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REVIEW

Effectiveness of Compassion-Based Interventions for Reducing Stress in Workers: A Systematic Review

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Abstract

Objectives With the increasing interest in compassion-based interventions for reducing stress, this systematic review aimed to assess their effectiveness in the workers.

Method A comprehensive search across four databases (PsycARTICLES, PubMed, Web of Science, and Scopus) on May 22, 2023, yielded 5,521 articles initially identified.

Results After screening and applying inclusion criteria, 19 studies published between 2017 and 2023 were reviewed. The population included healthcare professionals (74%), educators (16%), and other worker groups (10%). The interventions studied included Compassionate Mind Training, Compassion Focused Therapy, Mindful Self-Compassion, Compassion Cultivation Training, Cognitively Based Compassion Training, and other adapted interventions. The studies reported significant reductions in stress and burnout, with most interventions delivered weekly over multiple sessions. Pre- and post-intervention assessments were standard, and 60% of the studies included follow-ups. Both in-person and web-based interventions demonstrated effectiveness in stress reduction, particularly for healthcare workers.

Conclusions This review highlights the promise of compassion-based interventions in reducing workplace stress and the need for continued research, particularly through randomized controlled trials and research with diverse populations, to better understand and validate their long-term impact.

Preregistration This study was preregistered in PROSPERO under the registration number CRD42023400710. The registered title is identical to the title of this manuscript.

Keywords Compassion-based interventions · Stress · Burnout · Workers

Stress can be a natural human response that motivates action or, negatively, hinders adapting coping strategies. It is frequently followed by predictable biochemical, physiological, and behavioural changes (Wynne et al., 2019). Individuals are exposed to different sources of stress (e.g., work, home, interpersonal, and personal relationships) and, as a result, might experience symptoms like irritability, agitation, interpersonal difficulties, unhappiness, and burnout (e.g., Devi et al., 2019). Over time, high levels of stress are found to be associated with psychopathology, especially when they lead to suffering and dysfunction (e.g., Dollard & Bailey, 2021; Lee et al., 2020), frequent medical visits, or even drug addiction (e.g., Devi et al., 2019). This underscores the critical need for strategies to manage stress effectively. Given the impact of stress on individuals' health, interventions to promote mental health and well-being, and reduce the burden of stress are needed both at the individual and organisational levels. In fact, the promotion of mental well-being is assumed to be a public health priority and one of the 2030 objectives of sustainable development (UNICEF, 2024).

Given the adverse effects of stress on mental health and productivity, compassion-based interventions have been gathering the attention of researchers and clinicians, positively impacting emotional regulation essential for stress management and promoting well-being. Literature presents

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different definitions of compassion, regarding it as an emotion (e.g., Goetz et al., 2010), a multidimensional construct (e.g., Strauss et al., 2016), or a motivational system (e.g., Gilbert, 2014). According to Gilbert (2017), compassion exists in a flow (i.e., it can be directed at oneself, to others, and received from others). As defined by Gilbert (2014) compassion is "the sensitivity to suffering in self and others, with a commitment to try to alleviate and prevent it" (p. 19). The conceptualizations of compassion characterise a compassionate attitude that integrates cognitive (awareness of suffering), affective (understanding and empathy), and intentional (desire to find relief from suffering and readiness to help alleviate suffering) components (e.g., Gilbert, 2010). Over the last 20 years, research has underlined the benefits of compassion in cross-sectional, correlational, interventional, and longitudinal studies (e.g., Kirby, 2017). Results from experimental studies show that compassion seems to regulate negative affect through caring behaviours and expressing feelings of warmth and safeness and can act as an emotional regulation process that protects from psychopathology (e.g., Ferrari et al., 2019; Gilbert, 2010; Kirby et al., 2017; Petrocchi et al., 2023), providing numerous benefits for mental health in clinical and non-clinical settings (e.g., Kirby et al., 2017; Maratos et al., 2019, 2024; Matos et al., 2022a, b; 2024; Wilson et al., 2019). Though studies have outlined compassion as a skill that can be learned using different strategies that activate the parasympathetic nervous system and consequently reduce stress (e.g., Krygier et al., 2013; Seppala et al., 2017), it also increases the capacity to handle difficult challenges and situations that are perceived as unsafe (e.g., Andersson et al., 2022).

Considering the significant positive associations and benefits related to compassion, several interventions have been developed to cultivate it (e.g., Kirby, 2017; Matos et al., 2022a, b). However, it is important to acknowledge that these interventions differ in their theoretical foundations. Compassion-Focused Therapy (CFT) and Compassionate Mind Training (CMT) are distinguished by their basis in biopsychosocial models and evolutionary psychology theory, which allow for empirical hypothesis testing and a theoretically grounded interpretation of findings. This is not the case for all compassion-based interventions (e.g., Gilbert, 2010). Overall, evidence suggests that these interventions can be effective in relieving suffering across several mental-health problems, including depression, anxiety, eating-related problems, posttraumatic stress, and personality disorders (e.g., Bates et al., 2021; Ferrari et al., 2019; Lloyd et al., 2019; Luo et al., 2021; Palmeira et al., 2017; Petrocchi et al., 2023; Salgó et al., 2021; Shapira & Mongrain, 2010; Wilson et al., 2019).

A systematic review found that compassion-based interventions are promising for fostering body acceptance and improving psychological well-being in individuals struggling with body weight shame (e.g., Carter et al., 2023). Similarly, a meta-analysis showed that compassion-based interventions led to moderate improvements in mental health, particularly in reducing anxiety, depression, and stress, with applications expanding to different populations (e.g., Kirby et al., 2017). Other systematic reviews have focused on specific compassion-based interventions, such as CFT in clinical samples. For example, CFT was found to be generally effective in reducing symptoms of depression, anxiety, and trauma-related issues (e.g., Craig et al., 2020), as well as in addressing self-criticism (Leaviss & Uttley, 2015) and stress, particularly in clinical populations with high levels of self-criticism and shame (e.g., Millard et al., 2023). Recent meta-analyses further support the effectiveness of CFT, demonstrating medium to large effects across various mental health outcomes (Kirby et al., 2017; Petrocchi et al., 2023).

However, as far as we know, there is no systematic review of the effectiveness of compassion-based interventions for stress reduction in workers. Given the growing number of studies using compassion-based interventions for stress reduction and the evidence gathered across various outcomes, this systematic summarised the effectiveness of these interventions in reducing stress in workers. Specifically, the review aimed to: (1) identify the various types of compassion-based interventions employed to mitigate stress in workers; (2) examine the characteristics of the target populations; (3) assess the primary research methodologies used in the studies; (4) evaluate the design elements of the interventions, including the number of sessions, frequency, duration, measurement instruments, sample size, presence of control groups, and use of repeated measures; and (5) critically analyse the overall effectiveness of these interventions in achieving stress reduction.

Method

Protocol

A systematic review was conducted adhering to the PRISMA guidelines outlined by Moher et al. (2009). The protocol was pre-registered on PROSPERO, an international prospective register of systematic reviews, in May 2023 (CRD42023400710).

Search Strategy

Searches were conducted across four electronic databases (PsycARTICLES, PubMed, Web of Science, and Scopus). All searches took place on May 22, 2023, using the following search terms and Boolean operators applied to titles and/or abstracts: 'compassion OR self-compassion OR

compassionate OR self-compassionate' AND 'stress' AND 'intervention OR training OR programme OR treatment.' The search strategy was tailored to meet the specific requirements of each database, including adjustments in search syntax and the use of Boolean operators to refine the search results and retrieve the most relevant articles.

Inclusion and Exclusion Criteria

All data were uploaded to the Rayyan platform (Ouzzani et al., 2016) for selection. After removing duplicates, the first and second authors independently conducted a blinded screening of all titles and abstracts, applying the following inclusion criteria: (i) journal articles; (ii) human studies; (iii) workers; (iv) published in English or Portuguese (as these were the languages spoken by the research team, ensuring accurate screening and data extraction); (v) primary interventions focused on compassion for reducing stress; (vi) studies including comparative pre- and post-intervention measures; and (vii) studies published between inception and May 22, 2023.

Exclusion criteria included theses, unpublished and qualitative studies, and grey literature not published in peer-reviewed sources (e.g., book chapters, literature reviews, conference abstracts), protocol studies, and studies published after May 2023.

When titles and abstracts did not provide sufficient information for a definitive decision, the articles were advanced to full-text review. Disagreements between the first and second reviewers during the full-text assessment phase were resolved through discussion or arbitration with a third reviewer. Data extraction was performed by the first author and independently verified by the second to ensure accuracy. The agreement rate between the first and second authors during the screening of titles and abstracts was 94%. All disagreements were subsequently resolved through discussion or arbitration, ensuring 100% agreement in the final selection. The PICOS framework (Methley et al., 2014) guided the development of inclusion and exclusion criteria, as detailed in Fig. 1.

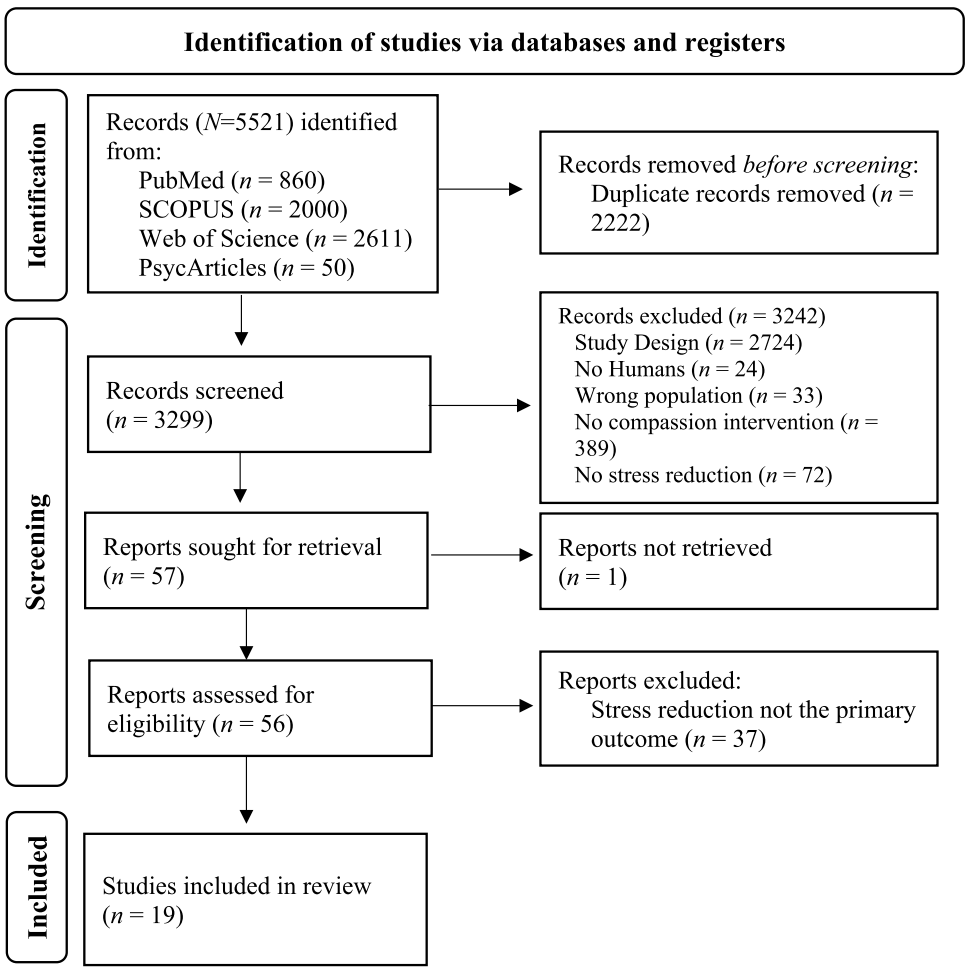

Fig. 1 PRISMA flow diagram off identification and selection of included studies

Data Extraction and Analysis

The data extracted from the studies that met the inclusion criteria were organized into six key categories: (i) general information, including the year of publication, author, title, and study location; (ii) the type of compassion-based intervention (e.g., Compassionate Mind Training, Mindful-Self Compassion Training); (iii) population characteristics; (iv) study design details, such as the type of study; (v) intervention design specifics, including research design, number of sessions, frequency, duration, home practice, number of participants, type of comparator or control group, sample size, and outcome measures; and (vi) the primary impacts of the intervention.

Quality Appraisal

The first and second authors independently applied the Joanna Briggs Institute (JBI) critical appraisal tool to evaluate the quality and risk of bias in both randomized controlled trials (RCTs; Barker et al., 2023) and quasi-experimental studies (Tufanaru et al., 2020). The tool assessed nine domains for quasi-experimental studies and thirteen domains for RCTs, with responses categorized as "yes," "no," "unclear," or "not applicable" (see details in Online Resource 1). Any discrepancies between the reviewers were resolved through discussion. Interrater reliability for the independent full-text screening yielded a Kappa value of 0.96, indicating excellent agreement ($p < 0.001$).

Results

General Information

A total of 5,521 titles were initially identified through database searches. After removing duplicates ($n = 2{,}222$, see Fig. 1), 3,242 articles were excluded based on title and abstract screening for not meeting the inclusion criteria. Of the 57 studies that initially met the inclusion criteria, 1 was unavailable and thus excluded. The remaining 56 articles underwent full-text screening, resulting in the exclusion of 37 studies because stress reduction was not the primary outcome.

The 19 articles which met the inclusion criteria were published between 2017 and 2023, and most ($n = 14$) were published in the last 3 years. Although all the articles were written in English, 47% ($n = 9$) were published in Europe (Andersson et al., 2022; Corrigan et al., 2022; Eriksson et al., 2018; Johansson et al., 2022; Maratos et al., 2019; Marconi et al., 2019; Matos et al., 2022a, 2022b; Matos et al., 2022a, 2022b; Santos et al., 2023), 37% ($n = 7$) in America (Ash et al., 2021; Bluth et al., 2021; Crandall et al., 2022; Kratzke et al., 2023; Mascaro et al., 2021; Neff et al., 2020; Scarlet et al., 2017), 11% ($n = 2$) in Asia (Li et al., 2021; Shin et al., 2023) and 5% ($n = 1$) in Oceania (Watts et al., 2021).

Type of Compassion-Based Interventions

The nineteen articles presented various compassion-based interventions, among which the following stand out: *Compassionate Mind Training* (CMT; Maratos et al., 2019); *Compassion Focused Therapy* (CFT; Corrigan et al., 2022), *Mindful Self-Compassion Training* (MSC; Bluth et al., 2021; Crandall et al., 202; Eriksson et al., 2018), *Compassion Cultivation Training* (CCT; Scarlet et al., 2017), and *Cognitively-Based Compassion Training* (CBCT; Ash et al., 2021).

Some of these interventions were adapted, resulting in interventions with different names, such as *Compassionate Mind Training for Caregivers* (CMT-Care Homes; Santos et al., 2023); *Compassionate Mind Training for Teachers* (CMT-T; Matos et al., 2022a, 2022b; Matos et al., 2022a, 2022b); *Self-Compassion for Healthcare Communities* (SCHC; Bluth et al., 2021; Neff et al., 2020; Shin et al., 2023); *Compassion-Centered Spiritual Health Team Intervention* (CCSH-TI; Mascaro et al., 2021); *Internet-Based Compassion Course* (ICOP) and *Internet Cognitive–Behavioral Stress Management Course* (ICB; Johansson et al., 2022); *Compassion-Oriented Mindfulness-Based Program* (COMP; Marconi et al., 2019); *Mindfulness-Based Compassion Training* (MBCT4HP; Watts et al., 2021); *Online Self-Compassion Meditation* (Li et al., 2021) and *Resilience Training for the Healthcare Community* (RTHC; Kratzke et al., 2023).

In one study, a program was developed using models and exercises from CFT and MSC (Andersson et al., 2022).

Population Characteristics

The total population across the 19 studies amounted to 958 participants, with studies including a minimum of 15 participants (Ash et al., 2021; Shin et al., 2023) and a maximum of 127 (Santos et al., 2023), with an average of 48 participants.

The populations in the various studies consist of non-clinical groups, predominantly health professionals (74%; $n = 14$), followed by those in the education sector (16%; $n = 3$) and other workers with unspecified work areas (10%; $n = 2$).

Among health professionals, the groups highlighted are Health Care Professionals (Johansson et al., 2022; Marconi et al., 2019; Watts et al., 2021), Nurses (Bluth et al., 2021; Corrigan et al., 2022; Crandall et al., 2022), Psychologists (Eriksson et al., 2018), Surgery Residents (Kratzke et al., 2023), and Oncology Clinical Research Coordinators (Mascaro et al., 2021). Additionally, Healthcare Communities

(Neff et al., 2020; Shin et al., 2023), Healthcare Workers (Scarlet et al., 2017), Professional Caregivers (Santos et al., 2023), and Hospital Chaplain Residents (Ash et al., 2021) are also included.

Two studies included workers from unspecified fields (Andersson et al., 2022; Li et al., 2021), two studies included teachers (Matos et al., 2022a, 2022b; Matos et al., 2022a, 2022b), and one study included both teachers and support staff (Maratos et al., 2019).

Eleven studies reported the age range of participants, with the youngest being 18 years old (Ash et al., 2021; Bluth et al., 2021) and the oldest being 80 (Scarlet et al., 2017).

Six studies, although not specifying the age range of participants, provided their average age (Crandall et al., 2022; Li et al., 2021; Marconi et al., 2019; Mascaro et al., 2021; Shin et al., 2023; Watts et al., 2021), ranging from 30.6 (Shin et al., 2023) to 51.35 (Matos et al., 2022a, 2022b).

Three studies did not report participants' ages or their average age (Corrigan et al., 2022; Maratos et al., 2019; Mascaro et al., 2021).

Study Design

Regarding study designs, five were RCTs (Andersson et al., 2022; Eriksson et al., 2018; Johansson et al., 2022; Matos et al., 2022a, 2022b; Santos et al., 2023), and 14 quasi-experimental studies (Ash et al., 2021; Bluth et al., 2021; Corrigan et al., 2022; Crandall et al., 2022; Kratzke et al., 2023; Li et al., 2021; Maratos et al., 2019; Marconi et al., 2019; Mascaro et al., 2021; Matos et al., 2022a, 2022b; Neff et al., 2020; Scarlet et al., 2017; Shin et al., 2023; Watts et al., 2021).

Five of the studies employed both qualitative and quantitative methodologies (Crandall et al., 2022; Johansson et al., 2022; Kratzke et al., 2023; Maratos et al., 2019; Mascaro et al., 2021) and fourteen were purely quantitative studies (Andersson et al., 2022; Ash et al., 2021; Bluth et al., 2021; Corrigan et al., 2022; Eriksson et al., 2018; Li et al., 2021; Marconi et al., 2019; Matos et al., 2022a, 2022b; Matos et al., 2022a, 2022b; Neff et al., 2020; Santos et al., 2023; Scarlet et al., 2017; Shin et al., 2023; Watts et al., 2021).

Intervention Design

Two of the analysed articles (Bluth et al., 2021; Neff et al., 2020) each present two studies with different intervention methodologies, so in some of the following sections, where applicable, the same author may be listed more than once.

Regarding the study design (see Table 1), only seven studies (35%) included a control group (Andersson et al., 2022; Ash et al., 2021; Eriksson et al., 2018; Mascaro et al., 2021; Matos et al., 2022a, 2022b; Neff et al., 2020; Santos et al., 2023), while no comparison group was present in the remaining 13 studies (65%; Bluth et al., 2021; Corrigan et al., 2022; Crandall et al., 2022; Johansson et al., 2022; Kratzke et al., 2023; Li et al., 2021; Maratos et al., 2019; Marconi et al., 2019; Matos et al., 2022a, 2022b; Neff et al., 2020; Scarlet et al., 2017; Shin et al., 2023; Watts et al., 2021).

The number of sessions ranged from 4 (Ash et al., 2021; Corrigan et al., 2022; Mascaro et al., 2021) to 20 (Li et al., 2021), with the majority (95%; $n = 18$) delivered weekly. While one study implemented daily sessions over 4 weeks (Li et al., 2021), others followed a bi-weekly schedule (Maratos et al., 2019).

Session duration ranged from a minimum of 30 min (Corrigan et al., 2022) to a maximum of 3.5 hr (Eriksson et al., 2018). One study did not specify session length, only the number of sessions and their frequency (Li et al., 2021).

Regarding home practices, 48% of the studies ($n = 9$) recommended daily practices (Anderson et al., 2022; Eriksson et al., 2018; Marconi et al., 2019; Matos et al., 2022a, 2022b; Matos et al., 2022a, 2022b; Santos et al., 2023; Scarlet et al., 2017; Shin et al., 2023; Watts et al., 2021), with durations ranging from 15–25 min (e.g., Eriksson et al., 2018) to 45–60 min (Watts et al., 2021). Five studies (26%) did not specify exact durations for home practices, using terms such as "regularly" (Ash et al., 2021); "between sessions" (Corrigan et al., 2022); "when necessary" (Neff et al., 2020); "weekly" (Johansson et al., 2022), and "diary questions" (Li et al., 2021). Notably, in Maratos et al. (2019), home practice was not explicitly stated as a recommendation. However, the abstract mentions that participants who engaged in CMT exercises showed marked increases in self-compassion, suggesting that home practice may have been an implicit part of the intervention design. Furthermore, one study (5%) mentioned an optional 4-hr retreat (Crandall et al., 2022).

All studies included pre- and post-intervention assessments but only 12 studies (60%) included a follow-up assessment, ranging from 1 month (Li et al., 2021; Scarlet et al., 2017; Shin et al., 2023) to six months post-intervention (Bluth et al., 2021; Johansson et al., 2022; Santos et al., 2023).

Eleven studies used the *Depression Anxiety Stress Scales* (DASS; Ash et al., 2021; Crandall et al., 2022; Johansson et al., 2022; Maratos et al., 2019; Mascaro et al., 2021; Matos et al., 2022a, 2022b; Matos et al., 2022a, 2022b; Neff et al., 2020; Santos et al., 2023; Shin et al., 2023; Watts et al., 2021) to measure stress, while five studies employed the *Perceived Stress Scale* (PSS; Andersson et al., 2022; Bluth et al., 2021; Eriksson et al., 2018; Kratzke et al., 2023; Li et al., 2021).

For assessing burnout, nine studies used the *Maslach Burnout Inventory* (MBI; Bluth et al., 2021; Crandall et al., 2022; Kratzke et al., 2023; Li et al., 2021; Maratos et al., 2019; Marconi et al., 2019; Neff et al., 2020; Shin et al.,

Table 1 Intervention design

Authors	Instruments	Research design	Number sessions/weekly	Duration	Home practice	Follow-up	Follow-up time
Andersson et al. (2022)	SCS; PSS14; Hospital Anxiety and Depression Scale (HADS); Satisfaction with life scale (SWLS); EEG	a)	6	2 hr/session	Daily	yes	3 months post
Ash et al. (2021)	DASS ProQol	a)	4	1 hr/session	Regularly	yes	4 months post
Bluth et al. (2021)	Depression Scale—Short Form (PROMIS-D-SF); The Self-Compassion Scale -Youth (SCS-Y); Job Satisfaction Scale (JSS); Approach to Dementia Questionnaire (ADQ); PSS; MBI	b)	8 6	2.5 hr/session 1 hr/session	Not specified	yes	3 months post 6 months post
Corrigan et al. (2022)	ProQol; SCS-SF; Emotional Climate of Organizations Scale (ECOS)	b)	4	30 min	Between sessions	no	NA
Crandall et al. (2022)	SCS; ProQOL; Freiburg Mindfulness Inventory (FMI); Connor-Davidson Resilience Scale (CDRISC25); MBI; Degree of Satisfaction and Stress (DSS)	b)	8	3 hr/session	4-hr retreat (optional)	yes	3 months post
Eriksson et al. (2018)	PSS; SCS; SMBQ; Five Facets Mindfulness Questionnaire (FFMQ)	a)	6	3.5 hr weekly	15 min daily per 6 days a week	no	NA
Johansson et al. (2022)	SCS; Treatment credibility Scale (TCS); Stress of Conscience Questionnaire (SCQ); Copenhagen Psychosocial Questionnaire (COPSOQ); ProQOL; Qualitative Analysis of Phone Interview (QAPI)	b)	6	1 hr/session	Weekly	yes	10 and 15 weeks and 6 months
Kratzke et al. (2023)	Maslach Burnout Inventory-Human Services Survey (MBI-HSS); Patient Health Questionnaire-9 (PHQ-9); PSS; Spielberger State-Trait Anxiety Inventory-6 (STAI-6)	b)	6	1 hr/session	Not specified	No	NA

Table 1 (continued)

Authors	Instruments	Research design	Number sessions/weekly	Duration	Home practice	Follow-up	Follow-up time
Li et al. (2021)	SCS; Daily Self-Compassion Scale (DSCS); PSS-4; MBI	b)	20 daily (4 weeks)	Not specified	Diary Questionnaire	yes	1 month post
Maratos et al. (2019)	CMS; MBI; DASS-21; Forms of Self-Criticism and Self-Reassurance Scale (FSCSRS); SCS-SF; CMT Practice Scale (CMT-PS)	b)	6	2,5 hr/session	Not specified	no	NA
Marconi et al. (2019)	STAI; Beck-Depression Inventory (BDI); Five Facets of Mindfulness Questionnaire (FFMQ); MBI; Ruminative Response Scale (RRS); ProQOL	b)	18	3 hr/session	15/25 min daily	No	NA
Mascaro et al. (2021)	ProQOL; DASS-21; Nursing Incivility Scale (NIS); Connor-Davidson Resilience Scale (CDRS)	a)	4	60 min	Not specified	No	NA
Matos et al., (2022a, 2022b)	Compassion Engagement and Action Scales (CEAS); Compassion Motivation and Action Scale (CMAS); Types of Positive Affect Scales (TPAS); Satisfaction with Teachers'Professional Life (SWTPL); DASS-21; SMBQ; Fears of Compassion Scale (FCS); FSC-SRS; ECOS; Heart-Rate variability	a)	8	2.5 hr/session	Daily	yes	3 months post
Matos et al., (2022a, 2022b)	SWTPL; Psychological Well-Being Scales; SMBQ; DASS-21; CEAS; CMAS; FCS; FSCSRS	b)	6	2 hr/session	Daily	no	NA
Neff et al. (2020)	SCS—S1, S2; The Compassion Scale—S2; Cognitive and Affective Mindfulness Scale-Revised—S1, S2; Santa Clara Brief Compassion Scale—S1; DASS-21—S1, S2; ProQOL—S1, S2; Reactivity Index—S1; MBI—S2	S1 = a) S2 = b)	6 6	1 hr/session 1 hr/session	When necessary, at work	yes no	3 months post NA

Table 1 (continued)

Authors	Instruments	Research design	Number sessions/weekly	Duration	Home practice	Follow-up	Follow-up time
Santos et al. (2023)	ProQOL; DASS-21; SCS; Pandemic Related Questions	a)	12	2.5 hr/session	Daily	yes	3 months and 6 months post
Scarlet et al. (2017)	SCS-SF; Toronto Mindfulness Scale (TMS); Copenhagen Burnout Inventory (CBI); Brief Index of Affective Job Satisfaction (BIAJS); Interpersonal Conflict Scales (ICS); FCS	b)	8	2 hr/session	Daily	yes	1 month post
Shin et al. (2023)	MBI-HSS; DASS-21; SCS-26; WLS-5; Resilience Scale (RS27)	b)	6	1 hr/session	Daily	yes	1 month post
Watts et al. (2021)	MBI-HSS; ProQOL5; DASS-21; -SF) Mindful Attention Awareness Scales (MAAS)	b)	8	2.5 hr/session	45–60 daily	yes	2 months post

Note. a) Pre-post-test control group design; b) pre-post-test design

2023; Watts et al., 2021), and nine studies used the *Professional Quality of Life Scale* (ProQoL; Ash et al., 2021; Corrigan et al., 2022; Crandall et al., 2022; Johansson et al., 2022; Marconi et al., 2019; Mascaro et al., 2021; Neff et al., 2020; Santos et al., 2023; Watts et al., 2021). Three studies utilized the Shirom-Melamed Burnout Questionnaire (SMBQ; Eriksson et al., 2018; Matos et al., 2022a, 2022b; Matos et al., 2022a, 2022b), and one study used the Copenhagen Burnout Inventory (CBI; Scarlet et al., 2017).

The Self-Compassion Scale (SCS) was the most used measure for assessing compassion, appearing in twelve studies (Andersson et al., 2022; Corrigan et al., 2022; Crandall et al., 2022; Eriksson et al., 2018; Johansson et al., 2022; Li et al., 2021; Maratos et al., 2019; Neff et al., 2020; Santos et al., 2023; Scarlet et al., 2017; Shin et al., 2023; Watts et al., 2021).

Primary Outcomes of Compassion-Based Interventions

The primary outcomes across the analyzed studies highlight the effectiveness of compassion-based interventions in reducing stress, burnout, and other psychological measures, while also enhancing various aspects of well-being.

Stress and Burnout Reduction

Multiple studies reported significant reductions in stress and burnout following the interventions. For instance, participants in a study using CBCT experienced notable decreases in burnout and anxiety compared to a waitlist control group (Ash et al., 2021). Similarly, interventions like the ICOP and ICB led to reductions in stress of conscience, a form of stress experienced by healthcare professionals when they are unable to practice according to their ethical values or when high workloads negatively impact their personal lives. This type of stress has been linked to increased burnout and work dissatisfaction (Åhlin et al., 2015; Glasberg et al., 2006). Interventions in these studies reduced stress of conscience, secondary traumatic stress, and burnout symptoms (Johansson et al., 2022). CFT was also effective in lowering burnout and trauma symptoms (Corrigan et al., 2022), while CMT resulted in significant reductions in self-criticism, fears of compassion, burnout, depression, and anxiety (Maratos et al., 2019; Matos et al., 2022a, 2022b; Matos et al., 2022a, 2022b).

Web-Based Interventions

Of the 19 studies, only four (21%) focused on web-based compassion interventions, which appear to show promising results. For instance, a study using MSC showed that a brief web-based mindful self-compassion intervention

reduced perceived stress and burnout among practicing psychologists (Eriksson et al., 2018). Another study found that online self-compassion meditation significantly reduced perceived stress and emotional exhaustion (Li et al., 2021). Additionally, another study demonstrated that brief online compassion focused interventions may be a useful platform to promote nurse's well-being, reducing burnout, trauma, and emotional climate threat (Corrigan et al., 2022). Furthermore, a study using two internet-based stress management courses (ICB and ICOP) showed that stress of conscience and secondary traumatic stress decreased following ICOP, while healthcare professionals reported reduced burnout symptoms after ICB (Johansson et al., 2022).

Qualitative Corroboration

The quantitative findings were supported by qualitative analyses in several studies. For example, in a study using MSC, nurses reported decreases in burnout, which was corroborated in the focus group discussions (Crandall et al., 2022). Similarly, the RTHC program showed improvements in emotional exhaustion, as evidenced by both quantitative measures and focus group feedback (Kratzke et al., 2023). Additionally, in the CMT intervention with school staff, qualitative feedback collected at 1-month follow-up, highlighted enhanced emotional regulation and increased compassion towards themselves and others, supporting the quantitative results (Maratos et al., 2019).

Adapted Interventions

Overall, adapted compassion-based interventions have shown promising outcomes. For instance, the CMT-Care Homes intervention resulted in significant reductions in burnout, anxiety, and depression, and enhanced the ability to cope with pandemic-related challenges (Santos et al., 2023). The COMP improved stress resilience and coping strategies while simultaneously reducing worry and rumination (Marconi et al., 2019). The MBCT4HP was also effective, leading to decreases in anxiety, compassion fatigue (burnout), and emotional exhaustion over time (Watts et al., 2021). Additionally, the SCHC intervention was found to significantly reduce burnout, anxiety, stress, and high levels of emotional exhaustion and depersonalization (Neff et al., 2020; Shin et al., 2023). The high credibility ratings of the CCSH-TI intervention suggest it effectively improves burnout and offers benefits in resilience and stress management (Mascaro et al., 2021). In contrast, while CCT interventions led to significant improvements in self-compassion, mindfulness, and interpersonal conflict scores, and marginally significant improvements in self-reported job satisfaction, they did not result in notable differences in burnout measures (Scarlet et al., 2017).

Other studies have highlighted the positive effects of compassion-based interventions on self-compassion and other well-being measures. For instance, CFT and MSC interventions enhanced self-compassion and improved the emotional climate of work environments (Corrigan et al., 2022). MSC interventions were also effective in increasing nurses' self-compassion, mindfulness, and resilience (Crandall et al., 2022). CMT-T interventions for teachers led to significant increases in self-compassion, positive affect, and satisfaction with professional life (Matos et al., 2022a, 2022b), and enhanced compassion for others, self-compassion, and the motivation and actions related to compassion in teachers (Matos et al., 2022a, 2022b). Additionally, those who practiced CMT exercises showed marked increases in self-compassion (Maratos et al., 2019), while a web-based MSC program led to increased self-compassion among psychologists (Eriksson et al., 2018). Similarly, interventions such as the SCHC program significantly improved personal accomplishment, resilience, life satisfaction, and a sense of common humanity among healthcare professionals (Shin et al., 2023). Moreover, using interventions like ICB and the ICOP, both self-compassion and compassion satisfaction saw notable increases (Johansson et al., 2022). Daily online self-compassion meditation further contributed to increased self-compassion over time during the intervention period (Li et al., 2021). The SCHC program specifically was associated with increased self-compassion and overall well-being (Neff et al., 2020). A combined study using MSC and SCHC interventions found significant improvements in depersonalization immediately post-intervention (Bluth et al., 2021).

Sustainability of Gains

Many studies reported sustained benefits of the interventions. For instance, the CMT-Care Homes intervention showed reductions in burnout, anxiety, and depression that were maintained at both 3- and 6-month follow-ups (Santos et al., 2023). Similarly, the CFT and MSC interventions demonstrated reduced stress levels that persisted for 3 months (Andersson et al., 2022). Also, CMT-T improved teachers' self-compassion and compassion for others, self-compassion motivation & action, positive affect, and satisfaction with professional life, strengthening their physiological self-regulation, and reducing their resistance to psychological distress, which was maintained at three months follow-up (Matos et al., 2022a, 2022b). In the case of online self-compassion meditation, the gains from the intervention remained stable throughout the 1-month follow-up period (Li et al., 2021). The benefits of the SCHC intervention were maintained for a 3-month follow-up period (Neff et al., 2020), and the effects of MSC and SCHC on stress were observed over a 6-month follow-up (Bluth et al., 2021).

However, not all interventions showed sustained benefits. For example, the effects of CBCT on burnout and anxiety were not maintained at a 4-month follow-up (Ash et al., 2021). Similarly, while self-compassion improvements persisted over time, reductions in stress and depression were not sustained beyond three months in some studies (Shin et al., 2023).

Discussion

The present systematic review aimed to summarize the effectiveness of compassion-based interventions in reducing stress among workers. Overall, the results showed that different types of compassion-based interventions have been used to lower stress. These interventions targeted various worker populations and used different research methods, including differences in sample sizes and study designs. There were also variations in how the interventions were structured, such as the number of sessions, how often they occurred, how long they lasted, whether they included home practices, the tools used to measure outcomes, and whether control groups were included. Despite these methodological differences, compassion-based interventions were generally effective in reducing workers' stress. To enhance a more comprehensive interpretation of these general results, each aspect will be examined in further detail.

This review identified a range of compassion-based interventions, including CBCT, CCT, CFT, CMT, and MSC, alongside various adaptations such as CMT-Care Homes and ICOP (based on CMT), ICB and CCSH-TI (based on CBCT), SCHC and COMP (based on MSC), MBCT4HP (a hybrid integrating MSC, MBSR, and CCT), Online Self-Compassion Meditation (incorporating body scan and self-compassionate breathing), and RTHC (based on SCHC). This diversity underscores the flexibility and broad applicability of compassion-based approaches across different settings and populations. The versatility of these interventions allows them to be delivered through various formats, including in-person workshops, digital platforms, and self-guided practices, making them accessible to a wide range of audiences. Furthermore, the core principles of compassion—fostering self-kindness, emotional resilience, and empathy—are universally relevant, contributing to their effectiveness in addressing a broad spectrum of psychological and emotional challenges. This adaptability highlights the potential of compassion-based approaches to create a meaningful impact across diverse fields, promoting well-being and emotional health across cultures, professions, and individual experiences.

A notable feature of the reviewed studies is the diversity of target populations, including healthcare professionals (e.g., Johansson et al., 2022; Watts et al., 2021), teachers (e.g., Marconi et al., 2019; Matos et al., 2022a, 2022b), and workers from diverse occupational backgrounds (e.g., Andersson et al., 2022; Li et al., 2021). This breadth suggests that compassion-based interventions are versatile and can be effectively tailored to suit the distinct needs of various professional and demographic groups. Nevertheless, this diversity also presents challenges when attempting to synthesize findings or conduct meta-analyses, as the contextual and participant differences complicate direct comparisons and generalizations.

The predominance of studies involving healthcare professionals may reflect the high levels of stress intrinsic to these roles, often intensified by high workloads and frequent exposure to the suffering of others (e.g., Corrigan et al., 2022; Crandall et al., 2022). In such contexts, compassion-based interventions demonstrate promise in preventing and managing stress and burnout by cultivating emotional resilience. The inclusion of participants ranging in age from 18 to 80 years suggests that these interventions can be adapted across the lifespan. However, caution is warranted, as some studies did not specify age ranges or means, which may limit the generalizability of the findings.

An additional limitation pertains to the variability in sample sizes across studies, with several relying on small or unevenly distributed groups. These methodological constraints may influence statistical power and hinder the accurate evaluation of intervention outcomes. Future research should seek to address these issues by employing larger, more representative samples to strengthen the validity and generalizability of findings. Expanding the scope of research to include underrepresented professional groups and high-stress sectors beyond healthcare would further contribute to understanding the broader applicability of these interventions.

Furthermore, standardizing key variables such as age ranges, intervention duration, and outcome measures across studies would facilitate more accurate comparisons and meta-analyses. Finally, longitudinal studies could help determine the long-term effectiveness of compassion-based interventions, providing deeper insights into their sustained impact on emotional resilience and well-being.

This review revealed that most studies employed quasi-experimental designs, with only five adopting randomized controlled trials (RCTs) methodologies. This predominance of quasi-experimental designs may reflect logistical, ethical, or feasibility challenges associated with implementing RCTs in workplace settings. While quasi-experimental studies offer valuable insights, they often lack the methodological rigor requires to establish causality definitively.

Additionally, while most studies utilized quantitative methodologies, only five incorporated both qualitative and quantitative methods. This reliance on quantitative approaches could limit the depth of understanding regarding the nuanced impacts of interventions, as quantitative

data may not fully capture the subjective experiences and emotional responses of participants. Qualitative elements, such as interviews or open-ended surveys, could offer richer insight into how individuals engage with and perceive compassion-based interventions.

Future research should consider incorporating qualitative elements to capture more comprehensive data on participant experiences and intervention processes. Moreover, employing a broader range of methodologies, including longitudinal studies and experimental designs, would enhance the validity and reliability of findings. Collaboration among researchers from diverse disciplines could also facilitate the development of innovative research designs that better address the complexities of compassion-based interventions.

The variability observed in intervention designs—such as the number of sessions, duration, and at-home practices—highlights the need for methodological standardization to improve the comparability and replicability of results. Despite this heterogeneity, the overall positive outcomes reported suggest that compassion-based interventions have strong potential for stress reduction.

Nevertheless, the lack of control groups in a substantial portion of the studies (65%) limits the ability to draw definitive conclusions and underscores the need for more RCTs to rigorously evaluate the effectiveness of these interventions. Additionally, only 60% of studies included follow-up assessments, ranging from one to six months post-intervention. While the results were generally positive, the long-term impact remains unclear.

Subsequent research should prioritize the inclusion of extended follow-up periods to evaluate long-term outcomes and the potential for sustained benefits in stress management and psychological well-being. The use of standardized instruments, such as the DASS and the SCS, facilitates comparability; however, the inconsistency in outcome measures across studies suggests a need for the development of tailored metrics specific to compassion-based interventions. Establishing clear guidelines regarding optimal session length, frequency, and incorporation of home practices would support more systematic evaluations and facilitate cross-study comparisons.

The systematic review indicates that compassion-based interventions are effective in reducing stress among workers, supporting previous research that highlights their mental health benefits (e.g., Gilbert, 2010; Kirby et al., 2017). These interventions, regardless of the specific approach (e.g., CMT, CFT, MSC), were associated with significant reductions in stress levels, burnout, and other psychological measures, alongside improvements in participants' well-being. This is consistent with findings from other studies (e.g., Bates et al., 2021; Lloyd et al., 2019; Luo et al., 2021; Palmeira et al., 2017; Salgó et al., 2021; Shapira & Mongrain, 2010).

Furthermore, the review demonstrates the growing relevance of compassion-based interventions, as evidenced by a substantial increase in publications in recent years. This trend reflects an emerging focus in mental health research, where compassion is viewed not only as an emotional response but also as a skill that can be cultivated. Such a perspective carries significant implications for promoting well-being and preventing psychopathologies.

Considering these findings, it is essential for future research to continue exploring the mechanisms through which compassion-based interventions exert their effects. This could involve examining specific components of the interventions that contribute most to their success, as well as identifying factors that may enhance or inhibit their effectiveness across different populations and contexts. Additionally, a focus on long-term outcomes and the sustainability of the benefits associated with these interventions would provide deeper insights into their potential for widespread application in various settings. Recent studies have begun to shed light on these mechanisms. For instance, Matos et al. (2024) demonstrated how CMT for teachers enhances well-being by increasing the flow of compassion and reducing fears of compassion, thereby mediating reductions in burnout, depression, anxiety, and stress. Similarly, Maratos et al. (2024) highlighted the protective role of self-compassion in buffering against burnout, particularly in high-stress environments, through physiological pathways such as heart rate variability. These insights underscore the importance of further investigating the underlying processes that drive the efficacy of compassion-based interventions. By continuing to refine the theoretical and practical foundations of these programs, researchers can contribute to the development of evidence-based strategies with the potential for broad and lasting impact on worker health and organizational well-being.

Limitations and Recommendations for Future Research

Despite its comprehensive nature, this review has limitations. The exclusion of grey literature and unpublished studies may introduce publication bias. Additionally, the heterogeneity in study populations and methodological designs limits the generalizability of the results. Future research should focus on standardizing intervention protocols and employing rigorous experimental designs, including active control groups and longer follow-up periods, to enhance the evidence base regarding the effectiveness of compassion-based interventions in stress reduction for workers. Overall, compassion-based interventions show promising outcomes in reducing stress and burnout while enhancing self-compassion and overall well-being. However, the variability in the sustainability of these benefits across studies highlights the

need for further research to explore long-term effects and identify strategies to maintain these gains over time.

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L. Palmeira: Conceptualization, Methodology, Formal Analysis and Investigation, Reviewing and Editing, Supervision, and Validation.

M. Matos: Writing – Reviewing and Editing, Methodology, Validation, Arbitration of Article Inclusion.

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Declarations

Ethical Approval This study is a systematic review and does not involve human participants, patient data, or clinical trials. Therefore, ethical approval was not required.

Inform Consent This study is a systematic review and does not involve human participants, patient data, or clinical trials. Therefore, informed consent was not required.

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Author L. Palmeira is the author of the following articles: Compassionate Mind Training for Teachers: The Mediating Role of Compassion Flows in Reducing Burnout, Anxiety, and Depression; Nurturing Compassion in Schools: A Randomized Controlled Trial of the Effectiveness of a Compassionate Mind Training Program for Teachers; and Building Compassionate Schools: Pilot Study of a Compassionate Mind Training Intervention to Promote Teachers' Well-being.

Author M. Matos is the author of the same articles as L. Palmeira, in addition to The Impact of Compassion-Focused Therapy on Positive and Negative Mental Health Outcomes: Results of a Series of Meta-Analyses.

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