

# **A Systematic Review of Interventions to Reduce Burnout Among Human Service Workers**

by

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University of Pittsburgh, 2020

### **Abstract**

**Background:** Burnout among human service professionals is a significant public health problem. While systematic reviews on this topic have been conducted, there remains a need for a critical synthesis of intervention studies to prevent or treat burnout in this population that include recent literature and an evaluation of study quality.

**Objectives of review:** This review aims to answer the following questions: 1) What is the state and quality of evidence that exists regarding burnout interventions for human service workers? 2) What are the best supported interventions to prevent or reduce burnout among human service workers at the individual and organizational levels based on current evidence? 3) What are the gaps in evidence in the existing literature on burnout interventions for human service workers?

**Data sources:** The data sources for this review include publications in PubMed, PsychInfo, and Medline.

**Eligibility Criteria:** Studies were eligible if they were English-language and published in a peer-reviewed journal.

**Participants:** The population of interest were human service workers. For the purposes of this review, nursing personnel, physicians, students and trainees were excluded.

**Interventions:** Studies were included if a primary or secondary outcome of the intervention was to prevent or reduce burnout or a dimension of burnout and if there were quantitative pre and post intervention measures of burnout.

**Study appraisal and synthesis methods:** Study characteristics were synthesized into tables and a narrative format and methodologies were evaluated using the EPHP Quality Assessment Tool.

**Results:** The final set of publications included 108 interventions at the individual level, 28 at the organizational level, and 6 with components at both levels. Few included publications had moderate or higher risk of bias ratings.

**Limitations:** The primary limitations of this review were that it was carried about by a single person and may have missed potentially relevant studies.

**Conclusions and implications of key findings:** There is a need for further, more robust research on interventions at all three levels. Mindfulness-based interventions show promise at reducing burnout at the individual level, but still need further research on diverse samples and with greater follow-up.

**Systematic review registration number:** The review was not registered.

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## **Preface**

Burnout is an increasingly popular research topic, and I imagine that this is for reasons personal to many researchers, and I am no exception. Burnout is a condition I have seen in myself and in many of my colleagues throughout my work, internships and studies. My passion to understand, prevent, and treat this condition in individuals and in organizations extends beyond the work of this thesis. I plan for this thesis to act as a springboard as I continue efforts in this area throughout my career.

My thesis, and my education, would not have been possible without support. I would like to thank my family and friends for allowing me to neglect them for the last three years while I have pursued my degrees. I would like to especially thank my mother and my husband for going above and beyond in their support for my education and this thesis process. I would like to thank my dedicated teachers and committee members who have also supported my efforts. The support I have received has been instrumental. Thank you!

## 1.0 Introduction

Burnout, defined as a condition due to work-related stress that is characterized by emotional exhaustion, depersonalization, or reduced sense of accomplishment, is a significant public health program. Burnout can lead to poor health outcomes for providers, such as heart disease, poor outcomes for patients, such as medical errors, and poor outcomes for businesses, such as increased costs due to turnover. Many professionals in the human services sector are at risk for burnout. Numerous interventions exist to prevent or treat burnout in this population. While researchers have conducted systematic reviews in the past on interventions to prevent or treat burnout, these reviews have only targeted specific populations such as nursing personnel or physicians, specific intervention types such as physical activity-based interventions, did not include recent publications, or did not evaluate quality of included publications. To address these gaps, the focus of this review is to synthesize and evaluate the quality of published interventions to prevent or treat burnout among human service workers. The following review will establish that while the number of intervention studies on the topic of burnout has increased substantially in the last decade, the need remains for more robust examinations of existing interventions that include organizational, individual, and multilevel components. This is largely due to limited number of publications at the multi-level and poor risk of bias ratings of many studies at the organizational and individual level. While mindfulness-based interventions show promise for reducing burnout at the individual level, the need remains for further robust research with more diverse samples and with longer follow-up after the intervention.

## **1.1 What is Burnout?**

Staff burn-out was first described in publication by psychoanalyst Herbert J. Freudenberger in 1974.<sup>1</sup> Freudenberger described the condition as a set of symptoms due to excessive work demands. Freudenberger identified that the burnout experience included exhaustion and looked similar to depression.<sup>1</sup> In 1981, Christina Maslach clarified the definition of burnout and published what is now one of the mostly widely used instruments to measure burnout, the Maslach Burnout Inventory (MBI).<sup>2</sup>

Currently, burnout is defined as a condition due to work-related stress characterized by dimensions of emotional exhaustion, depersonalization (or cynicism), and reduced sense of accomplishment (or lack of professional efficacy).<sup>3,4</sup> Exhaustion is defined as “the feeling of being emotionally drained and physically overextended; energy is lacking and mood is low” (page 29).<sup>4</sup> Cynicism, or depersonalization, is defined as “a distant and callous attitude toward one's job” in which “the individual is de-motivated and withdraws from his/her work” (page 29).<sup>4</sup> Lack of professional efficacy involves “feelings of inadequacy and incompetence associated with loss of self-confidence” (page 29).<sup>4</sup> While a widely recognized condition, there is no DSM-5 diagnostic code for burnout<sup>5</sup> and no clinical criteria for identifying it.<sup>3,6</sup>

## **1.2 Distinguishing Burnout from Depression and Anxiety**

Researchers who study burnout have identified a lack of clarity between burnout and anxiety, and burnout and depression, particularly when considering the burnout dimension of emotional exhaustion.<sup>4,6,7</sup> In addition, prior studies have identified that burnout and depression can

both act as a precursor to the other,<sup>4</sup> which contributes to some confusion about the relationship between these constructs. Several researchers have sought to clarify the relationships between burnout, depression, and anxiety. In a systematic review and meta-analysis, Koutsimani and colleagues found a significant association between burnout and depression ( $r = 0.520$ ) and between burnout and anxiety ( $r = .460$ ).<sup>6</sup> Their results indicate that while relationships exist between these constructs, they are still distinct, at least in published literature.<sup>6</sup> In a systematic review, Bianchi and colleagues found that factor analysis studies tend to identify burnout and depression as distinct factors, although this may be due to reasons other than the factors being distinct concepts.<sup>4</sup> Bianchi and colleagues identified that the factoring studies often used scales with different time frames and response options in their analysis which could affect the results.<sup>4</sup> The results of these and other studies indicate that the relationship between burnout and depression in part depends on how they are conceived and measured.<sup>7</sup> This limitation points to the need for further research to examine the relationship between burnout and depression.

Finally, Bakusic and colleagues conducted a systematic review to examine the relationship between depression and burnout or work/psychosocial stress on DNA methylation.<sup>7</sup> Published literature frequently focused on GR encoding in NR3C1, an HPA-axis related gene. While some literature appears to support a distinction between depression and work stress in GR encoding or cortisol activity, such as increased GR expression associated with job stress and reduced activation among those with major depressive disorder, Bakusic and colleagues report that more research is needed on the relationship between GR encoding, depression, and burnout.<sup>7</sup> In addition, publications frequently examined depression, burnout and SLC6A4, a serotonin transporter gene. Both depression and burnout were associated with SLC6A4 hypermethylation. Interestingly, while carriers of the short allele in the 5-HTTLPR promotor region exhibit more depressive symptoms

in the literature than those with the long allele; the relationship between SL6A4 hypermethylation and burnout remained regardless of 5HTTLPR allele genotype suggesting the greater importance of environmental factors in the burnout pathway relative to depression.<sup>7</sup> The importance of environment in the burnout pathway points to the potential of environmental modification as a target for intervention to prevent or reduce burnout in workers.

### **1.3 Why Does Burnout Matter? Public Health Significance**

Burnout can lead to adverse health outcomes for care providers and patients as well as increased costs for businesses. In a review of prospective studies, Salvagioni and colleagues found that burnout was consistently associated with adverse health outcomes for workers such as coronary heart disease, gastrointestinal issues, fatigue, and pain.<sup>8</sup> Worker burnout is associated with adverse outcomes for patients such as medical errors, poor patient care,<sup>9,10</sup> and decreased patient satisfaction.<sup>10</sup> The Triple Aim is a framework designed to improve population health through a focus on improving health, improving patient experiences and reducing costs. While this framework has been increasingly adapted in care practices, burnout in staff limits the ability to provide adequate care. The relationship between staff burnout and poorer quality care for patients has led to some calling for a Quadruple Aim, in which improving work life of care providers becomes an additional main objective for health care organizations.<sup>11</sup> Finally, burnout hurts businesses. Burnout leads to lower work productivity<sup>9,12-14</sup> and increased turnover,<sup>15,16</sup> absenteeism, and poor job performance;<sup>16</sup> all of which can in turn increase costs for employers.<sup>15,17</sup> Burnout has a reinforcing relationship with work pressure, in which burnout can lead to poorer performance and therefore greater job demands, and then more burnout in response to

corresponding increases in work pressure.<sup>16</sup> This cyclical pattern within burnout points to the need for intervention in order to stop or reverse this reinforcing loop and improve outcomes for staff, patients, and businesses.

#### **1.4 Who is at Risk for Burnout?**

Definitionally, Burnout is found frequently in “caring and social professions” such as in social workers, health care providers, and teachers.<sup>3</sup> The prevalence of burnout varies by profession and measure used. Prior studies report that 0-80.5% of physicians,<sup>18</sup> 15-31% of primary care nurses,<sup>19</sup> 17.3% of palliative care professionals,<sup>20</sup> 26% of dental staff,<sup>21</sup> 27% of palliative social workers,<sup>20</sup> 6%-47% of intensive care unit professionals,<sup>22</sup> 50% of anesthesiologists,<sup>23</sup> 55% of psychotherapists,<sup>24</sup> and 55% of emergency medicine physicians,<sup>23</sup> may be experiencing burnout.

Several individual factors have been found to be associated with development of burnout, such as adolescent socioeconomic status, personality traits, self-efficacy, optimism and self-esteem.<sup>16</sup> One of the most consistent individual factors associated with burnout is age. Younger age is a predictor of burnout in psychotherapists, dentists, anesthesiologists, and intensive care unit professionals.<sup>21-24</sup> In addition, less work experience was a predictor of burnout in psychotherapists and intensive care unit professionals.<sup>22,24</sup> Overinvolvement in client problems, female gender, and greater domestic responsibilities, are associated with greater risk of burnout in psychotherapists.<sup>24</sup> Personality traits such as neuroticism, rigid thinking style, excessive conscientiousness, perfectionism are associated with greater burnout in psychotherapists.<sup>24</sup>

In addition to demographic factors, situational factors or work characteristics have been found to be associated with development of burnout such as job demands or workload,<sup>16,23,25</sup> lack

of job resources,<sup>16,25</sup> stressful events,<sup>16</sup> role ambiguity,<sup>16</sup> interpersonal demands,<sup>25</sup> and job insecurity.<sup>25</sup> In addition, working night shifts, number of working hours, and often dealing with death are all associated with increased burnout in intensive care unit professionals,<sup>22</sup> while supervision and job support are protective against development of burnout in anesthesiologists.<sup>23</sup> In their review on work environment and burnout, Aronsson and colleagues identify the importance of job control, job demands, and workplace social support as precedents to burnout, consistent with the demand-control-support model,<sup>26</sup> in which job stress occurs when psychological demands of job exceed available resources for tasks in the absence of psychosocial support.<sup>27,28</sup> The identification of these as precedents to burnout points to potential targets of an intervention.

### **1.5 Existing Interventions**

Interventions at the individual and organizational level exist to prevent or reduce burnout. Examples of potential interventions at the individual level include skill building in the areas of coping with stress, relaxation, delegation of responsibility, along with increasing hobbies, upholding social support, reducing false expectations, and targeting spirituality.<sup>3</sup> Interventions at the organizational level may include such actions as optimization of job demands and resources, improved supervision of employees, job crafting, supporting employees in engagement of recovery activities,<sup>16</sup> creating a healthy work environment, increasing recognition of performance, training managers, suitability tests, programs for people in specific risk groups, and occupational monitoring such as through check-ins.<sup>3</sup>



## 2.0 Background

### 2.1 Existing Literature

Some of the existing interventions to address burnout among human service workers have been synthesized into reviews in the past. Frequently, these reviews focus on physicians,<sup>9,18,29-33</sup> nurses,<sup>29,34-38</sup> healthcare professionals,<sup>39-44</sup> and emergency staff or other shift workers.<sup>45,46</sup> Other reviews of interventions have addressed burnout in surgeons,<sup>47</sup> ICU professionals,<sup>48</sup> and dementia care staff.<sup>49</sup> In addition to published literature, registered review protocols of systematic reviews on burnout interventions also tend to focus on physicians<sup>50-52</sup> or health care workers.<sup>53,54</sup>

Previous systematic reviews of interventions for burnout often focus on specific types of interventions. Most frequently, they focus on mindfulness-based interventions<sup>42,55-59</sup> or on organizational factors such as policies or care models.<sup>35,36,38,41,45,46,60,61</sup> There have also been reviews of burnout interventions that focused on other interventions including yoga,<sup>39</sup> web-based and mobile applications,<sup>43</sup> physical activity,<sup>62</sup> and psychosocial interventions.<sup>30</sup> Registered systematic review protocols of burnout interventions also tend to focus on specific intervention types including return-to-work interventions,<sup>63</sup> multifactorial rehabilitation programs,<sup>64</sup> Acceptance and Commitment Therapy based interventions,<sup>54</sup> mindfulness-based interventions,<sup>50</sup> and coping strategies.<sup>51</sup>

In reviewing previous literature, the author was able to find two systematic reviews of burnout interventions that did not focus on a specific population or intervention.<sup>65,66</sup> While each of these studies has strengths, there are limitations to each. Korczak, Wastian, and Schneider (2012) reviewed individual therapies for burnout in a search across thirty-one databases.<sup>66</sup> The

authors did evaluate study quality, but they did not include prevention interventions or non-therapeutic interventions to treat burnout and had a relatively small range of publication dates included in their review (2006 to 2011). Awa, Plaumann, and Walter (2010) reviewed intervention studies published in three databases and divided published studies into person-directed, organization-directed, or a combination of both.<sup>65</sup> While the authors included interventions at multiple socioecological levels, they did not evaluate quality of study methodology and did not review any articles published prior to 1995 or after 2007. Even though interest in preventing and treating burnout has increased over the years, the need remains for a critical review of both therapeutic and non-therapeutic interventions at multiple socioecological levels, that includes an evaluation of study methods, and includes more recent publications.

## **2.2 The Purpose of this Review**

The purpose of this systematic review is to critically synthesize the literature on interventions to prevent or treat burnout among human service workers. To guide this synthesis, this review aims to answer the following questions: 1) What is the state and quality of evidence that exists regarding burnout interventions for human service workers? 2) What are the best supported interventions to prevent or reduce burnout among human service workers at the individual and organizational levels based on current evidence? 3) What are the gaps in evidence in the existing literature on burnout interventions for human service workers?

This review should conclude in one or more of the following: 1) recommendations for evidence supported interventions at the individual and organizational level to prevent or treat burnout in human service workers, 2) recommendations for more rigorous effectiveness studies of

existing interventions, 3) recommendations for effectiveness studies in unstudied populations, or 4) recommendations to develop interventions for burnout. Ultimately, this review and subsequent recommendations will help further our understanding of burnout and its prevention and treatment in human service workers.

### **3.0 Methods**

This systematic review is based on the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) methodology.<sup>67</sup>

#### **3.1 Protocol Registration**

There are no other protocols in PROSPERO looking at burnout interventions for a general human services population as of January 14, 2020. The review methods were submitted to PROSPERO on February 1, 2020, but were not published or assigned a registration number by the time of the defense.

#### **3.2 Search Strategy**

In January 2020, the author searched PubMed, PsychInfo, and Medline for English peer-reviewed articles and abstracts that had interventions that targeted burnout and were published prior to 2020.

In each database, the author filtered for English and used the key concepts: *intervention, prevention, treatment, and burnout*. Search terms in each database included MeSH terms for burnout in the article title or abstract with intervention, treatment, or prevention in the title or abstract. Searches by database are listed in Table 1.

**Table 1 Search Terms Used in Literature Search**

| <b>Database</b> | <b>Search terms</b>  |
|-----------------|--|
| PubMed          | (Burnout, Professional[mesh:noexp] OR Burnout, Psychological[mesh:noexp] OR burnout[tiab]) AND (intervention[tiab] OR prevention[tiab] OR treatment[tiab]) AND English[la] |
| PsychInfo       | ab(burnout) AND (ab(intervention) OR ab(prevention) OR ab(treatment))  |
| MEDLINE         | AB burnout AND (AB intervention OR AB treatment OR AB prevention)  |

The author uploaded potentially relevant citations into a reference management software that automatically excluded duplicates. After the initial search, the author reviewed the abstracts for inclusion and exclusion criteria. The author then obtained full-articles of remaining studies and reviewed full-texts for inclusion and exclusion criteria. The author initially planned to hand-search the references of each selected study for potentially missed articles. However, due to the unexpectedly large volume of full articles that met inclusion criteria from the database search, the author made a post-hoc decision not to conduct the hand search of references. After the final selection of articles, the author then reviewed the included articles and categorized the interventions as A) prevention, treatment, or both; and B) occurring at the organizational level, individual level, or both in a spreadsheet.

### **3.3 Definitions**

For this review, burnout was defined as a condition due to work-related stress characterized by dimensions of emotional exhaustion, depersonalization (or cynicism), and reduced sense of accomplishment (or lack of professional efficacy).

For the purposes of this review, human service workers were defined as individuals who work directly with patients, clients, or consumers to help service recipients meet their needs, such as physical or mental wellness or access to safe housing or regular food. Because interventions to prevent or reduce burnout have already been synthesized recently for nurse and physician populations, these groups were not included in the definition of human service workers for the purpose of this review. While students and trainees also experience burnout, and in some cases student interns or residents are in the same settings as human service workers,<sup>68</sup> interventions to prevent or reduce burnout may not translate well between student and worker populations due to their different settings, experiences, or roles. Therefore, students and trainees were not included in the definition of human service workers for the purpose of this review.

### 3.4 Inclusion and Exclusion Criteria

Articles were included only if they were peer-reviewed journal articles. The inclusion criteria were modeled after the PICO (Population, Intervention, Comparison, Outcome) framework for research questions:

- **Population** targeted was human service workers.
- **Interventions** in which reducing or preventing burnout was a planned focus. There were no restrictions on type, setting, country, or duration of the intervention. Potentially relevant articles were included if they had quantitative pre and post measures of burnout in their study. There were no restrictions on which measure was used to indicate burnout.

- **Comparison** Articles were included regardless of having a comparison or control group.
- **Outcome** of burnout or at least one of the burnout dimensions (emotional exhaustion, depersonalization, or cynicism). Studies that included constructs related to burnout (e.g. work stress, job satisfaction, or intent-to-quit) but that did not explicitly identify burnout as an intended target of the intervention were not included.

Articles were excluded for the following reasons:

1. Not being a peer-reviewed journal article
2. Being a review article or commentary
3. Not targeting human service workers
4. Study sample only included physicians, nurses, trainees, or students.
5. Planned outcome of intervention did not include burnout or one of the dimensions of burnout
6. Not including quantitative pre and post measures of burnout.
7. Not being in English

### **3.5 Risk of Bias**

Study methodologies were evaluated using the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool for Quantitative Studies which has been found to be suitable for systematic reviews,<sup>69</sup> and has higher inter-rater reliability than another widely used tool for assessing risk of bias.<sup>70</sup> The EPHPP Quality Assessment tool involves rating studies using pre-

determined criteria in eight components, namely selection bias, study design, confounders, blinding, data collection methods, withdrawals and dropouts, intervention integrity, and analyses; then creating a global rating for the paper based on the component ratings. Per the EPHPP Quality Assessment Tool, articles received a strong global rating if they had no weak component ratings, a moderate global rating if they had one weak component rating, and a weak global rating if they had two or more weak component ratings. The author created a web-based survey using Qualtrics based on the EPHPP Quality Assessment tool in order to facilitate risk of bias assessment for each study. Results of the risk of bias assessment were synthesized into tables and reported in a narrative format.

### **3.6 Review of Selected Studies**

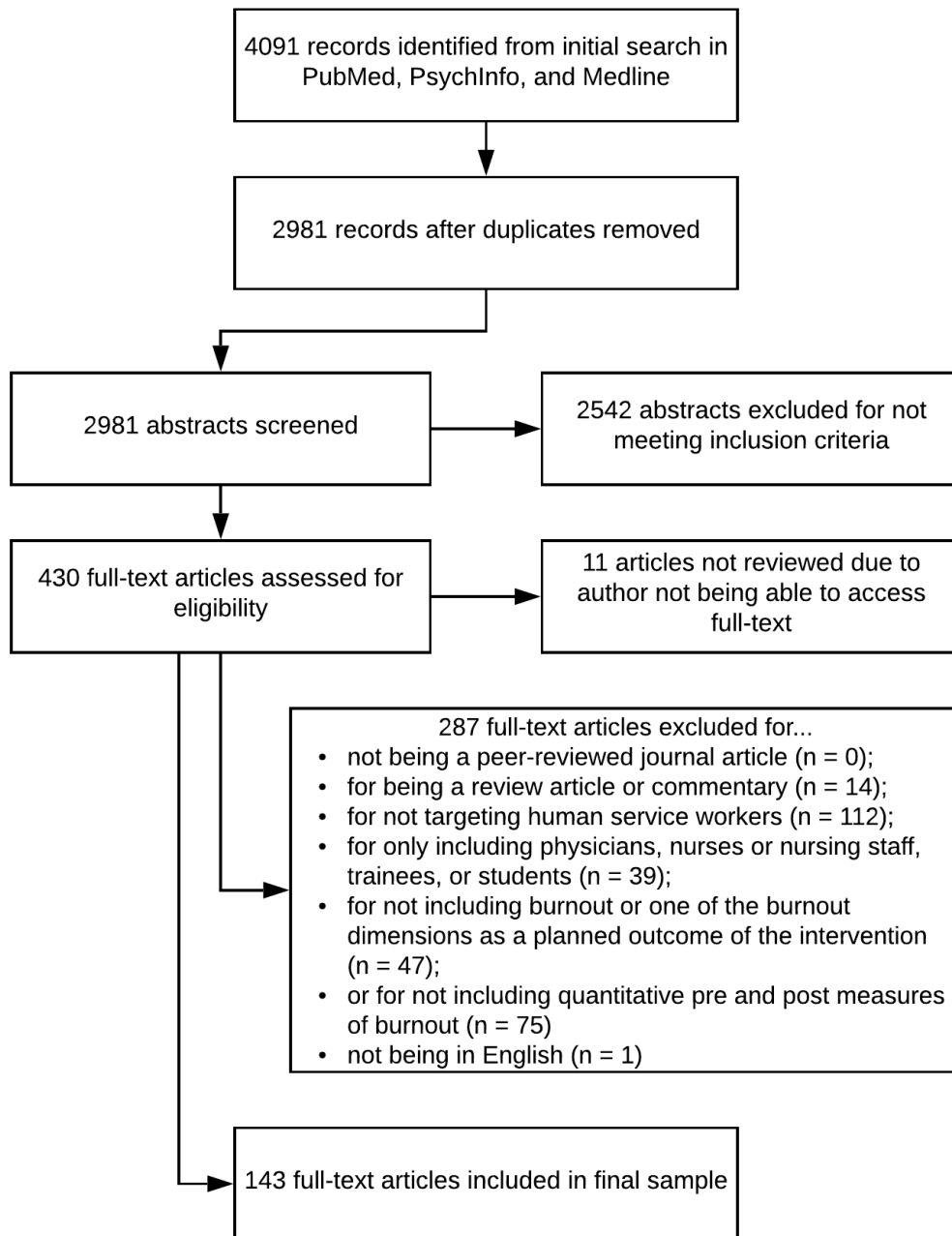
The author then reviewed all articles that met full inclusion criteria for intervention details, duration of intervention, study design, population and setting, measure of burnout, change in burnout, and changes in additional outcomes assessed. The author created a spreadsheet prior to review of study characteristics in order to guide the extraction of information. Study and intervention characteristics were synthesized into tables and a narrative format.



## **4.0 Results**

### **4.1 Search Results**

In the initial search, 1930 records were identified from PubMed, 1497 from PsychInfo, and 664 from Medline. After uploading citations into an electronic reference manager, 2983 records remained after duplicates were removed. The author then screened the abstracts for eligibility and excluded 2542. The author was unable to obtain full versions of 11 articles. The remaining full articles were reviewed for inclusion and exclusion criteria with zero excluded for not being a peer-reviewed journal article; 14 excluded for being a review article or commentary; 112 excluded for not targeting human service workers; 39 excluded for only including physicians, nursing staff, trainees, or students; 47 excluded for not having interventions in which preventing or reducing burnout or one of the burnout dimensions was a planned outcome of the study; and 75 excluded for not including quantitative pre and post measures of burnout. After the review of full-texts, 143 articles remained and were included in the final sample. A flowchart of the systematic review process is in Figure 1.



**Figure 1 Flowchart of Systematic Review Process**

The final sample of articles were published between 1996 and 2019. Articles were categorized by level of intervention (organizational, individual, or both) and whether the

intervention was designed to prevent burnout, treat burnout or both. There were 28 articles with interventions at the organizational level, six that had both organizational and individual level components, and 107 that included components at the individual level. Of the included articles, 11 were intended to treat burnout. This designation was determined when the authors only delivered the intervention to subjects who were identified as experiencing burnout or a related construct. All the articles with interventions designed to treat burnout occurred at the individual level. The categorization of articles by level and type of intervention are depicted in Figure 3.

**Level of Intervention in Study**

|  |                          | <b>Organizational</b> | <b>Multi-level</b> | <b>Individual</b> |
|--|--------------------------|-----------------------|--------------------|-------------------|
| <b>Target of Intervention on Burnout</b> | <b>Treatment</b>         | 0 articles            | 0 articles         | 11 articles       |
|  | <b>Prevent and Treat</b> | 0 articles            | 0 articles         | 0 articles        |
|  | <b>Prevention</b>        | 28 articles           | 6 articles         | 96 articles       |

**Figure 2 Types of Interventions Included In Review**

Risk of bias component and global ratings are reported in Tables 3, 5, 6, and 8. Characteristics of each study including population characteristics and sample size, intervention characteristics, study design, follow-up period, measure of burnout, and change in burnout are reported in Tables 2, 4, and 7. Additional outcome variables are characterized in Appendix Tables 1-4. In Appendix Table 1, outcomes related to the agency or organizational as well as employee perceptions of their workplace are summarized. In Appendix Table 2, employee attitudes, cognitions, and perceptions of issues relating to work, such as self-efficacy and attitudes toward patient families, are summarized. In Appendix Table 3, employee physical health outcomes and mental health outcomes are summarized. Finally, in Appendix Table 4, outcomes for patients, families, consumers, and students are summarized. Outcomes were described as positive, negative or neutral depending on their associated direction with the intervention relative to the control or comparison group or between the baseline and follow-up period. For example, if the intervention was associated with a greater decrease in burnout compared to a group without the intervention, it would be characterized as negative regarding burnout. If an intervention had no comparison group but was associated with an increase in job satisfaction compared to baseline, it would be characterized as positive regarding job satisfaction.

## **4.2 Evidence Synthesis**

### **4.2.1 Organizational Level Studies**

Twenty-eight articles described 27 interventions at the organizational level, in that they attempted to create changes to the work-environment of the employee. Study characteristics of

organizational level studies are summarized in Table 2. These interventions most frequently took the form of policy, process, workflow, or communication changes to the organization, team or unit.<sup>71-89</sup> Several organizational interventions took the form of adding structural support or resources to reduce job demand or increase resources available to the employee.<sup>90-96</sup> Finally, two organizational interventions targeted management and supervision in order to improve their support to employees.<sup>97,98</sup> Of interventions with a known duration, the interventions ranged from a three-day workshop for supervisors<sup>97</sup> to over four years to implement changes to organizational intervention model.<sup>79</sup>

**Table 2 Organizational Level Intervention Study Characteristics\***

| <b>Study</b>    | <b>Intervention (duration)</b>  | <b>Study Design (follow-up period)</b>             | <b>Population and sample size</b>  | <b>Setting</b>                                       | <b>Measure of Burnout</b>   | <b>Change in Burnout</b>  |
|-----------------|---|--|--|--|-----------------------------|---|
| Andersen 2010   | Institutional reorganization, revisions of decision making, information systems, communication and other changes with aid from a consultant to facilitate changes (all interventions occurred between baseline and first follow-up) | Cohort (3 years, 5 years)                          | Staff in human service organizations (n = 1868 at baseline, 1665 at final follow-up)                               | Organizations in the human services sector (Denmark) | CBI                         | Increase in burnout at first follow-up and decrease at second follow-up |
| Angelo 2013     | Leadership stress management workshop for middle supervisors (3 days)   | Cohort analytic (4 months)                         | Firefighters (treatment = 67 at baseline/follow-up; control = 37 at baseline/follow-up)                            | National Firefighters School (Portugal)              | MBI-GS, EE and DP subscales | No change in DP or EE   |
| Blumenthal 2011 | Weekly group consultation with psychotherapist (1 year)   | Cohort analytic (timing of follow-up not reported) | Direct care workers (Intervention = 33 at baseline, 16 at follow-up; Comparison = 32 at baseline, 16 at follow-up) | High security inpatient psychiatric hospital (UK)    | MBI                         | Decrease in DP, no change in EE or PA                                   |
| Corrigan 1997   | Monthly staff meetings for quality improvement and education (8 months)   | Cohort (immediately post)                          | MHWs (n = 35)  | Psychiatric residential programs (US)                | MBI                         | Decrease in EE, no change in PA or DP                                   |
| Davidson 2017   | Code Lavender kits (sensory comfort items, employee health referral information, and encouraging quotes on a card)  | Cohort (3 months)                                  | HCWs (n = 163 at baseline, 83 at follow-up)  | University teaching hospital (San Diego, CA, US)     | ProQol                      | No change in burnout  |
| Forsgarde 2000  | Ethical discussion groups (2-3 hours, once per month, 12-18 months)   | Cohort analytic (12-18 months after baseline)      | Medical and care staff (Treatment = 41 at baseline, 40 at follow-up;   | Shelter housing, nursing homes, retirement homes,    | MBI                         | No change in EE, DP, or PA  |

**Table 2 Continued**

|                    |  |  |   |  |   |   |
|--------------------|--|--|---|--|---|---|
|                    |  |  | Comparison = 43 at baseline, 53 at follow-up)   | and group dwellings for elderly or intellectually disabled people (Sweden)   |   |   |
| Ginex 2018         | Animal-facilitated therapy (AFT) on the unit for patients and staff  | Cohort (6 weeks)   | HCWs (n = 41)   | Surgical oncology unit (US)  | ProQol                                      | No change in burnout                            |
| Graham 2019        | Code Lavender with Caregiver Support Team - emotional first aid and triage intervention for clinicians in healthcare environment provided by trained peers | Cohort (3 months)  | HCWs (baseline = 164, code lavender alone = 83, follow-up = 75)   | Academic medical center (San Diego, CA, US)  | ProQol                                      | No change in burnout                            |
| Hung 2018          | Lean-based workflow redesigns in primary care practices (2 years)  | Cohort (Varied by site, follow-up 5 months - 3 years after intervention) | Primary care physicians and staff (n = 970 at baseline, 860 at follow-up)   | Nonprofit ambulatory care system (US)  | MBI-HSS                                     | Increase in EE, decrease in DP, no change in PA |
| Kazak 1996         | Implementation of pediatric Leukemia intervention for procedural pain  | 3-arm RCT with additional comparison group (8 months, 18 months)         | HCWs (n = 61 provided data at all data points)  | Division of Oncology in large, urban, pediatric teaching hospital and the Pain Management Team in the hospital (US)\ | MBI   | Decrease in DP, no change in EE or PA           |
| Le Blanc 2007      | Team based burnout intervention program (Take Care!) using Participatory Action Research Model (6 months)  | Cluster RCT (immediately post, 6 months)                                 | Direct care oncology care providers (Treatment = 260 at baseline, 208 at 6 months; control = 404 at baseline, 96 at 6 months) | Oncology wards in general hospitals (Netherlands)  | MBI-HSS EE and DP subscales (Dutch version) | Decrease in EE and DP                           |
| Leiter 2011 & 2012 | Civility, Respect, and Engagement at Work (CREW) intervention involving facilitated, weekly meetings to help improve civility between coworkers (6 months) | Cohort analytic (unit based; 1 year (Leiter 2011, 2-year Lieter 2012))   | HCWs (Intervention = 262 at baseline, 181 at 1-year follow-up, 196 at 2-year follow-up; Control = 911 at baseline, 726 at 1   | Health authorities and hospitals (Nova Scotia and Ontario, Canada)   | MBI-GS                                      | No change in EE or PA, decrease in DP           |

**Table 2 Continued**

|                      |   |  |  |  |                                       |  |
|----------------------|---|--|--|--|---------------------------------------|--|
|                      |   |  | year follow-up, 447 in 2 year follow-up)   |  |                                       |  |
| Madede 2017          | Intervention 1: HR management training and supervision and support skills training for direct managers; Intervention 2: Intervention 1 with added action learning sets for supervisors at the district and facility level (2 years) | 3-arm cohort analytic (2 interventions and 1 control; immediately post intervention) | Health workers (Intervention 1 = 22 at baseline, 11 at follow-up; Intervention 2 = 22 at baseline, 20 at follow-up; Control = 48 at baseline, 18 at follow-up) | Health facilities (Niassa, Mozambique)                             | MBI EE subscale                       | Intervention 1: No change in EE; Intervention 2: No change in EE |
| Menon 2015           | Transformation of service model into a single point of access (1 month)   | Cohort (10 months)   | Clinicians and administrative staff (Baseline = 49, follow-up = 50)  | Crisis Resolution and Home Treatment (CRHT) teams (Leeds, England) | MBI-HSS                               | No change  |
| Nocon 2019           | Collaborative learning sessions and on-site coaching to implement patient-centered medical home model (over 4 years)  | Cohort (immediately post intervention)   | Providers and staff (N = 536 at baseline, and 589 at follow-up)  | Primary care centers (US)  | Single item question                  | Decrease in burnout for providers, no change for staff           |
| O'Riordan 2019       | Posters promoting self-care, team bonding sessions, and end of shift meetings (6 months)  | Cohort (6 months)  | Obstetricians (28 at baseline; excluded from analysis due to lack of interest) and midwives (69 at baseline, 5 completed both pre and post measures)           | Delivery suite at Cork University Maternity Hospital (Ireland)     | MBI, ProQol                           | Decrease in burnout (ProQol); No change in EE, DP, or PA         |
| Ponzin 2015          | Sailing team-building activity (9 days total)   | Cohort (follow-up timing not reported)   | HCWs (n = 20 pre and post)   | Organ and tissue procurement organization (Veneto Region, Italy)   | MBI-HSS (adapted for Italian workers) | Increase in PA, decrease in EE and DP                            |
| Schrijnemaekers 2003 | Clinical lessons, training and supervision to shift agency model to emotion-oriented care (8 months)  | Cluster RCT (3, 6, and 12-month follow-up)   | Professional caregivers (treatment = 155 at baseline, 126 at 12-month follow-up; control = 145   | Homes for elderly persons (Netherlands)                            | UBOS-C/MBI-NL                         | Increase in PA, no difference in EE or DP                        |



**Table 2 Continued**

|                       |  |  |  |  |  |   |
|-----------------------|--|--|--|--|--|---|
|                       |  |  | at baseline, 116 at 12-month follow-up)  |  |  |   |
| Selamu 2019           | Integration of new mental health service into practice (duration not reported)   | Cohort (6 months)  | HCWs (n = 145, 136 returned questionnaires)  | Primary healthcare facilities (Rural Ethiopia)                 | MBI-HSS  | No change                                       |
| Sieja 2019            | Revised team-process (Sprint) to reduce EHR burden (6 months)  | Cohort (2 week)  | HCWs (119/205 clinicians responded to pre survey, 107 of 205 responded to post-survey)   | Clinicals in integrated health network (Colorado)              | MBI EE Subscale  | No change                                       |
| Smith 2019            | Primary Care Redesign process that improves team-based care strategies (1-2 months to create changes)                                    | Cohort analytic with wait-list control (biannually over 42 months) | Family medicine staff (sample size not reported)   | Family medicine practices (US)                                 | Single item from the Physician Worklife Study                          | Decrease in burnout                             |
| Strolin-Goltzman 2009 | Facilitated employee work teams to identify and solve problems related to turnover and poor outcomes for clients (duration not reported) | Cohort analytic (follow-up period not reported)                    | Child welfare employees (5 agencies in treatment, 12 in control, sample size of respondents not reported)  | Child welfare agencies (Northeast US)                          | Items on a workforce retention survey adapted from EE questions on MBI | No change                                       |
| Taylor 2012           | Revised service delivery though changing staff behavior (4 months)   | Cohort (8 months)  | Mental health nurses, health care support workers and occupational therapists (n = 28, with 18 returning questionnaires at T1 and 12 returning questionnaires at T2) | In-patient unit for adults with serious mental health problems | MBI  | Decrease in EE, and DP, slight increase in PA   |
| Wolk 2019             | Modules targeting team function competencies, communication and climate (duration not reported)  | Cluster RCT (5 months)   | School mental health teams (control = 3 teams, 13 individuals; treatment = 3 teams, 12 individuals)  | Philadelphia area (US)   | MBI-HSS  | Increase in EE, decrease in PA, no change in DP |

**Table 2 Continued**

|                |  |   |  |  |               |                                     |
|----------------|--|---|--|--|---------------|-------------------------------------|
| Zajac 2017     | Unit-based bereavement debriefs after patient deaths with 24/7 onsite support for staff (3 months)                                   | Cohort (3-month follow-up)  | 136 RNs and oncology care associates   | Medical and blended medical-surgical units in NCI-designated comprehensive cancer center (Midwestern US) | ProQol        | No change                           |
| Zimmerman 2013 | Workshop for families to increase their involvement in patient care, intervention included revised service plan component (6 months) | Cluster RCT (6 months)  | Nurses and direct care staff (control = 202 staff; treatment = 195 staff); residents (control = 258; control = 230); families (control = 258, treatment = 230) | Nursing homes, residential care, and assisted living settings (North Carolina, US)                       | MBI           | Increased PA; no change in EE or DP |
| Zwijssen 2015  | Care program with education and assessment tools to aid staff in evaluation and treatment of challenging behavior (12 months)        | Randomized cluster stepped-wedge cohort analytic (12 months, 20 months) | Care staff (n = 645)   | Dementia care units (Netherlands)  | UBOS-C/MBI-NL | No change                           |

\*BCSQ-12 = Burnout Clinical Subtype Questionnaire (Spanish short version), CBI = Copenhagen Burnout Inventory, Cluster RCT = Cluster randomized controlled trial, CSFST = Compassion Satisfaction/Fatigue Self-Test, DP = Depersonalization or Cynicism dimensions of burnout, EE = Emotional Exhaustion dimension of burnout; HCWs = Health care workers, MBI = Maslach Burnout Inventory, MBI-D = German version of MBI, MBI-ES = MBI Educator Survey, MBI-GS = MBI General Survey, MBI-HSS = MBI Human Services Survey, MHWs = Mental health workers, OLBI = Oldenburg Burnout Inventory, PA = Personal accomplishment or professional efficacy dimension of burnout, PCWs = Personal care workers, ProQol = Professional Quality of Life Scale, SBI = Spanish Burnout Inventory, SMBQ = Shirom Melamed Burnout Questionnaire, TBI = Teachers' Burnout Inventory, TBS = Teacher Burnout Scale, UBOS-C/MBI-NL = Dutch version of the MBI-HSS, UBOS-L = Dutch version of the MBI-ES.

Most organizational level interventions were with health care workers.<sup>73-81,87,91-96,98</sup> Others were with mental health care workers,<sup>72,83-85,87,88</sup> direct or personal care workers,<sup>73,82,89,90,96</sup> workers in human service organizations,<sup>71</sup> firefighters,<sup>97</sup> child welfare workers,<sup>86</sup> and school-based workers.<sup>88</sup> Interventions took place in a variety of settings. Four interventions were with oncology professionals.<sup>75,92,94,95</sup> Two organizational level studies were with staff that work with the elderly or those with dementia.<sup>73,82</sup> One was with individual who work with people with intellectual disabilities.<sup>73</sup> Organizational interventions took place in North America,<sup>72,74,76,77,79,84-86,88,91-96</sup> Europe,<sup>71,73,75,78,80-82,87,89,90,97</sup> and Africa.<sup>83,98</sup>

Most organizational interventions were studied with cohort<sup>71,72,74,78-81,83,84,87,91-93,95</sup> or cohort analytic designs.<sup>73,76,77,85,86,90,97,98</sup> Five organizational level interventions were examined with randomized controlled trial where either individuals<sup>94</sup> or clusters were randomized.<sup>75,82,88,96</sup> One organizational level intervention was examined with a randomized cluster stepped wedge trial.<sup>89</sup> Timing of final follow-up assessments in studies of organizational interventions ranged from immediately following the intervention<sup>72,79,98</sup> to five years after the baseline.<sup>71</sup>

Overall, 12 organizational level interventions were associated with lower levels of burnout on at least one measure or dimension,<sup>72,75-77,79-82,85,87,90,94,96</sup> while 12 were associated with no change.<sup>73,78,83,84,86,89,91-93,95,97,98</sup> In one intervention, there was an increase in burnout.<sup>88</sup> Two interventions were associated with mixed results. In one intervention, burnout increased at the first follow-up and then decreased at the second.<sup>71</sup> In another study, one dimension of burnout improved while another worsened.

Overall, three organizational level intervention studies had moderate global risk of bias ratings,<sup>78,82,97</sup> while the remaining had weak overall ratings (Table 3). Studies tended to score well in study design and data collection, with all studies achieving moderate or strong ratings on study

design, and all but one study achieving moderate or strong on data collection ratings. Many interventions failed to control for potential selection bias or confounders. Ratings on withdrawals were particularly mixed across studies.

**Table 3 Risk of Bias Ratings for Organizational Level Studies**

| <b>Article</b>        | <b>Selection Bias Rating</b> | <b>Design Rating</b> | <b>Confounders Rating</b> | <b>Blinding Rating</b> | <b>Data Collection Rating</b> | <b>Withdrawal Rating</b> | <b>Global Rating</b> |
|-----------------------|------------------------------|----------------------|---------------------------|------------------------|-------------------------------|--------------------------|----------------------|
| Anderson 2010         | Weak                         | Moderate             | Weak                      | Moderate               | Strong                        | Strong                   | Weak                 |
| Angelo 2013           | Weak                         | Strong               | Moderate                  | Moderate               | Strong                        | Strong                   | Moderate             |
| Blumenthal 2011       | Weak                         | Moderate             | Weak                      | Moderate               | Strong                        | Weak                     | Weak                 |
| Corrigan 1997         | Weak                         | Moderate             | Weak                      | Moderate               | Strong                        | Weak                     | Weak                 |
| Davidson 2017         | Weak                         | Moderate             | Weak                      | Weak                   | Strong                        | Weak                     | Weak                 |
| Forsgarde 2000        | Weak                         | Moderate             | Weak                      | Moderate               | Strong                        | Moderate                 | Weak                 |
| Ginex 2018            | Moderate                     | Moderate             | Weak                      | Moderate               | Strong                        | Weak                     | Weak                 |
| Graham 2019           | Weak                         | Moderate             | Weak                      | Moderate               | Strong                        | Strong                   | Weak                 |
| Hung 2018             | Weak                         | Moderate             | Weak                      | Moderate               | Strong                        | Moderate                 | Weak                 |
| Kazak 1996            | Moderate                     | Strong               | Weak                      | Moderate               | Strong                        | Weak                     | Weak                 |
| Le Blanc 2007         | Moderate                     | Strong               | Weak                      | Moderate               | Strong                        | Weak                     | Weak                 |
| Leiter 2011 & 2012    | Weak                         | Moderate             | Weak                      | Moderate               | Strong                        | Moderate                 | Weak                 |
| Madede 2017           | Moderate                     | Moderate             | Weak                      | Moderate               | Strong                        | Weak                     | Weak                 |
| Menon 2015            | Strong                       | Moderate             | Weak                      | Moderate               | Strong                        | Moderate                 | Moderate             |
| Nocon 2019            | Moderate                     | Moderate             | Weak                      | Moderate               | Weak                          | Strong                   | Weak                 |
| O'Riordan 2019        | Moderate                     | Moderate             | Weak                      | Moderate               | Strong                        | Weak                     | Weak                 |
| Ponzin 2015           | Weak                         | Moderate             | Weak                      | Moderate               | Moderate                      | Strong                   | Weak                 |
| Schrijnemaekers 2003  | Strong                       | Strong               | Weak                      | Moderate               | Strong                        | Strong                   | Moderate             |
| Selamu 2019           | Weak                         | Moderate             | Weak                      | Moderate               | Strong                        | Strong                   | Weak                 |
| Sieja 2019            | Weak                         | Moderate             | Weak                      | Moderate               | Strong                        | Weak                     | Weak                 |
| Smith 2019            | Weak                         | Moderate             | Weak                      | Moderate               | Strong                        | Weak                     | Weak                 |
| Strolin-Goltzman 2009 | Weak                         | Strong               | Weak                      | Moderate               | Weak                          | Weak                     | Weak                 |
| Taylor 2012           | Weak                         | Moderate             | Weak                      | Moderate               | Strong                        | Weak                     | Weak                 |
| Wolk 2019             | Weak                         | Strong               | Weak                      | Moderate               | Strong                        | Moderate                 | Weak                 |
| Zajac 2017            | Weak                         | Moderate             | Weak                      | Weak                   | Strong                        | Weak                     | Weak                 |
| Zimmerman 2013        | Moderate                     | Strong               | Weak                      | Moderate               | Strong                        | Weak                     | Weak                 |
| Zwijssen 2015         | Weak                         | Strong               | Weak                      | Moderate               | Strong                        | Weak                     | Weak                 |

#### 4.2.2 Individual Level Studies

One-hundred and eight articles described 107 interventions at the individual level, with 95 interventions aiming to prevent burnout, and 11 studies aiming to treat burnout among those already experiencing it. Individual level intervention studies are summarized in Table 4. Individual intervention studies designed to treat existing burnout most frequently involved therapy or counseling, either at the group or individual level.<sup>99-106</sup> Other individual treatments included mindfulness meditations,<sup>107</sup> skills training,<sup>108</sup> and Qigong.<sup>109</sup> Individual intervention studies designed to prevent burnout most frequently involved some type of individual or group therapy sessions, often utilizing strategies from Cognitive Behavioral Therapy or Acceptance and Commitment Therapy with mindfulness, or teaching individuals to recognize and respond to symptoms of burnout.<sup>110-163</sup> Many of the individual prevention intervention focused on stress reduction techniques, meditation and, frequently, mindfulness-based strategies.<sup>110,111,115-122,124-127,129-134,136,137,139-143,146,147,149-153,157,159,164-167</sup> Individual prevention strategies also were frequently designed to improve employee skills.<sup>134,153,164,168-195</sup> Other individual prevention interventions included physical activity,<sup>137,196-198</sup> activities to encourage self-reflection,<sup>194,199</sup> spending time in nature away from work,<sup>197,200,201</sup> peer support groups,<sup>117</sup> using noise protection at work,<sup>202</sup> acupuncture,<sup>203</sup> reiki,<sup>204</sup> and music or artistic expression.<sup>114,123,151,205,206</sup> Of interventions which durations are known, the duration of individual interventions ranged from a single two-hour training session,<sup>181,182</sup> to 24 months for supervised training and implementation of a new care model.<sup>193</sup>

**Table 4 Individual Level Intervention Study Characteristics\***

| <b>Study</b>     | <b>Prevention, Treatment, or Both</b> | <b>Intervention (duration)</b>  | <b>Study Design (follow-up period)</b>      | <b>Population and sample size</b>  | <b>Setting</b>  | <b>Measure of Burnout</b> | <b>Change in Burnout</b>   |
|------------------|---------------------------------------|---|---|--|---|---------------------------|--|
| Abos 2019        | Prevention                            | Leisure time physical activity intervention (8 months)  | RCT (1 week)                                | Teachers (Treatment = 58 at baseline, 22 at follow-up; Control = 48 at baseline, 35 at follow-up)  | Public secondary schools (Huesca, Aragon, Spain)                        | BCSQ-12                   | No change in overload, lack of development, neglect  |
| Aimola 2018      | Prevention                            | Peer and self-performance review of extent staff meet quality of care standards, training of select staff in good practice in field (~12 weeks) | Cluster RCT (12-month follow-up)            | Inpatient mental healthcare wards (treatment = 30 wards at baseline, 28 at follow-up; control = 45 at baseline, 39 at follow-up; staff N's not reported) | Low secure mental health inpatient (England and Wales)                  | MBI                       | DP higher at follow-up in treatment group compared to control group; no difference in PA or EE |
| Ancona 2014      | Prevention                            | Yoga and mindfulness intervention for teachers (6 sessions over 3 weeks)  | Cluster RCT (immediately post intervention) | Elementary and middle school teachers (Treatment = 21, Control = 22)   | Baltimore city public schools serving low-income neighborhoods (MD, US) | MBI-ES<br>EE subscale     | No change in EE  |
| Askey-Jones 2018 | Prevention                            | Mindfulness-based cognitive therapy course (MBCT) (8 weeks)   | Cohort (immediately post, and 6 months)     | MHWs (N=86 Baseline, 69 at follow-up Tx, 43 completed all measures)  | Mix of inpatient and secondary care (UK)                                | MBI                       | decrease in EE, DP, increase in PA   |
| Barbosa 2015     | Prevention                            | Person centered care-based psychoeducational intervention (8 week)  | Cluster RCT (2 weeks post intervention)     | PCW (Intervention = 27 at baseline, 25 at follow-up; Control = 31 at baseline, 25 at follow-up)  | Long term dementia care units (Portugal)                                | MBI-HSS (Portuguese)      | Decrease in EE, DP and PA null   |

**Table 4 Continued**

|              |            |  |  |   |   |                          |  |
|--------------|------------|--|--|---|---|--------------------------|--|
| Barbosa 2016 | Prevention | Person-Centered Care-Based PE Intervention (8 week)  | Cluster RCT (immediately post, 2 weeks, 6 months)      | PCW (Intervention = 27, 24 at follow-up; Control = 31 at baseline, 29 at follow-up)                                       | Long term dementia care units (Portugal)                                    | MBI-HSS (Portuguese)     | Decrease in EE, DP and PA  |
| Barr 2015    | Prevention | Professional development (5-day seminar with follow-up coaching and workshops)   | Cluster RCT (immediately post intervention)            | Humanities teachers (Treatment = 78 at baseline, 53 at follow-up; Control = 102 at baseline; 60 at follow-up)             | High schools from metropolitan areas (US)                                   | MBI                      | Increase in PA, no change in EE or DP  |
| Berg 2017    | Prevention | Intervention 1: PAX Good Behavior Game; Intervention 2: Intervention 1 and Promoting Alternative Thinking Strategies Program (1 school year) | Three arm cluster RCT (Three follow-ups within 1 year) | Teachers (N = 250, 25% in intervention 1, 29% in intervention 2, and 37% in control)                                      | Elementary schools in a large urban, east coast public school district (US) | Subset of items from MBI | Intervention 1: No change in EE, DP, or PA; Intervention 2: No change in EE, DP, or PA |
| Berry 2012   | Prevention | Workshop to improve care skills (single 3-hour session)  | Cohort (1 month)                                       | MHWs (25 at baseline, 16 completed treatment, 13 completed follow-up)   | Long term low security psychiatric ward aka LSU (UK)                        | MBI                      | Increase in EE, no change in PA or DP  |
| Bethay 2013  | Prevention | Acceptance and Commitment Training (ACT) (3 weekly 3-hour sessions)  | RCT (immediately post and 3 month)                     | Intellectual disability staff (Intervention = 20 at baseline, 18 at follow-up; Control = 18 at baseline, 16 at follow-up) | Residential facility for individuals with intellectual disability (USA)     | MBI-HSS                  | No change in EE, DP, or PA   |
| Brake 2001   | Treatment  | Individual and group counseling sessions to aimed at restoring the balance by obtaining insight in one's own situation and working           | Cohort analytic (1 month, 1 year)                      | Dentists at risk of burnout measured by MBI assessment (Intervention = 19 at baseline/follow-up; Comparison = 75 at       | Dentists identified through a national survey (Netherlands)                 | UBOS-C/MBI-NL            | No change in EE, DP, or PA   |



**Table 4 Continued**

|                |            |   |  |  |   |             |   |
|----------------|------------|---|--|--|---|-------------|---|
|                |            | with a personal plan of action'. (6 months)   |  | baseline, 73 at follow-up)   |   |             |   |
| Breeman 2016   | Prevention | Training and implementation of Good Behavior Game (three 2-hour trainings; 10 coaching sessions)        | Cluster RCT (9 months after start of intervention)   | Teachers (Intervention = 28 at baseline/follow-up; Control = 36 at baseline, 30 at follow-up)          | Special education (Netherlands)   | UBOS-L      | No change in EE, or PC (Personal competence)  |
| Brinkborg 2011 | Prevention | ACT for stress management, Swedish Version (3-hour session every other week x 4 sessions)               | RCT (Pre and 2 weeks post intervention)  | Social workers (Intervention = 70 at baseline, 58 at follow-up; Control = 36 at baseline/follow-up)    | Social workers employed by city of Stockholm (Sweden)                                 | MBI         | Decrease in EE, DP, and PA  |
| Brooker 2013   | Prevention | Training program for Occupational Mindfulness (8 weeks)   | Cohort (immediately post completion of training program)   | Management and direct care workers for a disability support provider (35 at baseline, 29 at follow-up) | Non-government provider of disability services in form of community homes (Australia) | CBI, ProQol | No change in client related, work related, or personal burnout, or burnout (ProQol) |
| Callender 2019 | Treatment  | Mindfulness-based mobile intervention providing mediations of various lengths (The Calm App) (12 weeks) | A-B single case research design with analysis of weekly journal entries (3-week assessment pre, the data collection during 12-week intervention) | Residential and outpatient substance abuse counselors (3 at baseline, 1 at follow-up)                  | Medium sized treatment facility (USA)   | CBI         | Decrease in burnout   |
| Carmel 2014    | Prevention | Training in Dialectical Behavioral Therapy (DBT; 10 days over 13 months)                                | Cohort (13 months)   | Mental health practitioners and substance abuse counselors (n = 9                                      | Large, urban public behavioral health system  | CBI         | Decrease in burnout overall   |

**Table 4 Continued**

|                  |            |  |   |  |  |        |                                       |
|------------------|------------|--|---|--|--|--------|---------------------------------------|
|                  |            |  |   | who completed pre and post measures)   | (North Carolina, US)   |        |                                       |
| Caruso 2013      | Prevention | Training in Cognitive-analytic therapy (2-hour weekly sessions for 5 weeks)                      | Cohort (immediately post and 1 month)                         | MHWs (n = 12)  | Community Rehabilitation Unit which provides residential and care to psychiatric patients (Ferrara, Emilia Romagna Region, north-east Italy) | MBI    | Decrease in EE, increase in PA        |
| Chan 2011        | Prevention | Self-improvement project to improve wellbeing through self-reflection and appreciation (8 weeks) | Cohort (immediately post)                                     | School teachers (n = 63)   | Chinese University of Hong Kong (Hong Kong)  | MBI-ES | No change in EE, DP or PA             |
| Cheek 2003       | Prevention | Music therapy added to CBT treatment (6 weeks)   | RCT (follow-up timing not reported)                           | Teachers (Intervention 1 = 28 at baseline; Intervention 2: 23 at baseline)       | Elementary schools in mid-sized suburban schools district (Southwest, US)  | MBI-ES | Decrease in DP, no change in EE or PA |
| Christopher 2016 | Prevention | Mindfulness-based resilience training (MBRT) (8 weeks)   | Cohort (4 weeks after baseline, immediately after last class) | Law enforcement officers (59 at baseline, 43 at follow-up)                       | Police department in medium sized city (Pacific Northwest, US)   | OLBI   | Decrease in burnout                   |
| Christopher 2018 | Prevention | Mindfulness-based resilience training (MBRT) (8 weeks)   | RCT (immediately post and three month)                        | Law enforcement officers (Treatment = 31 at baseline, 24 at follow-up; Control = | Urban area and surrounding metro (Pacific Northwest US)  | OLBI   | Decrease in burnout                   |

**Table 4 Continued**

|              |            |  |   |   |   |                |  |
|--------------|------------|--|---|---|---|----------------|--|
|              |            |  |   | 30 at baseline, 25 at follow-up)  |   |                |  |
| Cohen 2005   | Prevention | Group-intervention skills training or General hospital social work skills training (each training was 15 sessions) | Cohort analytic (1 month after completion)  | Hospital social workers (n = 15 at baseline, 15 at follow-up)   | Rambam Medical Center (North of Israel) | MBI            | Decrease in DP, increase in PA, no change in EE  |
| Cooley 1996  | Prevention | Intervention 1: Stress-management workshop (2 months); Intervention 2: Peer-collaboration workshop (2 months)      | Randomized cross over design (two interventions received in different order with wait-list group also receiving treatments after a delay) (follow-up period - different for different groups, all received follow-up immediately post interventions, some received follow-up 1 year after baseline) | Special education teachers and related service providers (Treatment first (received both interventions in different order) = 49 at baseline, 43 at follow-up; Waitlist control (also received treatment) = 33 at baseline, 33 at follow-up) | Unknown                                 | MBI            | Decrease in EE, increase in PA, no change in DP  |
| Crowder 2017 | Prevention | Mindfulness Based Stress Reduction (MBSR) (2.5-hour weekly sessions for 8 weeks with 1 full-day weekend session)   | RCT (immediately post, 13 weeks, for both groups, 26 weeks for treatment group)   | Social workers (Intervention = 7 at baseline, 7 at follow-up, control = 7 at baseline, 7 at follow-up)  | Canada                                  | MBI and ProQol | No change in burnout compared to control by week 13, decrease in burnout compared to baseline at week 26, no change in |

**Table 4 Continued**

|                  |            |  |  |  |  |                |   |
|------------------|------------|--|--|--|--|----------------|---|
|                  |            |  |  |  |  |                | EE, DP, or PA in either comparison  |
| Domitrovich 2016 | Prevention | Intervention 1: PAX Good Behavior Game; Intervention 2: Intervention 1 and Promoting Alternative Thinking Strategies Program (1 school year) | Cluster 3-arm RCT (4 assessments, final at end of school year)   | Teachers (n = 350; 25% in intervention 1, 29% in intervention 2, 37% in control)   | Elementary schools (PA, US)  | MBI            | Intervention 1: No change in EE, DP, or PA; Intervention 2: Increase in PA, no change in EE or DP |
| Ducar 2019       | Prevention | Mindfulness for healthcare providers course (8 weeks)  | Single group interrupted time series (2 weeks before, immediately before, 4 weeks into intervention, 8 weeks into intervention, 1 month after, 3 months after, 6 months after) | Emergency medical technicians (n = 15 at baseline, 10 at final follow-up)  | Rural volunteer EMS rescue squad (US)                                | ProQol         | Decrease in burnout   |
| Duchemin 2015    | Prevention | Mindfulness-based intervention (8 weeks)   | RCT (1-week post intervention)   | HCWs (Intervention = 16 at baseline, 16 at follow-up; control = 16 at baseline, 16 at follow-up)   | Surgical intensive care unit of a large academic medical center (US) | MBI and ProQol | No change in EE, DP or PA; ProQol burnout change not reported in results                          |
| Duijts 2008      | Treatment  | Preventative coaching program (7 to 9 1-hour sessions over 6 months)   | RCT (6 and 12 months)  | Employees at risk of sickness related work absence (Treatment = 76 at baseline, 57 at final follow-up; Controls = 75 at baseline, 61 at final follow-up) | Healthcare and education sector (Southeastern part of Netherlands)   | UBOS-A         | Decrease in EE, no change in PA or DP   |

**Table 4 Continued**

|             |            |   |                                      |  |   |                                |  |
|-------------|------------|---|--------------------------------------|--|---|--------------------------------|--|
| Dunne 2019  | Prevention | Attention-based training program (4 sessions over 7 weeks)  | RCT (1 week, 2 months)               | Emergency multidisciplinary team members (Treatment = 22 at baseline, 17 at follow-up; Control = 25 at baseline, 25 at follow-up)  | Large urban hospital (Ireland)                | MBI-HSS                        | Decrease in EE, no change in PA or DP  |
| D'Urso 2019 | Prevention | Stress management intervention including monthly reflective practice groups, team away days, staff drop-in sessions and teaching on managing difficult conversations (9 months) | Cohort (0-1 month post)              | HCWs (n = 160 on unit, ns for measures not reported)   | Level 3 neonatal intensive care unit (London) | ProQol                         | No change in burnout                   |
| Dutton 2017 | Prevention | Holistic Healing Arts Retreat (4 day)   | Cohort (2 weeks, 3-months, 6 months) | Female counselors, advocates and lawyers who deliver services to survivors of child abuse, domestic violence, and sexual assault (n = 18 at baseline, 14 at 6-month follow-up) | Community organizations (Southern CA, US)     | ProQol                         | Decrease in burnout                    |
| Ebert 2014  | Treatment  | Internet-based problem-solving training   | RCT (6 weeks, 3 months, 6 months)    | Teachers with depressive symptoms (Treatment = 75 at baseline, 61 at follow-up; Control = 75 at baseline; 66 at follow-up)   | National sample (Germany)                     | MBI-D (MBI for human services) | Decrease in EE and DP, no change in PA |

**Table 4 Continued**

|                  |            |  |   |  |  |                        |   |
|------------------|------------|--|---|--|--|------------------------|---|
| Elder 2014       | Prevention | Transcendental meditation course (2 lectures, individual interview, and review after 3 days)             | RCT (4 months)  | Teachers and support staff (Treatment = 20 at baseline, 17 at follow-up, controls = 20 at baseline, 19 at follow-up) | Residential therapeutic school for students with severe behavioral problems (US)         | MBI-ES                 | Decrease in EE, increase in PA, no change in DP |
| Ellen Braun 2019 | Prevention | Mindfulness for Interdisciplinary Health-care Professionals (MIHP) intervention (8-week course)          | Cohort (immediately post and 6 months-1.5 years post) | HCWs (n = 18 completed all measures)   | Setting not reported   | MBI-HSS                | Decrease in DP and EE, no change in PA          |
| Eriksson 2018    | Prevention | Web-based mindful self-compassion program (6 weeks)  | RCT (7 weeks from baseline)                           | Psychologists (Intervention = 52 at baseline, 40 at follow-up; Control = 49 at baseline, 41 at follow-up)            | Online (Sweden)  | SMBQ                   | Decrease in burnout                             |
| Flook 2013       | Prevention | Modified Mindfulness-based Stress Reduction (MBSR) (2.5 hours per week for 8 weeks plus 1-day immersion) | RCT (1-3 weeks post intervention)                     | Public elementary school teachers (Treatment = 10; Control = 8)  | Medium sized Midwestern city (US)  | MBI-ES                 | Decrease in EE, increase in PA, no change in DP |
| Forbat 2019      | Prevention | Training in staff-patient conflict management (4 days)   | Cohort (4 months)                                     | HCWs (Baseline = 55, follow-up = 31)   | A pediatric oncology department day-patient and 23-bed inpatient ward (Perth, Australia) | ProQol                 | Decrease in burnout                             |
| Fukuda 2018      | Prevention | Education program to train staff in coping with behavioral and psychological symptoms                    | Cluster RCT (1 month after baseline)                  | Care staff (Intervention = 214 at baseline, 185 at follow-up; Control =  | Residential aged care facilities (Japan)   | MBI (Japanese version) | No change in EE, DP, or PA                      |

**Table 4 Continued**

|                   |            |   |   |   |   |                |   |
|-------------------|------------|---|---|---|---|----------------|---|
|                   |            | of dementia (2-hour training)   |   | 186 at baseline, 172 at follow-up)  |   |                |   |
| Gentry 2004       | Prevention | Certified Compassion Fatigue Specialist Training (CCFST; 17-20 hours over 2 days)   | Cohort (immediately after training)                     | MHPs (n = 83)   | Florida, US   | CSFST          | Decrease in burnout   |
| Goodman 2012      | Prevention | Mindfulness-based stress reduction (MBSR) course (8 weeks plus 7-hour retreat)  | Cohort (immediately after training)                     | HCWs (73 completed pre and post)  | University medical center (Charlottesville, VA, US) | MBI            | Decrease in EE, DP, increase in PA  |
| Gorter 2001       | Treatment  | Career counseling program   | Cohort analytic (2 comparison groups; 1 month)          | Dentists with burnout (Treatment = 19 at baseline, 17 at follow-up; Both comparison groups = 75 at baseline and follow-up)      | National population (Netherlands)                   | UBOS-C/MBI-NL  | Decrease in EE, increase in PA, no change in DP   |
| Grafestatter 2017 | Prevention | Intervention 1: Spend 1 week in village 1024m above sea level with daily hike; Intervention 2: Intervention 1 with daily 1-hour trips to waterfall; all groups (including control) received Cholera vaccination | Three arm RCT (immediately post, 10 days, and 60 days)  | People working in care professions (Intervention 1 = 32 at baseline; Intervention 2 = 33 at baseline; Control = 26 at baseline) | Carinthia, Austria                                  | MBI-D (German) | Intervention 1: No change in DP, EE, or PA; Intervention 2: decrease in depersonalization ; no change in EE or PA |
| Gridley 2016      | Prevention | Life Story Work training for staff (LSW; 2-hour training)   | Cohort (1, 2 and 6 months after start of intervention); | Staff in dementia care homes (n = 26 at baseline, 15 at final follow-up)  | Dementia care homes (England)                       | CBI            | No change in work-related burnout, personal burnout, or client-related burnout                                    |
| Grupe 2019        | Prevention | Mindfulness Based Stress Reduction (MBSR; 8 weeks)  | Cohort (up to 3 weeks after the class; 5 months)        | Police officers (baseline = 30, follow-up = 28)   | Police Department (Madison, WI, US)                 | OLBI           | Decrease in exhaustion, no change in disengagement  |

**Table 4 Continued**

|                  |            |  |  |   |   |                    |                                       |
|------------------|------------|--|--|---|---|--------------------|---------------------------------------|
| Harris<br>2016   | Prevention | Community Approach to Learning Mindfully (CALM) program to promote socio-emotional competence, stress management, and wellbeing (4 days a week for 16 weeks) | Cluster RCT (second half of school year) | Teachers (Intervention = 34 at baseline/follow-up; Control = 30 at baseline, 29 at follow-up)                         | Middle schools (US)   | MBI-ES             | No change in EE, DP, or PA            |
| Hastings<br>2018 | Prevention | Who's Challenging Who? training (half a day)   | Cluster RCT (6 weeks, 12 weeks)          | Care staff and managers (Intervention = 118 at baseline, 57 at follow-up; control = 118 at baseline, 75 at follow-up) | Community-based residential settings for adults with intellectual disabilities (UK) | MBI                | Increase in PA, No change in EE or DP |
| Hayes<br>2019    | Prevention | The Incredible Years Teacher Classroom Management (TCM) course (1-day workshop)  | Cluster RCT (2 months post training)     | Teachers (Intervention = 40 at baseline, 37 at follow-up; Control = 40 at baseline, 37 at follow-up)                  | Schools (Southwest England)   | MBI-GS             | No change in EE, DP, or PA            |
| Jacobs<br>2016   | Prevention | Brief psychologically informed physiotherapy training (1 day)  | Cohort (immediately post)                | Physiotherapists (25 completed pre and post assessments)  | Outpatient musculoskeletal department (UK)  | Items from the MBI | No change in burnout                  |
| Jacobs<br>2017   | Prevention | Mindfulness-based skills training (6 weeks)  | Cohort (immediately post and 4 weeks)    | Paraprofessionals (26 completed all pre and post measures)  | Paraprofessionals early intervention/prevention program (Chicago area, US)          | MBI                | Decrease in EE, no change in DP or PA |



**Table 4 Continued**

|               |            |   |   |   |   |         |   |
|---------------|------------|---|---|---|---|---------|---|
| Jennings 2013 | Prevention | Cultivating Awareness and Resilience in Education (CARE for Teachers) mindfulness-based professional development program (5 full day sessions over 4 weeks, with 1-day booster after 1 month) | RCT (timeline of post assessments not reported) | Teachers (N = 53; n's by group not reported)  | Urban and suburban public schools in a small metropolitan area (Northeast US) | MBI-ES  | Increase in PA, no change in EE or DP   |
| Jensen 2006   | Prevention | Intervention 1: Transfer technique education to reduce risk of lower back pain and injuries; Intervention 2: Stress management intervention to prevent burnout (6 month)                      | 3-arm Cluster RCT (2 years)                     | HCWs (Intervention 1 = 65 at baseline, 53 at follow-up; Intervention 2: 68 at baseline, 49 at follow-up' Control = 77 at baseline, 61 at follow-up) | Eldercare wards (Denmark)   | MBI     | Intervention 1: No change in DP, EE, or PA; Intervention 2: No change in DP, EE or PA             |
| Jeon 2012     | Prevention | Intervention 1: Training and support in person centered care, Intervention 2: training and support in dementia care mapping (4 months)  | 3-arm Cluster RCT (immediately post, 4 months)  | HCWs (Intervention 1 = 56, Intervention 2 = 45, Control = 23)   | residential aged care sites (Sydney metropolitan area)                        | MBI-HSS | Intervention 1: No change in EE, DP, or PA; Intervention 2: Decrease in EE, no change in PA or DP |
| Johnson 2013  | Prevention | Capacitar trauma healing and transformation workshop (8 days over 4 months)   | Cohort analytic (1 week)                        | HIV/Aids coordinator teachers (Intervention = 27; Control = 27)   | Primary and secondary schools (Metro South, South Africa)                     | CBI     | Decrease in work burnout; no change in client burnout   |
| Johnson 2017  | Prevention | Intervention 1: TRE workshops, which focus on trembling exercises; Intervention 2: TP workshops which focus on education about stress   | 4-arm Cohort analytic (1 week)                  | Teachers (Intervention 1 = 17; Intervention 2 = 16; Intervention 3 = 10; Control = 20)  | High risk-schools (Cape Flats, Western Cape, South Africa)                    | CBI     | Decrease in personal burnout, decrease in work burnout, decrease in learner burnout               |

**Table 4 Continued**

|                  |            |  |  |   |  |                          |  |
|------------------|------------|--|--|---|--|--------------------------|--|
|                  |            | and burnout combined with emotional processing exercises; Intervention 3: TA workshops which presented main TA education models which are based on social psychology (Each intervention occurred via 10 1.5 hour weekly sessions)*Interventions combined in analysis |  |   |  |                          |  |
| Kang 2011        | Prevention | Sabbatical program (1 month)   | Cohort analytic (3 weeks, 3 months)  | Helping professionals (treatment = 8, comparison = 8)   | Nonprofit service organizations (South Korea)  | MBI-HSS (Korean version) | Decrease in EE and DP, no change in PA   |
| Kaplan 2017      | Prevention | Mindfulness-Based Resilience Training (MBRT; 8 weeks)  | Cohort (Immediately post)  | Law enforcement and firefighters (N = 69)   | Suburban community (Pacific Northwest, US)     | OLBI                     | Decrease in burnout  |
| Karjalainen 2019 | Prevention | Training in evidence-based strategies to improve classroom communication (5 weeks of 1.5 hours per week of training)   | Cohort analytic with wait-list control (immediately post, 5 weeks, 3 months) | Grade 3-6 teachers (Immediate intervention = 13 at baseline, 13 at final follow-up; Delayed start intervention = 12 at baseline, 11 at final follow-up) | Public mainstream schools (Southern Sweden)    | CBI                      | Decrease in student-related burnout; no change in work-related or personal-related burnout |
| Kinser 2016      | Prevention | Mindfulness and mindfulness movement course (1x week for 8 weeks)  | Cohort (immediately post)  | HCWs and trainees (n = 27 completed pre and post)   | Recruitment source not reported (Virginia, US) | MBI-HSS                  | Decrease in EE and DP, no change in PA   |
| Klein 2018       | Prevention | Resiliency education program (three 90-minute sessions, 2 weeks apart)   | Cohort (1 week, 6 months)  | HCWs (n = 18 at baseline, 8 at 6-month follow-up)   | Inpatient palliative care department and       | ProQol                   | No change in burnout   |

**Table 4 Continued**

|            |            |   |  |   |   |  |                           |
|------------|------------|---|--|---|---|--|---------------------------|
|            |            |   |  |   | neonatal advanced practice providers at a large Midwestern academic medical center (US) |  |                           |
| Koch 2016  | Prevention | Molded hearing protectors for noise exposure and stress (involved 2 visits to an audiologist)   | Cohort analytic (12 months)                        | Childcare workers (Intervention = 45 at baseline, 33 at follow-up; comparison = 154 at baseline, 61 at follow-up)   | Multi-site institution for children and adolescents (Germany)                           | CBI personal burnout subscale (German version) | No change in burnout      |
| Kuske 2009 | Prevention | Intervention 1: Training program for staff to improve staff-resident interactions; Intervention 2: Relaxation training for staff (3 months) | Three arm cluster RCT (immediately post, 6 months) | Dementia care staff (Intervention 1 = 38 at follow-up, Intervention 2 = 30 at follow-up; Control = 28 at follow-up; baseline n's by group not reported for staff) and residents (Intervention 1 = 89 at baseline, 68 at follow-up; Intervention 2 = 90 at baseline, 68 at follow-up; Control = 94 at baseline, 74 at follow-up) | Nursing homes (Leipzig, Germany)  | MBI-D  | No change in EE, DP or PA |

**Table 4 Continued**

|                       |            |   |   |   |  |                                |   |
|-----------------------|------------|---|---|---|--|--------------------------------|---|
| Leary 2018            |            | Online mindfulness Mantram Repetition Program (6 50-minute classes over 3 months)   | Cohort (immediately post, and 3 months)       | VA Staff (n = 39 who completed all data points)   | VA (Nationwide, US)                                  | MBI-GS                         | Decrease in EE, no change in PA or DP   |
| Livingston 2019       | Prevention | Managing Agitation and Raising Quality of Life intervention for care of people with dementia (6 session training procedure)                           | Cluster RCT (8 months)                        | Care home staff (Treatment = 243 at baseline, 175 at follow-up; Control = 249 at baseline, 179 at follow-up)  | Care homes for people with dementia (England)        | MBI                            | No change in EE, DP, or PA  |
| Luberto 2017          | Prevention | Mindfulness based cognitive therapy (4 week)  | Cohort (immediately post)                     | Hospital employees (67 completed intervention, 26 completed both pre and post measure of burnout)   | Large academic medical center (Midwest, US)          | Single item measure of burnout | Decrease in burnout   |
| Lusilla-Palacios 2015 | Prevention | Training in Motivational Interviewing (9 months)  | Cohort (1-5 months after training)            | HCWs (n = 45)   | Spinal cord injury rehabilitation team (Spain)       | MBI                            | No change in EE, DP or PA   |
| Marlow 2015           | Prevention | Incredible Years Teacher Classroom Management course (6 sessions)   | Cohort (immediately)                          | Teachers (n = 40 at baseline, 34 at follow-up)  | State-funded primary schools (Southwest England)     | MBI                            | No change in EE, DP, or PA  |
| Mistretta 2018        | Prevention | Intervention 1: Mindfulness-Based Resilience Training program (6 weeks); Intervention 2: Smartphone delivered resiliency-based intervention (6 weeks) | Three arm RCT (immediately post and 3 months) | HCWs (Intervention 1 = 22 at baseline, Intervention 2 = 23 at baseline, control = 15 at baseline; 74% across groups completed measures at all time points, differences by group not reported) | Major tertiary health care institution (Arizona, US) | MBI-HSS                        | Intervention 1: Decrease in EE, no change in DP or PA; Intervention 2: No change in EE, DP, or PA |

**Table 4 Continued**

|                    |            |   |  |  |  |                               |   |
|--------------------|------------|---|--|--|--|-------------------------------|---|
| Moody 2013         | Prevention | Mindfulness-based course (MBC; 8 weekly sessions)                                       | RCT (immediately post intervention)              | Pediatric oncology staff (treatment = 23 at baseline, 22 at follow-up, control = 24 at baseline and follow-up) | Urban academic pediatric hematology/oncology programs (NYC, US and Petach Tikva, Israel) | MBI                           | No change in EE, DP or PA                       |
| Muir 2019          | Prevention | Emergency Resiliency Initiative: mindfulness and compassion training program (3 months) | Cohort (immediately after completion of program) | RNs and patient care technicians (n = 35 at baseline, and 26 at follow-up)                                     | Level 1 trauma care center emergency department (US)                                     | MBI-HSS for medical personnel | Increase in PA, decrease in EE, no change in DP |
| Muse 2016          | Treatment  | Intensive outpatient therapy (1 week)   | Cohort analytic (immediately post)               | Clergy with depression and burnout (Treatment = 23, Control = 121 with 23 as matched pair)                     | Pastoral Institute's "Clergy in Kairos" program (GA, US)                                 | MBI                           | Decrease in EE and DP, no change in PA          |
| Noulet 2018        | Prevention | Pastoral crisis intervention training (3 day)   | Cohort (1 year)                                  | Clergy (n = 73 at baseline, 39 at follow-up)   | Trainings and conferences (US)   | ProQol                        | Decrease in burnout                             |
| Nwabuko 2019       | Treatment  | Rational-emotive adult education intervention (2 2-hour sessions per week for 16 weeks) | RCT (Immediately post, 3 months)                 | Teachers with burnout (Treatment = 43; Control = 43)   | Primary schools (Southeast Nigeria)  | TBI                           | Decrease in burnout                             |
| Oman 2006          | Prevention | Passage meditation (8 weekly, 2-hour training sessions)                                 | RCT (post intervention, 8 weeks, and 19 weeks)   | HCWs (Intervention = 30 at baseline, 27 at follow-up; control = 31 at baseline, 31 at follow-up)               | Large hospital (Colorado, US)  | MBI                           | No change in EE, DP or PA                       |
| Orellana-Rios 2017 | Prevention | Meditation and mindfulness program with <i>Tong-len</i> (10 weeks)                      | Cohort (post intervention)                       | Palliative care team members (N = 28)  | Faith-based community hospital (Germany)   | MBI-HSS                       | Decrease in EE, increase in PA, no change in DP |

**Table 4 Continued**

|                  |            |  |   |   |   |                          |  |
|------------------|------------|--|---|---|---|--------------------------|--|
| Pandya 2019      | Prevention | Meditation app (M-App)   | RCT (1 year)  | Chaplains (Intervention = 48 at baseline, 45 at follow-up; Control = 48 at baseline, 40 at follow-up)       | Hospices for older adults (Mumbai, Bangkok, Pretoria, and Nairobi)                | MBI-HSS                  | Decrease in EE, DP, and increased PA                                   |
| Passalacqua 2012 | Prevention | VIPS Communication skills training for patient-centered dementia care (Four 1-hour workshops over 4 weeks)                             | Cohort (6 weeks)  | Professional caregivers (n = 26)  | For-profit long-term care facility with specialty in memory issues (Southwest US) | MBI EE and DP subscales  | Decrease in DP, no change in EE  |
| Perseus 2007     | Prevention | Use of Dialectical behavioral therapy with patients with Borderline Personality Disorder (6 months of training, 18 months of practice) | Cohort (6, 12, and 18 months post training)                                   | Psychiatric professionals (baseline = 22, 18-month follow-up = 18)  | Adult and child psychiatry clinics in Uppsala County (Sweden)                     | MBI-GS (Swedish version) | No change in EE, DP, or PA   |
| Peterson 2008    | Treatment  | Reflecting peer-support groups (weekly for 10 sessions)  | RCT (immediately post, 7 months, and 12 months)                               | HCWs with burnout (treatment = 64 at baseline, 47 at 12 months; control = 87 at baseline, 63 at 12 months)  | Several geographic regions (Sweden)   | OLBI (Swedish version)   | Decrease in exhaustion, no change in disengagement                     |
| Pfaff 2017       | Prevention | Compassion fatigue resiliency program (6 weeks)  | Cohort (follow-up period not reported)  | Interprofessional staff (HCWs) (27 completed programs, 12 completed both pre and post-intervention surveys) | Regional cancer center (Canada)   | ProQol                   | No change  |
| Potash 2014      | Prevention | Intervention 1: Art therapy-based supervision (6-week, 18-hour) compared to Intervention 2: Standard skills-based                      | Cohort analytic (post was 6 weeks for art therapy, and 3 days for comparison) | End-of-life care workers (art therapy = 69 at baseline, 56 completed follow-up questionnaires;              | Various settings, training through Hospice Care                                   | MBI-GS                   | Intervention 1: decrease in EE, no change in DP or PA; Intervention 2: |

**Table 4 Continued**

|             |            |   |  |   |  |                       |  |
|-------------|------------|---|--|---|--|-----------------------|--|
|             |            | supervision (3-day, 18-hour)  |  | comparison = 63 at baseline, 57 completed follow-up questionnaires) | society (Hong Kong)  |                       | Decrease in DP, no change in PA or EE  |
| Powell 2016 | Prevention | Resilience and Coping for the Healthcare Community psychoeducation program  | Cohort (immediately post workshop, and 3 weeks)  | Community health workers (baseline = 69; follow-up = 45)            | Federally qualified health centers in areas affected by Hurricane Sandy (US)                                 | ProQol                | No change in burnout                   |
| Raab 2015   | Prevention | Mindfulness Based Stress Reduction education (Weekly for 8 weeks)   | Cohort (immediately post)  | Female mental health professionals (n = 22)                         | Large urban mental health center (Canada)  | MBI-HSS               | No change in PA, EE, or DP             |
| Ranta 2008  | Prevention | Multidimensional intervention with relaxation, self and mood management, and rehearsal (3 one-hour sessions) or relaxation only (control) | RCT (immediately post intervention)  | Police personnel (treatment = 10, control = 10)                     | Police stations  | MBI                   | Decrease in EE and DP, no change in PA |
| Reilly 2014 | Prevention | Auricular acupuncture (5 sessions over 16 weeks)  | Cohort (immediate after last session)  | HCWs (76 at baseline, 37 completed intervention and follow-up)      | Inpatient surgical burn/trauma intensive care and step-down units at an urban medical center (Northeast, US) | ProQol                | Decrease in burnout                    |
| Reyes 2019  | Prevention | "Helping the Helper" program based on Functional Analytic Psychotherapy (through 6 weekly online sessions)                                | Interrupted time series (data points at 5, 3, and 1 weeks before and 1, 4, and 7 weeks post) | MHWs (n = 6)  | Borderline Personality Disorder Clinic (Mexico)  | MBI (Mexican Version) | Decrease in EE and DP; increase in PA  |

**Table 4 Continued**

|              |            |  |  |   |   |  |  |
|--------------|------------|--|--|---|---|--|--|
| Riley 2017   | Prevention | Study 1: Yoga-Based Stress Management (YBSM; 8 weeks); Study 2: Cognitive Behavioral Stress Management and YBSM (8 weeks each)   | Study 1: Cohort (1 week); Study 2: RCT (post intervention, 2 months, 6 months) | MHWs (Study 1: n = 44 at baseline, 37 completed follow-ups; Study 2: YBSM = 19 at baseline; CBSM = 19 at baseline. Follow-up by group not reported for study 2) | Study 1: Multisite mental health center (Massachusetts); Study 2: Psychiatry department in a large hospital (New England) | Study 1: Not measured; Study 2: ProQol | Study 1: N/A; Study 2: Decrease in burnout for both intervention                     |
| Rollins 2016 | Prevention | Intervention 1: BREATHE: Relapse prevention-based group workshop with mindfulness, cognitive restructuring, boundary setting, and social support (1 day); Intervention 2: Person-centered treatment planning (1 day) | Cluster Randomized comparative effectiveness trial (6 weeks, 6 months)         | Behavioral health providers (Intervention 1 = 76 at baseline, 63 completed all assessments; Intervention 2 = 69 at baseline, 43 completed all assessments)      | US Department of Veterans Affairs facilities and social service agencies (Midwestern US)                                  | MBI                                    | Intervention 1: Decrease in EE, and DP, no change in PA<br>Intervention 2: No change |
| Rosada 2015  | Prevention | Reiki (weekly, 30-minute sessions for 6 weeks)   | Randomized crossover with placebo and washout period (immediately post)        | Community mental health clinicians (n = 45)   | Community mental health agencies (New England)  | MBI-HSS                                | Decrease in EE; no difference in DP or PA  |
| Saganha 2012 | Treatment  | "White Ball" Qigong exercises (2 weeks)  | RCT (3 weeks)  | Physical therapists with burnout (treatment = 8, control = 8)   | Private hospitals (Portugal)  | MBI                                    | Decrease in EE and DP; No change in PA   |
| Sahlin 2014  | Prevention | Nature based stress management course (12 weeks)   | Cohort (course end, 3 months, 6 months, 12 months)                             | HCWs (baseline = 38, 12-month follow-up = 32)   | Botanical garden, course offered through large public health care   | SMBQ                                   | Decrease in burnout  |



**Table 4 Continued**

|              |            |  |  |   |   |     |  |
|--------------|------------|--|--|---|---|-----|--|
|              |            |  |  |   | organization (Sweden)   |     |  |
| Sallon 2017  | Prevention |  | Cohort analytic (weeks following intervention completion)  | Hospital staff (treatment = 118 at baseline, 82 at follow-up; controls = 97 at baseline, 67 at follow-up)                                 | Tertiary care center (Jerusalem)  | MBI | Decrease in EE, no change in DP or PA                                |
| Salyers 2011 | Prevention | BREATHE: Relapse prevention-based group workshop with mindfulness, cognitive restructuring, boundary setting, and social support (1 day)   | Cohort (6 weeks)   | Behavioral health care employees (baseline = 79, follow-up = 74)  | Public agency providing comprehensive substance abuse and mental health services (Midwest US) | MBI | Decrease in EE and DP; No change in PA                               |
| Salyers 2019 | Prevention | Intervention 1: BREATHE - Relapse prevention based group workshop with mindfulness, cognitive restructuring, boundary setting, and social support; Intervention 2: Motivational interviewing training (both trainings 8-8.5 hours total) | Randomized comparative effectiveness (3, 6, and 12 months) | Direct care professionals (Intervention 1 baseline = 89, 12-month follow-up = 59; Intervention 2 baseline = 103; 12 month follow-up = 66) | Community mental health centers (Midwest US)  | MBI | Intervention 1: no change; Intervention 2: no change                 |
| Scarlet 2017 | Prevention | Compassion cultivation training to prevent burnout (8 week)  | Cohort (midway, immediately post, and 1 month)             | HCWs (n = 62)   | CE offered in a Hospital (San Diego)  | CBI | No change  |
| Schoeps 2019 | Prevention | Training to reduce work-related stress and enhance wellbeing through emotional ability and skills (7 2-hour training sessions over 3 months)   | RCT (Immediately post, 6 months)                           | Teachers (Intervention = 135; Control = 205)  | Private and public schools (Valencia, Spain)  | SBI | Decrease in indolence, exhaustion and guilt; no change in excitement |

**Table 4 Continued**

|                |            |   |   |  |   |                                      |   |
|----------------|------------|---|---|--|---|--------------------------------------|---|
| Scott 2015     | Prevention | Educational and networking in-person meetings with capacity building remote support for individuals (duration varies)                                 | Cohort (5 follow-up periods within 18 months)   | Pastors (baseline = 51; completers = 34)   | Rural (US)  | Scale developed for use with pastors | Decrease  |
| Sexton 2019    | Prevention | Three Good Things intervention (15 days)  | Cohort (1, 6, and 12 months)  | HCWs (baseline = 228, 1 month = 127, 6-month follow-up = 119, 12 month follow-up = 121)  | Online (US)   | MBI EE Subscale                      | Decrease in EE  |
| Siu 2014       | Prevention | Study 1: Intensive positive psychology stress-management training program (2 days); Study 2: Added recovery strategy component to training (2.5 days) | Study 1: Cohort (7-10 days); Study 2: Cohort analytic (follow-up period not reported) | Study 1: HCWs (1034 attended trainings, 817 completed both pre and posttest); Study 2: Teachers (Treatment = 50, control = 48) | Study 1: Public hospitals; Study 2: Primary and Secondary Schools (Hong Kong) | MBI-HSS                              | Study 1: Decrease in DP, EE, increase in PA; Study 2: No change |
| Slade 2018     | Prevention | Educational and supportive resources to prevent PTSD in midwives (single workshop)  | Cohort (6 months)   | Midwives (baseline = 176, follow-up = 91)  | Hospital (northwest England)  | MBI-HSS                              | Decrease in DP, Increase in PA, no change in EE                 |
| Suyi 2017      | Prevention | Sessions to increase mindfulness (six two-hour sessions over six weeks)   | Cohort (immediately post, and 3 month)  | Mental health professionals (n = 37)   | Institute of Mental Health (Singapore)  | OLBI                                 | No change   |
| Tonarelli 2018 | Prevention | Expressive writing session (1 session)  | RCT (follow-up within 1-3 days)   | Professionals that work in palliative care (nurses, health care assistants and a psychologist; treatment = 15; control = 11)   | Palliative Care operating units and Hospice and Local Health Services (Italy) | MBI                                  | No change   |

**Table 4 Continued**

|                                  |            |   |  |  |  |                      |  |
|----------------------------------|------------|---|--|--|--|----------------------|--|
| Ugwoke 2018                      | Treatment  | Rational-emotive adult education intervention (12 weeks)  | RCT (2 follow-up assessments, timing not reported)                                     | Special education teachers with burnout (Intervention = 28 at baseline/follow-up; Control = 26 at baseline/follow-up)  | Schools for students with special needs (Southeast Nigeria)      | TBS                  | Decrease in physical fatigue, EE, and cognitive weariness                      |
| Unterbrink 2012; Unterbrink 2014 | Prevention | Manualized group to reduce stress and increase social support between teachers (10 90-minute sessions over 10 months) | RCT (follow-up timing not reported)  | Teachers (Intervention = 166 at baseline, 92 at follow-up; Control = 146 at baseline; 117 at follow-up)  | Grammar schools and Secondary modern schools (Southwest Germany) | MBI (German version) | Decrease in EE, increase in PA, no change in DP or involvement (ITT no change) |
| Visser 2008                      | Prevention | Dementia behavior education training program with or without peer-support (8 weeks)                                   | 3-arm cluster RCT (3 months, 6 months)   | Care staff (education only = 10 at baseline, 6 at follow-up; education and peer support = 17 at baseline; control = 25) and residents (education only = 21; education and peer support = 23; control = 32) | Aged care facilities (Australia)                                 | MBI third edition    | No change  |
| Wegner 2011                      | Treatment  | Inpatient individual and group therapy for burnout (average duration was 7 weeks)                                     | Cohort (first exam post treatment)   | Teachers with emotional exhaustion (n = 200 at baseline, 150 at follow-up)   | Rural treatment center (Germany)                                 | MBI (German version) | Decrease in EE, increase in PA, no change in DP                                |
| Weingardt 2009                   | Prevention | online CBT modules and group supervision (2 months)   | Randomized trial with high dose and low dose groups (timing of follow-up not reported) | Substance abuse counselors (high fidelity group = 73; low fidelity group = 74)   | Online procedures (Northwest US)                                 | MBI-HSS              | Increase in PA; no change in EE or DP  |

**Table 4 Continued**

|                               |            |   |               |  |                                      |                                 |   |
|-------------------------------|------------|---|---------------|--|--------------------------------------|---------------------------------|---|
| Zolnierczy<br>k-Zreda<br>2005 | Prevention | Stress management<br>workshop (2 day, 6 hours<br>per day) | RCT (1 month) | Teachers<br>(Intervention = 29,<br>Control = 29) | Setting not<br>specified<br>(Poland) | MBI<br>(Koniarek<br>adaptation) | Decrease in EE,<br>no change in DP<br>or PA |
|-------------------------------|------------|---|---------------|--|--------------------------------------|---------------------------------|---|

*\*BCSQ-12 = Burnout Clinical Subtype Questionnaire (Spanish short version), CBI = Copenhagen Burnout Inventory, Cluster RCT = Cluster randomized controlled trial, CSFST = Compassion Satisfaction/Fatigue Self-Test, DP = Depersonalization or Cynicism dimensions of burnout, EE = Emotional Exhaustion dimension of burnout; HCWs = Health care workers, MBI = Maslach Burnout Inventory, MBI-D = German version of MBI, MBI-ES = MBI Educator Survey, MBI-GS = MBI General Survey, MBI-HSS = MBI Human Services Survey, MHWs = Mental health workers, OLBI = Oldenburg Burnout Inventory, PA = Personal accomplishment or professional efficacy dimension of burnout, PCWs = Personal care workers, ProQol = Professional Quality of Life Scale, SBI = Spanish Burnout Inventory, SMBQ = Shirom Melamed Burnout Questionnaire, TBI = Teachers' Burnout Inventory, TBS = Teacher Burnout Scale, UBOS-C/MBI-NL = Dutch version of the MBI-HSS, UBOS-L = Dutch version of the MBI-ES.*

Most individual interventions targeted teachers,<sup>100,108,110,114,124,171,172,175,179,196,199-103,106,127,131,133,135,155,157,160,161,163,184,187,190</sup> mental and behavioral health care workers,<sup>107,111,126,128,146,148-150,152,153,159,162,168,173,176,177,193,204</sup> health care workers,<sup>100,104,109,119-122,125,129,132,134,137-145,154,156-158,165,166,180,185,189,201,203,205-207</sup> or personal care staff.<sup>113,164,169,170,174,181-183,188,192,195</sup> Ten individual level studies were with people who work with the elderly or those who have dementia.<sup>164,167,169,170,181,182,188,192,195,207</sup> Seven individual level intervention studies were with people who work with those who have intellectual disabilities.<sup>105,113,117,124,174,175,183</sup> Other interventions targeted police,<sup>115,116,130,136,147</sup> religious leaders,<sup>102,167,191,194</sup> social workers,<sup>112,118,178</sup> dentists,<sup>99,101</sup> firefighters,<sup>136</sup> special education teachers,<sup>105,117</sup> EMTs,<sup>119</sup> HIV/AIDS educators,<sup>186</sup> people that work to help victims of interpersonal violence,<sup>123</sup> childcare workers,<sup>202</sup> and helping professionals in general.<sup>197,200</sup> Five individual studies were among professionals who work in palliative or hospice care,<sup>138,143,167,205,206</sup> and two were will oncology professionals.<sup>141,180</sup> Individual interventions took place in Europe,<sup>99,111,168-170,173,196-100,101,104,106,108,109,112,121,122,126,134,143,155,158,160,161,163,164,175,177,182-185,187-190,193,197,201,202,206</sup> North America,<sup>102,107,110,114-116,118-120,123,124,127-133,136-142,144-146,148-150,152-154,165,166,171,172,174,176,179,191,192,203,204-156,162,194</sup> Asia,<sup>147,157,159,167,181,199,200,205</sup> Africa,<sup>103,105,135,167,186</sup> Australia,<sup>113,180,195,207</sup> and the Middle East.<sup>141,151,208</sup>

Most individual level treatment studies were randomized controlled trials.<sup>100,103-105,108,109</sup> Other individual level treatment study designs were cohort,<sup>106</sup> cohort analytic,<sup>99,101,102</sup> and an AB single case study.<sup>107</sup> Of the individual level prevention interventions, most designs were cohort studies,<sup>111,113,115,122,123,125,128-130,132,136-139,142-146,149,152,154,156-159,165,173,176,177,180,182,185,189-194,199,201,203</sup> randomized controlled trials,<sup>112,114,116,118,120,121,124,126,127,133,140,141,147,149,155,166,167,174,196,197,206-160,161,163</sup> cluster randomized controlled trials,<sup>110,131,134,164,168-172,175,179,181,183,184,188,195,207</sup> or cohort

analytic studies.<sup>135,151,157,178,186,187,200,202,205</sup> Other study designs included randomized crossover,<sup>117,204</sup> interrupted time series,<sup>148,209</sup> randomized cluster comparative effectiveness,<sup>150,153</sup> and randomized trial with high dose and low dose groups.<sup>162</sup> Final follow-up measures of individual level interventions occurred as early as immediately after the intervention<sup>110,113,115,128,136,137,139,141-143,146,171,179,185,190,199,203</sup> to two years after the intervention.<sup>134</sup>

All but one individual level treatment interventions were associated with reductions in burnout. The remaining individual treatment intervention was not associated in any change in burnout.<sup>99</sup> Of the individual level prevention studies, 32 were not associated with any change in burnout,<sup>110,113,120,122,131,134,138,141,144-146,153,154,159,164,166,172,174,175,181,182,184,185,188-190,193,195,196,199,202,206</sup> one was associated with an increase in burnout,<sup>168</sup> and two had mixed results where one dimension of burnout worsened and one dimension improved.<sup>112,170</sup> The remaining individual prevention studies were associated with decreases in at least one dimension of burnout.

Of the individual level treatment studies, two studies had a moderate global risk of bias rating,<sup>100,104</sup> while the remaining studies had weak global risk of bias ratings (Table 5). Of the individual level prevention studies, one study had a strong global risk of bias rating,<sup>168</sup> 13 had a moderate global risk of bias rating,<sup>113,132,134,139,140,142,143,148,165,169,188,189,202</sup> and the remaining studies had a weak global risk of bias rating (Table 6). Like the organizational level studies, individual level studies tended to have better ratings in the areas of design and data collection method, poorer ratings in controlling for selection and confounders, and mixed ratings in the area of withdrawals.

**Table 5 Risk of Bias Ratings for Individual Level Treatment Studies**

| <b>Article</b> | <b>Selection Bias Rating</b> | <b>Design Rating</b> | <b>Confounders Rating</b> | <b>Blinding Rating</b> | <b>Data Collection Rating</b> | <b>Withdrawal Rating</b> | <b>Global Rating</b> |
|----------------|------------------------------|----------------------|---------------------------|------------------------|-------------------------------|--------------------------|----------------------|
| Brake 2001     | Weak                         | Moderate             | Weak                      | Moderate               | Strong                        | Strong                   | Weak                 |
| Callender 2019 | Moderate                     | Moderate             | Weak                      | Moderate               | Strong                        | Weak                     | Weak                 |
| Duijts 2008    | Moderate                     | Strong               | Weak                      | Moderate               | Strong                        | Moderate                 | Moderate             |
| Ebert 2014     | Weak                         | Strong               | Weak                      | Moderate               | Strong                        | Strong                   | Weak                 |
| Gorter 2001    | Weak                         | Moderate             | Weak                      | Moderate               | Strong                        | Strong                   | Weak                 |
| Muse 2016      | Weak                         | Moderate             | Weak                      | Moderate               | Strong                        | Strong                   | Weak                 |
| Nwabuko 2019   | Weak                         | Strong               | Weak                      | Moderate               | Strong                        | Weak                     | Weak                 |
| Peterson 2008  | Weak                         | Strong               | Moderate                  | Moderate               | Strong                        | Moderate                 | Moderate             |
| Saganha 2012   | Weak                         | Strong               | Weak                      | Moderate               | Strong                        | Strong                   | Weak                 |
| Ugwoke 2018    | Weak                         | Strong               | Weak                      | Moderate               | Strong                        | Strong                   | Weak                 |
| Wegner 2011    | Moderate                     | Moderate             | Weak                      | Weak                   | Moderate                      | Strong                   | Weak                 |

**Table 6 Risk of Bias Ratings for Individual level Prevention Studies**

| <b>Article</b>   | <b>Selection Bias Rating</b> | <b>Design Rating</b> | <b>Confounders Rating</b> | <b>Blinding Rating</b> | <b>Data Collection Rating</b> | <b>Withdrawal Rating</b> | <b>Global Rating</b> |
|------------------|------------------------------|----------------------|---------------------------|------------------------|-------------------------------|--------------------------|----------------------|
| Abos 2019        | Weak                         | Strong               | Moderate                  | Moderate               | Moderate                      | Weak                     | Weak                 |
| Aimola 2018      | Moderate                     | Strong               | Moderate                  | Moderate               | Strong                        | Strong                   | Strong               |
| Ancona 2014      | Weak                         | Strong               | Weak                      | Weak                   | Strong                        | Strong                   | Weak                 |
| Askey-Jones 2018 | Weak                         | Moderate             | Weak                      | Weak                   | Strong                        | Strong                   | Weak                 |
| Barbosa 2015     | Moderate                     | Strong               | Weak                      | Moderate               | Strong                        | Strong                   | Moderate             |
| Barbosa 2016     | Weak                         | Strong               | Weak                      | Moderate               | Strong                        | Strong                   | Weak                 |
| Barr 2015        | Weak                         | Strong               | Weak                      | Moderate               | Strong                        | Moderate                 | Weak                 |
| Berg 2017        | Weak                         | Strong               | Weak                      | Moderate               | Weak                          | Weak                     | Weak                 |
| Berry 2012       | Moderate                     | Moderate             | Weak                      | Moderate               | Strong                        | Weak                     | Weak                 |
| Bethay 2013      | Weak                         | Strong               | Weak                      | Moderate               | Strong                        | Strong                   | Weak                 |
| Breeman 2016     | Weak                         | Strong               | Weak                      | Moderate               | Strong                        | Strong                   | Weak                 |
| Brinkborg 2011   | Weak                         | Strong               | Weak                      | Moderate               | Strong                        | Strong                   | Weak                 |

**Table 6 Continued**

|                   |          |          |      |          |        |          |          |
|-------------------|----------|----------|------|----------|--------|----------|----------|
| Brooker 2013      | Moderate | Moderate | Weak | Moderate | Strong | Strong   | Moderate |
| Carmel 2014       | Weak     | Moderate | Weak | Moderate | Strong | Weak     | Weak     |
| Caruso 2013       | Weak     | Moderate | Weak | Moderate | Strong | Strong   | Weak     |
| Chan 2011         | Weak     | Moderate | Weak | Moderate | Strong | Weak     | Weak     |
| Cheek 2003        | Weak     | Strong   | Weak | Moderate | Strong | Weak     | Weak     |
| Christopher 2016  | Weak     | Moderate | Weak | Moderate | Strong | Moderate | Weak     |
| Christopher 2018  | Weak     | Strong   | Weak | Moderate | Strong | Moderate | Weak     |
| Christopher 2018  | Weak     | Strong   | Weak | Moderate | Strong | Moderate | Weak     |
| Cohen 2005        | Weak     | Moderate | Weak | Moderate | Strong | Strong   | Weak     |
| Cooley 1996       | Weak     | Strong   | Weak | Moderate | Strong | Strong   | Weak     |
| Crowder 2017      | Weak     | Strong   | Weak | Moderate | Strong | Strong   | Weak     |
| Domitrovich 2016  | Weak     | Strong   | Weak | Moderate | Strong | Weak     | Weak     |
| Ducar 2019        | Weak     | Moderate | Weak | Moderate | Strong | Moderate | Weak     |
| Duchemin 2015     | Weak     | Strong   | Weak | Moderate | Strong | Strong   | Weak     |
| Dunne 2019        | Weak     | Strong   | Weak | Moderate | Strong | Weak     | Weak     |
| D'Urso 2019       | Weak     | Moderate | Weak | Moderate | Strong | Weak     | Weak     |
| Dutton 2017       | Weak     | Moderate | Weak | Moderate | Strong | Moderate | Weak     |
| Elder 2014        | Weak     | Strong   | Weak | Moderate | Strong | Strong   | Weak     |
| Ellen Braun 2019  | Weak     | Moderate | Weak | Moderate | Strong | Strong   | Weak     |
| Eriksson 2018     | Weak     | Strong   | Weak | Moderate | Weak   | Strong   | Weak     |
| Flook 2013        | Weak     | Strong   | Weak | Moderate | Strong | Weak     | Weak     |
| Forbat 2019       | Weak     | Moderate | Weak | Moderate | Strong | Weak     | Weak     |
| Fukuda 2018       | Weak     | Strong   | Weak | Moderate | Weak   | Strong   | Weak     |
| Gentry 2004       | Weak     | Moderate | Weak | Moderate | Weak   | Weak     | Weak     |
| Goodman 2012      | Weak     | Moderate | Weak | Moderate | Strong | Weak     | Weak     |
| Grafestatter 2017 | Weak     | Strong   | Weak | Moderate | Weak   | Weak     | Weak     |
| Gridley 2016      | Weak     | Moderate | Weak | Moderate | Strong | Weak     | Weak     |
| Grupe 2019        | Weak     | Moderate | Weak | Moderate | Strong | Strong   | Weak     |
| Harris 2016       | Weak     | Strong   | Weak | Moderate | Strong | Strong   | Weak     |
| Hastings 2018     | Weak     | Strong   | Weak | Moderate | Strong | Weak     | Weak     |
| Hayes 2019        | Weak     | Strong   | Weak | Weak     | Strong | Strong   | Weak     |
| Jacobs 2016       | Moderate | Moderate | Weak | Moderate | Weak   | Strong   | Weak     |
| Jacobs 2017       | Moderate | Moderate | Weak | Moderate | Strong | Strong   | Moderate |
| Jennings 2013     | Weak     | Strong   | Weak | Moderate | Strong | Weak     | Weak     |



**Table 6 Continued**

|                       |          |          |          |          |        |          |          |
|-----------------------|----------|----------|----------|----------|--------|----------|----------|
| Jensen 2006           | Moderate | Strong   | Weak     | Moderate | Strong | Moderate | Moderate |
| Jeon 2012             | Weak     | Strong   | Weak     | Moderate | Strong | Moderate | Weak     |
| Johnson 2013          | Weak     | Moderate | Weak     | Moderate | Strong | Strong   | Weak     |
| Johnson 2017          | Weak     | Moderate | Weak     | Moderate | Strong | Strong   | Weak     |
| Jones 2009            |          | Moderate | Weak     | Moderate | Strong | Moderate | Weak     |
| Kang 2011             | Weak     | Moderate | Weak     | Moderate | Weak   | Strong   | Weak     |
| Kaplan 2017           | Weak     | Moderate | Weak     | Moderate | Strong | Weak     | Weak     |
| Karjalainen 2019      | Weak     | Moderate | Weak     | Moderate | Strong | Strong   | Weak     |
| Kinser 2016           | Weak     | Moderate | Weak     | Moderate | Strong | Moderate | Weak     |
| Klein 2018            | Weak     | Moderate | Weak     | Moderate | Strong | Strong   | Weak     |
| Koch 2016             | Moderate | Moderate | Moderate | Moderate | Strong | Weak     | Moderate |
| Kuske 2009            | Moderate | Strong   | Weak     | Weak     | Strong | Moderate | Weak     |
| Leary 2018            | Moderate | Moderate | Weak     | Moderate | Strong | Moderate | Moderate |
| Livingston 2019       | Moderate | Strong   | Weak     | Moderate | Strong | Moderate | Moderate |
| Luberto 2017          | Moderate | Moderate | Weak     | Moderate | Strong | Strong   | Moderate |
| Lusilla-Palacios 2015 | Moderate | Moderate | Weak     | Moderate | Strong | Moderate | Moderate |
| Marlow 2015           | Weak     | Moderate | Weak     | Moderate | Strong | Strong   | Weak     |
| Mistretta 2018        | Moderate | Strong   | Weak     | Moderate | Strong | Moderate | Moderate |
| Moody 2013            | Weak     | Strong   | Moderate | Weak     | Strong | Strong   | Weak     |
| Muir 2019             | Moderate | Moderate | Weak     | Moderate | Strong | Moderate | Moderate |
| Noullet 2018          | Weak     | Moderate | Weak     | Moderate | Strong | Weak     | Weak     |
| Oman 2006             | Weak     | Strong   | Weak     | Weak     | Strong | Strong   | Weak     |
| Orellana-Rios 2019    | Strong   | Moderate | Weak     | Moderate | Strong | Strong   | Moderate |
| Pandya 2019           | Weak     | Strong   | Weak     | Moderate | Strong | Strong   | Weak     |
| Passalacqua 2012      | Weak     | Moderate | Weak     | Moderate | Strong | Strong   | Weak     |
| Perseus 2007          | Weak     | Moderate | Weak     | Moderate | Strong | Strong   | Weak     |
| Pfaff 2017            | Weak     | Moderate | Weak     | Moderate | Strong | Weak     | Weak     |
| Potash 2014           | Weak     | Moderate | Weak     | Moderate | Strong | Weak     | Weak     |
| Powell 2016           | Weak     | Moderate | Weak     | Moderate | Strong | Moderate | Weak     |
| Raab 2015             | Weak     | Moderate | Weak     | Moderate | Strong | Weak     | Weak     |
| Ranta 2008            | Weak     | Strong   | Weak     | Moderate | Strong | Strong   | Weak     |
| Reilly 2014           | Weak     | Moderate | Weak     | Moderate | Strong | Weak     | Weak     |
| Reyes 2019            | Moderate | Moderate | Weak     | Moderate | Strong | Strong   | Moderate |

**Table 6 Continued**

|                                      |      |          |      |          |        |          |      |
|--------------------------------------|------|----------|------|----------|--------|----------|------|
| Riley 2017 Study 1                   | Weak | Moderate | Weak | Moderate | Strong | Strong   | Weak |
| Riley 2017 Study 2                   | Weak | Strong   | Weak | Moderate | Strong | Weak     | Weak |
| Rollins 2016                         | Weak | Strong   | Weak | Moderate | Strong | Moderate | Weak |
| Rosada 2015                          | Weak | Strong   | Weak | Moderate | Strong | Strong   | Weak |
| Sahlin 2014                          | Weak | Moderate | Weak | Moderate | Strong | Strong   | Weak |
| Sallon 2017                          | Weak | Moderate | Weak | Moderate | Strong | Strong   | Weak |
| Salyers 2011                         | Weak | Moderate | Weak | Moderate | Strong | Strong   | Weak |
| Salyers 2019                         | Weak | Strong   | Weak | Moderate | Strong | Moderate | Weak |
| Scarlet 2017                         | Weak | Moderate | Weak | Moderate | Strong | Weak     | Weak |
| Schoeps 2019                         | Weak | Strong   | Weak | Moderate | Strong | Weak     | Weak |
| Scott 2015                           | Weak | Moderate | Weak | Moderate | Weak   | Moderate | Weak |
| Sexton 2019                          | Weak | Moderate | Weak | Moderate | Strong | Weak     | Weak |
| Siu 2014 Study 1                     | Weak | Moderate | Weak | Weak     | Strong | Moderate | Weak |
| Siu 2014 Study 2                     | Weak | Moderate | Weak | Moderate | Strong | Strong   | Weak |
| Slade 2018                           | Weak | Moderate | Weak | Moderate | Strong | Moderate | Weak |
| Suyi 2017                            | Weak | Moderate | Weak | Moderate | Strong | Strong   | Weak |
| Tonarelli 2018                       | Weak | Strong   | Weak | Moderate | Strong | Strong   | Weak |
| Unterbrink 2012 &<br>Unterbrink 2014 | Weak | Strong   | Weak | Moderate | Strong | Moderate | Weak |
| Visser 2008                          | Weak | Strong   | Weak | Moderate | Strong | Weak     | Weak |
| Weingardt 2009                       | Weak | Strong   | Weak | Moderate | Strong | Moderate | Weak |
| Zolnierczyk-Zreda<br>2005            | Weak | Strong   | Weak | Moderate | Weak   | Strong   | Weak |

### 4.2.3 Multilevel Studies

There were six articles describing six interventions that had both individual and organizational components, all of which were prevention studies (Table 7). These interventions involved helping individuals learn how to personally cope with stress or burnout,<sup>210-213</sup> skills trainings for workers,<sup>210,212,214,215</sup> organizational changes to work process or workflow,<sup>210,214,215</sup> trainings for supervisors,<sup>211,213</sup> strategies to improve communication or team-functioning,<sup>211,213</sup> and changes to the physical work environment.<sup>212</sup> One of these interventions had a participatory component, in which feedback from employees informed the interventions used.<sup>210</sup> Of interventions with reported duration, duration of interventions ranged from five weeks<sup>213</sup> to six months.<sup>211</sup>

**Table 7 Multilevel Intervention Study Characteristics\***

| <b>Study</b>   | <b>Intervention (duration)</b>  | <b>Study Design (follow-up period)</b>  | <b>Population and sample size</b>   | <b>Setting</b>   | <b>Measure of Burnout</b> | <b>Change in Burnout</b>              |
|----------------|---|---|---|--|---------------------------|---------------------------------------|
| Innstrand 2004 | Staff met to discuss ideas to reduce burnout and stress and implemented changes at the individual (e.g. regular physical activity and seminars) and organizational level (e.g. scheduling changes and improvements to new employee routines; 2 months)              | Cohort analytic (10 months)   | Staff that work with people who have intellectual disabilities (treatment = 43 at baseline, 36 at follow-up; Control = 22 at baseline, 11 at follow-up) | Community residential care (Norway)  | MBI-GS                    | Decrease in EE, no change in DP or PA |
| Jones 2008     | Training in evidence-based psychological interventions designed to enhance practitioners' ability to foster engagement and develop collaborative therapeutic relationships with people with serious mental illness with changes to inpatient environment (12 weeks) | Cohort with repeated measures (one month before training, immediately before training, immediately after training)                            | Acute inpatient mental health team (n = 18 at baseline, 12 completed all assessments)   | Adult acute inpatient team in Mental Health and Learning Disability Trust (South of England) | MBI                       | No change in EE, DP, or PA            |
| Jones 2009     | Training in evidence-based interventions for psychosis (15 weeks) with unit changes to support implementation of skills from training   | Cohort with repeated measures (3 months prior to training, immediately before training, immediately after training, 18 months after training) | Inpatient workers (n = 72 at baseline, 49 at follow-up)   | Three wards in a single mental health unit at a district general hospital (outer London)     | MBI                       | Increase in DP, no change in PA or EE |
| Scarnera 2009  | Series of six monthly 3-5-hour workshops to manage interpersonal relationships, leadership training for managers, and trainings for   | Cohort (6 months, 18 months)  | Mental health workers (n=25)  | Public and private services (Italy)  | Italian MBI               | Decrease in DP; no change in PA or EE |

**Table 7 Continued**

|                      |  |  |  |   |               |  |
|----------------------|--|--|--|---|---------------|--|
|                      | employees to manage negative emotions (6 months)   |  |  |   |               |  |
| Sottimano 2018       | Intervention 1: Counseling, supported working groups, and revisions to school layout and furniture to support physical needs of teachers and students; Intervention 2: Counseling, supported working groups, and programs to improve posture, movement, and use of voice (duration of intervention periods not reported) | 3-arm cluster RCT (follow-up timing not reported)                | Preschool teachers (Intervention 1 = 88 at baseline, 69 at follow-up; Intervention 2 = 88 at baseline, 65 at follow-up; Control = 230 at baseline, 190 at follow-up) | Large municipality preschools (Italy)   | SBI           | Intervention 1: Increase in enthusiasm, decrease in exhaustion and indolence, no change in guilt; Intervention 2: Increase in enthusiasm and indolence, decrease in exhaustion, no change in guilt |
| van Dierendonck 1998 | Series of group meetings designed to reduce feelings of burnout with training for supervisors to handle burnt out staff (5 week)   | 3-arm cohort analytic (2 comparison groups; 6 months, 12 months) | Direct care professionals who work with people with mental disabilities (treatment = 36, same agency (internal) control = 39, external control = 74)                 | Direct care organizations (Netherlands) | UBOS-C/MBI-NL | Decrease in EE, no change to PA or DP  |

\*BCSQ-12 = Burnout Clinical Subtype Questionnaire (Spanish short version), CBI = Copenhagen Burnout Inventory, Cluster RCT = Cluster randomized controlled trial, CSFST = Compassion Satisfaction/Fatigue Self-Test, DP = Depersonalization or Cynicism dimensions of burnout, EE = Emotional Exhaustion dimension of burnout; HCWs = Health care workers, MBI = Maslach Burnout Inventory, MBI-D = German version of MBI, MBI-ES = MBI Educator Survey, MBI-GS = MBI General Survey, MBI-HSS = MBI Human Services Survey, MHWs = Mental health workers, OLBI = Oldenburg Burnout Inventory, PA = Personal accomplishment or professional efficacy dimension of burnout, PCWs = Personal care workers, ProQol = Professional Quality of Life Scale, SBI = Spanish Burnout Inventory, SMBQ = Shirom Melamed Burnout Questionnaire, TBI = Teachers' Burnout Inventory, TBS = Teacher Burnout Scale, UBOS-C/MBI-NL = Dutch version of the MBI-HSS, UBOS-L = Dutch version of the MBI-ES.

Multi-level interventions targeted intellectual disability support staff,<sup>210,213</sup> mental health care workers,<sup>211,214</sup> health care workers,<sup>215</sup> and teachers.<sup>212</sup> All multilevel interventions occurred in European countries. Multilevel interventions were studied with cohort studies,<sup>211,214,215</sup> cohort analytic study designs,<sup>210,213</sup> and a cluster randomized controlled trial.<sup>212</sup> Final collection of measures in studies examining multi-level intervention occurred as early as immediately following the intervention<sup>214</sup> or as late as 18 months after the intervention.<sup>211,215</sup>

Of the multi-level intervention studies, three were associated with a decrease in at least one dimension of burnout,<sup>210,211,213</sup> one was not associated with any change in burnout,<sup>214</sup> one was associated with an increase in burnout,<sup>215</sup> and one had mixed results in which one dimension of burnout increased while others decreased.<sup>212</sup>

Of the multi-level intervention studies, one of the studies had a global risk of bias rating of moderate (Table 8).<sup>212</sup> The remaining studies all had weak risk of bias ratings. All multilevel studies scored weak on selection bias and moderate on blinding. All but one study had a weak rating for confounders and a strong rating for data collection methods. Like organizational and individual level studies, ratings for withdrawals were mixed.

**Table 8 Risk of Bias Ratings for Multi-level Studies**

| <b>Article</b>       | <b>Selection Bias Rating</b> | <b>Design Rating</b> | <b>Confounders Rating</b> | <b>Blinding Rating</b> | <b>Data Collection Rating</b> | <b>Withdrawal Rating</b> | <b>Global Rating</b> |
|----------------------|------------------------------|----------------------|---------------------------|------------------------|-------------------------------|--------------------------|----------------------|
| Innstrand 2004       | Weak                         | Moderate             | Weak                      | Moderate               | Strong                        | Weak                     | Weak                 |
| Jones 2008           | Weak                         | Moderate             | Weak                      | Moderate               | Strong                        | Moderate                 | Weak                 |
| Jones 2009           | Weak                         | Moderate             | Weak                      | Moderate               | Strong                        | Moderate                 | Weak                 |
| Scarnera 2009        | Weak                         | Moderate             | Weak                      | Moderate               | Moderate                      | Weak                     | Weak                 |
| Sottimano 2018       | Weak                         | Strong               | Moderate                  | Moderate               | Strong                        | Strong                   | Moderate             |
| van Dierendonck 1998 | Weak                         | Strong               | Weak                      | Moderate               | Strong                        | Weak                     | Weak                 |

#### **4.2.4 Additional Outcomes**

Like burnout, most studies reported outcomes that were either null or in the desired direction. A few studies reported outcomes in the opposite direction of what was desired. Studies frequently assessed work satisfaction, with 10 out of 34 associated with increased levels of work satisfaction (Appendix Table 1). Studies also frequently assessed employee depression, anxiety, and stress, with 14 out of 25 interventions associated with a decrease in depressive symptoms, eight out of 19 interventions associated with a decrease in anxiety, and 28 interventions out of 46 interventions associated with a decline in stress (Appendix Table 3).

Several studies assessed compassion satisfaction and compassion fatigue, frequently referred to as secondary traumatic stress. Both constructs are often assessed with the ProQol, a measure frequently used to measure burnout. Seven out of 20 interventions were associated with an increase in compassion satisfaction (Appendix Table 3), and six out of 17 interventions were associated with a decline in compassion fatigue (Appendix Table 1). Additional outcomes are summarized in Appendix Tables 1-4.



## 5.0 Discussion

Workers in the human services sector are at risk of developing burnout. Despite this known risk, there are no interventions either at the individual level or organizational level that have strong evidence base to support their use with this population to the author's knowledge. This lack of evidence indicates the need to synthesize the existing literature and identify directions for future research.

One hundred and forty-three studies met inclusion criteria for this review, and 108 of the included studies described interventions at the individual level. Individual level interventions most frequently involved a form of individual or group therapy or relaxation or mindfulness training. Twenty-eight articles examined interventions that were designed to change the work-environment of employees in order to prevent burnout. Most frequently, these interventions targeted workflow, work processes, policies, or communication. Six articles examined interventions that had both individual and organizational components. The multilevel interventions frequently included components to teach individuals strategies to cope with stress or burnout, skills trainings for workers, strategies to improve team functioning, and trainings for supervisors.

Most study designs were cohort studies, cohort analytic studies, or randomized controlled trials, or cluster randomized controlled trials. Out of all the included studies, only one had a strong global risk of bias rating and only 19 had a moderate global risk of bias rating. Studies tended to have moderate or strong component ratings in the domain of design and data collection methods. Studies performed well in study design as the EPHPP Quality Assessment tool indicates strong ratings for randomized controlled trials and controlled clinical trials, and moderate for cohort analytic studies, case control study, cohort studies, and interrupted time series. All studies had one

of the study designs that indicated a strong or moderate rating. Further, studies performed well in data collection methods, as most studies used tools with demonstrated validity and reliability.

While most studies had moderate or strong ratings in the domains of design and data collection methods, many studies were weaker in controlling for selection bias or confounders. Based on the EPHPP Quality Assessment tool, studies could only be rated strong on the selection bias component if the study sample was randomly selected from a comprehensive list and if there was 80% or greater participation in the study. Studies were rated as weak in selection bias if participants were self-referred, there was less than 60% participation, or if selection methods and participation levels were not described. Two studies in the sample were rated strong in selection bias.<sup>78,82</sup> Many studies relied on self-referral from the population of interest. Studies were rated strong on the confounders component if there were no differences between groups prior to the intervention or if the study design or analysis controlled for most of the potential confounders, such as through matching. Studies were rated weak on confounders if control of confounders was not described, or if there appeared to be uncontrolled differences between groups prior to the intervention. No studies achieved a strong rating in the area of confounders and many studies did not report on potential differences between groups.

Ratings were particularly mixed across studies in the component of withdrawals. The withdrawal rating was based on the percent of participants at follow-up, with studies obtaining a strong rating if follow-up was 80% or greater, a moderate rating if follow-up was between 60-79% and a weak rating if follow-up was less than 60% or not reported. The percent of participation at follow-up varied substantially between studies, which is the reason for the variation in ratings on this component.

These findings are consistent with previous reviews which found that, while there appears to be a number of promising interventions to prevent or treat burnout, the evidence is limited by small sample sizes, high rates of withdrawals, and short durations of interventions.<sup>65</sup> The lack of robust evidence for interventions in this study may be partly accounted for by the large number of pilot studies. Eighteen of the included interventions self-identified as pilot studies in the title of the publication.<sup>88,115,120,122,127,132,138,141,142,144-146,152,156,174,191,202,211</sup>

Previous reviews on this topic had 17<sup>66</sup> and 25<sup>65</sup> studies included in their final selection. This is in great contrast to the 143 studies that were included in the final sample of this review. Part of this difference is due to the increasing awareness of burnout and the need for interventions for it that has occurred in the last decade. This increasing awareness is evident in the fact that over 100 of the studies included in this review were published after 2011, with approximately 60 published in the last three years alone.

Authors of one of the preceding reviews categorized identified studies into organizational level interventions, individual level, or mixed.<sup>65</sup> In the previous review, only two of the included publications were at the organizational level, indicating an important gap in the literature on this topic. In the current review, 28 of the included studies were characterized as targeting the organizational level. While this is a substantial increase from two, all but three of the studies had weak global risk of bias ratings, indicating a need for future studies of organizational level interventions with more robust methodology. Of the organizational level interventions with moderate risk of bias, only one was associated with a change in burnout. This intervention involved lessons, training, and supervision to shift a residential care home for elderly persons to an emotion-oriented care model and was associated with an increase in personal accomplishment, but not with changes in emotional exhaustion or depersonalization.<sup>82</sup> The other two organizational level

interventions that rated moderately on the global risk of bias involved a leadership and stress management workshop for firefighter supervisors,<sup>97</sup> and a transformation of Crisis Resolution Home team to a single point of service.<sup>78</sup> Neither of the second two interventions were associated with any change in burnout.

The potential importance of researcher organizational level interventions is highlighted by the findings of a recent systematic review of interventions that target burnout in physicians. The researchers of this review found that organizational level interventions significantly outperformed individual level interventions in reducing burnout.<sup>32</sup>

In the preceding review that categorized intervention levels, the reviewers identified six interventions that had both organizational level and individual level components.<sup>65</sup> The reviewers found that individual level interventions tended to produce desired results, but only in the short term (less than six months) while interventions that combined individual level and organizational level components had more lasting effects.<sup>65</sup> Despite the potential of interventions that combine individual and organizational level components, only six of the included studies in this review were multilevel. Further, only one of the included multi-level studies had a global risk of bias rating of moderate, while the remaining were identified as weak. The lack of included studies in this category indicate a gap in the literature of interventions that target individuals and their workplaces to reduce burnout.

The emphasis on individual level interventions in the literature stands in contrast to calls to shift focus from individual level to social and ecological level determinants of health. The World Health Organization (WHO) called for shift in focus to social determinants in the 1986 Ottawa Charter.<sup>216</sup> In the United States, the Centers for Disease Control and Prevention called for Public Health 3.0, which also emphasizes the need for public health strategies that target social

determinants.<sup>217</sup> The WHO has further identified the relationship between working conditions and health, including high job demand, low control, and effort-reward imbalance.<sup>218</sup> Recognition of the importance of these factors is consistent with both the demand-control support model of burnout<sup>27,28</sup> and the job demands-resources model of burnout,<sup>219</sup> in which burnout occurs under conditions of excess job demand without adequate support.

Conceptually, the root cause of burnout is not individual, so while treating the individual may help alleviate symptoms of stress or burnout, it does not address the causes, which are organizational. Despite the awareness of social determinants of health and the role of organizational factors in burnout, most interventions continue to target individuals. This emphasis on individuals may be evident of organizations shifting responsibility from themselves to their employees, and may demonstrate a lack of accountability among organizations for unhealthy work environments. For example, an organization with a high rate of burnout among employees, may hold a mindfulness training workshop, rather than change policies or management practices that are contributing to the high rate of burnout. Given the power imbalance between organizations and their employees, this poses an ethical problem of social justice in which agencies are not always adequately supporting their employees.

While organizational level interventions may be ideal, individual level interventions are still important in preventing or treating burnout. Of the 61 individual studies associated with reductions in burnout, 10 had moderate global risk of bias ratings. Of these 10 interventions, one was a skills training for staff, in which staff in a long-term dementia care unit learned person-centered care strategies for their work. This intervention was associated with a decrease in emotional exhaustion, with no changes in depersonalization or personal efficacy.<sup>169</sup> One involved online functional analytic psychotherapy and was associated with decreases in emotional

exhaustion and depersonalization with increases in personal efficacy.<sup>148</sup> Another involved preventative coaching for workers<sup>100</sup> and another involved reflecting peer-support groups,<sup>104</sup> both of which were associated with reductions in exhaustion. The other six individual level prevention interventions involved a mindfulness skills or meditation component, either for relaxation training only or in conjunction with other types of therapy. One was associated with reductions in burnout as a dimension of the Professional Quality of Life Scale.<sup>139</sup> Three of these were associated with decreases in emotional exhaustion with no changes in personal efficacy or depersonalization.<sup>132,140,165</sup> Two were associated with decreases in emotional exhaustion and increases in personal efficacy with no change in depersonalization.<sup>142,143</sup>

In past systematic reviews of interventions to treat or prevent burnout at the individual level, authors have noted a lack of consistency in intervention intensities and duration which limit comparability between studies.<sup>66</sup> The authors found that of the 17 studies included in their review, that most had relatively high evidence levels and that Cognitive Behavioral Therapy and the roots of Rhodiola were the most promising interventions in their review, while other interventions examined had results that were too inconsistent to draw any conclusions.<sup>66</sup> The findings in this review are consistent with that of past reviews, in that the bulk of interventions included at the individual level used a variety of methods that made them difficult to compare and draw larger conclusions.<sup>66</sup>

While the author cannot draw conclusions about the bulk of the intervention studies, it does appear the mindfulness-based interventions demonstrate some promise. Mindfulness-based interventions have been increasing in popularity in recent years. Twenty-seven of the interventions included in this review had mindfulness components,<sup>107,110,111,115,116,118-120,125,127,129,130,132,136,137,139-143,146,150-153,159,165</sup> the earliest of which was published in 2011.<sup>152</sup> Of these interventions, 21 were

associated with a decrease in burnout or dimension of burnout.<sup>107,111,115,116,118,119,125,127,129,130,132,136,137,139,140,142,143,150-152,165</sup> Of the included mindfulness based intervention studies, six had moderate global risk of bias ratings and all of those with moderate ratings were associated with reductions in burnout.<sup>132,139,140,142,143,165</sup> The results of this review regarding mindfulness are consistent with other systematic reviews. Past systematic reviews on mindfulness-based interventions for burnout include mindfulness in healthcare professionals,<sup>42,58</sup> workplace mindfulness randomized controlled trials,<sup>55</sup> mindfulness based stress reduction and mindfulness based cognitive therapy,<sup>57</sup> and mindfulness in general for burnout.<sup>59</sup> Several prior reviews have identified that mindfulness-based interventions may be promising for reducing burnout in certain groups,<sup>57-59,220</sup> but that there is poor methodological quality in many of these publications and a need for higher quality studies.<sup>42,55,58</sup> While the mindfulness-based interventions identified in this study show promise, there is a need for further research. Of the mindfulness-based interventions in this study that had moderate global risk of bias ratings, interventions ranged from four weeks<sup>139</sup> to 10 weeks in duration<sup>143</sup> with follow-up occurring up to three months after the intervention.<sup>140,165</sup> All of the interventions were with various types of health care workers, so their effectiveness with groups like police officers, firefighters or clergy is unknown. Further, all but one<sup>143</sup> of the interventions took place in the United States. Because of these limitations, there is a need for robust research on mindfulness based interventions for burnout with a greater variety of professionals, in a greater variety of settings, and that include follow-up after a longer period of time in order to examine if the effect of the intervention last over time.

## 5.1 Limitations to This Review

There are several limitations to this review. First, the review was conducted by a single person rather than two or more independent reviewers. This may introduce bias into the study selection and synthesis process. Second, a limitation of this review is the potential for incomplete retrieval of identified research. While the author initially planned to hand-search the references of included articles, due to the high number of included articles from the initial search, this was not feasible. This review is limited in that it only includes publications in the three databases searched and may be missing important and relevant articles on the topic. In addition, because the review was limited to studies published in English, additional relevant publications may have been missed. Further interventions may have been missed as the author did not search for any related grey literature.

With the author did conduct risk of bias assessments of individual studies, the reviewer did not assess for risk of bias across studies, limiting the possibility of identifying systematic bias such as publication bias or selective reporting.

Because of how population criteria were defined, this review systematically underrepresented the presence of individual treatment studies in the literature. Several publications that studied interventions at the individual level to treat existing burnout were with samples who could no longer work due to the severity of their symptoms. Even if these interventions were effective with human service workers, they were typically not included as most of these studies did not identify what profession the workers were on leave from. This likely skews the selection of interventions in this review to those used with more mild cases of burnout.



As identified by several other reviewers, there is no clinical diagnostic criteria for burnout and one of the most used tools for assessing burnout, the MBI, has not been validated for clinical purposes. This limits the interpretation of any results of this review for clinical use.

## **5.2 Conclusions**

In conclusion, while the number of intervention studies on the topic of burnout has increased substantially in the last decade, the need remains for more robust examinations of existing interventions. The author is currently unable to provide recommendations for evidenced-based interventions for human service workers that occur at the organizational level, due to lack of robust evidence. The author is also unable to provide recommendations for evidence-based interventions that include both organizational and individual level components due to the lack of literature identified. To address these limitations, the author recommends future research on both organizational level and mixed level interventions with robust methodology in order to fill this gap in the literature.

At the individual level, it appears that mindfulness-based interventions show promise for reducing burnout in human service workers, based on the results of six of the included studies. The mindfulness-based intervention studies had limited follow-up periods after the studies, only included healthcare personnel, and all but one were based in the United States. The author recommends continued good-quality research on mindfulness-based interventions with more diverse samples and with longer follow-up. The author further recommends more robust research on other forms of individual level interventions.

## **6.0 Funding**

This review was conducted without financial support

## Appendix Additional Outcomes Tables

**Appendix Table 1 Organizational Outcomes and Perceptions of Workplace Characteristics**

| Outcome Category                             | Outcome   | + (Positive)                                   | 0 (Null)  | - (Negative) |
|--|---|--|---|--------------|
| <b>Perception and Satisfaction with work</b> | Work satisfaction   | 117,196; 157 (Study 1);<br>74,76,82,89,158,210 | 91,113,143,166,169,170,189; 150 (Intervention 1 & 2);<br>152; 153 (Intervention 1 & 2);<br>154; 157 (Study 2);<br>73,93,206,214 98 (Interventions 1 & 2);<br>81,83,86 | 79,215       |
|  | Work-life balance   | 156  | 150 (Interventions 1 & 2)   |              |
|  | Anticipation of client/consumer success (hope for patients) | 192; 150 (Intervention 1); 152                 | 150 (Intervention 2)  |              |
|  | Professional quality of life                                |  | 145   |              |
|  | Development opportunities at work                           | 104  |   |              |
|  | Work enjoyment  | 143  |   |              |
|  | Work enforcement  |  | 143   |              |
|  | Organizational commitment                                   | 117  | 200   |              |
|  | Self-rated lifting behavior                                 |  | 134 (Interventions 1 & 2)   |              |
|  | Positive contributes to work                                |  | 183   |              |

**Appendix Table 1 Continued**

|                    |   |     |                          |     |
|--------------------|---|-----|--------------------------|-----|
|                    | Positive work motivation  | 183 |                          |     |
|                    | Relatedness satisfaction at work  | 196 |                          |     |
|                    | Quality of professional support subjects have received  | 171 |                          |     |
|                    | Psychological and social health of workplace  |     | 187                      |     |
|                    | behavioral work control   | 163 |                          |     |
|                    | cognitive work control  |     | 163                      |     |
|                    | Job satisfaction (intrinsic)  |     | 113,169,170              |     |
|                    | Job satisfaction (extrinsic)  |     | 169,170                  |     |
|                    | Work-related support  |     | 112                      |     |
|                    | Percent of "accepting" staff-patient interactions (relative to tolerating, rejecting, or unknown) | 90  |                          |     |
|                    | Satisfaction with EHR   | 84  |                          |     |
|                    | Positive Perception of work situation   |     | 82                       |     |
|                    | Ownership (sense that employee work contributes to organization's goals)                          |     | 74                       |     |
|                    | Perceived barriers to behavior therapy: institutional constraints                                 |     |                          | 72  |
|                    | Morale  |     | 79                       |     |
|                    | Personal motivation at work   | 74  |                          |     |
|                    | Physical Safety (assaults)  | 168 |                          |     |
|                    | Emotional Safety  | 168 |                          |     |
| <b>Job demands</b> | Overload and role conflict demand   |     |                          | 163 |
|                    | Quantitative demands at work  |     |                          | 104 |
|                    | Perceived exertion (physical)   |     | 134 (Interventions 1 &2) |     |
|                    | Perceived exertion (mental)   |     | 134 (Interventions 1 &2) |     |
|                    | Psychological and safety work demands   |     |                          | 163 |
|                    | Work-related demands  |     | 112                      |     |
|                    | Professional demands (chronic)  |     | 97                       |     |

**Appendix Table 1 Continued**

|                                    |   |     |     |                              |
|------------------------------------|---|-----|-----|------------------------------|
|                                    | Professional demands (acute)  |     | 97  |                              |
| <b>Effort/reward balance</b>       | Perception of Organizational Equity (balance between investment put in and received from work effort) | 213 |     |                              |
|                                    | Effort reward imbalance: Effort   |     | 160 |                              |
|                                    | Effort reward imbalance: Reward   |     | 160 |                              |
|                                    | Effort reward imbalance: Appreciation   |     | 160 |                              |
|                                    | Effort reward imbalance: Job safety   |     | 160 |                              |
|                                    | Effort reward imbalance: Status   |     | 160 |                              |
|                                    | Effort reward imbalance ratio   |     | 160 |                              |
| <b>Work engagement</b>             | Work engagement: vigor  | 196 |     |                              |
|                                    | Work engagement: absorption   | 196 |     |                              |
|                                    | Work engagement: dedication   |     | 196 |                              |
|                                    | Work engagement: vigor  |     |     | 97; 98 (Interventions 1 & 2) |
|                                    | Work engagement: dedication   |     |     | 97; 98 (Interventions 1 & 2) |
|                                    | work engagement: absorption   |     |     | 98 (Interventions 1 & 2)     |
|                                    | Participation at work   | 104 |     |                              |
| <b>Ward atmosphere and quality</b> | Ward quality - relationships  |     | 173 |                              |
|                                    | Ward quality - personal development   |     | 173 |                              |
|                                    | Ward quality - system maintenance   |     | 173 |                              |
|                                    | Ward atmosphere: involvement  | 90  |     |                              |
|                                    | Ward atmosphere: support  |     | 90  |                              |
|                                    | Ward atmosphere: Spontaneity  |     | 90  |                              |
|                                    | Ward atmosphere: autonomy   |     | 90  |                              |
|                                    | Ward atmosphere: practical orientation  |     | 90  |                              |
|                                    | Ward atmosphere: personal problems orientation  |     | 90  |                              |

**Appendix Table 1 Continued**

|   |   |                                  |                                   |     |
|---|---|----------------------------------|-----------------------------------|-----|
|   | Ward atmosphere: anger and aggression                             |                                  | 90                                |     |
|   | Ward atmosphere: Order and organization                           |                                  | 90                                |     |
|   | Ward atmosphere: Program clarity                                  |                                  | 90                                |     |
|   | Ward atmosphere: Staff control                                    |                                  | 90                                |     |
| <b>Social support at work</b>                     | Combi work-family   |                                  | 100                               |     |
|   | Attitudes related to teamwork constructs                          |                                  | 88                                |     |
|   | perceptions of group-level team skills                            |                                  | 88                                |     |
|   | Collegial support network size                                    |                                  | 72                                |     |
|   | Satisfaction with collegial support network                       | 72                               |                                   |     |
|   | Perceived barriers to behavior therapy: collegial support         | 72                               |                                   |     |
|   | Supervisor social support   |                                  | 97                                |     |
|   | Colleague/coworker social support                                 | 97; 212<br>(Interventions 1 & 2) |                                   |     |
|   | Perception of management trust in worker ability (vertical trust) | 212 (Interventions 1 & 2)        |                                   |     |
|   | Support from superiors/managers                                   |                                  | 163, 207<br>(Interventions 1 & 2) |     |
|   | Work satisfaction with colleagues                                 | 206                              |                                   |     |
|   | Support at work   | 104                              |                                   |     |
|   | Perceptions of workplace civility within organization             | 76                               |                                   |     |
|   | Experienced incivility  |                                  |                                   | 76  |
|   | Instigated incivility   |                                  | 76                                |     |
|   | Respect from supervisors and colleagues                           | 76                               |                                   |     |
|   | Trust in management   | 76                               |                                   |     |
|   | Feeling cared for   | 93                               | 91                                |     |
|   | Treatment team cohesion: attraction to group task                 |                                  | 177                               |     |
|   | Treatment team cohesion: attraction to group-social               |                                  |                                   | 177 |
| Treatment team cohesion: group integration-task   |   | 177                              |                                   |     |
| Treatment team cohesion: group integration-social |   |                                  | 177                               |     |

**Appendix Table 1 Continued**

|                                 |   |  |  |  |
|---------------------------------|---|--|--|--|
| <b>Work-related stress</b>      | Job tension   |  |  | 151  |
|                                 |   |  | 113; 118 (compared to control at 26 weeks); 80,91,93,95,119,138, 144,145,180 | 123,128,191,203; 149 (Study 2 Interventions 1 & 2) |
|                                 | Work stress   |  | 120,130,189  | 147  |
|                                 | Clinical Stress   |  |  | 144  |
|                                 | Frequency of stressful events   |  | 165  |  |
|                                 | Subjective noise exposure   |  | 202  |  |
|                                 | Operational stress  |  | 116  |  |
|                                 | Job demands   |  | 89   |  |
|                                 | Job content (work factors)  |  | 83   |  |
|                                 | Impact of client behavioral disturbances on their workload and stress |  | 207 (Interventions 1 & 2)  |  |
|                                 | Organizational stress   |  |  | 115,116  |
|                                 | Operational stress  |  |  | 115  |
| <b>Time Urgency</b>             | Time urgency  |  | 131  |  |
|                                 | Time urgency: speech patterns   |  | 133  |  |
|                                 | Time urgency: eating behavior   |  | 133  |  |
|                                 | Time urgency: competitiveness   |  | 133  |  |
|                                 | Time urgency: task related hurry                                      |  | 133  |  |
|                                 | Time urgency: general hurry   |  |  | 133  |
| <b>Turnover and absenteeism</b> | Turnover intention  |  | 150 (Interventions 1 & 2); 153 (Interventions 1 & 2); 213                    |  |
|                                 | Absenteeism/sick days   |  | 108,122 150 (Interventions 1 & 2); 82  | 76,106,201,213                                     |

**Appendix Table 1 Continued**

|                     |  |                      |  |     |
|---------------------|--|----------------------|--|-----|
|                     | If worker had taken off work due to a trauma exposure                                    |                      | 158  |     |
|                     | If worker had made short- or long-term changes to work practice due to a trauma exposure |                      | 158  |     |
|                     | If worker had considered leaving profession due to a trauma exposure                     |                      |  | 158 |
|                     | Considering leaving position   |                      | 152,158  |     |
|                     | Turnover - likely to leave   | 153 (Intervention 2) | 150(Interventions 1 & 2); 152 153 (Intervention 1) |     |
|                     | Stress related illnesses   |                      | 122  |     |
|                     | Organizational/agency commitment   | 76,86                |  |     |
|                     | actual turnover  |                      |  | 86  |
|                     | intent to leave  |                      | 76   | 86  |
|                     | Seriously considering leaving organization   |                      | 98 (Interventions 1 & 2)                           |     |
|                     | Actively seeking other employment  |                      | 98 (Interventions 1 & 2)                           |     |
| <b>Work Quality</b> | Professional excellence  | 194                  |  |     |
|                     | Quality of care: Person centered care  | 153 (Intervention 2) | 153 (Intervention 1)                               |     |
|                     | Quality of care: discordant care   |                      | 153 (Interventions 1 & 2)                          |     |
|                     | Quality of care-total  | 153 (Intervention 2) | 153 (Intervention 1)                               |     |
|                     | Percent of time doing socioemotional care for patients                                   |                      | 192  |     |
|                     | Staff-patient relationship   |                      | 173  |     |
|                     | work-ability   |                      | 212 (Interventions 1 & 2)                          |     |
|                     | Staff positive behavior  |                      | 188  |     |
|                     | Staff abusive behavior   |                      | 188  |     |



**Appendix Table 1 Continued**

|                                |   |     |                           |     |
|--------------------------------|---|-----|---------------------------|-----|
|                                | Productivity  | 151 |                           |     |
|                                | Silencing response (communication problem of directing conversation away from distressing things)     |     | 144                       |     |
|                                | Quality of communication with patients  | 192 |                           |     |
| <b>Organizational outcomes</b> | Quality of Environment (QELS)   |     | 168                       |     |
|                                | Incidents of challenging behavior, damage or injury   |     | 168                       | 87  |
|                                | Patient access to care  | 85  |                           |     |
|                                | Clinical Quality Metrics  | 85  |                           |     |
|                                | Adequate Staffing   | 85  |                           |     |
|                                | Quality of organizational climate   | 148 |                           |     |
|                                | Organizational Performance  | 81  |                           |     |
|                                | Quality of interactions between care staff and residents  |     | 207 (Interventions 1 & 2) |     |
|                                | Teamwork  | 74  |                           |     |
|                                | Participation in decision making/collective problem solving   | 74  |                           |     |
|                                | Workplace stress (perception of workplace environment as stressful)                                   | 74  |                           |     |
|                                | Sense of coherence  |     | 73                        |     |
|                                | Severity of conflicts   |     |                           | 180 |
|                                | Time spent on conflicts   |     |                           | 180 |
|                                | Incidence of conflicts  |     |                           | 180 |
|                                | Departmental function/impact (desired impact of intervention of factors like budget, and time demand) | 94  |                           |     |

**Appendix Table 2 Attitudes and Cognitions of Employee Toward Work-Related Issues**

| <b>Outcome Category</b>  | <b>Outcome</b>   | <b>+ (Positive)</b>        | <b>0 (Null)</b>      | <b>- (Negative)</b> |
|--|--|----------------------------|----------------------|---------------------|
| <b>Skills and efficacy</b>                                     | General self-efficacy  | 108,133                    |                      |                     |
|  | Work specific self-efficacy  | 108                        |                      |                     |
|  | Verbal communication behavior  |                            | 170                  |                     |
|  | Nonverbal communication behavior   |                            | 170                  |                     |
|  | Provider knowledge of interventions from training                          |                            | 214                  |                     |
|  | Sense of competence with dementia  |                            | 188                  |                     |
|  | Socioemotional learning self-efficacy                                      | 172 (Intervention 2)       | 172 (Intervention 1) |                     |
|  | Behavior management self-efficacy  | 172 (Intervention 2)       | 172 (Intervention 1) |                     |
|  | CBT knowledge  | 162                        |                      |                     |
|  | CBT self-efficacy  | 162                        |                      |                     |
|  | Self-assessed work ability   | 201                        |                      |                     |
|  | Ability to care for others   | 203                        |                      |                     |
|  | Knowledge and competence in dealing adequately with challenges of dementia | 164                        |                      |                     |
|  | <b>Teaching efficacy</b>   | Personal teaching efficacy | 171,187              |                     |
| Teacher self-efficacy: learner centered                        |  | 171                        |                      |                     |
| Teacher self-efficacy: community centered                      |  | 171                        |                      |                     |
| Teacher self-efficacy: Knowledge centered                      |  | 171                        |                      |                     |
| Teacher self-efficacy: historical understanding                |  | 171                        |                      |                     |
| Teacher self-efficacy: tolerance and psycho-social development |  | 171                        |                      |                     |
| Teacher self-efficacy: Deliberation                            |  | 171                        |                      |                     |
| Teacher self-efficacy: civic literacy                          |  | 171                        |                      |                     |
| Teacher efficacy in student engagement                         |  | 133,175                    | 131,184,190          |                     |
| Teacher self-efficacy: classroom management                    |  | 131                        | 133,175,184,190      |                     |
| Teacher socioemotional learning efficacy                       |  | 179 (Intervention 2)       | 179 (Intervention 1) |                     |

**Appendix Table 2 Continued**

|   |   |                      |                      |                      |
|---|---|----------------------|----------------------|----------------------|
|   | Teacher behavioral management efficacy  | 179 (Intervention 2) | 179 (Intervention 1) |                      |
|   | Emotional support to students (observer reported)                                     | 127                  |                      |                      |
|   | Classroom organization (observer reported)  | 127                  |                      |                      |
|   | Instructional support (Observer reported)   |                      | 127                  |                      |
|   | Teaching efficacy: instructional practices/strategies                                 | 133                  | 131,184,190          |                      |
|   | Teaching efficacy: relational trust   |                      | 131                  |                      |
| <b>Perceptions towards interventions used</b> | Positive perception of intervention technique for clients/patients                    | 94                   |                      |                      |
|   | Perception of effectiveness of psychological and pharmacologic interventions for pain |                      | 94                   |                      |
|   | Satisfaction with intervention  | 84                   |                      |                      |
|   | Evidence-based practice attitudes   |                      | 88                   |                      |
|   | Perceived barriers to behavior therapy: philosophical opposition                      |                      |                      | 72                   |
| <b>Attitudes toward caregiving role</b>       | attitudes/perceptions of caregiving role  | 195                  | 221                  |                      |
| <b>attitudes toward patient families</b>      | attitudes towards families  | 221                  |                      |                      |
|   | perception of family involvement  | 221                  |                      |                      |
| <b>Attitudes about death</b>                  | Fear of death   | 205 (Intervention 2) |                      | 205 (Intervention 1) |
|   | Death avoidance   | 205 (Intervention 2) |                      | 205 (Intervention 1) |
|   | Neutral acceptance  |                      | 205 (Intervention 1) | 205 (Intervention 2) |
|   | Approach acceptance   | 205 (Intervention 1) | 205 (Intervention 2) |                      |
|   | Escape acceptance   | 205 (Intervention 1) | 205 (Intervention 2) |                      |
| <b>Attitudes about aging and dementia</b>     | Positive attitudes about aging  |                      | 192                  |                      |
|   | Positive attitudes about dementia   | 182                  | 192                  |                      |
|   | Personhood in dementia  | 182                  |                      |                      |
| <b>Attitudes about pain</b>                   | Health care provider pain and impairment relationship (higher scores are worse)       |                      |                      | 185                  |
|   | Biomedical orientation to treating pain   |                      |                      | 185                  |

**Appendix Table 2 Continued**

|  |  |     |     |  |
|--|--|-----|-----|--|
|  | Biopsychosocial orientation to treating pain             | 185 |     |  |
| <b>Attitudes about people with intellectual disabilities</b> | Empathy for people with intellectual disabilities        |     | 183 |  |
|  | Similarities (Community Living Attitudes Scale)          |     | 183 |  |
|  | Empowerment attitudes (Community Living Attitudes Scale) | 183 |     |  |

**Appendix Table 3 Employee Mental Health, Social Health, Resilience, and Coping Skills Outcomes**

| <b>Outcome Category</b>                          | <b>Outcome</b>             | <b>+ (Positive)</b>                                 | <b>0 (Null)</b>   | <b>- (Negative)</b>  |
|--|----------------------------|---|---|--|
| <b>Depression, Anxiety and negative emotions</b> | Psychoticism               |   | 197 (Interventions 1 & 2)   |  |
|  | Depressive reaction        |   |   | 100  |
|  | Expressing emotions        |   | 100   |  |
|  | Positive symptoms distress |   | 197 (Interventions 1 & 2)   |  |
|  | Hostility                  |   | 197 (Interventions 1 & 2)   |  |
|  | Psychological wellbeing    | 130   |   |  |
|  | Aggression                 |   |   | 197 (Interventions 1 & 2)  |
|  | Obsessive-compulsive       |   |   | 197 (Interventions 1 & 2)  |
|  | Paranoid ideation          |   | 197 (Intervention 1)  | 197 (Intervention 2)   |
|  | Mental health              | 108,112,115,129,166; 149 (Study 2 Intervention 1&2) |   |  |
|  | Depressive Symptoms        |   | 104,113,116,125,130,133,137,141,143,221; 140 (Intervention 2)   | 83,102,108,123,124,155,156,200; 197 (Interventions 1 & 2); 140 (Intervention 1); 149 (Study 1 & Study 2 Interventions 1 & 2) |
|  | Loneliness                 |   |   | 194  |
|  | Negative affect/emotion    | 113   | 131,133,184,190   | 130,151  |
|  | Psychological detachment   |   | 157 (Study 2)   |  |
|  | Anxiety                    | 113   | 116,125,186; 197 (Interventions 1 & 2); 140 (Interventions 1 & 2); 104; 149 (Study 2 Interventions 1 & 2) | 121,130,137,143,155,200, 203; 149 (Study 1)  |
|  | Feeling sad                |   | 140 (Interventions 1 & 2)   |  |
|  | Feeling nervous            |   | 140 (Interventions 1 & 2)   |  |
| Troubled conscience about stressful events       |                            |   | 165   |  |

**Appendix Table 3 Continued**

|                          |   |                            |   |  |
|--------------------------|---|----------------------------|---|--|
|                          | Rumination                                  |                            | 137   |  |
|                          | Fatigue                                     |                            | 130   |  |
|                          | Phobic anxiety                              |                            |   | 197 (Interventions 1 & 2)  |
|                          | Anxious mood                                |                            | 100   |  |
|                          | Fatigue                                     |                            | 100   | 115  |
|                          | Suicidal ideation                           |                            | 116   |  |
|                          | Anger                                       |                            | 116   | 115  |
|                          | Aggression                                  |                            | 116   |  |
|                          | Worry                                       |                            |   | 108  |
|                          | Psychological/emotional distress            | 215                        | 214; 197 (Intervention 1)   | 100,105,127; 197 (Intervention 2)  |
|                          | Presence of depression or anxiety           |                            | 81  |  |
|                          | Stress                                      | 81,113,215                 | <sup>120,125,131,169,170,222</sup> ; 214 (Interventions 1 & 2); 212 (Intervention 1); 140 (Intervention 2); <sup>80,141,155,206,221</sup> | 110,112,115; 118 (compared to control; at 26 weeks) 108,119-121,123,124,126; 197 (Interventions 1 & 2); <sup>132,137,139,187,210,223</sup> ; 140 (Intervention 1); 143,145,166; 149 (Study 1 & Study 2 Interventions 1&2) 151,159; 212(Intervention 2) |
|                          | Symptoms of PTSD                            |                            | 158   | 123,130  |
|                          | Physical & psychological symptoms of stress |                            | 157 (Study 2)   | 151,201; 157 (Study 1)   |
| <b>Positive emotions</b> | Positive Emotions/Affect                    | 113,131,151; 157 (Study 1) | 130,133,184; 157 (Study 2); 190   |  |
|                          | Subjective happiness                        | 156                        | 192   |  |
|                          | Feeling calm                                | 140 (Intervention 1)       | 140 (Intervention 2)  |  |
|                          | Feeling cheerful                            | 140 (Intervention 1)       | 140 (Intervention 2)  |  |

**Appendix Table 3 Continued**

|  |   |   |               |     |
|--|---|---|---------------|-----|
|  | Well-being  | 200   |               |     |
|  | Hope  |   | 123           |     |
|  | Comforting cognitions   |   | 100           |     |
| <b>Knowledge and coping self-efficacy in trauma, stress, and burnout</b> | Confidence in knowledge of how to identify and manage personal or colleague responses to traumatic perinatal events | 158   |               |     |
|  | Coping self-efficacy  |   | 145           |     |
|  | Knowledge about stress  | 145   |               |     |
| <b>Coping skills and emotional functioning</b>                           | Coping strategies (avoidance)   |   |               | 206 |
|  | Coping skill: Relaxation  | 149 (Study 1 & Study 2 Intervention 1&2)      |               |     |
|  | Coping Skill: Awareness   | 143; 149 (Study 1 & Study 2 Intervention 1&2) | 149 (Study 1) |     |
|  | Coping Skill: Assertion   |   | 149 (Study 1) |     |
|  | Coping confidence/self-efficacy   | 149 (Study 1 & Study 2 Intervention 1&2)      | 123           |     |
|  | Emotion regulation  | 149 (Study 1)                                 | 143           |     |
|  | Emotion regulation/coping: clarity  |   | 143           |     |
|  | Emotional regulation/coping: sensations   |   | 143           |     |
|  | Emotional regulation/coping: understanding  |   | 143           |     |
|  | Emotional regulation/coping: acceptance   |   | 143           |     |
|  | Emotional regulation/coping:  | 143   |               |     |
|  | Emotional regulation/coping: self-support   |   | 143           |     |
|  | Emotional regulation/coping: Readiness to confront  |   | 143           |     |
|  | Adherence to meditation practices   | 166   |               |     |

**Appendix Table 3 Continued**

|                               |  |   |  |                      |
|-------------------------------|--|---|--|----------------------|
|                               | Acceptance of ones own thoughts and feelings     |   | 185  |                      |
|                               | Acceptance and action                            |   |  | 123                  |
|                               | Psychological flexibility                        | 116   | 112  |                      |
|                               | Difficulties in emotion regulation               |   |  | 115                  |
|                               | Intrapersonal competence/mindfulness             |   | 179 (Interventions 1 & 2)                                      |                      |
|                               | Interpersonal competence/mindfulness             |   | 179 (Interventions 1 & 2)                                      |                      |
|                               | Emotional regulation: reappraisal                | 133   | 131,133  |                      |
|                               | Emotion regulation: suppression                  |   | 131,133  |                      |
|                               | Emotion regulation: distress tolerance           | 131   |  |                      |
| <b>Mindfulness</b>            | Mindfulness                                      | 111,115,119,126,133; 149 (Study 1); 154,159                                   |  |                      |
|                               | Informal mindfulness practices                   | 130   |  |                      |
|                               | Mindful attention awareness scale                |   | 123  |                      |
|                               | Mindfulness: Observing                           | 113,131,133; 205 (Intervention 1)   | 123,125,127; 205 (Intervention 2)                              |                      |
|                               | Mindfulness: Describing:                         | 127   | 113,123,125,131,133; 205 (Intervention 1 & 2)                  |                      |
|                               | Mindfulness: Acting with awareness               | 115,125,136   | 113,116,123,127,131,133; 205 (Intervention 2)                  | 205 (Intervention 1) |
|                               | Mindfulness: Non-judging of inner experiences    | 115,123,125,136   | 113,116,127,131,133; 205 (Intervention 2)                      | 205 (Intervention 1) |
|                               | Mindfulness: Non-reactivity to inner experiences | 115,116,125,133,136   | 113,123,127,131; 205 (Intervention 1 & 2)                      |                      |
| <b>Compassion and Empathy</b> | Self-Compassion                                  | 118 (at 26 weeks); 126,127; 140 (Intervention 2); 146; 149 (Study 1); 154,159 | 113,116; 118 (compared to controls); 123; 140 (Intervention 1) |                      |
|                               | Compassion                                       | 159   | 113  |                      |
|                               | Compassion Satisfaction                          | 118 (at 26 weeks); 119,128; 149 (Study 2 Interventions 1&2); 95,194           | 113; 118 (compared to control); 80,91-                         |                      |



**Appendix Table 3 Continued**

|                             |                                     |                   |                                |                      |
|-----------------------------|-------------------------------------|-------------------|--------------------------------|----------------------|
|                             |                                     |                   | 93,123,138,144,145,180,191,203 |                      |
|                             | Fear of compassion                  |                   |                                | 154                  |
|                             | Empathy                             | 192               | 123,189                        |                      |
|                             | Compassion for others               |                   | 140 (Interventions 1 & 2)      |                      |
|                             | Self-coldness                       |                   |                                | 126                  |
|                             | Self-Compassion: Self-kindness      |                   | 113,123                        |                      |
|                             | Self-Compassion: Self-judgement     | 123               | 113                            |                      |
|                             | Self-Compassion: Common humanity    |                   | 113,123                        |                      |
|                             | Self-Compassion: Isolation          | 123               | 113                            |                      |
|                             | Self-Compassion: Mindfulness        |                   | 113,123                        |                      |
|                             | Self-Compassion: Over-identified    | 123               | 113                            |                      |
| <b>Resilience</b>           | Resilience                          | 115,136,167,191   | 116                            |                      |
|                             | Decentering                         | 118 (at 26 weeks) | 118 (compared to control)      |                      |
| <b>Self-esteem</b>          | Self-esteem                         | 123,155,215       | 112,214                        |                      |
|                             | Appearance self-esteem              |                   | 123                            |                      |
|                             | Performance self-esteem             |                   | 123                            |                      |
|                             | Body Esteem - Sexual Attractiveness |                   | 123                            |                      |
|                             | Body Esteem - weight concern        |                   | 123                            |                      |
|                             | Body Esteem - Physical condition    | 123               |                                |                      |
|                             | Social self-esteem                  |                   | 123                            |                      |
| <b>Spiritual health</b>     | Daily spiritual experience          |                   | 194                            |                      |
|                             | closeness to God                    |                   | 194                            |                      |
| <b>Interpersonal health</b> | Social dysfunction                  |                   |                                | 200                  |
|                             | Frequency of going out              |                   | 200                            |                      |
|                             | Interpersonal sensitivity           |                   | 197 (Intervention 1)           | 197 (Intervention 2) |
|                             | Peer support                        | 208               |                                |                      |
|                             | Family functioning                  |                   | 115                            |                      |
|                             | interpersonal conflict              |                   | 221                            |                      |

**Appendix Table 3 Continued**

|              |  |                      |                                      |     |
|--------------|--|----------------------|--------------------------------------|-----|
|              | Interpersonal conflict                       |                      | 154                                  |     |
|              | Quality of social relationships              | 145                  |                                      |     |
|              | Enjoyment of relationships                   | 140 (Intervention 1) | 140 (Intervention 2)                 |     |
|              | Social Support                               |                      | <sup>222</sup> (Interventions 1 & 2) |     |
|              | Social participation                         |                      | 130                                  |     |
|              | Trust  |                      | 123                                  |     |
| <b>Other</b> | Recovery Experience                          | 157 (Study 2)        |                                      |     |
|              | Mastery Experiences                          | 157 (Study 2)        |                                      |     |
|              | Vitality                                     |                      | 166                                  |     |
|              | Acting in accordance with personal values    | 140 (Intervention 2) | 140 (Intervention1)                  |     |
|              | Emotional intelligence                       | 115                  |                                      |     |
|              | Sustained attention                          | 127                  |                                      |     |
|              | Errors of commission in emotional processing |                      |                                      | 127 |

**Appendix Table 4 Patient, Client, Family and Student Outcomes**

| <b>Category</b>  | <b>Outcome</b>                                       | <b>+ (Positive)</b>  | <b>0 (Null)</b>           | <b>- (Negative)</b>  |
|--|--|----------------------|---------------------------|----------------------|
| <b>Client/Patient/Consumer:<br/>Mental health</b>                    | Hope   |                      | 153 (Interventions 1 & 2) |                      |
|  | Patient Activation Measure - Mental Health           | 153 (Intervention 1) | 153 (Intervention 2)      |                      |
|  | Mental Health Functioning                            |                      | 153 (Interventions 1 & 2) |                      |
|  | Depression   |                      | 153 (Intervention 2)      | 153 (Intervention 1) |
|  | Anxiety  |                      | 153 (Intervention 2)      | 153 (Intervention 1) |
|  | Fatigue  |                      | 92                        |                      |
|  | Stress   |                      | 92                        |                      |
|  | Hopefulness  |                      | 92                        |                      |
|  | Happiness  |                      | 92                        |                      |
|  | Energy   |                      | 92                        |                      |
|  | Anxiety  |                      | 92                        |                      |
|  | Depression   |                      | 92                        |                      |
|  | Mental wellbeing                                     |                      | 168                       |                      |
|  | Depressive symptoms                                  |                      | 221                       |                      |
|  | Activity involvement and enjoyment                   |                      | 221                       |                      |
|  | Neuropsychiatric symptoms                            |                      | 188                       |                      |
| Psychotropic medication prescriptions                                |  | 188                  |                           |                      |
| <b>Client/Patient/Consumer:<br/>Physical health</b>                  | Physical Health Functioning                          |                      | 153 (Interventions 1 & 2) |                      |
|  | Pain   |                      | 92                        |                      |
| <b>Client/Patient/Consumer:<br/>Health behaviors and attitudes</b>   | Medication Adherence                                 | 153 (Intervention 1) | 153 (Intervention 2)      |                      |
|  | Positive Medication Attitudes                        | 153 (Intervention 1) | 153 (Intervention 2)      |                      |
| <b>Client/Patient/Consumer:<br/>satisfaction and quality of care</b> | Satisfaction   |                      | 95,168                    |                      |
|  | Autonomy Support - Health Care Climate Questionnaire |                      | 153 (Interventions 1 & 2) |                      |

**Appendix Table 4 Continued**

|   |   |                      |                           |                      |
|---|---|----------------------|---------------------------|----------------------|
|   | Working Alliance Inventory  |                      | 153 (Interventions 1 & 2) |                      |
|   | Client Satisfaction   | 153 (Intervention 1) | 153 (Intervention 2)      |                      |
|   | Quality of Care - total   |                      | 153 (Intervention 2)      | 153 (Intervention 1) |
|   | Quality of Care - Person centered care subscale                             |                      | 153 (Interventions 1 & 2) |                      |
|   | Quality of Care - Negative Interactions Subscale                            |                      | 153 (Interventions 1 & 2) |                      |
|   | Quality of Care - Inattentive Care Subscale                                 |                      | 153 (Interventions 1 & 2) |                      |
|   | Staff use of physical restraints  |                      | 164                       |                      |
|   | Staff use of sedative drugs   |                      | 164                       |                      |
|   | Staff use of restrictive practices  |                      | 183                       |                      |
| <b>Client/Patient/Consumer: aggression and challenging behaviors</b>          | Incidents of challenging behaviors  |                      | 183                       |                      |
|   | Aggressive behavior   |                      | 183                       |                      |
|   | Agitated Behavior   |                      | 188,195                   |                      |
| <b>Client/Patient/Consumer: quality of life</b>                               | Quality of Life   |                      | 182                       |                      |
|   | Dementia Quality of Life (rated by proxy)                                   |                      | 182                       |                      |
|   | Dementia Quality of Life (rated by person with dementia)                    | 182                  |                           |                      |
|   | Overall sense of well-being   |                      | 92                        |                      |
|   | Quality of Life   | 221                  | 195                       |                      |
|   | Dementia specific quality of life   |                      | 188                       |                      |
|   | health related quality of life  |                      | 188                       |                      |
| <b>Client/Patient/Consumer: independence and relationship with caregivers</b> | Quality of relationship of people with dementia and their family caregivers |                      | 182                       |                      |
|   | Severity and burden to caregiver of dementia related symptoms               |                      |                           | 181                  |
|   | Patient independence (Care Dependency Scale)                                |                      | 181                       |                      |

**Appendix Table 4 Continued**

|  |   |     |     |     |
|--|---|-----|-----|-----|
| <b>Client/Patient/Consumer: engagement</b> | Patient engagement with services: availability                | 177 |     |     |
|  | patient engagement with services: collaboration               |     | 177 |     |
|  | patient engagement with services: help seeking                |     | 177 |     |
|  | patient engagement with services: treatment adherence         |     | 177 |     |
|  | Service use (direct/indirect costs of health and social care) |     | 188 |     |
| <b>Client/Patient/Consumer: safety</b>     | Physical Safety (assaults)                                    |     | 168 |     |
|  | Emotional Safety  |     | 168 |     |
| <b>Patient/client's family outcomes</b>    | Positive experience with caregiving of people with dementia   |     |     | 182 |
|  | involvement in care   |     | 221 |     |
|  | depressive symptoms   |     | 221 |     |
|  | perception of care  |     | 221 |     |
|  | interpersonal conflict  |     | 221 |     |
|  | perception of caregiving role (guilt and conflict)            | 221 |     |     |
|  | caregiving burden   |     |     | 221 |
| <b>Student outcomes</b>                    | Racism tolerance  |     | 171 |     |
|  | Political tolerance   | 171 |     |     |
|  | deliberation convictions (tolerance)                          |     | 171 |     |
|  | Civic self-efficacy   | 171 |     |     |
|  | Deliberation practice (civic participation)                   |     | 171 |     |
|  | Civic discourse (civic participation)                         |     | 171 |     |
|  | Open climate: teachers overall                                | 171 |     |     |
|  | open climate: students overall                                |     | 171 |     |
|  | Engagement with civic matters                                 | 171 |     |     |

**Appendix Table 4 Continued**

|  |  |     |     |     |
|--|--|-----|-----|-----|
|  | Historic understanding   | 171 |     |     |
|  | Social and ethical competency: response rating on relationship questionnaire |     | 171 |     |
|  | Social and ethical competency: best choice on relationship questionnaire     |     | 171 |     |
|  | Social and ethical competency: Justification (choices in social context)     |     | 171 |     |
|  | Social and ethical competency: Strategy (choices in social context)          |     | 171 |     |
|  | Emotional and behavioral problems  |     |     | 175 |
|  | Teacher-child closeness  |     | 175 |     |
|  | Child social preference  |     | 175 |     |

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