



A Meta-analysis of the Impact of Social and Emotional Learning Interventions on Teachers' Burnout Symptoms

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Accepted: 3 March 2021/Published online: 24 March 2021
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Abstract

Over the last decades, extensive research has given considerable attention to teachers' burnout. Owing to its negative personal, organizational, and social impacts (e.g., mental ill health, decreased work performance, turnover), intervention and prevention efforts have consequently been employed to minimize the effects of this phenomenon/syndrome. As teaching-specific stressors are mainly related to the socio-emotional domain, interventions targeting social and emotional learning (SEL) for teachers have been seen to increase in recent years. A meta-analysis of 13 empirical studies was conducted to investigate the effects of SEL interventions on teachers' burnout. Results showed a statistically significant medium effect size favoring the experimental group regarding the impact of SEL on emotional exhaustion ($g = -0.37$, 95% CI $[-0.70, -0.03]$) and personal accomplishment ($g = 0.45$, 95% CI $[0.12, 0.79]$). Impacts on depersonalization ($g = -0.51$, 95% CI $[-1.13, 0.11]$) were found to be not statistically significant. Meta regression analyses found narrower confidence intervals for interventions carried out over 3 months and tailored to the precise needs of class-level teachers for personal accomplishment. The findings add to the growing empirical evidence of the contribution of SEL interventions to improving teachers' personal accomplishment, identified in prior literature as a mitigating factor of teacher burnout syndrome and diminishing their emotional exhaustion, thus sustaining the importance of promoting SEL within teacher training. As for their practical and methodological implications, the results contribute to understanding the role of the specific features of SEL interventions, and also important features of research design and methodological constraints, which may impact the effectiveness of these interventions.

Keywords Burnout · Meta-analysis · Social and emotional learning interventions · Teachers

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Introduction

Occupational stress is a part of every profession; however, prolonged and cumulative experiences of job stress over time may lead to burnout (Leiter & Maslach, 2003). Although any worker may be prone to developing this syndrome, burnout has been more extensively studied in the human service professions (e.g., physicians, nurses, teachers), which involve considerable direct contact with others (Maslach et al., 1996). In particular, research has suggested that teachers' burnout has received high attention due to its purportedly worldwide prevalence (Iancu et al., 2018; Maslach et al., 1996) and negative personal, organizational, and social impacts (e.g., mental ill health, decreased work performance, turnover) (Maslach & Leiter, 2016). Indeed, the presence of this syndrome affects not only teachers' mental health and well-being but also their work performance, classroom climate, and students' well-being (Durlak et al., 2015; Schonert-Reichl, 2017). Therefore, teachers' burnout has attracted the interest of researchers, practitioners, and education policy leaders in establishing its determinants and developing practices and interventions aimed at preventing/reducing this phenomenon (Durlak et al., 2015).

Research has shown that the teaching profession presents specific occupational stressors (McCarthy et al., 2016) that are mainly related to an imbalance between social and emotional demands and resources (Iancu et al., 2018). Hence, recent interventions seeking to prevent and treat teachers' burnout symptoms have addressed teachers' social and emotional skills for dealing with these job requirements. Nevertheless, the efficacy of these interventions is still unclear (e.g., Iancu et al., 2018); and therefore, it is the aim of this study to conduct a systematic review with meta-analysis on the impacts of social and emotional learning (SEL) interventions on in-service teachers' burnout levels.

In-service Teachers' Burnout Predictors and Interventions

According to Maslach's model, teachers' burnout is defined as a three-dimensional syndrome characterized by *emotional exhaustion* (also referred to as *exhaustion*; i.e., feelings of emotional distress and depletion of emotional resources, loss of energy, and fatigue), *depersonalization* (also referred to as *cynicism*; i.e., negative, detached feelings and behaviors towards students, irritability, loss of idealism, and psychological withdrawal), and a *reduced personal accomplishment* (also referred to as *low sense of professional efficacy*; i.e., loss of feelings of competence and efficacy at work, reduced productivity, demoralization, and inability to cope with one's work demands), which is driven by chronic teaching stressors (Maslach, 1976; Maslach et al., 2001; Maslach & Leiter, 2016).

As far as the development of burnout symptoms is concerned, the conceptual frameworks range from individual to context work-related approaches, or a combination of both (e.g., Schaufeli et al., 2009). For example, the Job Demands-Resources (JD-R) model (e.g., Demerouti et al., 2001; Schaufeli & Bakker, 2004), which has been recognized as a leading burnout model, namely for teachers (Prieto et al., 2008), advocates that long-term perceived excessive job demands lead to emotional exhaustion while perceived lack of job and personal resources contribute to reduced motivation and increased depersonalization (Schaufeli & Taris, 2014). More specifically, prior literature has suggested that burnout symptoms may be driven by the particular social and emotional features of teaching (Iancu et al., 2018), namely when teachers perceive high social and emotional demands (e.g., classroom management, decision

making, time management to respond to workload) and low social and emotional resources (e.g., lack of institutional support, lack of time to engage with other teachers) (McCarthy et al., 2016; Roeser et al., 2013).

Mirroring the theory and research findings on burnout drivers, interventions seeking to reduce the risk of burnout in different professional groups, namely in teachers, have adopted both individual-focused and/or context work-related solutions. However, a growing body of evidence shows that a majority of interventions have been individual-directed (e.g., Ahola et al., 2017; Bagnall et al., 2016; Jennings et al., 2013; Maricuțoiu et al., 2016; Panagioti et al., 2017; Roeser et al., 2013; West et al., 2016) and adopt mainly cognitive-behavioral or, as observed more recently, mindfulness-based stress reduction strategies (Maricuțoiu et al., 2016; Richardson & Rothstein, 2008), among other approaches (Iancu et al., 2018). On the contrary, organization-directed interventions including measures such as reducing workload or strategies to enhance teamwork have been scarce (e.g., Ahola et al., 2017; Bagnall et al., 2016; Maricuțoiu et al., 2016; Panagioti et al., 2017; West et al., 2016).

Importantly, findings regarding the efficacy of the different types of approaches are remarkably inconsistent (Ahola et al., 2017; Maricuțoiu et al., 2016). For instance, two recent systematic reviews and a meta-analysis (Panagioti et al., 2017; West et al., 2016) showed that the effects of organization-directed intervention programs on physicians' overall burnout were significantly larger than the effects of physician-directed interventions. On the contrary, other meta-analyses focusing on different occupational groups (e.g., teachers, office workers, maintenance workers, hospital staff, factory workers, social services staff) have pointed to a greater effectiveness of individual-level interventions compared with organizational interventions in reducing work-related stress (Richardson & Rothstein, 2008) and burnout (e.g., Awa et al., 2010).

In this scenario, it is impossible to establish general guidelines on the best forms of intervention to prevent or treat burnout (Ahola et al., 2017), namely due to the specific features of each occupational group (Iancu et al., 2018). Hence, additional studies should be conducted in order to disentangle what works best for whom (Nielsen & Maglia, 2017). As regards teachers' burnout, interventions aiming to promote teachers' social and emotional competence call for careful examination due to the social and emotional nature of teaching-specific stressors (McCarthy et al., 2016).

The Evolution of Social and Emotional Learning Interventions for Teachers

Despite research findings suggesting that the main teaching-specific stressors are driven by the social and emotional features of teaching (Iancu et al., 2018), initial teachers' education lacks explicit training as regards social and emotional competences (SEC), and mainly as regards intrapersonal competences, such as teachers' being able to identify and duly manage their emotions and behaviors, and to monitor their own progress toward achieving goals (Schonert-Reichl et al., 2017). Hence, social and emotional learning (SEL) interventions aiming to directly develop in-service teachers' SEC have increased exponentially over the last decade (Oliveira et al., under revision; Jennings et al., 2017; Schonert-Reichl, 2017).

The SEL rationale was advanced by Elias et al. (1997), as a framework to systematize, guide, and assess student-targeting policies and practices seeking to promote the optimal development of children and youths, preparing them to face the challenges of the twenty-first century (Durlak et al., 2015; Tolan et al., 2016). Therefore, to date, most of the SEL interventions within educational contexts have adopted a student-centered approach

(Domitrovich et al., 2016; Greenberg & Abenavoli, 2017). Even though a *one whole school* approach was initially developed, according to which teachers were deemed relevant partners in SEL programs, these interventions continued to assume that teachers would be socially and emotionally competent in a nearly dispositional manner (Durlak et al., 2015; Greenberg et al., 2003; Jennings & Greenberg, 2009). As a consequence, SEL interventions for teachers began to be developed as a sub-product of more global interventions, seeking to prepare teachers to intervene with their students: either by training teachers to learn how to teach SEC to their students or, in a second wave, by targeting the development of teachers' interpersonal SEC to deal with and better relate to their students (Greenberg et al., 2003; Osher et al., 2016). Only recently have SEL interventions targeting teachers own SEC (inclusive intrapersonal SEC) been considered *per se* (Durlak et al., 2015; Jennings & Greenberg, 2009; Schonert-Reichl, 2017).

According to the SEL rationale as understood today, SEL refers to the process by which individuals acquire and apply core skills (referred to as SEC) in five interrelated areas: self-awareness and self-management (also referred to as *intrapersonal* SEC), social awareness and relationship skills (also referred to as *interpersonal* SEC), and responsible decision-making (Durlak et al., 2015; Tolan et al., 2016). Thus, these competences enable teachers to adapt to and face life challenges through the enhancement of personal development and positive interpersonal relationships, in addition to effective and ethical work and performance (Durlak et al., 2015; Tolan et al., 2016). Therefore, SEL was operationalized in this study as “the process through which children and adults develop the skills, attitudes, and values required to acquire social and emotional competence” (Elias et al., 1997, p. 2), the latter defined as the aforementioned five core skills.

With reference to the theoretical background, and when applied to teachers, the SEL rationale not only is primarily informed by the emotional intelligence theory (Salovey & Mayer, 1990), but also resorts to the transactional model of stress and coping (Lazarus & Folkman, 1984) and the self-determination theory (Deci & Ryan, 1985) (Jennings & Greenberg, 2009). These three main theoretical frameworks of reference assist the development and evaluation of SEL interventions, providing information at two main levels: the first referring to the specific contents (e.g., teacher-specific stressors and teacher-specific needs, intrapersonal or interpersonal SEC) and the second to the strategies used to address such contents (e.g., strategies for stress management and to promote motivation for behavior change and learning) (Oliveira et al., [under revision](#)). A detailed explanation of the SEL rationale development and evolution is presented in Oliveira et al. ([under revision](#)). A recent meta-analysis has indicated that SEL interventions for teachers, although relatively recent, present promising results, particularly with regard to reducing teachers' psychological distress (e.g., anxiety and depression symptoms, emotional exhaustion) and increasing their well-being (e.g., self-efficacy, job satisfaction, personal accomplishment) (Oliveira et al., [under revision](#)). Nevertheless, systematic literature reviews are still needed to understand the specific impact of these interventions on burnout.

Although several recent meta-analyses have evaluated the efficacy of general interventions aimed at reducing burnout in employees (Maricuțoiu et al., 2016), and specifically in teachers (Iancu et al., 2018), shedding some light on the possible specific impacts of SEL interventions, a more in-depth and narrow analysis is still needed. Maricuțoiu et al. (2016) concluded their study by stating the need to investigate new intervention approaches that would complement traditional stress-reduction interventions (i.e., cognitive-behavioral interventions and interventions based on relaxation techniques), since the latter alone were only efficient in reducing

emotional exhaustion symptoms. Even though Iancu et al.' (2018) study contemplated new intervention types specifically designed for teachers, they considered "Social and Emotional Skills Interventions" as those aiming to increase teachers' relationship skills. However, as previously mentioned, the SEL rationale encompasses more competencies than relationship skills. Therefore, due to the specific features of both teachers' professional group and the SEL intervention approach, research evaluating the effects of SEL interventions designed for teachers on teachers' burnout is still needed.

Moreover, although prior research has found a generally small overall effect of interventions seeking to reduce burnout levels ($d < .30$; Cohen, 1988), a more in-depth analysis of data has presented somewhat inconsistent results, particularly with regard to the impact of SEL interventions on an increase in personal accomplishment. While Iancu et al. (2018) found small but significant intervention effects on both decreased emotional exhaustion and increased personal accomplishment, Maricuțoiu et al.' (2016) study showed that the interventions had only a small significant effect on a decrease in emotional exhaustion. Therefore, the present study aims to conduct a systematic review with meta-analysis on the impacts of SEL interventions for in-service teachers on teachers' burnout levels. Given the above, the following initial research question was established:

Q1: Are SEL interventions for teachers effective in reducing teachers' overall burnout and its symptoms?

Previously Studied Covariates of Teachers' Burnout

In addition to the teaching-specific stressors and, accordingly, the type of interventions developed to reduce teachers' burnout, to date, the extensive literature on burnout has also identified groups of variables that may predict the development of this syndrome, namely socio-demographic and organizational variables (Leiter & Maslach, 2003; Maslach et al., 2001; O'Connor et al., 2018) and intervention-related covariates (Maricuțoiu et al., 2016) for teachers (Brewer & Shapard, 2004; Iancu et al., 2018). As regards socio-demographic characteristics, prior research has emphasized the role of gender (i.e., although inconsistent, females tend to display higher global burnout symptoms while males appear to present particularly high levels of depersonalization), age (i.e., negative correlation between age and burnout symptoms), and teaching experience (i.e., negative correlation between experience and burnout symptoms) as predictors of teachers' burnout (Brewer & Shapard, 2004; Maslach et al., 2001). As far as organizational variables are concerned, most studies have referred to at least one covariate at this level which presents positive correlations with burnout (e.g., workload, lack of autonomy, job insecurity, lack of organizational support, and poor relationships within the workplace) (Leiter & Maslach, 2003; Schaufeli & Taris, 2014). Nevertheless to date, to the best of our knowledge, SEL interventions for teachers have been designed to target the individual and have not taken organizational-level factors into consideration (Oliveira et al., under revision). Therefore, our second research question focuses solely on socio-demographic variables:

Q2: Do socio-demographic covariates such as teachers' age, gender, and/or teaching experience predict the effect of SEL interventions on overall burnout and its symptoms?

Lastly, prior research on the effectiveness of interventions targeting teachers has highlighted the following variables that may interfere with outcomes: dosage (i.e., number of effective formal training hours); duration (i.e., time window between first and last sessions); cross-session training (i.e., training between formal sessions); and suitability of content presented to teachers' teaching level (i.e., whether or not the intervention has been tailored to teaching level characteristics). These variables have been identified as possible predictors of the impact of the interventions on teachers (Gulamhussein, 2013; Iancu et al., 2018). Nonetheless, with regard to these features, best practices appear to vary, and inconsistent results have been found (Oliveira et al., [under revision](#)).

As far as dosage is concerned, prior research has shown that in order to be effective, general interventions targeting teachers must have a duration of over 14 h (Gulamhussein, 2013). However, studies focusing on SEL interventions for teachers have presented inconsistent results, suggesting that duration may play a more important role than dosage in the efficacy of the interventions (Oliveira et al., [under revision](#)). This insight has been tested for interventions aiming to reduce teachers' burnout, and results suggest that in order to be effective, the intervention time window should be at least 1 month (Iancu et al., 2018).

Inconsistent results have also been found for the role of cross-session training and the suitability of the content presented to teachers' teaching level. In relation to cross-session training, research on general interventions for teachers has suggested the importance of including explicit training between formal sessions (Gulamhussein, 2013), although the specific research on SEL interventions for teachers has revealed no significant prediction effect (Oliveira et al., [under revision](#)). Likewise, as regards the suitability of the content presented to teachers' teaching level, despite research on general interventions for teachers suggesting that interventions should be tailored to the specific features of teachers' teaching level (Gulamhussein, 2013), research on interventions aimed at reducing teachers' burnout and on SEL interventions for teachers has found either that those with more heterogeneous groups are more beneficial (Iancu et al., 2018), or that this feature is not significantly predictive of SEL interventions' effect (Oliveira et al., [under revision](#)). Therefore, in order to clarify the covariate role of these variables, in specific relation to the impact of SEL interventions for teachers on teachers' burnout, a third research question was established:

Q3: Do intervention-level covariates such as dosage, duration, cross-session training, and suitability of content presented to teachers' teaching level predict SEL interventions' effects on overall burnout and its symptoms?

Method

This study followed the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines (Moher et al., 2015). An electronic [supplementary material file](#) is available for greater detail on the methodological procedures adopted in this study.

Eligibility Criteria

The studies were required to have the full-text version available and to have been published in psychology or education peer-reviewed journals or with *ProQuest Dissertation and Theses*, after 1995 (the year of publication of Goleman's book *Emotional Intelligence*, which underlies

and binds the terms “SEL” and “emotional intelligence” that correspond to the operationalization presented by Elias et al. (1997) and is followed in this study). Additionally, studies were only considered when sufficient information was reported to estimate the effect sizes of the interventions’ impacts. No language constraints were applied.

Participants Studies were included whenever they targeted in-service teachers from pre-kindergarten to 12th grade (i.e., preK–12). To ensure homogeneity of the sample, which directly affects the reliability of the meta-analytic process (Higgins et al., 2019), whenever studies focused on university teachers, undergraduates, and/or trainees, they were excluded due to the specific features of these groups compared to preK–12 in-service teachers.

Intervention Studies were considered if they provided empirical research (with quasi-experimental or experimental designs) on the impact of a SEL intervention. Furthermore, the interventions had to be developed in accordance with the SEL rationale (as presented by Elias et al., 1997 and Durlak et al., 2015) and specifically designed for the development of teachers’ own SEC.

Outcomes Considering the purpose of this research, studies were required to assess the impact of interventions on teachers’ burnout levels. Records were considered regardless of whether they represented a global score of burnout or specific scores for its dimensions (i.e., emotional exhaustion, depersonalization, and/or personal accomplishment¹).

Covariates In order to test for meta regression effects, covariates were selected in accordance with prior literature (Oliveira et al., [under revision](#); Brewer & Shapard, 2004; Gulamhussein, 2013; Iancu et al., 2018). Possible predictors were selected for two domains: socio-demographic and intervention features. Concerning the socio-demographic variables, we tested for teachers’ age (i.e., mean age in years), gender (i.e., percentage of females in the sample), and/or teaching experience (i.e., mean years of teaching experience). As for intervention features, we tested for dosage (i.e., re-coded as an ordinal variable with three levels: 1–14 h, 15–29 h, and 30 h or more), duration (i.e., re-coded as an ordinal variable with three levels: less than 1 month, 1–3 months, more than 3 months), cross-session training (i.e., presence/absence), and suitability of content presented to teachers’ teaching level (i.e., re-coded as whether the intervention addressed only class-level teachers (e.g., elementary school), only discipline-level teachers (e.g., high school), or both (considering a universal SEL intervention)).

Search Strategy

Systematic screening was computed on the *EBSCOhost web*, *b-ON*, *SCOPUS*, *SciELO*, and *ProQuest Dissertation and Theses* databases, in mid-2020. Advance and Boolean search options were used to narrow the search based on the eligibility criteria. Synonyms, different

¹ Despite inconsistencies in the assessment of personal accomplishment symptoms presented in the literature (for detailed information see Bresó et al., 2007), most of the research on burnout presents its results in view of alterations in participants’ perceived personal accomplishment (i.e., positively phrased items) and therefore, our research questions and results were established accordingly.

spellings, singular/plural forms, verbal forms, and adjectives of the terms used as descriptors were taken into consideration to improve the sensitivity of the search. The following English keywords were defined as main descriptors and cross-searched, within the title, abstract, or subject terms: *teacher*, *social and emotional learning*, *burnout* (and its dimensions), and *professional development*. Detailed information on the combination of descriptors may be found in the electronic [supplementary material](#). To ensure saturation of data, a hand search of reference lists was also carried out to identify any further studies.

This initial search yielded 485 hits after the removal of duplicates (PRISMA flow diagram of search results is available in Fig. 1). The lead author screened the titles and abstracts, which led to the removal of 458 articles due to a misfit. The full-text versions of the 27 remaining articles were examined in detail. The main reasons for subsequent exclusion were owed to the fact that the articles did not present experimental or quasi-experimental studies, did not follow a SEL intervention, did not evaluate the burnout syndrome, or did not meet participants' criteria. A total of 13 final records that met all the selection criteria were considered for the analysis (referred to in the final reference list with an asterisk). Among these 13 studies, two major types of interventions were found: one related to SEL interventions addressing intra-personal SEC (i.e., self-awareness and self-management) with the specific aim of promoting teachers' knowledge of their own emotions and of increasing their coping strategies with regard to stress management; and another in which these same intra-personal SEC were not considered, where the interventions sought only to promote the development of teachers' professional performance (i.e., classroom management, sensitivity and awareness towards their students' needs) and to emphasize their interpersonal SEC (i.e., social-awareness and relationship skills). Therefore, for the purpose of the meta-analytic procedure, these 13 studies were then grouped according to the type of intervention into a subsample of 11 studies addressing

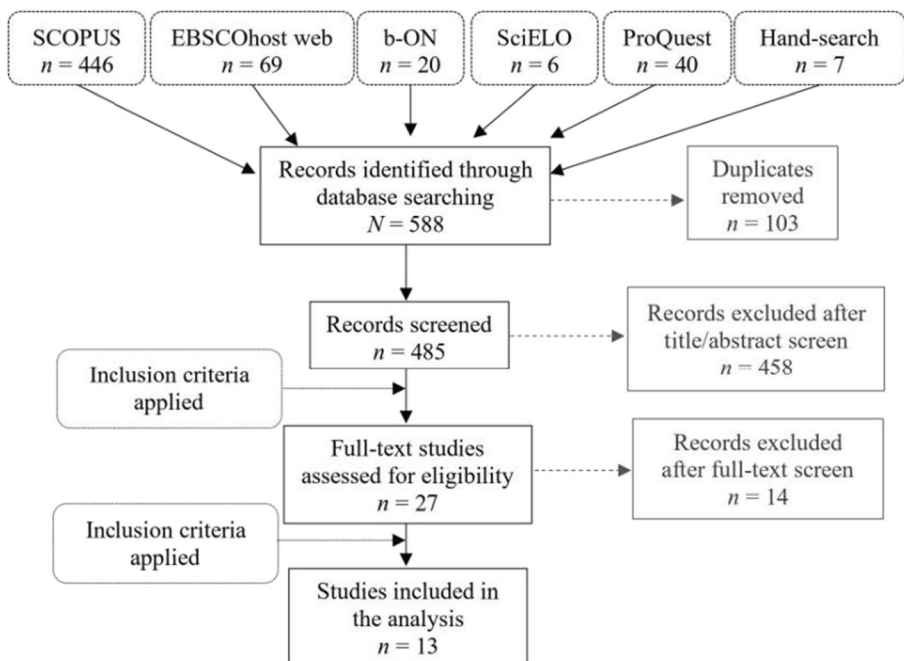


Fig. 1 PRISMA diagram displaying the data collection process

intra-personal SEC and a subsample of two studies where intra-personal SEC were not targeted. To assure interrater agreement, a selection of excluded hits and all the studies that met the inclusion criteria were screened by the last author and an agreement was reached with the lead author whenever studies were contested.

Data Synthesis

Data from the 13 eligible records were then synthesized based on four general criteria referring to the intervention (e.g., target, cross-section training, dosage, content), participants (e.g., sample size, gender, age, teaching experience), outcomes (e.g., comparison, variables assessed), and study design (e.g., fidelity, control of biases). These general criteria were defined in accordance with the PRISMA recommendations on data items (Moher et al., 2015). As for the specific indicators within each general criterion, their selection was based on prior literature guidelines which suggested that these specific features were associated with both the efficacy of the interventions (e.g., cross-section training) and the quality of the research (e.g., control of biases) (Oliveira et al., [under revision](#); Gulamhussein, 2013; Higgins et al., 2011; Iancu et al., 2018; Moher et al., 2015). Detailed information on the specific criteria used for the data coding and synthesis, and initial results regarding this process are available in the electronic [supplementary material](#).

Additionally, covariates were selected on the basis of prior research orientations as regards both teacher-level variables (i.e., gender, age, and teaching experience) related to the experience of burnout symptoms and intervention-level variables (i.e., dosage, content addressed) associated with the efficacy of the interventions overall.

Data Analysis

A meta-analysis with a random effects model was performed for 13 studies addressing the impact of SEL interventions on in-service teachers' burnout levels. Between-group standardized mean differences at posttest (Hedges' g) as uniform measures (Kline, 2004) were calculated based on the means, standard deviations, and group sample sizes collected from the pooled studies. Due to missing information, five effects were converted from Cohen's d , and one effect was converted from its F statistic.

Among the 13 pooled studies for the meta-analysis, several dependent effect sizes were identified (two studies measured burnout as a unidimensional construct, one study provided only scores for the emotional exhaustion scale, one study computed both emotional exhaustion and personal accomplishment scales, and nine studies measured burnout as a tridimensional construct depicting scores for emotional exhaustion, depersonalization, and personal accomplishment). Consequently, a random effects model was computed using robust variance estimation (RVE). RVE is a meta-analytic procedure that is able to handle non-independent effect sizes without prior knowledge of the within study covariance, allowing effects to be estimated even when non-normality is identified, and providing robust standard errors with degrees of freedom adjusted for small samples (Fisher & Tipton, 2015). To this end, instead of following a traditional approach where multiple effects from the same study are assumed to be independent and averaged (e.g., Rosenthal, 1991), RVE estimates the overall effect by taking into account the fact that most of the effect sizes pooled from the studies are correlated and based on the same study participants (Fisher & Tipton, 2015). Despite the suitability of other multivariate procedures to handle effects dependency (e.g., Kalaian & Raudenbush, 1996), RVE offers a significant advantage by not requiring information on the within study covariance.

In terms of the meta-analytic steps, first, an intercept-only model using RVE was adjusted to estimate the global burnout average effect, followed by estimates across the burnout dimensions; effects were computed by equally partitioning the studies' total effect size variance within studies and taking their inverse, which leads to approximate inverse variance weights and allocates more weights to studies with smaller variance (Fisher & Tipton, 2015). The percentage of heterogeneity across the effect sizes due to between study differences was then assessed using the I^2 statistic where values equal to 25% revealed low heterogeneity, equal to 50% suggested moderate heterogeneity, and equal to 75% indicated substantial heterogeneity (Higgins et al., 2003). Furthermore, prediction intervals were estimated to provide a range of values where future effects from new studies are expected to fall, based on the evidence retrieved from the current meta-analysis (Harrer & Ebert, 2018). The impact of continuous socio-demographic covariates (e.g., age, teaching experience, and percentage of female teachers) on the estimated average effect was assessed through meta-regression models, where the analyses were performed for each burnout dimension. The same procedure was applied to assess the impact of intervention-level covariates (e.g., dosage, duration, cross-training, and grade). In addition to the visual inspection of funnel plots, publication bias was analyzed with a sensitivity analysis based on Vevea and Woods' (2005) approach, where the effect size (unadjusted model) is compared to an adjusted model with pre-specified weights given to the p -values. If the adjusted model provides a decrease in the estimated effect, a possible pattern of this bias may be occurring (Coburn, 2018; Coburn & Vevea, 2019). In this study, the traditional p -value cutoffs for statistical significance (.001, .01, and .05) complemented with two weights were used: 1 for p -values surviving publication (below .05) and 0.50 for the remaining p -values (above .05).

Analyses were performed using the following meta-analysis packages designed for R environment (R Core Team, 2018): *esc* (Lüdtke, 2019) for effect size conversion, *robusta* (Fisher et al., 2017) for RVE estimates, *meta* (Schwarzer, 2007) and *metafor* (Viechtbauer, 2010) for graphical representations, and *weightr* (Coburn & Vevea, 2019) for publication bias sensitivity analysis.

Results

Descriptive Synthesis

Table 1 contains detailed information based on the four general pre-defined criteria. All the studies were published after 2013, 12 of which were written in English and one in Spanish. Eligible interventions were delivered in North America ($n = 9$), Europe ($n = 3$), and Asia ($n = 1$).

Participants The studies involved a total of 994 in-service teachers, with sample sizes ranging from 18 (Flook et al., 2013) to 230 (Domitrovich et al., 2016) participants. Across the eligible records, most participants were females (ranging from 70 to 100% of females), with a mean age above 33 years and more than 6 years of teaching experience. Additionally, participants in the selected studies taught students from pre-kindergarten to senior year.

Interventions As for the intervention features, most of the studies used interventions which only targeted teachers ($n = 11$). Regarding delivery conditions, most interventions had half-day (i.e., mean of 4 h per session) weekly formal sessions (53.85%). Nevertheless, the length of the

Table 1 Summary table of the characteristics of the included studies

Authors (year). Source	Participants	Intervention	Study design	Outcomes
Ancona and Mendelson (2014). <i>Advances in School Mental Health Promotion</i>	Forty-three US teachers (grades 1–8). 84.1% females. Mean of 8.84 years of teaching experience (SD = 7.78)	<i>Yoga and mindfulness intervention for teachers</i> . This intervention lasted 4.5 h and was delivered in 6 sessions, two per week. The intervention did not contain training between formal sessions, and targeted only teachers. The content covered two SEC domains, namely self-awareness and self-management	Quasi-experimental study with self-report measures. Assessment at pre-posttest. Study was not an independent replication. Fidelity of interventions' delivery was not assessed	This study assessed emotional exhaustion through MBI-ES. Mean of reported emotional exhaustion was lower for the intervention group than the control group, at posttest ($d = -0.09$)
Carvalho et al. (2017). <i>Mindfulness</i>	Twenty Portuguese teachers (grades 3–4). 100% female. Mean of 40.37 years of age (SD = 6.30) and 8.84 years of teaching experience (SD = 7.78)	<i>MindUP</i> . This intervention lasted 50 h and was delivered in 6 weekly sessions. The intervention contained training between formal sessions, and targeted both teachers and their students. The content covered all SEC domains	Experimental study with self-report measures. Assessment at pre-posttest. Study was not an independent replication. Fidelity of interventions' delivery was not assessed	This study assessed all three subdimensions of burnout through MBI-ES. At posttest, the intervention group reported a higher mean of personal accomplishment ($d = .57$), and lower means for emotional exhaustion ($d = -.20$) and depersonalization ($d = -.40$) than the control group
Castillo et al. (2013). <i>Journal of Education and Training Studies</i>	Forty-seven Spanish teachers (grades K-8). 70% female. Mean of 44.27 years of age and 15 years of teaching experience (SD=9.7)	<i>RULER</i> . This intervention lasted 30 h across 6 months, did not contain training between formal sessions, and targeted only teachers. The content covered all SEC domains.	Quasi-experimental study with self-report measures. Assessment at pre-posttest. Study was not an independent replication. Fidelity of interventions' delivery was not assessed	This study assessed all three subdimensions of burnout through MBI-ES. At posttest, the intervention group presented lower means of emotional exhaustion ($d = -0.22$), and depersonalization ($d = -0.40$), and a higher mean of personal accomplishment

Table 1 (continued)

Authors (year). Source	Participants	Intervention	Study design	Outcomes
Castillo-Gualda et al. (2017). <i>Electronic Journal of Research in Education Psychology</i>	Fifty-four Spanish teachers (grades K–8). 79.6% female. Mean of 35.98 years of age ($SD = 8.45$) and 8.31 years of teaching experience ($SD = 4.03$)	<i>RULER</i> . This intervention lasted 24 h and was delivered in eight 3-h sessions across 3 months. The intervention did not contain training between formal sessions, and targeted only teachers. The content covered all SEC domains	Quasi-experimental study with self-report measures. Assessment at pre-posttest. The study was not an independent replication. Fidelity of interventions' delivery was not assessed	($d=0.38$) than the control group This study assessed all three subdimensions of burnout through MBI-ES Reported personal accomplishment was higher in the intervention group than the control group ($d = 0.38$), after intervention. Additionally, in comparison to the control group, means were lower in the intervention group for emotional exhaustion ($d = -0.76$) and depersonalization ($d = -0.67$), at posttest
Domitrovich et al. (2016). <i>Prevention science</i>	Two hundred and thirty US teachers (grades K–5). 87.7% female. The study did not report either age or teaching experience	<i>PATHS to PAX</i> . This intervention lasted 25 h across 3.5 daily sessions, did not contain training between formal sessions, and targeted both teachers and their students. The content covered only relationship skills	Experimental study with self-report measures. Assessment at pre-posttest. The study was an independent replication. Fidelity of interventions' delivery was not assessed	This study assessed both emotional exhaustion and personal accomplishment through MBI-ES After intervention, both emotional exhaustion ($d = 0.22$) and personal accomplishment ($d = 0.06$) means were higher in the intervention group in comparison to the control group
Figueiredo-Ferraz et al. (2013). <i>Revista de Psicodidáctica</i>	One hundred and eighty-six US teachers (grades preK–K). 97.3% female. Mean of age not specified. Mean of 12.09 years of teaching experience	<i>Name not specified</i> . This intervention lasted 13 h and was delivered in four monthly 3-h sessions. The intervention did not contain training between formal sessions, and targeted only teachers. The	Quasi-experimental study with self-report measures. Assessment at pre-posttest. The study was not an independent replication. Fidelity of interventions' delivery was not assessed	This study assessed overall burnout through SBI At posttest, participants in the intervention group reported lower levels of overall burnout than the control

Table 1 (continued)

Authors (year). Source	Participants	Intervention	Study design	Outcomes
		content covered two SEC domains, namely self-awareness and self-management		group participants ($d = -0.35$)
Flook et al. (2013). <i>Mind, Brain and Education</i>	Eighteen US teachers (grades 1–4). 88.9% females. Mean of 43.06 years of age ($SD = 9.87$) and 12.83 years of teaching experience ($SD = 8.68$)	<i>mMBSR</i> . This intervention lasted 26 h and was delivered in eight 2.5-h weekly sessions plus a day-long immersion session, across 2 months. Intervention contained training between formal sessions, and targeted only teachers. Content covered all SEC domains, except responsible decision making	Experimental study with self-report measures. Assessment at pre–posttest. The study was an independent replication. Fidelity of interventions' delivery was not assessed	This study assessed all three subdimensions of burnout through MBI-ES. At posttest, the intervention group presented lower means of emotional exhaustion ($d = -0.34$) and depersonalization ($d = -0.03$), and a higher mean of personal accomplishment ($d = 0.94$) than the control group
Frank et al. (2015). <i>Mindfulness</i>	Thirty-six US teachers (grades 9–12). 77.8% females. Mean of 40.72 years of age ($SD = 10.77$). Study did not report data on teaching experience	<i>Adapted MBSR</i> . This intervention lasted 16 h through eight 2-h weekly sessions, contained training between formal sessions, and targeted only teachers. The content covered all SEC domains, except responsible decision making	Quasi-experimental study with self-report measures. Assessment at pre–posttest. The study was not an independent replication. Fidelity of interventions' delivery was not assessed	This study assessed all three subdimensions of burnout through MBI-ES. After the intervention, the intervention group presented lower means of emotional exhaustion ($d = -0.26$) and personal accomplishment ($d = -0.27$), and a higher mean of depersonalization ($d = 0.26$) than the control group
Harris et al. (2016). <i>Mindfulness</i>	Sixty-four US teachers (grades 6–8). 88% females. Mean of 43.00 years of age ($SD = 12.53$) and 14 years of teaching experience ($SD = 9.01$)	<i>CALM</i> . This intervention lasted 21 h and was delivered in 64 20-min sessions, across 16 weeks. The intervention did not contain training between formal sessions, and targeted only	Quasi-experimental study with self-report measures. Assessment at pre–posttest. The study was an independent replication. Fidelity of interventions' delivery was assessed through	This study assessed all three subdimensions of burnout through MBI-ES. After the intervention, participants from the intervention group reported lower means of

Table 1 (continued)

Authors (year). Source	Participants	Intervention	Study design	Outcomes
		teachers. The content covered two SEC domains, namely self-awareness and self-management	external observation, indicating a percentage of 94.25% of fidelity	emotional exhaustion ($d = -1.10$) and depersonalization ($d = -2.06$), and a higher mean of reported personal accomplishment ($d = 1.01$), than the control group
Jennings et al. (2013). <i>School Psychology Quarterly</i>	Fifty US teachers (grades preK–12). 89% females. Mean of 36 years of age and 11.70 years of teaching experience. Standard deviations were not reported	<i>CARE</i> . This intervention lasted 30 h delivered in five 6-h sessions across 3 months. The intervention contained training between formal sessions, and targeted only teachers. The content covered three SEC domains, namely self-awareness, self-management, and social awareness	Experimental study with self-report measures. Assessment at pre–posttest. The study was an independent replication. Fidelity of interventions' delivery was assessed through self-report checklists, indicating a percentage of 100% of fidelity	This study assessed all three subdimensions of burnout through MBI-ES. At posttest, in comparison to the control group, participants from the intervention group reported higher means of emotional exhaustion ($d = 0.04$) and depersonalization ($d = 0.06$), but also of personal accomplishment ($d = 0.39$)
Roberts et al. (2019). <i>Journal of Early Childhood Teacher Education</i>	Eighty-nine US teachers (grades PreK–K). Mean of age not reported. Mean of 8.6 years of teaching experience ($SD = 7.3$)	<i>Effective classroom interactions</i> . This intervention lasted 35 h delivered in weekly 2.5-h sessions across 2 months. The intervention contained training between formal sessions, and targeted only teachers. The content covered four SEC domains, namely self-awareness, self-management, social awareness, and relationship skills	Experimental study with self-report measures. Assessment at pre–posttest. The study was an independent replication. Fidelity of interventions' delivery was not assessed	This study assessed all three subdimensions of burnout through MBI-ES. At posttest, in comparison to the control group, participants from the intervention group reported higher means of emotional exhaustion ($d = 0.55$), depersonalization ($d = 0.13$), and lower levels of personal accomplishment ($d = -0.48$)
Roeser et al. (2013). <i>Journal of Educational Psychology</i>	One hundred and thirteen North American teachers (Canada)	<i>SMART-in-Education</i> . This intervention lasted 36 h and was delivered in 11	Experimental study with self-report measures. Assessment at	This study assessed overall burnout through MBI-ES

Table 1 (continued)

Authors (year). Source	Participants	Intervention	Study design	Outcomes
	and the USA; grades 1–8). 89% females. Mean of 46.9 years of age ($SD = 9.2$) and 14.9 years of teaching experience	sessions across 8 weeks. The intervention contained training between formal sessions, and targeted only teachers. The content covered three SEC domains, namely self-awareness, self-management, and social awareness	pre-posttest and follow-up (3 months). The study was not an independent replication. Fidelity of interventions' delivery was not assessed	At posttest, participants in the intervention group reported lower levels of overall burnout than the control group participants ($d = -0.75$). This result was maintained after 3 months ($d = -0.66$)
Tarrasch et al. (2020). <i>Mindfulness</i>	Forty-four Israeli teachers (grades 6–8). 90.9% females. Mean of 34.9 years of age ($SD = 7.9$) and 6.27 (7.99) years of teaching experience, for the intervention group	<i>C2CIT</i> . This intervention lasted 30 h and was delivered in 20 weekly sessions across 5 months. The intervention contained training between formal sessions, and targeted only teachers. The content covered three SEC domains, namely self-awareness, social awareness, and relationship skills	Experimental study with self-report measures. Assessment at pre–posttest. The study was an independent replication. Fidelity of interventions' delivery was not assessed	This study assessed all three subdimensions of burnout through MBI-ES. At posttest, in comparison to the control group, participants from the intervention group reported lower means of emotional exhaustion ($d = -0.13$), depersonalization ($d = -0.44$), and higher levels of personal accomplishment ($d = 0.39$)

formal sessions ranged from 20 min (i.e., Harris et al., 2016) to full-day training (e.g., Carvalho et al., 2017), and frequency ranged from daily to monthly formal sessions. In terms of the interventions' dosage, the shortest intervention consisted of 4.5 training hours (i.e., Ancona & Mendelson, 2014) and the longest intervention had a dosage of 50 training hours (i.e., Carvalho et al., 2017). Overall, the analyzed interventions had a mean dosage of 28-h training and a mean duration of approximately 3 months (i.e., 11 weeks; ranging from 3 days (Domitrovich et al., 2016) to 6 months (Castillo et al., 2013)). Moreover, all the interventions were delivered in the school context, face-to-face and in group format, by an expert. Additionally, apart from *PATHS to PAX* (Domitrovich et al., 2016), the interventions were delivered during the school year.

In terms of their content, 61.54% of the interventions adapted their contents to specific groups of teachers (i.e., class-level teachers or discipline-level teachers). Regarding the SEC domains addressed within each intervention, only one intervention emphasized an exclusive

SEC domain (i.e., relationship skills; Domitrovich et al., 2016) and most of the interventions ($n = 9$) addressed three or more SEC areas. More specifically, all the interventions targeted intra-individual areas (i.e., self-awareness and self-management), except *PATHS to PAX* (Domitrovich et al., 2016), which focused only on relationship skills training, and *Effective Classroom Interactions* (Roberts et al., 2019), which despite promoting the self-awareness of teachers focused on the consciousness of their classroom practices only. Thus, these two interventions were grouped separately in the meta-analytic procedure. Additionally, 53.85% of the interventions included cross-session training (e.g., homework assignments, tutoring sessions, ongoing coaching). Moreover, all the eligible interventions were developed with a universal approach (i.e., were delivered in the same way to all teachers despite their baseline levels of burnout symptoms) and designed at an individual level (i.e., targeting each participant as an individual and not considering the group/school-level dynamic/characteristics). Consequently, and to the extent by which conclusions can be drawn from the shared specific contents, the interventions did not directly promote job-related resources (e.g., social support from colleagues and/or supervisors) tailored to the participants' needs.

Methodological Features and Outcomes Six of the studies were independent replications and two records reported fidelity of implementation (i.e., Harris et al., 2016; Jennings et al., 2013). Regarding measures of bias control, most of the studies (76.92%) presented a low risk of selection bias (i.e., conducted randomization processes) and across all the studies no risk of reporting bias was taken since all outcomes were reported (Higgins et al., 2011). However, concerning performance, detection, and attrition biases, the risk across the studies was unclear, since most records did not specify the procedures used (Higgins et al., 2011).

Moreover, due to the eligibility criteria, all the studies considered both intervention and comparison groups and presented data for pre-posttest assessment concerning the intervention's effect on burnout levels. Additionally, only one study presented follow-up assessment data (i.e., Roeser et al., 2013). All the studies resorted only to self-report measures. Most of them used the *Maslach Burnout Inventory – Educators Survey* (MBI-ES; Maslach et al., 1996), and one study used the *Spanish Burnout Inventory* (SBI; Gil-Monte & Olivares, 2011) to evaluate teachers' burnout levels. Moreover, two studies presented a global burnout evaluation (i.e., Figueiredo-Ferraz et al., 2013; Roeser et al., 2013), one study provided scores exclusively for the emotional exhaustion scale (Ancona & Mendelson, 2014), one study computed both the emotional exhaustion and personal accomplishment scales (Domitrovich et al., 2016), and the remaining nine studies measured burnout as a tridimensional construct considering scores for emotional exhaustion, depersonalization, and personal accomplishment. As regards the suitability of the burnout measures used, the studies resorted to an internal consistency analysis for the sample used, presenting adjusted values of Cronbach's alpha ($> .60$; Nunnally, 1978) for the overall burnout level, for the emotional exhaustion scale, and for the personal accomplishment scale. However, of the nine studies to assess depersonalization, five of them (71.43%) found a Cronbach's alpha of $< .60$, and two studies even found an alpha of $< .50$ (i.e., Castillo-Gualda et al., 2017; Roberts et al., 2019). In all the studies, the depersonalization scale presented the lowest level of internal consistency (even if $> .60$). Among the study which included follow-up evaluation, the results were sustained.

Meta-analysis Results

Figures 2 and 3 depict the forest plots for the 13 pooled studies organized by burnout dimensions and type of intervention. Significant results were found for both the emotional exhaustion and personal accomplishment dimensions, regarding the effect of SEL interventions assessing intrapersonal SEC. Despite low heterogeneity values, prediction intervals

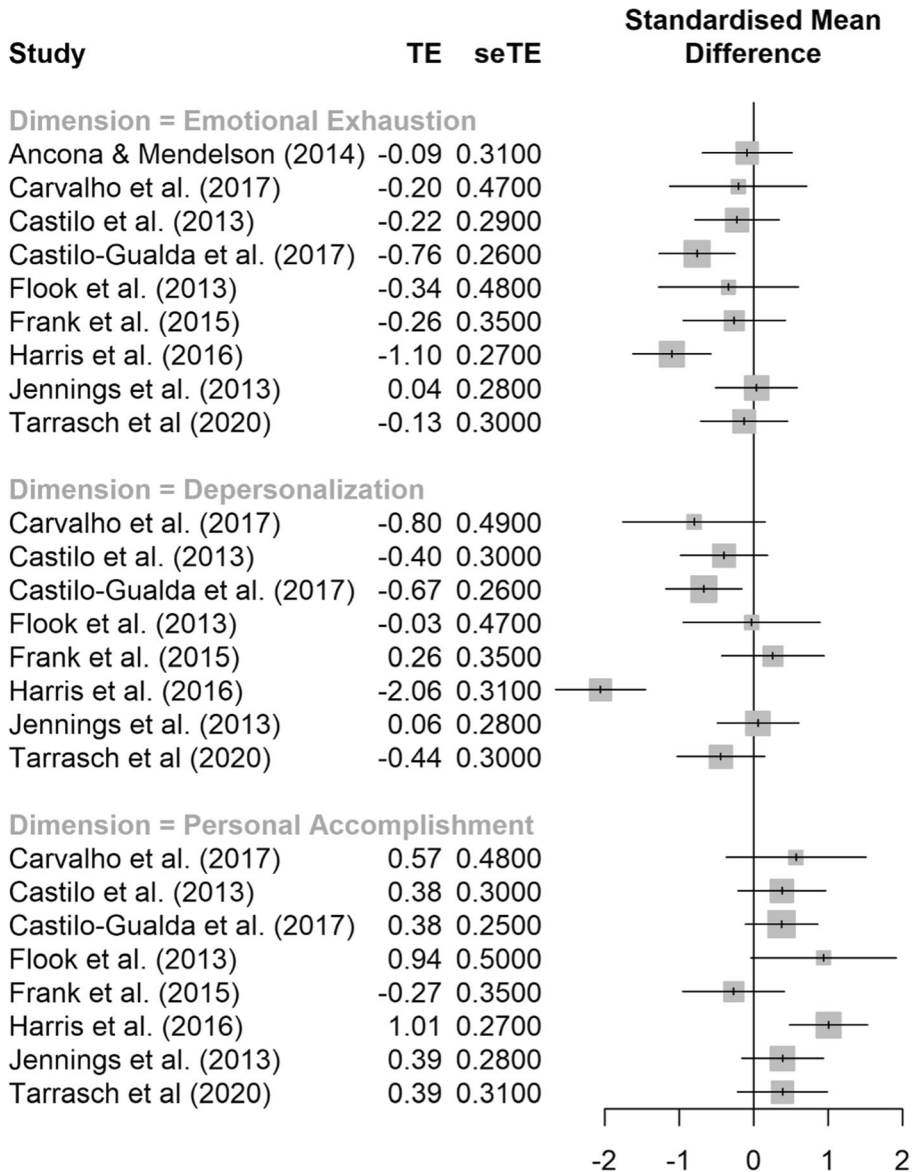


Fig. 2 Forest plot for the studies addressing intrapersonal SEC. Treatment effect (TE) and standard errors (seTE). Estimates considered all effects reported in Table 2, but to improve readability of the graphical representation, forest plots report effects aggregated at the study level

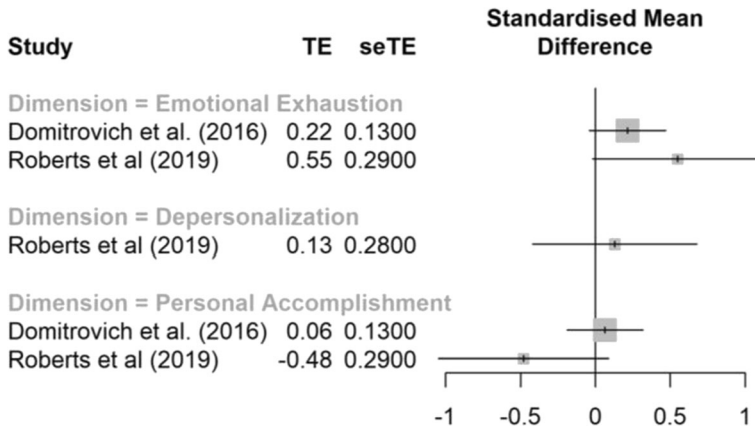


Fig. 3 Forest plot for the studies addressing only interpersonal SEC. Treatment effect (TE) and standard errors (seTE). Estimates considered all effects reported in Table 2, but to improve readability of the graphical representation, forest plots report effects aggregated at the study level

remained broad. No significant effects were found for the studies evaluating SEL interventions which only addressed interpersonal SEC. These results are available in Table 2.

The meta-regression models did not reveal significant results for either the socio-demographic or intervention covariates (see Table 3), even though for personal accomplishment narrower confidence intervals were found for durations beyond 3 months ($p = .078$) and SEL interventions tailored to class-level teachers ($p = .053$). The meta-regression models were only adjusted for the interventions addressing intrapersonal SEC, due to the small number of studies available for interventions only targeting interpersonal SEC and the sample requirements (minimum of 10 studies) for simultaneously testing explanatory variables (Thompson & Higgins, 2002). The sensitivity analysis using the weight-function model for publication bias revealed a decrease in the effect for personal accomplishment ($g = 0.36$) when the adjusted model was estimated. For the remaining effects, similar results were found between the unadjusted and the adjusted estimates. Funnel plots are presented in Fig. 4 for visual inspection of publication bias.

Discussion

Teachers' burnout has become a major concern for educational institutions, given its negative impacts not only on teachers' mental health but also on their work performance (Durlak et al., 2015; Jennings & Greenberg, 2009). Therefore, a growing effort to develop effective interventions to prevent/reduce teachers' burnout has been seen (Durlak et al., 2015). As the burnout syndrome is driven by chronic exposure to workplace stressors resulting from an imbalance between job demands and resources (Demerouti et al., 2001; Maslach et al., 2001), and teaching-specific stressors have been described as mainly related to social and emotional competences (McCarthy et al., 2016; Roeser et al., 2013), SEL interventions for teachers geared towards reducing teachers' burnout have increased in the last decade (Schonert-Reichl, 2017). However, a gap has been identified in the literature in terms of an overview of the impacts of this specific approach on teachers' burnout. Hence, the aim of this study was to analyze the effects of SEL interventions for teachers on teachers' burnout levels. Three

Table 2 Hedges *g*, heterogeneity levels, and prediction intervals for overall burnout and its dimensions

	Intrapersonal SEC					Interpersonal SEC				
	n_p	$[n_s, k]$	g (SE)	95% CI	I^2	95% Prediction Interval	n_p	$[n_s, k]$	g (SE)	95% Prediction Interval
Burnout	675	[11, 27]	- 0.18(0.11)	[- 0.41, 0.07]	77.1%	[- 1.46, 1.11]	319	[2, 5]	0.11(0.04)	[- 0.34, 0.56]
Emotional exhaustion	376	[9, 9]	- 0.37(0.15)	[- 0.70, - 0.03]	42.3%	[- 1.06, 0.33]	319	[2, 2]	0.29(0.14)	[- 1.50, 2.09]
Depersonalization	333	[8, 8]	- 0.51(0.26)	[- 1.13, 0.11]	80.2%	[- 2.17, 1.14]	89	[1, 1]	-	-
Personal accomplishment	333	[8, 8]	0.45(0.14)	[0.12, 0.79]	32.8%	[- 0.13, 1.03]	319	[2, 2]	- 0.15(0.27)	[- 3.54, 3.24]

n_p , sample size; n_s , number of studies; k , number of within effects

The n_p regarding *Burnout* corresponds to the total sample included in the meta-analysis procedure. For Emotional exhaustion, Depersonalization, and Personal accomplishment, the n_p corresponds to the sum of the participants from the pool of studies which measured this symptom

Table 3 Meta-regression estimates and confidence intervals for socio-demographic and intervention covariates on burnout, emotional exhaustion, depersonalization and personal accomplishment

	Burnout ($n = 8, k = 22/n = 11, k = 27$)		Emotional exhaustion ($n = 7, k = 7/n = 9, k = 9$)		Depersonalization ($n = 7, k = 7/n = 8, k = 8$)		Personal accomplishment ($n = 7, k = 7/n = 8, k = 8$)	
	B (SE)	95% CI	B (SE)	95% CI	B (SE)	95% CI	B (SE)	95% CI
Socio-demographic								
Age	- 0.08(0.06)	[- 0.27, 0.12]	- 0.12(.09)	[- 0.49, 0.26]	- 0.12(0.23)	[- 1.05, 0.80]	0.11(0.04)	[- 0.02, 0.24]
Teaching experience	0.06(0.06)	[- 0.14, 0.26]	0.11(.10)	[- 0.23, 0.45]	0.07(0.20)	[- 0.62, 0.77]	- 0.07(0.04)	[- 0.22, 0.08]
Gender (% female)	- 0.01(0.02)	[- 0.08, 0.07]	- 0.10(.03)	[- 0.12, 0.10]	- 0.02(0.04)	[- 0.19, 0.14]	0.03(0.01)	[- 0.02, 0.07]
Intervention								
Dosage (15–29 h)	- 0.11(0.48)	[- 1.88, 1.65]	-	-	-	-	-	-
Dosage (≥ 30 h)	- 0.31(0.60)	[- 2.56, 1.94]	-	-	0.04(0.53)	[- 3.35, 3.44]	- 0.18(0.22)	[- 1.50, 1.14]
Duration (1–3 months)	- 0.64(0.85)	[- 4.49, 3.21]	-	-	-	-	-	-
Duration (> 3 months)	- 0.06(0.43)	[- 1.80, 1.69]	-	-	- 1.03(0.68)	[- 4.01, 1.95]	1.02(0.30)	[- 0.28, 2.32]
Cross-session training (existence)	0.60(0.43)	[- 0.96, 2.15]	0.66(0.23)	[- 0.43, 1.75]	0.99(0.67)	[- 2.00, 3.98]	- 0.12(0.27)	[- 1.34, 1.11]
Level (class)	0.37(0.43)	[- 1.37, 2.11]	- 0.48(0.23)	[- 1.57, 0.61]	- 1.75(0.73)	[- 5.07, 1.56]	1.45(0.28)	[- 0.06, 2.97]
Level (discipline)	- 0.17(0.25)	[- 1.15, 0.81]	- 0.50(0.24)	[- 1.60, 0.60]	- 1.06(0.49)	[- 4.87, 2.75]	0.35(0.30)	[- 2.21, 2.91]

 $p < .10$

To the left of the bar, number of studies (n) and number of within effects (k) for socio-demographic covariates. To the right, the same information for intervention covariates. Estimates are significant when confidence intervals do not include the 0. n corresponds to the number of studies included in the meta regression model with complete data for the covariates. For dosage, the reference group is 1–14 h (Burnout and Emotional exhaustion) and 15 to 29 h (Depersonalization and Personal accomplishment); for cross training the reference group is absence; for teaching level the reference group is both

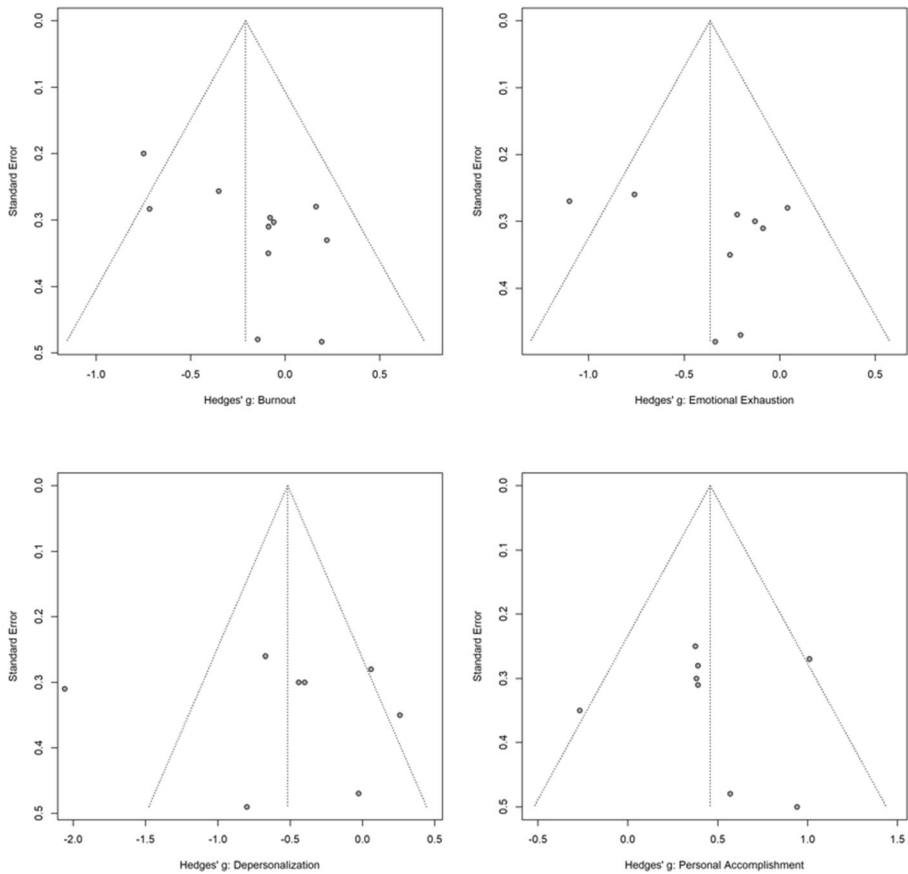


Fig. 4 Funnel plots of effect sizes for studies addressing intrapersonal SEC aggregated at study level plotted against the inverse of the standard error

research questions were defined, for which answers were provided through a systematic review with a meta-analysis procedure performed on 13 empirical studies.

As regards Q1 (i.e., Are SEL interventions for teachers effective in reducing teachers' overall burnout and its symptoms?), the results indicated that when addressing intrapersonal SEC, SEL interventions had a medium positive and significant effect on personal accomplishment ($g = 0.45$) with low heterogeneity ($I^2 = 32\%$) and a medium negative and significant effect on emotional exhaustion ($g = -0.37$), also with low heterogeneity ($I^2 = 42\%$). In accordance with these findings, this type of SEL intervention appears to have contributed to promoting teachers' sense of personal accomplishment, a dimension of burnout that is particularly related to the appraisal of personal resources and one's perceived ability to respond to job demands/lack of resources (Bresó et al., 2007; Schaufeli & Taris, 2014), and to decreasing the presence of feelings of emotional distress through the promotion of emotional resources. These results are in keeping with the findings of previous meta-analytic studies as far as the effective impacts of these interventions on diminishing emotional exhaustion (i.e., Iancu et al., 2018; Maricuțoiu et al., 2016) and increasing personal accomplishment (i.e., Iancu et al., 2018) are concerned. This latter finding is particularly relevant and responds to a specific need highlighted by Maricuțoiu et al. (2016). As previously mentioned, these authors

emphasized the need to develop specific intervention approaches that complement traditional stress-reduction interventions (i.e., cognitive-behavioral interventions and interventions based on relaxation techniques), and which surpass the effect that is generally attained of reducing emotional exhaustion to also address depersonalization and personal accomplishment symptoms. Later, Iancu et al. (2018) showed that interventions which created work groups to promote social support among teachers had small but significant impacts on personal accomplishment; however, they did not diminish emotional exhaustion. According to the findings in the present study, **even though SEL interventions were not effective as far as depersonalization is concerned, when addressing intra-personal SEC, these interventions were one step ahead in responding to an important gap in interventions aiming to prevent burnout (Maricuțoiu et al., 2016) by not only diminishing teachers' emotional exhaustion symptoms but also acknowledging their current personal accomplishment needs.** These SEL interventions for teachers did not have a significant direct impact either on teachers' overall burnout, or on their depersonalization, a core dimension that is on a par with emotional exhaustion and more related to perceived job demands and lack of resources (Bresó et al., 2007; Schaufeli & Taris, 2014). These findings are also in line with those of previous meta-analyses by Iancu et al. (2018) and Maricuțoiu et al. (2016), which also found no impacts of interventions aimed at reducing teachers' burnout on depersonalization.

The findings of the present study also revealed that SEL interventions which were only centered on teachers' interpersonal SEC and shared the aim of improving teachers' professional performance through better classroom management, classroom interactions, and sensitivity to students' needs had no significant impacts on teachers' burnout levels. The effects found (although not significant) were opposed to the expected as they revealed a tendency for an increase in overall burnout and emotional exhaustion levels and a decrease in perceived personal accomplishment. Although authors tend to be silent regarding these types of unexpected effects, some reflections have been shared suggesting that, within the scope of SEL interventions targeting solely interpersonal SEC, the support and guidance given to teachers have probably been insufficient to prevent the increase of teachers' feelings of emotional distress and perceived professional inefficacy when attempting to address demanding classroom situations and apply the new competences learned (Roberts et al., 2019). Additionally, other variables may also have affected the results (Domitrovich et al., 2016). Although the findings of the present study call for an in-depth reflection, they appear to highlight a very important aspect regarding teachers' professional development: it is crucial that SEL interventions explicitly aim to address the intrapersonal competencies of these professionals. Even though they should also address interpersonal competencies with a view to improving teachers' performance directly with their students and within the classroom, it is known that teaching-specific stressors are beyond the classroom dynamics (McCarthy et al., 2016), and therefore, the explicit training of intrapersonal competencies cannot be neglected.

That said, these results indicated that one of SEL interventions for teachers' greatest assets appears to be the development of an increased sense of confidence in one's own ability to cope with job demands. The stronger association of intra-personal SEC (e.g., self-management) with a sense of personal accomplishment is in line with prior research which posits that this dimension of burnout is more like a personality construct and is therefore more linked to intrapersonal variables such as those specific SEC areas (Bresó et al., 2007; Schaufeli & Enzmann, 1998). In this scenario, with personal accomplishment performing a role of predisposition for the development of the core dimensions of burnout (Bresó et al., 2007), SEL interventions and, consequently, the development of SEC may act as a protection feature,

through which teachers became less predisposed to developing emotional exhaustion and depersonalization. The findings also showed that these types of interventions were also important to reduce teachers' feelings of emotional exhaustion, one of the core dimensions of the burnout syndrome and the first symptom to emerge in accordance with the conceptual models of burnout development (Bresó et al., 2007; Maslach & Jackson, 1981; Maslach & Leiter, 2016; Schaufeli & Taris, 2014). This result is particularly promising as far as the use of SEL interventions for teachers is concerned to prevent and reduce burnout development. Still regarding this first research question, the results presented low (regarding emotional exhaustion and personal accomplishment symptoms) to high heterogeneity levels (for overall burnout and depersonalization) suggesting, in line with prior studies, the presence of covariates. Thus, subgroup and meta regression analyses were conducted, enabling a response to this study's second and third research questions.

As for the socio-demographic variables (responding to Q2: Do socio-demographic covariates such as teachers' age, gender, and/or teaching experience predict the effect of SEL interventions on overall burnout and its symptoms?), contrary to what was expected considering the prior literature (e.g., Brewer & Shapard, 2004; Maslach et al., 2001; O'Connor et al., 2018), **no significant effects were found**. The absence of significant effects may be due to the homogeneity of the sample. In fact, prediction impacts of age were in line with prior research, i.e., older teachers tend to perceive less burnout (Brewer & Shapard, 2004; Maslach et al., 2001) but average values were used, and mean years of age and teaching experience tended to be similar across the analyzed studies, with no samples with less than 6 years of teaching experience and 33 years of age. The same explanation may be relevant for the absence of a predictive effect of gender, since there was an overrepresentation of females among the teachers, hence affecting this result. Also, the meta-regression models may lack power due to the small sample used (Fisher & Tipton, 2015).

Likewise, within the intervention features considered (i.e., regarding Q3: Do intervention level covariates such as dosage, duration, cross-session training, and suitability of content presented to teachers' teaching level predict SEL interventions' effects on overall burnout and its symptoms?), no statistically significant effects were found. Point estimates provided by confidence intervals were narrower for duration and suitability of contents for teachers' personal accomplishment. These results are in keeping with previous findings which suggested that above dosage (which was considered a non-significant predictor of effect in both studies), the duration of interventions (i.e., distance between the 1st and last training sessions) appeared to influence SEL interventions' impact for teachers' perceived personal accomplishment (Oliveira et al., [under revision](#)), with SEL interventions longer than 3 months presenting higher proficiency in promoting teachers' personal accomplishment (Iancu et al., 2018). Additionally, these results suggested that SEL interventions appear to be more effective in promoting teachers' personal accomplishment when tailored to the precise teacher-group needs, although this effect was only found for class-level teachers (i.e., pre- and elementary school teachers). However, findings regarding the role of this covariate seem to not be consensual throughout the literature which have found inconsistent results (Oliveira et al., [under revision](#); Iancu et al., 2018) and need further investigation. Also, given that the Satterthwaite degrees of freedom for these estimates were below 4, and due to the complexity of the models, the results should be interpreted with caution due to the high level of unreliability arising from the limited sample size used (Fisher & Tipton, 2015). Additionally, and contrary to the general guidelines for interventions with teachers

(Gulamhussein, 2013), explicit training between formal sessions did not emerge as a significant predictor of SEL interventions' impact on teachers' burnout. This finding is in line with prior research focusing on SEL interventions for teachers' efficacy, in which the explicit training between formal sessions did not reveal a prediction effect either (Oliveira et al., [under revision](#)).

Limitations and Future Research

When interpreting this study's findings, some limitations should be considered. Although the eligibility criteria contributed to ensuring the quality of the research, the fact that some studies were left out (e.g., studies which did not provide sufficient data for the estimation of effect sizes, reports, conference papers, and proceedings) may have led to a bias of the findings. Nevertheless, since research within the SEL rationale still requires further integration and higher heterogeneity is expected (Oliveira et al., [under revision](#)), the inclusion of gray literature could paradoxically increase the bias (Higgins et al., 2019); and hence, these choices were made to promote the homogeneity of the data. Future research adopting other eligibility criteria can contribute to extend and deepen the comprehension of the findings. Another important limitation to consider when interpreting the study results is associated with the small sample of pooled studies. Consequently, generalization of the findings is limited, and conclusions should be read with reservations. Nevertheless, implementing a multilevel approach to be able to use all the relevant effects reported within studies, the overall number of pooled studies remains small, contributing to heterogeneity and broad confidence intervals. Moreover, low to high levels of heterogeneity among the studies were found, particularly regarding depersonalization, suggesting that around 80% of the between-study variance of this domain is explained by covariates and subgroup analyses, which may have contributed to the broad prediction intervals found. These broad prediction intervals alert to the possibility of future studies finding negative, absent, or positive effects of different magnitudes; and thus, conclusions within this study should be drawn with caution.

Lastly, the selected covariates (even though they were selected on the basis of prior literature guidelines) did not contribute to explain the variance found for the core dimensions of burnout. Moreover, although the findings did not report significant effects of SEL interventions on depersonalization, a large marginally significant effect size was found. These results lead to the conclusion that the absence of significance may be associated with the high variance observed between studies. Since only a small number of studies were included, meta-regression results may lack power. Nevertheless, since meta-analytic studies on the prevalence of burnout often report high levels of heterogeneity (Brewer & Shapard, 2004; Maricuțoiu et al., 2016; O'Connor et al., 2018), the achieved results may be a consequence of both elements. Thus, apart from improving the sample size, it would be important for future studies to test for different explanatory factors and inter-variable relations. In addition, and despite the previous considerations regarding limitations in the meta-regression models, publication bias was evaluated using Vevea and Woods' (2005) approach. This sensitivity analysis was limited to the small number of pooled studies, and the absence of changes in the unadjusted effects for most burnout dimensions (with the exception of personal accomplishment) should not be perceived as a non-publication bias pattern.

Theoretical and Practical Implications

Notwithstanding the aforementioned limitations in this study, SEL interventions for teachers appear to have a medium positive and significant effect on promoting perceived personal accomplishment and a medium negative and significant effect on preventing feelings of emotional exhaustion among preK–12 in-service teachers. Despite the discussion in the literature regarding the conceptual model of burnout development, it is unanimous that perceived personal accomplishment is a protective feature against burnout, either since it may act as a buffer against the core dimensions of burnout (Bresó et al., 2007), or due to the fact that it represents the ultimate level through which one can reach a burnout diagnosis (Maslach & Jackson, 1981). Likewise, within both conceptual models of burnout development, emotional exhaustion emerges as the first (or one of the first) symptom(s) of burnout. Therefore, these results reinforce the potential of SEL interventions for teachers to withstand a worldwide phenomenon that calls for our attention and intervention which is teachers' burnout (Iancu et al., 2018; Maslach et al., 1996), and the utility of explicitly promoting intra-personal SEC within teacher training. This is particularly relevant since, historically, the professional development of teachers, particularly regarding SEL, has mainly emphasized teachers' ability in relation to their students' needs and classroom management. Indeed, SEL interventions for in-service teachers targeting their own SEC development only emerged 15 years after the introduction of the SEL rationale (Oliveira et al., [under revision](#)), and to date, preservice teachers' training still lacks explicit SEC development mainly in terms of intra-personal SEC (i.e., ability to identify and adequately manage emotions and behaviors, training in monitoring teachers' own progress toward achieving goals; Schonert-Reichl et al., 2017).

This study's results have also helped to reflect on the role of specific features regarding the design of SEL interventions which may increase their effectiveness in promoting teachers' personal accomplishment. Indeed, the findings suggest that longer duration seems to play an important role in these interventions' effects, signaling that the time span between the 1st and last training sessions should be at least 3 months to allow for the acquisition and consolidation of SEC. The results also suggest that, when designing an intervention targeting pre/ kindergarten and elementary school teachers, a tailored approach to the group's specific characteristics could play a role in increasing the impact of the interventions on personal accomplishment. Thus, even though additional research is needed to clarify these potential pathways, intervention developers should consider these aspects while designing future SEL interventions aiming to impact teachers' burnout.

Another important factor to discuss is that, although the literature has pointed to a strong association between emotional exhaustion and depersonalization, and high job demands and lack of job resources, respectively (Demerouti et al., 2001; Schaufeli & Taris, 2014), none of the addressed interventions was designed at an organizational level or consigned the promotion of job-related resources (e.g., social support from colleagues and/or supervisors) (Leiter & Maslach, 2003). Hence, future research is needed to consider these aspects and explore the contribution and effectiveness of organizational-level interventions (Durlak et al., 2015; Iancu et al., 2018; Maslach et al., 2001). Along with this constraint, the eligible SEL interventions within this study were developed with a universal approach not considering the baseline levels of participants' burnout. Thus, as previously discussed, these aspects may possibly affect the results (Iancu et al., 2018). It may, therefore, be important for future studies to assess and test for pathways of efficacy, considering a multi-tiered approach (Oliveira et al., [under revision](#)).

Likewise, the results of this study also pointed to important insights addressing the design of research studies and methodological constraints. In fact, only two studies reported fidelity of implementation measures, and only one research paper included follow-up assessment data. Both aspects play an important role to ensure a more robust and comprehensive view of both the burnout syndrome evaluation and its predictors or moderators, by enabling the consistent evaluation of maintenance and sleeper effects (Iancu et al., 2018; Schaufeli & Taris, 2014), and by ensuring confidence and reliability of the intervention processes (e.g., Durlak et al., 2015).

As regards the heterogeneity found between studies, it may be important to reflect on the instruments used to measure the assessed constructs. As mentioned, all the studies resorted only to self-report measures and the majority used the MBI-ES (Maslach et al., 1996). Even though MBI is the most consensual and used instrument to measure burnout worldwide, there has been some debate within the literature regarding the robustness of the depersonalization scale, particularly its internal consistency (Garden, 1987), which was identified within the pooled studies either with the lower internal consistency index and/or with an internal consistency below the suitable values (Nunnally, 1978). Hence, it is possible that the variance between studies and the absence of significant effects in this dimension observed in this study may also derive from psychometric issues, which may be concealing the potential impacts of SEL interventions on depersonalization and must therefore be addressed in future research (Oliveira et al., [under revision](#)). Within this scenario, as more methodologically rigorous studies emerge, research including meta-analytic reviews should be conducted to refine and extend this study's findings.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s10648-021-09612-x>.

Author Contribution SO: designed and executed the study, analyzed the data, and wrote the paper. MSR: assisted with the design, collaborated with the data analyses and the writing of the study. AMVS: assisted with the design, execution, and writing of the study, collaborated with the editing of the final manuscript. AMP: assisted with the design and execution of the study, collaborated with the data analyses, and the writing and the editing of the final manuscript. All the authors approved the final version of the manuscript for submission.

Funding This work was supported by the Foundation for Science and Technology of the Science and Education Ministry of Portugal through a PhD grant (SFRH/BD/137845/2018) and through the Research Center for Psychological Science of the Faculty of Psychology, University of Lisbon (CICPSI; UIDB/04527/2020 & UIDP/04527/2020).

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