were associated with decreased psychopathology, the association between the negative sub-scales (known as self-judgement, isolation, and over-identification) and increased psychopathology appeared stronger. Thus, it appeared that the content of the “negative” self-compassion items may drive the correlations between self-compassion and psychopathology (Muris & Petrocchi, 2017).

### **Compassion and Wellbeing in Chronic Physical Health Conditions**

The term *chronic physical health condition (CPHC)* typically refers to a physical illness that is long-lasting (Bernell & Howard, 2016). These affect nearly half of all adults in the US, with heart diseases, cancer and diabetes being the most common examples (Centers for Disease Control and Prevention, 2009). CPHCs can impair individuals’ quality of life, which may require regular use of medication, treatment(s), or health care services (Megari, 2013). Having a CPHC represents a personal burden, can be accompanied by significant changes in important domains of daily functioning, and can require adapting to pain or other symptoms. Reduced health and functioning, and the process of adaptation to these, can be psychologically demanding as individuals need to face potential loss, threats, and uncertainty, and live a life that is different from that which they had originally imagined (Turner & Kelly, 2000).

Research has demonstrated that decreased psychological wellbeing, including high levels of depression and anxiety, is highly prevalent in patients with a CPHC. Accordingly, the World Health Organization (WHO) states that 9-23% of people with one or more CPHCs have co-morbid depression and these numbers are predicted to rise (Buist-Bouwman, De Graaf, Vollebergh, & Ormel, 2005; Härter, Conway, & Merikangas, 2003; Katon & Ciechanowski, 2002; McWilliams, Goodwin, & Cox, 2004; Moussavi et al., 2007).

Depression in the context of CPHCs can lead to poorer illness outcomes, lower treatment

adherence, increased treatment costs and premature death (Evans et al., 1999; Krishnan et al., 2002; Mykletun et al., 2009; Voinov, Richie, & Bailey, 2013). Therefore, the treatment of these co-morbid mental health problems is crucial to improve patients' well-being and prognosis.

National Institute for Clinical Excellence (NICE) guidelines for the treatment of co-morbid depression in CPHCs include pharmacological, psychosocial, and collaborative care approaches (NICE, 2009). However, some studies show that self-critical individuals are less likely to benefit from standard therapies like cognitive behavioral therapy (CBT) (Rector, Bagby, Segal, Joffe, & Levitt, 2000) and more likely to experience relapses after their treatment (Teasdale & Cox, 2001). Therefore, new approaches to tackle self-criticism, and improve wellbeing for people with CPHCs, are needed. These could include methods to increase self-compassion, which is one of many positive affect constructs.

Fredrickson (1998, 2001, 2004) states that experiencing positive emotions would augment individuals' momentary action repertoire, which would help them to build their own support system against negative events and summarizes this under the "*broaden and build*" theory of positive emotions. Accordingly, studies show that experiencing positive emotions would not only increase thought-action repertoires (e.g., Fredrickson & Branigan, 2005), or undo lingering negative emotions (Fredrickson, Mancuso, Branigan, & Tugade, 2000), but also increase psychological flexibility and personal resources (Tugade & Fredrickson, 2004), which would also be associated with better outcomes for patients with chronic physical health conditions (Pressman, Jenkins, & Moskowitz, 2019).

Increased self-compassion through self-kindness, common humanity, and mindfulness is associated with higher levels of positive affect (e.g., Wren et al., 2012) and with the use of more adaptive and problem-focused coping techniques like seeking social support or using positive reframing (Allen & Leary, 2010) which can lead to better outcomes in CPHCs

(Sirois & Rowse, 2016), including decreased stress. Individuals with high levels of self-compassion show more adaptive responses which may include increased health promoting behaviors (Sirois, 2014) such as controlling their diet, exercising, or attending regular check-ups, each one a potentially important part of managing a CPHC. Decreased stress may also increase individuals' adherence and lead to better management and control over one's health (Terry & Leary, 2011) and decrease the likelihood of developing of a mental health problem (MacBeth & Gumley, 2012). Therefore, therapies that aim to increase self-compassion can be beneficial for coping with a CPHC and may protect mental wellbeing.

Previous research in community and mental health populations highlights the possible pathways from self-compassion to decreased psychopathology, such as through enhanced coping or health behavior (Kirby, Tellegen, & Steindl, 2017; Wilson, Mackintosh, Power, & Chan, 2019). Despite the high levels of psychopathology reported across CPHCs which could benefit from self-compassion treatment, there is a significant gap in available reviews of evidence for this group. To our knowledge, this is one of the first systematic reviews which targets the application of self-compassion in CPHCs. Which therapy methods (e.g., Mindful Self-Compassion Course) are most effective and acceptable by patients with CPHCs are also unknown.

### **Objectives**

This systematic review aims to synthesize the current literature that examines the effect of compassion-related therapies to increase compassion and their methods of delivery for improving psychological and physiological outcomes of people with CPHCs. Therefore, the primary objective was to:

1. Assess the effectiveness of therapies to increase self-compassion in people with chronic physical health conditions.

The secondary objectives were to:

2. Assess the effectiveness of self-compassion-related therapies to improve psychological (e.g., distress) and physiological (e.g., sleep) outcomes
3. Identify the most effective therapy type based on its predominant active ingredients and mode of delivery.

## **Materials and Methods**

### **Protocol and registration**

The Cochrane Handbook for Systematic Reviews of Interventions (The Cochrane Collaboration, 2006) and the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) statement (Liberati et al., 2009) were used for designing, conducting, and reporting this systematic review. The study protocol for this review is registered with the PROSPERO system, registration number CRD42018095999 (Version 2, 30.10.2018) and can be found online at [www.crd.york.ac.uk/prospero/](http://www.crd.york.ac.uk/prospero/).

### **Eligibility criteria**

#### *Types of studies*

Only intervention studies, which are multi-arm pre-post study designs, non-randomized or randomized trials, and cross-over controlled study design, were included in this review. Other study designs, such as cross-sectional or single-arm pre-post study designs were excluded from the review (see Table 1).

#### *Types of participants*

Individuals with a CPHC as defined by chapters 2-17 (excluding chapters 5 and 15) of the World Health Organization's (2016) International Classification of Diseases 10 of any gender and age group, or geographical location were included in this review. All chronic physical health conditions were included as they represent a relevant whole population in some respects. In professional training, healthcare delivery systems and public understanding, there is often categorical thinking around mental health on one side and physical health on



the other; as demonstrated by previous systematic reviews in this area grouping a diverse range of mental health populations. Elevated distress is evident across CPHCs, suggesting a transdiagnostic approach to be suitable. Healthy adults without a CPHC and children and adolescents younger than 18 were excluded.

### *Types of interventions*

Any therapeutic method that aims to increase self-compassion (e.g., compassion-focused therapy, mindful self-compassion, compassion cultivation training and others) with at least one session where concepts of self-compassion were applied in individuals with CPHCs were included in this review. Other types of psychological therapies (e.g., cognitive behavioral therapy) that were not specifically designed and delivered in ways to enhance self-compassion were excluded after reviewing the reports. Included therapies need to consist of at least one stand-alone session. There was no exclusion based on who delivered the therapy to study participants, for instance, researchers, therapists, nurses, and others.

### *Types of comparators*

Included studies required a control group to understand the effectiveness of the therapy. One or more types of control methods, such as wait-list condition, usual care, an alternative active treatment (e.g., CBT), or any other active control (e.g., completing a placebo task) needed to be used. Studies without a control group were excluded.

### **Types of outcomes**

#### *Primary outcomes*

Self-compassion was the primary outcome of this review. Included studies were required to report self-compassion using a self-report measure.

#### *Secondary outcomes*

Psychological outcomes such as depression, and physiological outcomes such as sleep using a self-report measure.

**Language**

This systematic review was restricted to full text papers published in English.

**Search methods for identification of studies***Electronic searches*

Five electronic databases were searched; the Cochrane Central Register of Controlled Trials (Central), MEDLINE, EMBASE, and PsycINFO accessed via OVID, and CINAHL (The Cumulative Index to Nursing and Allied Health Literature). Search terms were defined using previous literature and MeSH terms (Medical Subheadings). “Compassion” AND “chronic disease” AND “psychological outcomes” (depression, anxiety, stress, etc.) and their synonyms were used for searching databases (see Table A, Supplemental Materials). Furthermore, searches were limited to peer-reviewed articles, published since 2003 (publication of Neff’s self-compassion scale), research design (experimental studies), and language (English). However, there were no restrictions on geographical location.

*Searching the grey literature*

Several search methods were applied to identify grey literature research, including hand searching the reference lists of papers included in the current review, searching for PhD theses and dissertations (ETHoS), and searching controlled trial registrations (Central).

**Data collection and analysis***Selection of studies*

The study selection process was conducted by two independent reviewers (AK & RR). The reviewers searched relevant databases using the pre-determined search terms between 2003 to March 2019. Then, results of these searches were exported into EndNote X8 (Clarivate Analytics, 2017). Duplicate papers were removed using the find duplicates function in EndNote and via hand searches. Next, the titles and abstracts were screened against the pre-specified inclusion/exclusion criteria. Finally, remaining full-text versions of

the relevant papers were examined for selection using an a priori screening table. The number of ineligible studies were recorded throughout and illustrated using a PRISMA flow diagram. Furthermore, the final findings of both reviewers were compared and discrepancies between them resolved through discussion. The reliability of the inclusion between the two reviewers was assessed using Cohen's Kappa agreement (McHugh, 2012) and there was moderate agreement (0.75) between the reviewers.

### ***Data extraction and management***

Findings of the included studies were coded using a pre-determined data extraction table by two independent reviewers. Extracted data included information about the baseline demographics of the study, details of the therapy type and its mode of delivery, findings of the study outcomes and the limitations of the study.

### ***Assessment of risk of bias (RoB) in included studies***

The included studies were assessed using the risk of bias (RoB) tool developed by the Cochrane Collaboration (The Cochrane Collaboration, 2006) for determining internal validity. Accordingly, selected papers were evaluated based on the following biases: selection, performance, detection, attrition, reporting, and other. Furthermore, they were ranked as low, high, or unclear RoB and the findings were reported using the recommended tables of the Cochrane Collaboration.

### ***Data synthesis***

Following SWiM guidelines, the findings of the included studies were grouped according to the type of the CPHC and the type of psychological therapy delivered (Campbell et al., 2020). A descriptive synthesis was used within these groups to illustrate the effectiveness of self-compassion-related therapies on the primary and secondary outcomes. Also, Morris' (2008) effect size calculation ( $d_{ppc2}$ ) was used for study designs which allowed for the below calculation:

$$d_{ppc2} = \frac{(\text{mean pre - post change in treatment}) - (\text{mean pre - post change in control})}{\text{pooled pretest SDs}}$$

The heterogeneous nature of the included studies and small samples sizes meant that meta-analysis was not appropriate and so a narrative synthesis of intervention effect estimates was carried out, as recommended by Campbell et al. (2020).

## Results

### Description of studies

#### *Results of the search*

The *PRISMA statement flow diagram* (see Figure 1) demonstrates the identification process of the relevant papers by reviewers (AK & RR) throughout the study. Although, study inclusion was limited to publication in English, searches were not limited to the English language and no studies were excluded due to being published in another language in the full text screening stage.

#### *Included studies*

All studies meeting the inclusion criteria originated from high-income countries (Netherlands, United States, New Zealand, Spain, Ireland, United Kingdom, Australia, Denmark), as classified by the World Bank (World Bank Country and Lending Groups, n.d.). In total, 1,190 people participated in these studies and 1,023 (85.97%) of them were women, with a mean sample size of 79.33 (range 16-304). Studies were restricted to those with adult samples (18 years old and above). All the included studies were randomized controlled trials with two arm ( $n = 12$ ) or three arm ( $n = 3$ ) study designs. While nearly half of the included chronic physical health conditions were related to cancer ( $n = 9$ ), the other half included multiple sclerosis ( $n = 1$ ), diabetes ( $n = 1$ ), chronic pain ( $n = 1$ ), rheumatoid arthritis ( $n = 1$ ), chronic fatigue syndrome ( $n = 1$ ), and people receiving an implantable cardioverter defibrillator ( $n = 1$ ). Most outcome measurements comprised of self-rating scales and main study outcomes were self-compassion followed by mindfulness ( $n = 8$ ), depression ( $n = 11$ ),

stress ( $n = 6$ ), anxiety ( $n = 7$ ), and other psychological and physiological outcomes (see Table 2).

Increasing self-compassion was a component of a broader treatment for most of the included therapies. Eleven different therapeutic approaches were found: mindfulness based cognitive therapy (MBCT,  $n = 3$ ), mindfulness based stress reduction (MBSR,  $n = 2$ ), mindfulness meditation (MM,  $n = 2$ ), positive writing (PW,  $n = 2$ ), mind-body bridging (MBB,  $n = 1$ ), linking affect and coping (LILAC,  $n = 1$ ), yoga ( $n = 1$ ), mindful self-compassion program (MSC,  $n = 1$ ), compassion based cognitive therapy (CBCT,  $n = 1$ ), an internal family systems-based psychotherapeutic intervention (IFS,  $n = 1$ ), and loving kindness meditation (LKM,  $n = 1$ ). Therapies included meditation and mindfulness practices, as well as educational information about the management of their illness and psychological wellbeing (see Table B, Supplemental Materials).

Studies used face-to-face group ( $n = 12$ ), online ( $n = 2$ ), or a combination of face-to-face and online therapies ( $n = 1$ ), which lasted approximately one day to eight weeks. The treatment time ranged between 1 hour to 25.5 hours. All studies included a control group, either treatment as usual ( $n = 9$ ), active control ( $n = 5$ ), or a combination of treatment as usual and active control ( $n = 1$ ). The active control conditions included sleep hygiene education (an educational program on how to change habits to improve the quality of sleep), educational information related to their condition, listening to music rather than meditation, expressive writing, or self-efficacy writing (see Table C, Supplemental Materials).

## **Results of individual studies**

### ***Effectiveness of compassion-related interventions to increase self-compassion***

Nearly all studies included in this review reported statistically significant increases in individuals' self-compassion after participating in a compassion-related intervention, except for one of the MBCT studies (Johannsen, O'Connor, O'Toole, Jensen, & Zachariae, 2018;

$d_{ppc2} = 0.29$ ) and the positive writing intervention (Ziemer, Fuhrmann, & Hoffman, 2015;  $d_{ppc2} = -0.09$ ) (see Table 3).

Effect sizes range between -0.07 to 0.96 for studies including a treatment as usual control group. When considering effect size thresholds as small ( $d \leq 0.2$ ), medium ( $d \leq 0.5$ ), and large ( $d \geq 0.8$ ), most studies had between-group effect sizes that were medium ( $n = 6$ ) for increasing participants' self-compassion, followed by large ( $n = 3$ ) and small effect sizes ( $n = 1$ ). The largest effect sizes were observed in yoga ( $d_{ppc2} = 0.96$ ; Toise et al., 2014), MBCT ( $d_{ppc2} = 0.87$ ; Kingston et al., 2015), and MBSR ( $d_{ppc2} = 0.80$ ; Simpson, Mair, & Mercer, 2017) interventions. Conversely, the smallest effect was found in LKM<sub>1</sub> ( $d_{ppc2} = -0.07$ ; Wren, 2016). When studies employed active control groups, effect sizes decreased and ranged between -0.19 to 0.46. The smallest effect size for studies with active controls was found in LKM<sub>2</sub> ( $d_{ppc2} = -0.19$ ; Wren, 2016) and the largest was LILAC ( $d_{ppc2} = 0.46$ ; Cheung et al., 2017).

### ***Effectiveness of compassion-related interventions on psychological and physiological outcomes***

Including all CPHC populations resulted in inclusion of various psychological and physiological outcomes. The most commonly investigated variables were depression ( $n = 12$ ), mindfulness ( $n = 8$ ), and anxiety ( $n = 7$ ), and they mostly showed medium to large effect sizes (see Table 3).

Nine studies included in the review involved cancer populations, which included breast cancer ( $n = 6$ ), lung cancer ( $n = 1$ ), and mixed cancer groups ( $n = 2$ ). These studies included MBCT ( $n = 2$ ), MM ( $n = 2$ ), LILAC ( $n = 2$ ), CBCT ( $n = 2$ ), MBCT ( $n = 2$ ), MBB ( $n = 2$ ), LKM ( $n = 2$ ), and PW ( $n = 2$ ). Studies in the cancer populations demonstrated statistically significant increases in self-compassion and mindfulness, and significant decreases in depression, anxiety, or stress scores.

Boyle and colleagues (2017) reported that the link between the intervention and decreases in depressive symptoms was mediated by increased self-kindness (a sub-scale of self-compassion scale) and mindfulness, as well as decreased rumination. However, the link between the intervention and the decline in perceived stress was only mediated by self-kindness. The interventions in cancer were also effective in decreasing negative affect and pain catastrophizing (e.g., Johannsen et al., 2018;  $d_{ppc2} = -.43$ ), however there were mixed findings around increasing the use of positive affect skills and quality of life. Further improvements included illness-specific outcomes like perceived body image, sleep disturbance or post-traumatic stress symptoms (e.g., Schellekens et al., 2017;  $d_{ppc2} = -.20$ ,  $p = .05$ ).

Research in other conditions found similar findings to the cancer populations. Multiple sclerosis patients demonstrated improvements in prospective memory, while chronic fatigue syndrome patients reported decreased fatigue (e.g., Rimes & Wingrove, 2013;  $d_{ppc2} = -1.30$ ) after the therapy. Illness specific outcomes were also found for implantable cardioverter defibrillator patients with decreased device-specific anxiety (experiencing anxiety because of not knowing when the device will fire) and diabetes patients with improvements in diabetes-distress ( $d_{ppc2} = -1.0$ ) and HbA<sub>1c</sub> levels ( $d_{ppc2} = -.33$ ) in the blood (Friis et al., 2016).

### ***Comparison of compassion-related interventions***

Even though 11 different interventions were featured in the studies reviewed, most of these shared similar durations. The length of the interventions ranged between one session (e.g., LKM; Wren, 2016) to 15 weekly sessions (e.g., IFS; Shadick et al., 2013) and most studies included eight weeks of treatment (e.g., MSC, MBCT, etc.). Total direct treatment time ranged from half an hour to twenty hours of participation, excluding the home practices, and most of the studies included practice outside of therapy sessions for participants to

rehearse and integrate what they have learned. Retention rates were adequate as studies demonstrated low attrition rates and these dropouts were mostly caused by external reasons (e.g., being busy). Most of the studies reported that participants attended at least 50% or more sessions during the interventions as well as indicated that home practice was completed by 60% to 89.30% of participants (see Table D, Supplemental Materials).

Most of the treatments were delivered by highly experienced providers ( $n = 8$ ), while two studies reported that their providers had 10 or more years of experience. Also, nearly all studies had face to face group participation while only two studies (PW, Sherman et al., 2018 and LILAC, Cheung et al., 2017) included online delivery. One of these studies was a three-arm-trial which compared online and face-to-face delivery of the same intervention with a control group. This study reported no difference between the face-to-face and online delivery. Most of the interventions included mindfulness and self-compassion as one part and also included various other methods, such as psychoeducation relating to mood problems, meditation, writing tasks, or breathing techniques.

### **Risk of bias (RoB) in included studies**

Risk of bias has been assessed by two reviewers and there was 63% Kappa agreement between the reviewers, indicating moderate agreement (McHugh, 2012). In summary, low risk was most common with respect to reporting bias, attrition bias, and selection biases whilst unclear risk was the most common classification for blinding, and 'other' bias categories which includes reporting other limitations in the study manuscript, such as no clinical assessments of study participants, and others (see Figure 2 and Figure A and Appendix E in Supplemental Materials).

### **Discussion**

This systematic review aimed to scrutinize the effectiveness of compassion-related therapies for increasing self-compassion for people with a CPHC and it evaluated these



therapies on their effectiveness for enhancing psychological and physiological outcomes (e.g., decreasing depression or blood sugar levels). Results of this systematic review illustrated that nearly all therapies were effective at significantly increasing self-compassion across a range of CPHCs. When taking effect sizes into consideration, most therapies showed medium to large effect sizes for the change in individuals' self-compassion. Also, these therapies were mostly associated with improvement in psychological and physiological outcomes. In particular, mindfulness, anxiety, depression, stress and sleep problems showed medium effect sizes. Thus, increases in self-compassion may be associated with decreases in depression, anxiety, and stress in people with CPHCs, which is consistent with previous research in community and mental health populations (e.g., Kirby, 2017; MacBeth & Gumley, 2012; Wilson et al., 2019; Zessin, Dickhäuser, & Garbade, 2015).

Previous literature, especially in community level studies (e.g., Klimecki, Leiberg, Lamm, & Singer, 2013; Neff, Rude, & Kirkpatrick, 2007), have shown that self-compassion may not only lead to increased positive affect, but also to decreased negative affect, which in turn leads to positive outcomes. Neff (2003b) interprets this as a result of increased positive affective response in the face of personal difficulties (e.g., being kinder towards oneself) would make individuals experience more positive feelings in their lives, which is also in line with the broaden and build theory. As stated earlier, increased experience of positive feelings on a regular basis, in this context experiencing more compassion towards the self, would make individuals be more resilient in the face of psychological distress and would build their personal resources. Similarly, wider literature in positive affect and health has shown that increased positive affectivity was associated with positive outcomes, such as decreased mortality, morbidity and disease severity and progression, in CPHCs (Pressman et al., 2019). Therefore, the apparent effectiveness of self-compassion to alleviate psychopathology in both

mental health and physical health groups highlights the potential utility of this type of treatment transdiagnostically.

When the range of effect sizes was examined across each type of therapy, no consistent patterns were identified which alludes to the possibility that no specific type of intervention is superior to the other. These therapies may be generally applicable in various CPHCs as this review included nine different illness groups and their findings were quite similar with respect to increasing self-compassion and other psychological and physiological outcomes. However, this should be interpreted with a high degree of caution as no formal statistical comparisons were possible given the limitation in the number and type of trials identified. As more compassion-focussed interventions emerge with more robust reporting standards, formal analyses will become possible.

Compassion-related therapies are time-consuming and need active participation (e.g., completing home practice). Even though the duration of the reviewed therapies ranged between one session (e.g., LKM) to 15 weeks (e.g., IFS), most of them were eight weeks long and included home practice. When studying patterns between the duration of therapy and effect sizes, it appears to suggest that more intensive treatments both in terms of their duration and number of treatment sessions result in larger effects. However, again this interpretation needs to be treated with a high degree of caution because we were not able to formally test this hypothesis using meta-regression techniques.

Previous research has shown that online delivery of the treatment, particularly in Cognitive Behavioral Therapies, would be as effective as its face-to-face delivery (Carlbring, Andersson, Cuijpers, Riper, & Hedman-Lagerlöf, 2018). The interventions included in this review were usually delivered by an experienced therapist on a face-to-face basis. However, one three arm trial, which tested face-to-face and online delivery of the same intervention in comparison to a control group indicated that the effectiveness of face-to-face and online

delivery did not differ significantly. This may have some further clinical implications as face-to-face therapies would be a much more expensive delivery method in comparison to online therapies. However, these results need to be carefully evaluated as the number of studies with online delivery was limited. Therefore, this study highlights the need for future researchers to evaluate the effectiveness of online delivery methods in comparison to face-to-face delivery to provide more cost-effective methodologies.

The quality of the studies was moderate, and blinding was a problem for most of the studies. This is common with this type of trial as it may not be possible to blind participants to the type of behavioral intervention they receive. However, the findings of the studies were promising, and these studies can be used as a guide for self-compassion therapy for CPHCs.

A recent meta-analysis found that self-compassion-related therapies were effective in producing greater improvements in self-compassion, anxiety, and depressive symptoms for people with a mental health condition or a subclinical psychological difficulty. However, when these studies were restricted to those with an active control group, these improvements were not significant, which raises concern about the true effect of self-compassion in therapy (Wilson et al., 2019). A similar pattern of results was found in the current review in CPHCs and highlights a potential limitation of the treatment which should be considered by future researchers. MacBeth & Gumley (2012) stated that even though self-compassion showed a high association with psychopathology, there is a need in the literature to explain the possible moderators which might affect the effect sizes. Thus, it shows that there is a need for longitudinal studies in patient populations to clearly understand the nature of the association between self-compassion and psychopathology in all groups. A limitation of these studies is that Neff's scale is currently the most commonly used questionnaire to measure individuals' self-compassion levels and the scale has different subscales -three categories with two sides-

which makes it hard to clearly understand which element of self-compassion is the active element and for whom (e.g., Muris & Petrocchi, 2017).

### **Strengths and weaknesses of review**

This systematic review included 1,190 people with eight different CPHCs, and it found twelve different therapies, which may be effective to increase self-compassion. The main criterion for the selection of the intervention methods was directly or indirectly aiming to increase self-compassion. Therefore, some of the intervention methods successfully increased self-compassion, even when this was not directly targeted, demonstrating that there may be many ways to increase self-compassion. This systematic review was able to collect information from studies involving a heterogenous group of CPHCs, and was able to detect similar findings for psychological outcomes, from generally similar therapies, in accordance with the previous literature (e.g., Kirby, 2017; Wilson et al., 2019).

### **Potential biases in the review process**

Several steps have been taken to prevent possible biases. Firstly, the study protocol is published on PROSPERO and the study followed the indicated methodology. Secondly, there were two independent reviewers who used the same instructions to detect the possible papers in these databases, and extract the data from the selected databases, with a moderate level of agreement. Thirdly, the effect sizes are reported rather than demonstrating the raw summary of the collected data, which would be helpful for researchers to have a better understanding of the results (Campbell et al., 2020). However, researchers need to be careful while interpreting these results as this review only provided a narrative synthesis as the heterogeneity of treatment methods and outcomes precludes meta-analysis.

There were several limitations for the study. Nearly all studies were conducted in high income countries and most of the participants were female; therefore, results may not generalize to the wider population.

**Implications for research and clinical practice**

This systematic review highlights areas needing further development in self-compassion research, which is also similar to the recommendations of Kirby and colleagues (2017). Even though 80% of the included studies in this review reported registering their proposal beforehand to minimize bias, only 33 percent of the studies in the review indicated following JARS (APA, 2008) or CONSORT (Moher et al., 2010) guidelines, and this highlights the need to improve the quality of research into self-compassion related therapies.

It is crucial for future research to investigate the mechanism of change in self-compassion related interventions, especially for specific CPHC patient populations. Also, this field of research would benefit from understanding the minimum effective dose (e.g., length of the intervention) and the potential effects of the deliverer (e.g., mindfulness practitioner vs. therapist; see Bruce, Manber, Shapiro, & Constantino, [2010] for further discussion). Moreover, future studies need longer follow-ups to be able to understand effectiveness in the longer term. Further consideration of the measurement of self-compassion is also warranted. Currently, self-compassion is treated as a discrete latent variable measured using the Neff self-report questionnaire (Neff, 2003b), calling validity and reliability into question. However, self-compassion overlaps with related concepts such as mindfulness and psychological flexibility, as evidenced by the multifaceted treatments included in this review. Further theoretical and conceptual work to psychometrically evaluate available measures is required to better understand and define concepts related to the burgeoning area of positive psychology.

The results of this systematic review demonstrate that self-compassion related therapies seem promising, for both psychological and physiological wellbeing, for CPHC patients. Some implications for clinical practice are summarized below.

Included studies reflected high acceptability (e.g., low dropout rates) of self-compassion related therapies among CPHC patients with participants in these studies reporting that they continue to practice what they have learned. Previous research shows that if an intervention is highly acceptable, patients are more likely to adhere to the treatment (Sekhon, Cartwright & Francis, 2017). Indeed, greater adherence to treatment will likely improve the efficacy of treatment outcomes although dose response relationships warrant further examination (Borrelli et al., 2005; Proctor et al., 2008; Senkon, Cartwright & Francis, 2017).

NICE guidelines recommend the use of CBT as a first line of treatment method for the management of CPHC (NICE, 2009). As previously mentioned, highly self-critical individuals are less likely to benefit from CBT and relapses are quite common (Rector et al., 2000; Teasdale & Cox, 2001). When patients present with high levels of self-criticism, clinicians may consider self-compassion related therapies as an alternative first line of treatment to promote engagement from the client and then progress towards implementing more traditional CBT interventions. Indeed, research shows increases in self-compassion relate to decreases in self-criticism (Ehret, Joormann & Berking, 2014) and using self-compassion related therapies as a preparatory step for resolving these therapy blocks in highly self-critical patients to increase the efficacy of provided first line treatment (e.g., CBT) may be advantageous. Furthermore, self-compassion based intervention may be considered when CBT enters its relapse prevention phase as research suggests increases in self-compassion are associated with decreased chance of relapse (Karl, Williams, Cardy, Kuyken & Crane, 2018; Krieger, Berger & Holtforth, 2016).

Included studies demonstrated that the application of self-compassion-related therapies varies considerably from simple online writing tasks to group-based weekly sessions. Therefore, while choosing the best methodology, it is recommended that clinicians consider patient preferences and possibly the length of the therapy. A primary finding of this study is

that the length of the compassion-focused training may affect the change in individuals self-compassion levels. However, this finding is tentative and will need confirmation.

Included studies demonstrate self-compassion related interventions may be applicable to wide range of CPHCs and their illness-specific outcomes (e.g., treating sleep problems in patients with cancer or device-specific anxiety for implantable cardioverter defibrillator patients). Therefore, even though these interventions may be broadly applicable to different conditions, it may also be important to customize these therapies to the specific needs of a CPHC; e.g., specifically targeting weight loss through using self-compassion-related therapies in diabetes patients.

### **Conclusion**

Self-compassion-based approaches appear promising for patients with a CPHC as demonstrated in improved self-compassion outcomes. In turn, these may specifically lead to improved psychological outcomes given the consistent findings that self-compassion and psychological, as well as physiological, outcomes are significantly correlated. However, this latter conclusion is a tentative one, as even though some studies report clinically significant improvements in the well-being of patients, the mechanism driving this is unclear.

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**Table 1***PICOS Table for Inclusion and Exclusion Criteria*

	Inclusion criteria	Exclusion criteria
Population	People with a CPHC; adults (18 years old and above); any gender; any geographical location	Healthy adults; individuals who are aged below 18 with or without a CPHC
Interventions	Compassion-related therapies (e.g., compassionate mind training, self-compassion-based therapy, and others) for one or more session	Traditional and other forms of psychological therapies (e.g., cognitive behavioral therapy)
Comparator	Baseline with no-treatment, or usual care for psychological problems in CPHCs (e.g., cognitive behavioral therapy, etc.) or active control (e.g., involvement in a type of therapy)	Only kindness-related therapy without any comparator
Outcomes	Primary: compassion or self-compassion Secondary: mindfulness, depression, anxiety, psychological stress, or well-being, physical well-being of participants (e.g., blood sugar levels), self-criticism, self-esteem, quality of life	Studies where compassion or self-compassion is not measured
Study Design	Experimental studies; multi-arm pre-post study design, non-randomized/ randomized trial, cross-over controlled study design	Other types of study designs (e.g., Qualitative studies, cross-sectional studies)

Note. CPHC; Chronic Physical Health Condition.



**Table 2***Summary of Study Characteristics*

Study, Year (Reference)	Country	Sample Characteristics	Intervention	Study design	Outcome measures	Data analysis	Results of included studies	Limitations
Boyle, Stanton, Ganz, Crespi, & Bower (2017)	USA	71 Women Breast Cancer	MM; WL Control	A randomized controlled trial	CES-D; PSS; SCS; FFMQ; RRS	Mediation	Declines in <b>depressive symptoms</b> mediated by increased <b>self-kindness</b> ( $b[SE] = -4.45 [1.51]$ ), decreased <b>rumination</b> ( $b[SE] = -2.03 [1.14]$ ), and increased <b>mindfulness</b> ( $b [SE] = -3.17 [1.43]$ ). Intervention effect on <b>perceived stress</b> only mediated by self-compassion ( $b[SE] = -2.53[1.20]$ ).	- Correlation between the variables - Low power for analyses
Cheung et al., (2017)	USA	39 women Breast Cancer	LILAC; In-person attention matched control	A pilot randomized controlled trial	SCS-SF CES-D DES MQOL-C MS	Longitudinal growth modelling	Increased <b>positive-affect</b> use, <b>mindfulness</b> , and <b>self-compassion</b> by the 1-month follow up ( $p < .08$ ) with medium to large effect sizes ( $0.50 < d < 0.91$ ) for LILAC intervention groups, in contrast to the control group ( $p > .34$ ). Significant reductions in <b>depression</b> for intervention groups ( $p = .03$ ), in contrast to the control group ( $p > .83$ ). No intervention effects on <b>positive affect</b> ( $p > .20$ ) or <b>cancer-specific quality of life</b> ( $p > .22$ ).	- Non-generalizable findings
Friis, Johnson, Cutfield, & Consedine, (2016)	New Zealand	63 people 43 Women (68.25%) Diabetes	MSC; WL Control	A randomized controlled trial	SCS PHQ-9 DDS	Mixed ANOVAs	<b>Self-compassion</b> increased for the treatment group and maintained in the follow-up ( $F [2,60] = 0.06, p = 0.001$ ). Intervention decreased the <b>depression</b> scores ( $F [2,60] = 7.07, p < 0.05$ ), in contrast to control group. Significant decrease in <b>diabetes-stress</b> for patients, ( $F[2,60] = 12.24, p < 0.001$ ).	- Non-generalizable findings - Failure to randomize baseline groups
Gonzalez-Hernandez et al., (2018)	Spain	56 women Breast Cancer	CBCT;	A randomized clinical trial	SCS-SF CS FACT-B	A linear mixed modal	Intervention effective in decreasing <b>psychological stress</b> relating <b>the fear of cancer recurrence</b> ( $F[2,69.863] =$	- Non-generalizable findings for

			TAU Control		BSI-18 FCRI FFMQ - SF		3.521, $P < .05$ ) and increasing <b>self-kindness</b> ( $F[2,97.453] = 5.769, P < .01$ ), <b>common humanity</b> ( $F[2,98.323] = 6.161, P < .01$ ), and general <b>self-compassion</b> ( $F[2,69.277] = 5.234, P < .01$ ). Effective to decrease the <b>depression</b> ( <i>Cohen's d</i> = 0.44) and <b>general symptomatology</b> ( <i>Cohen's d</i> = 0.55) , with moderate effect sizes. <b>Quality of life</b> did not differ from the control group ( $p > 0.5$ )	other ethnicities - Possible influencing effect of participants previous experiences
Johannsen et al., (2018)	Denmark	129 women Breast Cancer	MBCT; WL Control	A randomized controlled trial	NRS FFMQ SCS-SF PCS	Mediation	Statistically significant group x time effect for <b>pain intensity</b> ( $p = .002$ ) and no significant change was found for <b>self-compassion</b> on the effect of MBCT on pain intensity.	- Unbalanced drop-out rates over the study - Non-generalizable study findings - Missing priori power analysis - Missing documentation for treatment fidelity
Kingston et al., (2015)	Ireland	16 people 10 Women (62.5%) Cancer	MBCT; TAU Control	A pilot randomized controlled trial	SCS HADS POMS BSI 18 WHO-5 KIMS	ANOVAs	Statistically significant improvements in <b>depression</b> ( $F[2,22] = 13.69, P < .001$ ) and <b>anxiety</b> ( $F[1,13] = 6.18, P < .05$ ). Also, the positive changes in <b>stress, quality of life, mindfulness, and compassion</b> were not significant.	- Possible floor effect in the measures
Nakamura et al., (2013)	USA	57 Cancer survivors 43 Women (75.44%) Cancer	MM; MBB; SHE Control	A pilot randomized controlled trial	MOS-SS PSS CES-D IES FFMQ SCS WBI PANAS	Mixed ANCOVA	Decreased <b>depression</b> with mean improvements of 8.58 ( $p=.001$ ) for MBB; 4.36 ( $p=.008$ ) for MM; 3.25 ( $p=.064$ ) for SHE, and MBB was more effective method (MBB vs. SHE, $p=.040$ ; MM vs. SHE, $p=.776$ ). MM and MBB was effective to increase <b>mindfulness</b> ( $p=.056$ ). <b>Self-compassion</b> is increased for MM and	- Exclusive reliance on self-report measurements and no clinical evaluation - Missing intervention

							MBB groups with mean improvements of 7.25 ( $p=.002$ ) for MBB and 4.38 ( $p=.046$ ) for MM, while there was no difference for SHE (.177, $p=.939$ ). MM and MBB were more effective than the control (SHE) to decrease self-reported <b>sleep disturbances</b> with mean improvements of 22.29 for MBB, 18.70 for MM, and 12.11 for SHE (all $p<0.001$ ).	fidelity assessment
Rimes & Wingrove, (2013)	UK	35 people 29 Women (82.86%) Chronic Fatigue Syndrome	MBCT; WL Control	A pilot randomized controlled trial; wait-list control	SCS HADS CFS WASAS PF-10 BAES FFMQ CBRSQ	ANCOVAs Paired t-tests	While <b>beliefs about emotions</b> ( $t[15] = 3.4, p = 0.004$ ), <b>catastrophic thinking</b> ( $t[15] = 2.9, p = 0.012$ ), and <b>all-or-nothing behavior</b> ( $t[15] = 2.7, p = 0.017$ ) were lower than the pre-intervention scores at 6-month follow up, <b>self-compassion</b> ( $t[15] = -3.5, p = 0.003$ ) and <b>mindfulness</b> ( $t[15] = -3.2, p = 0.006$ ) showed significant improvements. 6-month follow up scores were significantly lower than the pre-intervention scores for <b>fatigue</b> , ( $t[14] = 3.0, p = 0.010$ ), and <b>impairment</b> ( $t[15] = 3.4, p = 0.004$ ).	- Non-generalizable findings outside of CFS
Schellekens et al., (2017)	Netherlands	63 people 33 Women (52.38%) Cancer	MBSR; TAU Control	A randomized controlled trial; wait-list control	HADS IMS-S FFMQ SCS RRS-Br IES	Linear mixed modelling	Decreased <b>psychological distress</b> ( $p = .008, d = .69$ ), <b>depression</b> (mean difference of -2.55, $p = .027, d = .69$ ), and <b>anxiety</b> (mean difference of 2.78, $p = .007, d = .62$ ) for the intervention group. Also, significant improvements in <b>quality of life</b> ( $p = .047, d = .60$ ), <b>mindfulness skills</b> ( $p = .001, d = .84$ ), <b>self-compassion</b> ( $p = .009, d = .80$ ), and <b>rumination</b> ( $p = .018, d = .67$ ).	- High dropout rates because of illness progress
Shadick et al., (2013)	USA	79 people 71 Women	IFS; RA Education Control	A randomized controlled trial	DAS28-CRP4 RADAI VAS	Mixed modal repeated measures	Sustained improvements for <b>self-compassion</b> [1.8 (2.8), $p = 0.01$ ], and <b>depressive symptoms</b> [-3.2 (5.0), $p = 0.01$ ] while the change in <b>anxiety, self-</b>	- Differences between the treatment and control group

		(89.87%) Rheumatoid Arthritis (RA)			BDI STAI SF-12 MHAQ SCS		<b>efficacy</b> , and <b>disease activity</b> were not sustained. Treatment group showed significant improvements in overall <b>pain</b> [mean treatment effects -14.9 (29.1 SD), $p = 0.04$ ], and <b>physical function</b> [14.6 (25.3), $p = 0.04$ ]. One year later follow up showed that self-reported <b>joint pain</b> related improvements remained, [-0.6 (1.1), $p = 0.04$ ].	at baseline may affect the results
Sherman et al., (2018)	Australia	304 women Breast Cancer	PW; Expressive writing control	A randomized controlled trial; an active control	SCS-SF BIS DASS-21 ASI-R	Linear mixed models	Significant group x time interaction for <b>self-compassion</b> ( $F = 6.17, p < .001$ ) and <b>body appreciation</b> ( $F = 4.39, p = .004$ ).	- Exclusion of people without internet connection
Simpson et al., (2017)	UK	50 people 45 Women (90%) Multiple Sclerosis	MBSR; WL Control	A feasibility randomized controlled trial; wait- list control	PSS EQ-5D-5 L MFIS MHI MSSS PDQ PES IVIS BCS BWCS SSS MAAS SCS	Two sample t-tests ANCOVA	Improvements with large effect sizes for <b>perceived stress</b> ( $ES 0.93, P < 0.01$ ), <b>depression</b> ( $ES 1.35, P < 0.05$ ), <b>positive affect</b> ( $ES 0.87, P = 0.13$ ), <b>anxiety</b> ( $ES 0.85, P = 0.05$ ), and <b>self-compassion</b> ( $ES 0.80, P < 0.01$ ), and small effect size for <b>quality of life</b> ( $ES 0.17, P = 0.48$ ) in the MBSR (intervention) group. Also, large effect sizes sustained for mindfulness, self-compassion, anxiety, and prospect memory, while it became smaller for perceived stress and diminished in quality of life at 3-month follow up	- Imbalanced female/male ratio
Toise et al., (2014)	USA	46 people 10 Women (12.7%) Implantable Cardioverter Defibrillator	Yoga; TAU Control	A randomized controlled trial	ICD FSAS FPAS CES-D PHE STPI IPS SCS SEC	t-tests	Increased <b>self-compassion</b> ( $p = 0.0074$ ), <b>mindfulness</b> ( $p = 0.0422$ ) and decreased <b>anxiety</b> ( $p < 0.0001$ ) in the intervention group. Intervention group had 32% lower chances to experience <b>device related firings</b> than the control group.	- Limited time and resources for the recruitment - Direct contact with the clinical stuff for the control group

					EMT			
Wren, (2016)	USA	60 women Breast Cancer	LKM; TAU Control & Listening to Music Control	A pilot randomized controlled trial; wait- list and active control	STAI BPI FACIT FS PROMIS SCS-SF ERQ FFMQ	Multilevel modal analysis ANCOVAs	LKM significantly reduced <b>emotional distress</b> , specifically in <b>state anxiety</b> [ $F(2, 144) = 2.11, p = 0.13$ ] during the peri-surgical period, compared to the wait list control. Both LKM and music group decreased the state anxiety; however, this decrease was quicker in the LKM group. Self-compassion is increased for LKM over time ( $B = 0.16, SE = 0.05, t = 3.59, p = 0.001, 95\% CI = 0.07, 0.25$ ). LKM improved the experienced body pain [ $F(2, 83) = 3.56, p = 0.03$ ], in comparison to the wait list control.	- Non-generalizable findings - Missing blinding between hospital staff and participants
Ziemer et al., (2015)	USA	93 people 80 Women (86%) Chronic Pain	PW; Self-efficacy writing control	A randomized controlled trial; active control	IIRS CPAQ-8 SCS CES-D SWLS PANAS PCS CPSS	Two-way mixed ANCOVAs; Moderate multiple regression analyses	Both interventions led to similar outcomes. <b>Self-efficacy</b> and <b>self-compassion</b> increased in both treatment groups. Increased acceptance of <b>pain</b> and confidence in managing pain for both groups [ $F(1,91) = 7.01, p < 0.01, n^2 p = 0.07$ ]. Both groups reported decrease in reported pain and increased <b>quality of life</b> [ $F(1,91) = 4.04, p < 0.05, n^2 p = 0.04$ ].	- Non-generalizable findings

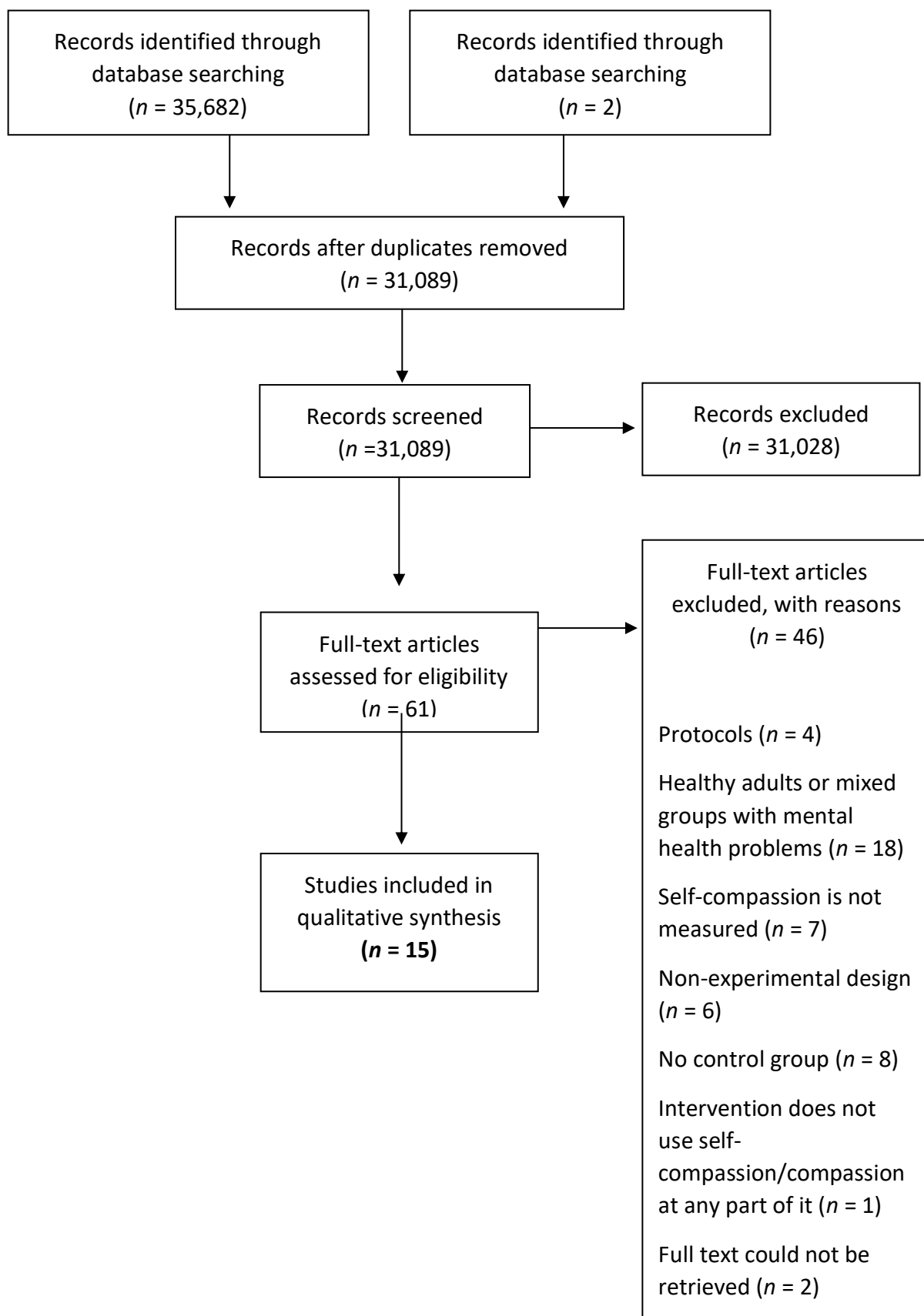
Note. ASI-R. Appearance Schemas Inventory-Revised; BAES. Beliefs About Emotions Scale; BCS. Bladder Control Scale; BDI. Beck Depression Inventory; BIS. Body Image Scale; BPI. Brief Pain Inventory; BC. Brief Coping; BRS. Brief Resilience Scale; BSI-18. Brief Symptom Inventory; BSI-18. Brief Symptoms Inventory 18; BWCS. Bowel Control Scale; CBRSQ. Cognitive and Behavioral Responses to Symptoms Questionnaire; CES-D. Centre for Epidemiological Studies -Depression; CFS. Chalder Fatigue Scale; CIS-F. Checklist Individual Strength - Fatigue; CPAQ-8. Chronic Pain Acceptance Questionnaire; CS. Compassion Scale; DAS28-CRP4. Disease Activity Score - 28-C-reactive Protein 4; DDS. Diabetes Distress Scale; DES. Differential Emotions Scale; EMT. Expression Manipulation Test; EQ-5D-5 L. Quality of Life; ERQ. Emotion Regulation Questionnaire; FACIT. Fatigue Scale; FACT. Functional Assessment of Cancer Therapy; FACT-B. Functional Assessment of Cancer Therapy - Breast Cancer; FCRI. Fear of Cancer Recurrence Inventory; FFMQ. Five Facet Mindfulness Questionnaire; FPAS. Florida Patient Acceptance Survey; FSAS. Florida Shock Anxiety Scale; HADS. Hospital Anxiety and Depression Scale; ICD specific measures; IES. Impact of Event Scale (IES); IIRS. Illness Intrusiveness Rating Scale; IPS. Interpersonal Support Evaluation; IVIS. Impact of Visual Impairment Scale; KIMS. Kentucky Inventory of Mindfulness Skills; LLT. Location Learning Test; MAAS. Mindful Attention Awareness Scale; MFIS. Modified Fatigue Impact Scale; MHAQ. Multidimensional Health Assessment Questionnaire; MHI. Mental Health Inventory-18; MMQ. Multifactorial Meta Memory Questionnaire; MOS-SS. Medical Outcomes Study Sleep Scale; MQOL-C. Multidimensional Quality of Life Scale -Cancer; MS. Mindfulness Scale; MSQ-54. Multiple Sclerosis Quality of Life - 54; MSSS. Modified Social Support Survey; NRS. Pain Numbered Rating Scale; PANAS. Positive and Negative Affect Schedule; PASAT. Paced Auditory Serial Addition Test; PCS. Pain Catastrophizing Scale; PCS. Pain Catastrophizing Scale; PDQ. Perceived Deficits Questionnaire; PES. Pain Effects Scale; PF-10. Physical Functioning; PHE. Positive Health Expectation Scale; PHQ-9. Patient Health Questionnaire - 9; POMS. Profile of Mood States; PROMIS. Patient-Reported Outcomes Measurement Information System; PSS. Perceived Stress Scale; PTGI. Posttraumatic Growth Inventory; RADAI. Rheumatoid Arthritis Disease Activity Index; RAVLT. Rey Auditory Verbal Learning Test; RRS. Rumination and Reflection Scale; SCS. Self-compassion Scale; SEC. Symptom/Emotion Checklist; SF-12. Short Form - 12; SSS. Sexual Satisfaction Scale; SSTAI. Spielberger State-Trait Anxiety Inventory; STAI. State Trait Anxiety Inventory; STPL. State-Trait Personality Inventory; SWLS. Satisfaction with Life Scale; CPSS. Chronic Pain Self-Efficacy Scale; VAS. 100-mm Visual Analogue Scale; WBI. WHO Well-being Index; WSAS. Work and Social Adjustment Scale.; MBSR. Mindfulness Based Stress Reduction; MSC. Mindful Self-Compassion Course; MM. Mindful Meditation; MBB. Mind-Body Bridging; LILAC. Linking Affect and Coping; CBCT. Cognitively Based Compassion Therapy; MBCT. Mindfulness Based Compassion Training; IFS. Internal Family Systems; LKM. Loving Kindness Meditation; PW. Positive Writing; SHE. Sleep Hygiene Education Program; WL. Wait list; TAU. Treatment as Usual.

**Table 3***Effect Sizes for Outcomes of the Included Studies*

		Effect sizes				
	<i>Studies w. a WL/TAU control</i>	Self-compassion	Mindfulness	Depression	Anxiety	Stress
<b>MBSR</b>	Schellekens et al. (2017)	0.67*	0.47			
	Simpson et al. (2017)	0.80*	-0.18*			
<b>MM</b>	Boyle et al. (2017)	0.42 <sup>?</sup>	0.42 <sup>?</sup>	-0.31 <sup>?</sup>		-0.61 <sup>?</sup>
<b>Yoga</b>	Toise et al. (2014)	0.96*				
<b>MSC</b>	Friis et al. (2016)	0.58*		-0.45*		
<b>CBCT</b>	Gonzalez-Hernandez et al. (2018)	0.52*		-0.29*	-0.15	-0.63*
<b>MBCT</b>	Johannsen et al. (2018)	0.29 <sup>?</sup>				
	Kingston et al. (2015)	0.87*	0.81	-0.34	-0.56	0.41
	Rimes & Wingrove (2013)	0.41*	0.47	-0.29*	0.73	
<b>LKM<sub>1</sub></b>	Wren (2016)	-0.07*			0.02*	
<i>Studies w. an active control</i>						
<b>LILAC</b>	Cheung et al. (2017)	0.46*	1.20*	-0.90*		
<b>MM</b>	Nakamura et al. (2013)	0.26*	0.20	0.10*		-0.15
<b>MBB</b>	Nakamura et al. (2013)	0.34*	0.55*	-0.26*		-0.23
<b>LKM<sub>2</sub></b>	Wren (2016)	-0.19*			0.02*	
<b>IFS</b>	Shadick et al. (2013)	0.37*		-0.64	-0.35	
<b>PW</b>	Sherman et al. (2018)	0.18*		-0.06	-0.19	
	Ziemer et al. (2015)	-0.09		0.14 <sup>?</sup>		

Note. MBSR. Mindfulness Based Stress Reduction; MSC. Mindful Self-Compassion Course; MM. Mindful Meditation; MBB. Mind-Body Bridging; LILAC. Linking Affect and Coping; CBCT. Cognitively Based Compassion Therapy; MBCT.

Mindfulness Based Compassion Training; IFS. Internal Family Systems; LKM. Loving Kindness Meditation; PW. Positive Writing. \*p < .05, ? = Unknown

**Figure 1***PRISMA Flow Chart*

**Figure 2**

*Risk of bias graph of between study bias*

