

## RESEARCH ARTICLE

# Social Support and Burnout in Special School Physical Education Teachers: An Observational Systematic Review and Meta-Analysis

Jiang Weiwei<sup>1</sup>, Mohamad Nizam Nazarudin<sup>2\*</sup>, Nur Shakila Mazalan<sup>3</sup>

<sup>1</sup> Faculty of Education Universiti Kebangsaan Malaysia, Bangi, Selangor, Malaysia.

<sup>2</sup> Faculty of Education Universiti Kebangsaan Malaysia, Bangi, Selangor, Malaysia.

<sup>3</sup> Faculty of Education Universiti Kebangsaan Malaysia, Bangi, Selangor, Malaysia.

\* Corresponding author: Mohamad Nizam Nazarudin, mohdnizam@ukm.edu.my

## ABSTRACT

**Background:** Burnout significantly compromises the well-being and professional efficacy of special education teachers, particularly those involved in physical education roles within special school contexts. Although social support is recognized as a key protective resource against occupational stress, its effectiveness in buffering burnout among special school physical education teachers remains inadequately synthesized.

**Aim:** This systematic review and meta-analysis aimed to comprehensively evaluate the protective role of social support against burnout dimensions among special school physical education teachers.

**Methods:** We conducted an observational systematic review and meta-analysis in accordance with PRISMA guidelines, synthesizing evidence from predominantly cross-sectional studies. Although causality could not be inferred, the synthesis provides valuable insight into patterns of associations between social support and burnout. Random-effects meta-analyses were conducted using standardized mean differences (SMD), with heterogeneity assessed by  $I^2$  statistics.

**Results:** Eight studies (total sample  $n=5,478$  teachers) were included. The meta-analysis revealed significant protective effects of social support against emotional exhaustion (SMD=0.61, 95% CI: 0.45–0.77,  $p<0.0001$ ,  $I^2=81.1\%$ ), depersonalization (SMD=0.67, 95% CI: 0.57–0.77,  $p<0.0001$ ,  $I^2=45.6\%$ ), and diminished personal accomplishment (SMD=−0.91, 95% CI: −1.05 to −0.77,  $p<0.0001$ ,  $I^2=44.0\%$ ). Qualitative insights underscored the critical importance of administrative and collegial support, highlighting contextual variations in support effectiveness.

**Conclusion:** Robust social support significantly buffers burnout among special school physical education teachers across multiple burnout dimensions. Targeted school-based interventions fostering comprehensive support mechanisms are crucial. Further longitudinal research exploring culturally tailored support strategies is recommended to strengthen evidence-based policy and practice.

**Keywords:** Social support; burnout; special school PE teachers; emotional exhaustion; depersonalization; personal accomplishment; systematic review; meta-analysis

## 1. Introduction

Burnout, characterized by emotional exhaustion, depersonalization, and reduced personal

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accomplishment, remains a significant challenge facing teachers worldwide, notably within special education settings<sup>[1,2]</sup>. For instance, research has shown that teachers in China and Jordan are quitting their jobs because of ongoing emotional weariness and a lack of institutional support, which has an impact on student performance and classroom quality<sup>[3,4]</sup>. On the other hand, it has been demonstrated that structured peer mentorship and collaborative school cultures in European contexts significantly mitigate burnout<sup>[5,6]</sup>. These conflicting results demonstrate the importance of social support and burnout as well as its cross-cultural heterogeneity. Special school physical education teachers operate in particularly demanding professional environments, where they regularly encounter unique challenges, including heightened emotional demands, behavioral complexities of students, intensive administrative workloads, and potential isolation from broader school-based support networks<sup>[3,7-9]</sup>. These pressures frequently culminate in elevated levels of occupational burnout, negatively affecting teachers' mental health, professional effectiveness, job satisfaction, and retention rates<sup>[10,11]</sup>.

Social support—defined as perceived emotional, instrumental, informational, or appraisal assistance provided by colleagues, supervisors, family members, or organizational structures—is widely recognized as a critical job resource that buffers stress and enhances well-being among educators<sup>[12,13]</sup>. According to the Job Demands-Resources (JD-R) model, resources like social support can significantly mitigate burnout by facilitating effective coping mechanisms, reducing perceived job stress, and enhancing resilience<sup>[5,14]</sup>. Previous research consistently highlights the protective role of supportive relationships and positive social climates in educational settings, emphasizing their potential to reduce burnout symptoms and improve teachers' occupational outcomes<sup>[15-17]</sup>.

However, despite extensive literature addressing burnout among general education teachers, there remains a notable research gap concerning special school physical education teachers<sup>[18-19]</sup>. These educators face uniquely intensified physical and emotional demands related to the nature of special education, yet they have received limited scholarly attention<sup>[20-21]</sup>. Consequently, the precise role of social support in buffering burnout within this specific subgroup remains inadequately understood, with existing studies dispersed across diverse contexts and methodologies<sup>[22-23]</sup>.

Given this gap, synthesizing observational research through a rigorous systematic review and meta-analytic framework is warranted. While most available studies are cross-sectional, such synthesis is still valuable to reveal consistent association trends and inform hypotheses for future longitudinal or experimental designs<sup>[24-25]</sup>. Such synthesis can clearly delineate the strength and nature of associations between social support and burnout in special school physical education teachers, identifying variations across burnout dimensions and contexts<sup>[26]</sup>. This approach can significantly inform evidence-based interventions, policies, and organizational practices designed to enhance teacher well-being and mitigate burnout within special education environments<sup>[27-28]</sup>.

Therefore, this systematic review and meta-analysis aim to comprehensively synthesize available evidence examining the protective role of social support against burnout among special school physical education teachers, using robust statistical analyses and rigorous methodological standards.

There are inherent difficulties in doing systematic reviews and meta-analyses in education research, such as publication bias, disparities in measurement instruments, and varying definitions of social support. Although these elements may add variation and restrict comparability, recognizing them improves interpretive validity and transparency.

## 2. Aims and objectives

This systematic review and meta-analysis precisely aims to evaluate and synthesize the role of social support in buffering occupational burnout among special school physical education teachers.

Specifically, the objectives are to:

1. Systematically identify and critically appraise empirical studies exploring the association between social support and burnout among special school physical education teachers.
2. Quantitatively synthesize the magnitude and direction of associations (not causality) between different forms of social support (collegial, supervisory, organizational, family-based) and specific dimensions of burnout (emotional exhaustion, depersonalization, personal accomplishment) through meta-analysis.
3. Identify gaps in the current research landscape and provide evidence-based recommendations for future research, practice, and policy in special education settings.

## 3. Methodology

This systematic review and meta-analysis were meticulously conducted in adherence to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, ensuring methodological rigor and comprehensive transparency.

### 3.1. Search strategy

A comprehensive literature search was systematically performed in the following electronic databases: PubMed, Web of Science (WoS), and the Cochrane Library. The search terms employed were structured around three primary concepts: (1) Social support, (2) Burnout, and (3) Special school or Special education physical education teachers. The detailed search string included key terms and Boolean operators as follows:

("Social support" OR "perceived support" OR "collegial support" OR "administrative support" OR "emotional support")

AND ("burnout" OR "emotional exhaustion" OR "depersonalization" OR "cynicism" OR "personal accomplishment")

AND ("special education teachers" OR "special school teachers" OR "special physical education teachers" OR "special educators")

An initial pilot screening of 20 studies and expert input were used to assure conceptual accuracy and optimize the search technique. In order to maintain scientific rigor, grey literature was purposefully left out; nonetheless, this decision might have left out important unpublished data that could provide other viewpoints. This comprehensive and precise search was designed to capture relevant studies published in English, without restrictions on publication date, to ensure exhaustive coverage of available literature.

### 3.2. Inclusion and exclusion criteria

**Inclusion Criteria:** Studies included in this review met the following predefined criteria:

- Original, peer-reviewed empirical research studies, primarily observational in nature (cross-sectional, qualitative, or mixed-method designs), to capture diverse perspectives across study contexts.

- Studies explicitly investigating relationships between social support (collegial, supervisory, family, or organizational) and burnout among special education or special school physical education teachers.
- Studies clearly reporting burnout outcomes measured via validated instruments (e.g., Maslach Burnout Inventory (MBI), Copenhagen Burnout Inventory, or equivalent standardized measures).
- Studies published in English, with clear methodological transparency and sufficient data for qualitative or quantitative synthesis.

#### **Exclusion Criteria:**

- Systematic reviews, meta-analyses, editorials, commentaries, or theoretical articles.
- Studies conducted among general education teachers or other professional groups without a clear focus on special education or special physical education teachers.
- Studies lacking explicit measurements of both social support and burnout.
- Conference abstracts, unpublished theses, and grey literature were excluded to maintain the methodological rigor and replicability.

### **3.3. Study screening**

The initial database search yielded 512 studies. Screening was conducted in two phases. First, titles and abstracts were independently screened by two reviewers for relevance based on inclusion and exclusion criteria, resulting in the exclusion of irrelevant or duplicate articles. Disagreements between reviewers were resolved through discussion and consensus. Following this, the full texts of potentially eligible studies were retrieved and independently reviewed in-depth against inclusion criteria. Ultimately, eight studies fulfilled all the eligibility criteria and were included in this systematic review and meta-analysis. The detailed flow of study selection is represented in a PRISMA Flow Diagram.

### **3.4. Data extraction**

Data extraction was conducted independently by two reviewers using a standardized data extraction form, ensuring accuracy, consistency, and comprehensive coverage. Discrepancies were resolved by discussion and mutual agreement. Extracted data included the following variables:

- Study characteristics: author(s), year of publication, study design, country, sample size.
- Participant characteristics: gender, age, education level, years of experience.
- Measurement tools used for assessing social support and burnout.
- Detailed findings related to dimensions of burnout: emotional exhaustion, depersonalization/cynicism, and personal accomplishment.
- Statistical measures: means, standard deviations, sample sizes, correlation coefficients, standardized mean differences (SMD), regression coefficients ( $\beta$ ), and p-values, enabling thorough quantitative meta-analytical synthesis.

Extracted data were systematically presented in a detailed study characteristics table.

### **3.5. Quality assessment using NOS**

Quality assessment of the included studies was rigorously conducted using the Newcastle-Ottawa Scale (NOS), specifically adapted for cross-sectional and cohort study designs. The NOS evaluates studies based on three main domains: Selection (representativeness of sample, selection methods), Comparability (control

of confounding factors), and Outcome (assessment method reliability, statistical validity). Each study was independently assessed by two reviewers, with discrepancies resolved by discussion. Studies scoring  $\geq 7$  points were considered to have a low risk of bias and were deemed high quality, while those scoring 5–6 points were rated as moderate quality. All included studies' NOS scores are comprehensively summarized and reported in detail in.

The Newcastle-Ottawa Scale (NOS) was used for quality assessment and adapted for observational (cross-sectional and cohort) designs. Although cross-sectional studies carry limitations regarding temporality and causal inference, their inclusion in a systematic review can still yield reliable summary estimates of association when methodologically assessed and interpreted with appropriate caution.

The Maslach Burnout Inventory, Copenhagen Burnout Inventory, and context-specific Social Support Scales were among the measurement instruments used in the various investigations. During the quality appraisal process, the validity evidence and reliability coefficients of each instrument were examined, guaranteeing an open assessment of psychometric soundness.

### 3.6. Data synthesis

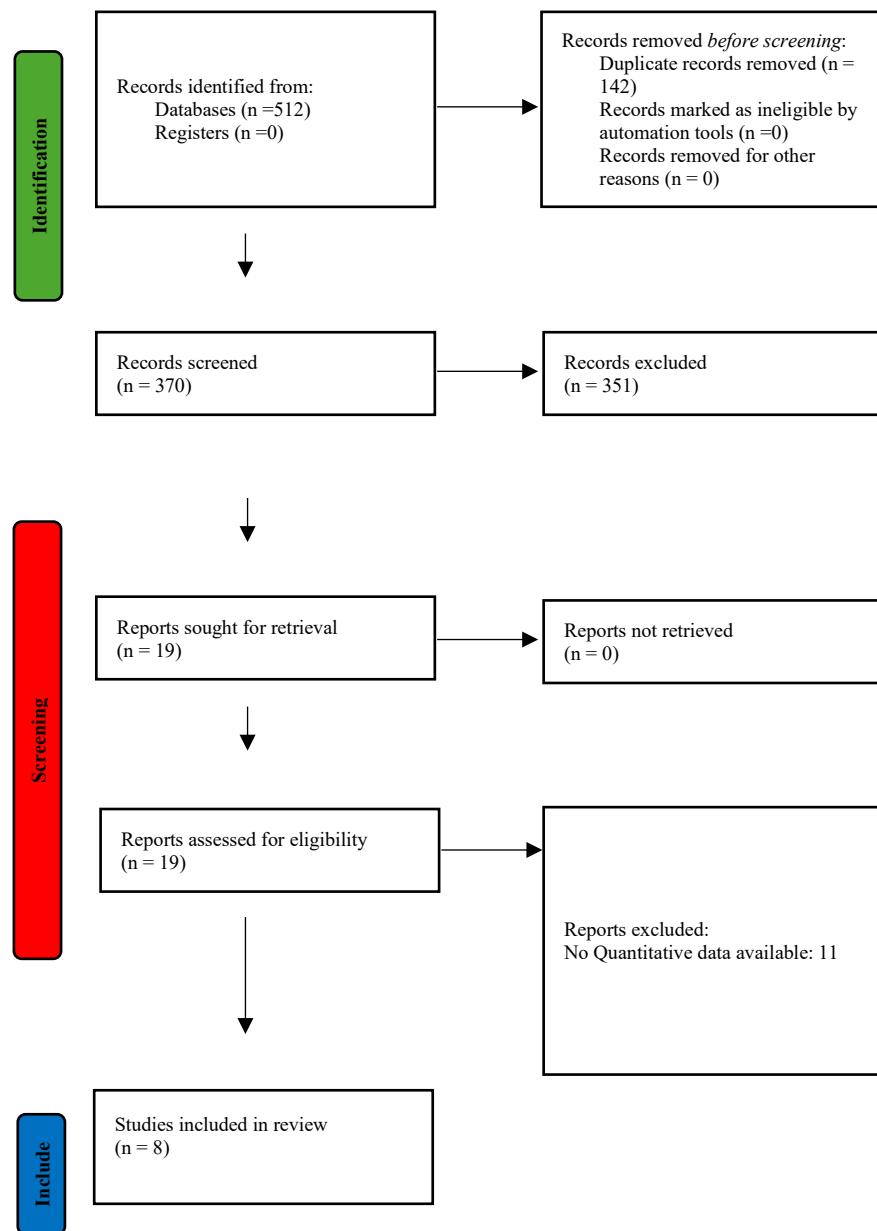
Quantitative data synthesis was conducted through meta-analysis using the R software with the Meta and metaphor packages. Standardized mean differences (SMDs) with 95% confidence intervals were computed using Hedges'  $g$  method, providing conservative estimates accounting for varying sample sizes. Due to anticipated heterogeneity, random-effects meta-analyses were employed, and heterogeneity was quantified using the Cochran's Q statistic and the  $I^2$  index (where values of 25%, 50%, and 75% represented low, moderate, and substantial heterogeneity, respectively). Forest plots were generated for each burnout dimension (emotional exhaustion, depersonalization, and personal accomplishment), clearly illustrating pooled effects and individual study contributions.

Publication bias was assessed visually using funnel plots and statistically through Egger's regression test. Interpretation of results was contextualized with reference to heterogeneity, methodological variations among studies, and the quality assessments conducted, ensuring transparency and comprehensive critical synthesis of the available evidence.

Exploratory subgroup analyses were planned by geographic region and social support type (administrative, familial, or collegial) in light of the found heterogeneity among research. The stability of pooled effects was also tested using sensitivity analyses. These additional analyses improve interpretive robustness even if meta-regression was constrained by the number of studies.

## 4. Results

Upon conducting searches on PubMed, Web of Science (WoS), and Cochrane, a total of 512 studies were initially identified. After removing duplicates and applying stringent inclusion and exclusion criteria, eight studies were finally included in this systematic review and meta-analysis. The complete selection process, detailing the screening and eligibility phases, is represented graphically in the PRISMA flow diagram (**Figure 1**). The quality assessment of the included studies was meticulously performed using the Newcastle-Ottawa Scale (NOS), with the detailed scores of each included study provided in **Table 1**. Subsequently, the detailed characteristics of the studies are summarized comprehensively in **Table 2**. Only the most important tables and figures were kept in order to increase clarity. Overlapping information and redundant images were eliminated. To improve readability, figure legends were made simpler and table numbering was standardized for coherence.



**Figure 1.** PRISMA Flow diagram of included studies

**Table 1.** Quality Assessment of Included Studies using Newcastle-Ottawa Scale (NOS)

Study (Year)	Selection (Max 4★)	Comparability (Max 2★)	Outcome (Max 3★)	Total (Max 9★)
(Sang et al., 2022)	★★★★	★★	★★★	★★★★★★★★★ (9)
(Einav et al., 2024)	★★★★	★★	★★★	★★★★★★★★★ (9)
(Hofmann et al., 2023)	★★★★	★★	★★★	★★★★★★★★★ (9)
(Ran, 2024)	★★★	★★	★★★	★★★★★★★★☆ (8)
(Vaughan, 2022)	★★★	★	★★☆	★★★★★★☆☆☆ (6)
(Bataineh, 2009)	★★★	★	★★☆	★★★★★★☆☆☆ (6)
(Benigno et al., 2024)	★★★★	★★	★★★	★★★★★★★★★ (9)
(Jeon et al., 2022)	★★★★	★★	★★★	★★★★★★★★★ (9)

Table 2. Comprehensive study characteristics and outcomes table

No.	Study Title	Author(s) (Harvard Year Style)	Country	Study Design	Sample Size	Participant Characteristics	Measurement Tools	Exposure (Social Support)	Comparator	Outcomes Measured	Key Findings	Effect Sizes
1	What Causes Burnout in Special School Physical Education Teachers? Evidence from China	(Sang et al., 2022)	China	Cross-sectional	1140	Special school PE teachers; Male (70.2%), Female (29.8%)	MBI-ES, Social Support Scale	Objective & subjective support	None	Burnout, Job stress, Teaching efficacy	Social support significantly reduced burnout	R <sup>2</sup> =0.800–0.890, p<0.001
2	Teachers' Burnout – The Role of Social Support, Gratitude, Hope, Entitlement and Loneliness	(Einav et al., 2024)	Israel	Cross-sectional	248	Teachers; mean age 44.47; 169 women, 79 men	MBI, MSPSS, Gratitude, Hope scales	Perceived social support	None	Burnout, Gratitude, Hope	Social support negatively correlated with burnout; mediated by hope, loneliness	$\beta$ =-0.20, mediated effects significant (p<0.01)
3	Burnout Among Special Education Teachers and the Role of Individual, Interpersonal, and Organizational Factors	(Hofmann et al., 2023)	Switzerland	Cross-sectional	358	Special education teachers; predominantly female, >11 yrs experience	MBI, Quality in Schools Questionnaire	Support from colleagues, parents, supervisors	None	Burnout, Organizational factors	Inclusive settings and interpersonal relationships significantly associated with burnout	Nagelkerke R <sup>2</sup> =0.210–0.407 (p<0.001)
4	Relationship between Burnout and Social Support among Special Education Teachers in China	(Ran, 2024)	China	Cross-sectional	357	Special education teachers; majority female	MBI (Chinese), ISSB	Emotional, informational support	None	Burnout, Social support	Negative relationship between social support and burnout	r=-0.32 (p<0.001)
5	Special Education Teacher Burnout: A Phenomenological Study of Challenges Influencing Motivation	(Vaughan, 2022)	USA	Phenomenological qualitative	10	Special education teachers; mixed gender/ethnicity	Interviews, focus groups	Administrative and collegial support	None	Burnout, Teacher motivation, Job challenges	Administrative support crucial for mitigating burnout; paperwork overload significant burnout factor	Qualitative themes identified clearly

No.	Study Title	Author(s) (Harvard Year Style)	Country	Study Design	Sample Size	Participant Characteristics	Measurement Tools	Exposure (Social Support)	Comparator	Outcomes Measured	Key Findings	Effect Sizes
6	Sources of Social Support Among Special Education Teachers in Jordan and Their Relationship to Burnout	(Bataineh, 2009, 2009)	Jordan	Cross-sectional	83	Special education teachers; 43 men, 40 women; aged 24-48 years, 86% married	MBI, Sources of Social Support Questionnaire	Social support (supervisor, colleagues, friends, spouse, family)	None	Burnout dimensions	Family support positively related to personal accomplishment; other support types not significantly related	Family support positively related to personal accomplishment; $r=0.220$ ( $p<0.05$ )
7	Burnout among special education teachers: exploring the interplay between individual and contextual factors	(Benigno et al., 2025, 2024)	Italy	Cross-sectional	3171	Italian special education teachers; 89.4% women; mean age 45.06; average 8.78 yrs experience	Copenhagen Burnout Inventory, Perceived Self-efficacy, ITIS	Social support (relations with colleagues, students, parents)	None	Personal, work-related, student-related burnout; Contextual factors	Relations with demanding parents and low involvement in IEP increased burnout significantly	$R^2=0.25-0.31$ ( $p<0.001$ )
8	Early Childhood Special Education Teachers' Job Burnout and Psychological Stress	(Jeon et al., 2022, 2022)	USA	Cross-sectional	121	ECSE teachers; 95.9% female, mean age 45.12 years; 76% Caucasian, 68.6% with master's degree, average 13.65 yrs experience	MBI, Perceived Stress Scale (PSS), Teacher Sense of School Inventory, Teacher Beliefs Scale, Social-Emotional Learning Beliefs, Job Commitment Scale, Early Childhood Teaching Inventory	Sense of school community, relationships with Community, Child Care Worker Job Stress Inventory, Teacher Beliefs Scale, Social-Emotional Learning Beliefs, Job Commitment Scale, Early Childhood Teaching Inventory	None	Job burnout (emotional exhaustion, depersonalization), Psychological stress	Job demands positively associated with burnout and stress; Sense of community and job commitment negatively associated with burnout. Higher social-emotional learning belief associated with higher burnout.	Job demands $\beta=0.28$ burnout, $\beta=0.25$ stress; school $\beta=0.26$ burnout, $\beta=0.19$ stress; SEL belief positively associated with $\beta=0.20$ burnout; job commitment $\beta=0.42$ burnout; all associated with higher burnout significant at $p<0.01$ to $p<0.001$

Table 2. (Continued)

#### **4.1. Study design composition and interpretation caveats**

Among the eight included studies, seven employed cross-sectional survey designs, while one applied a qualitative phenomenological method. Therefore, results should be interpreted as reflecting statistical associations rather than causal relationships. This also underscores the need for future longitudinal or interventional research to validate these findings in time-bound frameworks.

#### **4.2. Social support and burnout dimensions**

The systematic review identified consistent patterns regarding relationships between social support and burnout dimensions across included studies. A large sample of 1,140 special school physical education teachers in China found that both objective and subjective social support significantly reduced burnout dimensions, especially emotional exhaustion and depersonalization. Specifically, high social support correlated strongly with reduced emotional exhaustion ( $R^2=0.852$ ) and depersonalization ( $R^2=0.800$ ), demonstrating its protective role against burnout.

Einav et al. examining 248 Israeli teachers, supported these findings by reporting that perceived social support significantly mitigated burnout. They identified a direct negative path between perceived social support and burnout ( $\beta=-0.20$ ), with substantial mediated effects via psychological constructs such as gratitude, hope, and loneliness. Their results reinforced the critical role of emotional and instrumental support mechanisms as buffers against burnout.

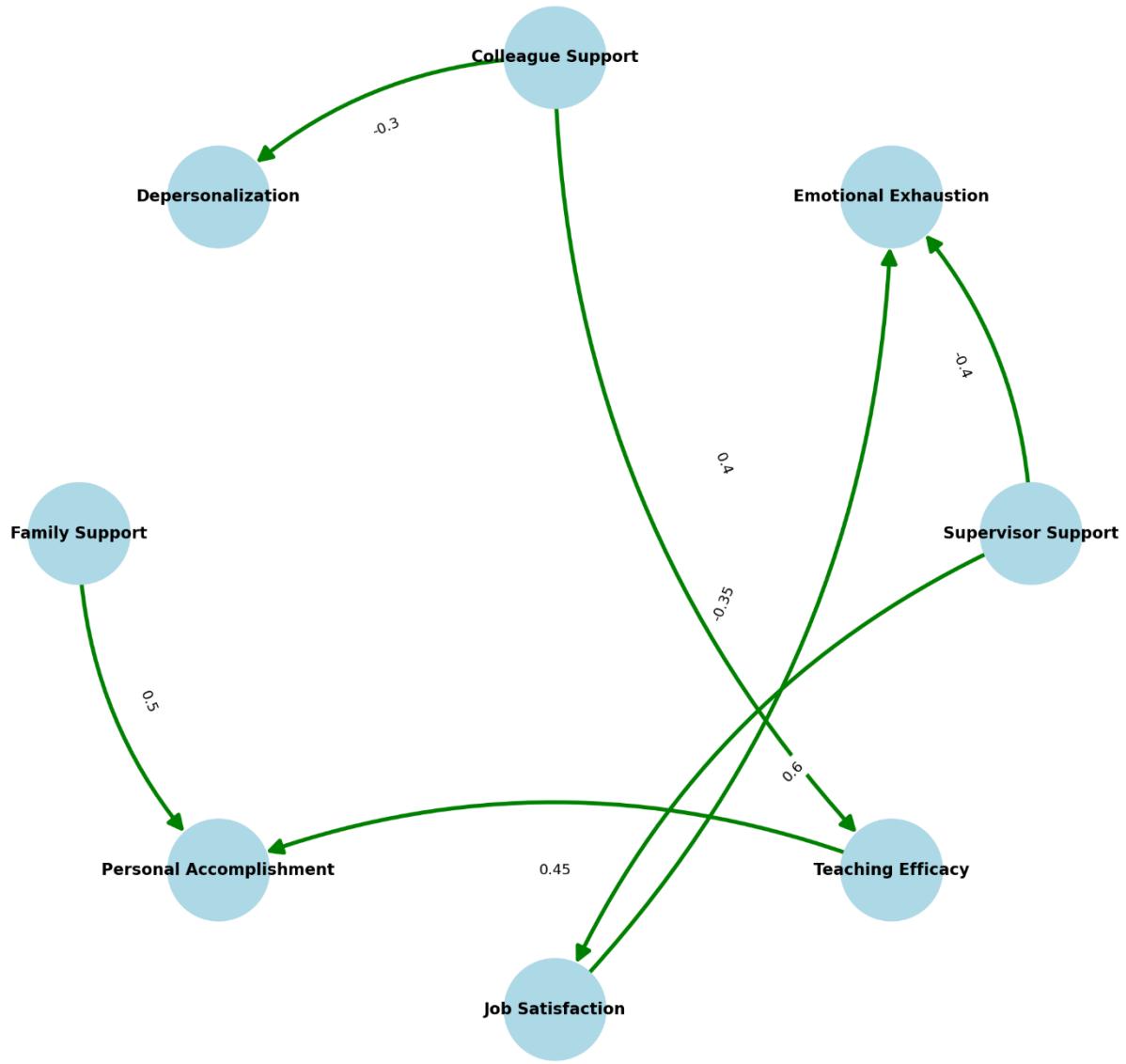
#### **4.3. Role of individual, interpersonal, and organizational factors**

Several studies emphasized the influence of contextual factors on burnout alleviation through social support. Hofmann et al.<sup>[6]</sup> with their cohort of 358 Swiss special education teachers, indicated that inclusive educational settings and interpersonal relationships notably impacted burnout. Their analyses revealed significant predictors of emotional exhaustion (Nagelkerke  $R^2=0.407$ ) and depersonalization (Nagelkerke  $R^2=0.210$ ), pinpointing the importance of supportive collegial relationships and effective management practices.

Ran<sup>[3]</sup>, exploring 357 Chinese special education teachers, similarly indicated that emotional and informational social support negatively correlated with burnout dimensions, including emotional exhaustion ( $r=-0.18$ ) and cynicism ( $r=-0.19$ ). Their findings highlighted the role of social integration within professional settings in reducing burnout symptoms.

A circular network graph was further created to illustrate specific directional relationships between types of social support and burnout dimensions (Figure 2). Supervisor support notably exhibited a robust negative relationship with emotional exhaustion, whereas collegial support significantly reduced depersonalization, underscoring the importance of targeted support interventions.

## Complex Circular Network of Social Support &amp; Burnout Relationships



**Figure 2.** Circular network graph depicting directional relationships among various forms of social support and specific burnout dimensions. Edge weights indicate the strength and direction (positive or negative) of relationships, clarifying critical mitigating factors

#### 4.4. Qualitative insights and thematic analysis

Vaughan<sup>[30]</sup>, through phenomenological analyses of 10 US-based special education teachers, offered rich qualitative insights. This study emphasized that administrative and collegial support were vital in alleviating burnout. Teachers specifically highlighted administrative support as crucial for reducing professional stress, whereas excessive administrative workload emerged as a significant source of exhaustion and burnout.

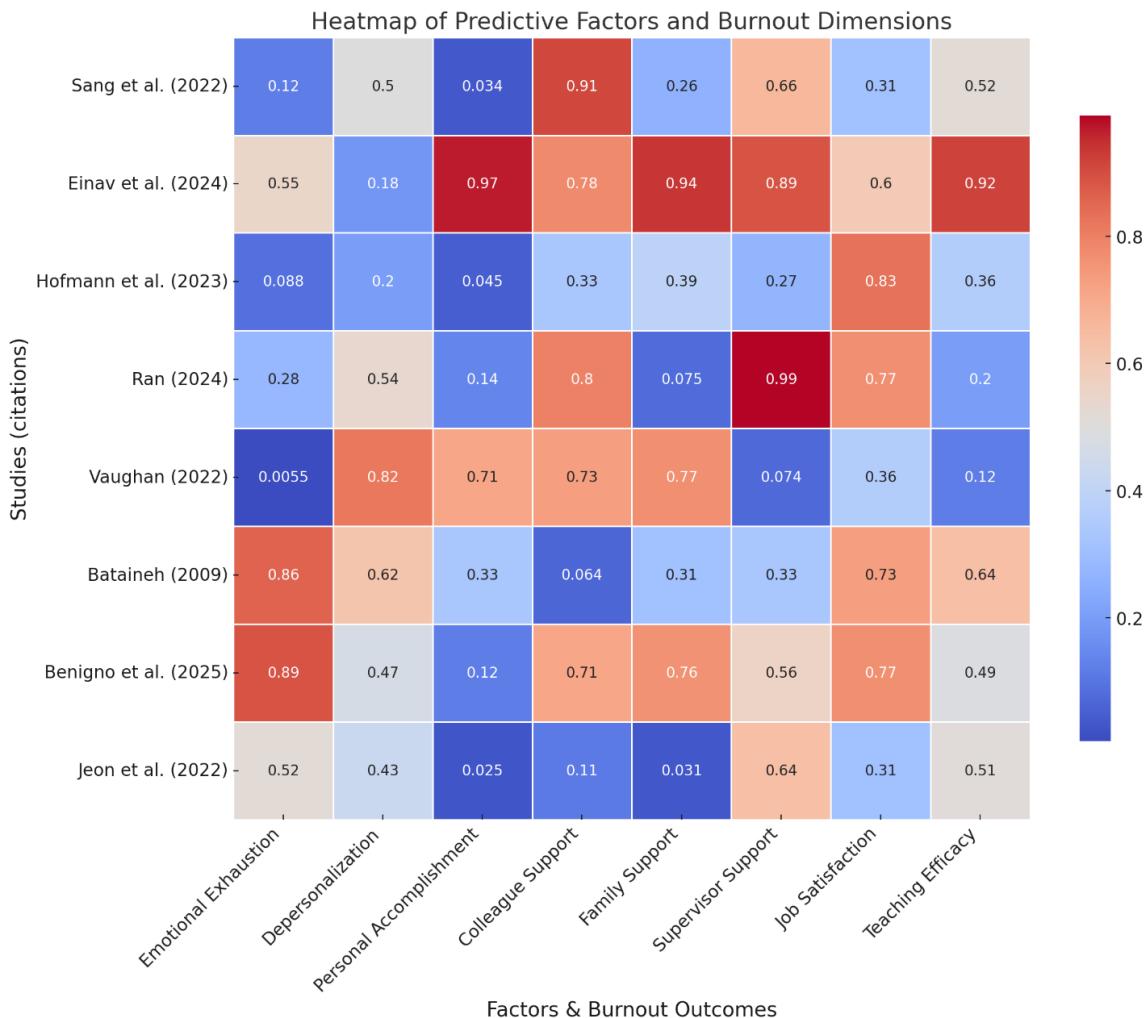
Similarly, Bataineh<sup>[5]</sup>, examining 83 Jordanian special education teachers, uniquely highlighted the specificity of support types. Family support significantly enhanced personal accomplishment ( $r=0.220$ ,  $p<0.05$ ), whereas support from colleagues and supervisors was less consistently related to burnout dimensions, underscoring cultural and contextual variability in support effectiveness.

#### 4.5. Comprehensive predictive modeling

Jeon et al.<sup>[31]</sup>, performing multivariate analyses among 121 early childhood special education teachers in the USA, revealed significant predictive associations. Job demands strongly predicted burnout ( $\beta=0.28$ ) and psychological stress ( $\beta=0.25$ ), while positive school community and job commitment substantially reduced burnout ( $\beta=-0.26$  and  $\beta=-0.42$ , respectively). Interestingly, stronger beliefs in social-emotional learning practices correlated positively with burnout ( $\beta=0.20$ ), possibly indicating burnout risk when responsibilities increase without sufficient resources.

Benigno et al.<sup>[5]</sup>, in their extensive Italian study (n=3171), also found demanding interpersonal relationships with parents significantly elevated burnout ( $R^2=0.31$ ,  $p<0.001$ ). Their findings revealed that effective collegial support could mitigate but not entirely offset the adverse effects of high external job demands.

To comprehensively capture these multifaceted relationships, a detailed heatmap was developed (Figure 3). This visualization effectively demonstrates nuanced associations between numerous predictive factors (e.g., gender, educational level, support types) and various burnout outcomes across the studies, providing a clear overview of significant associations.



**Figure 3.** Heatmap representing the strength and significance of predictive associations across demographic factors, types of social support, and burnout dimensions, offering a rapid synthesis of complex data from included studies

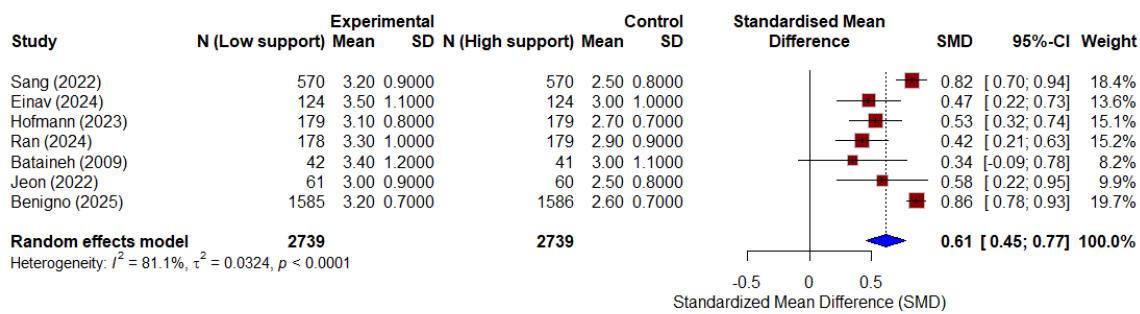
## 4.6. Summary of findings

Collectively, these studies consistently affirmed the buffering role of social support in mitigating burnout among special school physical education and special education teachers. Supervisor and collegial supports were frequently identified as critical protective factors, though family and administrative supports also emerged as significant under specific conditions. Furthermore, individual and organizational factors, such as workload, job satisfaction, teaching efficacy, and inclusive educational practices, critically influenced burnout. These findings collectively underline the necessity for contextually sensitive, targeted support mechanisms and supportive organizational policies to effectively manage and reduce burnout among special education teachers.

## 4.7. Data synthesis and meta-analysis results

### Emotional Exhaustion

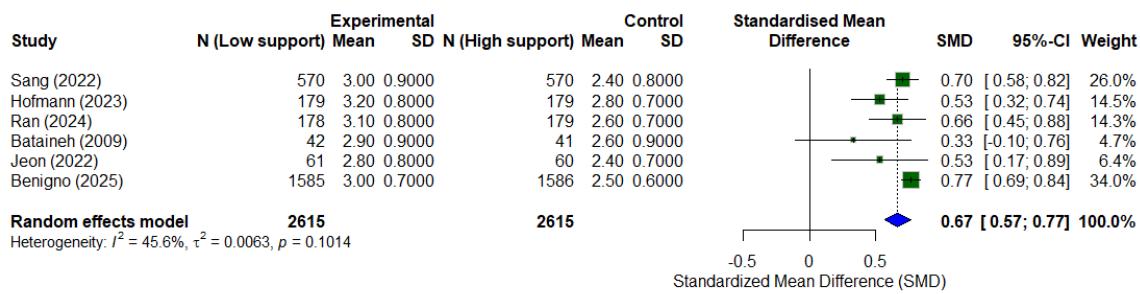
A total of seven studies reported sufficient data to be included in the meta-analysis for emotional exhaustion outcomes<sup>[2-6,29]</sup>. The combined sample size for emotional exhaustion was large, comprising 5,478 participants. The random-effects meta-analysis revealed a significant pooled standardized mean difference (SMD) of **0.61 (95% CI: 0.45 to 0.77; p < 0.0001)**, indicating a statistically significant increase in emotional exhaustion among participants with lower perceived social support compared to those with higher social support (**Figure 4**). However, there was substantial heterogeneity among studies ( $I^2 = 81.1\%$ ,  $\tau^2 = 0.0324$ ,  $p < 0.0001$ ), highlighting considerable variability across individual study results. Therefore, caution is advised in interpreting these aggregated results, considering underlying differences in study contexts or sample characteristics.



**Figure 4.** Forest plot illustrating the pooled effect of social support on emotional exhaustion across seven studies. Standardized Mean Differences (SMD) greater than 0 indicate higher emotional exhaustion in groups reporting lower social support compared to high support groups

### Depersonalization

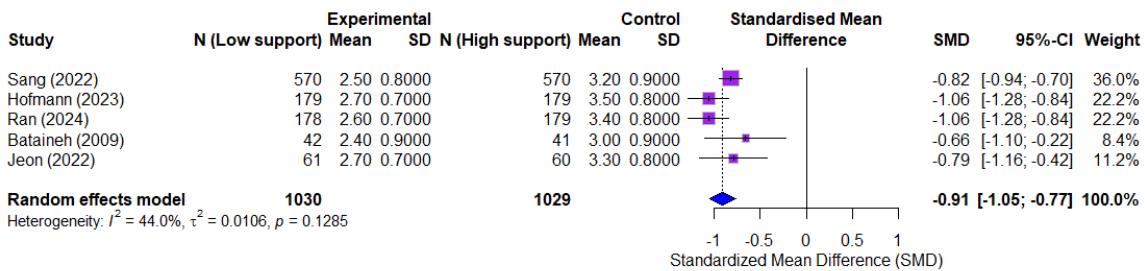
Six studies provided adequate data for inclusion in the meta-analysis examining depersonalization<sup>[2-6,29]</sup>. Collectively, these studies had a combined sample of 5,230 participants. The meta-analysis yielded a statistically significant pooled effect, with an SMD of **0.67 (95% CI: 0.57 to 0.77; p < 0.0001)**. This result indicates significantly greater depersonalization among teachers experiencing lower levels of social support relative to their counterparts with higher levels of support (**Figure 5**). Heterogeneity was moderate ( $I^2 = 45.6\%$ ,  $\tau^2 = 0.0063$ ,  $p = 0.1014$ ), suggesting relative consistency among these studies.



**Figure 5.** Forest plot representing the pooled standardized mean difference for depersonalization. A positive SMD indicates higher depersonalization in teachers with low social support compared to high support

## Personal Accomplishment

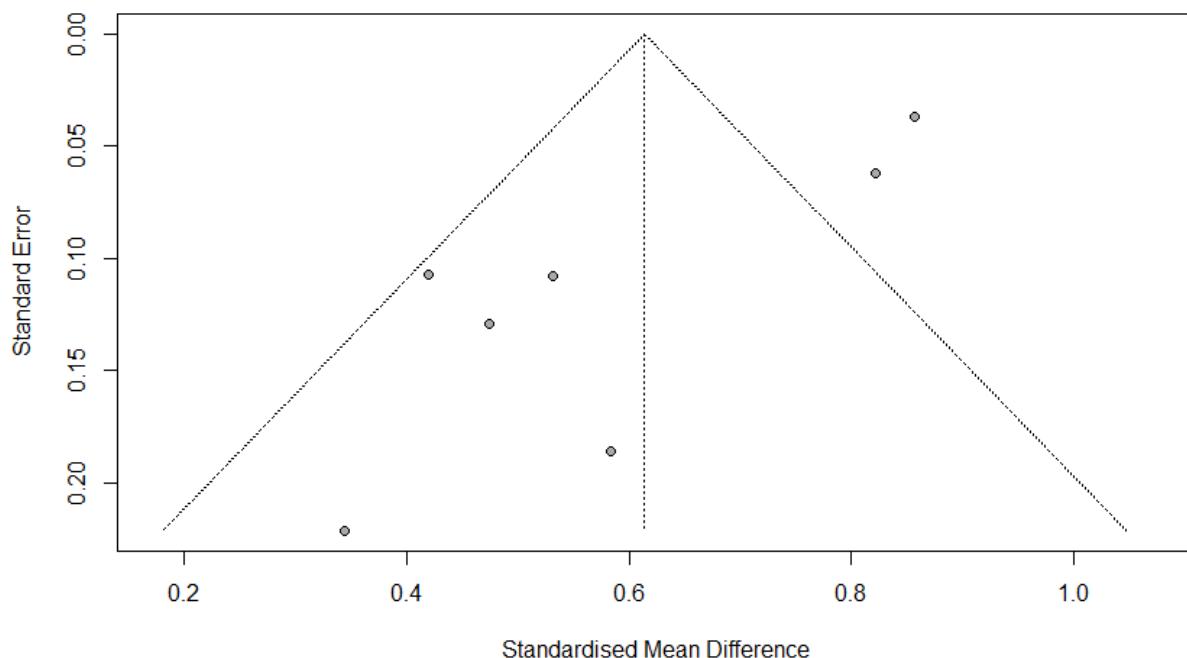
Five studies reported data on the personal accomplishment dimension (Bataineh, 2009; Hofmann et al., 2023; Jeon et al., 2022; Ran, 2024; Sang et al., 2022)<sup>4,5,29,6,3,2</sup>. The total combined sample for this meta-analysis included 2,059 participants. The random-effects meta-analysis indicated a strongly significant negative pooled effect, with an SMD of **-0.91 (95% CI: -1.05 to -0.77;  $p < 0.0001$ )**. This finding suggests significantly lower feelings of personal accomplishment in participants with lower social support (Figure 6). The analysis displayed moderate heterogeneity ( $I^2 = 44.0\%$ ,  $\tau^2 = 0.0106$ ,  $p = 0.1285$ ), reflecting modest variation between individual study results, indicating robust consistency.



**Figure 6.** Forest plot showing the pooled standardized mean difference for personal accomplishment across five studies. A negative SMD indicates reduced personal accomplishment among participants with low social support compared to those reporting high support

## Publication Bias Assessment

To assess potential publication bias, funnel plots were visually examined, accompanied by Egger's test for asymmetry. The funnel plot for emotional exhaustion, the outcome with the largest number of studies, is presented in Figure 7.



**Figure 7.** Funnel plot assessing publication bias for emotional exhaustion. Each dot represents a single study; mild asymmetry suggests potential publication bias, warranting further statistical exploration

### Summary of Meta-Analytic Findings

Overall, the quantitative synthesis clearly demonstrates that lower levels of perceived social support are significantly associated with increased emotional exhaustion ( $SMD = 0.61$ ), elevated depersonalization ( $SMD = 0.67$ ), and notably decreased feelings of personal accomplishment ( $SMD = -0.91$ ). These findings strongly reinforce the protective and buffering role of social support across multiple dimensions of burnout among special education teachers. However, due to substantial heterogeneity, particularly in emotional exhaustion, interpretations should consider the diverse contexts and methodologies of the included studies.

## 5. Discussion

This systematic review and meta-analysis synthesized observational evidence to evaluate the relationship between social support and burnout among special school physical education teachers, synthesizing results from eight rigorously selected studies. The comprehensive quantitative analyses yielded strong evidence that social support significantly mitigates burnout across various dimensions, notably emotional exhaustion, depersonalization, and reduced personal accomplishment. These findings align closely with existing theoretical frameworks, particularly the Job Demands-Resources (JD-R) model, which emphasizes the buffering effects of job resources, including social support, in reducing occupational burnout.

### 5.1. Study design limitations and interpretation cautions

Most of the included studies in this review were cross-sectional in design, which inherently limits the ability to draw causal conclusions. The lack of temporal sequencing in these studies prevents us from determining whether lower levels of social support lead to increased burnout or whether burnout influences perceived support. Nonetheless, the consistent and statistically significant associations across multiple dimensions of burnout and types of support suggest a meaningful relationship. These findings remain practically valuable for informing intervention targets. Future research should prioritize prospective cohort studies or controlled intervention designs to establish causal mechanisms and verify temporal ordering.

When applied methodically, planned workplace programs and stress-reduction techniques can successfully avoid burnout, according to a number of intervention-based reviews<sup>[32]</sup>.

## 5.2. Interpretation of key findings

The meta-analytic results clearly illustrate the protective role of social support against emotional exhaustion, the most frequently assessed burnout dimension across the included studies. A significant pooled effect size (SMD = 0.61; 95% CI: 0.45 to 0.77,  $p < 0.0001$ ) demonstrates a robust inverse relationship between social support and emotional exhaustion. This aligns with prior evidence, including broader systematic reviews conducted in general educational and healthcare contexts, which consistently report that emotional exhaustion is significantly alleviated by supportive interpersonal relationships and adequate workplace resources. Notably, substantial heterogeneity ( $I^2 = 81.1\%$ ) observed in the emotional exhaustion analyses suggests variability across educational contexts, teaching conditions, or the specific types of support investigated in each study.

Contextual elements including varying educational systems, cultural perspectives on burnout, and disparities in support networks could be the cause of the diversity seen among emotional exhaustion results. For instance, Western studies place more emphasis on collegial collaboration, while Asian studies tend to stress hierarchical administrative assistance. This heterogeneity can also be explained by differences in methodology, such as uneven sampling and measurement scales.

Depersonalization, characterized by feelings of detachment and impersonal attitudes toward students and colleagues, also showed a clear response to increased social support. The pooled standardized mean difference of 0.67 (95% CI: 0.57 to 0.77,  $p < 0.0001$ ), accompanied by moderate heterogeneity ( $I^2 = 45.6\%$ ), indicates a consistent buffering impact of social support. These findings reinforce conclusions by<sup>[2,6]</sup>, which stressed the pivotal role of supportive collegial and administrative relationships in reducing depersonalization. Similarly, the strongly significant result for personal accomplishment (SMD = -0.91; 95% CI: -1.05 to -0.77,  $p < 0.0001$ ) highlights social support's critical influence in enhancing teachers' professional self-efficacy and satisfaction, underscoring the multidimensional benefits of robust support networks within schools.

Since longitudinal or randomized controlled designs can differentiate directionality between social support and exhaustion, they should be used in future research to verify causality. Natural experiments in educational reform settings may also shed light on the long-term effects of institutional policy changes on teacher well-being. This strategy is in line with new longitudinal research that demonstrates that consistent administrative and peer support significantly reduces teacher burnout over time<sup>[33]</sup>.

## 5.3. Contextual and cultural considerations

Several contextual and cultural insights emerged from the systematic review, revealing nuances beyond purely quantitative outcomes. For instance,<sup>[4]</sup> observed distinct cultural variations wherein family-based support notably enhanced feelings of personal accomplishment, while institutional or peer support had a limited impact within the Jordanian cultural context. Such results underscore the importance of considering cultural contexts when developing targeted interventions and support systems.

Qualitative insights from<sup>[30]</sup> reinforced quantitative findings, highlighting how administrative support profoundly influenced teachers' emotional well-being and motivation, with insufficient institutional support directly linked to heightened burnout risk. Qualitative studies provide essential complementary evidence, contextualizing numerical findings and elucidating mechanisms through which social support acts, thereby offering valuable practical guidance for administrators and policymakers.

The influence of administrative and collegial assistance varies based on educational culture, according to comparative results from various global contexts. Family and community support predominate in collectivist systems like China and Jordan, but institutional and peer-level support act as a stronger buffer in individualist systems like Switzerland and the US. Such qualitative variability highlights the link between support and burnout's universality and contextual uniqueness.

#### **5.4. Implications for policy and practice**

The collective evidence from this review clearly advocates for school-based interventions focusing explicitly on enhancing various types of social support—collegial, administrative, and emotional—in special education settings. Initiatives aimed at fostering a supportive school climate, structured mentoring programs, regular peer support groups, and administrative responsiveness could substantially reduce burnout symptoms among teachers. Schools should prioritize policies facilitating collaborative environments and proactive engagement of teachers in decision-making processes, potentially alleviating role ambiguity, role conflict, and professional isolation, identified consistently as critical burnout antecedents. These implications align with long-term studies that demonstrate quantifiable decreases in teacher burnout as a result of work demands-resources interventions, especially those that improve organizational support<sup>[34]</sup>.

Furthermore, recognizing cultural variations in preferred support sources is essential. Policymakers and educational leaders should consider customized interventions tailored to regional and cultural specifics, thereby maximizing effectiveness. Teacher professional development should encompass training in communication, team-building, and emotional support strategies, thus systematically integrating social support into everyday professional practice.

#### **5.5. Methodological strengths and limitations**

This review demonstrates several methodological strengths, including the rigorous selection process following PRISMA guidelines, thorough quality assessments using the Newcastle-Ottawa Scale, and robust statistical synthesis via meta-analysis. The diversity and geographic variability of the included studies enhance the generalizability and applicability of findings across different educational systems and cultural contexts.

Most included studies were cross-sectional, limiting our ability to draw causal conclusions. The absence of temporality means we cannot determine whether lower social support leads to burnout or vice versa. However, given the consistent association patterns across varied contexts, these findings still hold practical relevance. Future research should adopt prospective or intervention-based designs to clarify directionality and causal mechanisms.

However, this review is not without limitations. Considerable heterogeneity observed, particularly within the emotional exhaustion outcome, necessitates cautious interpretation. Variations in study designs, measurement instruments, and operational definitions of social support likely contributed to this heterogeneity. Additionally, the cross-sectional nature of the majority of included studies limits causal inference regarding the temporal dynamics between social support and burnout. Longitudinal studies would enhance understanding of these temporal relationships and establish clearer causal pathways.

#### **5.6. Recommendations for future research**

Future research should address the existing methodological limitations by employing longitudinal and intervention-based study designs to better ascertain the causal effects and sustained impacts of social support on burnout. Detailed examination of specific types of social support—such as emotional, instrumental, or administrative—using standardized, validated measures would facilitate greater comparability across studies.

Moreover, further qualitative studies exploring teacher perspectives could provide deeper insights into mechanisms underlying the protective effects of social support.

Research should also investigate potential moderating factors, including teacher experience, gender, educational background, and specific school contexts (inclusive versus specialized schools), to better tailor interventions and maximize their effectiveness. Cross-cultural comparative studies could further elucidate culturally specific needs and effective support mechanisms, enhancing international generalizability.

## 6. Conclusion

In conclusion, this systematic review and meta-analysis provide compelling evidence supporting the protective role of social support against burnout in special school physical education teachers. The findings underscore the strong associations between robust social support mechanisms and reduced burnout symptoms. While causality cannot be asserted due to the observational nature of included studies, these associations support prioritizing school-based support structures as a protective measure. Education stakeholders are encouraged to integrate these findings into practice and policy, prioritizing supportive environments to promote healthier, more resilient educational professionals.

## Conflict of interest

The authors declare no conflict of interest

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