



Cumulative exposure to trauma at work

Phase 2: Prevention and intervention strategies

An Evidence Review of effective interventions and preventive strategies to address cumulative exposure to potentially traumatic events.

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CONTENTS

Acknowledgements	4
1. Executive Summary	5
1.1 Background and scope	5
1.2 Method	5
1.3 Key findings	5
1.4 Insights & implications	6
2. Introduction	7
3. Objective	8
3.1 Review questions and scope	8
4. Method	8
4.1 Scope and focus	8
4.2 Literature search	9
4.3 Search process	11
4.4 Data synthesis	11
4.5 Description of the evidence base	12
5. Findings	13
Key findings	13
5.1 Occupational groups	13
5.2 Proactive interventions	14
Summary of proactive interventions	14
5.3 Ameliorative interventions	17
Summary of ameliorative interventions	17
5.4 Reactive interventions	20
Summary of reactive interventions	20
5.5 Limitations and considerations	31
6. Summary & conclusions	32
6.1 Implications of the findings	33
7. References	34
8. Appendix	36

LIST OF TABLES

Table 1. Common terms used to characterise and measure cumulative trauma	9
Table 2. Inclusion and exclusion criteria	10
Table 3. Systematic reviews characteristics and key outcomes	21
Table 4. Primary studies characteristics	25
Table 5. Primary studies key outcomes	28
Table 6. List of common instruments used to measure effects of cumulative trauma.....	36

LIST OF FIGURES

Figure 1. PRISMA diagram showing search process for identifying studies that evaluated the effectiveness of interventions and prevention strategies to address cumulative trauma.....	11
Figure 2. 10-item Resilience scale.....	37

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Disclaimer

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1. EXECUTIVE SUMMARY

1.1 Background and scope

Work-related cumulative trauma refers to repeated exposure to potentially traumatic events in the course of one's work and may be a risk factor for poor mental health.

In 2018, ISCRR completed Phase 1 of this project – an Evidence Review of the prevalence and impact of vicarious trauma in the workplace, which related to indirect exposure to the traumatic experiences of others. For Phase 2, WorkSafe Victoria (WSV) recognised a need to identify effective interventions and preventive strategies that could be implemented in the workplace to support workers exposed to cumulative trauma. In collaboration with the Interdepartmental Committee (IDC) Occupational Health and Safety Sub-Committee Working Group – Exposure to Cumulative Trauma, WSV commissioned ISCRR to complete a second Evidence Review with a focus on strategies to address the impact of repeated exposure to work-related trauma, both direct and indirect (i.e. Cumulative Trauma).

1.2 Method

In Phase 2 of this project, a synthesis of evidence from systematic reviews and primary studies pertaining to the effectiveness of workplace-based interventions and preventive strategies that address cumulative trauma was undertaken in July-September 2019. The synthesis was based on ten relevant systematic reviews and ten primary studies that were published after the identified systematic reviews, or not included in the scope of the identified systematic reviews.

1.3 Key findings

Based on evidence from ten systematic reviews and ten primary studies, strategies were categorised into four approaches:

- **Proactive** or preventive interventions focus on reducing organisational stressors by changing work conditions, culture and environment.
 - **Strongest evidence** - flexible working conditions had a positive influence on work-related cumulative trauma across occupational groups
 - **Mixed effects** - professional skills training enhanced competencies among healthcare professionals
 - **Limited evidence** – a multi-component intervention with pay incentives for teachers improved staff retention
 - **No supporting evidence**
 - Education to raise awareness of cumulative trauma among healthcare professionals
 - Coaching support for teachers
- **Ameliorative** interventions focus on changing individuals' behaviour and enhancing workers' ability to cope with work-related stressors.
 - **Strongest evidence** - mindfulness and meditation training significantly reduced the negative effects of cumulative trauma in healthcare professionals
 - **Mixed effects** - coping and resilience skills training and clinical supervision
 - **No supporting evidence**

- Peer support mentoring
- Stress management training
- Communications skills training
- **Reactive** interventions focus on managing and supporting distressed workers.
 - **Inconclusive** due to insufficient evidence
- **Multi-faceted** interventions or **context-specific** interventions that were tailored to an occupational group or setting were promising for reducing exposure to, or risk of, cumulative trauma.

1.4 Insights & implications

No single intervention is effective for all workplaces. Therefore, workplaces should consider tailoring strategies to their specific setting or providing more than one type of approach to address the different needs. A flexible and supportive work culture, access to relevant professional skills training and a safe and appropriate channel to raise concerns and seek help may reduce the risks of work-related cumulative trauma. Different strategies may be offered in parallel, or combined in multi-faceted approaches that include elements across various categories; and allow workers time and opportunity to access interventions or support as needed.

2. INTRODUCTION

Cumulative trauma during the course of one's work refers to the psychological, emotional and physical distress associated with repeated exposure to potentially traumatic events, either directly or indirectly. While frontline emergency services personnel such as police, fire services and paramedics are known to experience direct and repeated exposure to trauma in their working day, other occupational groups also experience distress related to repeated exposure to traumatic incidents or the traumatic experiences of others. For example, nurses are frequently exposed to trauma in the course of their work, both directly (e.g. violent or aggressive patients) and indirectly (e.g. suffering of others).

In June 2018, ISCRR completed **Phase 1** of this project: Evidence Review 226 – *Vicarious exposure to trauma at work: a rapid review of the prevalence and impact of vicarious exposure to trauma within the workplace.*

For **Phase 2**, WSV and the IDC Occupational Health and Safety Sub-Committee Working Group – Exposure to Cumulative Trauma commissioned ISCRR to complete a second Evidence Review with a focus on strategies to address the impact of repeated exposure to work-related trauma, both direct and indirect (i.e. Cumulative Trauma).

Workplace-based strategies and interventions that address the adverse effects associated with repeated exposure to traumatic events aim to change aspects of the psychosocial work environment. They do this by taking a proactive (preventive), ameliorative or reactive approach.¹

Approaches to influence psychosocial work environments

Proactive (or preventative) interventions

- Focus on reducing the organisational stressors by changing work conditions, culture and environment.
- Examples include: modifying policies, processes, job roles or tasks; reducing workload; flexible work schedules; professional skills training; and education to raise awareness about the potential negative effects of cumulative trauma.

Ameliorative interventions

- Focus on changing individuals' behaviour and enhancing workers' ability to cope with work-related stressors.
- Examples include: resiliency and coping skills training; clinical supervision and mentoring; relaxation and lifestyle courses, such as stress management, mindfulness, meditation, yoga and exercise.

Reactive interventions

- Focus on managing and supporting distressed workers.
- Examples include: de-briefing or discussion groups; and Employee Assistance Programs.

3. OBJECTIVE

The main objective of this Evidence Review was to identify and evaluate the effectiveness of interventions and prevention strategies to address cumulative exposure to potentially traumatic events. The focus was on occupational groups that are not involved in frontline emergency services.

3.1 Review questions and scope

The research questions for **Phase 2** were:

- What prevention and intervention strategies address cumulative exposure to potentially traumatic events, whether direct or indirect?
- How effective are prevention and intervention strategies for reducing the negative impact of cumulative exposure to potentially traumatic events?

This report was prepared by the ISCRR research team and presents a rapid review of scientific evidence.

4. METHOD

A review of systematic reviews and primary studies pertaining to interventions and prevention strategies to reduce the impact of cumulative trauma in the workplace was undertaken from July to September 2019. The synthesis was based on ten relevant systematic reviews and ten primary studies that were published after the identified systematic reviews, or not included in the scope of the identified systematic reviews.

4.1 Scope and focus

Several related terms, which are used interchangeably in the literature, refer to indirect exposure to trauma, whereby workers interact with patients or clients who have experienced trauma. Repeated exposure to trauma can trigger physical, psychological and emotional symptoms that characterise post-traumatic stress disorder (PTSD), compassion fatigue, secondary traumatic stress (or Type II trauma), vicarious traumatisation and burnout. These terms share conceptual similarities, with overlapping definitions, characteristics and common dimensions used in relevant psychometric tools.

Table 1 provides definitions, dimensions and associated outcome measures for the terms used in this research area. For the purposes of this review, 'cumulative trauma' includes all of the related terms and outcome measures. Table 6 (Appendix) provides a list of common instruments used to measure these outcomes.

In addition to the negative outcome measures, resilience and ability to cope with stressful situations was also assessed in the literature using the Connor-Davidson Resilience Scale.^{2,3} Based on the original 25-item scale, a brief 10-item scale has been developed and the items are shown in Figure 2 (Appendix).

Table 1. Common terms used to characterise and measure cumulative trauma

Term	Definition	Dimensions / Outcome measures
Post-traumatic stress disorder	Anxiety that may develop after exposure to traumatic events, such as combat, natural disaster, violence or accident. ⁴	Avoidance Emotional arousal Intrusive thoughts Negative thoughts & emotions
Compassion fatigue^b	An array of psychological, behavioural, cognitive and physical responses resulting from prolonged engagement with traumatised and suffering individuals. Compassion fatigue occurs when emotional boundaries become blurred and the caregiver unconsciously absorbs the distress, anxiety, fears and trauma of the patient. ⁵	Avoidance Depression Exhaustion Fear & intrusion Frustration Hypervigilance
Secondary traumatic stress (STS)^a or Type II trauma^a	Behaviours and emotions resulting from exposure to the traumatic events experienced by others; and the stress of wanting to help the traumatised individual. STS mirrors characteristics of PTSD. ⁶	Avoidance Hyperarousal Intrusive thoughts
Vicarious trauma^a	The negative effects of engaging empathetically with people who have directly experienced trauma, resulting in a state of tension and preoccupation arising from the stories/trauma experiences described by clients. Over time, it may lead to negative changes in the professional's perceptions of themselves and the world. ⁷	Avoidance Depersonalisation Emotional exhaustion Hypervigilance Intrusive thoughts
Burnout	An emotional and behavioural response to prolonged exposure to occupational stressors. ⁸	Cynicism / depersonalisation Emotional exhaustion Inefficacy / Personal achievement
Compassion satisfaction	Positive emotion achieved by helping others and believing that you are doing a good job. ⁷ .	Job satisfaction Self-esteem

^a There are overlaps between these terms, which are used interchangeably in the literature.

4.2 Literature search

Five databases were searched (EMBASE, CINAHL, PubMed, PsychInfo, Cochrane Library) to identify relevant systematic reviews and primary studies that were published in English since 2009 (Table 2).

4.2.1 Search terms

Combinations of the following terms and associated synonyms were used in searches:

- employees; staff; organisation; workplace/workers
- secondary traumatic stress; vicarious trauma/traumatisation; compassion fatigue; PTSD; psychological distress; anxiety; trauma/traumatic; depression
- intervention; prevention; protection.

Table 2. Inclusion and exclusion criteria

Criteria	Inclusions	Exclusions
Patient/ population	<ul style="list-style-type: none"> ▪ Workers <u>directly</u> and repeatedly exposed to potentially traumatic events in the course of their work ▪ Workers <u>indirectly</u> and repeatedly exposed to traumatic material or traumatized individuals in the course of their work 	<ul style="list-style-type: none"> ▪ First responders, such as police, fire and emergency services personnel ▪ Individuals exposed to a single traumatic event in the workplace, or those exposed to traumatic events not related to a work context
Intervention/ indicator	<ul style="list-style-type: none"> ▪ Any interventions, both organisation-focused and individual-focused, delivered in the workplace to manage or treat the negative effects of repeated exposure to potentially traumatic events (i.e. cumulative trauma) ▪ Any prevention strategies delivered in the workplace to reduce the exposure to, or reduce the effects of, cumulative trauma 	<ul style="list-style-type: none"> ▪ Intervention or prevention strategies not provided in the workplace setting
Comparison/ control	<ul style="list-style-type: none"> ▪ No intervention, alternative intervention or usual care 	<ul style="list-style-type: none"> ▪ Nil
Outcomes	<ul style="list-style-type: none"> ▪ Any individual mental health outcomes, including anxiety, depression, psychological distress, emotional exhaustion, and other symptoms characterised in measures of PTSD, compassion fatigue, burnout, secondary traumatic stress or vicarious trauma (Table 1) ▪ Any work-related outcomes, including sickness absence, poor performance, staff turnover and job satisfaction 	<ul style="list-style-type: none"> ▪ Pre-existing psychological, physical or emotional distress
Setting	<ul style="list-style-type: none"> ▪ Any workplace where staff are repeatedly exposed to potentially traumatic events 	<ul style="list-style-type: none"> ▪ Non-work settings; first responder settings (e.g. police, fire service, paramedics)
Study Design	<ul style="list-style-type: none"> ▪ Systematic reviews (SR) or meta-analyses ▪ Controlled or uncontrolled studies 	<ul style="list-style-type: none"> ▪ Non-systematic reviews, case studies, editorials, letters and commentaries
Publication details	<ul style="list-style-type: none"> ▪ All English language studies conducted on humans 	<ul style="list-style-type: none"> ▪ Non-English language papers or studies conducted on animals
Time period	<ul style="list-style-type: none"> ▪ Published from July 2009 to August 2019 	<ul style="list-style-type: none"> ▪ Pre-July 2009

4.3 Search process

The search process is summarised in Figure 1.

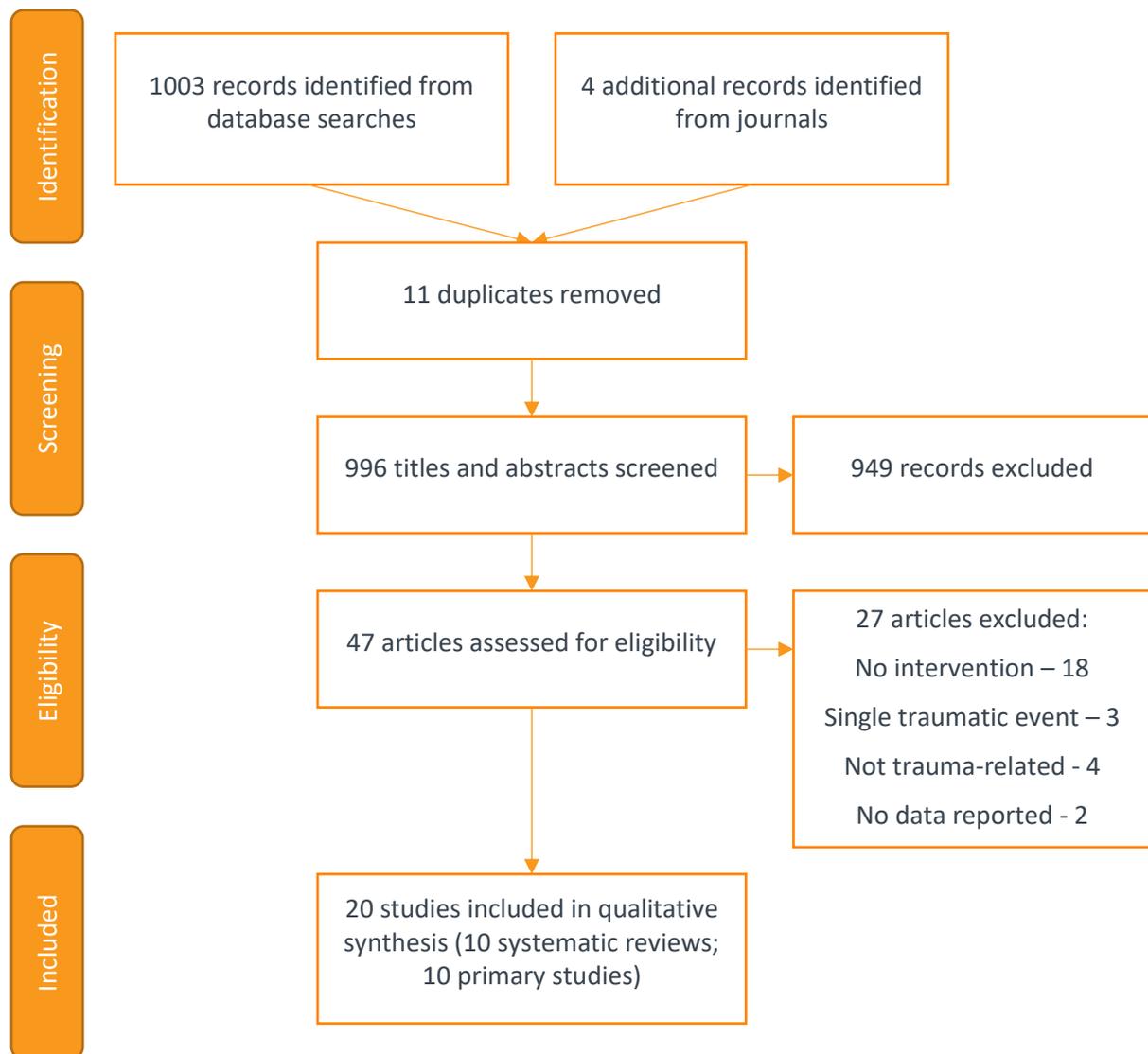


Figure 1. PRISMA diagram showing search process for identifying studies that evaluated the effectiveness of interventions and prevention strategies to address cumulative trauma

4.4 Data synthesis

Citations identified from academic sources were collated in an Endnote library; duplicates were removed; and one reviewer screened the remaining citations by title and abstract to remove those not in scope (see Exclusion criteria; Table 2). One reviewer extracted data from relevant articles; and two reviewers critically appraised the included articles using AMSTAR2 for systematic reviews and meta-analyses⁹ and the Effective Public Health Practice tool¹⁰ for primary studies.

4.5 Description of the evidence base

Ten systematic reviews and ten primary studies met the inclusion criteria and were reviewed. Of the systematic reviews, four were conducted in Australia,¹¹⁻¹⁴ two in the UK,^{1, 15} two in Germany,^{16, 17} and one each in Spain¹⁸ and Finland.¹⁹ The worker group populations of interest were primarily in healthcare^{12-15, 17-19} and education,¹ with two reviews containing a range of different worker groups.^{11, 16} Six reviews had a broad focus that included a variety of interventions,^{1, 12, 16-19} whereas two were more narrowly focused on mindfulness^{11, 14} and two focused on training in professional skills¹⁵ and coping skills.¹³ The target outcomes in these reviews included measures of burnout, compassion fatigue, secondary traumatic stress, psychological distress and wellbeing.

Of the ten primary studies, there were two randomised controlled trials (RCTs);^{2, 20} one non-randomised controlled study,⁴ six uncontrolled pre/post studies,^{3, 21-25} and one retrospective cross-sectional study.²⁶ Three studies were conducted in the US,^{3, 22, 26} and one each in Australia,²¹ Germany,²⁴ UK,⁴ Canada,²⁵ New Zealand,² Italy²⁰ and Spain.²³ Healthcare professionals were the target worker population in six studies;²¹⁻²⁶ educators in one study;² clergy in one study;³ prison staff in one study⁴ and both teachers and nurses in one study.²⁰ All primary studies took a person-directed approach that involved skills training, stress management or relaxation techniques.

5. FINDINGS

There was substantial variability in the approaches used to address cumulative trauma in the workplace. Interventions have been categorised in the literature as having an individual focus (i.e. changing individual's attitudes or behaviour); organisational focus (i.e. changing workplace conditions); or a combined approach that involved both individual and organisational elements. However, there was little consensus in the descriptions of these categories as some interventions (e.g. clinical supervision) were characterised as both individual and organisational in different studies.

Therefore, for the purposes of this review, interventions were categorised into three groups as described on page 7: 1) Proactive or preventive; 2) ameliorative; or 3) reactive.¹

Key findings

- **Proactive or preventive** strategies, such as flexible work conditions, schedules and tasks had an overall positive influence on work-related cumulative trauma.
- **Ameliorative** interventions had mixed effects. Mental relaxation techniques had overall positive effects on work-related trauma up to 6 months post-intervention; whereas limited evidence supported coping and resiliency training and clinical supervision.
- **Reactive** interventions, such as debriefing and discussion groups were inconclusive, due to limited evidence.

Characteristics and key outcomes of systematic reviews are shown in Table 3; characteristics and key outcomes of primary studies are shown in Table 4 and Table 5, respectively. Table 6 (Appendix) provides a list of the common instruments used to measure effects of cumulative trauma.

5.1 Occupational groups

An abundance of research that evaluated the effectiveness of interventions designed to mitigate the effects of cumulative trauma has been undertaken in the **healthcare** setting. However, apart from a small number of studies that investigated specific job roles (e.g. dementia care nurses; obstetricians/gynaecologists), healthcare staff were usually combined into one group. As a result, it is not known whether some strategies were more beneficial in certain job roles compared with others. In addition, it may not be feasible to implement some strategies (e.g. flexible work hours) for all job roles in the workplace.

Limited evidence was available for **teachers** and **social workers**; and findings were similar to those in healthcare workers. Only two small individual studies included **prison staff** and **clergy**. Other occupational groups were not well-represented or analysed separately in studies evaluating interventions.

Therefore, given that the distribution of evidence strongly favoured the **healthcare** setting, a comprehensive analysis by occupational group was not undertaken. However, a summary of the strongest evidence for healthcare workers, teachers and social workers is presented for each approach, where possible.

5.2 Proactive interventions

Summary of proactive interventions

Healthcare professionals, social workers and teachers

- **Strongest evidence supports:**
 - Flexible work conditions: providing flexibility in work schedules and job tasks had a positive influence on work-related cumulative trauma; significant benefits were sustained for ≥ 6 months.
- **Limited evidence supports:**
 - Professional skills training to enhance competencies for specific job roles (e.g. dementia care nursing) significantly reduced burnout in a small number of studies, but most were not statistically significant.
 - ERASE-Stress Program: significantly reduced symptoms of PTSD, compassion fatigue, and burnout; and increased compassion satisfaction in teachers exposed directly to trauma and dealing with traumatised students after Christchurch earthquakes in one study.
 - Multicomponent intervention with pay incentives significantly increased teaching staff retention rates in one study.
- **No supporting evidence for:**
 - Education to raise awareness of cumulative trauma
 - Communications skills training
 - School-wide coaching support program for teachers

Other occupational groups: Clergy

- **Limited evidence supports:**
 - A 'pastoral care crisis intervention' involving a combination of strategies to support and upskill clergy dealing with traumatised individuals resulted in significant benefits that were sustained for up to 12 months.

Proactive interventions aim to protect workers from, or reduce the risk of, exposure to the stressors that lead to cumulative trauma. For the most part, proactive approaches involve an organisational commitment to preventing stressful situations in the workplace by modifying work practices and conditions; building a supportive culture; providing a psychologically and emotionally safe workplace; and raising awareness of the risks of cumulative trauma. Empowering staff by giving them some control over their work; and raising awareness so they can prepare for the potential consequences of cumulative trauma may help to prevent negative outcomes.

Pre-employment screening of job candidates to select personnel with high levels of resilience to stressful situations has also been identified as a potential preventive strategy for work-related trauma.²⁷ However, this has not been assessed in non-frontline workers; and there is no evidence to support it in emergency services workers.²⁸

5.2.1 Changing work conditions

Providing flexibility in work schedules and tasks had an overall **positive** effect on work-related trauma. For example, changing schedules from continuous to including weekend breaks, or from a four-week rotation to a two-week rotation significantly reduced stress in healthcare workers.¹⁸

Similarly, in several healthcare and disability worker populations, changing work schedules and reorganising work significantly reduced stress;¹⁸ emotional exhaustion;¹⁶ burnout, depression and anxiety¹⁹ for at least six months follow-up.

Amongst teachers, a combined intervention involving stress management training, redesigning job tasks and flexible work schedules led to a modest but significant reduction in occupational stress (Occupational Stress Inventory scale) compared with a control group at 12 months follow-up.¹

5.2.2 Education and professional skills training

Professional skills training to enhance workers' competencies had **mixed effects** and were often context-specific. Westermann et al.¹⁷ evaluated interventions to reduce burnout in nursing staff at elderly care facilities. All 16 studies included training elements, primarily in developing professional skills to manage patients with dementia. Interventions included training in pain assessment, communication and managing challenging behaviours. Other elements of training involved coping with job stress. Duration and follow-up of interventions varied from one to 12 months. Overall, professional skills training significantly reduced burnout in almost 50 per cent of all studies (controlled and uncontrolled). In contrast, less than 30 percent of RCTs pertaining to training demonstrated reduced burnout. Therefore, effectiveness of the training may have been associated with self-selection to the intervention, with less benefit gained by individuals who were allocated to the training intervention.

Other systematic reviews also reported limited effectiveness of professional skills training for healthcare professionals. For example, only one (of seven) studies in Spector et al.¹⁵ reported significant reductions in burnout amongst nursing care assistants in a dementia facility; and nurses who received training in civility and conflict resolution had a significant improvement in job satisfaction, wellbeing and communication skills in only one (of three) studies in Romppanen et al.¹⁹

Other educational sessions, including communication skills training in nurses¹⁸ and raising awareness about compassion fatigue in cancer care staff²⁵ and other healthcare workers^{12, 22} had no significant impact on burnout, secondary traumatic stress, compassion fatigue or compassion satisfaction.

In contrast, there were significant improvements in burnout (34% ↓symptoms, $p=0.001$), secondary traumatic stress (19% ↓symptoms, $p=0.001$) and compassion satisfaction (10% ↑, $p=0.004$) amongst emergency department nurses who received a multi-faceted intervention.¹² The intervention involved a four-hour interactive group seminar about the signs, symptoms and risk factors associated with compassion fatigue, followed by individual and group exercises (e.g. guided imagery) and multimedia resources on resiliency. However, this was an uncontrolled pre/post-study; and as the follow-up was only four weeks, it is unclear whether the benefit was sustained.

Amongst teachers, two cluster RCTs implemented school-wide coaching support combined with either a mental health promotion program (Aussie Optimism program), or teacher training in literacy development.¹ Neither intervention had significant effect on burnout or job-related anxiety or depression amongst teachers up to two-year follow-up.

A 'pastoral crisis intervention' for clergy reported significant improvements in burnout, secondary traumatic stress and resilience 12 months post-intervention.³ Clergy attended a three-day workshop involving both professional skills development for clergy dealing with individuals in crisis and strategies to help clergy cope with the vicarious trauma of these interactions. The professional skills component included crisis communication skills, crisis assessment and psychological triage, crisis intervention techniques and awareness of when to apply spiritual or religious interventions.

Components to address vicarious trauma included personal self-care and stress management strategies. Although this was a small pilot study, the effect sizes were large, suggesting that this type of multifaceted, focused, context-specific approach may be promising.

5.2.3 Other proactive interventions

Amongst teachers, mentoring combined with incentives for promotion opportunities and performance-based bonus pay showed significantly higher staff retention rates at 12 months follow-up;¹ however, it was not clear whether the increased retention was directly related to the intervention.

Two studies took unique approaches that were very specific to their context.

One RCT adapted the ERASE-Stress program, which originated in Israel to help students who were exposed to political unrest. The modified ERASE-Stress program focused on helping educators who experienced the dual trauma of direct exposure to the 2010 Christchurch earthquakes and indirect exposure to traumatized students.² In a three-day intensive workshop, the program was delivered in various formats, including lectures, group discussions, experiential exercises, skill training practice and simulations. The comparator in this study was a three-day 'Managing Emergency and Traumatic Incidents program' that focused on the critical incidents, but did not address the distress experienced by the educators. Eight months post-intervention, teachers in the ERASE-Stress group had significantly lower symptoms of PTSD, compassion fatigue and burnout; and significantly higher levels of compassion satisfaction, professional self-efficacy and optimism compared with the control group.

Another study focused on healthcare staff who are repeatedly exposed to distress and grief when patients in their care die in intensive care units (ICU). The 'Sacred pause' ritual aims to "honor and recognize the lost human life and acknowledge the team's efforts to save the patient" (p 1338).²⁶ In a retrospective analysis of 70 'Sacred pause' rituals, over 70 per cent of ICU staff believed that the practice increased the sense of team effort, brought closure and helped them to manage their own distress. Although this was a very small study and weak study design, it is a simple strategy that may have benefit for those regularly dealing with death and dying in their work setting.

5.3 Ameliorative interventions

Summary of ameliorative interventions

Healthcare professionals, teachers and social workers

- **Strongest evidence supports:**
 - Mindfulness training significantly reduced psychological distress, depression, anxiety and burnout; and increased wellbeing for up to six months. However, healthcare staff found it challenging to sustain practice outside working hours.
- **Limited evidence supports:**
 - Coping and resilience skills training: improvements were reported in a limited number of studies, but most were not statistically significant. Longer-term benefits were sustained when refresher courses were provided.
 - Clinical supervision significantly reduced stress and burnout in nurses in a small number of studies. However, the quality of the supervisory relationship may be a mediating factor in determining effectiveness.
 - Cognitive behavioural therapy and a virtual reality program significantly reduced anxiety and burnout in studies involving teachers and social workers.
- **No supporting evidence for:**
 - Peer support mentoring
 - Stress management training.

Ameliorative interventions focus on changing individual behaviour and enhancing workers' ability to cope with work-related stressors. These interventions acknowledge the risks inherent in particular occupations and provide a range of self-care and support strategies to manage them.

5.3.1 Mental and physical relaxation techniques

Mental and physical relaxation techniques aim to divert attention away from distressing feelings, thoughts and emotions and to build resilience and ability to cope with stressful situations. Examples include meditation, mindfulness, exercise and music. Overall, the evidence indicates that mental and physical relaxation training provided in the workplace had a **positive** effect on the symptoms of cumulative trauma up to six months post-intervention.

The best available evidence involved mindfulness and meditation training interventions. Originally used to manage chronic pain, mindfulness training is underpinned by positive psychology, which focuses on skills to reduce psychological distress and enhance coping and resilience. The effectiveness of mindfulness training for the workplace was assessed in 25 RCTs in one systematic review.¹¹ Compared with controls (wait-list or usual treatment), workers who received mindfulness training reported significant reductions in work stress, psychological distress, depression and anxiety. There was no significant change in levels of burnout.

Workers also reported significant improvement in wellbeing post-intervention; and the beneficial effects were retained up to 12 months post-intervention. Detrimental effects (i.e. increased stress) were reported in one study, which required participants to attend ten hours of class time and 20-30 minutes daily practice. Weekly sessions and practice time were expected to be undertaken outside

work hours and Bartlett et al.¹¹ suggested that using their own time for this purpose may have added to their already demanding workload. While the 'gold standard' eight-week mindfulness training program includes 2.5 hours per week, with 40 minutes meditation and an expectation that participants will practice 25 minutes daily, low dose and flexible delivery of training (on-line, videoconferencing) were slightly less effective compared with attending classes, but still effective. Bartlett et al.¹¹ suggested that the flexibility and control over access to training may have counterbalanced the benefits of a supportive group environment. This was confirmed in a recent uncontrolled pre/post study²³ that reported small benefits of brief mindfulness sessions (5-8 minutes daily x eight weeks) in ICU healthcare professionals. The intervention was supplemented by a virtual community support group (WhatsApp) and daily reminders.

Similar findings were reported in two other systematic reviews that assessed the effectiveness of mindfulness meditation for nurses¹⁴ and for healthcare and community service workers.¹² The intervention session times varied substantially from five minutes pre-shift to nine hours per week; and duration of the interventions ranged from three weeks to 24 weeks. Training provided significant benefits across most studies: reduction in stress in four (of five) studies; reduced depression and anxiety in three (of five) studies; reduced burnout in six (of seven) studies; and improved wellbeing in three (of three) studies.¹⁴ One uncontrolled pre/post-study, which provided 16 minutes structured meditation (5 days/week for four weeks) showed a significant reduction in burnout in oncology nurses. However, the follow-up period was very short (four weeks), and nurses found the time commitment difficult to sustain.¹²

In terms of workplace factors such as productivity, absenteeism or presenteeism, there was no significant improvement. While the UK government has widely promoted workplace mindfulness training for improving work performance,²⁹ Bartlett et al.¹¹ suggested that the claims may be "ahead of the evidence".

Two systematic reviews evaluated the effectiveness of a range of interventions for preventing burnout¹⁶ and reducing stress¹⁸ in various worker groups. Overall, low-to-moderate quality evidence showed that both mental and physical relaxation techniques significantly reduced stress in workers (23% lower) compared with no intervention at one-month follow-up and this was sustained at six months follow-up in one study.¹⁸ Similarly, relaxation therapies significantly reduced emotional exhaustion in two (of two) studies at six months follow-up.¹⁶

In contrast, although one study involving physical exercise reported improvements in physical condition, another systematic review¹⁹ reported no significant change in levels of stress, anxiety or burnout in a range of interventions for improving nurses' wellbeing at work.

Other relaxation therapies, such as music therapy for nurses, social workers and hospice workers provided no significant benefit for reducing compassion fatigue in two (of two) studies in Cocker et al.¹².

Two multi-faceted interventions showed promising results. Significant improvement in compassion satisfaction was reported in medical centre staff who received eight weeks of combined mindfulness, meditation, music therapy and yoga sessions (7 x 1hr; 1 x 2hr sessions per week);¹² and a psycho-educational program comprising a total of six hours relaxation therapy and guided imagery significantly reduced emotional exhaustion and depressive symptoms in oncology nurses.¹³

5.3.2 Coping and resiliency training

Coping and resiliency training and cognitive-behavioural therapy aim to provide staff with more positive ways to feel, think and behave in stressful working conditions. There were **mixed results** in studies evaluating the effectiveness of coping and resiliency training for work-related trauma.

Two systematic reviews evaluated the effectiveness of coping and resiliency training in healthcare staff.^{12, 19} Session times and intervention duration varied from 90 minutes per week for five weeks to

six hours per week for 12 weeks. Two (of three) studies in one review¹² reported significant reductions in burnout at 30 days follow-up, but this was not sustained at three or six months. However, secondary traumatic stress was significantly reduced in one study and this was sustained at six months ($p < 0.05$). In contrast, a quasi-randomised controlled study in the same review reported no significant improvement in burnout or secondary traumatic stress at 12 weeks follow-up. Similar mixed results were reported in Romppanen et al.,¹⁹ with no significant change in stress, burnout or depression, but nurses reported significant increases in job satisfaction. No significant improvements in burnout, secondary traumatic stress or compassion satisfaction scores were also reported in two additional primary studies that evaluated the effectiveness of coping and resiliency training in cancer care staff²⁵ and nursing assistants in a long-term care facility.²² Due to the substantial heterogeneity in the duration and intensity of the interventions, it was not possible to determine which protocols were more effective than others.

Another systematic review¹⁶ that assessed the effectiveness of coping skills training in teachers and healthcare professionals reported significantly reduced burnout for up to six months in three (of three) studies. In one of these studies, the benefits were sustained for up to 2.5 years, with ongoing refresher courses.

Cognitive behavioural interventions for healthcare workers were evaluated in 16 controlled studies in one systematic review¹⁸ and three studies in another.¹⁶ Overall, compared with no intervention, while there was no significant difference at one month post-intervention (six studies), there was a significant reduction in stress (measured by various instruments) at 1-6 months post-intervention (eight studies) and over six months post-intervention (two studies).¹⁸ These findings suggest that it takes time for the benefits to develop and longer-term follow-up studies are needed to adequately assess outcomes. This was confirmed in Awa et al.,¹⁶ which reported significantly reduced burnout in all three studies at six months follow-up.

Stress management training was assessed in one systematic review, which showed no significant improvement in nurses' wellbeing at work.¹⁹

In a multi-faceted intervention that involved a five-week resilience training program with peer support, Gilman et al.¹³ reported a significant reduction in secondary traumatic stress in oncology staff at six months follow-up. Gilman et al.¹³ also reported significant reduction in anxiety and improvement in coping skills in oncology staff that received stress inoculation therapy delivered via a mobile app in one RCT.

5.3.3 Clinical supervision and mentoring

Clinical supervision and mentoring focusses on supporting staff and enhancing their professional development by providing opportunities to discuss and reflect on their work in a safe and confidential environment. There were **mixed results** for clinical supervision and mentoring.

Clinical supervision, which was evaluated in one systematic review,¹⁶ reported significant reductions in burnout in teachers and healthcare staff at six months post-intervention in two (of three) studies. Similarly, clinical supervision significantly reduced stress, burnout, depression and anxiety in one (of two) studies in Romppanen et al.¹⁹.

In contrast, Ruotsalainen et al.¹⁸ reported no significant benefit of peer support mentoring compared with controls in four (of four) studies. Having a positive supervisory working alliance may be a mediating factor for good outcomes.

5.4 Reactive interventions

Summary of reactive interventions

Healthcare professionals and prison staff

- **Limited evidence supports:**
 - Discussion groups (Balint-style) that provided a safe, non-judgemental environment to discuss challenging cases significantly reduced symptoms of psychological distress and increased compassion satisfaction in obstetricians/gynaecologists.
 - Debriefing: Structured group debriefing after a traumatic incident significantly reduced symptoms of distress in prison staff. Voluntary participation (versus mandatory attendance) may mediate the effects of debriefing.

Reactive interventions focus on managing and supporting distressed workers. While Employee Assistance Programs have been well-established and accepted in many organisations, no studies were identified that specifically assessed their effectiveness in occupational groups exposed to cumulative trauma.

5.4.1 Discussion group

Balint-style discussion groups, which are led by a psychiatrist and provide education based on case presentation and discussion, provide a safe forum for staff to discuss individual cases, raise problems and consider actions, without criticism or judgement of their decisions.²¹ The aim of these groups is to focus on support and solutions. One small pre/post study evaluated the effectiveness of Balint-style discussion groups for obstetricians and gynaecologists.²¹ At six months post-intervention, there was a significant reduction in levels of burnout and secondary traumatic stress; and increase in compassion satisfaction.

5.4.2 Debriefing

Debriefing is an intervention delivered soon after a traumatic incident and aims to relieve distress and avoid long-term psychological problems. According to the literature there is some controversy about the effectiveness of debriefing as some research suggests it may increase traumatic responses rather than deliver benefits.³⁰ However, the adverse effects may relate primarily to short, individual-oriented debriefing sessions, which deviate from the original group debriefing sessions facilitated by trained psychologists and involving a very structured format delivered over 2-3 hours duration.⁴

In a non-randomised controlled study, Ruck et al.⁴ implemented formal, structured debriefing sessions for prison staff following a traumatic incident. Compared with controls who chose not to receive an intervention, staff in the intervention group reported significantly lower levels of PTSD symptoms (avoidance, emotional arousal, intrusion) at one-month follow-up; but no significant change in levels of anxiety or depression in either group. The staff who self-selected to the intervention group had higher levels of PTSD symptoms pre-intervention, which was not controlled for in the analyses. However, the total post-intervention effect size for PTSD symptoms was large (0.62), suggesting that those in most need of support benefited from the intervention. This is consistent with earlier research that suggests compulsory debriefing is not effective.²⁷

While the available evidence on reactive interventions was limited, having the opportunity to discuss traumatic events in a safe and non-judgemental forum may be useful for workers seeking support.

Table 3. Systematic reviews characteristics and key outcomes

Reference; Country	N databases searched; Years searched	N primary studies	Worker groups	Type of intervention	Key outcomes	Quality rating ^a
Ruotsalainen ¹⁸ Spain	7 1966 to 2013	58 controlled studies	Healthcare workers	Various interventions, including: <ul style="list-style-type: none"> • Cognitive-behavioural therapy (CBT) • Relaxation • Organisational • Combined 	CBT: 3/7 studies ↓ stress @ 1-6 months FU, p<0.05 Relaxation: 2/8 studies ↓ psychological stress, p<0.05 Change in work schedules: 2/2 studies ↓ stress -0.35 [-0.84 to -0.25], p<0.05 Peer support mentoring: 1/3 studies ↓ stress, p<0.05 Communication skills training: NS	High
Gilman ¹³ Australia	12 2007 to 2013	3 controlled and uncontrolled studies	Oncology palliative care staff	Various interventions, including: <ul style="list-style-type: none"> • Psycho-educational program • Compassion fatigue resilience program • Stress inoculation therapy (mobile app) 	Relaxation & guided imagery (6 hrs): ↓ emotional exhaustion and depression, p<0.0005 post-intervention Resilience program (5 wks): ↓ secondary traumatic stress at 3m and 6m FU, p<0.05 Stress inoculation therapy: ↓ anxiety; ↑ coping, p<0.0001	Moderate
Naghieh ¹ UK	14 1966 to 2015	4 controlled studies	Teachers	Organisational interventions	Changing tasks + stress management: ↓ stress; ↑ work ability, p<0.05 (1 study)	Moderate

Reference; Country	N databases searched; Years searched	N primary studies	Worker groups	Type of intervention	Key outcomes	Quality rating ^a
					<p>Teacher training + coaching support: NS effect on anxiety, depression, burnout</p> <p>Multi-component (performance bonus, job promotion opportunities, mentoring): ↑ retention rates at 36 m FU, p<0.05</p>	
Romppanen ¹⁹ Finland	6 2009 to 2015	8 (6 controlled studies; 2 interrupted time series studies)	Nurses	<p>Various interventions, including:</p> <ul style="list-style-type: none"> • Clinical supervision • Workload / work conditions • Stress management • Resilience training • Exercise / lifestyle training • Training in civility and conflict resolution 	<p>Clinical supervision: ↓ stress, burnout, depression, anxiety in 1/2 studies, p<0.05</p> <p>Change in work conditions/ workload: ↓ stress, burnout, depression, anxiety in 1/1 studies, p<0.05</p> <p>Stress management: NS in 2/2 studies</p> <p>Resilience training: ↑ job satisfaction in 1/3 studies, p<0.05; NS for stress, burnout, depression</p> <p>Exercise / lifestyle training: ↑ physical condition, p<0.05; NS stress, anxiety, burnout</p> <p>Civility and conflict resolution training: ↑ communication, job satisfaction in 1/3 studies; ↑ wellbeing in 1/3 studies, p<0.05</p>	Moderate

Reference; Country	N databases searched; Years searched	N primary studies	Worker groups	Type of intervention	Key outcomes	Quality rating ^a
Bartlett ¹¹ Australia	5 1983 to 2016	25 RCTs	Variety of worker groups including: teachers, public servants, medical professionals, call centre staff	Mindfulness training	<p>Job stress: SMD 0.56 [95% CI 0.29-0.83], p<0.001</p> <p>Psychological distress: SMD 0.69 [95% CI 0.49-0.90], p<0.001</p> <p>Depression: SMD 0.38 [95% CI 0.14-0.62], p=0.002</p> <p>Anxiety: SMD 0.62 [95% CI 0.32-0.92], p<0.001</p> <p>Burnout: NS</p> <p>Wellbeing: SMD 0.46 [95% CI 0.17-0.72], p=0.002</p>	Low
Awa ¹⁶ Germany	3 1995 to 2007	25 controlled and uncontrolled studies	Healthcare, social workers	<p>Various interventions, including:</p> <ul style="list-style-type: none"> • Work schedule • Clinical supervision • Coping skills training • Relaxation therapy • CBT 	<p>Clinical supervision: ↓burnout 2/3 studies @ 6 m FU, p<0.05</p> <p>Coping skills training: ↓burnout in 3/3 studies @ 6m FU; and 12 m FU in 2/3 with refresher, p<0.05</p> <p>Relaxation therapy: ↓emotional exhaustion in 2/2 studies @ 6m FU, p<0.05</p> <p>CBT: ↓ burnout in 3/3 studies @ 6m FU, p<0.05</p> <p>Work schedule: ↓ emotional exhaustion in 2/2 studies @ 6m FU, p<0.05</p>	Critically low

Reference; Country	N databases searched; Years searched	N primary studies	Worker groups	Type of intervention	Key outcomes	Quality rating ^a
Cocker ¹² Australia	6 1990 to 2015	13 controlled and uncontrolled studies	Healthcare and community service workers	Various interventions, including: <ul style="list-style-type: none"> Mindfulness, meditation, exercise, transcranial magnetic stimulation Education & training 	1/5 studies: ↓ burnout, p=0.003 1/5 studies: ↑ compassion satisfaction, p=0.03	Critically low
Spector ¹⁵ UK	2 1997 to 2013	19 controlled or interrupted time series studies	Staff care assistants in dementia facility	Staff training	Burnout: ↓ in 1/7 studies, p<0.05	Critically low
Van der Riet ¹⁴ Australia	7 2004 to 2017	16 (12 quantitative; 1 qualitative; 3 mixed methods)	Nurses	Mindfulness meditation	Stress ↓ in 4/5 studies, p<0.05 Depression / anxiety ↓ in 3/5 studies, p<0.05 Burnout ↓ in 6/7 studies, p<0.05 Wellbeing ↑ in 3/3 studies, p<0.05	Critically low
Westerman ¹⁷ Germany	3 2000 to 2012	16 controlled and uncontrolled studies	Nurses in dementia care facility	Variety of interventions, including: <ul style="list-style-type: none"> Education & training Relaxation Clinical supervision 	Burnout: ↓ in 7/16 studies, p<0.05	Critically low

CBT = cognitive behavioural therapy; CI = confidence intervals; FU = follow-up; NS = not significant; RCT = randomised controlled trial; SMD = standardised mean difference; UK = United Kingdom; ^aBased on AMSTAR 2 rating overall confidence in the results of the review (High quality = no or one non-critical weakness; Moderate quality = more than one non-critical weakness; Low quality = one critical flaw with or without non-critical weaknesses; and Critically low = more than one critical flaw with or without non-critical weaknesses).

Table 4. Primary studies characteristics

Reference, country	Study design	N; % male	Worker group	Intervention	Intensity Follow-up (FU)	Outcomes	Quality rating
Berger ² New Zealand	RCT	63; 23% male	Educators	ERASE-Stress school-based resiliency program Control: Managing emergency & traumatic incidents program	1 x 3-day intensive workshop FU: 8 months	<ul style="list-style-type: none"> • Post-traumatic stress • Optimism • Professional self-efficacy • Resilience • Compassion fatigue • Burnout • Compassion satisfaction 	Moderate
Gaggioli ²⁰ Italy	Block RCT	121; 43% male	Teachers; Nurses	Virtual reality therapy Control: CBT stress management sessions	10 x 1 hour sessions for 5 weeks FU: 5 weeks	<ul style="list-style-type: none"> • Anxiety • Perceived stress • Use of emotional support 	Moderate
Allen ²¹ Australia	Uncontrolled pre/post	25; 24% male	Obstetricians / gynaecologists	Balint-style group discussion	6 x 1hr monthly FU: 3 months	<ul style="list-style-type: none"> • Burnout • Secondary traumatic stress • Compassion satisfaction 	Weak
Dreher ²² US	Uncontrolled pre/post study	45; 7% male	Nursing assistants in veterans' long-term care facility	Education about compassion fatigue; coping skills training	1 x 90 minutes education session including self-care skills; 'toolbox' with healthy snacks, pedometer and other lifestyle supports	<ul style="list-style-type: none"> • Compassion fatigue • Burnout • Secondary traumatic stress • Retention rates • Compassion satisfaction 	Weak

Reference, country	Study design	N; % male	Worker group	Intervention	Intensity Follow-up (FU)	Outcomes	Quality rating
					FU: 3 months		
Gracia-Gozalo ²³ Spain	Uncontrolled pre/post	32; 16% male	ICU Healthcare professionals	Mindfulness training	Short (5-8 minutes) daily practices; virtual community support (WhatsApp); daily reminders FU: 8 weeks	<ul style="list-style-type: none"> • Burnout 	Weak
Kapoor ²⁶ US	Cross-sectional study	34; % male not reported	ICU staff	“Sacred pause” ritual after patient’s death to honour lost life and recognise efforts of care team	Retrospective analysis of 70 ‘sacred pause’ rituals	<ul style="list-style-type: none"> • Perceived effect on burnout • Management of emotions • Connection to care team 	Weak
Nouillet ³	Uncontrolled pre/post study	39; 59% male	Clergy	Pastoral crisis intervention comprising: <ul style="list-style-type: none"> • Communication skills • Crisis intervention strategies • Religious /spiritual awareness 	1 x 3-day course FU: 12 months	<ul style="list-style-type: none"> • Burnout • Secondary traumatic stress • Resilience 	Weak

Reference, country	Study design	N; % male	Worker group	Intervention	Intensity Follow-up (FU)	Outcomes	Quality rating
				<ul style="list-style-type: none"> Personal self-care & stress management 			
Orellana-Rios ²⁴ Germany	Uncontrolled pre/post study	28; 25% male	Palliative care teams	Mindfulness	1 x 2hr session; 9 x weekly practice days; CD with guided meditation for home practice FU: 10 weeks	<ul style="list-style-type: none"> Burnout Post-traumatic stress Anxiety Depression Work satisfaction Cortisol levels 	Weak
Pfaff ²⁵ Canada	Uncontrolled pre/post study	27; 1% male	Cancer care staff	Inter-professional compassion fatigue resiliency program	6-week course (weekly sessions) FU: 6 weeks	<ul style="list-style-type: none"> Compassion fatigue Burnout Secondary traumatic stress Compassion satisfaction Clinical stress 	Weak
Ruck ⁴ UK	Controlled pre/post study	91; 100% male	Prison staff	Debriefing Control: no intervention	1 x 2-3hr group session FU: 1 month	<ul style="list-style-type: none"> Post-traumatic stress Anxiety Depression 	Weak

CBT = cognitive behavioural therapy; CI = confidence intervals; FU = follow-up; ICU = intensive care unit; NS = not significant; RCT = randomised controlled trial; SMD = standardised mean difference; UK = United Kingdom; US = United States; ^a Study quality assessed using the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool for quantitative studies.

Table 5. Primary studies key outcomes

Type of intervention	Reference	Intervention effect
Balint-style discussion group	Allen ²¹	6 months post-intervention: Burnout ↓ from median 26 [IQR 21-28] to 23 [IQR 20-26], p=0.01 STS ↓ from median 22 [IQR 20-26] to 20 [IQR 16-21], p=0.008 Compassion satisfaction ↑ from median 37 [IQR 34-39] to 40 [IQR 36-41], p=0.035
Group debriefing session	Ruck ⁴	At 1 month post-intervention (intervention vs control): Avoidance: 53% ↓ vs NS, p<0.01 Emotional arousal: 40% ↓ vs NS, p<0.01 Intrusion: 57% ↓ vs NS, p<0.01 Anxiety: NS Depression: NS
Mindfulness sessions	Gracia-Gozalo ²³	At 8 weeks FU (Pre vs post-intervention): Emotional exhaustion: ↓ (-3.78, p=0.012) ^a Self-compassion: ↑ (3.7, p=0.001) ^a
	Orellana-Rios ²⁴	At 10 weeks FU (Pre vs Post-intervention): Burnout (emotional exhaustion): ↓ 24.2%, p=0.005 Burnout (personal achievement, depersonalisation): NS Post-traumatic stress: ↓ 22.9%, p=0.005 Anxiety: ↓ 20.4%, p=0.022 Depression, emotional regulation: NS Work satisfaction: NS Work enjoyment: ↑ 10.5%, p=0.005

Type of intervention	Reference	Intervention effect
		<p>Cortisol levels: NS</p> <p>76% participants were satisfied or very satisfied with the course</p>
Education & skills training	Dreher ²²	<p>At 3 months FU (Pre vs post-intervention):</p> <p>Burnout: NS</p> <p>Secondary traumatic stress: NS</p> <p>Compassion satisfaction: NS</p> <p>Retention rates: ↑ during 3 month period post-intervention, but not clear if due to intervention</p> <p>49% participants agreed or strongly agreed that the program was useful</p>
	Nouillet ³	<p>At 12 months FU (Pre vs post-intervention):</p> <p>Burnout: ↓ 13.2%, p<0.001; effect size 0.82</p> <p>STS: ↓ 12.4%, p<0.001; effect size 0.81</p> <p>Resilience: ↑ 14.2%, p<0.001; effect size 0.88</p>
	Pfaff ²⁵	<p>At 6 weeks FU (Pre vs post-intervention):</p> <p>Compassion satisfaction: NS</p> <p>Burnout: NS</p> <p>STS: NS</p> <p>Clinical stress: ↓ 29.8%, p=0.005</p>
ERASE-stress program	Berger ²	<p>At 8 months FU (intervention vs control):</p> <p>Post-traumatic stress: ↓ 33.3% vs ↓11.9%, p<0.001</p> <p>Compassion fatigue: ↓ 21.6% vs ↓ 4.4%, p<0.001</p> <p>Burnout: ↓ 19% vs 2.8%, p<0.001</p> <p>Compassion satisfaction: ↑ 18.7% vs 1.3%, p<0.001</p> <p>Professional self-efficacy: ↑ 23.4% vs ↓ 3.2%, p<0.001</p>

Type of intervention	Reference	Intervention effect
		Optimism: ↑ 22.7% vs 0%, p<0.001 Resilience: NS (after adjusting for baseline differences)
Virtual Reality program	Gaggioli ²⁰	At 5 weeks FU (intervention vs control): Anxiety: ↓ 12.4% vs ↓ 0.7%, p<0.05 Use of emotional support: ↑ 14% in intervention vs 0.3% in control, p< 0.05 Perceived stress: NS
'Sacred pause' ritual	Kapoor ²⁶	79% respondents believed ritual brought closure and helped them to overcome feelings of grief, disappointment, failure and loss 73% reported an increased sense of team effort 55% believed the practice has potential to reduce burnout

FU = follow-up; IQR = interquartile range; NS = not significant; STS = secondary traumatic stress; ^a measured by Maslach Burnout Inventory scale

5.5 Limitations and considerations

Although there is an abundance of literature in the cumulative trauma field, good quality, high level evidence of effectiveness of interventions is lacking. The body of evidence that underpins this review is limited by several methodological weaknesses; and some caution is needed in interpreting the findings and determining a way forward.

5.5.1 Quality of the evidence

Overall, the quality of evidence was poor, largely based on weak study design (Level IV, uncontrolled, pre/post studies), predominantly self-selected participants and small sample sizes. Together, these factors introduce a wide range of biases that may overestimate the positive effects of interventions. Very few studies, including those evaluated in systematic reviews, contained a concurrent control group; and even fewer were randomised. Attrition rates and adherence to the intervention protocols were seldom reported in studies, which may also overestimate effectiveness if withdrawals and dropouts are not accounted for in the analyses.

5.5.2 Heterogeneity of the evidence

Heterogeneity across studies was high, with many different types of intervention used to mitigate risks of cumulative trauma. Within specific types of intervention, there was also substantial variability in the intensity, duration and implementation of the intervention. For example, the dose of meditation training ranged from ten minutes self-guided meditation, five days per week (no classes), to 42 hours class time over eight weeks, plus prescribed daily practice for at least 25 minutes. Therefore, it was not possible to identify an optimal protocol for any particular intervention.

5.5.3 Generalisability of the findings

Generalisability of the findings even within occupational groups was difficult to determine as some studies had a very narrow context-specific focus (e.g. nursing assistants in dementia care facilities)²² and others assessed a very broad range of interventions and workers. Study samples were not very representative of specific occupational groups as recruitment protocols relied mainly on self-selection within a single site. There was also a gender imbalance in studies, with males under-represented in healthcare and teaching.

5.5.4 Long-term outcomes

Follow-up periods were usually less than 12 months, so longer-term benefits (> 12 months) are unknown. One study in Awa et al.¹⁶ reported sustained longer term benefits with regular refresher courses in coping skills training sessions. While productivity and absenteeism rates were not reported, these may also require longer follow-up periods to show improvements.

5.5.5 Differential benefits across job roles

There was insufficient evidence to determine whether some job roles within an occupational group gained more benefit compared with others as sub-analyses were not undertaken.

6. SUMMARY & CONCLUSIONS

While recognising that there were many limitations in the research, the best available evidence indicated that there were three types of approaches that have the potential to prevent or mitigate the negative effects of cumulative trauma in the workplace: proactive, ameliorative and reactive interventions.

1. **Proactive interventions** provide a supportive organisational culture to limit exposure to risks: Overall this type of approach had a positive effect.
 - a. **Strongest evidence** supported flexible work schedules and reorganisation of job roles, which empowered staff by giving them a sense of control over their work. The benefits of this systems-oriented strategy were sustained for up to 12 months.
 - b. **Limited evidence** supported professional skills training to enhance competencies for specific job roles. Although a small number of studies reported significant reductions in burnout, most were not statistically significant. However, there was substantial variability in the type, duration and intensity of training and follow-up periods were typically less than six months. Skills training that is targeted to specific job roles and includes ongoing refresher courses may increase the relevance and sustainability of benefits for workers.
 - c. **No supporting evidence** for education to raise the awareness of cumulative trauma, communication skills training, or teacher coaching support. To date, there is no evidence to suggest these interventions are effective on their own. However, they may add benefit as components in a multi-faceted intervention.
2. **Ameliorative interventions** provide early intervention, education and training to reduce the adverse effects of cumulative trauma. There were mixed effects for this type of intervention.
 - a. **Strongest evidence** supported mindfulness training which significantly reduced psychological distress, depression, anxiety and burnout; and increased wellbeing for up to six months. However, staff found it challenging to sustain practice outside working hours. Providing time and opportunity to practice mindfulness and relaxation techniques in working hours may encourage participation and lead to sustained benefits over the longer term.
 - b. **Limited evidence** supported coping and resiliency training and clinical supervision, which reduced stress and burnout in a small number of studies. However, benefits were not statistically significant in most studies. Longer-term benefits were sustained when refresher courses were provided. Supervision and mentoring normalises the psychological and physical responses of exposure to trauma and reduces the stigma, which may be a barrier to help-seeking. In addition, formal recognition of worker's contribution may enhance compassion satisfaction. However, the quality of the supervisory relationship may be a mediating factor in determining effectiveness.
 - c. **No supporting evidence** for peer support mentoring or stress management training. Better quality studies are needed, with stronger study designs and larger sample sizes. Appropriate training in peer support is also needed to facilitate positive interactions with the worker.
3. **Reactive interventions** provide support to help workers experiencing the effects of trauma. The findings for these types of interventions were inconclusive due to limited evidence.

- a. **Limited evidence** supported Balint-style discussion groups and debriefing that provided a safe, non-judgemental environment to discuss challenging work issues. Obstetricians/gynaecologists that participated in the discussion groups reported significantly reduced symptoms of psychological distress and increased compassion satisfaction. Developing a culture of support to avoid distressed individuals from feeling isolated from their peers; and providing opportunities for open and safe discussion in the workplace after traumatic incidents may be beneficial. Prison staff who participated in a formal, structured debriefing session after a traumatic incident reported significantly reduced symptoms of distress. Voluntary participation (versus mandatory attendance) may mediate the effects of debriefing.
4. **Context-specific and multi-faceted interventions** were promising when they were targeted to a specific occupational group or work setting. For example, the ‘pastoral crisis’ intervention’ for clergy was an effective multi-faceted intervention that demonstrated significant improvements in participants’ resilience and symptoms of cumulative trauma. Interventions that are targeted to a specific setting or occupational group may encourage participation if workers perceive it as relevant to their roles. Multi-faceted interventions that incorporate elements of different approaches recognise the complex array of risk factors and pathways that lead to cumulative trauma and the different ways individuals react to stressful situations.

Amongst **healthcare professionals**, the best available evidence supported flexible working conditions and mindfulness training, followed by training in professional skills, coping and resilience. Similarly, in **teachers**, the best available evidence supported flexible working conditions, with limited evidence to support pay and promotion incentives, and cognitive behavioural therapy. The ERASE-Stress intervention was promising as it significantly reduced symptoms of PTSD, compassion fatigue, and burnout; and increased compassion satisfaction in teachers exposed directly to trauma and dealing with traumatised students after Christchurch earthquakes. While this intervention was specifically designed for teachers in this setting, it may have broader relevance for teachers in areas of disadvantage. Amongst **social workers**, evidence also suggested that flexible work schedules; clinical supervision; coping skills training; relaxation techniques; and cognitive behavioural therapy significantly reduced burnout.

6.1 Implications of the findings

A workplace culture that recognises the seriousness of cumulative trauma and acknowledges that it is not just “part of the job” is more likely to reduce the risks of exposure to cumulative trauma. In particular, providing flexibility in working conditions and job tasks at a system-level empowers and protects individuals. However, no single intervention is effective for all workplaces. Workplaces should consider tailoring interventions to their specific setting or offering more than one type of approach to address the different needs of workers. Workers may also benefit from relevant professional skills training that enhances self-efficacy in their job roles; as well as access to a safe and appropriate channel to raise concerns and seek help if they become distressed.

Different strategies may be provided in parallel, or combined in multi-faceted approaches that include elements across the various categories; and allow workers time and opportunity to access relaxation therapies or support as needed may reduce the impact of cumulative trauma.

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8. APPENDIX

Table 6. List of common instruments used to measure effects of cumulative trauma

Instruments	Details
Beck Depression Inventory (BDI) ^{14, 18}	Depression: 21 items
Connor-Davidson Resilience Scale ^{2, 3}	Resilience: 25 items Modified 10-item (Figure 2) and 2-item scales also available.
Depression, Anxiety & Stress Scale (DASS) ¹⁴	Depression, anxiety and stress: 21 items
Five facets of mindfulness ^{11, 23}	Mindfulness: Observation; description; acting with awareness; non-judging inner experience; non-reactivity to inner experience
Generalised Anxiety & Depression scale (GAD) ⁴	Depression & anxiety: 7 items
Hospital Anxiety & Depression Scale (HADS) ^{14, 24}	Anxiety & depression: 14 items
Impact of Event Scale – Extended (IESE) ⁴	Subjective distress caused by trauma: 22 items
Index of Clinical Stress (ICS) ²⁵	Clinical stress: 25 items
Maslach Burnout Inventory (MBI) ^{1, 11, 14, 16-18, 23, 24}	Burnout: emotional exhaustion; depersonalisation; personal achievement; 22 items
Nursing Stress Scale (NSS) ¹⁸	Burnout, job satisfaction, turnover, and patient care in nurses: 34 items
Occupational stress inventory ¹	Occupational role, personal strain, personal resources: 14 items
Perceived stress scale (PSS) ^{11, 14, 20, 24}	Anxiety: 10 items
Professional Quality of Life: Compassion Satisfaction and Fatigue (ProQOL) ^{2, 14, 18, 21, 22, 25}	Positive and negative effects of working in stressful environments: 30 items
Psychological stress measure ²⁰	Anxiety: 49 items
Self-compassion scale (SCS) ²³	Self-compassion: 12-items
Silencing Response Scale (SRS) ²⁵	Compassion fatigue: 15-item self-report scale that measures communication issues in helping professional work environments
State Trait Anxiety Inventory (STAI) ^{14, 18, 20}	Anxiety: 2 scales x 20 items
Visual Analogue Scale for anxiety (VAS) ²⁰	Anxiety: horizontal line with descriptors from ‘no anxiety’ to ‘very severe anxiety’

Figure 2. 10-item Resilience scale

Connor-Davidson Resilience Scale 10

	not true at all 0	rarely true 1	sometimes true 2	often true 3	true nearly all the time 4
1. I am able to adapt when changes occur					
2. I can deal with whatever comes my way					
3. I try to see the humorous side of things when I am faced with problems					
4. Having to cope with stress can make me stronger					
5. I tend to bounce back after illness, injury or other hardships					
6. I believe I can achieve my goals, even if there are obstacles					
7. Under pressure, I stay focused and think clearly					
8. I am not easily discouraged by failure					
9. I think of myself as a strong person when dealing with life's challenges and difficulties					
10. I am able to handle unpleasant or painful feelings like sadness, fear and anger					